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Sup. Ct.

Vol. I

TRANSCRIPT OF RECORD

(Pages 1 to 784)

Supreme Court of the United States

OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY, APPELLANT,

vs.

STATE OF ARIZONA, EX REL. JOE CONWAY, ATTORNEY GENERAL OF THE STATE OF ARIZONA

APPEAL FROM THE SUPERIOR COURT OF THE STATE OF ARIZONA, COUNTY OF PIMA

FILED APRIL 12, 1944.

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VOL. I

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IN THE SUPERIOR COURT OF THE STATE OF ARIZONA IN AND FOR THE COUNTY OF PIMA

No. 20087

STATE OF ARIZONA, ex rel. Joe Conway, Attorney General of the State of Arizona, Plaintiff

vs.

SOUTHERN PACIFIC COMPANY, a corporation, Defendant

COMPLAINT—Filed April 19, 1940

Now comes the State of Arizona by Joe Conway, Attorney General of the State of Arizona, and brings this action on behalf of the State of Arizona, a body politic, against Southern Pacific Company, a corporation organized and existing under the laws of the State of Kentucky and operating a railroad in the State of Arizona.

For a first cause of action plaintiff alleges:

That on May 16, 1912, the Governor of the State of Arizona approved an act of the Legislature of the State of Arizona entitled "An act limiting the number of cars in a train," which act was afterwards, on referendum at a general state election held November 5, 1912, approved by a majority of the voters of said state voting at said election (Laws, 1913, Referendum, p. 15; Sections 2166-2168, Revised Statutes of Arizona, 1913, Civil Code; Section 647 Revised Code of Arizona, 1928), and ever since has been and now is in full force and effect. Said Act has no preamble [fol. 2] and reads as follows:

"Section 1. It shall be unlawful for any person, firm, association, company or corporation, operating any railroad in the state of Arizona, to run, or permit to be run, over his, their, or its line of road, or any portion thereof, any train consisting of more than seventy freight, or other cars, exclusive of caboose.

"Section 2. It shall be unlawful for any person, firm, association, company or corporation, operating any railroad in the state of Arizona, to run, or permit to be run, over his, their, or its line of road, or any portion

thereof, any passenger train consisting of more than fourteen cars.

"Section 3. Any person, firm, association, company or corporation, operating any railroad in the state of Arizona, who shall wilfully violate any of the provisions of this act, shall be liable to the state of Arizona for a penalty of not less than one hundred dollars, nor more than one thousand dollars, for each offense; and such penalty shall be recovered, and suits therefor brought by the attorney general, or under his direction, in the name of the state of Arizona, in any county through which such railroad may be run or operated, provided, however, that this act shall not apply in cases of engine failures between terminals.

"Section 4. All acts and parts of acts in conflict with the provisions of this act are hereby repealed."

That said Act is generally known as, and is hereinafter referred to as, the Arizona Train Limit Law.

That said defendant is, and was at all times herein mentioned, operating a railroad in and through the State of Arizona; that in violation of the Arizona Train Limit Law said defendant, on April 4, 1940, wilfully run, or permitted to be run, over its railroad or line of road in the County of Pima, State of Arizona, a freight train consisting of more than seventy freight, or other cars, exclusive of caboose; [fol. 3] that said freight train consisted of ninety-one freight, or other cars, exclusive of caboose, and was run by defendant, or permitted by defendant to be run, over defendant's railroad or line of road westward from Tucson in the county of Pima, State of Arizona, leaving Tucson at or about 12:30 o'clock P. M. on said 4th day of April, 1940.

Plaintiff further alleges that by reason of the said violation of said Arizona Train Limit Law said defendant is liable to the plaintiff, State of Arizona, in an amount no less than one hundred dollars nor more than one thousand dollars, to be fixed by the court.

For a second cause of action plaintiff alleges:

That on May 16, 1912, the Governor of the State of Arizona approved an act of the Legislature of the State of Arizona entitled "An act limiting the number of cars in a train," which Act was afterwards, on referendum at a gen-

eral state election held November 5, 1912, approved by a majority of the voters of said state voting at said election (Laws, 1913, Referendum, p. 15; Sections 2166-2168, Revised Statutes of Arizona, 1913, Civil Code; Section 647 Revised Code of Arizona, 1928), and ever since has been and now is in full force and effect. Said Act has no preamble and reads as follows:

"Section 1. It shall be unlawful for any person, firm, association, company or corporation, operating any railroad in the state of Arizona, to run, or permit to be run, over his, their, or its line of road, or any portion thereof, any train consisting of more than seventy freight, or other cars, exclusive of caboose.

[fol. 4] "Section 2. It shall be unlawful for any person, firm, association, company or corporation, operating any railroad in the state of Arizona, to run, or permit to be run, over his, their, or its line of road, or any portion thereof, any passenger train consisting of more than fourteen cars.

"Section 3. Any person, firm, association, company or corporation, operating any railroad in the state of Arizona, who shall wilfully violate any of the provisions of this act, shall be liable to the state of Arizona for a penalty of not less than one hundred dollars, nor more than one thousand dollars, for each offense; and such penalty shall be recovered, and suits therefor brought by the attorney general, or under his direction, in the name of the state of Arizona, in any county through which such railroad may be run or operated, provided, however, that this act shall not apply in cases of engine failures between terminals.

"Section 4. All acts and parts of acts in conflict with the provisions of this act are hereby repealed."

That said Act is generally known as, and is hereinafter referred to as, the Arizona Train Limit Law.

That said defendant is, and was at all times herein mentioned, operating a railroad in and through the State of Arizona; that in violation of the Arizona Train Limit Law said defendant, on March 2, 1940, wilfully run, or permitted to be run, over its railroad or line of road in the County of Pima, State of Arizona, a passenger train consisting of more

than fourteen cars; that said passenger train consisted of sixteen cars, and was run by defendant, or permitted by defendant to be run, over defendant's railroad or line of road westward from Tucson in the County of Pima, State of Arizona, leaving Tucson at or about 5:45 o'clock P. M. on said 2nd day of March, 1940.

[fol. 5] Plaintiff further alleges that by reason of the said violation of said Arizona Train Limit Law said defendant is liable to the plaintiff, State of Arizona, in an amount not less than one hundred dollars nor more than one thousand dollars, to be fixed by the Court.

Wherefore, the plaintiff, State of Arizona, prays judgment:

1. That the Court fix and determine the amount of the penalty, not less than one hundred dollars nor more than one thousand dollars, to be adjudged against the defendant, Southern Pacific Company, by reason of plaintiff's first cause of action.

2. That plaintiff, State of Arizona, have judgment against the defendant, Southern Pacific Company, on said first cause of action in the amount so fixed and determined by the Court.

3. That the Court fix and determine the amount of the penalty, not less than one hundred dollars nor more than one thousand dollars, to be adjudged against the defendant, Southern Pacific Company, by reason of plaintiff's second cause of action.

4. That plaintiff, State of Arizona, have judgment against the defendant, Southern Pacific Company, on said second cause of action in the amount so fixed and determined by the court.

Joe Conway, Attorney General, W. E. Polley, Assistant Attorney General.

Charles L. Strouss, 703 Heard Building, Phoenix, Arizona, Of Counsel.

[fol. 6] [File endorsement omitted]

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA, IN AND FOR THE COUNTY OF PIMA

[Title omitted]

ORDER STAYING OTHER PROCEEDINGS—Filed April 19, 1940

On the affidavit and motion of the Attorney General of the State of Arizona,

It Is Now Ordered that all proceedings by any state officer or officers, other than the proceedings herein, under the Arizona Train Limit Law (Laws, 1913, Referendum, p. 15; Section 2166-2168 Revised Statutes of Arizona, 1913, Civil Code; Section 647 Revised Code of Arizona, 1928) be, and are hereby, stayed and restrained pending the determination of this proceedings.

Done in open court this 19 day of April, 1940.

Wm. Hall, Judge.

[fol. 7] [File endorsement omitted]

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA IN AND FOR THE COUNTY OF PIMA

[Title omitted]

ANSWER—Filed May 9, 1940

Southern Pacific Company, a corporation, the above-named defendant, for answer to the complaint on file in the above-entitled cause, admits, alleges, and denies as follows:

I

For answer to the alleged first cause of action set forth in said complaint:

1. Defendant admits that the statute of Arizona known as the Arizona Train-Limit Law (Arizona Revised Statutes, 1928, Section 647) was enacted in 1912, and that the text of said statute is correctly set forth in said first cause of action.

2. Defendant admits that, on April 4, 1940, substantially as in said first cause of action alleged, it operated or permitted the operation of a freight train consisting of more than 70 cars, exclusive of caboose, and that said train was operated over its line of railroad in Pima County, westward from Tucson, departing therefrom about 12:30 P. M. on April 4, 1940, and in this behalf defendant alleges that said train was then and there being operated in interstate commerce, and consisted in large part of cars moving in interstate commerce and carrying interstate traffic; but defendant denies that in so causing or permitting the op- [fol. 8] eration of said train, or in any other respect, it acted wilfully, or that such operation of said train was in any respect, or at all, a wilful violation of said Train-Limit Law.

3. Defendant denies that it has wilfully or otherwise violated said Train-Limit Law, either on the date or in the manner alleged in said purported first cause of action, or otherwise, or at all; and denies that it is liable to the plaintiff, by reason either of the circumstances alleged in said first cause of action, or otherwise, in either the amounts specified in said first cause of action, or in any other sum or amount whatsoever.

II

For answer to the alleged second cause of action set forth in said complaint:

1. Defendant admits that the statute of the State of Arizona known as the Arizona Train-Limit Law (Arizona Revised Statutes, 1928, Section 647) was enacted in 1912, and that its text is correctly set forth in said second cause of action.

2. Defendant admits that, on March 2, 1940, substantially as in said second cause of action alleged, it operated or permitted the operation of a passenger train consisting of more than 14 cars, and that said passenger train was operated over its line of railroad in Pima County, westward from Tucson, departing therefrom at or about 5:45 o'clock P. M. on said March 2, 1940; and in this behalf defendant alleges that said passenger train was then and there being operated in interstate commerce, and consisted

in large part of cars moving in interstate commerce and carrying interstate traffic; but defendant denies that in so causing or permitting the operation of said passenger train, or in any other respect, it has acted wilfully, or that such operation of said passenger train was in any respect a wilful violation of said Train-Limit Law.

[fol. 9] 3. Defendant denies that it has wilfully, or otherwise, violated said Train-Limit Law, either upon the date or in the manner set forth in said second cause of action, or otherwise, or at all; and denies that it is liable to the plaintiff, by reason either of the circumstances alleged in said second cause of action, or otherwise, in either the amounts specified in said second cause of action, or in any other sum or amount whatsoever.

III

For a first, separate and affirmative defense to said complaint, and to each and both of the alleged causes of action therein set forth, defendant alleges and shows that said Train-Limit Law is wholly void, invalid, unconstitutional, and unenforceable as to the defendant, and as to each and all of the train operations of the defendant, both within and without the State of Arizona, for the reasons hereinafter set forth, as follows:

1. Status of Defendant as an Interstate Common Carrier by Rail.

Defendant now is, and at all times herein mentioned has been, engaged as a common carrier in interstate commerce, in the operation of lines of railroad situated in the States of Oregon, California, Nevada, Utah, Arizona, Texas and New Mexico, and in the transportation of passengers and property from, to and between points in each and all of said states. At all times herein mentioned defendant, as such interstate common carrier by railroad, has been and now is subject to the provisions of the Act of Congress approved February 4, 1887, and Acts amendatory thereof and supplementary thereto, known as the Interstate Commerce Act.

2. Description of Defendant's Lines of Railroad.

Defendant's main lines extend from San Francisco, California, to Portland, Oregon, and across the State of Nevada

to Ogden, Utah; and extend also from San Francisco, south-
[fol. 10] easterly to Los Angeles, California, and thence to Yuma, Arizona, and thence across the southern part of the States of Arizona and New Mexico, via El Paso, Texas, to Tucumcari, New Mexico. At each of said points other than Yuma, as well as at numerous other points, defendant's lines connect with the lines of other interstate rail carriers, and thus enter into and become part of through routes for the transportation of freight and passengers between all parts of the United States, and to and from adjacent foreign countries.

The major portion of the interstate freight traffic transported by defendant across or partly in Arizona over its southern Arizona route is handled by way of the main line which extends through Indio, California, Yuma, Maricopa and Tucson, Arizona, and Lordsburg, New Mexico, to El Paso, Texas. Defendant also has an alternate main line, which departs from the Yuma-Maricopa-Lordsburg line just described at Wellton, Arizona, and runs thence northeasterly to Phoenix, Arizona, and thence southeasterly to Picacho, Arizona, where it joins the Yuma-Maricopa-Lordsburg line. A second alternate main line of the defendant leaves the Yuma-Maricopa-Lordsburg line at Mescal, Arizona (about 30 miles easterly from Tucson) running thence via Douglas, Arizona, to El Paso, Texas. The three lines of the defendant just described, considered together, afford to it practically two lines for the entire distance from Yuma to El Paso; but, except for short stretches of double-track near Yuma, Phoenix, and El Paso, and a double-track district about 43 miles in length between Stockham and Mescal, Arizona, these lines are operated as single-track lines.

Passenger traffic which originates in or crosses Arizona uses all these lines; but because the route between Yuma and Tucson via Phoenix is somewhat longer than via Maricopa, through interstate freight trains between Yuma and Tucson are generally routed via Maricopa. Between Tuc-
[fol. 11] son and El Paso, about 65 per cent of the through interstate freight traffic is moved via Lordsburg, and about 35 per cent via Douglas.

Defendant's main lines cross southern Arizona and New Mexico on comparatively light grades and through much level territory. They are well constructed, according to the

best modern railroad standards, and capable of sustaining the heaviest and most powerful locomotives owned or operated by defendant. They are equipped throughout with automatic block signals, and numerous other devices promoting safety of operation. The operating conditions upon said main lines generally are relatively favorable to speed, safety, and economy of operation.

The operating conditions upon defendant's main lines across Nevada and Utah are closely similar to those upon the main lines across Arizona and New Mexico. Said lines in Nevada and Utah are well constructed, according to the best modern railroad standards, and are equipped throughout with automatic block signals and numerous other devices promoting safety of operation.

3. Effect of the Train-Limit Law upon Defendant's Train Operations, particularly Freight Trains.

(a) Railroad operating conditions, both on defendant's lines in Arizona, and elsewhere, and on railroads throughout the United States generally, differ substantially from the operating conditions which existed in 1912, when the Arizona Train-Limit Law was passed, in that since 1912, and more especially since 1920, great improvements have been made in both road and equipment. Tracks, roadbeds, and bridges have been made stronger; grades and curves have been reduced or eliminated; side tracks and passing tracks have been lengthened; block signals and other safety devices have been installed; safer and more powerful locomotives, and stronger freight and passenger cars have been built and acquired. The greater part of these improvements has taken place since 1920, and has been accomplished by the expenditure of large sums of money, [fol. 12] which expenditures in many instances have been sanctioned by the Interstate Commerce Commission, under Section 20a of the Interstate Commerce Act. This is particularly true with respect to the acquisition of large and powerful locomotives designed and used for the handling of trains consisting of more than 70 freight cars, or more than 14 passenger cars. These and other expenditures have been made largely for the purpose of increasing the lengths and the loading of trains, and promoting the safety of handling thereof, so as to bring about and maintain safer and more efficient and economical operations.

(b) The locomotives and cars now used on defendant's main lines in Arizona, and elsewhere, have been greatly and continually improved since 1912, and have thus been made stronger and better able to withstand the most arduous and serious conditions. The standard locomotives generally used by defendant at the present time have been and are built with heavier frames and running gears, improved and strengthened brake equipment, draft gears and attachments, and air pumps of increased capacity. The boilers also have been much improved; and many if not all of such locomotives are equipped with feed-water heaters, super-heaters, and other modern devices designed to promote safety, efficiency and economy in operation.

The freight and passenger cars used in defendant's trains in the State of Arizona have likewise been greatly improved since 1912, and particularly since 1920. In 1912 about 40 per cent of the freight cars of the defendant were equipped with wooden underframes; that type of car has now been entirely withdrawn from main-line and interchange service, and all freight cars now used in such service are equipped with steel underframes. Modern draft gears and modern standard single-plate cast-iron wheels have been installed upon defendant's freight equipment. Improvements have been made in the air-brake triple-[fol. 13] valves in such freight cars, the result of which is practically to eliminate unintended emergency-brake applications.

(c) Since 1920 defendant has spent approximately $9,000,000.00 in Arizona, primarily for the purpose of improving its tracks, track facilities and terminals, and in installing block signals and other safety devices. Defendant has also invested about $13,000,000.00 further in Arizona, since 1920, in the rehabilitation, construction, and reconstruction of the alternate main line from Wellton through Phoenix to Picacho, heretofore described. The track, roadbed, and bridges on the defendant's main lines in Arizona and elsewhere are capable of carrying the heaviest locomotives owned by said defendant; and there is no reason, from the standpoint of climatic conditions, or track, grades, or curvatures, or the strength or capacity of road and equipment now owned and available, why defendant could not at once commence the operation, on its main lines in Arizona and in the adjacent states of California and New

Mexico, where the Arizona Train-Limit Law operates to restrict the length of trains, of a very substantial number of freight-train units of substantially more than 70 freight or other cars, and passenger-train units of substantially more than 14 passenger-cars, and thus operate its lines of railroad in said territory more safely, efficiently, and economically, and in line with the best modern railroad practices, and thereby secure the benefits of immediate, substantial, and much-needed operating economies.

(d) Prior to 1912, freight trains containing more than 70 cars were operated mostly on favorable grades, or consisted in whole or in large part of empty cars. Principally by reason of improvements in roadbed, equipment, and operating methods, made since that time, heretofore described in part, the operation of through trains containing more than 70 freight or other cars, either loaded or empty cars or both, on main trunk lines, including those of de- [fol. 14] fendant, has become and ever since about the year 1924 has been, and now is, the common standard railroad practice throughout the United States, except in Arizona, and the adjacent portions of California and New Mexico where the Arizona Law operates with extraterritorial effect; and the maximum lengths of such freight trains, outside of Arizona, are very much greater than those permitted in said state.

Except in Arizona and adjacent territories affected by said Train-Limit Law, freight is now transported between all parts of the United States, in trains of more than 70 cars, upon dependable schedules; and such schedules are one-half to one-third faster than prevailed prior to 1924. Such common standard operation of freight trains of more than 70 cars, upon such faster schedules, has made possible the nationwide distribution and consumption of the perishable and other products (including livestock) of California and Arizona, as well as other states and localities, moving in interstate and foreign commerce over the lines of defendant and its railroad connections.

Trains of greater lengths than 70 freight or other cars are handled by locomotives of modern type, of which those owned and operated by the defendant are typical, whose runs now extend for several hundred miles, in many cases passing through or across two or more states. The efficiency and economy of operation of such locomotives de-

pend upon the extent to which the trains which they handle are heavy enough so that their tractive power may be utilized to the fullest practicable extent. The improved methods of operation, of which the operation of trains of more than 70 cars is an essential part, have practically eliminated car shortages, which were frequently experienced prior to 1924, and have made it possible to reduce greatly the stocks of merchandise formerly required to be carried in order to protect against traffic congestion and delay: all of which [fol. 15] has been of great benefit to the commerce of the country, and particularly to the states and communities served by defendant's lines, which is and are largely dependent upon prompt, efficient, and reliable transportation at reasonable rates.

(e) The operation of freight trains containing substantially more than 70 freight or other cars, exclusive of caboose, and of passenger trains containing substantially more than 14 cars, subject to the requirements of traffic (which method of operation is herein, for convenience, referred to as "standard long-train operation"), is a general practice on the main trunk lines of all the major steam railroads throughout the United States, and on the main lines of railroad of the defendant, and its principal competitors and connections, except in Arizona and contiguous territory where the Arizona Train-Limit Law has extraterritorial effect. The operating conditions under which such standard long-train operation is carried on are substantially as favorable, generally speaking, as those on the main lines of the defendant in Arizona. The practice of such standard long-train operation has not retarded and does not retard, but on the contrary expedites materially the movement of the traffic carried therein, and does not delay, but on the contrary promotes and makes possible the early delivery of such traffic.

Freight trains of more than 70 freight or other cars, exclusive of caboose, and passenger trains of more than 14 cars, are commonly, safely, and economically operated through the United States, outside of Arizona, over lines of railroad substantially similar to the main lines of the defendant in Arizona; and there is no reason, from the standpoint of safety, or otherwise, why the length of defendant's freight or passenger trains in Arizona should be limited as required by the Arizona Train-Limit Law.

(f) By its terms the Arizona Train-Limit Law applies to [fol. 16] and regulates trains only within Arizona. However, it is wholly impracticable to split up or consolidate trains at state boundary lines, unless terminals are there located. While defendant has a terminal at Yuma, adjoining the California-Arizona boundary line, its nearest New Mexico terminal upon the Yuma-Maricopa-Lordsburg line is at Lordsburg, New Mexico, about 23 miles east of the Arizona line. Upon the Tucson-Douglas-El Paso line there is no terminal between the Arizona-New Mexico boundary, and the terminal at El Paso, Texas, about 166 miles east of said boundary. No facilities now exist at or adjacent to either of the points where defendant's two said main lines cross the Arizona-New Mexico boundary, whereby westbound trains of greater lengths than permitted by the Arizona Law could be reduced in length so as to conform to said law, or eastbound trains conforming to the law's limitations consolidated into the larger units permitted by the laws of New Mexico; and no such facilities could be constructed at or adjacent to either or both of said boundary-line points except at great expense.

The inevitable result of the Arizona Law is therefore to control completely train lengths between the boundary line of Arizona and the aforesaid terminals in New Mexico and Texas nearest thereto. But, on account of the transportation service required and furnished for eastbound perishable freight, traffic requirements ordinarily forbid its delay, either while trains are being split up at the first terminal west of or at the Arizona boundary line, or while trains are being consolidated at the first terminal east of Arizona. Consequently, in many instances, eastbound perishable freight trains, originating at southern California points, must be made up into trains not longer than are permitted by the law, at such points of origin; and such short trains must be transported intact as far east as El Paso, Texas, more than 160 miles east of Arizona, at which point, because of the requirements of re-icing and re-classi- [fol. 17] fication for diversion purposes, consolidation into larger train units may be effected with a minimum of interference and delay. The locomotive power and crews used to handle eastbound trains, of lengths conforming to the Arizona Law, from their originating points in California to Yuma, and from Lordsburg to El Paso, must be returned

to their western termini; and it is therefore necessary either to run short (i. e., Arizona-size) westbound trains from El Paso and from Yuma, or to bring back the locomotives without load and the crews without work, but under pay.

(g) Solely by reason of defendant's compliance with said Arizona Train-Limit Law, the average and the maximum lengths of defendant's freight trains operated upon its aforesaid main lines across southern California, Arizona and New Mexcio have been, now are and will continue to be greatly reduced below the average and maximum lengths which otherwise would obtain; by reason of which compliance with said Train-Limit Law, defendant has been compelled and will continue to be compelled to operate a substantially larger number of such trains and therefore to produce, as a result of such operations, a substantially greater number of train miles and locomotive miles for the handling of the same absolute volume of traffic, whether measured in cars handled or in car miles produced. The effect of such compliance with said Train-Limit Law is not and will not be confined to Arizona; for, as aforesaid, said Train-Limit Law operates and will continue to operate regularly and completely to control the lengths of defendant's freight trains, and the number thereof to be operated, not only upon defendant's lines in Arizona, but also upon its lines in California at least as far west as Indio, and upon its lines in New Mexico and Texas at least as far east as El Paso, Texas.

Detailed cost studies made by the defendant show that the additional financial burden to which it is subjected by [fol. 18] reason of the law, upon that portion of its main line which extends from Indio, California, via Yuma, Maricopa, and Lordsburg, to El Paso, amounts to more than $300,000.00 each year, which figure relates to freight train operations upon said line only, and does not include any additional expense imposed upon and incurred by reason of the limitation of the law upon the lengths of passenger trains. If it were not for the law, substantial additional savings could also be made by the defendant in the operation of its freight trains upon its auxiliary main line through Phoenix, and its auxiliary main lines from Tucson via Douglas to El Paso, both of which main lines constitute portions of its through routes from California and Arizona

to destinations east thereof; although neither of these routes was included in the above mentioned detailed cost studies made by the defendant.

Substantial additional savings, also not included in said cost study or in the above figure of $300,000.00, would also be made by defendant, by running and thus utilizing to the fullest practicable extent the tractive power of large locomotives, between points outside of Arizona and points in said state; and by shifting such large locomotives between the Arizona lines and similar lines outside of Arizona, in order to take care of peak seasonal business, thereby reducing the aggregate number of locomotives required and increasing the use and efficiency of the locomotives used. From the standpoint of aggregate power, large locomotives cost less in proportion to their tractive effort than do smaller ones; and under standard long-train methods of operation defendant's investment in motive power would be reduced because less total tractive power, at a lower cost per unit, would be required to handle the total traffic. Furthermore, under standard long-train operation, substantially less fuel would be required, so that the cost of hauling company fuel would be substantially reduced.

[fol. 19] (h) The standard long-train method of operation, heretofore and presently followed by defendant, except in Arizona and the adjacent districts where the Arizona Law operates with extraterritorial effect, results in safe, efficient and economical operation, at unit costs which are greatly reduced as compared to those experienced in prior years, and are also less than those incurred in Arizona and the contiguous territory where the Train-Limit Law operates with extraterritorial effect. Solely because of the Arizona law, defendant now is and will continue to be subjected to irreparable and continuing financial burden and expense amounting to at least $300,000.00 per year, being the difference between the expense of the short-train method of operation required by the Arizona Law, and the expense of the standard long-train method of operation heretofore defined, which is presently being followed elsewhere than in Arizona and adjacent territory, and would be adopted and followed in Arizona and said adjacent territory if it were not for the Arizona Law.

(i) The effect of the law is greatly and directly to interfere with and delay defendant's interstate freight traffic

while in the course of transportation out of, into, across, and within Arizona; and also greatly, directly and unreasonably to delay and interfere with the interstate freight traffic moving on defendant's main lines in California and New Mexico; because, as heretofore stated, the trains on those lines, destined to points within or beyond Arizona, must be initially made up, or split up either at the nearest terminals to Arizona or at terminals farther removed, so as to conform to the restrictions of the Arizona statute; and trains moving across Arizona, or from points within that state, destined to points in adjoining states or beyond, must be consolidated, either at the first terminals outside of Arizona or at terminals farther removed, so as to avoid carrying them, with the increased operating and other ex- [fol. 20] penses incident to such short-train operation, until they reach their destinations; and also because the increase in the number of trains run, inevitably resulting from the operation of the law, causes the number of meetings and passings of the trains, both freight and passenger, incident to the operation of defendant's lines of railroad, to be greatly and disproportionately increased, over and above those which would be required if it were not for the law, with resulting delay to each and all of the trains involved in such meetings and passings.

4. *Effect of the law upon defendant's passenger-train operations.*

(a) The passenger-train provisions of said Train-Limit Law are wholly arbitrary and unreasonable, and without any relation whatsoever to safety, efficiency, or economy of operation, and in fact result in imposing direct and irreparable financial burdens upon defendant, and in increased hazards; moreover, the law has an even greater extraterritorial effect upon passenger-train than upon freight-train operation. While the financial burden imposed upon passenger-train operation is not as great as that imposed by the law upon freight-train operation, nevertheless it is substantial in amount.

Except in the State of Arizona and in contiguous territory affected by the Arizona Train-Limit Law, passenger trains of more than 14 cars are regularly operated by defendant, and by other railroads generally, whenever and wherever traffic requirements make such operation advis-

able; and in the aggregate great numbers of such passenger trains are operated. The competition of other forms of transportation makes it imperatively necessary that passenger-train operation be carried on with the utmost economy.

Because of the Arizona Train-Limit Law, many passenger trains of the defendant must be initially made up, or, before reaching that state, broken up, so as to comply with [fol. 21] the limitations of said law. In order to minimize the effects of said law, and avoid breaking up trains, passenger-train cars are constantly being removed from passenger trains of more than 14 cars, and placed in shorter trains at terminals near Arizona, and at terminals farther removed, whenever and wherever such shifting may be accomplished with a minimum of interruption to traffic.

(b) The limitations fixed by said Train-Limit Law interfere with the movement of passenger-train equipment of all kinds, and particularly with the movement of empty equipment, which, on account of seasonal fluctuations in traffic, must at times be moved in one direction and at other times in the opposite direction. Such equipment could readily be handled on regular passenger trains, without interfering in any way with their ordinary operations, or with the safety or comfort of the passengers or the employes, if it were not for the law.

In addition to the passenger traffic carried on regular trains, which fluctuates greatly from day to day, in many cases special trains for or from Pacific Coast points, or for tours involving movement upon defendant's lines across Arizona, are chartered by parties, too large to be accommodated adequately in trains of 14 cars or less, which said parties desire for social or business reasons to travel together. They can travel by defendant's Arizona lines only if willing to be subjected to the inconvenience of having a part of the party handled in a second train, or having one or more baggage or other cars not actually occupied by them hauled in some other train, while in Arizona. In consequence, defendant is placed at a disadvantage in soliciting and handling such business in competition with other lines running to and from the Pacific Coast, north of Arizona; and the parties who travel via defendant's lines are subjected to inconvenience, delay, and interference while on their trips within and/or across Arizona.

[fol. 22] Solely as a result of said Train-Limit Law, defendant is forced to run numerous extra trains, involving substantial additional expense, not only for the operation of such extra trains themselves, but also in returning the extra crews and extra engines from the destination points of the extra trains to their home terminals, and of sending the extra engines and extra crews from their home terminals to the points where the extra trains originate.

(c) Detailed cost studies made by defendant show that the financial burden to which it is subjected by reason of the effect of the Train-Limit Law upon its passenger-train operations, in the territory between Los Angeles, California, and El Paso, Texas, amounts to more than $10,000.00 each year, which figure relates to passenger operations in said territory only, and does not include any additional expense imposed upon and incurred by reason of the limitations of the law upon the lengths of freight trains. Moreover, compliance with the law requires defendant to operate a substantial number of extra trains within and across the State of Arizona, and in adjacent and contiguous territory where the Train-Limit Law operates with extraterritorial effect; and solely by reason of said law much equipment is required to be held out and forwarded on following trains, defendant is greatly handicapped in the operation of its passenger trains and in the solicitation of its passenger traffic, and is subjected to delay and interference, both within and outside of Arizona, by reason of the necessity of shifting cars from train to train in connection with the splitting up, in compliance with said law, of trains destined to points within or beyond Arizona, and the consolidation of trains after leaving Arizona so as to reduce the increased expenses caused by the Arizona Law as soon as practicable; and said expenses are and will continue to be irreparable, substantial, and of constant occurrence, and are and would be wholly unnecessary if it were not for the law; and all [fol. 23] of said additional unnecessary expenses could and would be saved and avoided, if defendant were to operate its trains without regard to said law, and in accordance with the standard methods of operation presently being followed elsewhere than in Arizona and the aforesaid adjacent territory, both on defendant's lines and on the lines of other railroad carriers with which it connects and competes.

5. *The law not a reasonable safety measure.*

Said Train-Limit law is arbitrary and unreasonable, and bears no reasonable relation to the health, comfort or safety of persons or the safety of property, and does not operate to promote the health or safety of employes, or passengers, or of the public otherwise. To the contrary, said law creates certain hazards which would not exist, except for the law, and increases other hazards of railroad operation. Said law is wholly unjustified as a supposed regulation by the State of Arizona in the purported interest of the health and safety of persons or property; it takes the defendant's property without due process of law, in violation of the Fourteenth Amendment to the Constitution of the United States and Section 4 of Article II of the Constitution of the State of Arizona, for the following reasons among others;

(a) Said Train-Limit Law is permissible and sustainable, if at all, only under the reserved police power of the State.

(b) Daily, defendant has tendered and delivered to it a large volume of freight, and a large number of passengers, for transportation as a common carrier in interstate commerce and in Arizona intrastate commerce. Its obligation as a common carrier is to receive, transport, and deliver such freight and passengers with all practicable safety, expedition and economy, and to furnish to shippers at receiving points on its lines a supply of empty cars, and to passengers who offer themselves for transportation a supply of accommodations, suitable and adequate for their needs.

[fol. 24] Those obligations defendant performs to the best of its ability; and in so doing it is necessary for it to operate, and it frequently and as a standard practice does operate, over its lines (except within Arizona and the adjacent territory where the Arizona Law has extraterritorial effect) freight trains of substantially more than 70 cars, exclusive of caboose, and passenger trains of more than 14 cars. Practically all of its freight trains carry interstate freight to a substantial extent; many of them almost entirely. Practically all its passenger trains carry interstate passengers, and mail, baggage, and express moving in interstate commerce. Such long-train methods of operation are not only more economical and more expeditious, as

heretofore alleged, but are also substantially safer than the methods of handling freight and passenger traffic, in Arizona and adjacent territory, which are compelled by the terms of the Arizona Law.

(c) On defendant's lines in Arizona, as well as on all steam railroads, the frequency of accidents to trains and of resulting casualties to those who are exposed to the hazards of train operation, including employes and members of the public not riding upon such trains, and employes and passengers on passenger trains, is directly related to the number of train units operated; and when more train units are operated than are necessary to handle a given amount of traffic, all hazards incident to the handling of that traffic are correspondingly increased. As heretofore alleged, the effect of said Train-Limit Law is proximately and directly to cause defendant to operate in Arizona and in the adjacent contiguous territory heretofore mentioned many more freight and passenger-train units than it would operate if it were not for said law, and therefore correspondingly to increase the hazards of defendant's train operations in Arizona and said affected contiguous territory.

(d) There is no hazard of freight-train operation, either [fol. 25] generally or as conducted by defendant, that can reasonably be said to be related to the number of cars in a freight train, or that can be or is removed or minimized or measurably reduced, by limiting freight trains in Arizona or elsewhere to 70 freight or other cars, exclusive of caboose. There is no hazard of passenger-train operation, either generally or as conducted by defendant, that can reasonably be said to be related to the number of cars in a passenger train, or that can be or is removed or minimized or measurably reduced, by limiting passenger trains in Arizona or elsewhere to 14 cars.

To the contrary, there are certain distinct and well-known hazards in train operation that are productive of accidents and casualties, and injuries to persons and damage to property, and that are definitely related to and increase with the number of train units operated, viz.:

(1) head-end and rear-end collisions of trains, with each other and with other vehicles using the same track;

(2) grade-crossing accidents, the hazard of which to a given number of users of a crossing is directly proportional to the number of trains run;

(3) casualties due to additional meets and passings of trains, in connection with which employes must go on top of trains and also leave and board them to open or after closing switches, and for other purposes made necessary by the meet or pass. The number of meets and passings does not vary in proportion to the trains run, but more nearly in proportion to the square of the number of trains run;

(4) accidents in yards, which are related to the number of trains made up or broken up in the yards;

(5) accidents due to defects in or failures of locomotives, the hazard of which ratably increases with the number of locomotives in actual service.

[fol. 26] (e) There is, moreover, a large class of hazards in all train operations, which produce accidents and casualties and which are directly related to and increase with the operation of an unnecessary and additional number of trains and the consequent employment and service of a correspondingly additional number of train-men and enginemen to man those additional trains.

More than half of the accidents and casualties that occur in the operation of steam railroads in Arizona and elsewhere are caused by the negligence of, disobedience of rules by, or inadvertence of employes. To require defendant to operate more trains than are reasonably necessary to handle the traffic offered to it will inevitably be to increase the hazard to the public, to employes, and to property, by increasing the number of opportunities for individual negligence, disobedience of rules and inadvertence by the employes handling such traffic. Further, by increasing the number of employes necessary to handle a given amount of traffic, the number of individuals who are subject to the hazard of injury in the handling of that traffic is thereby correspondingly increased.

(f) It is not reasonably necessary to limit freight trains to 70 freight or other cars, exclusive of caboose, or passenger trains to 14 cars, in order to prevent or reduce accidents due to defects in or failure of equipment of any class. No

accident from these causes has occurred on defendant's freight trains of more than 70 cars in length, exclusive of caboose, or on defendant's passenger trains of more than 14 cars, of which it can reasonably be said that the same accident would not, or probably would not, have occurred if the train had been of the length permitted by the Arizona Law, or even substantially shorter. Defects in and failures of locomotives are solely related to the individual locomotive; and defects in and failures of cars are related to the number of cars run, and not to the trains into which they [fol. 27] are divided.

(g) There is no reason or basis for any claim that for reasons of safety or for any other reasons freight trains in Arizona should be limited to 70 freight or other cars, exclusive of caboose, or passenger trains to 14 cars; the Arizona Train-Limit Law does not and will not only not decrease whatever general or special hazard there is existent and inherent in defendant's freight and passenger-train operations in Arizona, but does and will, to the contrary, materially impair and substantially lessen the safety of defendant's freight and passenger-train operations in Arizona, by creating certain individual hazards which would not otherwise exist, and by increasing other hazards inherent in train operation as hereinbefore described.

6 *Defendant's traffic across Arizona preponderantly interstate.*

Substantially all of the freight and passenger traffic transported on defendant's main lines across the State of Arizona consists of interstate traffic, by far the greater part of which either originates in the State of California and is destined to points east of the Rocky Mountains, or originates at points east of the Rocky Mountains and is destined to California points, and is commonly known as transcontinental traffic. A large part of the remainder of such interstate traffic consists of traffic moving to or from the State of Arizona.

A substantial portion of the traffic originating in California as well as in Arizona, and destined to points east of Arizona consists of perishable freight (i. e., fruits and vegetables) which are required to be transported in as large train units as practicable, so as not to delay their receipt in eastern markets, where prices constantly fluctu-

ate, and so as to prevent loss of value by decay and deterioration.

The traffic handled upon defendant's lines extending [fol. 28] across the States of Nevada and Utah likewise consists almost entirely of interstate traffic, and principally of transcontinental traffic as above defined; and in large part of perishable products, moving from the States of California and Oregon to eastern destinations, and of traffic moving to the Pacific Coast states; and in many respects is thus closely similar to the traffic carried upon defendant's lines across the State of Arizona.

The Arizona Train-Limit Law, by preventing the proper and expeditious handling of the aforesaid interstate traffic from, to and across the State of Arizona, by limiting the lengths of the train units in which it may be handled, thereby unnecessarily and unreasonably burdens, delays, and interferes with the interstate commerce in which it moves.

The traffic on the interstate passenger trains operated by defendant upon its lines across the State of Arizona consists, almost in its entirety, of passengers, baggage, and express moving from one state to another; moveover, practically all of said interstate passenger trains carry United States mail. The inevitable effect of said Arizona Law is frequently to delay such interstate passenger trains, as they enter or are about to enter, or are leaving or about to leave, or are in transit across the State of Arizona, and thereby unreasonably and unnecessarily to burden, delay, and interfere with the interstate commerce carried on by means of said trains.

7. *The subject of train limitation one of national concern.*

The permissible number of cars in an interstate train is a subject of national, and not local, concern, and one which, if any regulation at all is to be required, should be regulated by the Federal Government and not by the individual states, in that it is wholly impracticable to move railroad terminals to state lines, or to split or consolidate through trains except at terminals; and at some terminals freight [fol. 29] trains containing perishable freight cannot be delayed for purposes of splitting up or consolidation. If other states should regulate train lengths in accordance with their several notions as to what would be proper within

their respective boundaries, all such regulations necessarily would have wide extraterritorial effect, as does the Arizona Law, and to comply with their conflicting provisions would seriously embarrass through interstate train operations.

8. *The law impairs the usefulness of defendant's facilities.*

The necessary effect and operation of said Train-Limit Law is directly, substantially, and continuously to impair the use and usefulness of the facilities used and usable by the defendant, in the carriage of interstate commerce across, into, through, and out of, the State of Arizona.

9. *The law inposes direct burdens upon interstate commerce.*

The additional and unnecessary expense of interstate freight train and interstate passenger train operation, more fully set forth heretofore, to which defendant is subjected as hereinbefore alleged, and which defendant could avoid if it were not for said Train-Limit Law, is a substantial and direct burden upon the interstate commerce carried on by defendant into, out of, across and through the State of Arizona by means of its said interstate trains.

10. *The Train-Limit Law violates the Commerce Clause of the Federal Constitution.*

Said Train-Limit Law is unconstitutional and void, as to each and all of the interstate trains of the defendant, in that it conflicts with and violates the Commerce Clause (Paragraph 3 of Section 8, Article I) of the Constitution of the United States; because:

[fol. 30] (a) The permissible number of cars in an interstate railroad train passing from one state to another, or passing from one state through another into a third, or passing through a number of states, is a subject over which exclusive legislative jurisdiction was and is vested in Congress by said Commerce Clause;

(b) The necessary effect of said law is: (1) to impose a direct and substantial burden upon, and directly and substantially to interfere with, delay, and regulate, the operation of defendant's interstate freight and passenger trains across and within Arizona, as well as in California and New

Mexico; (2) to determine the number of interstate trains to be run by defendant, not only within Arizona, but also within adjoining portions of California and New Mexico; and (3) to impair the usefulness of the facilties used, as well as those usuable, by the defendant in the carriage of interstate commerce across, through, into, and out of, the State of Arizona.

11. *The Train-Limit Law violates the Due-Process Clauses of the Fourteenth Amendment to the Federal Constitution and Article II, Section 4, of the State Constitution.*

Said Train-Limit Law is further unconstitutional and void, and in violation of the aforesaid Commerce Clause of the Constitution, and also operates unreasonably and arbitrarily to deprive defendant of its property without due process of law, in violation of the Due-Process Clause of the Fourteenth Amendment to the Constitution of the United States, and the Due-Process Clause set forth in Section 4 of Article II of the Constitution of the State of Arizona, because:

(a) It fixes maximum train lengths very much lower than those which generally obtain elsewhere throughout the United States, under operating conditions substantially the same as those on defendant's main lines in Arizona;

(b) It makes no allowance for grade or other operating [fol. 31] conditions, or for the construction, type, weight, or length of the cars composing the train, or whether such trains are loaded or empty, and if loaded the weight of the load;

(c) It imposes a great and substantial burden of expense upon, interference with, and delay to, interstate commerce and impairs the usefulness of defendant's transportation facilities; and

(d) It bears no reasonable relation to health or safety.

12. *The Train-Limit Law conflicts with Federal legislation.*

Said Train-Limit Law is further void, invalid, and unenforceable, for the reason that it is in conflict with, and/or an infringement upon, legislation heretofore enacted by

Congress, pursuant to its powers under the Commerce Clause of the Constitution, in the following respects:

(a) To the extent that said Train-Limit Law is or may be intended to prevent the use of heavy locomotives in the State of Arizona, and thus to regulate locomotive sizes, it is an infringement upon and in conflict with statutes enacted by Congress pursuant thereto, having the same or a like purpose, to wit, the Boiler Inspection Act of February 17, 1911 (36 Stat. 913), as amended in 1915 (38 Stat. 1192), and in 1924 (43 Stat. 659), being Sections 23 to 35, inclusive, of Title 45 of the United States Code, wherein and whereby full power over the size, design, weight or construction of locomotives was delegated to and is now vested in the Interstate Commerce Commission;

(b) To the extent to which said Train-Limit Law is intended to or has or may have the effect of limiting the number of cars in a freight or passenger train to the maximum number which properly and with reasonable safety can be controlled in one train by the type of air brakes and their appurtenances now used on such trains, or by any other [fol. 32] form of train-control devices or other safety devices, it is void, in that it attempts to and does enter a legislative field already entered and therefore completely occupied by Congress: the Congress having, under the Commerce Clause, by the enactment of the power-brake provisions of the Safety Appliance Act, as amended (Sections 1 and 9 of Chapter 1 of Title 45 of the United States Code), and the provisions of Section 26 of the Interstate Commerce Act (Section 26 of Chapter 1 of Title 49, of the United States Code), delegated to the Interstate Commerce Commission full and complete authority to investigate and determine the adequacy of the air-brakes, and their appurtenances, and other forms of train-control and other safety devices, used or proposed to be used upon locomotives and cars operated in interstate commerce, and by order to prescribe the form and type of such air-brakes, appurtenances and other train-control and safety devices, and from time to time to issue such amendatory and supplementary orders as it may deem necessary or desirable in the exercise of the power and jurisdiction thus conferred by Congress; and the Congress having, in particular, in and by said statutes, necessarily empowered said Interstate Commerce Commission to determine whether the types of air-brakes, and their appurte-

nances, presently used or proposed to be used upon trains in interstate commerce, are or will be adequate and effective, safely and properly to control and to stop trains of the lengths now being operated in interstate commerce, both in the State of Arizona and elsewhere, by the defendant and by other railroad common carriers throughout the United States.

13. *The Train-Limit Law prevents efficient operation.*

If it were not for said Train-Limit Law, defendant could and would at once begin and hereafter continue to operate a substantial number of its freight and passenger trains into, within, through and across Arizona, without regard to [fol. 33] the restrictions and limitations imposed by said law; and would thereby and thereupon at once begin and thereafter continue to effect the increased economy and efficiency and the greater safety of operation which, as heretofore set forth in detail, are and would be attendant upon and caused by such operation.

14. *Extent and cumulative character of penalties for violation of Train-Limit Law.*

In handling the interstate freight traffic moving over its lines across the State of Arizona, defendant operates daily in each direction between its freight terminals at Yuma, Arizona, and Gila, Arizona, and between its freight terminals at Gila and Tucson, Arizona, and between its freight terminals at Tucson and Lordsburg, New Mexico, a substantial number of through interstate freight trains, all of which move over the line heretofore described as the Yuma-Maricopa-Lordsburg Line. The number of such trains so operated each day varies according to the demands of traffic and ranges from approximately 75 trains per month on the average, in each direction between Yuma and Gila, and 75 trains per month in each direction between Gila and Tucson, and 90 trains per month in each direction between Tucson and Lordsburg, during the month of November, to 180 trains per month in each direction between Yuma and Gila, and 180 trains per month in each direction between Gila and Tucson, and 200 trains per month in each direction between Tucson and Lordsburg, during the month of June; which said months of November and June represent the months during

the year when such interstate traffic across Arizona is lightest and heaviest, respectively.

If defendant were to disregard entirely the provisions of the Arizona Train-Limit Law, and were to attempt to operate each of its aforesaid freight trains within or across the State of Arizona with more than 70 cars each, exclusive of caboose, it would thereby become subject to prosecutions for [fol. 34] the recovery of the severe penalties provided by Section 3 of said Train-Limit Law. Defendant would thus become liable for penalties, in the event such prosecutions should be instituted, as directed and required by said Section 3, which, in the event said law should be sustained in said prosecutions, would range, on the average, from $1,600.00 to $16,000.00 per day during the period of lightest traffic, and from $3,700.00 to $37,000.00 per day during the period of heaviest traffic; and said penalties would be and will be cumulative, and may or might be recovered in a single prosecution or in a series of prosecutions instituted for that purpose, unless said law be held invalid and unconstitutional as herein alleged. Said penalties would be additional to any penalties which might be incurred by the operation of freight trains of more than 70 cars, exclusive of caboose, upon the Wellton-Phoenix-Picacho or Tucson-Douglas main lines, heretofore described, or upon any of the branch lines in Arizona, or of passenger trains of more than 14 cars upon any part of the defendant's lines in Arizona.

If, on the other hand, defendant should continue to comply with said law, and should continue to operate all of its freight trains upon its lines within the State of Arizona, and the adjacent districts in which the law now has extra-territorial effect, with not more than 70 freight or other cars, exclusive of caboose, and were to continue to operate all of its passenger trains within Arizona and said adjacent districts with not more than 14 cars each, the added expense thus imposed upon defendant, solely as the result of said compliance, would be and will continue to be, as heretofore more fully alleged, not less than $300,000 per year, or, on the average, not less than approximately $822.00 per day, all of which said added expense is and will be continuous and irreparable.

[fol. 35] [15. *Defendant has no adequate remedy at law.*

Defendant, as a citizen and resident of the State of Kentucky, and irrespective of its residence and citizenship in a

state other than the State of Arizona, has no plain, speedy or adequate remedy at law for the protection and preservation of its constitutional and statutory right and immunities hereinbefore set forth, afforded or available to it in this or any other court in the State of Arizona, or in any other jurisdiction, or in any court of the United States of America.] Stricken by Judge Hall, June 25, 1940.

IV

For a second, separate and affirmative defense to said complaint, and to each and both of the alleged causes of action therein set forth, defendant further alleges and shows:

1. On April 18, 1939, this defendant commenced in the District Court of the United States in and for the District of Arizona a suit for declaratory judgment, by filing a verified complaint in which this defendant was named as plaintiff, and Joe Conway, identified in said complaint as the Attorney General of Arizona, was named as defendant. Said suit is known and numbered as No. Civil 31-Phoenix upon the records of said United States District Court. The defendant therein, said Joe Conway, was and is the same person who presently occupies the office of Attorney General of Arizona, and who, acting under color of that office, has filed and signed the complaint herein as relator. The purpose of said suit was to obtain a declaratory judgment and decree establishing the unconstitutionality and invalidity of the Arizona Train-Limit Law; and in and as part of its said complaint therein this defendant, as plaintiff, presented allegations with respect to said law, its effects upon defendant's operation, and its resulting invalidity, which were substantially identical to and in substantially the same wording as those which appear and are set forth in paragraphs 1 to 15, inclusive, of its first, separate and affirmative [fol. 36] defense herein.

2. After various proceedings, which included in particular a due trial and determination of all the facts, said United States District Court on February 14, 1940, duly made and entered its findings of fact and conclusions of law in said suit, wherein and whereby it determined and declared, among other things, that each and all of the allegations of certain paragraphs of the complaint of the plaintiff in said

cause had been admitted and conceded by said Conway, as defendant therein, to be true and correct, and were therefore found to be true and correct. The paragraphs of said complaint, the allegations of which were thus adopted and found to be true by said United States District Court, included all those portions of the complaint before said Court which correspond and, as aforesaid, are substantially identical to and are in effect reproduced in said paragraphs 1 to 15, inclusive, of the first, separate and affirmative defense herein.

3. In and by its said findings said United States District Court in particular found and determined that said Arizona Train-Limit Law was and is wholly void, invalid, unconstitutional and unenforceable as to this defendant, plaintiff in said suit, and each and all of its interstate trains.

4. Said United States District Court, on said February 14, 1940, also rendered its judgment and decree in the aforesaid suit, No. Civil 31-Phoenix, wherein and whereby, inasmuch as it appeared to said Court that the parties to said cause were not in disagreement upon any of the essential issues of law or fact therein, except the question whether an actual controversy was shown to exist, and the Court having concluded that no actual controversy was presented, the case was ordered to be dismissed.

5. An appeal from said judgment of said District Court was duly taken by this defendant, as plaintiff and appellant, [fol. 37] to the United States Circuit Court of Appeals for the Ninth Circuit; and said cause is now pending upon appeal in said Circuit Court of Appeals.

6. Said relator has never undertaken, either as defendant in the aforesaid suit in the United States District Court or otherwise, to challenge or dispute the correctness of any material portion of the findings of fact made by said District Court in said suit.

V

For a third, separate and affirmative defense to said complaint herein, and to each and both of the alleged causes of action therein set forth, defendant further alleges and shows:

1. Joe Conway, who as the relator named in said complaint has signed, filed, and presented the same, has been

at all times herein mentioned since January 1, 1938, and now is, the duly elected, qualified and acting Attorney General of Arizona.

2. Said relator, as defendant in the aforesaid suit, No. Civil 31-Phoenix, in the United States District Court for Arizona, on November 3, 1939, in open court expressly admitted that said Train-Limit Law was and is wholly void, invalid, unconstitutional and unenforceable as to this defendant and each and all of its interstate trains, because in conflict with and an infringement upon certain specified provisions of the Constitution of the United States, to wit, the Commerce Clause (Article I, Section 8, paragraph 3) and the Due-Process Clause of the Fourteenth Amendment thereof, and also certain Acts of Congress.

3. This defendant, as a party to said suit, was then and there caused and induced to believe in and to rely upon the truth and sincerity of relator's said admissions, and at all times subsequent to the making thereof did truly believe and rely upon the same; that is to say, defendant was induced to and did truly believe and rely upon relator's said admis-[fol. 38] sions as showing that said relator, Joe Conway, then was and would continue to be truly and sincerely persuaded and convinced (1) that said Train-Limit Law was and is wholly invalid and unconstitutional for each and all of the reasons aforesaid, and (2) that consequently no power or duty of prosecution for the violation or any violation thereof was thereby imposed upon or vested in him or possible of exercise by him, and (3) that he, said relator, having in mind his official oath of office as Attorney General, might therefore rightfully refrain from effort to enforce said law.

4. In having caused or permitted the operation of both and each of the trains specifically referred to in the complaint herein, said defendant was induced so to do, and did so, solely by reason of its aforesaid belief in and reliance upon the truth and sincerity of relator's said express admissions, and not otherwise.

Wherefore, defendant respectfully prays this Court to find and conclude, and to render and enter judgment in favor of defendant and against the plaintiff adjudging and declaring:

(1) That said defendant has not wilfully violated said Arizona Train-Limit Law, either at the times or in the manner in said complaint alleged, or otherwise, or at all;

(2) That said Arizona Train-Limit Law is wholly void, invalid, unconstitutional and unenforceable as to the defendant, and each and all of the defendant's railroad operations, both within and without the State of Arizona, upon each and all of the grounds hereinbefore set forth;

(3) That defendant is not liable to the plaintiff, either by reason of the circumstances alleged in said complaint or in either of the purported causes of action therein set forth, or otherwise, in either the amounts specified in said complaint, or in any other sum or amount;

(4) That plaintiff take nothing by its action;

[fol. 39] (5) That the complaint and each count thereof be dismissed;

(6) That defendant do have and recover its costs of suit herein incurred;

(7) That defendant have such other and further relief as may be proper.

Alexander B. Baker, Louis B. Whitney, 703 Luhrs Tower, Phoenix, Arizona; Cleon T. Knapp, Jas. P. Boyle, B. G. Thompson, 913 Valley National Bldg., Tucson, Arizona, Attorneys for Defendant.

C. W. Durbrow, Henley C. Booth, Burton Mason, 65 Market Street, San Francisco, California, of Counsel.

Due service of the within & foregoing answer admitted this 8th day of May, 1940.

Joe Conway, Charles L. Strouss, W. E. Polley, Attorneys for Plaintiff.

[File endorsement omitted.]

[fol. a] IN THE SUPERIOR COURT OF THE STATE OF ARIZONA
IN AND FOR THE COUNTY OF PIMA

No. 20087

STATE OF ARIZONA, ex rel. Joe Conway, Attorney General of the State of Arizona, Plaintiff,

vs.

SOUTHERN PACIFIC COMPANY, a corporation, Defendant

STATEMENT OF EVIDENCE—Filed April 8, 1942

Before the Honorable Levi S. Udall, Presiding

Tucson, Ariz., November 19, 1940.

Transcript of Testimony

APPEARANCES:

For the Plaintiff: Mr. Charles L. Strouss, Mr. W. E. Polley.

For the Defendant: Mr. Burton Mason, Mr. Henley C. Booth.

[fol. 1] COLLOQUY

The Court: Are the parties ready to proceed?

Mr. Polley: The State is ready.

The Court: Is the defendant ready?

Mr. Mason: Ready for the defense.

The Court: You may proceed.

Mr. Polley: If the Court please, in view of the fact that the pleadings raise a peculiar issue we will ask permission to read the complaint.

The Court: Fine, go right ahead.

(Thereupon the complaint was read to the Court by counsel).

The Court: In other words, the first cause of action has to do with the alleged unlawful operation of a freight train and the second cause of action alleges the operation of a passenger train in excess of the number of cars allowed by statute.

Mr. Polley: That is correct. I presume counsel wants to read the answer.

Mr. Mason: Your Honor, we do not desire to read the answer at length. The answer consists of some 33 pages of typewriting, each of them of 32 lines and it would take a great deal of the time of the Court. We assume that the Court has read or at least scanned over the answer.

The Court: No, I haven't; I have never seen the file [fol. 2] until this morning.

Mr. Mason: Then I will make a brief statement as to the contents of the answer and outline what is therein set forth as our defense.

The Court: I wish you would.

Mr. Mason: I should say first of all, that the answer was filed within the time required for pleading and thereupon and shortly after it was filed a motion to strike and a motion for summary judgment was filed by the plaintiff. The motion to strike was allowed as to one particular of the answer which I shall refer to later, and the motion for summary judgment was overruled. In other particulars, the motion to strike was likewise overruled by Judge Hall.

The answer, first of all, is in five separate subdivisions. The first subdivision is a direct answer to the allegations of the first cause of action. It admits the enactment of the statute, and admits likewise that a train was operated on April 4th consisting of more than 70 cars, and that it was operated at the time and from the point of origin mentioned in the first cause of action. Alleges that it was operated in interstate commerce and consisted in large part, if not entirely, of cars moving in interstate commerce and carry-[fol. 3] ing interstate traffic; denies that the operation or permission or the allowance of the operation of the train was wilful or that the statute was wilfully violated, and denies that the defendant has wilfully operated this or any other train in the manner alleged in the first cause of action, and denies liability.

The second portion of the answer is similarly addressed to the second cause of action and admits that the passenger train was operated at the time specified and on the same date, and that it likewise consisted in large part of cars moving in interstate commerce and carrying interstate traffic, and denies any wilful violation and denies liability.

The third subdivision of the answer is the first separate and affirmative defense and it consists of that portion of the complaint commencing on the eighth line of Page 3 and continuing to and including line nine on Page 29. However, the last paragraph of the third portion of the complaint, being Paragraph 15 of that portion, which is a short paragraph found on Page 29 was stricken by Judge Hall and I need not refer to it except to say it is no longer a part of the answer. It is Paragraph 15 commencing on [fol. 4] Line 1 and concluding on Line 9 of Page 29 of the answer.

The Court: Just nine lines were stricken?

Mr. Mason: Yes, one complete paragraph. It will come better in consecutive order to mention what it was.

The Court: Go ahead.

Mr. Mason: The first affirmative defense, part III of the answer, consists of fourteen paragraphs. The first paragraph simply describes the status of the defendant as an interstate common carrier, operating lines in interstate commerce in seven western states, including Arizona and the adjacent states and engaged in the transportation of persons and property and as such subject to the Interstate Commerce Act and acts relating thereto and amendatory thereof, the Federal Act of February 4, 1887, and other acts of Congress related to that act.

The second paragraph, 2, of Part III of the answer describes the defendant's railroad system in some detail and particularly the Arizona lines. It describes the lines as extending from San Francisco to Portland, from San Francisco to Ogden, from San Francisco via Los Angeles, Yuma, Tucson to El Paso and thence to Tucumcari, New Mexico, the connection of the defendant at various points [fol. 5] with other interstate railroad companies, and thus the fact that the defendant is a part of the general national transportation system and engaged in the handling with its connections of freight and passengers between all portions of the United States and to and from adjacent foreign countries.

Then it describes particularly the lines across Arizona. As your Honor knows, there is a main line extending from Yuma to Wellton, thence via Gila and Maricopa, Picacho to Tucson; thence eastward to Benson, Willcox, Lordsburg, New Mexico, and so to El Paso, Texas. There is an alter-

nate main line commencing at Wellton, running northeast to Hassayampa, Phoenix, thence southeast to a connection with the other main line, the one first described, at Picacho. From Tucson to Mescal there are alternate lines. At Mescal there is a line that diverges from the line first described and runs southeast to Bisbee Junction, Naco, Douglas and into New Mexico at a point west of Rodeo and thence along near the international boundary line to El Paso. The answer describes and alleges that the principal freight traffic carried between points west and east of Arizona by this system across Arizona is handled over the main line through Gila, Maricopa, Tucson and Lordsburg, but that a substantial portion of the traffic is likewise handled over [fol. 6] the line through Phoenix and likewise over the line through Douglas.

Passenger traffic, on the other hand, is handled by all of these different lines, and I may say that a major proportion of the traffic between Tucson and Yuma passes through Gila, but as between Tucson and El Paso the traffic is divided more nearly evenly.

This paragraph continues to state that the lines that cross Arizona and New Mexico are on comparatively light grades and run through much level territory. They are well constructed, according to the best modern railroad standards and capable of sustaining the heaviest and most powerful locomotives operated by defendant. They are likewise equipped with automatic block signals and numerous other devices conducive to safety of operation. The operating conditions upon the main lines, across Nevada and Utah, are in general quite similar to those encountered across Arizona and New Mexico, and the lines across those two states are likewise well constructed and equipped throughout with automatic block signals and other safety devices.

Paragraph 3 of part 3 of the answer describes the effect of the train limit law upon the defendant's train operations [fol. 7] and particularly freight train operations. It is a very lengthy paragraph and even to summarize it will take some time, but it proceeds to state that the operating conditions, both on the lines of railroad in Arizona and elsewhere and throughout the United States generally have vastly improved since 1912 when this law was enacted. Great improvements have been made in equipment, as well

as in roadbed. These consisted, of course, in the strengthening and increase of the weight and power of locomotives, installation of many devices conducive to greater safety and greater strength, and as to fixed equipment, roadbed, bridges and so forth have been strengthened and replacements of rail made up to the present time,—that these improvements have been made largely for the purpose of increasing the length and loading of trains so as to bring about a more efficient and economical operation. Then it is likewise alleged that the same conditions which prevail generally throughout the United States as to improvement of roadbed and equipment have likewise been made in Arizona; that the defendant has spent considerable sums of money in Arizona in the improvement of its track and roadbed, as well as in the building of the new line through [fol. 8] Phoenix. That the track and roadbed in Arizona are capable of handling and supporting the heaviest locomotives owned by defendant and that there is no reason from the standpoint of climatic conditions, or track, roadbed, curvature, grades or otherwise, why defendant could not at once commence the operation on its main lines in this state and in the adjacent states of California and New Mexico where the train limit law operates to restrict the length of trains, of a very substantial number of freight train units of substantially more than 70 freight or other cars, and passenger train units of substantially more than 14 passenger cars, and thus bring about safer and more economical opera- on those particular lines. The paragraph continues to describe that prior to 1912 and at that time freight trains of more than 70 cars were operated only under particular conditions, mostly on favorable grades or consisted in whole or large part of empty cars, but by reason of the improvements made since that time, the operation of long freight trains, by which term I mean trains consisting of more than 70 cars, and I shall use that term instead of the longer term from now on, and long passenger trains will be used to mean more than 14 cars, that the operation of long freight and passenger trains [fol. 9] has become and now is the common method and standard method of operation in the United States, except in Arizona and the adjacent territory where the train limit law operates with extra-territorial effects; that except in Arizona and adjacent territory freight is now transported

in such long trains on improved schedules which are very much better than they were prior to 1924 and that by such long train operation with resulting economy and greater efficiency and greater speed, the nation-wide distribution of perishable products of Arizona and California has been made possible; that car shortages have been practically eliminated by reason of long train operation and its resulting greater efficiency and economy with beneficial effects upon the necessity of those depending upon railroad transportation to maintain larger stocks of merchandise, they are no longer required to do so because they can depend upon fast and timely delivery of the merchandise that they require.

There is a further allegation that the practise of standard long train operation as carried on by the defendant and its principal competitors does not delay or retard the delivery of goods, but on the contrary expedites such move-
[fol. 10] ment, and that such trains, particularly freight trains but not omitting the mention of passenger trains as well, are commonly, safely, and economically operated throughout the United States outside of Arizona over lines of railroads substantially similar to the main lines of the defendant in Arizona, and that there is no reason, from the standpoint of safety or otherwise, why the length of defendant's freight trains in this state should be limited as required by the train limit law.

The paragraph follows to allege the circumstances under which the train limit operates with extra-territorial effect, showing the impossibility of constructing terminals at which trains may be broken up exactly at state boundaries and the fact that the principal traffic carried, particularly the perishable traffic moving east of Arizona forbids its being held at boundary line points in order that the length of the train may be reconstituted. The result is, therefore, that the trains consisting of perishables, particularly, must be made up in Arizona sizes at points west of Arizona and run through Arizona in order to meet the restrictions of the law to a point east of Arizona where they may be economically reconstituted into the lengths suitable to normal operation and on the eastward, the first
[fol. 11] point at which reconstitution can normally take place in the case of perishable trains is at El Paso, Texas, so that the inevitable effect as alleged here is that the train

limit law certainly operates extra-territorially as far as Lordsburg and generally as far as El Paso, 166 miles from Arizona, and on the west it operates extra-territorially to some extent as far west as Indio, California, some 120 miles west of Yuma.

The answer continues with paragraph 3 of part 3, alleges further that the average and maximum length of trains in Arizona by reason of the law are very much less than adjacent states or other states in which the defendant operates, the result therefore being that in order to handle the same absolute volume of traffic whether measured in number of cars handled or in the number of car-miles produced, a greater number of trains is required to be operated or a greater number of train-miles required to be made, with resulting increase in cost; and it is shown that the increased cost due to the number of train and locomotive miles imposed upon the defendant by the necessity of operating these greater number of train units, amounts to not less than $300,000.00 a year, considering only the effect on freight train operations on the direct main line between [fol. 12] Yuma via Gila and Maricopa, Tucson and Lordsburg to El Paso and not considering whatever additional expense may be imposed by reason of the restriction of the law on trains operated over the Phoenix line or the south line through Douglas.

Then the paragraph goes on to allege: If it were not for the law this additional operating expense could be saved and substantial additional savings could be made with respect to operations of these other lines and by reason in the saving in passenger operation as well. The paragraph concludes with the general allegation that the effect of the law is to interfere with and delay interstate traffic being handled into, through or across Arizona, to interfere with freight traffic being handled on the line in California and New Mexico, thus emphasizing extraterritorial effect, to impose the increased burden of expense to which I have referred, and to increase the number of meetings and passings because of the multiplication of train units operated and the fact that they operate largely upon single track where trains must both meet and pass in order that the operation may be carried on.

Paragraph No. 4 of part 3 of the answer, describes the effect of the law upon passenger train operations particu-

[fol. 13] larly and indicates that there is a similar disturbing effect upon passenger train operation because of the requirement of not more than fourteen cars be operated in any one train. The interference is described in considerable detail, which I need not go into here. There is likewise shown an additional cost of not less than $10,000 a year, some of which accrues because of extra-territorial interference.

Paragraph 5 of part 3 is the part which describes that the law is not a reasonable safety measure. It points out that it bears no reasonable relation to the health, comfort or safety of persons or the safety of property and does not operate to promote the health or safety of employees, or passengers or of the public otherwise. To the contrary, it creates certain hazards which would not exist except for the law and increases other hazards. It is alleged that the law is wholly unjustified as a regulation or supposed regulation by the state in the purported interest of the health and safety of persons or property and for that reason it takes defendant's property without due process of law in violation of the Fourteenth Amendment to the Constitution of the United States and Section 4 of Article II of the Constitution of the [fol. 14] State of Arizona. The paragraph points that the train limit law is permissible and sustainable, if at all, only under or solely as an expression of the police power of the State. That the defendant is required in its business as a common carrier to handle the freight and passengers which come to it to be transported with the greatest practicable safety; expedition and economy; that in doing so it is necessary to operate each train and it does so outside of Arizona in units greater than seventy or fourteen cars as the case may be; that all of these trains, or practically all of them, especially upon its main lines, carry interstate freight or passengers and some of them are entirely so composed. That the long train method of operation is not only more economical or expeditious but also much safer than the method of handling required in Arizona or adjacent territory because of the train limit law and its restrictions. Then it is pointed out that the number of casualties, the frequency of accidents to trains and of resulting casualties to those who are exposed to the hazards of train operation, including all classes, employees, passengers, those riding upon trains in neither classification, and the public generally, is directly related to the number of train units operated, and when [fol. 15] more train units are operated than are necessary

to handle a given amount of traffic, all hazards incident to the handling of that traffic are thereby greatly increased.

The paragraph further alleges there is no hazard of train operation either general or as such operations are conducted by defendant that can reasonably be said to be related to the number of cars contained in a freight train or that can be minimized or removed or substantially reduced by limiting freight trains to seventy cars as in Arizona. Equally there is no hazard of passenger train operation which can similarly be affected by reducing passenger train length to fourteen cars. On the contrary, there are certain well known and well recognized hazards of train operation which are increased by increasing the number of trains, which are among others the following: head and rear-end collisions; grade crossing accidents, the hazard of which to a given number of users of a particular crossing is directly in proportion to the number of trains run, that go across that crossing; casualties due to additional meets and passings in connection with which employees must go on top of trains or leave trains or board them while in motion for the pur- [fol. 16] pose of opening or after closing switches and of course the number of meets and crossings does not vary in proportion to the number of trains run but more nearly in proportion to the square or the product of the number of trains run. Then there are yard accidents which are in direct proportion to the number of trains made up in the yard; accidents due to defects in or failure of our locomotives which are in direct proportion to the number of locomotives run or in actual service. The paragraph goes on to say that the large class of hazards in train operation which are due to employee negligence are directly increased according to the increase in the number of employees required and as more trains are required, more employees are required, and there are more opportunities for employee negligence; and employee negligence, according to statistics, accounts for more than fifty per cent and perhaps more of the casualties which occur in the operation of steam railway trains both in Arizona and elsewhere. By "employee negligence," I also mean outright disobedience of rules, as well as such cases of negligence as are not covered by rule violation. The paragraph concludes there is no basis for any claim that for reasons of safety or for any other reason, freight trains should be limited to seventy cars as in Ari- [fol. 17] zona or passenger trains to fourteen cars and that

the Arizona law does not decrease whatever general or special hazards that exist or are inherent, but on the contrary materially impairs and substantially lessens the safety of defendant's freight and passenger train operations in Arizona and creates certain hazards which would not otherwise exist, as well as increasing other hazards inherent in train operations.

Paragraph 6 simply shows that the traffic handled on the main lines across Arizona and which are affected by the law consist preponderantly of interstate traffic originating beyond Arizona and moving across Arizona to points in other states, or originating in Mexico and moving across Arizona, or originating in Arizona and destined to points in other states, or originating outside of Arizona and destined here. A substantial part of the traffic consists of perishable products which are required to be transported in as large train units as practicable so as not to delay their receipt in eastern markets. Similarly, as to passenger train traffic it is preponderantly interstate.

Paragraph 7 alleges that the subject of train limitation is necessarily a subject of national and not local or state [fol. 18] concern, and if any regulation at all of train lengths is required it is to be undertaken by the Federal Government and not by any individual state.

Paragraph 8 simply alleges in a single sentence that the law impairs the usefulness of the defendant's facilities.

Paragraph 9 in a single sentence alleges that the law imposes direct burdens on interstate commerce.

Paragraph 10 alleges a violation of the Commerce clause of the Federal Constitution in that the permissible number of cars to be handled in an interstate train is a subject of National and not state concern and that the necessary effect of the law, as before alleged, is to impose burdens on Interstate Commerce, to interfere with and delay Interstate Commerce, to regulate the number of trains to be operated by the defendant as an interstate carrier not only in Arizona but also in California and New Mexico.

Paragraph 11 alleges a violation of the due process clause of the Fourteenth Amendment to the Federal Constitution and the corresponding and—I think—exactly similarly worded clause of Section 4 of Article II of the Constitution of the State, for the reason that the train limit law fixes [fol. 19] maximum lengths very much less than are customarily operated throughout the United States elsewhere

than Arizona; that the law makes no allowance for grade or other operating conditions or for the construction, height, weight or length of the cars composing the train, or whether the cars be loaded or empty, or what the weight of load may be; and because of the substantial burden of expense; and finally because the law bears no reasonable relation to health or safety.

Paragraph 12 alleges a conflict with federal legislation, an infringement upon the federal statutes, first because the train limit law, to the extent that it is intended or may be intended to prevent the use of heavy locomotives within Arizona regulates locomotive sizes and thus infringes with statutes enacted by Congress having that purpose, and secondly, to the extent to which the train limit law may be intended or may have the purpose or the effect of limiting the number of cars in a freight or passenger train to the maximum number which may be properly and with reasonable safety controlled by the device of airbrakes and their appurtenances now used on such trains or by any other form of train control device, it enters the legislative field occupied [fol. 20] by Congress; Congress having, under the Commerce Clause, by the enactment of the power brake provisions of the Safety Appliance Act, delegated to the Interstate Commerce Commission full and complete authority to investigate and determine the adequacy of the airbrakes and their appurtenances and by order to prescribe the form and type of such airbrakes and so forth, and from time to time to issue such orders as may be necessary in the premises.

Paragraph 13 alleges that the train limit law prevents efficient operation in that, if it were not for the law much more efficient and much safer operation could be conducted in Arizona at once.

Paragraph 14 alleges that the law would impose, if continuous violations were undertaken, extensive and cumulative penalties, and alleges the extent of the freight and passenger traffic. I believe it does not mention passenger traffic, but shows the number of freight trains handled by the defendant over the Yuma-Gila-Tucson-Lordsburg line.

Paragraph 15, as I said before, was stricken.

The Court: What page is that?

Mr. Mason: That is on page 29. It simply states that the defendant was without adequate remedy at law for its protection in this or any other court of the State of Arizona or

[fol. 21] elsewhere or in any court of the United States. The purpose of the paragraph was to establish this case or this defense as a defense equitable in nature, but since the paragraph has been stricken I only mention it for the purpose of showing it bears comparatively little importance to the fundamental issues of the case and probably would not be the subject of proof at all whether or not it remained in the answer.

That concludes all of the first of the affirmative defense. I need only refer very briefly to the second and third affirmative defenses, which are respectively parts 4 and 5 of the answer. Part 4 of the second affirmative defense refers mainly to the fact that a suit was brought against Mr. Conway who is the occupant of the office of Attorney General, in the United States District Court at Phoenix, and the purpose of the suit, which was to obtain a declaratory judgment, that the law was invalid and that Mr. Conway had no power to enforce the law.

The Court: Is that the action that was disposed of by the Circuit Court within this week?

Mr. Mason: Yes, that is right. The paragraph goes on to state that a trial was had and each and all of the allegations of certain paragraphs of the complaint, the factual [fol. 22] allegations were conceded by Mr. Conway as the defendant and that those paragraphs which he admitted in the federal suit were substantially identical to and in effect reproduced in paragraphs 1 to 15 of the first defense in this answer. Then it refers to the fact that the District Court made findings which reproduced the admissions of Mr. Conway, that a judgment and decree was entered dismissing this suit because of lack of controversy and that an appeal had been taken by the defendant, as plaintiff and appellant in the federal suit, that Mr. Conway, who is described as relator here, had never taken any appeal or otherwise disputed the findings of fact which reproduced his admissions.

Part 5 of the third affirmative defense, after referring to the fact that after the suit was brought and the findings had been made by the court to the effect that the law was void and unconstitutional, alleges that the defendant as party plaintiff to the other suit was induced to believe that Mr. Conway was of the opinion that the law was invalid and unconstitutional. That consequently he had no power or duty of prosecution and having in mind his official oath as Attorney General he might therefore rightfully refrain

[fol. 23] from any effort to enforce the law. It alleges that the defendant in having operated or permitted the operation of the two trains referred to had done so because of this inducement to believe in, and its belief in, the truth and sincerity of the relator's express admissions, and not otherwise. As stated in the argument before Judge Hall, these allegations are material in reference to the question of whether the violation may have been wilful, and whether, if the law be held constitutional and applicable in these two cases, the maximum or minimum or some intermediate figure should be imposed as the penalty for the violation. That is substantially the entire reason why they are included. There was a motion to strike, and the motion was denied.

The prayer of the complaint is for a finding and judgment that there has been no wilful violation; second, that the law is wholly void, invalid and unconstitutional, and therefore unenforceable as to all of defendant's operations both within and without the State of Arizona upon each and all grounds set forth; that there is no liability and that plaintiff take nothing by this action. There is also a prayer for costs and finally a prayer for general relief.

I am sorry to have taken so long, but as I warned the [fol. 24] court at the outset the answer is very extended. It is in substance, except of course, as to these two supplementary defenses, the complaint which was filed in the declaratory suit in the Federal Court in Phoenix and is likewise in substance the complaint which was filed and sustained by the three-judge court for the District of Nevada in the Nevada train limit case, which was heard and finally decided by the United District Court for Nevada between 1935 and 1937. The difference between this case and the Nevada case is simply that there we were talking of proposed limitations and were referring in our complaint to a present operation and what the proposed limitation would do. Here we are talking of a present limitation and referring to what the removal of that limitation would do for us in the betterment rather than in the Nevada case of what it would do by way of restriction.

The Court: We will take a brief recess before proceeding further.

[fol. 25] The Court: You had finished, had you, Mr. Mason?

Mr. Mason: Yes, your Honor.

Mr. Polley: We will call Mr. Skinner.

FRANK L. SKINNER, called as a witness on behalf of the plaintiff, having been first duly sworn by the court, was examined and testified as follows:

Direct examination.

By Mr. Polley:

Q. Will you state your name, please.
A. Frank L. Skinner.
Q. And your occupation?
A. Conductor of the Southern Pacific.
Q. And how long have you been employed by the Southern Pacific?
A. Twenty-four years.
Q. Will you tell the Court the experience you have had in railroading?
A. Well, I spent my entire life at it, started as call boy in 1910, and went from there into the repair department, went to switching in 1918, and then went in the road service the same year; been in the road service since then.
Q. Are you familiar with the Southern Pacific railroad's practice in regard to the makeup and movement of trains [fol. 26] out of the Tucson yards?
A. Yes, sir.
Q. Briefly, what are the duties of the chief dispatcher regarding the makeup and movement of trains out of the Tucson yard?
A. He issues the instructions in regards to the running and contents of trains.
Q. Is he the man that makes the decision as to how many cars will be put in a particular train?
A. It is over his signature. I am not positive whether he makes the decision or not.
Q. And how are his orders transmitted to the train crew?
A. They are telegraphed from the dispatcher to the operator, and the operator delivers them to the conductor.
Q. Is that over the signature of the dispatcher?
A. That is over the signature of the chief dispatcher; yes, sir.
Q. Now, Mr. Skinner, which member of the train crew is in charge of the train?
A. The conductor.
Q. Does that apply to both passenger and freight trains?
A. Yes, sir.

Q. Were you on duty as a conductor for the Southern [fol. 27] Pacific on April 4th, 1940?

A. Yes, sir.

Q. In Tucson?

A. Yes, sir.

Q. Did you take a train out of the Southern Pacific yard located at Tucson, Pima County, State of Arizona, on that day?

A. Yes, sir.

Q. And what time did that train leave?

A. We were called to leave here at 12:01 P. M.

Mr. Mason: May I interrupt you? I have no objection, your Honor, to the witness referring to the book which he has before him, but I think he should designate for the record the name of the book and the form that it is, and whether it is a book kept in his own handwriting.

The Court:

Q. What is the book that you hold in your hand?

A. It is a ~~conductor's freight~~ train book.

Q. That is a book that is kept by you?

A. It is kept by me, yes, sir, and it is a record of all cars and times called to leave, left, and delays on the road. It pertains to the record of the movement of all trains that the individual handles.

Mr. Mason: May I ask him a question?

[fol. 28] The Court: Yes.

Mr. Mason:

Q. It is an original record which each conductor keeps of his own, of the trains which he himself handles?

A. Yes, sir, that is all.

Q. Eventually becomes a part of the permanent records of the company, does it not?

A. Yes, sir; it is on file and the company keeps it.

Q. It is designated by a form number, is it not?

A. Yes.

Q. Will you state the form number for the record?

A. C. S. 2648.

Mr. Polley:

Q. What time did you say the train left Tucson?

A. At 12:20 P. M.

Q. That is, on April 4th, 1940?
A. April 4th, 1940.
Q. In which direction did it run?
A. West.
Q. Westward out of Tucson?
A. Westward from Tucson, yes.
Q. What type of train was it, freight or passenger?
[fol. 29] A. Freight train.
Q. How many cars did that train contain exclusive of the caboose, if you know?
A. Ninety-one cars, two loads and eighty-nine empties.
Q. What orders, if any, did you receive concerning the movement of this train?
A. I received our running orders from the operator over the signature of the chief dispatcher.
Q. Is that a certain form number of the Southern Pacific?
A. Yes, that has a form number.
Q. Do you know what that number is?
A. No, I don't. It is a "nineteen" order, but I don't know what the form number is on the order.
Q. And from whom did you receive that order?
A. From the operator, the telegraph operator in Tucson.

Mr. Polley: Heretofore there has been a supplemental motion to produce filed, covering all orders issued by the defendant or the defendant's agents in relation to and in connection with the operation on the Tucson Division of the defendant's railroad of freight trains referred to in plaintiff's first cause of action of the plaintiff's complaint. Is that record available, Mr. Mason?
[fol. 30] Mr. Mason: We made quite a search last night in response to the request from Mr. Strouss to find orders relating to the operation of this freight train to which the witness has referred, and I could not find in our record files for April 4th, 1940, the particular running order to which he refers.

Mr. Strouss: I wonder, Mr. Mason, in our discussion last evening there was an understanding we would have a stipulation as to how the train was made up and was operated by the chief dispatcher.

Mr. Mason: Yes. I don't think there is any question and I am willing to stipulate with opposing counsel, your Honor, that the train referred to by the witness—I think we should identify it by number sooner or later—was operated, and

that the dispatcher or some other person having the necessary authority issued the instructions that the train should operate with the consists which it actually contained as it departed from Tucson at or about 12:20 P. M. on April 4th, 1940.

Would that be an adequate stipulation?

Mr. Strouss: Yes, with the further explanation that the consists would mean the number of cars which were in the train.

The Court: The record may show the stipulation.

[fol. 31] Mr. Polley:

Q. Mr. Skinner, did you make any protest? You naturally saw the running order, did you not?

A. Yes, sir; I was given two copies of it.

Q. Can you state as nearly as possible what language it contained? Did it contain the number of the train?

A. Yes, sir. The order, as I remember it, said that engine 3764 would run extra, Tucson to Gila.

Q. And that was the engine that pulled the train referred to?

A. That was the engine that handled the train.

Mr. Mason: That is the standard form of order?

A. That is the standard form of written order for an extra train.

Mr. Polley:

Q. Did you make any protest before moving this train out of the yard?

A. Yes, sir; I filed a written protest to the superintendent.

Q. Did you receive any answer?

A. No, sir.

Q. Then, as I understand it—what was the number of that train again?

A. Extra 3764 west.

Q. Then I understand train No. Extra 3764 West containing 91 cars, exclusive of the caboose, was pulled out of [fol. 32] the Tucson yards, which is a terminal of the Southern Pacific Company on its regular main line track on April 4th, 1940, is that correct?

A. Yes, sir.

Q. How far was this identical train operated upon the line of the Southern Pacific Company?

A. Well, the train was kept intact into Eloy. We set out one empty at Eloy.

Q. Is Eloy within the limits of Pima County?

A. No.

Q. Then when it left Pima County the train still contained ninety-one cars exclusive of the caboose?

A. Yes.

Q. Do you know how many miles this identical train containing ninety-one cars was operated on the lines of the Southern Pacific Company in Pima County, Arizona?

A. Approximately twenty-six miles.

Q. What men constituted the train crew on this particular train?

A. I was conductor, brakeman O. N. Smith was the head brakeman, and brakeman Messer, swing brakeman, and Phillipson was the rear brakeman.

Q. Were there any other persons upon that train?

[fol. 33] A. Engineer Murphree and Fireman Thayer.

Q. Were there any other persons in the engine?

A. The road foreman of engines, Mr. Carr, rode the engine.

Mr. Strouss: Q. How was that train designated or known?

A. As an extra, Extra 3764, west.

Mr. Polley: That is all.

Cross-examination.

By Mr. Mason:

Q. Did you continue on the train to the end of your run?

A. Yes, sir, to Gila.

Q. To Gila?

A. Yes, sir.

Q. And when did you arrive at Gila?

A. Arrived at Gila at 6:20 P. M.

Q. That is six hours, isn't it?

A. Yes, sir, six hours.

Q. This train was what is generally known in ordinary railroad parlance as a drag, was it not?

A. As a drag, yes, sir.

Q. You had no rights over eastbound freight trains, did you?

A. That I couldn't say. I don't remember.

Q. You don't recall?

[fol. 34] A. I don't recall.

Q. Did you meet a number of eastbound trains?

A. We took the siding at Kino for 852.

Q. That is an eastbound freight train?

A. That is an eastbound freight train, yes, sir and we took siding at Eloy for—or at Picacho for first—856, and then we met second and third 854 at Maricopa.

Q. Both atrains at the same point?

A. Yes, sir.

Q. Did you take water at Maricopa?

A. Yes, sir, took water and picked up a water car.

Q. And you dropped an empty car at Eloy, didn't you?

A. You mean by the word "dropped" the drop we use, or do you mean set it out?

Q. Yes, you set it out.

A. Yes, sir, we set out a car at Eloy.

Q. And did you make any other meets before you got to Gila?

A. Yes, sir, we had a meet at Bosque, first—856.

The Court: Pardon me, did I understand you to say, Mr. Mason, that the Southern Pacific was not double-tracked across the State of Arizona?

[fol. 35] Mr. Mason: Your Honor, we will have a witness who will describe that exactly for you. There are some stretches of double track, yes sir. There is a short stretch out of Yuma. Then there is a stretch from Dome to Wellton.

The Court: But in this area here?

Mr. Mason: There is one stretch of double track between Tucson and Stockham which is a point—will you correct me, Mr. Skinner, now if I am wrong—a point four and one-half miles west of Tucson.

The Witness: Approximately.

Mr. Mason: Q. Your operation except for the short stretch between, the short stretch of track between Tucson and Stockham was entirely single track, was it not?

A. Yes, sir.

Q. And you did not meet or have any interference with passenger trains, did you?

A. No, there were no passenger trains out.

Q. You cleared all the westbound passenger trains out of Tucson.

Mr. Strouss: If the Court please, I don't see that this is proper cross examination. We haven't gone into any question of meets, or things of that sort.

The Court: What is the purpose of it?

[fol. 36] Mr. Mason: Well, I only wanted to find out what his delays were, what delays he had enroute. I understand he took six hours to get to Gila and I wanted to bring out what delays he had.

The Court: You mean by reason of any engine trouble?

Mr. Mason: No, I mean by reason of any train interferences, meets, etc. I think that is all I have.

Mr. Polley: Call Mr. Odegard.

K. C. Odegard called as a witness on behalf of the plaintiff, having been first duly sworn, was examined and testified as follows:

Direct examination.

By Mr. Polley:

Q. Will you state your name, please, and your occupation?

A. Conductor.

Q. You are employed by whom?

A. Southern Pacific.

Q. And how long have you been so occupied?

A. For thirty-two years.

Q. Will you relate to the Court your railroad experience?

A. About three years as a brakemen, about five years as [fol. 37] an extra conductor and brakeman, the rest of it as a conductor.

Q. Are you familiar with the practice of the Southern Pacific here in Tucson in regard to the makeup and movement of trains out of the Tucson yard?

A. Yes, sir.

Q. Is the Tucson yard a terminal of the Southern Pacific?

A. Yes, sir.

Q. You have just heard Mr. Skinner testify as to the above practice. Did he testify correctly?

A. Yes, sir.

Q. As to the duties of the chief dispatcher and the telegraph operators and the various clerks?

A. Yes, sir.

Q. Does the practice described by Mr. Skinner apply to both passenger and freight train operations?

A. Yes, sir.

Q. Were you on duty as a conductor for the Southern Pacific Company on March 2nd, 1940, at Tucson?

A. Yes, sir.

Q. I will ask you, did you take a train out of the yards of the Southern Pacific Company located in Tucson, Pima County, Arizona?

A. Yes, sir.

[fol. 38] Q. On March 2nd, 1940?

A. Yes, sir.

Q. And what type of train was that?

A. Passenger train.

Q. What was its number?

A. Number 5.

Q. Is that what it is known by?

A. Yes, sir.

Q. Was it a regular passenger train?

A. Yes, sir.

Q. Do you know how many cars that train contained?

A. Sixteen cars.

Q. What orders, if any, did you receive from the Southern Pacific concerning the movement of this train?

A. Train orders? You mean train orders?

Q. Yes, sir.

A. I don't recall. It being a regular train it could move out on a clearance without any orders, a regularly scheduled train.

Q. I notice you are referring to a record. What record is that?

A. This is the train book record, the trip on this particular date, train Number 5, which left Tucson March 2nd.

[fol. 39] Q. Does that record have any particular form number?

A. You mean the book?

Q. Yes, sir.

A. It has. I think it is 2036, I am not sure. Would you look at it? It is kind of blurred, right in the corner there.

Q. C. S. 2638. Is that an original record kept by you?

A. Yes, sir.

Q. And for what purpose?

A. Well, they refer back to number of cars, train crew, leaving time, arriving time, delays on the road. Then there is number of passengers handled, different things.

Q. In which direction was this freight train running?

A. West.

Q. Before moving this particular train, Mr. Odegard, did you make any protest?

A. Yes, sir; I asked the dispatcher for a message to handle sixteen cars.

Q. What do you mean by a message?

A. Well, a message giving me authority to go out of here with sixteen cars, as there was—you know fourteen cars was the limit up to that time.

[fol. 40] Q. Did you receive any such message?

A. No, sir.

Q. Was there anything at all said to you?

A. No; sir; he said he would not—they would not issue no message.

Mr. Strouss: Mr. Mason, as to this passenger train operation may we have the same stipulation, that is, the consists or train was made up under orders of someone having authority to so order, and the train was operated by the train crew under orders issued by somebody who had authority?

Mr. Mason: The same stipulation as in the case of the freight train, yes.

The Court: All right.

Mr. Polley: Q. What time of day did this train leave?

A. It left Tucson 5:45 P. M.

Q. What number did you say it was designated?

A. Number 5.

Mr. Booth: That is the Argonaut, isn't it?

A. Yes, sir.

Mr. Polley: Q. Then as I understand your testimony train, Number 5 containing sixteen passenger cars was pulled out

of the terminal yards of the Southern Pacific Company onto the main line track on March 2nd, 1940, is that correct?

A. Yes, sir.

[fol. 41] Q. How far was this sixteen-car passenger train operated on the line of the Southern Pacific in Arizona?

A. To Yuma, Arizona.

Q. To Yuma?

A. Yes, sir.

Q. When it left Pima County how many cars did it contain?

A. Sixteen cars.

Q. Can you state how many miles this particular sixteen-car passenger train was operated upon the lines of the Southern Pacific Company in Pima County, Arizona?

A. Practically twenty-six miles.

Mr. Polley: That is all.

Cross-examination.

By Mr. Mason:

Q. Mr. Odegard, the train book which you hold in your hand, form C. S.—

Mr. Polley: 2638.

Mr. Mason: Q. 2638 is a record of not only the train to which you have referred, but other trains which you have operated, isn't it?

A. Yes, sir.

Q. It is a sample of the permanent record which you yourself keep of all your train operations when you are [fol. 42] conductor?

A. Yes, sir.

Q. Eventually it is turned over to the company and becomes a part of the company's permanent record, so far as you know, that is correct, is it?

A. Yes.

Q. The book is issued to you by the company as a blank?

A. Yes, sir.

Q. And when it is filled up you give it back to them?

A. Well, the passenger record, we keep them as a record.

Q. Do you eventually turn them over to the company?

A. No, sir; that is the difference between the freight and the passenger. On passenger you don't turn it back.

Mr. Mason: That is all.

Mr. Polley: That is all.

The State rests, your Honor.

Mr. Mason: We are prepared to proceed, your Honor, with the affirmative defense:

The Court: Well, if you are prepared to proceed we will work until noon.

Mr. Mason: The defendant will call Mr. Sines.

[fol. 43] B. S. Sines, called as a witness for the defendant, having been first duly sworn, was examined and testified as follows:

Direct examination.

By Mr. Mason:

Q. State your name, Mr. Sines?

A. B. S. Sines.

Q. Where do you reside?

A. Oakland, California, with headquarters in San Francisco, California.

Q. By whom are you employed?

A. Southern Pacific Company.

Q. In what capacity?

A. Executive assistant.

Q. Now, you describe yourself as executive assistant. In what department of the Southern Pacific Company are you employed?

A. That is on the immediate staff of the president in the executive department.

Q. What has been your education and subsequent experience in railroad service?

A. In 1922 I graduated from Cornell University with the degree of civil engineer; then worked for two and one-half years with the Illinois Central in the Chicago terminal, improvement department, on electrification and terminal im-
[fol. 44] provement at Chicago, Illinois. In January, 1925, I went to work for the Southern Pacific Company at El Paso, Texas, in the engineering department where I remained for eight years. During that time I performed the ordinary routine duties in the division engineer's office,

and also was inspector and engineer in charge on various construction and maintenance projects of the railroad between Tucson, Arizona, and Tucumcari, New Mexico. In January, 1933, I was transferred to the San Francisco office, the bureau of transportation research, a part of the executive department. I remained in the bureau for four years during which time I made various surveys and studies for the guidance and as bases of recommendations to our officials and executives, and also served as a witness in various cases before the state commissions, the Interstate Commerce Commission and in cases in federal and state courts. In November, 1937, I became executive assistant as above described. Since that time I have performed, have made studies and surveys and made reports to our executives, and have assisted in determining the policy of the company. On July 15th, 1940, I was placed in active charge of the preparation of part of the present Arizona Train Limit case.

[fol. 45] Q. You say that you have participated in cases before the federal and state courts. Did you participate as a witness and otherwise in the preparation of the case for the Southern Pacific in the so-called Nevada Train Limit case, Southern Pacific Company versus Mashburn?

A. I did.

Q. In the federal court for Nevada?

A. Yes.

Q. Your experience in the engineering department was as an assistant in the office of the division engineer in El Paso, was it?

A. Yes.

Q. And included the subject of engineering problems and the working out of engineering construction and maintenance problems on the line of railroad between Tucson and Tucumcari?

A. That is right.

Q. Since then in San Francisco your work has been in connection with operating and construction problems, has it?

A. That is right.

Q. Carrying on the experience you gained previously, both your education as civil engineer and your experience in active railroad service?

A. Yes.

[fol. 46] Q. I will ask you if you have prepared for introduction here a map of the lines of the Southern Pacific Company.

A. I have had prepared such a map by the engineering department.

Mr. Mason: I will distribute copies of this, your Honor.

We ask that the map which has now been distributed be marked for identification as Exhibit Number 1.

Q. There is a counterpart of Exhibit Number 1 for identification on the easel in the court room?

A. Yes, that is an enlargement from the same tracing that the smaller exhibits were made from.

Q. Will you state whether the exhibit marked Exhibit Number 1 is a correct or a substantially correct reproduction of the underlying maps and records in the engineering department?

A. It is.

Q. As to the legend which appears under the Mileage Table on the righthand side, is that added by yourself or by the others who prepared the exhibit for you?

A. It was prepared under my direction and checked by myself.

[fol. 47] Q. Checked against the original mileage tables?

A. Of the Southern Pacific Company, yes.

Q. Will you state to the best of your knowledge and belief whether the exhibit is substantially true and correct?

A. It is.

Mr. Mason: We offer the exhibit in evidence as Number 1.

The Court: Any objection?

Mr. Strouss: Q. What are these distances on this mileage table, are they between the towns that are indicated just before the figures?

A. That is right.

Mr. Strouss: No objection.

The Court: It may be admitted.

The Clerk: Exhibit No. 1 in evidence.

Mr. Mason: Q. Now, Mr. Sines, there are certain portions of the exhibit which might well be explained here. Will you point out how double track and single track are respectively designated on the exhibit.

A. Looking at that portion of the Southern Pacific in Nevada between Lovelock and Rose Creek, there appears two parallel lines. This indicates double track. Immediately west of it, or to the left of Perth, Nevada, is a single dark line, indicating single track.

[fol. 48] Q. Is that designation used generally on all parts of the exhibit?

A. Yes.

Q. Now, between Roseville and Truckee you show two light black lines crossing and recrossing each other.

A. Yes.

Q. What is the explanation there?

A. In that area the operation is double track but the lines are separated; in some instances at a considerable distance, and not built upon the same alignment and profile.

Q. You show a somewhat similar indication between Tucson and Mescal, Arizona. Does the same explanation or a similar explanation apply?

A. That is right. The two tracks are operated as a double track, but are separated.

Q. I notice, too, that there are heavy solid lines and then lines of lighter density, too, also solid lines, on the exhibit. What is the distinction between them?

A. The solid lines indicate branch lines. The heavy solid lines indicate main lines and the lighter solid lines indicate branch lines.

Q. And I suppose that all double track is, of course, main line.

A. Yes.

[fol. 49] Q. I notice also on the exhibit a number of dashed lines, most of them distinguished by initials. What is the purpose of those?

A. Those are simply to indicate the major transcontinental lines in the western states, generally in the same territory served by the Southern Pacific.

Q. And I notice also that some of those dashed lines end in arrows with destinations shown, or points shown, names of cities shown.

A. That is right. As for example, in Utah the Denver & Rio Grande has a designation "To Denver".

Q. That indicates that the Denver & Rio Grande extends eastward generally to Denver?

A. That is right.

Q. I notice you show these other railroads mostly by initials.

A. That is right.

Q. Are those initial designations the ones commonly used in the railroad industry?

A. Yes, sir.

Q. To indicate those railroads?

A. Yes.

Q. What is the dashed line extending northward from a point near San Francisco to Eureka?

A. That represents the Northwestern Pacific, a sub-[fol. 50] sidiary of the Southern Pacific Company.

Q. Are there any other features of the exhibit to which you wish to call particular attention?

A. Yes. At junction points for foreign lines with the major transcontinental carriers that I have mentioned heretofore and also with the smaller railroads we have indicated the physical connections which make the Southern Pacific Company part of the net of railroads serving the entire United States. Starting in the upper lefthand corner of the map at Portland there are indicated connections with the Union Pacific, Northern Pacific and Great Northern. Extending to the right or easterly from Portland are indicated the Spokane, Portland & Seattle and the Union Pacific railroads. I need not cover the entire map, but it will be discovered that that principle applies at all of our junction points.

Q. Now one other feature which will be more material later, will you describe the condition which obtains between Weso, Nevada, and Alazon, Nevada where you have a designation "Southern Pacific-Western Pacific, paired track territory".

A. In that territory the Southern Pacific Railroad Company and the Western Pacific Railway Company have entered into a joint track contract by which the Southern Pacific line is operated in an easterly direction between [fol. 51] Weso and Alazon, and the Western Pacific is operated in a westerly direction between—before I go further——

Mr. Mason: May I suggest to the witness, your Honor, as I recall it, the operation is easterly over the Western Pacific and westerly over the Southern Pacific between these two points.

The Witness: That is correct.

The Court: I didn't get those points.

The Witness: The points are indicated by the black arrows pointing down, your Honor. Weso is the westerly limit of the joint track operation and Alazon is the easterly limit of the joint track operation.

The Court: Is that in Arizona, in our state?

The Witness: That is in Nevada.

The Court: In Nevada?

The Witness: Yes.

The Court: I was trying to find some such places here.

Mr. Mason: Q. Is it correct, Mr. Sines, that between these two points in Nevada which you have just mentioned the two railroads are operated as if there were a single road operating double track?

A. That is right.

Q. All trains of both companies operating eastward on [fol. 52] the Western Pacific and westward on the Southern Pacific?

A. Yes.

Q. The two tracks are substantially parallel although not necessarily adjoining, is that not correct?

A. Yes.

Q. Were there any other features of the exhibit which you wish to explain?

A. No.

Mr. Mason: Mr. Strouss, do you have any questions on the exhibit before we leave it for the time being? I don't mean to foreclose you from cross examination.

Mr. Strouss: No, I haven't any just now.

Mr. Mason: Q. Mr. Sines, do you know, and if so you may state whether the Inter State Commerce Commission issues certain regulations respecting the maintenance of accounts of railroads subject to the Interstate Commerce Act?

A. It does.

Q. Are these published and in printed form?

A. They are.

Q. Have you in your possession a copy of certain regulations issued by the Interstate Commerce Commission for the purpose just described?

[fol. 53] A. I have. The publication is entitled, "Uniform System of Accounts for Steam Railroads, Accounting

Classifications governing investment in road and equipment, operating revenues and operating expenses, income, profit and loss, and general balance sheet accounts, train-miles, locomotive-miles, and car-miles, prescribed by the Interstate Commerce Commission in accordance with Section 20 of the Act to regulate commerce, revised to January 1, 1936."

Q. Now is the issue revised to January 1, 1936, the latest revised edition of the commission's regulations that you have referred to?

A. Yes, and the one now in effect.

Q. It is the one currently in effect?

A. Yes.

Q. Do you know, and if so will you state whether the accounting practices of the Southern Pacific Company conform to the regulations issued by the Interstate Commerce Commission?

A. They do.

Q. Are the definitions of the various units applicable to the keeping of railroad accounts and records set forth in the regulations issued by the commission?

A. They are.

[fol. 54] Q. Do you find therein, for example, definitions for such units as train-miles, car-miles, etc.?

A. Yes.

Q. Now, referring to the commission's regulations, will you read there for the record the definition of a "train".

A. On page 227 of this publication——

Mr. Mason: We are perfectly willing to supply a copy or as many copies as are needed.

Mr. Strouss: No.

Mr. Mason: I am assuming that counsel know all about it. This is merely offered for the purpose of the record.

Q. Will you please read then.

A. On page 227 of this publication under the heading "Text pertaining to train-mile accounts", under the subheading, "Rules and Definitions" appears item 1.

"A train is a unit of equipment or a combination of units of equipment (exclusive of light locomotives) in condition for movement over tracks by self-contained motor equipment. A locomotive is a self-propelled unit of equipment designed solely for moving other equipment. A light loco-

motive is a locomotive in condition for movement by its own [fol. 55] motor equipment, uncoupled to cars, work equipment or dead locomotives. A motor car is a self-propelled unit of equipment designed to carry freight or passenger traffic, and is not to be considered a locomotive."

Q. Is there a definition there of a train-mile?

A. Item number 2: "A train-mile is the movement of a train a distance of one mile."

Q. Is there a definition also of locomotive-mile?

A. There is on page 231, under the heading, "Text pertaining to locomotive-mile account," under Item Number 1, appears the following:

"A locomotive is a self-propelled unit of equipment designed solely for moving other equipment. A locomotive-mile is a movement of a locomotive a distance of one mile under its own power."

Q. Have you there a definition of a car?

A. I have. On page 235 under the heading "Text pertaining to car-mile accounts" appears the following:

"A car-mile is a movement of a unit of car equipment a distance of one mile."

Q. That is the definition of a car-mile. The definition of a car as well, will you read that.

A. There is no definition of a car.

[fol. 56] Mr. Mason: I think we can suspend now, your Honor.

The Court: All right.

Mr. Mason: We have a few more questions of Mr. Sines after recess.

The Court: Until 1:30, I presume will be satisfactory. The court will be at recess.

[fol. 57] 1:30 P. M., November 19, 1940.

All parties being present as heretofore noted, proceedings were resumed as follows:

B. S. Sines, resumed the witness stand for further direct examination.

Mr. Mason:

Q. Mr. Sines, in the course of your experience with railroad reports and accounts, have you encountered the term "ton-mile"?

A. I have.

Q. Is that a term commonly used in such reports and statistics?

A. It is.

Q. Will you state just how the ton-mile is defined?

A. A ton-mile is a transportation unit computed by multiplying the weight by the distance traversed. For example, a ton carried one mile is a ton-mile.

Q. Are ton-mile units further described in various classes?

A. Yes, they are.

Q. What, for example, are those descriptions?

A. A ton-mile is subdivided into gross ton-miles and net ton-miles.

Q. Will you give an illustration of how gross ton-miles [fol. 58] are made or what falls in that description?

A. Gross ton-miles are computed by multiplying the weight of cars and contents exclusive of locomotives by the distances traversed. For example, a box car and contents weighing fifty tons traversing a distance of one mile negotiates fifty gross ton-miles.

Q. You spoke of net ton-miles, did you?

A. Yes, if that same box car has a pay load or if the contents of that box car are twenty-five tons the net ton-miles accumulated are twenty-five net ton-miles.

Q. For the movement for one mile?

A. Yes.

Q. Is there a further classification as between revenue and non-revenue ton-miles?

A. Yes, the net ton-miles are subdivided into revenue net ton-miles and non revenue net ton-miles. The revenue net ton-miles being those handled for the public and for which revenue is received and the non revenue net ton miles represent tonnage handled for the account of the railroad itself and is usually made up of material and supplies such as fuel, ties, and rail and other items.

Q. These units and ton-mile and its various separate de- [fol. 59] scriptions relate to the transportation of property, do they not?

A. Yes.

Q. Are there corresponding units made in connection with the transportation of persons?

A. Yes, we have passenger-miles.

Q. Those of course, divide into revenue and non-revenue passenger-miles, do they not?

A. Yes.

Q. Will you just define in your words the passenger-mile.

A. A passenger-mile is accumulated or manufactured when the passenger is carried a distance of one mile.

Q. If a passenger car contains 50 persons and moves for ten miles it will accumulate 500 passenger-miles?

A. Right.

Q. Referring to all of these definitions of units used in the measurement of railroad service or in the reporting of railroads, do you use these units as defined by you here in the preparation of various exhibits?

A. I have.

Q. Have they been used in the several exhibits which have been prepared for this case where those units ap-

[fol. 60] pear?

A. That is right.

Mr. Mason: I may say for the information of the court, although I think it is quite apparent, that this testimony is offered merely in a preliminary way to define certain units measuring railroad problems or used in the rendition of reports and which are also used in our exhibits prepared from the foundation of such reports.

The Court: It would be very helpful to the court in understanding the testimony.

Mr. Mason: I assume it will be, because we will be using these units from time to time.

The Court: Yes.

Mr. Mason:

Q. Did you in your previous testimony cover the subject of locomotive-miles?

A. Yes, that was the second series of a definition that I gave.

Q. Can you define for the court what is meant by the expression "train-hour"?

A. Trainhours represent the length of time that trains spend on the road between initial and final terminals, including time at intermediate stops.

Q. It does not include any time in initial or final terminals?

A. No.

[fol. 61] Q. What is meant by "average train speed"?

A. Average train speed for any district of a railroad is computed by dividing the train-miles negotiated by the trains in that district for a given length of time by the number of train-hours accumulated by the trains operating in the same district.

Q. That will give an average speed in miles per hour?

A. Yes.

The Court: You say that includes the stops at intermediate points?

A. Yes.

Mr. Mason:

Q. Mr. Sines, directing ourselves particularly to operations in Arizona, do you recall where the freight division points are in Arizona?

A. Yes, the first freight division point is Yuma; next is Gila, then Tucson. That is along the principal main line, besides which there is the secondary main line through Phoenix where the freight districts are Yuma to Phoenix and Phoenix to Tucson. Proceeding east from Tucson the next freight district is Tucson to Lordsburg. You said in Arizona——

Q. I mean the lines that are affected here.

A. The next succeeding freight district, the district from Lordsburg to El Paso. On the south line the freight districts are Tucson to Douglas and Douglas to El Paso.

Q. Do freight train crews ordinarily change at the points you have mentioned?

A. They do in all instances.

Q. Those are the normal runs of freight train crews between those points?

A. That is right.

Q. Will you state whether or not for purposes of designation a train originating, made up at Yuma, becomes a new train as it passes Gila?

A. It does become a new train as it passes Gila.

Q. It there requires a new crew and a new locomotive, normally?

A. Yes, and a new number designation.

Q. If that same unit comes to Tucson and without change or substantial change of consist, continues to move east, does it still require a new designation as train?

A. Yes.

Q. For how far, supposing it moves to El Paso by Lordsburg?

A. It will have a designation from Tucson to Lordsburg [fol. 63] and another designation from Lordsburg to El Paso.

Q. Even though there is no substantial change in the actual cars moving in it?

A. That is right.

Q. Will the same occur if moving by Douglas?

A. That is right.

The Court:

Q. Does that train bear the number, I am speaking of the freight train, of the engine? I took it from what the freight conductor said this morning, he was designating that train by the engine number.

A. That is in accordance with operating practice and applies to our west bound trains usually when there is no time table authority for the movement of the particular train, and when that occurs the train assumes the engine number, as for instance, that first freight train this morning was Extra 3764 west. Our manifest trains west bound have designated numbers and usually our east bound trains have numbers which are not determined by the engine number.

Mr. Mason:

Q. You spoke of manifest trains. Perhaps you better explain what you mean by a manifest train.

A. A manifest train is run usually upon a predetermined schedule or a schedule which is repeated every day and [fol. 64] contains freight which is manifested or for which particular records are kept in the division and headquarters offices.

Q. Is that character of freight usually given preferred or more expedited service?

A. Yes.

Q. Does it move on schedule from centers of production or centers of accumulation to other centers of distribution?

A. Yes.

Q. Is it correct to say that manifest trains are generally the west bound schedule freight trains?

A. That is right. That is usually what we mean on the Southern Pacific when we speak of a manifest train. We are thinking of the west bound trains with high class merchandise freight. By the same token, however, our perishable trains east bound are also manifest trains and we have formed the habit of referring to them as perishable trains.

Q. Do they likewise operate on schedule?

A. Yes.

Q. That is on agreed time from original point of accumulation to ultimate point of distribution?

A. Yes, that is right.

Q. Assume that 70 cars of loaded perishables are accumulated at Yuma with engine and caboose and move east- [fol. 65] ward across Arizona and through Lordsburg to El Paso. Where would the first change of locomotive and caboose take place?

A. Usually the locomotives would change at Gila. The cabooses would almost certainly change.

Q. Would there be a further change of locomotive and caboose at Tucson?

A. That is right.

Q. And again at Lordsburg?

A. That is right.

Q. And finally again at El Paso?

A. Yes.

Q. We are assuming that the train is broken up at El Paso for distribution to the various lines radiating from there?

A. That is right.

Q. How many actual trains would be involved in that movement?

A. There would be four trains in that movement.

Q. That would appear on the record as four different trains?

A. That is right.

Q. Whether there are four trains or one train, they would accumulate the same number of train-miles?

A. That is right.
Q. And the same number of car-miles?
[fol. 66] A. Yes.
Q. And the same number of locomotive miles?
A. Yes.

Mr. Mason: Your honor, of course Mr. Sines will appear as a witness subsequently in connection with more testimony, but the testimony now offered is for the purpose of laying a preliminary foundation for other testimony and I should like to withdraw him at this point, subject to such cross examination as opposing counsel may wish.

Cross-examination.

By Mr. Strouss:

Q. There is one thing, on this average speed, you say divide the train-hours into train-miles. In ordinary language that should mean divide the distance between the terminals by the elapsed time?
A. That is right.
Q. In other words, the train-miles would be distance between terminals and your elapsed time would be train-hours?
A. Yes.

Mr. Strouss: I think that is all for now.

(Witness excused.)

[fol. 67] C. C. Leriche, was called as a witness in behalf of the defendant and being first duly sworn, testified as follows:

Direct examination.

Mr. Mason:

Q. Your name is C. C. Leriche?
A. Yes.
Q. Where do you reside?
A. Alameda, California.
Q. Are you employed by the Southern Pacific Company?
A. Yes sir.

Q. With headquarters at San Francisco?

A. Yes.

Q. What is your present position with the company?

A. Draftsman in the Motive Power Department.

Q. Is that a department of the company having to do with the building and maintenance of rolling equipment?

A. Yes sir.

Q. Including freight and passenger cars?

A. Yes sir.

Q. What has been your experience in railroad serv-
[fol. 68] ice?

A. I began in 1917 as an apprentice in the car department and from there in 1919 to 1923 I was a draftsman in connection with car work in the Sacramento general shops. In 1923 I was sent to the San Francisco general office to do drafting. In 1924 and 1925 I was again at the Sacramento general shops as a draftsman. In 1926 I was sent again to the general office for car drafting and designing. In 1927 I was sent to Chicago as an inspector on construction of freight cars.

Q. Were those cars being built by some other company for the Southern Pacific Company?

A. Yes sir. In 1927 to 1930 I was again in the Sacramento general shops as a draftsman. In 1930 I was assistant freight car foreman in the Sacramento general shops. In 1931 I was a draftsman again in Sacramento. In 1932 to 1935 I was an apprentice in the P. F. E. at Roseville. In 1935 I went back to the general office as a draftsman in the freight car department.

Q. In your work as an apprentice in the car department and also as an apprentice with the Pacific Fruit Express were you actually engaged in the construction of freight and passenger cars?

A. Yes.

[fol. 69] Q. As a draftsman and car worker were you engaged in the drafting and design of freight and passenger cars?

A. Yes sir.

Q. What is the character and nature of your work generally as a draftsman in the Motive Power Department at San Francisco at the present time?

A. I prepare drawings and designs and specifications for the construction of cars.

Q. Freight and passenger cars both?

A. Yes sir.

Q. You speak of the Sacramento general shops. Is that a general shop maintained by the Southern Pacific Company?

A. Yes sir.

Q. And within the Motive Power Department?

A. Yes.

Q. Will you state whether or not locomotives and cars are built there?

A. They do build locomotives and cars there, yes, sir.

Q. Do they also do repair work on locomotives and cars?

A. Yes sir.

Q. Is that one of the principal general shops maintained [fol. 70] by the Southern Pacific Company on its system?

A. Yes sir.

Q. Does the Motive Power Department maintain records and specifications of the equipment owned by the company?

A. Yes sir.

Q. Do those run back for a series of years?

A. They do.

Q. How far, if you know?

A. They go back as far as 1900.

Q. Do they show the design and successive design in freight and passenger equipment owned and operated by the company?

A. Yes sir.

Q. Speaking of your experience running down these dates I believe it shows you have some 17 years experience as a draftsman of freight and passenger cars and six years in repair, construction and building and inspection, is that correct?

A. Yes sir.

Q. Have you taken any courses of instruction in connection with your work?

A. I have.

Q. Will you state what they were?

A. I completed two courses from the International Correspondence School. One was for mechanical draftsman [fol. 71] and the other was for structural engineering.

Q. Do you have access to the records of specifications and drawings relating to freight and passenger cars which you have stated as being within the possession and maintained by the Motive Power Department?

A. I do, yes sir.

Q. Have you made any review of those records for the purposes of this case?

A. Yes sir.

Q. I show you an exhibit of one sheet which I will ask to be marked defendant's Exhibit No. 2 for identification.

The Court: It may be marked.

Mr. Mason: Bearing at the top the title, "Chronology of Freight Box Cars, year 1900 to 1940, Showing Design and Capacity Characteristics." Are you familiar with that exhibit?

A. Yes sir.

Q. Was that prepared in the Motive Power Department?

A. Yes sir.

Q. Were you associated with its preparation?

A. I reviewed it.

Q. Have you compared it with the original records from [fol. 72] which it was prepared?

A. Yes, sir.

Q. Will you state whether or not it is a substantially correct reflection of those records?

A. It is.

Mr. Mason: We offer the exhibit as Defendant's Exhibit No. 2.

The Court: Any objection?

Mr. Mason: Perhaps I should have said first I am willing that Mr. Strouss examine in order to determine the authenticity and all the other details before it is offered and I will with-hold the offer until such time as Mr. Strouss has inquired.

Mr. Strouss: I just want to inquire,—this is a chronological statement of the development of the freight cars used on the Southern Pacific lines?

A. Yes sir.

Q. It does not purport to refer to cars on any other system?

A. No sir.

Mr. Mason: It is freight cars owned by the Southern Pacific Company as distinguished from freight cars of other ownership which are from time to time used on our railroad, is that correct, Mr. Leriche?

[fol. 73] A. That is correct, yes sir.

Mr. Strouss: I have no objection.

The Court: It may be received in evidence.

(Document received in evidence and marked Defendant's Exhibit No. 2.)

Mr. Mason:

Q. Mr. Leriche, referring to Exhibit No. 2 and particularly to the illustration opposite the year 1903, is that the first year in which the steel under-frame appeared in the construction of Southern Pacific Company box cars?

A. Yes sir.

Q. What does the significance of the drawing appearing in column F at the extreme right of the exhibit show?

A. That shows a cross-sectional area of the center-sill.

Q. Of the steel under-frame?

A. Yes sir.

Q. Has the steel under-frame or other steel body construction been a feature of all cars built or acquired by the Southern Pacific Company since 1903?

A. Yes sir.

Q. Going down to 1911 does that drawing indicate the characteristics of the typical freight car as operated and owned by the Southern Pacific Company as of 1911 and [fol. 74] 1912?

A. Yes sir.

Q. What particular changes happened in 1913 which were significant as adding strength or other advantageous features to box car construction?

A. These cars built in 1913 had a steel superstructure and also a K-2 triple valve was applied.

Q. That is a part of the brake mechanism?

A. Yes.

Q. Was that an advance over previous installation?

A. That was an improved type of triple valve.

Q. What was the effect of building a steel superstructure on these box cars?

A. It gave a more rigid construction on the side frame.

Q. Did that add strength?

A. Yes sir, and you will also note in column F the area of the center-sills was increased from 18 inches to 23 inches.

Q. Did that add strength and rigidity?

A. That added strength and rigidity to the car.

Q. What was the principal change that occurred in the next succeeding years?

A. The next principal change occurred in 1916 when we applied frictional draft gears and also the cross-sectional [fol. 75] area of the center sills was increased from 23 to 26 inches.

Q. Is it correct that each of these blocks shown here in columns D, E and F represent capacity or size or cross section?

A. It does.

Q. And its relative scale to each of the others in the same column?

A. Yes sir.

The Court: Will you explain what that frictional draft gear improvement consisted of? What does that mean?

A. The draft gear prior to this time was just an ordinary coil spring gear and the frictional draft gear had a friction feature.

Mr. Mason:

Q. Will you explain just what the draft gear is on the car?

A. It is a device to which the coupler and yoke are fastened and this device, the friction draft gear takes up the shocks due to buffing or pulling and reduces the shocks to the car body.

Q. Is the draft gear a device by which the coupler and the coupler shank are attached to the car body?

A. Yes sir.

Q. They form a sort of intermediate connection by means [fol. 76] of which these frictional gears take up the shock of collision and coupling and pulling and handling of the car?

A. Yes sir.

Mr. Mason: Does that explain it to Your Honor?

The Court: I think so.

Mr. Mason:

Q. Will you explain the improvement which next occurred following 1916?

A. The next improvement occurred in 1919. The cars built during that year had type D couplers, cast steel coupling yokes, corrugated steel ends. Type D coupler

was a larger and stronger coupler than had been applied to cars prior to this time and cast steel coupler yokes are made of cast steel in place of wrought iron yokes that they used to have before and corrugated steel ends was a one-piece end which greatly added to the strength of the car.

Q. Did that have the effect of eliminating breakages of the car ends?

A. Yes sir.

Q. Each time that these improvements were made that you have described were box cars of older construction likewise given such improvement as far as possible?

A. Yes sir.

[fol. 77] Q. Were friction draft gears applied to older cars as they were brought in for repairs?

A. Yes sir.

Q. When cars were rebuilt were these corrugated steel ends placed on them even though they may have been built prior to 1916?

A. Some of them were, yes.

Q. What was the improvement, if any, next following 1919?

A. The next major improvement occurred in 1924. On cars built prior to 1924 the roofs were made of thin metal covering with a wood lining underneath and the cars built in 1924 had an all-steel roof. They also applied a heavier wheel, a 750 pound cast iron wheel.

Q. What was the effect of the application of the heavier wheel?

A. It was a little stronger design.

Q. Did that tend to eliminate wheel breakages?

A. Yes, it would.

Q. Was this 750 pound wheel,—did that become a standard requirement on all cars?

A. It did, yes.

Q. Is it now a standard requirement?

A. The wheel we have now is also 750 pounds but instead of being what they call a double plate wheel it is a single [fol. 78] plate wheel.

Q. That is shown as the 1927 improvement?

A. Yes.

Mr. Strouss: May I ask, when you say "all cars" you mean all Southern Pacific Company owned cars?

Mr. Mason: I was going to ask about that.

Q. Is this requirement of a 750 pound single plate wheel a universal requirement in the United States now?

A. Yes, it is.

Q. On all cars which are handled in interchange between carriers?

A. Yes sir.

Q. Between standard railroad carriers?

A. Yes sir.

Q. The exhibit indicates an improvement in 1925. Will you go into that please and state what happened there?

A. In 1925 we applied heavy graduating springs in the triple valves. The purpose of that was to overcome undesirable emergency application of the brakes. I might say that the Association of American Railroads interchange rules effective January 1st, 1935 made the application of the heavy graduating springs mandatory when airbrakes were cleaned. We started applying these heavy triple [fol. 79] valves as you see here in 1925. This same series of cars were built in 1925, the center-sill area section was also increased from 26 to 29 square inches and an auxiliary handbrake lever was also applied. The purpose of the auxiliary handbrake lever was to increase the breaking power applied by hand. That about covers the 1925 improvements.

The Court: Those handbrakes I presume were used in your local switching after the cars were cut loose from the switch engine?

A. Yes sir.

Mr. Mason:

Q. In 1927 I think you have already referred to the application of single plate wheels?

A. Yes sir.

Q. Will you proceed to the next improvement following 1927?

A. That occurred in the years 1936 and 1937. During that year the principal change was an all-steel superstructure and also steel side doors, power handbrake, application of the A. B. airbrake, type E couplers and single snubber springs were applied on the trucks; No. 15 brakebeam applied on the cars in 1936 and No. 3 beam applied on the cars in 1937.

Q. Are those brake-beams heavier than the ones previously used?

[fol. 80] A. Yes sir.

Q. And less liable to breakage?

A. Yes sir, and also applied a brake-beam safety guard and bottom rod supports. The purpose of those two items are in case any of the parts of the brake hanger should break it wouldn't fall to the earth, the bottom rod would support it and prevent it from falling to the ground.

Q. And tends to eliminate the so-called dragging of the break-beam?

A. It would tend to eliminate a derailment too.

Q. I notice in 1936 and 1937 the cars constructed in that year had a smaller cross-section area of the center-sill than in 1927. How did that occur and what, if anything, was done to compensate for that reduction in area?

A. With the all-steel superstructure framing additional strength was obtained.

Q. Did the reduction of the center-sill area result in any less strength of the car from the standpoint of resistance to collapse or buckling?

A. No, it did not. These cars here were constructed in accordance with the A. A. R. recommendations. The A. A. R. tested five of these designs in 1933 and found this to be a very suitable design.

Q. Proceeding to the next and final change which is [fol. 81] shown on the exhibit, will you state what that is and what its effects have been?

A. The next and last exhibit covers the cars that are now being built during the year 1940.

Q. Are these cars presently in service?

A. No, they are not.

Q. They are about to be acquired, are they?

A. Yes. The improvements there consist namely, of a swivel shank coupler, coupling center device and metal running boards, metal brake step, W-section corner posts, steel floor plate applied across door-way, Wine brake balancer, brake hanger wearing plates and brake pipe anchors.

Q. What does the Wine brake balancer accomplish?

A. It returns the force set up in the foundation of the brake rigging to the car body from which it originates and tends to prevent the truck from screwing over to the side and also provides a better means of adjustment to the brakes due to the brakeshoe wear; it is more accessible.

Q. Going back to Exhibit No. 2 I notice in 1909 there appears the item "Cast steel truck side frames." What type of construction was replaced by the cast steel truck?

A. The arch bar type of truck frame.

Q. Do cars with arch bar trucks now operate over our [fol. 82] lines in interchange service?

A. No.

Q. When I say "cars" I mean freight cars.

A. Yes.

Q. When I speak of "interchange service" do you understand what I mean?

A. Yes.

Q. Will you explain what interchange service is?

A. It means the car is going from one railroad line to another, that would be interchange over a different system like the Southern Pacific and the Union Pacific, that would be an interchange.

Q. Is it correct that a freight car equipped with arch bar trucks cannot now be operated from Southern Pacific Company through an interchange point to the Union Pacific?

A. No, it can't, not with an arch bar truck.

Q. Are any cars with wooden underframes now operated in interchange service or is there a restriction on the interchange of wooden cars?

A. I believe there is a restriction on the operation of wooden underframe cars in interchange.

Mr. Strouss: Let me ask a question. We are getting into something that is a matter of record. I would like to ask a question or two before we have any more of this inter- [fol. 83] change. How are the rules of interchange governed?

A. I don't quite understand the question.

Mr. Strouss: Who determines what cars are permissible in interchange?

A. The I. C. C.

Q. Is it the I. C. C. or the American Railway Association?

A. I would say it is the I. C. C.

Mr. Strouss: I submit to counsel this witness is not qualified. As I understand these interchange rules your American Association puts out its rules of interchange on cars.

Mr. Mason: As to that I am not certain but it is my impression that the Association of American Railroads

of its own motion does impose certain restrictions upon interchange of cars not having the desired equipment.

The Court: That is requiring them to come up to certain standards?

Mr. Mason: Yes, but whether it be the American Association itself or the I. C. C. I am not certain. The I. C. C. may interpose certain restrictions.

Mr. Strouss: That is not the ordinary procedure as I understand it and if there are any orders of the I. C. C. requiring certain types of equipment before cars are ac-
[fol. 84] cepted as interchange I think those orders should be produced. They are the best evidence and not hearsay testimony of a witness and I don't think this witness is qualified.

Mr. Mason: Perhaps I should not have entered upon the subject except merely for the information of the Court, but whatever the rules may be we will produce them for your examination and we can make certain between ourselves as to whether it is the Association of American Railroads acting as the agency of all the railroads or the I. C. C. which imposes these interchange requirements.

Mr. Strouss: I say that, Mr. Mason, because with respect to the A. A. R. in particular, because I did inquire of the I. C. C. whether they had issued an order on interchange and was advised they had not and that the American Railroad Association had. So I take it that at least part of your interchange is governed by rules of the American Association and not fully by the I. C. C. I think we should have the authority or the rules themselves produced and not the hearsay testimony of the witness. I think, if the Court please, I will ask that the testimony of this witness as to interchange be stricken as not the best evidence.

Mr. Mason: I think that is a pretty generic objection, Mr. Strouss. Some of that testimony was perfectly com-
[fol. 85] petent and relevant.

The Court: I will deny the motion as to the striking of all of it; I think as to some of the last questions the motion might be good.

Mr. Booth: I suggest when the record is written up that counsel direct what portions he wants stricken.

Mr. Strouss: I have no objection to having evidence come in here as to what the rules of interchange are, in fact I think we should have that but I think it should come in in the proper way.

Mr. Mason:

Q. Mr. Leriche, have you before you a statement or chart consisting of one sheet entitled "Southern Pacific Company Lines, Comparison of freight cars of steel, steel underframe and other construction, years 1903 to 1939?"

A. Yes sir.

Mr. Mason: I will ask that the statement be identified as Defendant's Exhibit No. 3.

The Court: Before you go on with that there are one or two questions I would like to ask of this witness. How long does it take these freight cars to become obsolete? What is the average life? You are showing here on your chart with different types of freight cars from 1900 up [fol. 86] to date. What, for instance, would be the oldest car that is now in use of these different types?

A. As best I can recall I would say there are still some cars that were built in 1909 probably in service.

The Court: Do I understand that even those old cars from time to time as they go into the shop are remodeled and certain of these appliances and improvements made on the old type of car?

A. Some of the improvements are made, yes sir.

Mr. Mason:

Q. Is it correct, Mr. Leriche, that these older types of cars when they come in for repairs, particularly general repair, are given such of these improvements as can be applied?

A. Yes sir.

Q. For example, replacement of arch bar trucks by cast steel side frames?

A. Yes sir.

Q. Application of the later type triple valve?

A. You mean the K-2 triple valve?

Q. Yes?

A. Yes.

Q. Replacement of weak graduating springs by strong graduating springs?

A. Yes sir.

Q. Replacement of older type couplings by new ones?

[fol. 87] A. Couplers and also wheels.

Q. What about draft gears?

A. We apply nothing now but A. A. R. certified friction draft gears.

Mr. Strouss: Do I understand your question to be whenever any car goes in it is given all of these improvements?

Mr. Mason: No, I didn't mean to infer that. I meant only to suggest when cars go into the shops for general overhaul these newer appliances are applied so far as they can be. There are some cars that obviously you couldn't do that with.

Q. Where these older cars cannot be brought down to date or up to the same character of strength and efficiency of the later type cars what is done with them? Are they restricted to any particular use?

A. They convert a lot of them into M and W cars, outfit cars.

Q. By "M and W cars" what do you mean?

A. Maintenance of way.

Q. Then what are they used for?

A. They are used for crews working on the tracks to live in.

[fol. 88] Q. Used for bridge crews and track repair crews?

A. Yes.

Q. Do they move from place to place frequently or do they stand idle?

A. No, they stand for quite a while.

Q. Referring to the statement which has been marked for identification No. 3, how was this exhibit prepared?

A. It was prepared from the records of the Southern Pacific Company.

Q. Motive Power Department?

A. Motive Power Department.

Q. Have you compared it with the original records?

A. Part of it, yes sir.

Q. Are the figures which appear thereon reproduced from the records of the Motive Power Department?

A. Yes sir.

Q. Have you made any check to determine whether the exhibit is correct?

A. I have.

Q. Will you state whether or not it is a true and correct representation of what appears from the original records?

A. Yes sir.

[fol. 89] Mr. Mason: Do you wish to ask any questions before I offer the exhibit, Mr. Strouss?

Mr. Strouss: I would like to find out something about it so I will understand it.

Mr. Mason: I intend to ask those questions but I don't want them to appear of record until the exhibit itself is of record.

Mr. Strouss: May I have just a moment then? This refers only to Southern Pacific Company owned cars?

A. Yes sir.

Mr. Strouss: It purports to show the number of steel under-frame and other construction cars?

A. This bottom black line here shows the steel and steel under frame cars and ownership and different years. You will notice at the bottom of the page we have the years from 1903 to 1939; it shows the ownership of those cars in those years. You will notice beginning in the middle we have a dotted line which shows the number of cars with steel center sills and the top black line indicates the total number of cars owned, including wood, steel center sill cars, all-steel and steel under-frame cars.

Mr. Strouss: I have no objection.

The Court: It may be admitted in evidence.

[fol. 90] (Document received in evidence and marked Defendant's Exhibit No. 3

Mr. Mason:

Q. Referring to Exhibit No. 3 in evidence, Mr. Leriche, am I correct in understanding that the bottom line which appears to have the designation "A, steel and steel under-frame cars" indicates from year to year the total number of steel and steel under-frame cars owned by the Southern Pacific Company?

A. Yes sir.

Q. Then commencing at 1916, the dashed line indicates the total number of steel and steel under-frame cars and as well those cars with steel center sills which the Southern Pacific Company owned?

A. Yes sir.

Q. And the line, the solid line designated as line "C", "Total Cars" indicates for each year from 1903 to 1939 the total ownership of freight cars of all classes of construction including wooden cars in addition to the others?

A. That is right.

Q. In order to get at the number of wooden cars owned in any particular year would it be correct to take the difference between the figure of total cars and the figure of steel and [fol. 91] steel under-frame and steel center sill cars for that particular year?

A. Yes, that is right.

Q. You would have to make a subtraction of figures shown on the exhibit to get the number of wooden cars?

A. We did that here with the two top columns.

Q. You subtract Column A from C up to year 1915?

A. That is right.

Q. And column B from Column C after the year 1916?

A. That would give the total wood cars.

Q. To get at the number of cars with steel center sills as distinguished from those of steel construction or with steel under-frames could you get at that by taking the figures in Column A from those in Column B?

A. That is right.

Q. Am I correct in this, that the figures corresponding to Line C in Column C are inclusive of those corresponding to Lines A and B in Columns A and B?

A. State that again please.

Mr. Mason: Will you read the question?

(Question read by the Reporter.)

[fol. 92] A. That is right.

Mr. Mason: If I may suggest to Your Honor this exhibit perhaps goes far towards answering your question as to the change in the development of cars and how the number of steel cars rises as the number of wooden cars fall.

Q. Have you made any calculation as to the number of wooden cars of Southern Pacific Company ownership as of the end of the year 1939?

A. At the end of the year 1939 they owned a total of 557 wood cars.

Q. That is the difference between this figure of 41,299 in Column C and 40,742 in Column B on Exhibit No. 3?

A. Yes sir.

Q. Have you made any computation or can you tell us from the exhibit readily how many wooden cars Southern Pacific Company owned as of June 30, 1912, that being the year in which the Train Limit Law was adopted?

A. June, 1912 they owned 13,319 wood cars.

Q. Can you tell me what percentage that was of the total ownership in that year or it is capable of calculation from the exhibit, isn't it?

A. Just a little under 50 per cent.

[fol. 93] Q. And the percentage in 1939 was the relationship between 557 and 41,000?

A. That is right. I might add that of these 557 owned as of December, 1939 that 285 of those are narrow guage and the rest comprise tank cars, cabooses and logging cars.

Q. Are there any narrow guage lines in Arizona that you know of?

A. No, I don't believe there are.

Q. I would like to have you refer to statement entitled "Chronology of Passenger Coach and Chair Car", Defendant's Exhibit No. 4 for identification. Referring to the statement marked Defendant's Exhibit No. 4 for identification and which bears title "Chronology of Passenger Coach and Chair Car, year 1900 to 1940 Showing Design and Improvements". Are you familiar with the manner in which this exhibit was prepared?

A. Yes sir.

Q. Will you state whether or not it was prepared in similar fashion to No. 2?

A. I prepared this exhibit myself.

Q. From the records of the Motive Power Department?

A. Yes sir.

Q. Does it refer entirely to passenger equipment of Southern Pacific Company ownership?

[fol. 94] A. Yes sir.

Q. And only to coaches and chair cars?

A. Yes sir.

Q. It does not refer to Pullman equipment at all?

A. No, it does not.

Q. Or to baggage equipment?

A. No sir.

Q. Is the statement a true reflection of the original source from which you prepared it?

A. Yes sir.

Mr. Mason: Do you wish to ask any questions, Mr. Strouss?

Mr. Strouss: No, I have no objection.

Mr. Mason: I will offer the exhibit as No. 4.

The Court: It may be admitted.

(Document received in evidence as Defendant's Exhibit No. 4.)

The Court: Before you leave the other exhibit there is one other thing I wanted to ask about. I judge from this chart that as of the end of the year 1939 the Southern Pacific Company had considerably fewer freight cars than they owned back in 1929 to '32 and '33?

A. Yes, they had.

The Court: A very decided decrease in the number?

[fol. 95] A. Yes.

The Court: How do you account for that?

A. The older cars are being dismantled and they haven't built so many in recent years to take their place.

The Court: Depression years?

A. Yes, sir.

Mr. Strouss: Might the difference in capacity of the later cars have had something to do with that?

A. I don't think that would because the capacity hasn't been increased since 1911.

The Court: Does that necessarily follow that the business of the company would be decreased somewhat at least in proportion to the number of cars owned?

A. I would say that it would, yes.

Mr. Mason: Of course, Your Honor, we will have figures showing exactly the amount of tonnage and the amount of car miles we have made.

The Court: There is such a decided downward curve.

Mr. Mason: I think the answer is found in this that we are getting a greater utilization of our equipment.

[fol. 96] The Court: All right.

Mr. Mason:

Q. Going to Exhibit No. 4, does this exhibit indicate the improvements made in passenger car equipment from year to year or during the various years in the same manner and along much the same lines as No. 2 that shows for freight equipment?

A. Yes sir.

Q. Referring to the change effective in 1913 will you state whether any substantial improvements were made at that time and if so what they were?

A. The major improvement in 1913 was the strengthening of the car structure in general by increasing the size of the center sills from 10 inch 25 pound I-beams to 15 inch 60 pound I-beams and application of an improved type of brake called the "L and N"; also Sharon couplers, a heavy and stronger coupler applied in place of the Janney coupler.

Q. Had steel construction taken the place of wood construction prior to 1913?

A. The construction of the wood car commenced in 1906; the first steel car built in America was constructed in the company shops at Sacramento. It was an all-steel construc- [fol. 97] tion with the exception of the inside finish which was mahogany.

Q. Is it correct that all cars built since 1909 have been all-steel construction?

A. Yes sir.

Q. Are there any standards promulgated by any government department which are followed in the construction of Southern Pacific Company passenger cars?

A. All cars are constructed in accordance with the United States Railway Mail Service specifications for mail cars.

Q. Those specifications I take it refer to the equipment, the under-frames and the general construction?

A. When I say "all passenger cars" I mean coaches and chair cars and diners, that is with respect to strength.

Q. Does that include the brake appliances, the couplers?

A. No, the specifications do not cover that phase of it.

Mr. Strouss: I don't object to him going a little way but I think we are getting into something where the best evidence would be the specifications themselves.

Mr. Mason: I think the witness is qualified as having [fol. 98] stated he is a designer and draftsman of passenger car equipment.

Mr. Strouss: Perhaps so, but he is now testifying what are the specifications required by some governmental body. Those specifications themselves would be the best evidence.

Mr. Mason: If counsel desires we can produce those. I didn't intend to pursue the subject any further but we can produce those specifications of the Railway Mail Service. They must be readily available in our Motive Power Department.

The Witness: Yes, sir.

Mr. Mason:

Q. As to improvements subsequent to 1913, will you pick out the more important improvements, especially those having to do with the strength or convenience of operation?

A. In 1914 construction of the ends was strengthened and also straight electric lighting was applied with an axle generator.

Q. What type of lighting was done away with that existed prior to the use of the electric light?

A. Prior to 1914 cars were equipped with combination gas and electric lighting. They were equipped with gas lights and had a through train line and you could have electric lights providing there was a baggage car that was [fol. 99] equipped with a generator on the front end to supply the electricity. That was called combination gas and electric. The next year, 1914, it went straight electric with the application of an axle generator which supplied the electricity for each car. The next major change occurred in 1921, improved type of brake equipment, called the Universal equipment, was applied; flush hoppers and electric ceiling fans. In 1923 the length of the cars was increased from 68 feet 6⅜ inches over the platform to 80 feet 5½ inches, and the seating capacity increased from 72 to 90. Six wheel trucks with clasp brakes applied. A.A.R. Type "D" couplers and quadruple shear yokes.

Q. What about the 1927 improvements?

A. The 1927 improvements consisted of the application of pressed steel body bolsters in place of cast steel body bolsters which were on cars built prior to this time; integral pedestal type trucks applied which consisted of pedestals being cast integral with the side frame. Prior to this time the pedestals were bolted to truck frame. Cars were also equipped with locking center pins and the heat was thermostatically controlled. These double deck spring seats were applied which provided more riding comfort to the passenger.

[fol. 100] The Court: What is that locking center pin?

A. Prior to this time the center pin is what they commonly call a king pin, making the connection between the truck and car body, just a pin drops in there, but the locking center pin is put in there, it is locked so that in case of derailment the car couldn't leave the truck. In other words,

if a car tends to lift off the rails it would pull the truck with it. In 1928, the improvement consisted of installation of men's and women's wash room separate from the toilet; porcelain wash basins; size of journals increased to 5½ by 10 and two inch by two inch train line valves applied. The next year, 1929, the principal improvement was the installment or inclusion of a men's and women's lounge and double pan hoppers.

Mr. Mason:

Q. When did the streamline construction first appear?

A. That first appeared in 1937.

Q. What are these units illustrated here opposite 1937? Of what train operated by the company are they characteristic?

A. The Daylight.

Q. Is the same true of the cars shown here for 1939?

A. Yes, sir.

[fol. 101] Q. Are those air-conditioned?

A. Yes, they are.

Q. Where do those trains operate? Entirely in California?

A. They operate between San Francisco and Los Angeles.

Q. Are there any cars of the type similar to and bearing the same general characteristics and improvements as these shown for 1939 now on order?

A. There are, yes, sir.

Q. Will any of those operate in Arizona?

A. I believe some of them do, yes.

Q. Do you know for what trains they have been particularly ordered?

A. The Lark and San Joaquin.

Q. Where does the Lark operate?

A. Los Angeles and San Francisco.

Q. And the San Joaquin?

A. Los Angeles and San Francisco also.

Q. Has there been any improvement in the steam train line as between the earlier type of cars and those now in use?

A. Yes, there has. Any cars built prior to 1909 were equipped with inch and a half steam train line and one and a half by one and a half end valve. These one and a half,

[fol. 102] by one and a half end valves were subsequently changed out and replaced with two inch by one and a half end valves and also the train line was increased from inch and a half to two inch.

Q. What about the connections between cars?

A. 1930 we began the application of two inch flexible metallic train line connection and two inch by two inch end train line valve was also started and at the present time we have about 75 per cent of our equipment equipped with two inch steam train line connections, metallic connections.

Q. What is the advantage of this larger train line and the flexible metallic train line connections?

A. It gives you a greater supply of steam which results in greater efficiency in heating of cars at the rear end of the train.

Q. Are cars thus equipped in use on the principal main line trains?

A. Yes, sir.

Q. Where is the older type of equipment or equipment not so fixed up? Where is that used?

A. We have, as I said before, practically all of our equipment equipped with a full two inch train line with a metallic conduit.

Q. You said I think that all-steel construction has pre-
[fol. 103] vailed in passenger car equipment since 1909. Are there any wooden passenger train cars of Southern Pacific Company ownership at the present time?

A. Yes, we still have some.

Q. Have you any figures to show how many such wooden cars were owned by the company as of December 31, 1912?

A. December 31, 1912 we owned a total of 1554 cars which included observation, dining, chair, coach and the head-end cars such as baggage, baggage and mail and postal cars.

Q. How many of those were steel? How many of those of the baggage, postal and mail?

A. 150 head-end cars were steel.

Q. How many coaches were steel?

A. 221.

Q. How many chair cars were steel?

A. 52.

Q. Did we have any steel dining cars or steel observation cars as of December 31, 1912?

A. No, we didn't.

Q. And the balance I take it of the 1554 you mentioned were wooden cars?

A. Yes, sir.

Q. As of December 31, 1939 are there any wooden head-
[fol. 104] end cars still in the company ownership?

A. 20.

Q. Are there any wooden coaches still in the company ownership?

A. One.

Q. Are there any wooden chair cars?

A. One.

Q. Are there any wooden dining cars or observation cars or lounge or tavern cars of wood of company ownership at the present time?

A. No, none at all. We have one dining car with a steel under-frame.

Q. You say these are of company ownership. Do you know whether they are in use or not?

A. To the best of my knowledge none of these wooden coaches or this wooden coach is in any service at all.

Q. When was air conditioning on Southern Pacific Company passenger train equipment first commenced?

A. It was first commenced in 1932 in our diners.

Q. Were coaches subsequently air-conditioned?

A. We began to air condition the coaches in 1935.

Q. Do we have any non-air conditioned diners in the service that you know of at the present time?

[fol. 105] A. No, sir.

Q. I think in connection with the freight car exhibit you stated that improvements where they could be made to the earlier and older types of freight cars were made in line with the improvements placed on the newer cars constructed. Will you state whether or not a similar policy and practice is followed in connection with passenger train cars?

A. It is, yes, sir.

Mr. Mason: I think that is all for the present.

The Court: Any cross-examination of this witness?

Mr. Strouss: Yes, I have some questions.

The Court: We will take a recess at this time.

Thereupon a short recess was taken at 2:50 p. m. November 19, 1940, after which proceedings were resumed as follows:

[fol. 106] Cross-examination.

By Mr. Strouss:

Q. Mr. Leriche, the steam train line, what is this valve you spoke about, the end valve?

A. That is the valve on the end of the train line to which the hose which connects between the two cars is fastened to.

Q. And the present valve is now 1½ by 2, is that correct?

A. 1½ by 2 did you say?

Q. Yes, that is what I understood you to say in your direct examination.

A. No, I think most of those have been changed out now. I will read it just as I have it in my notes.

Q. All right.

A. Cars built in 1909 were equipped with 2-inch steam train lines and end valves, having 2-inch inlets and 1½-inch outlets. The connection between the cars was of 1½-inch rubber hose with 1½-inch couplers. Cars built prior to 1909 were equipped with 1½-inch steam train line, 1½ by 1½-inch end valves which were subsequently changed out and replaced by 2-inch train line and 2-inch by 1½-inch end valves. All right. Now then, in 1930 the application of 2-inch flexible metallic train line connection and 2-inch [fol. 107] by 2-inch end train valves was started, and at the present time about 75% of our equipment is equipped with full 2-inch steam train line and connections.

Q. So that now you have a full 2-inch train line all through the train?

A. Yes.

Q. And one of the purposes of that, as I believe you testified, was to give greater efficiency in heating cars in the rear end of the train?

A. Yes.

Q. That is one of the problems that you have to overcome in designing cars and passenger car equipment.

A. Yes, sir.

Q. What is this auxiliary handbrake lever you refer to on the freight cars? I ask that because that is a new one on me.

A. Well, the auxiliary brake lever is an auxiliary lever placed in between the cylinder push rod and a brake connection that would eventually lead up to your freight train. The purpose of that was to increase the braking power applied by hand.

Q. That is down under the car?

A. Yes.

Q. It is operated from the ground then, I take it. [fol. 108] A. No, you see when you operate your hand brake wheel there is a chain down to the end of the brake staff, which connects or ought to connect with the hand brake connection, and this connection is in turn connected to this auxiliary brake lever which is in turn—which force is then transferred to the cylinder lever.

Q. Then the hand brake would still have to be applied from the top of the car?

A. Oh, yes.

Q. I notice in the pictures of the three cars they designed in 1936 and 1937 and 1940 that the hand brake is not shown on the top.

A. Well, that is what we might term a multi-power hand brake.

Q. It was put on the end?

A. Yes.

Q. Now, this design beginning from 1900 and going down through each of these improvements, has been for the purpose of increasing the strength of the freight car?

A. Yes, all-steel tends to increase that center sill section.

Q. The steel construction of the car itself and the steel frames are built for the purpose of strengthening the cars? [fol. 109] A. Yes, sir.

Q. That is so it can withstand the shocks of strains and stresses that the car is expected to receive in the ordinary usage in transportation?

A. Yes, sir.

Q. And from this increased strengthening of the car is it reasonable to assume that those stresses and shocks and strains have increased with the amount of transportation, requiring stronger cars and heavier construction to meet the shocks and strains that the cars are now called upon to meet than they did back in 1912 and 1913.

A. Yes.

Q. Now you don't mean to testify that the cars which are shown as designed in 1936 and 1937, that that represents the cars which are now in use, the company-owned cars which are now in use?

A. Not all of them, no.

Q. Not all of them?

A. No.

Q. Just those——

A. Built in those years.

Q. And beginning with the cars designed in 1909, you have testified about some of those cars which are still in use?

[fol. 110] A. Yes.

Q. And each of the years subsequent thereto?

A. Yes.

Q. So that the cars, the company-owned cars now in use; there may be cars designed in 1909, 1911; 1913, 1916, 1919, 1924, 1925 and 1927.

A. That is right. As far as the year 1909, I wouldn't be positive of that unless I looked up the records.

Q. Now then, on your Exhibit 3 you say, referring to the line A, "steel and steel underframe cars," what do you mean by the term "steel"?

A. In other words, all-steel; that is what that means.

Q. That is, the car is steel construction all the way through?

A. Yes.

Q. Body and top and underframe and sill?

A. As represented in 1936, 1937 and 1940.

Q. But all the improvements which are shown here, your total cars that are shown on your columns A, B and C, column B represents those with the steel construction throughout, steel underframe and steel center sill?

A. Column B represents steel and steel underframe, and cars with steel center sill.

[fol. 111] Q. And those are the only improvements which you show having been placed in all of the cars under that column. I mean if there have been changes in the triple valves it would not be reflected in this exhibit?

A. No, this exhibit just merely shows the ownership of the cars.

Q. And the improvements in the cars with respect to whether they are steel construction or steel underframe or steel center beams.

A. Yes.

Q. But it does not in any way reflect other improvements than those?

A. No.

Q. Now, when cars go in for repairs they do not necessarily have these other improvments added to them?

A. Not necessarily.

Q. Some of them may and some of them may not?

A. Yes.

Q. You don't mean to testify these earlier cars of 1911 and 1913, that all of them when they have gone into the shops they come out with the improvements shown in the later designs?

A. Not in all cases, no.

Mr. Strouss: This interchange, as we said, I want to [fol. 112] check that testimony. I think that Mr. Leriche is probably wrong as to the rule of interchange as to wooden underframe cars.

Q. Isn't there a rule with respect to wooden underframe cars, as to their position in the train? In other words, are they classed as a rear end car, when a wooden underframe car shows up?

A. Well, it is my understanding that a wooden car cannot be used in interchange.

Q. Getting away from interchange for a minute, I mean in the operation of your road, in making up freight trains, do you know what the rules are as to the construction of the freight train?

A. Yes.

Q. So far as the position of the car in the train is concerned?

A. It is generally understood that a wooden car should be placed in the rear, yes.

Q. There is a rule of the company of that sort?

A. I believe there is, yes.

Mr. Strouss: I think that is all the cross-examination now. I want to check over this exhibit a little further.

Mr. Mason: I had planned to have the witness return to San Francisco, Mr. Strouss. Did you desire to cross-examine him any further?

[fol. 113] Mr. Strouss: Well, I wanted time to examine the exhibits.

Mr. Mason: Well, we will ask Mr. Leriche to return if Mr. Strouss desires to examine him further after examining the exhibits and the testimony.

The Court: Call your next witness.

Mr. Mason: We will call Mr. Russell.

FRANK E. RUSSELL, called as a witness on behalf of the defendant, being first duly sworn was examined and testified as follows:

Direct examination.

By Mr. Mason:

Q. Please state your name and residence, Mr. Russell.

A. Frank E. Russell, I reside at 2105 Eagle Avenue, Alameda, California.

Q. What is your official position with the Southern Pacific?

A. Mechanical engineer.

Q. In what department?

A. Motive power department.

Q. Is that the department with which Mr. Leriche is connected and which has charge of the maintenance and construction of rolling equipment?

A. That is correct.

[Vol. 114] Q. Now, what is your particular function as a mechanical engineer?

A. To supervise and advise in connection with the design, the repair of the equipment and rolling stock, locomotives.

Q. Do you deal particularly with the Company's locomotives?

A. At the present time, for the past few years, I have dealt considerably with the locomotive design.

Q. How long have you been in the railroad service, Mr. Russell?

A. I commenced work for the Company in September, 1899.

Q. Have you been at all of the times since then in the motive power department?

A. Yes.

Q. And principally connected with the design and handling of locomotives?

A. Just a minute, I said all that time I was in the motive power department. As a matter of fact, I was a few months transferred to the store department, but that was only a few months. All the rest of the time I have been in the motive power department. I was promoted to lead locomotive draftsman in 1903 and to Chief Locomotive Draftsman in [fol. 115] 1906, and to Assistant Mechanical Engineer in 1917, and at that time I had charge of the design of both freight cars, passenger cars, steamers and locomotives. And in 1924 I was made Mechanical Engineer and a few years later they started, or rather created the position as engineer of car construction in our department and that relieved me of the particular work in connection with passenger and freight cars.

Q. So that now and since that time your work is principally concerned with locomotives?

A. That is right.

Q. With their design and repair?

A. That is right.

Q. Does the motive power department maintain records showing the details of the design and construction of locomotives which the Company has owned and now owns?

A. They do.

Q. Are those records accessible to you?

A. Yes.

Q. And are they in the department or in the branch of the work of which you have charge?

A. Yes, they are all in the motive power department.

Q. Have you prepared certain exhibits from the records, [fol. 116] or had prepared for you certain records from the motive power department?

A. I have.

Q. With relation to the locomotives?

A. Yes.

Q. I'll ask you first to direct your attention to the statement entitled "Chronology of Freight Locomotives, Pacific Lines, years 1899 to 1940, Showing Improved Design and Increased Tractive Effort." Have you that exhibit before you?

A. I have.

Mr. Mason: I'll ask that that be marked 5 for identification.

Q. Is this one of the exhibits prepared by you in the manner you have just described?

A. It is.

Q. Are you personally familiar with all the details upon this exhibit?

A. I am.

Q. Will you state whether or not the representations appearing thereon are a correct representation of the records from which the exhibit is taken?

A. It is.

Mr. Mason: Have you some questions now, Mr. Strouss, before I offer it?

Mr. Strouss: No, I have no objection.

[fol. 117] Mr. Mason: I offer the exhibit as No. 5.

The Clerk: Defendant's Exhibit 5 in evidence.

Mr. Mason:

Q. Now, referring first to the left-hand side of the exhibit under the word "type", does that indicate the name and classification of the locomotive referred to.

A. At the extreme left-hand, under the title "type" is the usual name affixed to that particular type of locomotive.

Q. And then what is the significance of "Wheel Arrangement, Whyte System"?

A. The Whyte system was adopted generally and used generally by the railroads as a classification of locomotives and refers simply to the wheel arrangement. The name does not necessarily designate the particular type. In other words, one road may call a locomotive with a certain wheel arrangement a certain name that is more or less associated with the particular railroad, and some other railroad apply a name to the same wheel arrangement that it associates with its railroad, so that it got to a point where a name did not mean much. So then they adopted this Whyte system of classification that definitely designates the certain wheel arrangement of the locomotive, so that if you say 2-10-2 or 2-8-0, you know positively what is meant. For [fol. 118] instance, on this exhibit we show here under the type, the 2-10-2. Well, the Santa Fe Company calls that the Santa Fe type. Some other road may call it some other name.

Q. We call it sometimes the F type?

A. Sometimes we call it the F type.

Q. You speak of the White arrangement. That is spelled W-H-Y-T-E as shown on that exhibit?

A. That is right.

Q. Because of the name of the man who invented it?

A. That is correct.

Q. When you speak of the 2-8-0, what does the 2 indicate?

A. The 2 refers to the number of truck wheels.

Q. Those are immediately behind the pilot?

A. The leading truck wheels, and the next number designates the number of the driving wheels, and the next number denotes the number of trailing wheels, if any.

Q. Those are the wheels that roll under the cab?

A. Under the cab.

Q. And these numbers have nothing to do with the wheel arrangement of the wheels on the tender at all, do they?

[fol. 119] A. No.

Q. They don't relate to the tender at all, do they?

A. They don't relate to the tender at all.

Q. Proceeding further on the exhibit, what do the black lines indicate underneath each separate drawing of locomotive?

A. The black lines under the diagrams of the locomotive graphically and to scale represent the tractive power. The figure above the line indicates the value of this line in pounds of tractive power.

Q. What is tractive power?

A. Tractive power is the effort that the locomotive exerts at the rim of the driving tire on the rail to move itself forward or backward, as the case may be.

Q. And is relative tractive effort a fair measure of the amount of power that the locomotive will develop for the movement of traffic?

A. That is the customary designation of the power that is developed to move traffic, but it also includes, of course, power that is necessary to move the locomotive itself.

Q. Now, going down to the foot of the exhibit I notice you refer to articulated consolidation 4-8-8-2 and 2-8-8-4, [fol. 120] and they are further subdivided as AC-8 and AC-9. Are those types now actually in service?

A. They are.

Q. Are those the types of locomotives most recently purchased for freight service?

A. That is correct. The AC-8 is on our lines in California and the AC-9 on our lines in Texas at the present time.

Q. Just where does the AC-9 operate at the present time?

A. Between El Paso and Tucumcari, New Mexico.

Q. Going to the tabulation on the right-hand side of the sheet, I notice you show there in addition to the word "type", the word "class". Is that still a different means by which locomotives may be designated?

A. Yes, the class there is our common class we use on our drawings and specifications and time tables, and is designated that way for brevity.

Q. Does it have any relation by initial?

A. To the type, yes.

Q. For instance, "M" stands for "Mogul"?

A. M stands for Mogul and "4" is the fourth design of Mogul.

Q. And "MK"?

A. Mikado.

[fol. 121] Q. "AC" means Articulated Consolidation?

A. Yes, that is right.

Q. On the column "Year put in service", is that the year when the M-4's were put in service?

A. That is correct, yes, the years 1899 up to including the year 1901.

Q. Under the heading "Number Purchased", does that mean the number of M-4's purchased?

A. During that period, that is the sum total.

Q. That does not mean necessarily that there are 103 of those M-4's now in service, does it?

A. No, but it means that there were 103 locomotives of that type placed in service during those years.

Q. When you go to the column "Average Price", of course, I think that is self-explanatory. "Tractive Effort, Lbs.", is that an average of the group of each of that number?

A. Each one of the locomotives would develop a tractive effort of 28,710 pounds.

Q. There is no variation?

A. No, not to speak of.

Q. Now, here you have the 2-10-2, I notice there are two classes there, F-4 and F-5, is that 84,000 figure a more or less average?

A. No, those are two types of locomotives. In other [fol. 122] words, one is a little older edition than the other, and powers are the same, but there are certain improvements and changes in design that are incorporated in the later locomotives that are not incorporated in the first, and the new number of classification is given simply for record purposes.

Q. I notice under "tender capacity" you have a column "oil gals." and "water gals."; are all of these types shown on exhibit No. 5 oil-burning locomotives.

A. They are with the exception of the AC-9's referred to.

Q. And that is a coal burner?

A. That is a coal burner.

Q. So the figure there refers to the ton-capacity of the coal?

A. The ton-capacity of the coal.

Mr. Mason: Before we pass from the exhibit, have you any questions that you would like to ask at this time, Mr. Strouss?

Mr. Strouss: Just one question I want to ask here.

Q. Going back to this tractive effort, did I understand you to say that was the power developed to move traffic?

A. It is the power or effort that is developed at the rim [fol. 123] of the driving wheel against the rail to move the locomotive and cars forward.

Q. It includes, of course, or of course there is included in that the weight of the locomotive?

A. Oh yes; the resistance. In other words, in order to get the exertion available to haul the train you must deduct the resistance or the effort that is necessary to move the locomotive itself. In other words, it gets back to what is referred to as draw bar pull. The draw bar pull might be referred to as the net tractive effort. That is what you have got left.

Q. In other words, taking the tractive effort that is shown here and deducting from that the effort necessary to——

A. Move the engine and the tender.

Q. —move the engine and tender would give you the draw bar pull?

A. That would give you the draw bar pull, yes.

Q. And what is that?

A. That means the net effort to haul a train. You also get into the frictional resistance of the locomotive and such like. That is generally in use, and they always refer to it for comparative purposes by tractive power.

Q. Of course, there is a considerable difference in the [fol. 124] weight of these locomotives?

A. Yes.

Q. So that there would be a greater part of that tractive effort required to move the articulated consolidation, for example, than would be required to move Southern Pacific type?

A. That is true when you take the type as a whole, but when you come to comparing the weight of that tractive power on a pound basis, etc., you might find the AC-9 would exert a greater tractive effort per 1,000 pounds of weight than some other engine. I don't say that is the fact here.

Q. Yes, I understand you say it might be?

A. It might be. I know some of the types, for instance, comparing our more modern types with the earlier types, that is a fact.

Mr. Mason:

Q. It is generally true, is it not, Mr. Russell, that these larger locomotives will develop more power per pound by weight than the smaller and the older type?

A. That is true, and our modern tenders hold more water per 1,000 pounds of weight than old earlier types.

Q. I want to ask you this, Mr. Russell, the locomotives shown on exhibit No. 5 are those which have been used or [fol. 125] which are presently being used by the Southern Pacific lines generally, are they not? By that I mean the lines west of Tucumcari and Ogden.

A. Yes.

Q. And include types which have been and are currently being used in this territory east of Indio, California, and El Paso, Texas?

A. Yes.

Q. I notice there is a star on this exhibit, indicating two of the types have booster equipment. Will you explain what the booster is, what it does?

A. That is correct. The 2-10-2's here shown as the Southern Pacific type are both equipped with boosters. A booster is a small reciprocating steam engine that is car-

ried on the trailing truck and geared to the trailing axle so that it can be cut in or cut out and the trailing axle used to develop tractive power, and that roughly gives an additional tractive power of about the equivalent of one extra driver in starting the train. It is like starting out your automobile in low gear. It gives you increased starting power, and when you get it up to about 10 or 12 miles per hour, the engineer throws the latch and the gear automatically cuts out and is no longer used until again required.

Q. By the trailing axle you mean the axle of the truck [fol. 126] under the cab?

A. Yes.

Q. And the booster is just a little auxiliary helper which may be cut in in starting?

A. That is right.

Q. To give additional effort?

A. Yes.

Mr. Strouss:

Q. It is only used in starting?

A. Yes, it should only be used in starting. It is not effective at high speeds. When you get up to 10 or 15 miles an hour it is not effective and should be cut out.

Mr. Mason: Will you now pass to the state, this statement. I shall read the title and ask that it be marked for identification No. 6—the statement entitled "Chronology of Passenger Locomotives, Pacific Lines, Years 1895 to 1940, Showing Improved Design and Increased Tractive Effort." Did you prepare this statement?

A. I had it prepared under my supervision.

Q. Was that prepared from the records under your immediate supervision in the office of the motive power department?

A. It was.

Q. Are you familiar with all the details of this exhibit?

[fol. 127] A. I am.

Q. Will you state whether it correctly reflects the information shown on the original records in your possession?

A. It does.

Q. And you believe it to be true and correct?

A. I do.

Q. This exhibit, if I understand it correctly, is a showing of the history of the passenger locomotive development somewhat similar to the development of the freight locomotive development shown on exhibit 5?

A. Yes.

Mr. Mason: I am about to offer the exhibit, Mr. Strouss. Have you any questions?

Mr. Strouss: Q. This "Golden State 4" is that an engine actually in existence?

A. Well, it is almost in existence. In other words, it is being built. I just came from there, from the plant.

The Court: Q. It is on order?

A. It is on order, and I have been engaged in getting it assembled. There is a bunch of them on order now and they are actually in the process of being built. Some of the boilers have been built.

Mr. Mason: Q. Is the GS-4 closely similar to any other [fol. 128] type now presently in use?

A. Yes, sir, it is very similar to the GS-3 now in service between San Francisco and Los Angeles.

Q. And it presents much the same appearance as the GS-3?

A. Much the same.

Q. The GS-3 is not shown on the exhibit, of course.

A. No.

Q. Is there any distinctive coloration of the GS-3 and the GS-4?

A. Yes, there is a distinctive color, and they are a streamline job—semi-stream lined.

Q. Are they the locomotives that operate on the daily trains between Los Angeles and San Francisco?

A. Yes, that is correct.

Q. That has the red and yellow color?

A. That is correct.

Q. Have these locomotives been used in freight service to any extent, if you know?

A. They are used in both freight and passenger service between Los Angles and San Francisco.

Mr. Strouss: Q. On the "Hot Shots?"

A. Yes.

Mr. Mason: Q. They are the locomotives pictured in the [fol. 129] article in the current Saturday Evening Post; are they not?

A. That is correct.

Q. Being used on the overnight trains?

A. That is correct.

Q. And do you believe the GS-4 is very closely similar to the GS-3?

A. Very similar.

Q. Was there any particular reason for showing the GS-4 here instead of the GS-3?

A. The particular reason was, it simply illustrated the last power, the last development. The GS-4 is a little more powerful than the GS-3, so to bring the exhibit up to the last minute, we showed the GS-4.

Q. His honor referred to the fact that these are on order, to use the phrase that has become currently popular recently. Are these locomotives to be distinguished from some other locomotives which are on order in that they are in the process of manufacture and surely to be delivered.

A. That is correct.

Q. Is there any particular feature of this exhibit to which you wish to call attention as distinguished from Exhibit No. 6, are there, Mr. Russell?

[fol. 130] A. I don't think there is anything in particular. There are certain other locomotives, for instance the Mountain, the Golden State, and both as to the GS-1 and the GS-4, they are shown as equipped with boosters. You will notice in the tabulation there is also an additional reference marked opposite the Golden State which says that the "price and weight of these locomotives estimated but added here for comparative purposes."

Q. Price and weight, not freight?

A. Weight, yes, prices and weight, which are not actual, they are estimated.

Q. I think you indicated that the GS type locomotives are also used in freight service. Is it possible to use the Mountain type locomotive in freight service?

A. Yes, they are used in freight service.

Q. They have been and are used to considerable extent, are they not?

A. Yes.

Q. Is it possible to use the Pacific type of locomotive in freight service?

A. It is possible but not ordinarily advantageous because it is too light to have sufficient power.

Q. But they have been used?

A. They can be used. They can be used. It is simply [fol. 131] a question of the amount of tonnage you have to haul.

Q. There are other Mountain types other than the Mt-1?

A. Oh yes.

Q. That is shown as the example of the Mt. type?

A. That is the Mt-1, but not shown here are the engines built from 1923 to 1929. In later years there were additional classes built very similar but still slightly different from these.

Q. Some slight difference in arrangement?

A. Some slight difference in arrangement.

Q. Also booster-equipped?

A. Also booster-equipped.

Q. The variation, if any, would be in the boiler, the driver, or inside or some other mechanical differences there?

A. The boiler, driver or mechanical construction.

Q. Mr. Russell, are these locomotives or any of them equipped with other devices besides these boosters which tend to lessen fuel consumption or increase their efficiency? If so, what are they?

A. Yes, they have a great many other devices, particularly so on a modern engine. They are getting more and more devices than were formerly applied to locomotives, [fol. 132] such as super-heaters, safety valves, injectors, feed water heater equipment, brakes, and steam guages, and a great many devices that are used in the actual operation of the locomotive, that are, as we commonly refer to them, specialities that we buy from the manufacturer who manufactures and develops that particular device.

Q. You speak of brakes, what have you in mind when you speak of improved brakes.

A. Well, there has been a great deal of improvement made in the brakes, both as to the foundation brakes and the operative mechanism.

Q. Do these later types of locomotives have any greater capacities in the air reservoirs?

A. Yes, they have greater air capacity in the reservoirs and they have a higher percentage of braking power as a rule.

Q. Do they maintain any higher pressures in the air reservoirs than was formerly the rule?

A. Yes.

Q. What air pressures are now maintained in the air reservoirs in the modern locomotives?

A. 180 to 200 pounds.

Q. How is the air pressure built up in these air reservoirs?

A. They are built up by the air compressors and con- [fol. 133] trolled by the governors. You can set the governors to any particular pressure you desire on the line.

Q. When the pressure falls, does the governor operate?

A. Yes, when the pressure falls the governor operates.

Q. Then what happens to the air pumps?

A. The air pumps begin to operate, and when the pressure is built up to the proper pressure, the air pump cuts out.

Q. Are there any changes in design of these air pumps or any increase in their capacity?

A. Yes, both as to capacity and efficiency.

Q. Did these earlier types of locomotives, the 10-wheelers and Moguls, have single or double air pumps?

A. They had small pumps, the old Westinghouse pump of small capacity, and they had only one type.

Q. What have you to say in regard to the modern pumps?

A. The modern types of locomotives are equipped with an air pump which has a much higher capacity.

Q. What is the function and character of the superheater.

A. Well, the superheater is a device that is placed in the [fol. 134] boiler, that is, I would say in the flue of the boiler so that when the steam leaves the boiler on the way to the cylinders it passes through the superheater. After the steam has been separated from the water in the boiler, it is increased in temperature, and in the modern engines this temperature is up to as high as 700 degrees, 750, which very materially increases the efficiency and power of the locomotive, especially at high speed. With the old saturated engine, as long as steam was in contact or closely associated with water, there is a definite relation between

temperature and pressure. In other words, if you know the temperature you can determine the pressure or if you know the pressure you can determine the temperature. But when you separate water and steam and then apply heat you increase the temperature of the steam which will either increase the volume of the steam or increase the pressure.

Q. That is under Boyle's law, isn't it?

A. Yes.

Q. Boyle's law is simply applied by means of the superheater to give you more efficiency in the use of your steam?

A. More efficiency in the use of your steam, and you get a greater amount of power out of a given amount of [fol. 135] water.

Q. What is the function of the feed water heater?

A. The feed water heater is a device that is applied to the locomotive to divert a part of the exhaust gases after they have been used in the cylinders expansively to heat the feed water on its way to the boiler and in that way to recapture or save some of the heating units for use, which would be lost otherwise, and put them back in the boiler. It serves in two ways: first of all, it gives you slightly increased power, saves in fuel, saves in water and actually reduces the back pressure between the nozzle and the cylinders, establishing higher differentials which results in increased power.

Q. Does the engineer in operating these locomotives have to rely on main strength to move his controls or does he have assistance?

A. Oh, no, he doesn't have much to do nowadays.

Q. What is the nature of his duties?

A. Well, on the modern locomotive, they have the power reverse gear, for instance. All he had to do is to operate the small lever and that in turn operates the reverse mechanism by steam or air power; that is, air power is ordinarily used, but in case of emergencies steam is used. [fol. 136] Q. Is there any heavy labor upon the fireman in order to get the fuel in the firebox?

A. No, he doesn't have to do any more than the engineer does. All he has to do is to operate the feed water equipment, the injector and the oil regulator handle and occasionally adjust his dampers.

Q. And the oil regulator handle enables him to draw the fuel from the tender?

A. Controls the supply of fuel from the tender to the locomotive burner.

Q. I notice this AC-9 is a coal burner. Is there any labor imposed on a fireman thereon to get the fuel into the firebox?

A. No, he doesn't have a great deal to do. The locomotive is equipped with a stoker, a coal stoker.

Q. How does the coal stoker function?

A. Your coal stoker operates to take the coal from the tender and distribute it in the firebox. All he has to do is operate the necessary control and occasionally look in the firebox to see if the fire is burning properly. If not, then he has to adjust his coal and balance up the fire or throw more coal on the fire.

Q. Are there locomotives in use by the company in Arizona or New Mexico which use coal instead of oil?

[fol. 137] A. Yes, we have some locomotives, I don't remember just how many, but we have a number of locomotives, not a great many.

Q. They are of the F type, are they not?

A. I believe they are all of the F type now, although there were a few Mountain type.

Q. Are those equipped with stokers?

A. Yes.

Q. All the coal-burning locomotives in the main line service are equipped with stokers, are they not?

A. I believe that question may be a little bit broad. In general, that is true, but there might be some few of the small ones that have not yet been equipped.

Q. I am speaking of locomotives in main line service.

A. Generally in main line service it is true, but still they might run a small locomotive out on the main line. But all the large locomotives are equipped with stokers.

The Court:

Q. Are most of them oil burners?

[fol. 138] A. The great majority of them are oil burners. We only have a few old coal burners. I might add in this AC-9 class of locomotives and the F. class are also equipped with coal pushers, pushers that are controlled by the fireman, so that he can push the coal down off of the sloping coal sheets into place so that the stoker will deliver the coal properly to the fire box.

Q. Referring to these AC-8's and AC-9's, I notice these AC-8's were acquired in 1939, twenty-eight of them, at an average price of $183,000. Have you been asked to make an estimate of the cost of acquiring twenty-five, more or less, engines of the AC-8 type as of 1940?

A. I have.

Q. Have you made such an estimate?

A. I did.

Q. What is the result of that estimate as to the individual cost?

A. We estimate that they would cost $188,000.

Q. That is an increase of approximately $5,000 over the 1939 figure, is that correct?

A. Yes, that is about correct.

Q. Of a similar type of locomotive?

A. That is correct.

Mr. Mason: Was Number 6 offered and received?

[fol. 139] The Court: I think not.

Mr. Mason: If not, I would now like to make a formal offer.

The Clerk: Defendant's Exhibit 6.

Mr. Strouss: I have some questions. I have just one or two I will ask him.

Q. What you testified to, Mr. Russell, concerning the use of boosters on freight trains and the tractive effort and drawbar pull of freight locomotives would apply also to passenger locomotives.

A. That is correct.

Mr. Mason: I will ask that this be marked for identification Exhibit 7.

Q. I will call your attention, Mr. Russell, to the statement which has just been marked by the Clerk Number 7 for identification, entitled "Locomotives purchased or built in company shops, years 1922 to 1940". Will you state whether this exhibit was prepared by you or under your direction?

A. It was prepared under my direction.

Q. Likewise from records in the motive power department in San Francisco?

A. That is correct.

Q. And this undertakes to show, does it, the locomotives of the various types of wheel classification and engine numbers, number of units purchased and the price paid for [fol. 140] each, etc.?

A. It does.

Q. And the type of service to which they are assigned or could be assigned?

A. Yes.

Q. It shows here on the righthand side "Trust Series (k.)" What does that mean?

A. That is the designation of the trust series under which these locomotives were bought and paid for. In other words, it refers to a trust agreement. In other words, where the company had borrowed money to purchase equipment.

Mr. Booth:

Q. Equipment trust.

A. Equipment trust is correct. That is more nearly the proper designation.

Mr. Mason:

Q. Are those issues of equipment trust obligations by the company whereby it obtained the money to buy these locomotives, or a part of the money?

A. Yes, as I understand, they apply to the Interstate Commerce Commission and get authority or permission to borrow the money to purchase, and they negotiate these trust agreements.

Q. Now do you understand that these equipment trust obligations were so issued by an application to the Interstate Commerce Commission?

[fol. 141] A. Yes, they were so issued because we have to apply the trust plates bearing these designations onto the equipment at the time they are built, and they have to be maintained.

Q. I don't know that I made *by* question quite clear, but do I understand the company did actually apply to the Interstate Commerce Commission in order to obtain the money, if you know?

A. I am not in a position to say of my own knowledge, but I understand that is the case.

Mr. Strouss: I ask what he understands be stricken.
The Court: It may be stricken.

Mr. Mason:

Q. Your records show, in any event, the information shown under column K, Trust Series, is that correct?
A. That is correct.
Q. Is all of this other information taken from your own records?
A. It is.

Mr. Mason: If I haven't done so previously, your Honor, I now offer this exhibit as Defendant's Exhibit Number 7.
The Court: It may be admitted in evidence.
The Clerk: Defendant's Exhibit 7 in evidence.

Mr. Mason:

Q. Mr. Russell, I notice that this exhibit contains entries [fol. 142] for nearly every year between 1922 and 1940;—of course, the years between 1931 and 1937 are omitted—whereas the preceding exhibits, Numbers 5 and 6, do not cover each separate year in the same fashion. Do I understand that Exhibit 7 shows all of the purchases made during the period represented on the exhibit?
A. That is correct.
Q. Is it correct to say that the showing on Numbers 5 and 6 is representative of the types purchased and in service over these successive years?
A. Exhibits 5 and 6 show typical representative types for periods, covering the periods.
Q. In other words, Mr. Russell, during a six-year period there from 1931 to 1937 there were no locomotives whatever purchased.
A. That is correct; and the exhibit 7 shows all the locomotives purchased or built during the period shown.
Q. Is it necessarily the fact that all these locomotives are in service now?
A. No, not necessarily. This simply shows the number of locomotives and the information in connection with them as of the date they were built and placed in service. Some of the other types have been sold or broken up, or dis- [fol. 143] mantled, or wrecked, or are not being serviced at the present time.

Q. I notice there an entry on line 45 of Exhibit 7, "1940" and it is starred and a reference to the 4-8-4 class. Are those twenty locomotives the same ones which are shown in the last entry in that block, Exhibit Number 6?

A. That is correct.

Q. And those are the locomotives the delivery of which is to commence during the remainder of the present year?

A. That is correct.

Mr. Mason: I think that is all that I have now, Mr. Russell. Now I am perfectly willing, in fact, I would like to agree with counsel, that his examination be deferred, and the witness may return to Tucson for that purpose at some time convenient to you, Mr. Strouss.

Mr. Strouss: That is all right.

Mr. Mason: We would like to arrange a definite date, not necessarily now, because Mr. Russell has the job of getting GS-4's in our service as soon as possible.

Mr. Strouss: I understand you want to start with other witnesses Monday.

Mr. Mason: Yes, we do.

Mr. Strouss: There is one question I would like to ask Mr. [fol. 144] Leriche which I forgot.

Mr. Mason: We will have Mr. Leriche resume the stand for that purpose. May we have Mr. Russell withdrawn for the time being, your Honor?

The Court: Yes.

C. C. Leriche, a witness called for the defendant, resumed the stand and testified further as follows:

Cross-examination (continued).

By Mr. Strouss:

Q. I forgot about passenger car development here, Mr. Leriche. These coaches, the cars shown as designed in 1937 and 1939 on Exhibit 4, you don't mean to testify that they are the type of coach or car that is in service now exclusively?

A. Oh, no.

Q. It just represents the design of that year and there may be some of them of that type in service?

A. Yes, we have some of both those types in service.

I wish to make a correction here. I think I was asked by Mr. Mason where these cars, in what service they were in, and I think I said between San Francisco and Los Angeles. That is true, but they are also in service on the Overland Route.

[fol. 145] Q. Now, of course, some of these earlier cars are still in service?

A. Oh, yes.

Q. What is the earliest design that would still be in service?

A. Well, I would say the earliest design in service would be the steel coach, all steel coaches.

Mr. Strouss: I think that is all.

Re-direct examination.

By Mr. Mason:

Q. Mr. Lerich, isn't it also true that some of these articulated units of late design, either of Southern Pacific or other ownership, or of this 1937 design, are in service across Arizona?

A. Yes.

Q. In 43 and 44?

A. Yes.

Q. And perhaps on other trains as well?

A. Yes, that is right.

Mr. Mason: Now, subject to our agreement that these gentlemen will return at your convenience, we are ready to recess.

The Court: Very well.

Whereupon a recess was taken until Monday, November 25, 1940, at 10:00 o'clock A. M.

[fol. 146] Monday, November 25th, 1940. 10:00 A. M.

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed, gentlemen. I believe you had finished with the witness on the stand.

Mr. Mason: Yes. Your honor, we have obtained from the Interstate Commerce Commission and now offer in

evidence, it is the certificate of the Commission accompanied by certain documents, which will be the form of two separate exhibits. The first exhibit which we will ask to be numbered——

The Clerk: Defendant's Exhibit 8 for identification.

Mr. Mason: —8 for identification, we are going to offer it in evidence as soon as I have described it. I might say copies of the documents, not of the certificate, have been furnished to the opposing counsel.

This is a certificate of the secretary of the Interstate Commerce Commission, stating that there are attached to the certificate two copies of the following:

Classification of Investment in Road and Equipment of Steam Roads, prescribed by the Interstate Commerce Commission, issue of 1914; Orders of the Commission—I am not reading this verbatim but in substance—entered July 25, [fol. 147] 1935, June 13, 1934, January 16, 1935, December 27, 1935, December 6, 1939, January 31, 1940; Classification of Operating Revenues and Operating Expenses of Steam Roads prescribed by the Interstate Commerce Commission, issue of 1914; and Orders of the Commission entered July 25, 1925, April 18, 1928, November 23, 1928, January 17, 1940; Condensed Classification of Operating Expense of Steam Roads Prescribed by the Interstate Commerce Commission, First Revised Issue; Condensed Classification of Income, Profit and Loss and General Balance Sheet Accounts for Steam Roads prescribed by the Interstate Commerce Commission, issue of 1914; and orders of the Commission entered December 20, 1920, March 14, 1921, August 19, 1921, December 18, 1933, May 28, 1935, April 12, 1937, May 9, 1938, March 8, 1940; Classification of Train-miles, locomotive-miles and car-miles for Steam Roads prescribed by the Interstate Commerce Commission, issue of 1914; and Order of the Commission entered December 7, 1935, Accounting Bulletin No. 15, Interpretations of Accounting Classifications prescribed by the Interstate Commerce Commission for Steam Roads; an Order of the Commission entered November 15, 1929, January 27, 1938, January 17, 1940; and Regulations to cover Destruction of Records of [fol. 148] Steam Roads prescribed by the Interstate Commerce Commission, Revised Issue of 1938.

The certificate continuing: "The originals of which are now on file and of record in the office of said Commission."

And the certificate concludes with the testimonium and the signature of W. T. Bartell, Secretary of the Interstate Commerce Commission, affixed on November 8, 1940, with the seal of the Commission.

The Court: You are now offering this in evidence?

Mr. Mason: I am offering that particular certificate with the documents annexed thereto and bound and covered by the seal of the certificate, as Defendant's Exhibit No. 8.

The Court: Any objection, gentlemen?

Mr. Strouss: We have no objection.

The Court: The exhibit may be admitted in evidence.

Mr. Mason: Your honor, I ask that there be marked as Defendant's Exhibit No. 9, a certificate with certain accompanying documents, which I shall describe by reading the certificate in the same manner, as No. 8: The certificate of the Secretary of the Interstate Commerce Commission upon the letter-head of the Interstate Commerce Com- [fol. 149] mission reads as follows, in substance: "I, W. T. Bartell, Secretary of the Interstate Commerce Commission, do hereby certify that the attached are true copies of the following:

Order of the Commission entered December 10, 1938; Rules governing Monthly Reports of Railway Expense, 1932 Revision; Order of the Commission entered October 24, 1935, June 8, 1936, October 30, 1936, January 28, 1939; Form T; Monthly Report of Railway Expense, 1936 Revision, Supplement to Form T, Monthly Report of Expense for Public Highway Grade Crossings, 1939 Revision. Form V; Monthly Report of Railway Expense, 1940 Revision, Form R, Monthly Report of Railway Expense, Form F, Monthly Report of Railway Expense, Substance Fatalities; Order of the Commission entered May 29, 1940 and November 10, 1937; Order of the Commission entered November 25, no year specified, exclusive of forms made a part thereof; Order of the Commission entered November 10, 1937; Circular dated June 19, 1936, addressed to the Chief Accounting Officers of all Class 1 Steam Railways; Orders of the Commission entered November 16, 1939, November 22, 1927, December 14, 1938, April 10, 1933, July 17, 1940 and January 13, 1940, the originals of which are now on [fol. 150] file and of record in the office of said Commission. Following which is the affixed signature of the secretary

and the seal of the Commission as of the 9th day of November, A. D., 1940.

We now offer the certificate with the accompanying orders and other material attached thereto and covered by the seal as Defendant's Exhibit No. 9.

The Court: Any objection?

Mr. Strouss: No objection.

The Court: The documents marked may be admitted in evidence.

The Clerk: Defendant's Exhibit 9 in evidence.

Mr. Mason: We will now call Mr. Porter, Leroy V. Porter.

LEROY V. PORTER called as a witness on behalf of the defendant, having been first duly sworn, was examined and testified as follows:

Direct examination:

By Mr. Mason:

Q. Will you please state your name and residence, Mr. Porter.

A. Leroy V. Porter, residence Bronxville, New York.

Q. Where do you maintain your official headquarters?

A. New York City.

[fol. 151] Q. By whom are you employed?

A. New York Central Railroad Company.

Q. In what capacity?

A. Assistant Vice-President and Comptroller.

Q. What has been your experience in railroad service?

A. I have been connected with the New York Central for 44 years, starting as a railroad agent, travelling auditor, clerk in the auditor's office, Chief Clerk to the Vice-President in charge of accounting, Assistant Comptroller, Comptroller, and Assistant Vice-President and Comptroller.

Q. Now, as Assistant Vice-President and Comptroller, Mr. Porter, what particular subdivision of the work of the railroad comes under your supervision or direction?

A. Accounting, all of the accounting.

Q. All accounting of the New York Central Railroad Company?

A. All the accounting of the New York Central Railroad Company.

Q. Does that include its affiliates and leased lines?

A. Yes, sir.

Q. Mr. Porter, I show you a document which purports to be a map, which I will now ask be marked for identifica-
[fol. 152] tion as defendant's exhibit——

The Clerk: Defendant's Exhibit No. 10.

Mr. Mason:

Q. Will you state generally what railroad lines that map covers?

A. This map shows the New York Central system. It does not show all of the connecting lines, but does show the territory covered by the entire New York Central Railroad.

Q. Is that the system and the group of lines whose accounts are subject to your jurisdiction?

A. Yes, sir.

Q. I understand that explanations of certain details of the map will be made by a later witness at the time it is offered?

A. Yes, particularly with respect to the heavy black line.

Q. Mr. Porter, I show you a document consisting of one sheet, headed, The New York Central Railroad Company, Including all Leased Lines, Freight Operating and Freight Transportation Expenses, Related to Traffic, Calender Years 1922 to 1939. Do you have that document before you?

A. I have.

Mr. Mason: Has that been handed to the clerk?

The Clerk: Defendant's Exhibit 11 for identification.

[fol. 153] Mr. Mason: Will you state whether or not the document marked defendant's exhibit No. 11 for identification was prepared by you or under your supervision?

A. Yes, sir, it was prepared under my supervision.

Q. And are the sources as indicated on the face of the exhibit?

A. The sources are from the annual reports to the Interstate Commerce Commission.

Q. Are those reports regularly rendered by the New York Central Railroad Company on behalf of itself and its leased lines to the Interstate Commerce Commission?

A. Yes, sir.

Q. In accordance with the Interstate Commerce Commission orders and requirements?

A. Yes, sir.

Q. Are you familiar with those requirements?

A. Yes, sir.

Q. Are all of the figures shown hereon, either taken directly from those reports or computed from *from* figures taken from those reports?

A. Yes.

Q. Now, as to certain of the figures shown hereon, I take [fol. 154] it they are computations rather than shown on the face of the report?

A. Well, the averages are computations.

Q. And the totals for the three-year period shown at the end of the sheet, are they computations, as well?

A. They are, that is the totals for the four-year periods.

Q. Yes, the four-year period, I should have said.

A. Yes.

Q. And the comparisons between the two four-years periods are computed?

A. Yes.

Q. I take it the figures appearing in columns B, C and D are taken from the reports themselves without alterations?

A. That is right.

Q. Have you compared the exhibit with the original sources to determine whether it is correct?

A. It was prepared under my supervision, but I have not taken it and compared the figures for every year personally.

Q. Have you made a check to determine whether or not it is correct?

A. I have.

[fol. 155] Q. Will you state whether or not, to the best of your knowledge and belief, it is a true reflection of the original sources?

A. It is.

Mr. Mason: We now offer the exhibit in evidence as No. 10.

Mr. Strouss: We object to this exhibit as incompetent, irrelevant and immaterial, as we are not concerned with the operation of the New York Central. We are trying a case in Arizona.

The Court: What is the purpose of this?

Mr. Mason: Your honor, as it will appear from paragraph 3 of part 3 of the answer, we have alleged—I take it, by the way, that Mr. Strouss is not objecting to the competency but rather to its relevency and materiality.

Mr. Strouss: I have a further objection that it is not the best evidence. The records themselves are the best evidence, and unless those are produced for the purpose of cross-examination, then the exhibit is inadmissible. But I also say that the evidence is inadmissible because there is no relation between operations in New York and operations here. We are trying the question of whether a law which applies to operations in Arizona is constitutional or not. [fol. 156] The operations of a railroad in New York certainly are not relevent or material to the issue here presented.

Mr. Mason: Your honor, I will call your attention to paragraph 3A of part 3 of the answer.

The Court: What page is that?

Mr. Mason: It is on page 5, and paragraph 3 continues on from page 5 through several pages.

"A" relates to the improvements in operating results generally throughout the United States, on railroads throughout the United States generally.

Paragraph 3 relates to the best modern railroad practice, and of course, the experience of the New York Central may be taken as typical of standard modern railroad practices.

On page 8 in paragraph D, reference is made to common standard railroad practice throughout the United States except in Arizona. In the same paragraph on page 8, reference is made to the long-train practice in the transportation of freight between all parts of the United States in trains of more than seventy cars. In the same paragraph reference is made to long-train operation in states other than Arizona by locomotives of modern type and the efficiency and economy of operation thereby obtained.

Paragraph E on page 9, there it is stated that the opera- [fol. 157] tion of freight trains containing substantially more than 70 cars is a general practice on the main trunk lines of all of the major steam railroads throughout the United States, except in Arizona; that the operation of these standard long trains is carried on under conditions substantially as favorable as in Arizona; that the results are favorable; that such freight train operations are carried

on commonly, safely and econbmically over lines substantially similar to the main lines of the defendant.

The Court: Well, Mr. Mason, on the first ground stated, the Court will overrule the objection.

Mr. Strouss: If the Court please, I apprehend this is going to come up, I can see, on all of these witnesses. We would like to be heard on the question of the admissibility of this evidence because we didn't think it is proper evidence.

The Court: I will vacate my ruling and hear you. You are confining yourself, Mr. Strouss, to the first ground as to its being incompetent, irrelevant and immaterial?

Mr. Strouss: Now, the fact, of course, that trains are operated in other states, long trains, where there is no law [fol. 158] which regulated those trains would not mean that a law which regulated those trains, and the train lengths, in this state, is invalid, nor would it be evidence of any invalidity. It is much like the little boy, who says when his parents get after him, that he did it because Johnny did it. Now, that is the argument which is made here, and it is no justification for the operation of trains in violation of law, or any argument that the law is unconstitutional.. Now, certainly, there is no relevency or materiality in this until, at least it is shown that the operating conditions are identical with those in that territory.

The Court: I am inclined to agree with you, probably not identical but similar.

Mr. Strouss: Well, the similarity must be such, under the cases, that it comes very close, pretty close to identical. We have a number of authorities which we will be glad to cite to your honor, that your honor may read, holding that it is a necessary requisite to the materiality, before the evidence becomes material. On the admissibility of evidence, that is one of the requisites that must be shown, that there is such a similarity, that it is almost identical. Of course, there has been no such showing here. In fact, I [fol. 159] think that if this witness were to be examined as to the train operations on the New York Central, you will not only find they have a double track over a good part of the system shown on this map, but probably a four-track operation on some parts of it, while your honor heard the testimony the other day, which is, that very little of the track in the State of Arizona is double track. Of course, there

is no showing as to grade conditions, the curves, the hog backs and dips, how they compare in the two territories, which would of course, affect the operation of trains and operating conditions. We have no evidence as to what the laws of New York are governing the operation of trains, such as the full-crew law, which in some states—there is no such a thing as a full crew law. Other states do have it, but they operate in different states. Now, of course, your honor, your honor can see that would affect the operating costs, because if one state requires a certain number of men in a crew and another state has no full-crew law, the less men required to operate a train is going to affect operating costs. So the evidence, which is here offered on operating expenses would be affected by laws of that sort. The length of divisions would have its effect upon operating [fol. 160] costs. Certainly, until these conditions are shown to be similar, or so nearly similar as to be practically identical, there could not be any evidentiary value to this testimony.

Mr. Polley has a number of cases. The case of Morse vs. Kentucky Electric Co., 208 S. W. 15, was an action for the price of constructing an engine. Evidence that an engine such as the one in controversy would operate well, if properly constructed, by proving a similar engine in a different place did operate properly, was held inadmissible at least until there was a showing that the conditions surrounding the operation were similar or identical.

[fol. 161] Mr. Strouss: In the case of Perkins vs. City of Springfield, Massachusetts, 143 N. E. 329, was an action to recover damages for the establishment of a building line; evidence that the owners on another street had set back their buildings voluntarily was held inadmissible, not showing similarity.

Superior Loader Company vs. Huttig, etc. Missouri, 264 S. W. 396, was an action for the price of a machine shovel and evidence as to how a similar shovel had operated in other mines was held inadmissible.

A similar case was Osborne vs. Eyster, 192 S. W. 143.

In Fort Worth & D. C. Ry. Co. vs. Strickland, a Texas case, 208 S. W. 410, an action against a railroad for failure to furnish cars within a reasonable time after requested, evidence that another road did so furnish cars was held not admissible.

McLaughlin vs. L. A. Ry. Corp. 182 Pac. 44, evidence as to the distance within which a car of a railway company other than the defendant would stop held inadmissible.

Thayer vs. Glynn, 106 Atlantic, 834, the distance in which an automobile would stop was held inadmissible.

Evidence that ads had been run profitably in other cities [fol. 162] was held in Johnston Publishing Co. vs. Briggs, 76 Fe. (2nd) 601 as inadmissible.

Crouch against National (etc.) Remedy Co. 217 N. W. 577. Cretors vs. Troyer, 247 N. W. 558.

Puget Sound Co. vs. Packing Co. 136 Pac. 117 where the plaintiff claimed transportation of certain cars belonging to the defendant were dangerous owing to defective loading, evidence that another railroad transported such cars was held inadmissible.

There is quite a lengthy annotation in 66 A. L. R. at Page 1203.

Now it would seem quite apparent that that rule must be true because of all the different conditions that may affect railroad operations, unless those conditions exist in the case of the respective railroad whose evidence of operations is offered and that they are similar to the conditions which exist in the operation of the railroad whose case is before the court, there couldn't be any evidentiary value to the testimony. We say that is the situation here. I am talking now only to the point of cost of operation. I suppose that eventually the defense will question him about the matter of safety operations. Now certainly that would have a further [fol. 163] objection that there is—of course it would be opinion evidence upon which expert testimony is not admissible because it is the ultimate facts, and the facts themselves going to prove that ultimate facts are available and where such is the case opinion evidence is not admissible. In other words, these exhibits will show which have been introduced in evidence this morning, exhibits 7 and 8, under the requirements of the Interstate Commerce Commission are required to make reports of all accidents occurring on their railroad. I say all accidents, that is a little general because there is a limitation as to accidents in which the time off is three days or more and train accidents where the property damage is $150 or more. That type of accident they are required to report to the I. C. C. and those reports are available, both in the I. C. C. and the company's records. They have a record of all their trains

operating, from which record can be determined the number of long and short trains, that is, trains of 70 cars or less or trains of 70 trains and over, and the accident reports related to those train lengths to show from the evidence all of the facts themselves whether there is a relation of safety in the regulation——

[fol. 164] Mr. Mason: I don't mean to interrupt counsel but he is certainly anticipating a great deal when he anticipates we are going to question Mr. Porter about safety operations. I qualified Mr. Porter as head of the Accounting Department of the New York Central. I have not so far indicated and I will say in order that counsel's apprehensions may be quieted, I don't intend to ask Mr. Porter anything about safety of operations on the New York Central, and in fact I didn't intend to ask him any questions about their operations at all, but merely to introduce exhibits through him which will reflect the results taken from their underlying records. If that will somewhat abate the anticipatory objection now being argued it may be for the benefit of both of us.

Mr. Strouss: I still insist upon my objection and in order that what I have said may not be wasted it will be unusual if the defense here does not in some of these executives of foreign roads question them upon the point of safety.

The Court: We will cross those bridges when we get to them.

Mr. Strouss: It goes to the general question to the admissibility of testimony of witnesses and executives from other roads and upon the general question of whether that [fol. 165] type of testimony is admissible and has any evidentiary value. Of course it does have the further objection as to opinion evidence.

Mr. Mason: We haven't offered any opinion evidence yet. When the time comes, if we have any opinion evidence to offer we will offer it. First of all, as to the objection as to the materiality or relevancy——

Mr. Strouss: May I interrupt; Mr. Mason read from the answer. Of course the fact that it is pleaded in the answer would not make it admissible in evidence.

The Court: Not necessarily, it would lay the predicate for it.

Mr. Mason: The allegations set forth in the answer are our affirmative allegations, they haven't been stricken and there was no move to strike them. Apparently the allega-

tions are regarded by the prosecution as raising a proper issue of an affirmative defense. In our answer we have undertaken to show that the Train Limit Law is peculiar to Arizona and that it is unreasonable because elsewhere in the United States on other railroads operating under, as we shall show, reasonably similar conditions, operations are [fol. 166] carried on without observing the statutory maximum train limit and with satisfactory or at least more satisfactory results than in Arizona. That is the gist of our allegations. Necessarily we will have to develop our case as to each of the individual railroads by the representatives of those railroads and as to the accounting features which will show the effects as reported under them to the I. C. C. we will develop them from the accounting witness. As to the operating features we will develop that from the operating witness. We do not propose to call the comptroller to tell how the trains are operated. We have a man fully qualified for that purpose here in the court room. I don't think there is any question as to relevancy. The cases cited by Mr. Strouss didn't indicate whether there were any allegations such as in this case going to the reasonableness or unreasonableness of a statutory restriction such as this which exists as unique and under all testimony everywhere else in the United States has been rejected and overturned.

The Court: It seems to the Court, Mr. Mason, that probably I should require you to make some showing of similarity.

Mr. Mason: We will make that. We will have the precise [fol. 167] figures to show sufficient similarity in operating conditions to give weight and materiality. It is not a mere tissue of evidence, as if we had taken operations in Australia or South Africa and attempted to assimilate them in our operations here.

Mr. Strouss: What they will do and what they have done is a different thing. I insist that the mere fact that they have pleaded in their answer certain things doesn't give them a right to prove that if it is not material to the issue before the court.

Mr. Mason: The pleading makes the issue and unless the pleading is stricken we are entitled to bring proof in support of our allegation.

Mr. Strouss: So far there has been no proof of similarity of conditions.

Mr. Booth: Suppose instead of this being a separate defense raised in the answer it was a bill in equity challenging the constitutionality of this law as unreasonable, as we did in the state of Nevada and in the United States court where this identical class of testimony was introduced. Let us suppose we had challenged the constitutionality of this law under a statute permitting the Southern Pacific or any railroad aggrieved to sue the state of Arizona in the state court [fol. 168] and we had filed a bill in equity challenging the constitutionality of the law in precisely the same language as the affirmative defense in this case, and the Attorney General, answering for the state, had come in and denied it without moving to strike the allegation of the complaint, I submit to your honor it couldn't be said we should be debarred from introducing testimony in support of our challenge of the constitutionality of the law in such a case as that. There is no difference in principle between a defendant who enters and challenges the constitutionality of a law upon which a penalty suit is pending and the same defendant who as a plaintiff challenges the constitutionality of a law on the same grounds. We are virtually in the position of going forward in this case, as Dean Wigmore says, we have the burden of going forward. We are in the position of a plaintiff in this case. If we had interposed no such defense as this, it would have been the duty of your honor to have rendered judgment against us and determined the exact — of the penalty upon the close of the plaintiff's case, but we come in as a moving party and challenge the constitutionality of this law on the ground it is unreasonable, that it is an interference upon interstate commerce, that it [fol. 169] is a burden upon interstate commerce and against the interest of safety, and counsel says in order to prove that, just as we proved it in Nevada, just as we proved it in the first case in Arizona with which your honor may or may not be familiar, but which was dismissed because of a substitution of Attorney Generals, in every case of this kind and I have been in every one tried so far in this country, the same general testimony has been introduced, because as Mr. Mason says, the law is unique. The only way by which we can establish the unreasonableness of this law is to show what under conditions generally the same in other parts of the country has been the practice of American railroads. Now this testimony here is not to prove actual dollars and

cents operating costs. It is to show a trend in freight operating expense and freight transportation expense which we will show has been coincident with increase in the length of trains. We cannot try our case by one witness, we cannot try it by twenty witnesses but I am satisfied when all the evidence is in that a mosaic, a composite picture will be presented to the court, whether the court sees fit to adopt it or not as a composite picture was presented to the Federal court in the Nevada case in which the bill of complaint was [fol. 170] almost exactly the same as this answer and in which testimony of this kind was received and considered and commented on in the findings of the court.

Mr. Strouss: If the Court please, I want to say a word because I happened to be in the former Arizona case. Those matters were heard by a Master and the Master in the Arizona case, as Mr. Booth will remember, said frankly he didn't feel it his duty to exclude any evidence. Time after time, when objections were made, he stated that he felt the objections were proper but he should admit all of the evidence and that was the policy followed in that case, and I think in the Nevada case also.

Mr. Mason: No, that is not correct.

Mr. Strouss: Well, the parts of the record that I read from Nevada, that seemed to be the policy of the Master there. At any rate, Mr. Morrison stated frankly that he didn't feel he should sustain the objection to any evidence and all through the taking of evidence overruled all objections and allowed all evidence in. He did in a number of instances state that he doubted the evidence was proper but felt he should receive all. Coming back to the proposition as put by Mr. Booth, that if we were in court in a bill of [fol. 171] equity in which the allegations were denied that that would make the testimony admissible, which I take it is the argument made. I know of no such law that you can plead in a bill of equity or in a complaint in a civil action matters that are irrelevant and immaterial to the issue which the court has to decide and that the court must receive evidence upon those immaterial matters.

The Court: No, I don't subscribe to that doctrine. The mere fact that you fail to move to strike it doesn't preclude you from making your objection.

Mr. Strouss: As I say, up to now there has been no basis laid, no showing whatever that would qualify this evidence

as admissible. On the second point, there cannot be any question, we have case after case here that summaries of all records are admissible where those records are in court, available for examination and for use in cross-examination of a witness, but unless they are then a summary is not admissible.

The Court: We might shorten this up, conditioned upon your showing the similarity, the court is going to overrule the objection upon the first ground. I will, however, Mr. Strouss carefully look into these authorities, I will not recess [fol. 172] to do it now but if I find I am in error I will correct it.

Mr. Polley: The general rule is stated in 22, Corpus Juris, 750, and especially note 81 on Page 751. That is the general rule supporting our first ground of our objection that the evidence is inadmissible.

Mr. Booth: I don't think I made myself quite clear on that point that to sustain the objection to this line of testimony is virtually to say to this defendant he is standing in the place of the plaintiff, attacking the statute, "You will not be allowed to present your case upon the theory that you believe the case depends." I don't believe if the conditions were reversed and we were the plaintiff in this case that it would be a proper objection for the Attorney General to say in effect to the plaintiff "You are off on the wrong theory of this case. We ask the court not to receive any evidence on that theory." That is virtually what he is asking you to do here.

The Court: As to the second ground, I take it that will dispose of all the objections before you can proceed with this witness, on this question of whether or not this exhibit which you have marked for identification is admissible where the [fol. 173] original records are not produced as against the objection that it is not the best evidence, I will hear you on that, Mr. Mason.

Mr. Mason: Your honor, almost from time immemorial and I think you will find the cases, I haven't them in hand, but the rule has been so well recognized, I haven't thought to bring the cases into court but it has been recognized in Federal court and I think every state court has proceeded upon the basis that excerpts from original records maintained by carriers in accordance with the requirements of the I. C. C. if duly proved by a competent witness are com-

petent testimony and that the original records themselves need not be produced if the witness is prepared to and does certify that the figures he prepared were compared with the original and are true transcripts thereof. As to this particular exhibit we have the further fact that the figures, except the computed figures, on the face of the exhibit, are themselves contained in annual reports made to the I. C. C. in accordance with the requirements of Section 20 of the Inter-State Commerce Act and as such are preserved in the records of the Commission as public records. Of course the carrier maintains counter-part copies for its own records. It is required to by the I. C. C. and the witness on the stand [fol. 174] is the officer who has charge of the department in which those records are maintained and kept so as to his competency to produce the records in his charge, which are the counterpart of reports made to the I. C. C. there could be no question. Our exhibit No. 9 this morning contains among other forms the form of the annual report rendered by carriers to the Interstate Commerce Commission. It is quite an elaborate form and this is the form furnished to carriers by the I. C. C. and by them filled out and returned to the Commission and we keep counter-part copies and are required to keep them as permanent records. Another document is a blank form prescribed by the Commission and furnished to the company and that is the reason I say that railroad accounts are kept in accordance with Commission requirements and records kept in accordance with the Commission requirements and are rendered on forms prescribed by the Commission. The authority of the Commission to prescribe such forms is contained in Section 20 of the Interstate Commerce Act. So far as I know there has never been any serious question raised as to the admissibility of excerpts. I know it has been followed and done in cases which I have tried in Federal courts, before the I. C. C. and state [fol. 175] commissions and in particular in the Nevada Train Limit case precisely the same type of evidence was received over the strenuous objection of the Attorney General of Nevada and was fully relevant and competent.

Mr. Strouss: They keep referring to this Nevada case. I submit if your honor will read the decision in that case there is no decision on any question of evidence of this sort by the court itself. If it cannot be found in the decision, it certainly was not part of the court's determina-

tion. I have yet to find a case, except one, where it has been held that excerpts or summaries of records are admissible unless those records are either in evidence or in court or available to counsel so they may be used for the cross-examination of the witness who is submitting the summary. The rule is stated in Corpus Juris 22 at Page 896, "Written statements prepared for use at a trial are not ordinarily admissible in evidence although they may be received where they are merely in the nature of summaries of voluminous records which are in evidence." The rule is again stated in 20, American Jurisprudence on Page 400, "To render a summary of voluminous records prepared by an expert admissible in evidence, the competency of the [fol. 176] records themselves as evidence must have been established and the records must further have been made available to the opposite party for the purpose of cross-examination. The Wigmore, 3d Edition, Section 1230." Two quite recent Federal cases are Berthold (etc.) Co. vs. St. Louis I. M. & S. Ry. Co., 80 Federal (3d Page 32; Hartford Accident & Insurance Co. vs. Collins, Dietz, Morris Co., 80 Federal (2d) 441; Chicago T. & T. Co. vs. Chicago Traction Co., 1 N. E. (2d) 87. The summary was permitted in evidence because the records were available before the Master.

The Court: One comparatively recent case is Shreeve vs. United States, I think. The only question in my mind is whether you have to have the use of the original books available.

Mr. Mason: Under the bulky document rule there isn't any necessity of that.

The Court: There is no gainsaying if the court is to function properly, to permit experts, such as the comptroller here, to summarize and point out what those records contain, but it is just a question of whether those records must be produced for their examination.

Mr. Mason: As stated here, all that the witness has done is to take from the annual report to the Interstate Com- [fol. 177] merce Commission for the counter-part copies which he retains, the figures in columns B, C, and D for the appropriate years. The computations of course are his own but the computations can be made by anyone with a pencil and paper. Those I don't think are questioned if the underlying figures are not questioned.

Mr. Strouss: As he first testified on some of these matters he has actually gone to the actual records of the company.

Mr. Mason: I think it says right here, "Source of these figures, annual reports to the Interstate Commerce Commission."

Mr. Strouss: I may be mistaken.

Mr. Mason: Section 16, Paragraph 13 of the Interstate Commerce Act provides, it is 49 United States Code, at page 58 of the West Publishing Co. Edition, first part of title 49, I will read only the part that happens to be material here, "The statistics, tables, and figures contained in the annual or other reports of carriers made to the Commission as required under the provisions of this chapter shall be preserved as public records in the custody of the secretary of the Commission and shall be received as prima facie evidence of what thy purport to be for the purpose [fol. 178] of investigations by the Commission and in all judicial proceedings and copies from and extracts from any of said schedules, classifications, tariffs, contracts, agreements, arrangements for reports made public record as aforesaid, certified by the secretary under the Commission seal shall be received in evidence with like effect as the original." I take it that the carrier's counter-part copies can be received in evidence under that section. What we have done, however, in recognition of the bulky document rule, in place of bringing before you nearly twenty annual reports and perhaps other periodical reports rendered quarterly, have taken certain significant figures therefrom and brought them before you on one sheet. It seems to me that under the purpose and intent of Section 16, Paragraph 13 this is fully admissible without any citation of the cases at all.

The Court: It now appears that the original source of this is from the Interstate Commerce Commission record itself.

Mr. Mason: It is on the face of the exhibit and the witness so testified.

Mr. Strouss: That wouldn't make it admissible. If that record is admissible it is admissible for the purpose of [fol. 179] showing the matters therein stated and the record itself might be admissible.

The Court: You mean the record filed with the Interstate Commerce Commission?

Mr. Strouss: Yes, but that is not what is offered here and under our rules of court, if your honor will remember, which really govern the admissibility of evidence here, it would require a certified copy of the records of the I. C. C. in order for the matter to be admissible in evidence before this court.

The Court: Well, gentlemen, while you are looking that up we will take a ten minute recess.

Thereupon a short recess was taken after which proceedings were resumed as follows:

Mr. Mason: Your Honor, I have one or two additional comments to make.

The Court: All right.

Mr. Mason: In the first place I want to direct attention to rule 43A of the New Rules of Procedure for Superior Courts of Arizona in which it is stated that in any case the statute or rule which favors the reception of the evidence governs and the evidence shall be presented according to the most convenient method prescribed in any of the statutes or rules to which reference is herein made. The competency of a witness to testify shall be determined in [fol. 180] like manner. I take it that likewise goes to any portion of his testimony such as an exhibit which he may have prepared. I should also like to refer again to what Section 16, Paragraph 13, which "renders admissible in evidence" where authenticated by the secretary of the Commission, extracts from any reports which are made public records and are on file with that Commission. Then to the rule of the Arizona Superior Court, which provides that while proof of any matter of a copy may be made by a certificate of the officer having legal custody of the record or his deputy and accompanied by the certificate, this does not present the proof of official record or of entry or lack of entry therein by any method authorized by any applicable statute, or by the rules of evidence at common law. In so far as concerns the immediate question we have the officer who is by virtue of his position the custodian of the accounting records of the New York Central and by virtue of that office necessarily familiar with them and who testified to the accuracy of the official entries kept by that company which are counterparts of the official records on file with the I. C. C. and which official records are themselves evidence, and extracts from them are likewise evidence duly

[fol. 181] authenticated by the secretary. But here we have the official custodian of the counterparts required to be kept by the carrier, accurate and sworn counterparts on file with the Commission. This has not been mentioned before, we have here and this hasn't been produced previously, an official publication of the I. C. C. issued over its facsimile seal for the year ending December 31, 1939, and being merely a series of similar annual reports. This is an abstract of railway statistics for some of the railways of the United States and therein will be found the underlying figures for the year 1939 for the New York Central and its subsidiaries, Boston and Albany, which have been consolidatd by this exhibit which are capable of check here in the courtroom as to 1939. Whether or not the summaries from 1922 to date are here available in Tucson I don't know, but I mention the fact that these records are figures from available sources and given recognition in the annual publication. This document would be admissible under the r[illegible] of Section 16, Paragraph 13, having the seal of the Commission on its face. Finally, I should like to point out that the exhibit is the consolidation of excerpts from annual reports over a period of years and I am in-[fol. 182] formed that there are some 55 or 60 of such annual reports, because in years prior to 1930 the New York Central rendered its reports individually through several of its subsidiaries which were then treated as individual reporting roads for the purposes of such reports. Those reports were consolidated when the New York Central formally took over the subsidiaries. So there would be a considerable number of annual reports brought into the courtroom merely for the accuracy of checking two figures from each of those reports. For the purpose of this exhibit it seems to us under the rule which permits excerpts or a consolidated showing of extracts made from a number of documents which it would be inconvenient to bring to court, that it is properly admissible and properly competent if properly testified to by the person who is in charge of the original document and who certifies to the correctness of the entries which he here produces.

The Court: Do you have anything further, Mr. Strouss?

Mr. Strouss: No, your honor, except this rule of the court which has application here, rule 44, Proof of Official Record which requires that an official record which is to be offered in evidence must be authenticated as set out in

[fol. 183] rule 44. The Federal statute does not control the admissibility of evidence in our courts, that is controlled by our rule here.

Mr. Mason: We are not proving an official record here, we are proving a company record by the custodian thereof who produces these excerpts.

Mr. Strouss: They are blowing hot and cold.

Mr. Mason: No, I am not, it is also a counterpart of an official record in Washington on file with the I. C. C. and by statute made evidence in and of itself.

The Court: There is no question but what if there was offered here a certificate of the proper officer of the I. C. C. as to these figures, if that were attached such certificate, I take it, would be admissible as a public record.

Mr. Strouss: No, even a member of the I. C. C. itself couldn't make a summary of the records that are filed with the I. C. C. and by attaching a certificate of the Commission make that admissible in this court. The record itself which is filed by the company, if properly authenticated, would be admissible under the rules of our court but a summary made by a member of the Commission or anyone connected with the Commission would not be admissible.

[fol. 184] Mr. Boyle: What about an extract?

Mr. Mason: We are offering an extract of the Commission, not summaries. These are extracts from the official records or counterparts of the official records.

Mr. Strouss: I would like a chance to finish my argument.

Mr. Mason: I don't want the court to gain an erroneous impression.

Mr. Strouss: You will have your chance to straighten him out if I have given the wrong impression. I certainly have the right to the same information that this witness has in preparing his exhibit. I have the right to have that same information, to examine it for the purpose of cross-examining him as to the summary which he has prepared and unless that is produced I am denied the information to which I am entitled. The bulk rule that Mr. Mason talks about doesn't mean because it is bulky you can make a summary and not permit the other side to see the record from which that summary is made. The bulk rule is that a summary may be made in order to do away with the necessity of introducing into evidence all those exhibits or entries into evidence to require the court to examine them to arrive [fol. 185] at the summarization of them but the evidence

must be available either in evidence or for the examination of opposing counsel so that opposing counsel may have the opportunity to use those in cross-examination.

[fol. 186] Mr. Mason: I just want to point out that this is not a summary, as Mr. Strouss insists on calling it. These figures which appear on the face of Exhibit No. 11 are themselves entries, that is, columns B, C and D are themselves entries in the report of the New York Central to the Interstate Commerce Commission. They are the figures shown in a particular line in that particular annual report. The figure for total railway operating expenses are shown in line 247 on page 213 of the annual report. It is the same for every railroad, of course, because every railroad must follow the same form. This witness has a form here for the year 1937.

The Court: Do you have something, Mr. Boyle.

Mr. Boyle: Well, I had a thought in mind when Mr. Strouss was arguing to your honor, but I think the court's observation to the effect that a described extract from the records of the Interstate Commerce Commission would be admissible here, is in a general way the answer to the question now before the court. Mr. Strouss says, "What can I do with this?" "I can't cross-examine intelligently unless I have all of the books of the railroad company or I have the records made to the Interstate Commerce Commission out of which these figures were derived and out of which these figures came." Now, he would be in exactly [fol. 187] the same position if these gentlemen had come in here with a certified copy of an extract of a report to the Interstate Commerce Commission, and I believe under the law is admissible here in evidence. Those matters, when they are filed there become public matters. They can be gotten by anyone. They are obtainable. We can bring them in here. But while perhaps all of us are not as familiar with the interpretations that may be placed upon our new rules, as we should be, the last sentence on page 69 to the effect that the rule does not prevent the proof of official records or of entries or lack of entries therein by any method authorized by any applicable statute or by the rules of evidence at common law. Now, an authenticated record or a certified copy of this record, certified to by the clerk or one of the Commissioners, I submit would be admissible here, and here is a man who knows of his own knowledge what that record is. He is in charge

of it. He caused the report from which this extract is taken to be filed with the United States Commerce Commission. Isn't he in such a position that proof of that particular thing may be made by other methods, and particularly any method or under any rule of evidence recognized [fol. 188] by the common law? As I say, if there is any doubt about the figures—I don't know that Mr. Strouss has seriously contended that there is or may—as I say, if there is any doubt that, of course, the reports from which these extracts are taken are available and we can get them for him.

Mr. Strouss: Just one answer to the argument made by Mr. Boyle, and that is, we don't have before us the matter of the authenticated copy of an extract of the I.C.C. When that problem arises, we will be ready to meet that with cases. That isn't the question which is here. This isn't any authenticated copy, and the argument which has just been made does not go to any question which is before the court.

The Court: Well, conditioned upon your showing similarity, the objection will be overruled.

Mr. Mason: Then, I take it, the exhibit is admitted in evidence?

The Court: Defendant's exhibit No. 11 in evidence.

Mr. Strouss: May I say, of course, we have given your honor a number of cases upon the other point.

The Court: Yes.

Mr. Strouss: We also have considerable authority on this, and we would be glad to give you a memorandum [fol. 189] of it.

The Court: I wish you would because I want to look into this matter as soon as I possibly can.

Mr. Strouss: I would like to ask that the court do that as early as possible, and we are confident when the court examines the question there might be a different view taken of this objection by the court. We think our objection is sound, and we think the court should look into it before permitting a lot of this testimony to come in. Of course, the court might strike it out later, but I always have a feeling that it is pretty hard to put out of one's mind things that are already in there, and I don't think the evidence should be allowed to be put in.

The Court: Well, you gentlemen give me a list of your authorities, and at the very earliest opportunity I will look into it.

Mr. Mason: May we have a list of them?

Mr. Strouss: Surely.

Mr. Mason: We may want to submit something.

Mr. Mason:

Q. Mr. Porter, referring to your Exhibit No. 11, did you yourself make the computation or have the computations made which reflect the results in column E.

A. I had the computations made.

[fol. 190] Q. And how did you derive the figure, for example, for the year 1939, in column E.

A. Column E, I divided the revenue from miles, as shown in column B, by——

Mr. Strouss: May I just interrupt a minute. Of course, as I understood the court's ruling, on that first objection, that is subject to a showing——

The Court: Showing similarity between the New York Central line.

Mr. Strouss: I think that showing should be made before the admission of this testimony.

The Court: Yes, I think so. I think that showing should be made by this or some other witness.

Mr. Mason: Then I will have to withdraw the witness. I intended to make it by a subsequent witness. Of course, we will have to have the Southern Pacific. Are we to be required to show that the grades and the general construction and the general description of the roads are similar?

The Court: I said generally.

Mr. Mason: We are going to show that. I think that if we don't show it, the court will properly disregard the testimony. But could we not proceed to do that later?

The Court: Well, you may proceed in that way.

[fol. 191] Mr. Mason: We will agree, if we don't make a sufficient showing of similarity to render the comparison a proper comparison, it should be disregarded. But comparisons cannot be made all at once. You must lay your foundation by a succession of witnesses.

The Court: You may proceed.

Mr. Mason:

Q. I understand the figure in column E is obtained by dividing the figure of money in column C by the figure "revenue ton-miles" in column B?

A. Yes.

Q. As to the figure in column F, is that similarly computed?

A. Yes, by dividing the money shown in column D by the revenue ton-miles, by the thousand revenue ton-miles.

Q. Will you state whether or not these computations are to the best of your knowledge correct?

A. They are.

Q. The total shown in the blocks at the end of the sheet, now, were those computations made or checked by you?

A. They were made under my direction.

Q. And those are likewise capable of mathematical check?

[fol. 192] A. Yes, sir.

Q. And when you speak of percent of improvement, what does that signify?

A. That signifies your freight operating expenses, for instance, being less than the years 1936 and 1939 for one thousand revenue ton-miles than they were in the four years 22-25, in other words, we were able to operate the freight service at a less cost per thousand revenue ton-miles.

Q. Per thousand revenue ton-miles?

A. Yes, sir.

Q. Does the improved figure in column F, is that computed in the same way, on the basis of a reduction in cost?

A. Yes, sir.

Q. Now, what is the difference between freight operating expenses and freight transportation *transportation* expenses?

A. Freight operating expenses include all of the operating expenses, such as your maintenance of tracks, maintenance of your buildings, your stations, and other structures, your maintenance of equipment—all of your transportation expenses, including your train crew and station expenses, etc., plus your general expenses and your traffic expenses, which are assigned to freight operation in ac-

[fol. 193] cordance with the formulas prescribed by the Interstate Commerce Commission. Your freight transportation expenses are merely one group of your operating

expenses and governs the cost of the actual operation of your freight train, station services, yard crews and so forth.

Q. Are those items which go into freight transportation expenses found in a particular group of accounts in the annual report?

A. Yes, they are found in a group which is known as "transportation expenses", a separate group.

Q. And are the expenses assigned to each of those cost accounts in accordance with the Interstate Commerce Commission accounting rules?

A. Yes, sir.

Q. Does the Commission designate that particular group as the group making up freight transportation expenses?

A. Yes, that is, they designate the various accounts which make up that group of expenses.

Q. For example, referring to exhibit No. 9, to the annual report, Form A, which is a part of Exhibit No. 9, can you state on what account and on what account numbers, and upon what pages of Form A which you have before you, [fol. 194] the transportation expenses which entered into or formed a part of the operating expenses?

A. The transportation expense will be found on page 308, commencing with line 162, and carried over to page 310, concluding with line 215.

Q. And the figures which appear here are the figures taken from your annual report under that particular designation?

A. Yes, sir.

Q. And of those particular pages?

A. Yes, sir.

Q. Mr. Porter, I show you again defendant's Exhibit No. 9 and ask you if you are familiar with a form OSA and the form OSE issued by the Commission?

A. Yes, sir.

Q. Will you state how frequently those reports were rendered to the Interstate Commerce Commission?

A. These reports are rendered monthly.

Q. And on forms furnished by the Interstate Commerce Commission?

A. Yes, sir.

Q. Are those reports accumulated by months for each year?

A. They are. In other words, the report itself shows the figures for the month and the figures for the accu-
[fol. 195] mulated period.

Q. Up to the end of the year?

A. Up to the end of the year.

Q. Then, am I correct in understanding that the report for the month of December in any particular calendar year would cover not only that month but also the entire twelve months of that calendar year?

A. That is right.

Q. Have you before you a document in one sheet, Mr. Porter, entitled "New York Central Railroad Company, (including all leased lines), freight service operating averages, calendar years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 and 1939?"

A. Yes, sir.

Q. In what manner was that statement prepared?

A. This statement was prepared from our office copies of the reports filed by the Interstate Commerce Commission, forms OSA and QSE, and also from data taken from the annual report, Form A as filed with the Interstate Commerce Commission.

Mr. Mason: Your honor, may we have the statement marked No. 12 for identification?

The Court: It may be marked for identification.

Mr. Mason:

[fol. 196] Q. Has the exhibit been compared with the original report or the counterparts thereof on file in your office?

A. They have, and the exhibit was prepared under my direction from those reports and I personally verified the figures for the year 1939. I did not attempt to verify them for each of the years. However, I have no reason—I have every reason to believe that they are correct.

Q. Now, there are certain of these figures shown on here which are computations of the other figures, are they not?

A. Yes, sir.

Q. Are those the items contained in the legends as to the various sources shown at the foot of the exhibit?

A. Yes.

Q. And the computations in the column M, are they entirely computed from the preceding figures?

A. Those computations are computed from the figures shown for the years 1939 to 1922.

Q. Now, the "DEC", which appears in lines 1 and 2, what does that signify?

A. That indicates a decrease in the percentage.

Q. Are all those percentage figures in column M?

A. They are.

[fol. 197] Q. Are all of the units to which the figures in the other columns relate indicated under the word "item," column B?

A. Yes, sir.

Q. For example, I have this in mind, the figure 43.6 in column C, line 6 indicates "tons," for example.

A. Yes, of course; this is an average. That is the average capacity for freight-carrying tons. The unit for that does not appear in the item. You have to arrive at that by taking your capacity of all freight-carrying cars, which is shown in schedule 417 of the annual report of the Interstate Commerce Commission. Divide that by the total number of cars available for that service, which is also shown in the same schedule.

Q. Will you say, Mr. Porter, whether the exhibit is a true and correct statement, to the best of your knowledge and belief?

A. Yes, sir, I believe it is.

Mr. Mason: I will say, your honor, this exhibit is for the same general purpose, and will be coupled up with the Southern Pacific operations, and particularly, those in Arizona in the same manner we shall undertake in connection with the exhibit received as No. 11. It is for the [fol. 198] purpose of showing the trend of the operations over a representative recent period of years upon one of the major trunk lines of the United States, particularly, for the purpose of showing the results of such operations.

The Court: You are offering it evidence?

Mr. Mason: We are now offering it in evidence as No. 12.

The Court: I presume you have the same objection to this, Mr. Strouss?

Mr. Strouss: Yes, sir, the same objection as to Exhibit 11. I would like to ask the court for the right to examine the witness on voir dire.

Mr. Mason: I have no objection. Perhaps I should have withheld the offer until after the examination had been made.

The Court: Go ahead.

Mr. Strouss:

Q. Mr. Porter, you have before you Defendant's Exhibit 11, which is the map of the New York Central Lines?

A. Yes, sir.

Q. Are you familiar with these lines that are indicated there on the map as to the number of tracks which were operated?

A. No, I would not say that I am. I do know that they—that we have double track line all the way from Chicago [fol. 199] to New York, and part of it is four tracks, but as to just between what points that four-track is I would not attempt to say.

Q. But you do know that there is a double track the complete distance between New York and Chicago?

A. Yes, sir.

Q. And at some parts there is a four-track system?

A. Right.

Q. Now, isn't it true also between—of course, that would have, the number of tracks that are operated would have some effect upon the cost of operation, would it not, Mr. Porter?

A. The number of tracks operated would have some effect, yes, but usually the more tracks you have the more maintenance expense you have.

Q. And the more traffic you can handle?

A. Undoubtedly more traffic you can handle.

Q. The purpose of having the double track is to reduce the cost of operation, isn't it?

A. Well, that probably would have some bearing to it, probably, also the four tracks have something to do with the speed of handling the traffic, too.

Q. Well, of course, the speed of handling the traffic goes [fol. 200] to the cost of operation, also, does it not?

A. Yes.

Q. What about density of traffic? Does that have any effect upon operating costs, too?

A. Yes.

Q. Considerable, does it not?

A. Yes, sir.

Q. So that a system which was located where there is great density of traffic would probably have a lesser operating expense than a system where there was a lighter traffic, isn' that true.

A. Yes, I would say that railways having a very large density of traffic, your operating cost per ton-mile, per revenue ton-mile, would probably be less than it would be where you have a very light traffic.

Q. The length of divisions would have an equal effect upon operating costs, too, would it not?

A. Well, I don't know so much about that. I would rather have an operating man testify as to that.

Q. Of course, one of the items which enters into cost of operating a locomotive is steaming that locomotive up before it goes out on the run, that is true, isn't it?

A. Yes, sir.

[fol. 201] Q. And if that locomotive is run over a division of longer miles, of course, that initial expense would be spread over more miles?

A. The initial expense of steaming up the locomotive, yes.

Q. Preparing the locomotive?

A. Yes, sir.

Q. Now, the wage scales have a bearing upon operating costs, don't they?

A. Oh, yes.

Q. And wage scales differ in different parts of the country?

A. I would not say as to that. That would only have to be an assumption on my part.

Q. You only know as to the New York Central.

A. Right..

Q. Fuel cost is another item that enters into cost of operation, isn't it?

A. Yes, sir.

Q. And the amount of fuel required, of course, would depend upon the operating conditions to some extent, whether there — grades, or curves, because all that would resist the operation of the train?

A. Well, I have no doubt that the amount of fuel required would depend upon the grade. It would also depend upon the size of the train. It may depend upon various causes, [fol. 202] other causes.

Q. The availability of the fuel enters into the cost, that is whether you have to transport a short or a long distance to the particular division?

A. That has a bearing on the cost, of the fuel, yes, sir.

Q. Switching costs are applied to your general transportation costs?

A. They are.

Q. A part of your general transportation costs?

A. Yes, sir.

Q. And where the type of traffic is such that it requires a great deal of switching, that would tend to increase the cost?

A. Undoubtedly, if your traffic has to be switched often there is no question but what the cost would be more.

Q. For example, the type of traffic that you pick up or send out, for example, you take the lettuce which requires to be iced, picked up at lettuce sheds and transported 35 to 40 miles to an icing plant, would that switching cost, that would enter, of course, into the cost of transportation?

A. I assume so. I don't know that we have any of that kind of operations, though.

Q. Well, that, of course, would be a different type of [fol. 203] expense than what you have on your railroads, or enters into your operations?

A. It would probably be an expense.

Q. Yes, but you don't have that type on your railroads?

A. I don't know that we do.

Q. Do you know of any citrus that is grown anywhere along the New York Central Lines that might require switching?

A. I don't know of any citrus that is grown along the New York Central Lines, where we originate any.

Q. Do you know any centers where lettuce is grown along the New York Central Lines to any great extent?

A. Well, I think there is some places where there is some that is grown, but I don't know that we handle a lot of it. I think a good deal of it is handled by trucks.

Q. Of course, another item that enters into your transportation cost is your water for your locomotives?

A. Yes, sir.

Q. And the availability of water would have and does have an effect upon the cost of that item, would it, Mr. Porter?

[fol. 204] A. Oh, yes.

The Court: I see the noon hour has arrived. We'll take our recess until 2:00 o'clock.

[fol. 205] 2 P. M. November 25, 1940.

All parties being present as heretofore noted, proceedings were resumed as follows:

LEROY V. PORTER resumed the witness stand.

Mr. Strouss:

Q. Mr. Porter, these exhibits which you have testified to, are they related to the whole New York Central system?

A. Yes, New York Central Railroad Company.

Q. That is not limited then to that part of the system which is in the heavy black lines?

A. No, sir.

The Court: That is, it is to the company itself and all its subsidiaries and leased lines?

A. Yes, sir.

Mr. Strouss: I was asking you this morning before recess about some items that enter into operation and transportation costs. Of course the wages of engine men, trainmen, yardmen, and so forth would all be a considerable item in that.

A. They are all included as part of the cost.

Q. Do you know how many states your railroad operates in?

A. Thirteen.

Q. Of course the full crew laws would have some effect upon operation and transportation costs, wouldn't they?

[fol. 206] A. I imagine they would but as to what effect I am not prepared to say. I think that is something that an operating witness ought to testify to.

Q. You don't know whether there are full crew laws in all of the different states?

A. No, sir.

Q. Do you have the double-header rule?

A. I couldn't say.

Q. That would have an effect upon operations and operation costs, wouldn't it? You know what a double-header rule is, don't you?

A. You mean where you double head?

Q. Limiting the tonnage to the rating of one of the engines.

The Court: I might say that the court doesn't know what it is so if you can enlighten me, Mr. Strouss.

Mr. Mason: We will have an operating witness from the New York Central who will answer these questions. I haven't objected but his witness is not qualified as to that.

Mr. Strouss: He has testified to transportation expense.

Mr. Mason: Purely as shown in reports to and records of the Interstate Commerce Commission as required by [fol. 207] the Commission and rendered to the Commission. He has offered solely for the purpose of identifying these figures taken from these reports which are prepared as I understand him under his direction and by him and for the company rendered to the Interstate Commerce Commission.

Mr. Strouss: Are you objecting to my question?

Mr. Mason: No, I am just making clear what the witness's qualifications are.

Mr. Strouss: My recollection is that he testified as to the form of the annual report and as to all the items which enter into the transportation expense, beginning with items on Page 308 and extending to Page 313 and these are the items I am inquiring about at the present time.

Mr. Mason: The entries which appear on these pages are the entries which summed up together make the figures here and which figures are reported to the Commission. Now what or how those are affected is not a subject of the witness's direct testimony. However, whatever information you can extract from him within his qualifications you are welcome to try to do.

Mr. Strouss:

Q. Locomotive supplies would be an item of transportation costs?

A. Yes, they are an item.

[fol. 208] Q. And would vary according to the availability of the supplies and the market at the time they are purchased?

A. That is true; of course, that would apply to any material, the availability of the material as to whether

you have to haul it a long or short distance would probably have some bearing upon its ultimate cost.

Q. It would of course vary with respect to those items the same as any other item of that sort?

A. You mean it would——

Q. According to its availability.

A. If you don't have to transport it.

Q. Do you use any electric locomotives or Diesel locomotives for switching?

A. Yes, sir.

Q. Is that quite a usual operation on the New York Central?

A. We have electric locomotives in New York City, I think, and also we have used Diesels and we have some Diesels now in Buffalo.

Q. I notice in your exhibit No. 11——

Mr. Mason (Interrupting:) If your honor, please, this voir dire examination on exhibit No. 12. The witness was not submitted for cross-examination.

[fol. 209] The Court: Yes, I will sustain the objection. Had you completed with your voir dire, Mr. Strouss?

Mr. Strouss: Just a minute. Of course it is voir dire on 11 but I have asked the court for permission to go into this question of similarity of conditions also.

The Court: The court would prefer that you defer any further examination you have and let Mr. Mason finish with his direct examination.

Mr. Strouss: Very well.

Mr. Mason: I didn't mean to object to any further questions that Mr. Strouss might have preliminary to a further objection, if he has one, to exhibit No. 12 and if there are further questions along that line I will be glad to defer to Mr. Strouss.

Mr. Strouss: For the purpose of the record I want to make the same objection to any oral testimony by the witness relative to operating conditions on the New York Central lines.

Mr. Mason: I haven't offered the witness as an operating witness and I don't pretend he is qualified as an operating witness to discuss operating conditions on the New York Central lines.

The Court: That is very apparent.

Mr. Strouss: I am not limiting this to operating testimony. My objection goes to any testimony relative to the [fol. 210] New York Central lines, their costs, or whatever it may be. This law is an Arizona law which depends upon conditions in Arizona. First our objection is that it is immaterial and, second, there has been no foundation laid for it and it is incompetent for that reason.

The Court: The objection is overruled.

Mr. Mason: We offer the exhibit as exhibit No. 12.

The Court: It may be received.

The document referred to was received in evidence and marked defendant's exhibit No. 12.

Mr. Mason:

Q. I take it, Mr. Porter, that these exhibits, 11 and 12, were prepared by you or under your supervision for the primary purpose of showing the trend of the various operating averages and expenses rather than for the purpose of showing absolute cost, is that correct?

A. That is correct.

Q. And the development of these matters with relation to the New York Central system operation for the period between 1922 and 1939 both inclusive.

A. Yes, sir.

Mr. Mason: I think that is all, Mr. Porter, thank you. Cross-examine.

[fol. 211] Cross-examination.

Mr. Strouss:

Q. Of course this only shows trend of operating averages and expenses on the New York Central, doesn't it?

A. That is right.

Q. You don't purport to offer testimony as to anything else than the New York Central lines?

A. No, sir.

Q. Of course those trends may be affected by a number of different situations, may they not? I mean, for example, improvement in equipment.

A. Well, that may have some effect on them.

Q. The locomotives, for example, have been equipped with super heaters which would give more efficient opera-

tion of the locomotives, that would affect the trend, wouldn't it?

A. I am not qualified to say whether the application of a super heater does or does not.

Q. Assuming that it does increase the efficiency of the locomotive, that would affect the average trend of costs, would it not?

A. Yes, assuming that it gives a locomotive more power, that would have some effect.

Q. Of course variations in costs of materials and in fuel costs would affect the averages and trends of the different years?

[fol. 212] A. Yes, sir.

Q. And variations in your wage agreements with men would have their effects?

A. Well, they would have some effect where there was very much of a change in those wages either up or down. Of course it would have some effect for that particular year or when the change was made.

Q. Wages is a big item in transportation costs?

A. Oh, yes.

Q. And a variation of a percentage up or down would affect the transportation costs and the trend from year to year?

A. That is true.

Q. Improvements in your system such as grade eliminations and curve eliminations would have their effect on costs, transportation costs, wouldn't they, changes from year to year?

A. I don't know what effect the curve elimination might have, I wouldn't want to say.

Q. Assuming that the elimination of the friction on a curve would reduce fuel consumption, that would affect the trend of course.

A. If it was something that you didn't have before and something new that was applied and if as you say it might [fol. 213] reduce fuel, why naturally that would have some effect upon the results after the application of the improvement.

Q. Which item was this in the annual report from which this exhibit was made, exhibit No. 11?

A. That is on Page 312 and 313, line 247. The freight expense is shown in column E.

Q. That item is a total of the different items of transportation expense which you testified to in direct?

A. That is a total of all operating expenses including maintenance of way, maintenance of equipment, traffic generally and transportation.

Q. You are speaking of the item in column C of exhibit No. 11?

A. Yes, that is column C.

Q. And that, as it appears in the annual report, is merely a total of the preceding items, itemizing the operating expense of the railroad?

A. That is right.

Q. Item D is the total transportation item?

A. That is the total of the transportation items shown on pages 310 and 311.

The Court: All of the items listed in D in defendant's exhibit No. 11 are included I take it under column C of your freight operating expense?

A. Yes, sir.

[fol. 214] The Court: That is the over-all expense?

A. That is right.

The Court: Whereas this other is merely the transportation expense?

A. Yes, sir.

Mr. Strouss:

Q. This total is made up from all these items which appear beginning at Page 303 of the annual report?

A. Page 303 is your railway operating revenue.

Mr. Strouss: Excuse me, Page 304?

A. Beginning at Page 304, yes, sir.

Q. So that these items which begin at 304 and extend over to 313, what you have set out in your exhibit is the total of those items?

A. Right.

Mr. Strouss: That is all.

Mr. Mason: That is all for Mr. Porter. May the witness be excused.

The Court: Have you any objection to his being excused.

Mr. Strouss: No, but I don't in excusing him withdraw my objection.

The Court: I understand.

[fol. 215] ALFRED H. WRIGHT was called as a witness in behalf of the defendant, and being first duly sworn, testified as follows:

Direct examination.

Mr. Mason:

Q. Please state your name and business headquarters to the Reporter.

A. Alfred H. Wright, Assistant General Manager New York Central Lines East with headquarters at Syracuse, New York.

Q. Have you before you a copy of the document which has heretofore been marked as Defendant's Exhibit No. 10 for identification?

A. Yes sir.

Q. That exhibit has previously been stated by Mr. Porter to be an outline map of the lines of the New York Central Railroad Company. Are you familiar with the lines of the New York Central and its affiliated and subsidiary lines?

A. Yes, in a general way. The territory over which I have jurisdiction is shown in the heavy line.

Q. Will you state whether or not from your familiarity with the New York Central system this map is a reason-[fol. 216] ably accurate outline reproduction of the system lines and their location?

A. Yes sir.

Mr. Mason: I will explain to Your Honor and for the benefit of counsel that we don't offer the exhibit as an accurate and complete reproduction but merely an outline map to show the general location of the railroad which the witness represents and which is being discussed.

Q. What portion of the lines shown on Exhibit 10 for identification did you say are the lines over which you have jurisdiction as assistant general manager?

A. The lines indicated by the heavy black line extending from Buffalo and Suspension Bridge on the west to Weehawken and New York on the east, to Newberry Junction and Cherry Tree on the south, which points are located in Pennsylvania and Montreal and Ottawa on the north.

Q. Does your jurisdiction extend to certain lines shown in the State of New York and the Province of Ontario and Quebec, which are shown in lighter lines, as well?

A. Yes, sir.

Q. How long have you been employed by the New York Central?

[fol. 217] A. I entered the service of the New York Central in 1900 as a clerk at Rotterdam Junction. I served in a clerical capacity in yards and stations for a period of eleven years. I was then appointed assistant trainmaster of the Mohawk Division, and served in that capacity for four months, and then was transferred as trainmaster to the River Division, which embraces the territory between Albany and Weehawken, New Jersey. I served in that position for twelve years. I was then appointed assistant superintendent of the River Division and served in that capacity from April, 1923, to December, 1924. I was appointed superintendent of the River Division in December, 1924, and served in that capacity until January, 1927. I was appointed assistant to the general superintendent and marine manager of the New York Central in January, 1927, and served in that position until February, 1930, when I was appointed superintendent of the Consolidated River Division and New York terminal districts. I served in that position from February, 1930, to November, 1937. On the latter date I was appointed assistant general manager of the lines east and am still serving in that capacity.

Q. As assistant general manager of the lines east, what [fol. 218] is the nature of your duty and jurisdiction?

A. I have general charge of the operation in the territory I have described as comprising the New York Central Lines, East.

Q. Between what points does the Mohawk Division extend, or did it extend, when you were assistant trainmaster and otherwise employed?

A. The same as at the present time. By referring to the map it would be the territory between Syracuse and Albany, New York.

Q. Is it part of your duty to travel frequently over the lines subject to your jurisdiction?

A. That is true, yes, sir.

Q. And to become familiar with all the operations thereon?

A. Yes, sir.

Mr. Mason: Exhibit Number 10 has not been formally offered in evidence, and we now offer it in evidence.

Mr. Strouss: We make the same objection to this exhibit as made to the other.

The Court: It may be admitted in evidence.

The Clerk: Exhibit 10.

Mr. Mason:

Q. What is the mileage of the lines east which are subject to your jurisdiction?

[fol. 219] Mr. Strouss: I don't want to be interrupting the examination continually, but I would like an objection, so it may be understood that I am objecting to all the oral testimony as to the New York Central——

The Court: Yes, the record may show the objection.

Mr. Strouss: The same objection, incompetent, irrelevant and immaterial.

The Court: The same objection is renewed as heretofore made.

Mr. Strouss: And no proper foundation.

Mr. Mason: I can see the pertinency of the objection as to the relevancy, but certainly as to competency it seems to me that question has been settled. However, I will not comment further in view of the ruling.

The Witness: May I hear the question again.

Mr. Mason: Yes, I wanted to say that I agree with Mr. Strouss that he may have the objection without repeating it. Now the question, I think, Mr. Reporter, was asking as to the mileage included in the lines east.

(Last question read by the Reporter.)

A. Approximately 2950 miles.

Q. Is the operation of that mileage single track?

[fol. 220] A. Yes, 1885 miles are single track.

Q. How much double track and how much four-track?

A. 658 miles of double track, 414 miles of four tracks.

Q. Does the mileage which you have recited include branch lines as well as main lines?

A. Yes.

Q. Is there a substantial branch line mileage included there?

A. Yes, a considerable part of the single track mileage is branch line mileage.

Q. What is the standard rate of rail in the main line?

A. 115 pound section. We have more than that, it runs from 115 to 130.

Q. Do you observe any speed limits for your trains?

A. Yes, we have maximum speeds established for both freight and passenger.

The Court: You mean established by the company or by law?

A. By the company.

Mr. Mason:

Q. They are of your own establishment?

A. That is true.

Q. Omitting for the purpose of this question special restrictions at particular locations or curves, or for other sim-
[fol. 221] ilar reasons, what general speed limit on freight trains do you observe in main line operation?

A. Forty-five miles per hour on freight tracks, 3 and 4, and fifty miles per hour on high-speed tracks 1 and 2.

Q. That is, in four-track territory?

A. Yes.

Q. In double track territory?

A. Double track territory, forty-five miles an hour; some branch lines, forty.

Q. Single-track the same?

A. The same, yes. I might add, to make my answer more fully correct, in some of our single-track territory in Pennsylvania, the maximum speed is thirty-five miles per hour.

Q. Is that dictated by curves or mountainous character of the territory?

A. It is physical conditions due to the lack of elevation on the curves.

Q. Is your main line mileage generally protected by block signals?

A. Entirely so.

Q. Are your trains operated, or your operations conducted pursuant to any particular code of rules?

A. We follow very closely to the standard code of rules of
[fol. 222] the American Railroad Association.

Q. Is that a general code of rules promulgated by the Association of American Railroads?

A. Yes, sir.

Q. And adopted with slight variations by the New York Central?

A. That is true.

Q. Have you been supplied heretofore with copies of exhibits already received in the trial relating to the freight and passenger cars of the Southern Pacific Company, being Exhibits 2, 3 and 4, and also Exhibits 5 and 6 relating to freight and passenger locomotives of the Southern Pacific Company?

A. Yes, sir.

[fol. 223] Q. I will ask you to direct your attention first to Defendant's Exhibit No. 2, which is the chronology of the freight box cars.

A. Yes, sir.

Q. In your capacity as an operating officer of the New York Central have you become familiar generally with the characteristics of the freight box car equipment owned by your Company and operated over its lines?

A. Yes, sir.

Q. Will you say, addressing yourself to Exhibit No. 2, whether or not the developments and improvements in box car construction which are there indicated, are reasonably representative of the developments and improvements in box car construction of the box cars on it by your Company?

Mr. Strouss: Just a minute; I would like to ask the witness a question or two.

Q. The information you have along that line would be information that was taken from the records of your Company, isn't that true?

A. No, I would answer that question from my general knowledge. I have not the detail description of our equipment with me.

Mr. Mason: To qualify him further, in order to meet the objection——

Q. Have you in the course of your duties, or do you in [fol. 224] the course of your duties as an operating officer have access to and observe the box car equipment owned and operated by your Company?

A. Yes, sir.

Q. Is that a necessary part of your duties?

A. Yes, sir.

Q. Is it any part of your duty to become familiar with the appliances attached to box cars, including those used for the control of their speed and brake or stoppage?

A. I would not attempt to qualify as mechanical man on the details of the devices. My knowledge would extend more generally to the size, capacity, and general construction of the cars.

Q. Would it include, for example, any knowledge as to the use of steel center sills, or steel under frames, steel sides?

A. Yes.

Q. Would it include any knowledge as to the type of wheels being applied to such cars?

A. I don't think I could go into the details of the mechanics of it. To go into the wheels and other specifications, I don't think that I could do that in detail.

Q. Has the New York Central made improvements in its [fol. 225] box car equipment over the period of your service?

Mr. Strouss: If the court please, that is again a matter of record, what their equipment is, a matter of record with that Company.

The Court: Objection overruled as to this particular question. The witness seems to be qualified to answer it.

Mr. Strouss: I had not finished my question that I was—that I had asked to ask the witness before. I would like to finish the question.

Q. Where do you get your information from concerning this equipment?

A. This equipment and such information as I have is taken from our equipment guide issued by our equipment department.

Q. That is a record of your Company?

A. Yes, sir.

Mr. Strouss: Now, we submit the record is the best evidence.

Mr. Mason:

Q. Have you obtained any of your knowledge from your own observation of the cars?

A. Yes, sir.

Mr. Strouss:

Q. How many freight cars does the New York central own?

A. Well, as of 1939 we had 35,577 steel under frame [fol. 226] cars.

Q. Now, just a minute, how many cars, without describing them, approximately, if you know, without referring to the record? Do you know of your knowledge?

A. I know from our equipment register, our ownership.

Q. You don't mean to testify that you have examined and seen all of the different freight cars that the New York Central Line owns, or any considerable portion, with your own eyes?

A. Well, I have seen a considerable portion, but I could not attempt to say what percentage of it.

Mr. Strouss: We urge our objection.

Mr. Mason:

Q. Can you say whether or not you have seen substantially all of the different types?

A. I think I have seen every type of box car that we own.

Q. (Read by the reporter as follows:) Q. Has the New York Central made improvements in its box car equipment over the period of your service?

A. Well, I might say that in 1920——.

Mr. Strouss: That can be answered "yes" or "no".

The Court: Yes, that can be answered "yes" or "no".

[fol. 227] A. Yes, there has been an improvement.

Mr. Mason:

Q. Has there been any improvement, for example, in the —as indicated by Exhibit No. 2 for Southern Pacific box cars in the substitution of steel or steel under frame cars in place of wooden under frame cars previously used.

A. Yes, sir.

Mr. Strouss: May my objection go to all this interrogation?

The Court: Yes.

Mr. Mason: Have you made any examination to determine approximately the number of steel and steel under frame cars now owned by the New York Central? Box cars, I mean.

Mr. Strouss: Of course, that can be answered yes or no.

A. Yes.

Mr. Mason:

Q. And where did you obtain that information?

A. From the equipment records in our equipment office.

Q. And is that one of the offices subject to your jurisdiction?

A. Not directly subject to my jurisdiction, but required [fol. 228] to furnish any information that I may require.

Q. Is that record available to you as Assistant General Manager?

A. Yes.

Q. By virtue of your position?

A. Yes.

Q. You have already stated, I take it, in answer to a question asked by opposing counsel, the number of steel and steel under frame cars as owned by the Company. As of what date was that? What was that date?

A. I don't think I made a complete answer.

Mr. Strouss: If the court please, that answer was not responsive to the question I asked. I did not ask about steel frame cars, and I don't think counsel can take advantage of the voluntary statement.

The Court: He may answer. Go ahead.

Mr. Strouss: Of course, I want my objection in.

The Court: Very well.

Mr. Mason: I will ask the witness directly. How many steel and steel under frame cars does the New York Central own or did own at a recent date which you may specify?

Mr. Strouss: May we have our objection as incompetent, [fol. 229] irrelevant and immaterial, not the best evidence, no foundation laid.

The Court: Objection overruled.

A. As of 1939 we owned 35,577 steel under frame cars, 129,239 all-steel cars and there were 145 other cars.

Q. Does the New York Central, according to your own observation, ever handle cars of the Southern Pacific ownership?

A. Yes, sir.

Q. Is that a regular and ordinary incident?

A. Oh yes, yes, sir.

Q. Will you state whether or not you handle freight cars owned by other railroads of the United States and Canada other than the Southern Pacific and New York Central?

A. Yes, sir.

Q. Is that a common and regular occurrence?

A. Yes, sir.

Q. It is a fact, is it not, that nearly every freight train containing box cars will contain so-called foreign equipment?

A. That is true.

Q. Does your Company ever handle cars of the Pacific Fruit Express Company classification, the so-called PFE refrigerators?

[fol. 230] A. Yes, sir.

Q. Are those handled by you in substantial volume?

A. Yes, we have many of those running into New York.

Q. You have observed those in numerous trains, have you?

A. Yes, sir.

Q. You handle other refrigerator cars owned by railroad companies or by railroad-owned agencies?

A. Yes, cars of many ownerships.

Q. So-called private refrigerator car lines?

A. Yes, sir.

Q. Can you give us some examples of such private refrigerator car lines with which you are familiar?

A. The meat companies, the Armour Refrigerating Company, Swift Packing Co.

Q. What is the line which operates the particular refrigerator cars from the Southeast and the Atlantic Coast?

A. Merchants' Dispatch Transportation Co.

Q. Is there another one in that territory, the Fruit Growers Express Co.

A. The Fruit Growers Express Co., and the Merchants Dispatch Transportation Co., and Pacific Fruit Express are the three larger ownerships.

[fol. 231] Q. Now I will ask you if you will please refer to Exhibit No. 4, Defendant's Exhibit No. 4, which is a showing of passenger car construction——

Mr. Mason: And I think we may again agree, Mr. Strouss, your objection to the very same testimony may go to that.

Mr. Strouss: Yes, but particular objection, as calling for the conclusion of the witness.

The Court: Yes.

Mr. Mason:

Q. Have you examined that exhibit, Mr. Wright?

A. Yes, sir.

Q. Are you familiar from your observation or in the course of your career as an operating officer of the New York Central generally with the construction of the passenger cars owned by the New York Central?

A. Yes, sir.

Q. And without undertaking to go into the detail of the passenger car construction, can you say whether the New York Central has made improvements in those passenger cars in the past forty years?

A. Yes, sir.

Q. Has it gone from wood to steel construction, for example?

A. Yes, sir.

[fol. 232] Q. Has it made any increases in the strength of the frame and the size?

A. Yes, sir. The size is increased and the steel construction has resulted in a larger car.

Q. Has there been any improvement at all, and if so, to what extent generally since 1912?

A. Well, our carrying capacity, for instance, has increased from an average of perhaps fifty passengers to eighty-four passengers, increased the seating capacity, and has grown from—changed from wooden construction to steel.

Q. Do you operate any wooden coaches any more in regular passenger train service?

A. No, sir.

Q. Do you know, and if so, will you say whether there has been any improvement in heating arrangements upon your passenger cars?

A. Yes, there has been heat along with the air-conditioning. There has been a steady improvement in air-conditioning.

Q. Does your company operate any passenger cars owned by the Pullman Company?

A. Yes, sir.

Q. If you know, will you state whether the Pullman cars are a standard type of sleeping car operated generally over the United States?

[fol. 233] A. Yes, sir, they are.

Q. Do you interchange such Pullman Passenger cars with other railroads with which you connect?

A. Yes, sir.

Q. Now, you have made a trip as a passenger over a part of the Southern Pacific, have you not?

A. Yes, sir.

Q. Have you ridden on a Pullman car on the Southern Pacific.

A. Yes, sir.

Q. Are the types of Pullman car on the Southern Pacific on which you have ridden similar to the types of Pullman car operated on the New York Central?

Mr. Strouss: Similar in what respect?

Mr. Mason:

Q. Is there any substantial dissimilarity?

Mr. Strouss: How do you mean, mechanically or steel construction?

Mr. Mason: That came within the observation of the witness as an operating officer.

A. The car on which I rode on the Southern Pacific and one or two other cars that I entered are what I would call the standard Pullman type construction in its layout. I made no examination as to the type of consfruction or equipment.

[fol. 234] Q. Was it air-conditioned?

A. Yes, sir.

Q. Will you say whether or not the Pullman cars operated by the New York Central are in general air-conditioned?

A. In general, yes. Our through-passenger service, all regular line cars, are air-conditioned. When we are required to substitute extra cars we sometimes have to use cars that are not air-conditioned.

Q. Does your company have air-conditioned coaches in certain of its trains?

A. Yes.

Q. I would like to refer you again to Exhibit No. 4 and to certain types of passenger equipment which are shown in the last four blocks on the right-hand side of the exhibit. Does your Company operate coaches bearing any general similarity in appearance to those coaches?

A. Yes, sir.

Q. Have you before you Exhibits Nos. 5 and 6, relating to Southern Pacific locomotives, freight and passengers?

Mr. Strouss: I have not made my objection.

Mr. Mason: It is understood yours is a running objection.

[fol. 235] Q. No. 5 is the freight locomotive and No. 6 the passengers?

A. Yes, sir.

Q. Mr. Wright, in your position as an operating officer is it necessary for you to become familiar generally with the types of locomotives, steam locomotives used by the New York Central?

A. Yes, sir.

Q. Now, in the forty years that you have been with the New York Central, has there been any development in or improvement in the locomotives operated by your Company in freight and passenger service?

A. Yes, sir.

Q. Did you ever have on the New York Central any locomotives corresponding in wheel arrangement and otherwise generally to those shown on Exhibit No. 5?

A. Yes.

Q. Will you state what your types were?

A. Our locomotives which we term the type F correspond in wheel arrangement, tractive effort, to what is indicated as ten-wheel 4-6-0 on the exhibit referred to.

Q. That is Exhibit No. 6, I think, the passenger exhibit that you now have, isn't it?

A. Yes, I have both here.

[fol. 236] Q. Yes, the one to which you are now referring, the one showing the passenger locomotives. Will you proceed then, with No. 6? You have it before you.

A. We also have engines which we term the Class H, corre ponding in a general way to the one shown on the exhibit as being of the Pacific type.

Q. Now, there are two Pacific types there, one apparently somewhat larger than the other because the tractive effort is much greater and the weight on the drivers is shown as much greater. Which of the two?

A. The second one, which indicates a tractive effort of 43,660 pounds.

Q. Have you any locomotives corresponding generally to the Mountain type there?

A. Yes, our L engine is of the same wheel arrangement, although somewhat greater capacity as regards the tractive effort.

Q. Are these types that you referred to presently in service?

A. They are. A small number of the ten-wheel engines are in service on branch lines.

Q. And the K and L types to which you referred, are those in branch and main line service?

A. Yes, sir.

[fol. 237] Q. Have you any other locomotive not corresponding exactly in wheel arrangement but generally in tractive effort to those in the exhibit before you, No. 6?

A. Yes, we have a passenger known as the Hudson type or type J.

Q. What is its wheel arrangement?

A. 4-6-4.

Q. Under the Whyte system?

A. 4-6-4, with a tractive effort of 53,960 pounds.

Q. Now, referring to No. 5, the freight locomotive exhibit, I will ask you the same question as to the types of freight locomotives, whether you have any corresponding to those there or have had, and if they are now in service?

A. We have in service an engine known as the Class H, which corresponds to the Mikado type engine with the 2-8-2 wheel arrangement. Our tractive effort is somewhat greater than that of the engine shown in the exhibit, but it is of the same general type.

Q. Do you have a freight type of locomotive corresponding to the so-called 2-10-2 engine, either large or small there?

A. No, sir.

[fol. 238] Q. Mr. Wright, have you made a particular study of the freight train [illegible]tions over certain portions of the New York Central System during a recent period?

A. Yes, sir.

Q. What was the period studied?

A. It was ten days in the month of September, 1940.

Q. And what particular documents or records of your company did you study for the purpose of this freight train operation study?

A. What we call our dispatching sheets that are in use by our train dispatchers on the different divisions.

Q. Are your train dispatching sheets a permanent record of the company?

A. Yes, sir.

Mr. Mason: Your honor, we have here a sample of a train sheet of the New York Central. I am going to produce it for your inspection, but if it is agreeable to Mr. Strouss and yourself, I will forego offering it in evidence.

Q. Now, Mr. Wright, is it your understanding that the dispatchers train sheets are a particular form, certain essentials of which are prescribed by the Interstate Commerce Commission?

[fol. 239] A. Yes, sir, we are required to show certain information in the train sheets, but some of the detail as to the names of the stations and so on, is left to the local properties.

Q. What is actually recorded on the train sheets and by whom?

A. The records on the sheets are all made by the train dispatcher. At the top of each column is indicated the name of the conductor, the name of the engineer, the engine number, and in the case of passenger trains the number of cars of each particular type, and in freight trains we record the number of loaded and empty cars, and the tons; then certain information as to the time the crew went on duty, the time they were relieved from duty, and the time their sixteen hours would expire. Then follows the names of the stations and times are entered opposite those stations, and those times are the passing times of the trains by those stations.

Q. Then do I understand the dispatcher's train sheet when completed is a record of the movement of each train over the division covered by the sheet?

A. That is correct.

Q. And what period of time is covered by a train sheet?

[fol. 240] A. Twenty-four hours.

Q. From what hour to what hour?

A. A calendar day, midnight to 11:59 P. M. Of course, a train sheet which starts from the terminal at 10:00 o'clock in the evening would be carried through on this

same sheet, although it would arrive at its destination on the next calendar day.

Q. You say a train would start at 10:00 P. M.——

A. Yes.

Q. ——would show two hours on the train sheet of that particular day?

A. It would be carried on it all the way through until it arrived at its destination.

Q. You follow the same rule as stated by the witness Sines in his testimony, of treating a unit as it passes a freight division point as a new train for purposes of the dispatcher's train sheet?

A. Yes, sir.

Q. Then for a 10-day period there would be ten of these sheets for each division studied?

A. Yes, sir, there might be more than ten sheets because of our divisions are divided into two dispatching districts. Then there would be two sheets.

Q. There would be a sheet for each dispatching district?

A. Yes, sir.

[fol. 241] Q. Now referring you to Exhibit No. 10, I will ask you if the black lines, the heavy black lines of your system shown on that exhibit are the districts which you studied for the 10-day period in September?

A. Yes, sir.

Q. And about how many separate districts are included within that, the territory outlined in the heavy black lines?

A. Nine dispatching districts—ten dispatching districts.

Q. Now, having made this study of the operation of trains over a 10-day period, did you prepare or have prepared an exhibit showing typical examples of the freight trains thus operated?

A. Yes, sir.

Q. And have you a statement before you bearing the title, "New York Central Railroad, Typical Example of Freight Trains Handled?"

A. Yes, sir.

Q. Is that the result of your study of the 10-day period?

A. Yes, sir.

Q. Prepared by you or under your direction?

A. Yes, sir.

Q. Did you personally examine the train sheets to which [fol. 242] you have referred?

A. Yes, sir, I had the trains tabulated from each sheet. Then I checked this tabulation against the sheets to see that the information shown here was correctly transcribed.

Q. I notice that the——

Mr. Mason: Before I go further, may we have the statement—I think it is now in the hands of counsel and the Clerk—marked the next exhibit in order?

The Clerk: 13 for identification.

The Court: Gentlemen, we will take a brief recess at this time.

[fol. 243] (After Recess)

3:20 p. m. Nov. 25, 1940.

Afred H. Wright resumed the stand.

Mr. Mason:

Q. Mr. Wright, referring to defendant's Exhibit No. 13 for identification, what are the names of places which are shown as Columns B and C with reference to operating divisions?

A. Southport, New York to DeWitt is the first run indicated on the exhibit. Southport is a yard——

Q. Aren't you looking at Sheet No. 2?

A. That is right. The first entry on the report is Malone to Watertown, New York. Malone is located in northern New York near the Canadian border and is located a distance of 112 miles from Watertown.

Q. I was going to ask you particularly this, whether or not these locations are points in Column B at which freight trains originate and points in Column C at which those trains terminate?

A. That is correct.

Q. Generally the originating and terminating points of runs of freight trains over dispatchers, districts or divisions?

A. Yes sir.

Q. The distance in miles in Column D are the distances between those points?

[fol. 244] A. Yes sir, the distances between B and C.

Q. Are those distances in miles shown on the train sheets?

A. Not in exactly that manner but they can be computed from the column on the train sheet next to the name of the station.

Q. By adding the intermediate figures between terminal points?

A. Yes, by adding and subtracting.

Q. Are you familiar with these distances here from your knowledge of the railroad?

A. Generally, yes, but exact I might have to refer to the exhibit.

Q. Of course Column E is the operating study which you have already referred to?

A. Yes.

Q. Where do you get the information in Column F?

A. From profiles on file in each division office prepared by our Maintenance of Way Department.

Q. Is the Maintenance of Way Department under your supervision?

A. No sir.

Q. Are they accessible and available to you as assistant general manager?

A. Yes sir, and posted in all train-dispatching offices.

[fol. 245] Are they permanent records of the company?

A. Yes sir.

Q. Are you familiar as assistant general manager with the ruling grades which prevail generally in the districts under your supervision?

A. Yes sir.

Q. Do these figures in Column F correspond to your own personal knowledge?

A. Yes sir.

Q. From what source did you take the information in Column G?

A. From the train sheet.

Q. And Column H?

A. From the train sheet.

Q. And Columns A, B, C and D, where do you get the information—by the way, what do these indicate?

A. Those indicate (a) the perishable loads; (b) other loads; (c) empty cars, including caboose, (d) the total of all cars.

Q. Is that the average consist for example in the line reading from Malone to Watertown, the average consist of these

three trains which operate with a Mikado locomotive and contain 70 cars or less?

A. Yes sir.

[fol. 246] Q. What does Column M indicate?

A. The tonnage of that train.

Q. Is that taken also as an average?

A. That is taken from the train sheet and is the average tonnage of those three trains.

Q. Referring to the block consisting of Columns N to T inclusive, was that information as to trains between 71 and 100 cars taken in the same way?

A. Yes sir.

Q. And represents in Columns P, Q, R, S and T the averages of the six trains therein indicated?

A. Yes sir.

Q. Going to the next block consisting of Columns U to Z and then AA inclusive, you show one train operated with a Mikado locomotive?

A. Yes sir.

Q. Does the figure in Column Z indicate the number of cars in that train?

A. Yes sir.

Q. And the figure in Column AA the number of tons in the train?

A. That is correct.

Q. I take it that the same explanation as to sources and the meaning of the figures would apply to each of the other lines and columns?

[fol. 247] A. That is true.

Q. Going to the column on the extreme right of the exhibit headed "Maximum cars per train", Column II. Is that information taken from the train sheet for the period studied?

A. Yes sir.

Q. It indicates what?

A. It indicates the maximum number of cars in any one of the trains included in the four classifications.

Q. Is that inclusive or exclusive of the caboose?

A. That is inclusive.

Q. That is including the caboose?

A. Yes sir.

Q. For example, let's go down to this line which shows in the Columns collectively 126 cars or over. You show 31 trains in Column BB and their average consist. Do I under-

stand that Column II shows that of those 31 trains one had the consist shown in Column II?

A. Yes sir.

Q. Has this exhibit been checked by you against the original source and other information which you have testified as having been used in its preparation?

A. Yes sir.

[fol. 248] Q. On the second sheet I notice a computation at the bottom of the second sheet, total trains and so forth. Were these computations made from the figures shown on the face of the exhibit?

A. Yes sir.

Q. And the totals of the percentages and averages are all capable of computation from the exhibit itself, are they?

A. Yes sir.

Q. Will you say whether or not the statement is correct as reflecting the information shown on the original sources and the other information within your personal knowledge?

A. Yes sir.

Q. Was there any particular reason for selecting the ten day period during September, 1940?

A. No, except this, after being requested to furnish this information I started immediately and had run currently for the ten day period which represented to me an average period of usual conditions in that time.

Q. Does that period reasonably and fairly reflect the ordinary trend of operations over these districts during any particular 12 months?

A. It does.

Q. Will you state whether the exhibit of the conditions [fol. 249] reflected by the exhibit as to the lengths of trains operated and their average consist corresponds generally to your own observation of freight train operations upon the territory under your charge?

A. It does.

Q. And to conditions as reflected in the reports regularly reaching you from your subordinates.

A. That is true.

Q. I take it you are in constant touch with the division superintendent and other subordinate officials in that territory?

A. Yes, sir, we received reports in our office every day of trains handled and cars handled and like information pertaining to the railroad operation.

Q. I think my previous question was whether this was typical of a current twelve-month period. Does it reasonably reflect the conditions during the past several years on the district of the New York Central?

A. I think over a period of years we would find that eight or ten years ago our movement was a little heavier by reason of the greater volume of business.

[fol. 250] Q. Subject to fluctuation in the volume of tonnage handled?

A. It is typical.

Q. You say eight or ten years ago your movement was heavier. Would that mean a greater percent of trains of more than 71 cars than are shown upon this statement?

A. I would say that is true. I might also say that this period selected is one of what you might term average weather conditions too throughout the year.

Mr. Mason: I am about to offer the exhibit, Mr. Strouss. Do you desire to ask any questions?

Mr. Strouss: Yes, I take it that my objections heretofore made, including the last one that it calls for a conclusion of the witness applies to the testimony already given with respect to this exhibit.

The Court: Yes, the record may show the objection made to all this line of testimony.

Mr. Strouss: Mr. Wright, this exhibit 13 for identification, that was prepared by you for the purpose of this trial, was it not?

A. Yes sir.

Q. Or under your direction?

A. Yes sir.

[fol. 251] Q. As you have testified it was prepared from records of the New York Central office?

A. Yes sir.

Q. Are those records here available for cross-examination?

A. They are not here but they are available. They are permanently maintained at division headquarters.

Q. They are not available here for examination at this trial?

A. No sir.

Q. None of the records that you have referred to in your testimony are here available for examination by counsel?

A. No sir.

Q. You have said that you had personal knowledge as to the ruling grades stated here and that they conform to your personal knowledge. How did you gain that personal knowledge?

A. By experience, riding on the railroad and checking the loading of trains which was part of my duties.

Q. You mean by riding on the train you can determine the per cent of grade?

A. Not the exact percentage but I do know the general location of ruling grades and for the exact percentage of [fol. 252] grade I must consult the engineering records.

Q. And that is where you actually gained the information that you have concerning ruling grades?

A. Yes sir.

Q. You testified that this truly reflects your observation as to the operation of trains during the 12 months period. How did you gain that observation or information?

A. From the fact that our car movement during that period was about what I would call normal.

Q. You gained it through reports made to you, records of your company, isn't that true?

A. Yes sir.

Q. That is the way you obtained the information you have?

A. That is true.

Mr. Strouss: We make the same objection to this exhibit.

The Court: Same ruling, it may be admitted.

(Document received in evidence and marked Defendant's Exhibit No. 13.)

Mr. Strouss: And the further objection, I notice this is headed "A typical example of freight trains handled" as calling for a conclusion of the witness and his testimony as to it being typical as a conclusion.

[fol. 253] The Court: That objection is overruled.

Mr. Mason: May it please Your Honor, it is possible we shall desire to use this specimen of a train sheet as a typical example of a train sheet in connection with some of the other testimony and for that reason I should like to have it marked for identification.

The Court: It may be marked.

(Document marked for identification as Defendant's Exhibit No. 14).

Mr. Mason: Defendant's Exhibit No. 14 for identification is a dispatcher's train sheet for New York Central Railroad Company, Hudson Division, and indicates that it is between the points of Croton-on-Hudson at mile post 33.67 and Signal Station S.N. north of Troy at mile post 132.01.

Q. Now, Mr. Wright, from your experience will you state what factors in general determine the number of cars to be placed in a freight train handled on the New York Central?

A. The main factor with us in our main line operation is the amount of business that is offered for the train. Nearly all of our freight train service today is what is known as "manifest" service with symbol trains. The service demands are such that these trains must be operated almost [fol. 254] every day regardless of the tonnage available.

Q. Are they operated on time schedules?

A. Yes sir.

Q. With stated departure and arrival times?

A. Yes sir. Those times are not made part of a timetable but they are published and given to shippers and receivers as a service we offer between given points. Our train loading—we have no definite orders, either in tons or cars as to the limit of which a train may be loaded, but we have found from experience that 125 to 130 cars is about the maximum we can handle and maintain the schedules. For that reason we seldom pull cars in excess of that. Our train loading of course is also subject to weather conditions during the winter months when we sometimes have to operate a symbol train in two sections that would under fair weather conditions be operated in one train.

Q. Do I understand that the amount of tonnage to be handled rather than any other particular factor is the primary factor in determining the length of the train to be operated?

A. That is true.

Q. And it is the amount of tonnage rather than the number of cars in which that tonnage is loaded which determines the length, is it not?

[fol. 255] A. Yes sir, up to the limits I have mentioned of 125 to 130 cars; which is practically the limit with which we can make the time.

Q. What factors in general determine the number of cars in passenger trains?

A. We have a limit of 18 cars on our passenger trains which we have found by experience is about the maximum number we can handle and make the scheduled time.

Q. Is there any other factor than the 18 car maximum which determines the number of cars in a particular passenger train unit?

A. No, we aim to handle all the cars we can, that is, when we have the business and still maintain the schedule.

The Court: You say 18 cars is the maximum?

A. Yes sir.

Mr. Mason:

Q. You don't normally operate in excess of 18 cars in a main line passenger train?

A. No, we hold them to 18 cars because we can't make the schedule with a greater number.

Q. Do you have on the New York Central a rule prohibiting the use of more than one engine on a train in default of a penalty payment to the train crew?

A. No sir.

[fol. 256] Q. Do you have any full crew laws in the states where you operate and if so what is their effect upon your train crews on freight trains?

A. We are operating under full crew regulations practically all over the line east so that our freight trains consist of an engineman, conductor, fireman and three brakemen.

Q. That is your standard freight train crew, engineer, fireman, conductor and three brakemen?

A. Yes sir.

Q. Which includes as I take it the flagman?

A. Yes sir, that meets all full crew requirements.

Q. That is regardless of the length of the train, whether 50 or 130 cars?

A. Yes sir.

The Court: Do I understand in a number of these 13 states in which you operated that they do have what is known as the full crew law that requires six men?

A. Yes sir. I might state that I can't testify for the whole eleven states. The territory over which I have jurisdiction is in the States of New York, New Jersey and Pennsylvania.

Mr. Mason: You satisfy all full crew requirements in those states by the three brakeman crew that you have [fol. 257] mentioned?

A. Yes sir.

Q. Do you occasionally run into zero or sub-zero weather in the territory between Buffalo and New York City?

A. Yes sir, and to the north of our main line much below that.

Q. Do you operate 18 car passenger trains in that territory when the weather is as cold as zero or below?

A. We have operated on our main line 18 cars in extreme cold weather.

Q. Do you operate such trains in weather where the prevailing temperature is below the freezing point of water, 32 degrees?

A. Yes sir.

Q. Customarily?

A. Well, 32 degrees temperature wouldn't affect our loading.

Q. Would zero affect your loading of passenger trains?

A. No, not on our main line of passenger but it would on freight.

Q. Referring to passenger, do you know of any difficulty in heating the rear cars of passenger trains in excess of [fol. 258] 14 cars during the cold weather periods you have described?

A. No sir.

Q. Have you ever experienced any such difficulty according to your knowledge?

A. You mean in forcing steam back through the train?

Q. So the rear passenger car is habitable?

A. I don't know; sometimes it takes a little longer to force steam through at terminals.

Q. When the train was operating between terminals have you known of any difficulty?

A. No sir.

Q. You spoke of the various factors and particularly the factor of tonnage hauled which determines the number of cars to be operated in a freight train. Do those factors produce in the case of freight trains any difference in the lengths of the trains operated on different divisions?

A. Yes sir.

Q. Why is that?

A. As I stated it is the volume of traffic that is offered and available. We for instance have a schedule service, St. Louis to New York, of approximately 50 hours with an established cut-off or leaving time from St. Louis and that schedule is maintained all the way through from St. Louis [fol. 259] to New York. The train might have 65 cars or it might have 100.

Q. Then the length of that train between different division points would depend upon the traffic available to be put into it?

A. That is true.

Q. Referring particularly to freight trains for the moment, does the fear of hazard to any members of the train crew enter into the conditions which dictate or influence the length of freight trains?

Mr. Strouss: We object to that as calling for a conclusion of the witness.

The Court: Will you read the question?

(Last Question read by the Reporter).

Mr. Strouss: That is a back-handed way of asking the question, getting into the matter of safety of operation which we submit is a record of the company, the record of safety on trains of 70 cars or less or over 70 cars. The number of train miles operated by the different type of trains and showing the accidents which are, reports of which are made by the company to the I.C.C. and which they have on their own records.

The Court: I will hear from you on that, Mr. Mason.

[fol. 260] Mr. Mason: My question was not whether a particular type of operation is safe or not and whether the management fears hazard to the train crew and as the result of its fear reduces or increases the length of trains. It is not an attempt to circumvent the showing of statistics. We will have ample statistics relative to safety of operation and they will not necessarily be this New York Central Line. We are not trying to circumvent the showing of anything at all but whether the management cuts down the length of the train——

Mr. Strouss: You may have statistical evidence in here as to other roads. This evidence as to the New York Central, if it is not going in the back door, as a matter of safety

what the New York Central does as a matter of safety on their road is immaterial here.

The Court: Under the avowed purpose of the question the objection is overruled.

Mr. Mason: Will you read the question?

(Question read by the reporter.)

A. No sir.

Mr. Mason: Mr. Wright, as a supervising operating officer in your position do you recognize the different between density of traffic on one hand and volume of traffic on the other?

[fol. 261] A. Personally I do.

Q. What do you understand from your standpoint to be the measure of volume of traffic? What does volume of traffic indicate to you?

A. Volume of traffic indicates to me the amount of tonage that we handle, our volume of business.

Q. What does density of traffic indicate?

A. Density of traffic indicates to me the number of train movements in a given territory.

Q. Between given points for a given stretch of track?

A. Yes, in a given territory.

Q. Is it correct, to summarize, that density of traffic is measured by the number of train movements while volume of traffic is measure- by the number of cars or tons hauled?

A. That is correct, that would be my interpretation.

Q. When volume of traffic increases does the expense of handling the increased volume tend to rise, stated in terms of cost per unit of traffic handled or tend to fall?

A. We should with greater volume be able to make a reduction in our unit cost as a general proposition.

[fol. 262] Q. Referring to increasing density of traffic measured by the number of train units, as density increases does the expense per unit handled tend to increase or decrease?

A. It tends to increase and I am basing that statement on my experience around our harbor terminals in New Jersey and New York City where by reason of the density of the movements our unit costs are probably the highest of any point on our line.

Q. I would like to refer you to Mr. Porter's exhibit No. 12. It is the freight service operating averages for certain calendar years?

A. Yes sir.

Q. Particularly to Item 8. You have certain indexes or other statistics which reveal performance. What place does the figure showing gross ton mile per freight train hour occupy with the indexes which indicate performance?

A. To me the gross ton miles per freight train hour is the best measuring stick we have for efficiency. Shall I expand on that?

Q. If you will please?

A. Authorities generally I believe recognize that statement to be correct. Gross ton miles per freight train hour [fol. 263] is really the product of the tonnage of your train and the speed as measured in miles per hour. For the utmost efficiency it follows we should handle in our trains the greatest amount of tonnage possible and still maintain the speed that we are required to maintain to meet service demands and competition. I have found from experience that if your gross ton miles per freight train hour show up well almost all other features of your operation will show up well.

The Court: There is just one question the Court has on that Exhibit No. 12. If I correctly read from Line No. 3 there on "Freight cars per freight train", the records of your railroad, the New York Central, you show that the average train operated by your company contains 55.2 cars, is that correct?

A. That is correct.

The Court: That takes in I believe all classes of service, through freight, local freight and others which brings the average cars per train somewhat lower than we have been discussing. Are you through, Mr. Mason?

Mr. Mason: Yes, I have finished the direct examination.

The Court: If counsel have no objection we can work on through to make up for some of the lost time.

[fol. 264] Mr. Strouss: My cross-examination will not be very long because I don't have the under-lying records to cross-examine from so my examination of necessity is limited by the type of evidence which is in here.

Mr. Mason: I am willing, if Mr. Strouss desires, that he may defer the cross-examination until tomorrow.

The Court: Well, those records wouldn't be here tomorrow.

Mr. Mason: No.

Mr. Strouss: That wouldn't help me any.

Cross examination.

Mr. Strouss:

Q. Going back, Mr. Wright, to this mileage and single, double and four-track. How much of your main line is single track?

A. When I referred to main line I have referred to territory that is multiple track, two or more.

Q. There is no main line that is single track?

A. No sir.

Q. What type block signal do you use on the New York Central?

A. We have automatic signals and manual block. Gen- [fol. 265] erally speaking we use the manual block for single track territory and automatic signals for two or more tracks.

Q. You were asked by Mr. Mason about the penalty in using more that one engine, that was the so-called double-header rule?

A. Yes sir.

Q. What is that rule on the New York Central?

A. We have no restriction on double-heading.

Q. You have no double-header rule at all?

A. No.

The Court: By that do you mean you do customarily use——

A. Not customarily. On our main line we do very little double-heading but we do double-head on our branch lines such as in the coal regions of Pennsylvania.

The Court: That is where you have steeper grades?

A. Yes sir.

The Court: I notice that your average grade was in most instances below one per cent. Is that true?

A. That is true.

The Court: That means one foot rise in 100 feet?

A. Yes sir.

[fol. 266] Mr. Booth: Do you have any undulating or rolling territory?

A. We have some of that but I wouldn't say to any great extent.

Mr. Strouss: That is hog-backs and dips.

A. No; there are certain locations on certain divisions where we have this roller-coaster effect but not any great amount of it.

Q. That is not on your main line either?

A. No sir.

Q. Aren't the terms "density of traffic" and "volume of traffic" sometimes used interchangeably?

A. They might be but as I stated they don't mean the same thing to me.

Q. What is the character of the traffic which you handle on the New York Central?

A. Food-stuffs.

Q. What do you mean by "food-stuffs"?

A. Meats, fruits, vegetables, all sort of commodities for human consumption and we also have a considerable amount of what we term "dead freight" such as coal, cement, building material.

Q. Which type of traffic predominates? What is your percentage as to each?

A. I do not think I can give you the percentages but the New York Central is generally considered a merchandise [fol. 267] carrying railroad.

Q. Not a great deal of "drag" freight?

A. That is it.

Q. In your gross ton miles per freight train hour that tonnage includes, that is the gross of the load plus the equipment?

A. That is right.

Q. To get the tonnage of the load would be the next ton mile?

A. That is right.

Q. Mr. Porter testified that you had some electric and Diesel locomotives. Do you use any of those except in yard operation?

A. Yard operation for what I will term the straight Diesel engine. We use a considerable number of those. I think we have about 29 in the Buffalo territory. In the New York territory we have combination locomotives that

we term Diesel locomotives but they are also electric locomotives and also operated from storage battery. In other words, this engine when it is on a section of road where the third rail is available the third rail shoes are lowered and the locomotive operates as an electric engine. When we are in territory on the west side of Manhattan where there is no third rail it is Diesel operation and those [fol. 268] particular locomotives are also equipped with storage batteries to work in the interior of buildings where we are under-ground. In such location they operate from the storage battery.

Q. Do any of those operate outside of yards?

A. Yes, the New York engines that I referred to operate from the lower west side of Manhattan to Harmon, a distance of 33 miles.

Mr. Strouss: That is all.

Re-direct examination.

Mr. Mason:

Q. I take it from your answer to the Judge and Mr. Strouss that you use the double-header largely if not almost entirely for limited purposes in territories where help is required?

A. That is true.

Q. What we call "helper districts"?

A. That is true.

Q. For example to push a train out of a yard where there is a heavy grade out to the main line.

A. That is true and as I mentioned in our mining regions we have some heavy grades for reasonably short distances and there we double-head.

Q. That is the mountainous region of Pennsylvania?

[fol. 269] A. Yes, the coal region.

Q. You spoke also of the character of traffic that you handle. The New York Central handles a rather substantial volume I take it of machinery and manufactured and industrial products generally?

A. That is true.

Q. You also handle a considerable volume of perishable, do you not?

A. Yes sir.

Q. Is that to some extent originated on your line?

A. Some of it. We have a fruit district in the Lake

Ontario region where apples and peaches are grown and I believe lettuce was mentioned this morning. We have a lettuce growing district where during the season there is quite a heavy shipping of lettuce and celery.

Q. Do you handle livestock as well as meats?

A. Yes sir, we have daily movement of livestock into New York.

Q. Do you serve livestock producing are-s in the middle west?

A. I can't answer that, I am not sufficiently familiar with the western lines.

Q. Does your company deliver perishables at the important eastern terminals?

A. Yes sir.

[fol. 270] Q. It maintains switching delivery service for that purpose?

A. Yes, sir.

Mr. Mason: I think that is all.

(Witness excused).

Mr. Mason: If we are going to be referring to this double header rule, I was going to make that statement to the Judge but being familiar with the rules of agreement in effect on the Southern Pacific Company and in general on western railroads but not eastern railroads with relation to using more than one locomotive on a train, the rule,—I am not attempting to quote it verbatime, provides that with trains of more than 40 cars two engines or more will not be used except in districts designated as helper districts where the tonnage in the train exceeds the tonnage rating of the largest locomotive in the train or if two engines are used under those conditions and except in helper districts the conductor and the brakemen on the train will be paid double miles, that is, twice what they ordinarily are paid. The rule is a penalty rule and operates to prevent the use of two engines on heavy trains where the tonnage of one locomotive is exceeded, except as I say in districts designated as helper districts and these helper [fol. 271] districts are those where grades and other conditions are such that the trains in other territory may be handled with one engine cannot be moved except with the assistance of one or more additional engines. As to tonnage ratings, those again are determined I think by the

Mechanical Department and the tonnage ratings for the various types of locomotives designated by their nominal designation and their numbers are printed in the employe's time tables with the points between which and the direction in which such tonnage ratings apply. To cite a specific example, the district between Tucson and Maricopa is not helper territory and if we were to operate a train in either direction between those two points with tonnage greater than the rating of one locomotive and were to attach another locomotive in order to move the train we would pay double miles, but the district between Tucson and Dragoon eastward is helper territory and an additional locomotive may be used without the penalty.

The Court: I see. I take it that the hour is such that we wouldn't be justified in starting a witness tonight. The Court will stand at recess until ten o'clock tomorrow morning.

(Court recessed until 10:00 A. M. November 26, 1940).

[fol. 272] Tuesday, November 26, 1940. 10:00 A. M.

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed. Call your first witness.
Mr. Mason: Call Dr. Parmelee.

J. H. PARMELEE called as witness on behalf of the defendants, having been first duly sworn, was examined and testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you please state your name, residence, and employment, Dr. Parmelee?

A. My name is J. H. Parmelee. I am Director of the Bureau of Railway Economics of the Association of American Railroads, with headquarters at Washington, D. C. I have been connected with that Bureau since 1911, and have been its Director since 1920.

Q. What is the Association of American Railroads, Doctor?

A. The Association of American Railroads was organized by the railroads in 1934 and is an amalgamation of

the American Railway Association, the Bureau of Rail-
[fol. 273] way Economics and certain other closely allied railway organizations. The Association represents practically all the railroads in the Class I group, numbering among its members companies which operate approximately 99% of the mileage of that group of railways. Railways of Class I are those which according to the classification of the Interstate Commerce Commission earn annual operating revenues of $1,000,000 or more.

Q. By "operating revenues" you mean the gross operating revenues without regard to the expenses?

A. Yes, the gross receipts from all transportation sources.

Q. And the designation of Class I railways is a designation originating with the Interstate Commerce Commission?

A. Yes, that is according to the classification laid down by the Commission.

Q. Can you state the number of Class I railways as of the year 1939?

A. There were approximately 137 Class I railways operating last year. The number changes slightly from year to year.

Q. What is the function of the Association in its representation of the railway industry?

A. The Association of American Railroads acts for the
[fol. 274] railway industry in all matters where concert of policy and action are appropriate. It consists of several departments which deal with operations and maintenance, traffic, accounting, legal matters and many other subjects. The several departments of the Association regularly obtain data in the respective fields from individual railroad companies, summarize and analyze that data, and put their findings to such use as may be for the best interests of the Industry. Members of the staff of the Association frequently appear and offer testimony on behalf of the Industry as a whole before Congressional Committees, before the Interstate Commerce Commission and before State Legislatures and state regulatory bodies, before the courts and before other official bodies.

Q. Now, will you address yourself particularly to the Bureau of Railway Economics of which you are the Director, and state its functions and purposes?

A. The Bureau of Railway Economics was organized by the Railways in 1910 and has been maintained by them for the primary purpose of the scientific study of the economics of transportation. The functions of the Bureau are of three types; first, compilation and publication of statistics dealing with the business and operation of the [fol. 275] railways for whom it acts as a clearing house in such matters; second, maintenance of an extensive library on transportation and economic subjects open to all persons who may wish to consult material of that nature; and third, continuing study by the Bureau staff of the developments of current importance in the field of transportation.

Q. Now, I understand that you became associated with the Bureau in 1911?

A. Yes, sir.

Q. Dr. Parmelee.

A. Yes.

Q. What was your academic training and experience prior to your going with the Bureau?

A. I graduated from Yale University in 1904 and later took a graduate course in Economics and Statistics, receiving my degree of Doctor of Philosophy in that major subject six years later. On graduation I was appointed to a teaching position at Yale and taught Economics there for three years. Following that I went to Washington as the result of a Civil Service examination for general examiner, joined the staff of the Interstate Commerce Commission where I remained for nearly three years. At the Commission I occupied a position which today would be classified [fol. 276] as an Examiner with the Bureau of Accounts of the Commission, although at that time the Bureau of Accounts had not yet become a separate bureau of the Commission I resigned from the Commission staff after nearly three years of service, had two or three other different appointments with several Government Bureaus, including the United States Census Bureau, the United States Immigration Commission and the United States Conservation Commission, following which I was appointed as the Statistician of the Bureau of Railway Economics in 1911, which had just been organized. I have been a member of the staff of the Bureau since that date.

Q. What has been the nature of the action of the Bureau of Railway Economics since its organization in 1910?

A. The Bureau of Railway Economics, as I have already stated, has acted as the statistical clearing house for the Railroad Industry in addition to the regular compilation and publication of data with respect to railway revenues and expenses, railway traffic, railway capital expenditures, purchases by the railways of fuel, materials and supplies, railway operating statistics, the number and compensation of railway employees, and other similar factors. In carry- [fol. 277] ing out the Bureau's activities, the Bureau obtains from the carriers from time to time such statistics as may be desired. As Director of the Bureau I appear as a witness on behalf of the Railroad Industry in practically all matters involving the Industry as a whole.

Q. Has your appearance in such matters included your participation in the hearings involving matters dealing with train limitation, for the purpose of limiting the length of freight and passenger trains or either?

Mr. Strouss: I object to that as immaterial.

The Court: Objection overruled. He may answer.

A. Yes, I have appeared in a number of rather widely separated cases involving train limitation.

Mr. Mason:

Q. Have there been such bills introduced in Congress in connection with which you have appeared?

A. Yes.

Q. Have hearings been held before Congressional Committees in which you have appeared?

A. Yes, a number of hearings.

Q. Will you state when those were held and in connection with which bills?

A. During the past few years a number of bills have been [fol. 278] introduced in Congress seeking to limit the length of freight and passenger trains, and extensive public hearings were held by Congressional Committees considering these bills. First, in April and May, 1934, before a sub-committee of the Senate Committee on Interstate Commerce with respect to Bill S-2625, 73rd Congress, 2nd Session; second, in June 1935 before a sub-committee of the Senate Committee on Interstate Commerce with respect to bills S-27 and S-344, 74th Congress, First Session; third, in

January, February and March, 1938 before the entire committee on Interstate and Foreign Commerce of the House of Representatives, considering Bill S-69, 75th Congress, Third Session. None of these bills was enacted as a law. I appeared as a witness at each of the hearings opposing the bills on behalf of the railroads.

Q. Have there been bills introduced in the States in connection with which you have appeared or furnished information.

A. Yes.

Q. Will you briefly recount what has happened in the several States.

Mr. Strouss: May I have the record show an objection to all of this?

The Court: Yes, the record may show the objection and [fol. 279] it is overruled.

Mr. Mason: I might say that this is merely a part of the witness' qualifications, to show his experience.

The Court: I understand that.

Mr. Strouss: The question of the action of legislative bodies is not a part of his experience.

Mr. Mason: That is a part of his knowledge.

Mr. Strouss: Not a part of his experience to qualify him as a witness.

A. With respect to the states, from 1923 to 1940, inclusive, a total of 144 bills designed to limit the length of freight and/or passenger trains were introduced in the legislatures of thirty-five different states. In only three states were these bills enacted into law; Nevada in 1935, Louisiana in 1936, Oklahoma in 1937. In none of these three states was the law ever in force.

Mr. Polley: We object to that, if the Court please.

Mr. Strouss: That is certainly not going to his qualifications.

The Court: Well, we are probably getting a little beyond the border-line on that. I will sustain the objection.

[fol. 280] Mr. Strouss: We ask that that part of the answer be stricken, that part of the testimony.

Mr. Mason: As to whether the laws have become effective.

The Court: Yes, that may be stricken.

Mr. Mason: Very well.

Q. Do you know whether the law in Nevada was ever challenged?

Mr. Polley: We object to that, if the court please, upon the same grounds and for the same reason.

The Court: Objection overruled.

Mr. Mason:

Q. Did you appear in the proceedings in which the Nevada law was challenged?

A. Yes, I appeared as a witness in the Nevada case on behalf of the Southern Pacific Company and certain other railroads that were interested in that proceeding.

Q. Is that the case of Southern Pacific Co. vs. Nashburn, which is reported in the Federal Reporter in the 8 Fed. Sup., do you know?

A. Yes, I think that is the reference.

Q. Do you know whether the Louisiana law was ever challenged?

A. Yes, it was.

Q. Did you participate in those proceedings in any way? [fol. 281] A. Yes, I did.

Q. In what way?

A. In the case of the Louisiana proceeding my activity consisted in the preparation of rather extensive affidavits and filing those affidavits as a part of the proceedings.

Q. Do you know if there were any oral hearings or testimony in the Louisiana case?

A. I can't answer that question. I did not participate in them, if there were.

Q. Now, as to the Oklahoma law, do you know whether or not that law was challenged?

A. Yes, that law was challenged.

Q. Did you participate in the proceedings in the cases in which that law was challenged?

A. Yes, I did, also through the preparation and filing of certain affidavits.

Q. Do you know whether there has been any hearing on oral testimony in that case?

A. I am afraid I can't answer that question.

Q. Have you made or do you make studies and analyses of matters involved in train-limit litigation, and if so, what?

A. My study and analysis of train-limit proposals have

approached the question principally from an economic and [fol. 282] financial standpoint, and primarily from the standpoint of the industry as a whole. However, the principles which I shall develop here, based on those studies and analyses, apply with equal force to all train-length limitation matters, whether state or national in scope, whether already on statute books or in the form of legislative bills.

Q. Have you made a study of the capital expenditures undertaken by the railroads of the United States during the recent period as indicated by the statistics issued by the Interstate Commerce Commission?

A. Yes, I have.

Q. Has there been any substantial increase in capital expenditures for the purpose of augmenting or improving the railroad physical properties in the United States since 1922?

Mr. Strouss: Just a minute, we make the same objection as we made yesterday. This is immaterial, incompetent and irrelevant. It is not the best evidence, calls for a conclusion of the witness.

The Court: The objection is overruled. You may proceed.

(Question read by the reporter.)

A. Yes, a considerable program of that nature has been [fol. 283] under way since the spring of 1923.

Q. What was the occasion which led up to the inauguration of that program?

Mr. Strouss: May our objection, without repeating it, go to all this testimony?

The Court: The record may so show.

A. During and following the World War of 1914 to 1918, unusual demands on railroad facilities taxed the rail plant beyond its then capacity. Periodic car shortages disrupted the smooth flow of trade and commerce. Operating costs per unit of traffic were high and the speed and dependability of service was not up to the standards required of modern transportation. Some of the development of that period lay outside the control of railroad management, but the industry recognized its obligation to clear up the situation.

Q. What steps were taken in order to discharge that obligation?

Mr. Strouss: There is a further objection. I think the witness should identify the railways he is referring to, because, of course, in our objection we object on one ground that this testimony is irrelevant and immaterial because there is no showing of similarity of conditions.

The Court: Well, he may identify them.

[fol. 284] Mr. Mason: To what railways do you refer, Doctor, when you speak of the railway industry?

A. I am referring throughout to the group of railways to which I have already referred and described, namely, the railways of Class I, those which operate something more than 90% of the total mileage of the United States and earn about 97% of the total revenues of all railways in the United States.

Q. Are those railways which contribute to and are members of your Bureau of the Association?

A. Yes, I have already stated that 99% of the mileage of the Class I group have membership in the Association and contribute to the Association and our Bureau.

Q. Then I take it, when you are speaking, that the railways of which you are speaking, represent broadly stated, the National Railway Transportation System, excluding unimportant short lines which do not enter into the Class I?

A. Yes, I think that is a fair statement, excluding more or less local and short lines.

Q. Is the Southern Pacific a railroad of Class I, if you know?

A. Oh, yes.

Q. Is it a member of the Association?

A. Yes, and has been such from the beginning.

[fol. 285] Q. What is the fact as to the Atchison, Topeka and Santa Fe Company?

A. That is a member and has been from the beginning.

Mr. Mason: May we stipulate that hereafter we may refer to that as the Santa Fe?

Mr. Strouss: Yes.

Mr. Mason:

Q. I will ask you as to certain other railroads, whether they are likewise Class I railways and members of the Association. If they are neither or both, will you so indicate? The New York Central?

A. Yes, that is one. It is both a Class I railway and a member of the Association.

Mr. Booth: You might include in your answer whether they have been from the beginning to save repeating.

The Witness: The answer is "yes" to all those questions.

Mr. Mason:

Q. The Boston & Maine?
A. Yes.
Q. The Pennsylvania & Erie?
A. Yes.
Q. The Illinois Central?
A. Yes.
Q. The Chicago & Northwestern?
[fol. 286] A. Yes.
Q. The Chicago, Milwaukee, St. Paul & Pacific?
A. Yes.
Q. The Northern Pacific?
A. Yes.
Q. The Great Northern?
A. Yes.
Q. The Missouri Pacific?
A. Yes.
Q. The Union Pacific?
A. Yes.
Q. The St. Louis & Southwestern?
A. Yes.
Q. The Chicago, Burlington & Quincy?
A. Yes.
Q. The Chicago, Rock Island and Pacific?
A. Yes.
Q. The Chesapeake & Ohio?
A. Yes.

Q. Now, reverting to a question which I had asked you before and which was not followed up, in order to discharge the obligations which you have described, what steps were taken, if you know, by the railroad industry or its representatives?

A. Railroad executives of Class I railways in the Spring of 1923 formulated and inaugurated a continuing program [fol. 287] designed to rehabilitate and modernize the entire rail plant. This involved not only the physical fitness of the plant but also an increase in the unit output of rail facilities. The primary objective of the program was to provide equipment and facilities capable of handling mass

transportation with the smallest possible number of units, that is, cars and trains. To that end railroads installed new locomotives and cars of modern design and greater unit-hauling and carrying capacity. They retired obsolete equipment units from service. They laid millions of tons of heavier rail. They renewed and strengthened roadbeds. They reduced curves and grades. They rebuilt or replaced bridges, trestles and culverts. They greatly extended signalling systems and safety devices. In every way they remodelled the rail plant to permit, where conditions were favorable, use of trains of greater carrying capacity and moving at a greater average speed between terminals. During the first year of the improvement program, 1923, more than $1,000,000,000 of gross expenditure was made on capital account. During the 17 years ending with 1939 the total was approximately $9,000,000,000.

Q. Doctor, have you prepared an exhibit showing the gross expenditures for additions and betterments to rail-[fol. 288] way properties, railways of Class I in the United States?

A. Yes, for this period that I have mentioned, 1922 to 1939, inclusive.

Mr. Mason: We ask that the statement which has been circulated be marked as Defendant's next in order for identification.

The Clerk: Defendant's Exhibit 15 for identification.

Mr. Mason:

Q. Was Exhibit 15 for identification prepared by you or under your direction, Doctor?

A. Yes, it was prepared in my office and under my direct supervision.

Q. And from what source was the exhibit prepared?

A. The source which is indicated at the foot of the exhibit is the lengthy official statistical report published by the Interstate Commerce Commission each year, and known as "Statistics of Railways in the United States." The foot-note I. referred to indicates the exact pages of that report from which these statistics were taken year by year.

Q. Now, are the figures shown on this exhibit the exact counterpart of the figures appearing on the face of the

publication of the Interstate Commerce Commission to [fol. 289] which you refer?

A. Yes, each of those figures has been taken direct from the noted page of the Commission's report.

Q. Omitting, of course, the totals which you show for the two nine-year periods?

A. Yes, that is correct.

Q. Those are your own additions?

A. The sub-totals and totals shown on the sheets are my additions.

Q. Have you available here in the court room one or more of the lengthy publications by the Commission to which you referred and from which these figures are taken? Now, information reaches us, that they are all here.

Mr. Mason: And if your honor please, we hereby tender them to counsel for the plaintiff for their examination, if they so desire either presently or at any time during the presence of the witness on the stand.

The Court: That is, if I understand it, the original reports from which these figures shown on Defendant's Exhibit 45 are taken, are now produced by you in open court.

Mr. Mason: The original publication by the Interstate Commerce Commission, the publication for the year 1938 [fol. 290] I am now submitting for the examination of counsel. If I may have the publication for the year 1937, I will be glad to place it before your honor to show just what it is.

Mr. Booth: Of course, we don't want these taken up to Phoenix. They will be available here in our office for examination, but we are using them currently for other purposes.

Mr. Mason: Placing before your honor the document for the year 1937, which bears the title, excluding the reference to the serial number, "Statistics of Railways in the United States," as referred to by the witness.

Q. Is the publication "Statistics of Railways in the United States" a publication gotten out annually by the Interstate Commerce Commission and made available to those who are interested in it, Doctor?

A. Yes, that has been published each year since the year 1888, the year succeeding the passage of the Interstate Commerce Act of 1887.

Q. Will you say whether or not the publication is in your experience generally used by statisticians interested in the railway industry?

A. Oh, yes.

Mr. Strouss: We object to that as immaterial, if the court [fol. 291] please.

The Court: Note the objection. Overruled. He may answer.

A. Oh, yes, it is the publication most often used by students of transportation both in the Universities, colleges and in general business, and of course, in the transportation field itself it is the outstanding source of railway information.

Q. Do you know from your experience with the Commission upon what information the Commission's report is based, the Commission's publication is based?

A. Yes, I was assigned to work on this particular report at the time I was a member of the staff of the Interstate Commerce Commission, and at that time had some connection with the preparation of the so-called classifications of the Commission, that is, their rules and regulations dealing with railroad accounts and railroad statistics. Each year each railroad subject to the Interstate Commerce Act files under oath a report, an annual report to the Interstate Commerce Commission on certain forms which are prescribed by the Commission, and those reports are carefully checked by members of the Commission staff and the returns contained in the reports are then, after thorough re- [fol. 292] view and checking, are then assembled and tabulated. Those for Class I are tabulated in one group, for the smaller classes of railroads in another group, and so on. The Class I statistics which appear in Exhibit 15 are those of the Class I group, which have been tabulated by the Commission and are then published by the Commission's staff in the statistics of railways.

Q. Now, returning to Exhibit 15 for identification, Doctor, has the exhibit been checked to determine whether it is a correct reproduction of the figures appearing in the original sources to which you have referred?

A. I have personally made what is known as a "spot check" of this, that is, taken certain sample figures and checked them back to the original sources, and in my opin-

ion it is a correct copy of these figures from the Commission's reports.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit 15, and I will withhold the offer until Mr. Strouss or Mr. Polley have had a chance to examine it, if they so desire.

Mr. Strouss: We make the same objection we made to the other exhibits.

The Court: Objection overruled. The exhibit may be admitted in evidence.

[fol. 293] The Clerk: Defendant's Exhibit 15 in evidence.

Mr. Strouss: I think perhaps the character of this material, which is available here should be more definitely identified in the record as the printed publication of statistics of railways in the United States, each year published by the ICC and not a certified copy of any record of the ICC.

Mr. Mason: No, I think we can agree that the underlying documents from which the underlying reports—from which the exhibit has been prepared—is a published statistical report in book form, printed at the United States Government Printing Office, bearing as its title, "Prepared by the Bureau of Statistics" and having on its title page the facsimile seal of the Interstate Commerce Commission, and the sample which I have before me bears the title, "Fifty-First Annual Report on the Statistics of Railways in the United States for the year ending December 31, 1937." And I think that we can also agree that the Commission, as the witness testified, issues an annual report of this type for each calendar year, and has so done since it was first organized.

Mr. Strouss: Yes, I am not questioning that.

Mr. Mason: I assume that plaintiff's counsel are as familiar with this report as we are. As the witness has [fol. 294] said, it is a matter of common and current use among those who are interested in railway statistics and railway operations.

Mr. Strouss: There is one question I would like to ask Dr. Parmelee.

Q. The method of preparing this volume of annual sta-

tistics of railways is set forth in the volume itself, isn't it, Dr. Parmelee?

A. May I ask what you mean by "method"? I am not sure that I understand your question.

Q. How the Interstate Commerce Commission goes about preparing this report?

A. I don't believe that the Commission goes into all that detail in its own report here, but as to the classifications, if that is what you mean, that is the rules and regulations which the Commission lays down to the railways to guide them in the preparation of the original returns, those are very fully set out by the Commission, but in separate documents from these statistics of railways.

Q. Doesn't the introduction of each of these volumes outline or indicate the manner in which the volume was prepared?

A. In a rather general way, yes, that is true. That is, there is a definition of certain terms and there is an expla- [fol. 295] nation of what is meant by Class I railroads, and the geographical distribution that is used in the statistics is explained, and so on. Other general matters of that kind. Perhaps I did not understand your question.

Q. That is what I was referring to, Doctor.

A. Yes, that is correct. I am sorry I did not get your question.

Mr. Mason:

Q. I notice that you have shown the year 1922 on Exhibit 15. Will you state why that is?

A. Yes, the improvement program to which I referred was inaugurated in the Spring of 1923, and in order to get a background for that program, I included the complete year 1922 in this series in order that the comparison and contrast between that year, the following year, 1923, which was the first year of the program, and succeeding years, should be rather clearly brought out.

[fol. 296] Mr. Mason: Will you state from the exhibit and from computations what the aggregate expenditures for additions and betterments were during the eighteen year period covered and what the average per year was.

A. As I have already stated this exhibit 15 relates only to railways of Class I and it covers gross expenditures for additions and betterments. The phrase "additions and

betterments" has a rather definite connotation in the commission's report. It doesn't include what are known as expenditures for new lines and extensions. In other words, for the building of new railroad lines, extension of track into new territory, expenditures of that kind are not included. This exhibit only includes the additions and betterments on existing property, that is, improvement of the existing plant. With that in mind I would like to call attention to certain statistics in the exhibit.

Q. Will you proceed.

A. During the eighteen years as a whole, 1922 to 1939 inclusive, additions and betterment expenditures aggregated $9,363,427,000.00, an average of $520,000,000.00 per year. Three-quarters of the total expenditure was made during the first nine years period when annual expenditures averaged $785,000,000.00. The effect of the economic [fol. 297] depression reduced that annual rate of expenditure by about two-thirds.

Q. As to equipment expenditures, do you wish to mention those figures?

A. The equipment expenditures which are shown in the first figure column of the exhibit include purchases of new locomotives and freight and passenger cars. These expenditures aggregated four and one-half billion dollars over the eighteen-year period or 48.3 per cent of the total which was expended for all classes of additions and betterments. Equipment expenditures averaged $251,000,000.00 per year for the eighteen years as a whole and averaged $377,000,000.00 per year during the nine years 1922 to 1930 inclusive.

Q. As to the expenditures for improvements and betterments to the fixed property?

A. The expenditures on roadway and structures so-called included expenditures for heavier rail, additional main track, additional and heavier ballast, new or improved shops and engine houses, stations and office buildings, new or improved bridges, trestles, and culverts, improved signaling and interlocking devices, and many other items of that general class.

[fol. 298] Q. Would that include extensions of sidings, for example?

A. Oh, yes, if those sidings were extended from presently operated tracks or lines they would be included.

Q. What was the total of that?

A. The total expenditures over the eighteen years for this class of expenditure, roadway and structures, was four and three-quarters billion dollars or 51.2 per cent of the grand total for all classes of expenditures. The annual average for roadway and structures expenditures was $266,000,000.00 for the eighteen-year period and $403,000,000.00 for the nine years, 1922 to 1930 inclusive.

Q. Have you a series of subsequent exhibits to show what the effect from the benefit standpoint was of these expenditures?

A. Yes, sir.

Q. Was there any benefit to the public as a result of the improvement program which you have described?

Mr. Polley: We object to that as calling for a conclusion.

Mr. Mason: We are about to introduce an exhibit which will exemplify the fact which I have endeavored to elicit [fol. 299] from the witness.

The Court: The objection is overruled.

Mr. Mason: Will you read the question.

(The question was read by the reporter.)

A. Yes, sir.

Mr. Mason:

Q. Have you prepared an exhibit for the purpose of showing what benefit there was to the public?

A. Yes, sir.

Q. Will you state the title, please?

A. The exhibit is entitled, "Average Revenue per Ton Mile and per Passenger Mile, Railways of Class I," and covers the same period of years already referred to, namely, 1922 to 1939 inclusive.

The Court: It may be marked for identification.

The Clerk: Defendant's exhibit No. 16 for identification.

Mr. Mason: Are the sources from which this exhibit was prepared shown on the face of the exhibit?

A. Yes, the footnote at the foot of the exhibit shows that the statistics for each year have been derived from those same statistics of railways to which reference has been

made and the only exception is the year 1939 and in the case of the year 1939 the statistics were derived from a prelimi-
[fol. 300] nary publication of the Commission for that year entitled, "Preliminary Abstract."

Q. Does the exhibit correctly reproduce the information appearing in the original sources?

A. Yes.

Q. Has it been checked by you to determine its correctness?

A. Yes, it was carefully checked by members of my staff and then certain of the years as samples were checked by myself personally.

Q. Can you state whether or not it is a true and correct reproduction?

A. In my opinion it is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No, I have none.

Mr. Mason: We offer the exhibit.

Mr. Strouss: I am not restating my points in respect to my objection but I take it it may be taken that the same objection is made.

The Court: The record may show the State's objection to this applies and the objection is overruled and the exhibit admitted in evidence.

The document referred to was received in evidence and marked as defendant's exhibit No. 16.

The Court: May I ask if the preliminary report for 1939 is also here in the court room?

[fol. 301] A. Yes, Your Honor. I might say by way of explanation in order to produce its reports more promptly the Commission has for a number of years been in the habit of publishing certain extracts from its later Statistics of Railways in advance of the Statistics of Railways in order that the information should be available at the earliest possible moment. I have in my hand the Preliminary Abstract of Railway Statistics for 1939 published by the Commission and I might say that everyone of these statistics in here will later appear in the formal 1939 publication of the Commission in addition to certain other details which will appear in the Statistics of Railways and which are not contained in this volume but the entries for 1939 which appear in exhibit No. 16 were taken from this Preliminary Abstract.

Mr. Mason: Do I understand that the figures which appear on No. 16 of average revenue are the average actual receipts regardless of expense per ton mile or per passenger mile made?

A. Yes, they are the total revenue received from the handling of the average ton mile or passenger mile as the case may be.

Q. And no expense has been deducted in order to arrive at a net?

[fol. 302] A. No, this is a gross figure but it is an average per unit.

Q. Would it be correct to say then that the amount shown here is the amount paid by the public for the transportation service represented by the average ton mile or passenger mile as the case may be?

A. Yes, that is a correct statement.

Q. Will you state then in what manner exhibit No. 16 shows a benefit to the public during the years covered by the exhibit?

A. Taking the first figure column of exhibit No. 16 the average revenue per ton mile and these relate of course to only revenue ton miles, that is, miles performed for the public on a revenue basis, the average revenue per ton mile was 1.177 cents in 1922 and it declined almost steadily over the period to 0.973 cent in 1939. In other words a little less than one cent per ton mile in the latest year. If the 1939 revenue ton miles had been carried at the 1922 average rate the freight revenue of the railways in 1939 would have been greater than they were by $680,000,000.00. That is a computation derived from the figures in this exhibit. This would have been the increase in the freight bill of the American public in that year alone, 1939, had freight rates [fol. 303] not gone down since 1922.

Q. What as to passenger rates?

A. In the passenger service the decline in average revenue has been even more striking. The average revenue per passenger mile in 1922 was 3.027 cents and showed an almost steady decline to 1.840 cents in 1939. If the passenger miles handled in 1939 had been carried at the average of the 1922 rate the passenger revenue earned by the railways in that year, 1939, would have been greater than it actually was by $269,000,000.00. That is, this would have been the increased travel bill of the American public in that year, 1939, had the passenger fares not gone down.

Q. Have you made a computation of the combined reduction as to both freight and passenger service?

A. Combining these reductions in freight and passenger revenue because of reduced revenue per ton mile and passenger mile since 1922, the benefit to the public in 1939 aggregated $949,000,000.00. Similar benefits aggregating hundreds of millions of dollars in each year have accrued during the whole period since 1922. That is, I have worked out the computation for only one of these years but similar [fol. 304] benefits appear from the figures for the intervening years from 1922 to 1938.

Q. Has the benefit to the public been confined purely to the reduction in the transportation cost paid by the shipping and traveling public?

A. No, I have referred in this exhibit only to what may be called the money benefit that the public has experienced during this eighteen-year period. Many additional benefits have also been realized to the public in the form of better and faster transportation service rendered by the railroads as the result of the capital improvement program to which I have referred. To this improvement in service I shall devote some attention at a later point in my presentation.

Q. Have you made a study for the purpose of this case of the benefit accruing to railway employees over the years since 1922, and when I say "benefit to employees" I mean particularly from the standpoint of their average and aggregate earnings?

A. Yes.

Q. You have made such a study?

A. Yes.

Q. Is that set forth in the form of an exhibit or two exhibits?

[fol. 305] A. Yes.

Q. Will you state the title of the first exhibit?

A. The first exhibit referred to is entitled, "Number, Man-Hours and Earnings of Employees, Railways of Class I," and covers the same years already referred to, 1922 to 1939 inclusive.

Mr. Mason: May we have the statement marked No. 17 for identification?

The Clerk: Defendant's exhibit No. 17 for identification.

Mr. Mason: Was the exhibit prepared in the same manner as the exhibits Nos. 15 and 16?

A. Yes, sir.

Q. From the same sources?

A. From the same sources, Statistics of Railways in the United States for the years 1922 to 1938 and for the year 1939 from this same Preliminary Abstract to which reference has been made.

Q. Has the exhibit been compared and checked to determine its correctness?

A. Yes, very carefully compared by members of my staff and spot-checked by myself.

Q. Will you state whether or not it is correct?

A. In my opinion I believe it to be correct.

Mr. Mason: Have you any questions, Mr. Strouss?

[fol. 306] Mr. Strouss: No.

The Witness: The figures are exactly as shown in the Commission's reports except for one or two things that I would like to refer to. Column C which is headed "Man-Hours Paid for" shows the total number of hours for which the employees in the respective years were paid. In its reports, the Commission classifies certain men as working on a daily basis and a much larger number of men as working on an hourly basis. For the daily working employees the Commission report days worked and for the hourly working employees the Commission reports number of hours worked. For the purpose of this exhibit and in order to place the men and classes throughout on a comparable basis we have reduced the days to an hourly basis by multiplying the days by eight, eight hours per day. To that extent there has been some computation in that column. The final two columns of exhibit No. 17, namely, columns E and F, "Average Earnings per Employee," per hour and per year are computations based on the preceding columns of the exhibit. I might say that this reduction of a day to an hourly basis is common practice among railroad statisticians and others.

[fol. 307] Mr. Mason:

Q. It has been done in the same manner for each of the years so as to preserve the comparison?

A. Yes, for each of the years throughout. The number of men paid on a daily basis is not large relatively in the whole railroad employment.

Q. Generally speaking what classes of employees?

A. Generally speaking they are the classes paid on a monthly basis, for example, the higher officers, supervisory officers, and certain classes among the clerical staff.

Mr. Mason: We offer the exhibit as No. 17.

Mr. Strouss: We make the same objection and I particularly want to call the court's attention to our objection on the basis that it is calling for a conclusion of the witness. It seems clear to me that a big part of the testimony of this witness as opinion testimony, is conclusions and interpretations of records, and for that reason in addition to our other objections it is inadmissible.

The Court: The objection is overruled, it may be admitted in evidence.

The document referred to was received in evidence and marked as defendant's exhibit No. 17.

Mr. Mason:

Q. Any other particular features of No. 17 to which [fol. 308] you wish to direct special attention, Doctor?

A. I would like to say that looking at column E in exhibit No. 17, railway employees of Class I——

Mr. Strouss: Just to be sure, pardon me, Doctor, of course my objections take in all the oral testimony as well as the exhibits, that is understood, Mr. Mason?

Mr. Mason: Yes, that is understood.

The Witness: Railway employees as a whole in 1922 averaged 61.3 cents per hour paid for. That average showed a general and rising tendency during the period covered by the exhibit and was 74.9 cents in 1939. This was an increase of 22.2 per cent or more than one-fifth during the period. Similarly in the last column of the exhibit, column F, which shows the average annual earnings per railway employee, that increased from $1,623.00 per man per year in 1922 to $1887.00 per man per year in 1939. This was an increase of 16.3 per cent. The average railway employee not only benefited as to his increase in annual earnings but also as to a reduction in the total number of hours which he worked during the average year. This may be indicated by the statement that the average railway employee in 1939 worked 130 fewer hours than he did in 1922 but he received [fol. 309] $264.00 more pay for the fewer hours.

Mr. Mason:

Q. Have you made any computation to determine what the aggregate compensation would have been in 1939 if the 1922 hourly rate had applied?

A. If Railway employees of Class I had been paid in 1939 the same hourly compensation which they received in 1922, their aggregate compensation in 1939 would have been less by $338,000,000.00 than it was. In other words, in spite of the severity of subsidized competition and the depression, the railroads were able to increase the earnings of the employees on their payrolls in 1939 by $338,000,000.00 above what they would have earned at the 1922 rates of pay. This was accomplished only by reduction in the unit cost of operations.

Q. Have you a statement similar in form to No. 17?

The Court: We will take a ten-minute recess at this time.

Thereupon a short recess was taken after which proceedings were resumed as follows:

J. H. PARMELEE resumed the witness stand for further direct examination as follows:

Mr. Mason: Will you read the last question?

[fol. 310] (The last question was read by the reporter.)

A. Yes, I have an exactly similar statement which deals only with train and engine service and employees, that is, that particular group of the total number.

The Court: That may be marked as defendant's exhibit No. 18 for identification.

Mr. Mason:

Q. Was statement No. 18 prepared in the same manner as No. 17?

A. Yes, and from the same sources with one exception, that the 1939 figures in this particular case are drawn from the primary or preliminary work sheets of the Interstate Commerce Commission which form the final tables and statistics on their Statistics of Railways for that year. That publication is now in the presses, the 1939 Statistics of Railways. One further comment may I make on this, and

that is that column C, Man-Hours Paid for, which I explained in respect to exhibit No. 17 had in it certain computations which reduced the eight-hour day to an hourly basis. That computation was not necessary in respect to exhibit No. 18 because all men working in these classes of employees are paid on an hourly basis so there is no computation work in column C of this table. The last two columns, E and F, are of course computations based upon [fol. 311] the other statistics in the table.

Q. They are computations from the face of the exhibit?

A. From the face of the exhibit, yes, sir.

Q. Has the exhibit been checked and compared as stated by you previously in connection with the others?

A. Yes, in the same way.

Q. Will you state whether or not the exhibit is true and correct?

A. In my opinion it is to the best of my belief?

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss. No.

Mr. Mason: We offer the exhibit as No. 18.

The Court: Subject to the same objections which are overruled it may be admitted in evidence.

The document referred to was received in evidence and marked defendant's exhibit No. 18.

Mr. Strouss: I might add on this column C, you are going to bring out more fully what that "man-hours paid for" means?

Mr. Mason: I am going to ask the witness if he will explain in connection with that what is meant by the term, [fol. 312] "man-hours paid for"?

A. May I say first of all that the phrase "train and engine service employees" is the phrase employed by the Interstate Commerce Commission. They classify railway employees into certain general groups and one of those general groups which they identify as Group VI-B is defined by them as transportation train and engine service, that is the Commission's own classification. Man-hours paid for, also following the classification of the Interstate Commerce Commission, is the total number of hours for which payment is made regardless of whether that corresponds to the number of hours worked. In other words,

if a man is paid overtime, we will say at the rate of time and one-half, he is paid for one and one-half hours although he works only one hour. His time for that particular hour in this column would go in as one and one-half hours because that is the time he is paid for although his work was only one hour. That distinction is particularly important with respect to train and engine service employees because they work for the most part on what is known as a mileage basis, they are paid for miles rather than hours, but the mileage basis is translated into hours on the basis of 12½ miles per hour in freight service and generally speaking [fol. 313] 20 miles per hour in passenger service. The thing works out something like this, a man will have a run in freight service of one hundred miles over a day which is looked upon as a day's work or the equivalent of eight hours of work. Now he may actually make his run in five hours or six or seven. He is paid, however, for eight hours or the equivalent of one hundred miles or if he operates 125 miles in a day, which at the rate of 12½ miles an hour is equivalent to ten hours work, he is paid for ten hours although he may actually make his run in consdierably less than ten hours, so the man-hours paid for here are the hours for which payment is actually made whether the time is actually put in or not. I shall a little later refer to that fact and point out that if the average compensation per hour which is shown in column E of this table were computed on an hours worked basis the average would be considerably higher than it is shown in this exhibit.

Q. The figures of the average number of employees, are those absolute figures without any conversion?

A. Yes, the figures in column B, C, and D of exhibit No. 18 are taken directly from the Interstate Commerce [fol. 314] Commission's report without any change or computation. As in the case of the total number of employees covered by exhibit No. 17 the hourly compensation or average earnings per hour of employees in this class, train and engine service employees shown on exhibit No. 18, has shown a gradually upward trend during the period from 1922 to 1939. In 1922 the average hourly earnings of this class were 79.1 cents per hour. In 1939 the average had increased to 92.2 cents per hour or an increase of 16.6 per cent during the period. In the same way the average annual earnings per man in 1922 were $2,226.00 and that

average had increased by 1939 to $2,526.00 per year or an average of something more than two hundred dollars per month averaged over the whole of this class of employees. Reverting to the matter of the hourly earnings on which I commented a moment ago and using as my illustration only the year 1939, the average hourly earnings per employee that year on the basis of man-hours paid for were 92.2 cents. Were that same average re-computed on the basis of hours actually worked for this class of employees the average would be increased to $1.12 cents per hour. In other words, that class of employees in 1939 for the hours that they actually put in in service earned $1.12 per hour. [fol. 315] Q. Will you state whether or not yard employees are included in the classification of train and engine service employees?

A. Yes, they are, this includes engineers, firemen, brakemen, conductors and baggagemen in road service and also the same groups of men in the yard service.

Q. Have you made any comparison between the reduction as it appears in these exhibits in the average number of train and engine service employees as between 1922 and 1939 and the average number of all employees as between 1922 and 1939?

A. I haven't the figures in exact form.

Q. That is a computation that can be made from the face of the exhibit?

A. Yes.

Q. To show whether there has been a greater or less decline in one class as compared to the entire group?

A. I was just going to say that the reduction in number of train and engine service employees as shown on exhibit No. 18 as between 1922 and 1939 was considerably less relatively than the reduction in the number of all employees as shown on exhibit No. 17. I will be glad to work those figures out in exact percentages and have them later. [fol. 316] Q. At the same time will you undertake to work out the relative decline in the total compensation earned by the train and engine service group and the total compensation earned by the entire group?

A. Yes, I will be glad to do so.

Q. Doctor, was the year 1939 a year of relative prosperity or otherwise for the railroad industry as a whole?

A. I would say that it was a year of comparative e-

pression. In other words, not quite so bad as some of the years in the very depths of the depression like 1932, 1933, and 1934 but still of a considerably depressed character.

Q. So far as the railroad industry is concerned how long has the depression continued?

A. I would say that the depression has continued certainly from the beginning of 1931 and is still continuing.

Q. Have you some figures as to revenues and earnings to bear out the statement that you have just made?

A. Yes, I have prepared an exhibit which is entitled, "Income Account, Railways of Class I in the United States, Calendar Years 1929 to 1939."

[fol. 317] Mr. Mason: May this be marked as No. 19?

The Court: It may be marked.

The document was marked as defendant's exhibit No. 19 for identification.

Mr. Mason: The sources from which this exhibit was prepared are shown on its face, are they?

A. Yes, the sources are indicated in the foot-note at the foot of the exhibit and they are for the first nine years, 1929 to 1938, the Statistics of Railways which reference has been made and for the year 1939 the Preliminary Abstract of those statistics which has also been described and the figures in the exhibit with one exception are taken directly from the respective report of the Commission.

Q. What is that exception?

A. The exception I refer to is item 10 in exhibit No. 19, "Return on property investment—per cent," which is a computed figure. It is computed, however, on the basis of a property investment figure which appears in the Commission's report.

Q. That is, it is taken by applying the figure in line 9?

A. Yes, the rate of return as shown in item 10 is the percentage ratio of the net railway operating income shown [fol. 318] in line 9 to the property investment, the property investment being the investment of the railroad in road and equipment plus materials, supplies, and cash. That is the Commission's own classification. Perhaps I should add that item 16 shown as "Other deductions" and item 11 shown as "Other income" in each case is a combination of several smaller items which I have made as a

mere matter of convenience, so that those items are subject to some slight explanation. However, the items which go to make up those entries in this exhibit are all taken from the Commission and are merely added together so as to condense this statement to some extent.

Q. You haven't undertaken to deal with those figures other than to sum them up for the purpose of making a single item out of three or four?

A. That is right, I can give the component items if desired but simply as a matter of convenience and not to have this too detailed a statement they have been summarized here for condensed purposes.

Q. Have you checked the exhibit against the original sources?

A. Yes, I have made a very careful check of all the figures in this statement myself and it has been very thor- [fol. 319] oughly checked by members of my staff, checked and double-checked.

Q. Would you say whether or not it is true and correct?

A. I believe it to be so, yes, sir.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: We offer the exhibit as No. 19.

Mr. Strouss: Same objection.

The Court: The record may show the same objection and it is overruled and the document admitted in evidence.

The document referred to was received in evidence and marked defendant's exhibit No. 19.

Mr. Mason:

Q. There are one or two figures on the exhibit I would like to have explained a little further, Doctor. Does the figure "Net railway operating income" mean that that is the amount of money available after bond interest and all other fixed charges have been paid or is there some deductions on that?

A. No, that is the net which is available to the railways before interest and other fixed charges. That is the sum of money out of which the interest and other fixed charges must be derived and must be paid.

[fol. 320] Q. These items, 13, 14, 15, and 16, do they represent the fixed charges and other deductions?

A. Yes.

Q. In what line of the exhibit will be found the figures indicating the money available for the payment of dividends upon common and preferred stock?

A. The dividend payments if any would have to come out of net income which appears in line 18 or the last line on the exhibit.

Q. I think you said that the last ten years have been in your view years of relative depression. Can you illustrate that from the exhibit—or the depression for the railroad industry?

A. Yes, I can call attention to two or three features which I think bring that point out and support my statement. Take first the total operating revenues, item No. 1 or line No. 1 in the exhibit, that represents the gross money available to the railways from all transportation sources from which of course all the expenses, taxes, and other obligations must be met. In the year 1929 that gross or total exceeded six billion dollars, $6,279,500,000 according to the entry in the exhibit. I might say that during the ten years ending with 1929 the operating revenues of [fol. 321] railways of Class I exceeded six billion dollars in seven of those ten years and they were not below five and one-half billion dollars in any of the remaining three of the ten years.

Q. The figures which you are now reciting as to the ten-year period ending with 1929 are taken from your own inspection of the Commission's statistical reports, are they not?

A. Yes, that is correct.

Q. They do not appear on the exhibit?

A. They do not appear except for the year 1929 on this exhibit. I was simply using that as a background against which to present this exhibit. Summarizing in the preceding ten-year period seven years showed a total of more than six billion dollars and the remaining three years exceeded five and one-half billion dollars. From 1930 to 1939, however, all of which years do appear in this exhibit there was only one year that exceeded five billion dollars, that is the year 1930 when we were still on the downward trend. In only three additional years did the revenues

exceed four billion dollars and in the remaining six years the total revenues were less than four billion dollars. In 1939 they were three billion, nine hundred ninety-five [fol. 322] million dollars. So much for the gross. The net railway operating income, item 9, is the sum available to the railroads after the payment out of revenues of the operating expenses, which include of course payments to employees, the taxes to the various Federal, state, and local governments and certain so-called "operating rentals" for the use of equipment and things of that sort. It is the net railway operating income on the basis of which the Commission compute a rate of return on either investment or value, the "fair rate of return" so-called. Now the net railway operating income in 1929 equalled approximately one and one-quarter billion dollars. It dropped in 1930 to less than nine hundred million dollars and the largest amount that has been earned since that year was in the year 1936 when it was $667,000,000. In 1939 it was approximately $589,000,000. More important perhaps than the gross figures of net railway operating income is the rate of return which that net represents as a basis of a rate of return in percentage terms on the property investment. The highest figure of rate of return during this period covered by the exhibit was 4.81 per cent in 1929. It dropped very quickly and very rapidly to 1.24 per cent in 1932, that is line 10 on the exhibit. In other words, in [fol. 323] 1932 the railways earned less than one and one-quarter per cent on their investments and out of that had to pay their interest and other fixed charges. There has been some improvement since 1932 but in 1939 it had risen only to 2¼ per cent on invesments. The only other item I would call attention to is the final one, line 18, net income after fixed charges, as it is sometimes called. That is the net income which is available, if there is any available, for the payment of dividends, for financing improvements, capital improvements, and so forth, and for additions, reserves, and surplus. In 1929 the railroad had $896,000,000.00 of net income, that is the railroads of Class I as a whole, including those which earned and those which did not earn in that year any net income. In 1930 that dropped to approximately $524,000,000.00. It dropped off in 1931 to $135,000,000.00 and then for three years, 1932, 1933, and 1934, there were actual deficits in the in-

come. In other words, the railroads in each of those years failed to earn enough to meet and pay their fixed charges. There was a very small net income in 1935 of seven and one-half million dollars. In 1936, $165,000,000.00 of net income which was reduced in 1937 to less than one hundred [fol. 324] million dollars and there was a renewed net deficit in 1938 of $123,000,000.00. The net income last year, in 1939, was $93,000,000.00.

[fol. 325] Q. What factors are responsible for this situation that you describe?

A. Two primary factors are responsible for this situation, as outlined in Exhibit No. 19, namely, the economic depression and subsidized competition. That the railroads have weathered this storm as well as they did, was due almost entirely to the foresight of management in negotiating and carrying out the capital improvement program, which, as I will shortly show, resulted in a substantial reduction in the unit cost of railroad operation.

Q. Are there any demands for improving or continuing to improve transportation service now which face the industry from any standpoint?

A. Yes, the industry is faced with meeting certain demands which are now accruing and will accrue in the future from the national defense program. Railroads are meeting these demands adequately, efficiently and economically, because the railroad is designed for mass transportation. It is essential to the national welfare that it be maintained on such a mass transportation basis and be kept free from potential bottlenecks.

Q. Have you any statement, Doctor, relating to the total of the unit cost of transportation service for the railways [fol. 326] of the United States, Class I?

A. Yes, I have.

Q. Will you state its title, please?

A. This exhibit carries the title "Railways of Class I in the United States, Freight Operating and Freight Transportation Expenses, Calendar years 1920 to 1939, inclusive." I would like to call attention to the fact that although the actual title says: "Calendar years 1920 to 1939" that is a mistake and should be "Calendar years 1922 to 1939, inclusive.

Mr. Mason: May we have this statement marked as Defendants Exhibit No. 29 for identification.

The Clerk: Defendant's Exhibit No. 20, marked for identification.

Mr. Mason: I will also ask that the Court permit the record copy, and that counsel also correct their copies, so as to show "1922" in the place of "1920", if there is no objection.

The Court: The record may show the change.

Mr. Mason:

Q. Exhibit No. 20, marked for identification shows on its face, does it not, the source from which it was prepared?

A. Yes, the sources are indicated in the foot note, and [fol. 327] that applies to the first three figure columns, b, c and d, although it is stated in the foot note that the data for 1939 were compiled by and on file in Bureau of Statistics, Interstate Commerce Commission. I would like to say that the preliminary abstract for that year, to which I have already referred, has become available, and the figures for 1939 were checked back, with the preliminary abstract, so that they do really come from the preliminary abstract, and are on all fours with the previous statements. The last figure columns e and f are computations based on the previous columns and the totals at the foot of the exhibit total, 1936 to 1939, and 1922 to 1925, are, of course, summarized figures which are drawn right from the earlier entries in the exhibit. Also the percentage of the improvement, which is shown in the foot of the statement.

Q. The figures of the columns e and f simply show summarized computations from the preceding columns?

A. Yes. I would like to also comment on the words "per cent of improvement". The word "improvement" is used in the sense of a reduction in costs. That is, the per cent of improvement is a reduction in costs.

[fol. 328] Q. Has the exhibit been checked?

A. Yes, in the same way as the other exhibit.

Q. Will you say whether or not it is true and correct?

A. I believe it to be so.

Mr. Mason: Have you some questions, Mr. Strouss?

Mr. Strouss:

Q. The freight operating expense, covering overhead expense, includes transportation?

A. Include all overhead, transportation and maintenance,

and the figures as they stand are reported by the railways in accordance with the regulations and classifications.

Mr. Strouss: We make our same objection.

The Court: The objection overruled and it may be admitted.

The Clerk: Defendant's Exhibit 20 admitted in evidence.

Mr. Mason:

Q. Do you wish to call attention to particular figures shown in the exhibit, Dr.?

A. Very briefly, the total cost of rendering the freight service, that cost being computed in line with the classification laid down by the Interstate Commerce Commission, was in the year 1922 $9.50 per 1,000 revenue ton-miles. [fol. 329] That is the entry against the year 1922, in the next to the last column of the exhibit, $9.50 per 1,000 revenue ton-miles in 1922. And that average was reduced almost yearly throughout the period until it left in 1939 an average of $6.43 per 1,000 revenue ton-miles. In the two years, 1922 and 1939 it will be observed that the total revenue tom miles were very close to each other. 339 billion ton miles in 1922 and 333 billion ton miles in 1939. For that reason the two years are quite closely comparable with each other, with respect to the value and the volume of freight traffic, which makes the reduction in the cost of operating freight per thousand ton-miles as between those two years even more striking than ordinary. The reduction from 1922 to 1939 from $9.50 per thousand ton-miles to $6.43 per thousand ton-miles was a reduction of 32.3% or almost one-third. For the four years at the beginning of that 18 year period, 1922 to 1925, and the four years which stand at the end of the period, 1936 to 1939, the averages are shown at the foot of the exhibit. The average for the first four-year period was $8.71 per thousand ton-miles, and had declined in the last four years to $6.49. A reduction or improvement of 25.5% or approx- [fol. 330] imately one-fourth.

Q. Doctor, is the comparison of the four-year periods at the beginning and end of the period steady in your opinion, or more or less flexible?

A. For the purpose of demonstrating a trend it is hard to give a general answer, because there are cases where single comparisons are better and some where a period

comparison is better. I have shown in this exhibit the basis of an annual and also divided into four-year periods at the beginning and end. The trend can be measured in several different ways. I think for the purposes of this particular showing, and because the years 1922 and 1939 were as I have indicated, comparable in other respects, I think a comparison of the reduction between 1922 and 1939 is somewhat more significant than the four-year comparison, but they both, in my opinion, carry considerable significance.

Q. Do you find from the exhibit similar trends in the transportation expense group?

A. Yes, the freight transportation expense, which is shown in column d are, of course, those expenses which are related only and are restricted to the handling of the trains on the road, and the transportation expenses [fol. 331] are those that are Classified by the Interstate Commerce Commission as the expense of conducting transportation.

Q. You said that they included all the road expense. Do they include also the costs and expenses in yards associated with the making and breaking up of trains?

A. Yes. I meant to use those words. The general figures which appear in column (d) have been reduced to an average of per thousand revenue ton-miles, and those averages appearing in column (f), briefly, shows a reduction between 1922 and 1939 from $4.62 in 1922 to $3.14 in 1939. This was a reduction, or improvement as it is shown on the sheet, of 32 per cent, or almost one-third. Now, a four-year average is also shown in the foot of the exhibit. The reduction based on that form of comparison was from $4.16 per thousand ton-miles in the first four years of the period to $3.18 in the last four years of the period, or a reduction of 23.6 per cent.

Q. Doctor, you have spoken in connection with some of your earlier exhibits of the benefits flowing to the public, that is to say, the patrons of the railroads, to employees of the railroads of Class I, following the adoption of, in 1923, a program of betterment, will you say whether or not [fol. 332] the benefits flowed to the railways themselves following the adoption of that program, and if so, how it is illustrated by your exhibits?

A. You are speaking of Exhibit No. 20.

Q. Yes?

A. The fact that the railroads were able, because of this improvement program, to reduce their operating expense per unit of traffic, meant of course that they were able to handle the same traffic in 1939 as 1922, with a reduction of One Billion One Hundred Million Dollars, and with a reduction of transportation expense of more than Five Hundred Million Dollars, the benefit, therefore, was largely made up of reduction of expenses, and all the money benefits from such reduction went or flowed to the public.

Q. Were there other benefits by way of increased speed, which are to be later demonstrated?

A. Yes. I am referring to only money benefits.

Q. Have you an exhibit similar to exhibit number 20, but relating to passenger service?

A. Yes.

Q. Will you state the title of the exhibit now before you, Doctor?

[fol. 333] A. This exhibit No. 21 is a companion to the previous exhibit No. 20, except that this deals with the passenger service, whereas the other dealt with the freight service.

Mr. Mason: May we have this statement entitled "Passenger Operating and Passenger Transportation Expenses, Railways of Class I" marked for identification as Defendant's Exhibit No. 21?

The Court: It may be marked.

The Clerk: Defendant's Exhibit 21 marked for identification.

Mr. Mason:

Q. Was Exhibit No. 21 prepared in the same manner as Exhibit 20?

A. Yes.

Q. Given a similar check as to its accuracy?

A. Yes.

Q. And will you say whether or not it is true and correct?

A. I believe it to be correct.

Q. I take it that it embodies certain computations which you have made or supervised?

A. Yes, they are similar with respect to Exhibit No. 20.

Q. And the unit of expense, which is the unit as to which the expense is computed, instead of being revenue ton miles is the car miles of passenger trains?

[fol. 334] A. Yes. The so-called passenger train car mile, which is the usual unit selected and used for that purpose in passenger service.

Q. Have you certain comparisons on the face of the exhibit to which you wish to call attention? Just a moment. I now offer Exhibit No. 21 marked for identification, in evidence?

Mr. Strouss: Same objection.

The Court: Objection overruled, it may be admitted.

The Clerk: Defendant's Exhibit No. 21, admitted in evidence.

Mr. Mason:

Q. Will you proceed?

A. In respect of this exhibit No. 21, as to that of Exhibit 20, there has been a considerable decline, a considerable reduction in the average cost of operating the unit of service in the passenger service, which in this case is the passenger train car mile. It will be noted that in 1922 that the total passenger operating expense—averaged per car mile in that year 34.19¢, and had been reduced by 1939 to 25.69¢. That reduction was 24.9%, or approximately one-fourth. Taking the first four years, or the period 1922 to 1925, and the last four years, or the period 1936 to 1939, the reduction was [fol. 335] from 32.8¢ per car mile in the first four-year period to 25.67¢ per car mile in the last four year period. This was a reduction, or improvement as it is shown on the exhibit, of 21.74%. Those figures deal with the total operating expense. Column (d) shows passenger transportation expenses, and are the expenses of handling the trains and the cars over the road, including the yard service. The average cost of transportation alone per car mile was 16.57¢ in 1922, and had been reduced to 12.26¢ per car mile in 1939. This was a decline of 26%. On the four-year basis the decline was from 15.40¢ during the first four years of the period to 12.31¢ during the last four years of the period. This was a decline of 20.06%.

Q. Have you made any computations from exhibits 20 and 21 to determine what the increase in the total expense of freight operations would have been if the 1922 unit cost had prevailed in 1939 and similarly as to the total passenger operating cost?

A. Yes.

Q. Will you state the result of this computation?

A. Had the railways of class I operated in 1939 at the 1922 cost per unit, the total freight operating expenses [fol. 336] in 1939 would have been greater than they actually were by One Billion Twenty Four Million Dollars, and the total passenger operating expenses would have been greater than they were by Two Hundred Fifty-three Million Dollars. The two items combined would have represented a total increase in operating expense in 1939 over what they actually were, amounting to One Billion Two Hundred Seventy-seven Million Dollars.

Q. Does this amount of money, One Billion Two Hundred Seventy-seven Million Dollars, represent a saving of operat- cost to the railroads?

A. A saving in this sense, that if they had operated the same business in 1939 with the 1922 cost and expense, it would have been greater by that amount of more than One and one-quarter billion dollars?

Q. Did the railroads themselves receive the benefit, or to whose benefit did it flow?

A. Every dollor of this savings of expenses and more besides was passed on either to the public in the form of reduction of freight rates or passenger fares; or to railroad employees in the form of increased compensation per hour, or the various federal, state or local governments in the form of increased taxes.

[fol. 337] Q. Can you point to any figure on Exhibit 19. which may illustrate what you have just said.

A. It would be a little difficult to pick those figures out from Exhibit 19. The statements which I have made are statements which I have derived from certain exhibits, particularly as to the savings to the public. Exhibit No. 16, dealing with average revenues per ton mile, or passenger mile, and exhibit No. 17 shows the number of man-hours and earnings of employees; and as to increased taxes, exhibit No. 19 shows that during the past few years there has been a considerable increase in the total amount of taxes paid by the railroads, and that amount represents a much greater relative burden on the revenues of the railroads, because as the taxes have increased, the actual revenues from which the taxes are paid have been declining.

The Court: We will take our noon recess at this time until 2: p. m.

[fol. 338] Tuesday, November 26, 1940. 2:00 P. M.

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed with the examination of the witness.

J. H. PARMELEE, a witness called on behalf of the defendant, resumes the stand and testifies further as follows:

Direct examination.

Continued by Mr. Mason:

Q. Dr. Parmelee, at the conclusion of the morning session you had given for the record, the figures showing what the expenses would have been if 1922 unit costs had been applied to 1939 total traffic units, and indicated, I think that the increase in operating costs computed on that basis would have been $1,277,000,000, and had then stated as I recall, that this reduction—that considering this as a reduction or saving in expense, it had been passed on either to the public in reduced fares or to employees in increased rates of pay, or to the Government in the form of taxes. Have you made some computation to show just how this has come about?

[fol. 339] A. Yes, it is based on Exhibit 16, which went into the record this morning, showing the average revenue per ton mile and passenger mile. It appears that the saving to the public in 1939 from lowered freight and passenger rates in that year was $949,000,000. Based on Exhibit 17, which dealt with the average earnings per hour of the railway employees, it appears that in 1939, compared with 1922, because of increased hourly earnings the employees received in that year $338,000,000 more than they would have received had the 1922 average rate of pay prevailed.

Q. That is, as to this last computation, you apply the 1922 average rate of pay to the man-hours paid for in 1939?

A. Yes, and as to taxes paid by the railways there was an increase in their tax bill between 1922 and 1939 of approximately $54,000,000. Adding together, then, the $949,000,000 savings from lowered rates to $338,000,000 more paid off to employees because of higher hourly compensation and the increase of $54,000,000 in railway taxes, the sum of those

three figures is $1,341,000,000, which is considerably higher than the $1,277,000,000 which I computed as having been derived by the railways from lowered unit costs of operation.

[fol. 340] Q. Dr. Parmlee, have you made a computation from the figures on Exhibits 17 and 18 to determine, first, the relative reduction in the average pay of all employees as between 1922 and 1939, and the relative reduction in the total compensation paid to all employees, and then the relative reduction in percentage between the average pay of train and engine service employees in 1922 and 1939, and in their total compensation in those two years, and finally the relative reduction in percentage of all employees other than train and engine service employees, and their total compensation for the two years?

A. Yes.

Q. Will you recite those computations, and I take it these computations are made from the figures appearing on the face of Exhibits 17 and 18?

A. Yes, they are computations based on the entries in those Exhibits 17 and 18 for the years 1922 to 1939. Taking first the number of employees as between the two years and taking first all employees, there was a reduction of 39.3%. For train and engine service employees, however, the reduction was less. It was 29.4%.

The Court: You mean, Dr. Parmelee, of the employees [fol. 341] that were actually employed during that period?

A. There was that percentage of reduction in the number of employees on the payrolls in 1939 compared with 1922. And taking all employees, other than the train and engine service, the reduction was 41.5%.

A. There was that percentage of reduction in the number of employees on the payrolls in 1939 compared with 1922. And taking all employees, other than the trains and engine service, the reduction was 41.5%.

Turning next to the reduction in the total payrolls, the aggregate compensation paid to these several classes, the reduction between the 1922 and 1939 payrolls of all classes of employees was 29.4%. For train and engine service employees it was 19.9%, and for all classes other than train and engine service employees it was 32.6%. In other words, during that period, other employees than the train and engine service groups suffered more severely from the depression and from other causes than did the train and

engine service employees. The latter less as to the number of employees laid off, and they suffered relatively less as to their total compensation.

Mr. Booth: Pardon me, as to the total compensation, you mean the total amount paid these employees, paid by the Company for their service?

A. Yes.

Q. You don't mean to indicate that their average compensation was decreased?

[fol. 342] A. No, by total compensation I mean the total or aggregate sum of money paid to the employees as a group, which has nothing to do, of course, with the average hourly rate of pay.

Mr. Mason:

Q. Or the individual earnings?

A. Or the individual earnings per man.

Q. Have you prepared a statement entitled, "Freight Service Operating Averages, Calendar years 22" and so on to 1939?

A. Yes.

Q. Consisting of one sheet.

Mr. Mason: May we have the statement marked.

The Clerk: Defendant's Exhibit 22 for identification.

Mr. Mason: Is this exhibit prepared from the sources shown on the sheet, itself, Doctor.

A. Yes, the sources are described and indicated in the foot-note at the foot of the exhibit. They are in part the statistics of railways, of the Commission to which reference has been made, and in part the Commission's monthly summary of freight train performance and of fuel and power for locomotives and rail motor cars, those summaries being in each case for railways of Class I as a whole.

Q. Now, the notation also says that certain figures for 1939 were compiled by and are on file in the Bureau of [fol. 343] Statistics. Do those figures also appear in the preliminary abstract?

A. Yes, they do. The preliminary abstract has become available to me since this was prepared, and these figures have been checked back against the preliminary abstract and they are correct.

Q. Are all the documents or reports shown as sources,

actual publications by the Interstate Commerce Commission?

A. Yes.

Q. And available to the public at large?

A. Yes, they are matters of public record.

Q. And are similar where they are not the same, similar to the statistics of railways in the United States, the publication to which you referred this morning as an annual publication?

A. Yes.

Q. Has the exhibit been checked against these underlying sources to determine its correctness?

A. Yes sir, it has been very thoroughly checked in my office. I have personally checked almost every figure of the exhibit.

Q. I take it the figures shown in the exhibit, with the exception of those shown in column M are the figures which appear in the various sources and documents, are they?

[fol. 344] A. Yes, except in one or two cases it was necessary to add one or two items together in the Commission's report to get a total.

Q. Will you refer to those sources?

A. All right. In line 3, Item 3, "Freight cars per freight train," down to and including the year 1935, the Interstate Commerce Commission in its own monthly summaries include caboose-miles in its averages. Beginning with the year 1936 the Commission has not included caboose-miles in its basic figures. For this particular exhibit, in order to put the figures throughout this whole period on a comparable basis and inasmuch as up to the year 1935 the Commission did include caboose-miles, I added for the years 1936, 1938 and 1939 in this exhibit—I have added the caboose-miles in, and reworked a new average so that the figures are comparable throughout the period, and those earlier years from 1934 back are taken direct from the Commission's reports. The last three entries against that particular item are my own computations, but worked out on exactly the same basis as the Commission used in previous years.

Q. Would the computation for the last three years shown, by adding in the caboose-miles, result in a greater average

[fol. 345] number of cars per train than would otherwise appear?

A. Yes, it would be a fraction of one more car on the average.

Q. I take it, then, that these averages shown in line 3 are in effect the average length of freight trains inclusive of caboose?

A. That is correct.

Q. Will you state whether or not the exhibit is true and correct as a reproduction of the underlying sources?

[fol. 346] A. It is, to the best of my belief.

Q. Were you present in the court room when Mr. Porter testified, Doctor?

A. Yes.

Q. Did you have an opportunity to examine Exhibit Number 12 introduced by Mr. Porter?

A. I haven't had a copy in my hands, no.

Q. I will show you one, Mr. Porter's number 12, and ask you to look at it for a moment.

A. The entries in Exhibit 22 correspond exactly to the entries in Exhibit No. 12. That is, by "correspondent" I mean they are the same entries described in the same language and for the same years.

The Court: But Number 12 takes care of the New York Central system only, whereas, this is all class-1 railroads?

A. Yes, that is correct, your Honor, it is; although, the same form had been used, of course, filled in for that single railroad and figures filled in in Exhibit 22 for all railroads of class-1 as a group.

Mr. Booth:

Q. As a matter of fact, we furnished you with that form, did we not?

A. Yes.

Mr. Mason: Have you any questions at this time, Mr. Strouss?

[fol. 347] Mr. Strouss:

Q. This exhibit was prepared by you for the purpose of this trial?

A. Yes, sir.

Q. The sources of this information other than the Statistics of Railways in the United States are not available here in court, are they?

A. Yes, they are here.

Q. Other than these other statistics, other than the railway statistics?

A. Yes.

Mr. Strouss: Will you let us have those for use, too? I don't mean right now, but I would like to have them this evening.

The Court:

Q. You refer, Mr. Strouss, to Interstate Commerce Commission Summary of Freight Train Performance, Class 1?

Mr. Strouss: Class 1; I don't want them right now.

Mr. Mason: What Mr. Strouss desires are these M-211 and M-230 statements shown in the first paragraph under "Source".

Mr. Strouss: That is right.

A. Yes, I have the complete files in my hands from which these statistics were drawn, and I will be glad to hand them to you after the hearing.

Mr. Strouss: That is the only question we have.

[fol. 348] The Clerk: Defendant's Exhibit 22 in evidence.

Mr. Mason:

Q. Are there any indexes or other figures on this exhibit, Doctor Parmelee, which indicate relative efficiency of freight train operation for the railroads of the United States?

A. I would say that all of the entries from "3" down to "10," inclusive, are indexes of operating efficiency of one type or another. The first two items, "1" and "2", are, of course, basic figures showing the mileage operated in freight service and the total number of freight train-miles. The remaining eight items in the exhibit are indexes of operating efficiency.

Q. Is there any particularly pertinent comparison of years upon the exhibit to which you wish to draw attention?

A. As I stated earlier with respect to another exhibit, I believe the years 1922 and 1939 are very excellent years for comparison one with the other so far as freight operating statistics are concerned, chiefly because the volume of freight traffic in those two years was almost exactly the same. There was a very slight difference between the two years.

Q. The volume that is actually shown on the preceding [fol. 349] exhibit?

A. Yes. For that reason any variations that might be due to differences in volume of traffic disappear from such a comparison and the comparison can be quite directly made, one with the other.

Q. Did you wish to draw any particular attention to Item 1 of the exhibit.

A. Item 1 on Exhibit 22 shows the miles of line operated in freight service for each of the years covered by the exhibit. That item, miles of line, reached its peak in the year 1932, at 240,208 miles, but because of the severity of subsidized competition has been declining gradually during the subsequent period, reaching a total of 232,026 miles at the end of 1939, as shown on the exhibit.

Q. Turning to Item 2, "Freight train-miles", will you please call attention to such significant comparisons there.

A. Freight train-miles declined from five hundred and fifty-five million, in round figures, in 1922, to four hundred and fifty-two million in 1939. That is a decline of 18.6 per cent; and I call particular attention to that decline in the light of the fact that, as I have already stated, the actual ton-miles in 1939 were about the same as they were in 1922. [fol. 350] In other words, approximately the same number of ton-miles was handled with eighteen per cent fewer train-miles.

Q. Does that mean that each train-mile was productive of more actual transportation service?

A. Yes, on the average.

Q. And what factor or factors contributed to this greater productivity per train-mile?

A. One of the most important factors in that connection is indicated by Item 3 on Exhibit Number 22, more cars per freight train. That factor contributes to an increased output per train-mile and shows an increase from 38.4 cars per train in 1922 to 49.1 cars per train in 1939—an increase of 27.9 percent over the period.

Q. Does the figure of "Freight cars per freight train, which of course, here is an average, as the title indicates—does that increase the average length of the typical freight train?

A. No, not at all.

Q. Just how is the figure arrived at and what does it indicate as to freight train performance?

A. The average of freight cars per train should not be used as to the number of cars in a typical freight train. It is a mere composite average made up of the varying num- [fol. 351] bers of cars in a great many different kinds of trains. Railroads, of course, perform a number of different kinds of freight service. One type of service is the through service, usually involving a relatively long haul, which moves products of one section of the country, the producing area, to other sections, the consumer areas. The movement of perishable fruits and vegetables from the west coast to midwestern and eastern points is another special example of this type of service. Speed, dependability, efficiency and low cost transportation are vital to movements of this kind, and the use of longer trains is particularly suitable and desirable for this type of service. Another type of service is the movement of heavy commodities such as coal, which also move a relatively long distance, and are most efficiently and economically handled in longer train units. Still another type of service is that known as local and way service, the many smaller communities on main lines between train terminals on the branch and division lines require service of this kind. While most trains in this type of service are short trains, they do sometimes exceed seventy cars. Other things equal the length of freight trains depend upon the quantity of traffic available [fol. 352] for movement. Generally speaking, traffic is moved most efficiently and most economically in longer train units. However, service requirements will not permit the holding of cars at concentration points in order to build up a longer train, and in such cases short trains are run. This phase of the matter will be gone into in some detail by witnesses who will follow me on the stand. The point I wish to make clear here is that item you see on this exhibit 22 is the average length of all trains, some long some short, some exceeding seventy cars and some with less than seventy.

Q. Now will you address yourself to Item 4, which is "Net tons per freight train", and call attention to any other significant matters that appear in connection therewith.

A. "Net tons per freight train" is sometimes referred to as the average train load, the number of tons of freight, both revenue and non-revenue, that are in the average freight train. This average increased from 676 tons in

1922 to 813 tons in 1939. This was an increase of 137 tons per train or 20.3 percent. In other words, five trains in 1939 handled as much revenue tonnage as six trains did in 1922, which was the result of handling more cars per train and of increasing the capacity of the average freight car.

[fol. 353] Q. As to Items 5 and 6, will you explain what they indicate?

A. Items 5 and 6 deal with the tractive power of the locomotive and the average capacity of the average freight carrying car. As a result of the installation of new and larger locomotives and the retirement of smaller and obsolete units the average tractive power of steam locomotives in service increased from 37,441 pounds per locomotive in 1922 to 50,395 pounds in 1939, an increase of 34.6 percent, or more than one-third. In the same way the average capacity of the average freight car has increased from 43.1 tons in 1922 to 49.7 tons or just short of 50 tons, in 1939, an increase over the period of 15.3 percent.

Q. What is the significance, Doctor, of the item Number 7, "freight train speed"?

A. Item 7 deals with the average speed made by the average freight train between terminals in terms of miles per hour. The new and powerful locomotives which have been installed not only handled more cars and more net tons per train, but also made better time between terminals while doing so. Item 7 shows the average freight train speed increased from 11.1 miles per hour in 1922 to 16.7 miles per hour in 1939, an increase of 50.5 percent, or more than [fol. 354] one half.

One factor in this increased average speed was a considerable reduction in road delay, through traffic congestion, train accidents, etc.

Q. You will find in the next items, 8 and 9, a combination of speed and loading, which enables you to arrive at performance indexes?

A. Yes.

The Court: Pardon me just a moment there, Doctor Parmelee, I believe the testimony from one of the witnesses who heretofore testified, referring to Number 7, the freight train speed, was that those figures represent elapsed time rather than actual running time between destinations.

A. Yes, that is what I tried to show. It was the actual time between terminals including all road delays divided into the total number of miles covered.

Mr. Mason: And I understand, Doctor, from what was said previously that in computing freight train speed the time in terminals is not taken into account?

A. No, simply the time when the train is checked out of one terminal and the time it is checked into the destination terminal.

Mr. Strouss: Again I want to say I am not making my [fol. 355] objections here upon the understanding that the objections heretofore made go to all this testimony.

Mr. Mason: The general objection of relevancy and competency.

The Court: Yes.

Mr. Strouss: I repeat that because there might be some question. Because when an exhibit is introduced specific objections are made then, I don't want that to be taken that I am not urging my objection to all the testimony as well as the exhibits.

Mr. Mason: I think we understand, your Honor, that the objection to the introduction of the exhibit likewise goes to the discussion of the exhibit by the witness, without its being repeated.

The Court: Yes, the court will so construe it.

Mr. Mason: Q. Will you proceed now to Items 8 and 9?

A. Mr. Wright quite fully described the items of the gross ton-miles per freight train-hour and indicated what in his opinion was its significance and its importance in railroad operating statistics. I do not need to repeat what he said and will simply say I agree with him fully as to the significance and importance of that particular operating index.

[fol. 356] The item, gross ton-miles per freight train-hour found on Exhibit 22 more than doubled between 1922 and 1939, showing an increase of 102.7 percent. That is purely an index of railroad operating efficiency. The next item, net ton-miles per freight train-hour, is an index of efficiency of handling the freight, loading and getting the freight itself over the line, because it is restricted to the freight in the train and does not include the weight of the train which is included in Item 8. Now net ton-miles per

freight train-hour have also shown a very marked increase over this period, the increase being 79.8 percent, or nearly 80 percent over the seventeen-year period.

Q. Will you say in connection with Number 9 whether or not the action of shippers in loading freight cars to capacity or less than capacity, or barely to minimum, has any effect upon the carrier's ability to realize a high figure of net ton-miles per freight train-hour?

A. Yes, it does have an effect. The more fully the shipper loads his car and the more cars on the train, of course, the more tons of freight can be hauled within a given period of time.

Q. Are the carriers able to control completely or to a substantial extent the policy of shippers, or individual [fol. 357] shippers, in loading to capacity or barely to capacity?

A. Directly, they can't control it at all. Indirectly, of course, there are inducements offered shippers to load more heavily in the way of minimum carload rates and things of that sort. But in the last analysis it is for the shipper to decide how much he will load in his freight car.

Q. Have you any comments in connection with that Item Number 10?

A. Item Number 10 shows the total number of gross ton-miles handled by the railways for each ton of fuel consumed by locomotives, and the word "fuel" in that connection means all kinds of fuel, coal and fuel oil, and where electric power is used, the equivalent of that electric power in terms of tons of coal. For each ton of fuel consumed in 1922 in freight service by locomotives the carriers derived 10,750 gross ton-miles. This was increased to 15,528 in 1939, an increase in fuel efficiency of 44.4 percent.

The Court: Q. That increased efficiency came primarily with the improvement in the locomotives themselves?

A. I think from three principal sources, your Honor. I think the improvement in the locomotive itself, the loco- [fol. 358] motive unit itself, is the most important factor; second, however, was the improvement in the methods, the improved methods of handling the fuel, in handling it through the coal piles, in taking care of it and storing it, and in handling it into the engine; and third, there have been improvements, or at least, it might be put this way—there has been a much greater care exercised in the pur-

chase of fuel, particularly coal. In other words, better grades of fuel have been purchased, and of course, better results are obtained. But in my opinion the first of those three factors is by far the most important and has had the greatest effect—the larger and better locomotive.

Q. Doctor, I think in your comment upon Item Number 3, freight cars per freight train, you stated that this average should not be used as indicating the length of the typical freight train.

A. Yes.

Q. I will ask you if a somewhat similar comment does not apply to Item Number 4, net tons per freight train?

A. Yes, that is true. That is not the typical freight train. It is the average, a sort of composite of the freight trains of the United States, which indicates that there are [fol. 359] a great many freight trains which are operated with fewer tons than the average, and of course, a great many with more tons than the average.

Q. And the variation in service which you have described will equally apply to this average?

A. Yes.

[fol. 360] Mr. Mason:

Q. Does the ability or willingness or tendency of shippers to load to capacity or less than capacity have any effect upon the figures of net tons per freight train?

A. Yes, both on the net tons per car and on the net tons per train.

Q. In the manner which you described in connection with item No. 9?

A. Yes, sir.

Q. I think you have stated that the purpose of tendency on exhibit No. 22 is to indicate a greater efficiency in performance. Do the figures shown on this exhibit indicate anything else as to the railroad service?

A. I would make only this general comment, that a substantial increase in operating efficiency and in economy of operation which is strongly indicated by the figures on exhibit No. 22 could only have been achieved by adoption of the long train method of operation which is the basis of the mass transportation principle and that was what was made possible by the improvement program of 1923 and later years to which I have already adverted.

Q. Have you made for the purposes of this case or otherwise a survey of the railroad situation as of the present year, 1940?

[fol. 361] A. Yes.

Q. Based upon statistics coming to you through the Interstate Commerce Commission or otherwise during the first nine months of this year?

A. Yes.

Q. What is the most significant development during the first nine months of 1940?

A. Briefly summarized, I would say that the rather striking factors in the operations this year have been, first, an increase in the demand for freight traffic, demand for freight service by rail, a considerable increase to which I shall refer in particular in a moment, and, second, that despite that increased demand for service the financial returns which the railways have been deriving from that increased demand have been less, have been reduced. In the last month or two as I shall show in a moment, their revenues have actually fallen off in the face of an increase in business and their expenses, their operating expenses have been going up in relation to the business with the result that the net has been considerably reduced.

Q. How do you measure the demand for freight service?

A. By the number of freight cars loaded and moved and by the number of ton miles.

[fol. 362] The Court: You referred a few moments ago to subsidized competition. Just what do you have reference to on that?

A. That is a large subject to enter upon, Your Honor, but briefly there are three forms of competition which the railroads face today which are largely or partially subsidized, those are the forms of transportation by air, by water, and by highway. I don't refer to the pipe line competition which is also serious but which is not subsidized. The growth of transportation by air, a very marked growth in the last few years, has been due almost wholly to government subsidies which are of two general types. First, the air mail subsidy with which I think we are all familiar, which has amounted to millions of dollars per year and which has enabled and is now enabling air carriers to haul passengers at much less than it costs to haul them. The rates charged to the passenger for his air travel is much lower than it costs the air line to handle him and the differ-

ence is made up out of this air mail subsidy. The second form of subsidy lies in the development of these municipal and other public airports and the development of the so-called "airways," lighted and marked airways which is done at the expense of ten to twenty million dollars a year [fol. 363] to the Federal government and I don't know how many millions of dollars per year to the various localities, municipal, state and other governments. All that represents service which the airlines receive at least at the expense of little charge to them or no charge at all. In the case of water carriers I think it is generally agreed that they are almost wholly subsidized in the sense that they receive from the government their rights of way, their canals, their rivers, their harbors free of all charges.

Q. I take it you are referring to those water carriers that actually compete with rail carriers to points in the United States?

A. Yes, I am speaking of what we call inland water transportation which would include coastwise, Great Lakes, and primary rivers and canals, all of which are furnished to the water carrier without any tolls being charged for the use of the public improved waterways. Just how much that subsidy amounts to it is almost impossible to say but it enables the water carriers to handle their traffic at much less than it would cost them were they required to pay tolls for the service by improved waterways. As to the highways, the question is not so simple and is a question which [fol. 364] is being greatly debated at the present time as to whether those who do commercial business over the highways in busses and trucks pay a sufficient fee in the form of gasoline taxes, tag taxes and other fees, whether they pay enough to offset the costs to the states and Federal government for the building and maintenance of the highways over which they operate. It is a very difficult question to solve or to secure a solution for but the railways believe there is a considerable subsidy to the commercial—I emphasize the word "commercial"—to the commercial carriers of freight and passengers by highways and to whatever extent that exists it means subsidized competition with which the railways find it more and more difficult to compete.

The Court: Are the railways subsidized in any way from the Federal treasury?

A. I would say at the present time they are not. There is a good deal of discussion on the old land grants which they received some seventy years ago, but even in the case of the land grant there was always a consideration. The railroads agreed to give the government lower rates for government goods and that has been done for a period of seventy years, so that the land grants have been paid for a number of times over in those lower rates on government [fol. 365] troops, mail, and so forth.

The Court: Is there any end to that, lower rates to the government?

A. Congress enacted a law in the present session, the so-called "Transportation Act of 1940" which did remove some of the land grant reductions, not all of them but that was done only on condition that any particular railroad that wished land grant rates removed should file a rather complex document with the government, waiving any rights or claims it might have now or in the future to any land in land grant patents. So that was only a partial relief to the railroads in that particular respect.

The Court: All right, pardon the interruption. You may now go ahead.

Mr. Mason:

Q. How do the carloadings for the year 1940 for the period so far accrued compare with those in 1939?

A. Up to the beginning of October the carloadings this year ran generally higher than they did last year for the same period.

Q. Has there been any substantial change in passenger traffic volume as distinguished from freight traffic?

A. The passenger traffic in terms of volume has been about [fol. 366] the same as last year, in fact it has been a little greater. The passenger revenue, however, in terms of money has been less than last year.

Q. What has the effect been upon the gross revenue as reported to the Interstate Commerce Commission or otherwise available to you, Doctor, during 1940 as contrasted with 1939 for the latest period available?

A. Using the figures for the first nine months of 1940 and comparing certain factors with the corresponding periods of 1939 and also 1937 the results are as follows,

and I would like to say I am using 1937 there because that is the best year in terms of volume of traffic and all gross earnings that the railroads have had since the year 1930, it is the best of the last ten years, so I use it for the moment as a yardstick to show how we are operating this year compared with last year and also with 1937. The operating revenues this year have been greater than in 1939 by two hundred sixty-four million dollars but less than in 1937 by forty-nine million dollars. These figures are all for a nine-month period, not an annual period. The operating expenses this year have been greater than in 1939 by one hundred forty-six million dollars but less [fol. 367] than in 1937 by sixty-nine million dollars. The taxes paid by the railroads have been greater this year than in 1939 by $35,500,000.00 and have been also greater than in 1937 by fifty-two million dollars. The net railway operating income after expenses and taxes have been greater than in 1939 by eighty-five million dollars but less than in 1937 by thirty million dollars. The rate of return on property investments has been 2.36 per cent in 1940, 1.91 per cent in 1939, and 2.54 per cent in 1937. The net income after fixed charges for the first eight months of 1940 has been greater than in 1939 by one hundred million dollars, 1939 having been in the red during the first eight months, having been a net deficit instead of net income, but the net income this year is less this year than 1937 by thirty-eight million dollars.

Q. Have you the figures for the month of September, 1940?

A. More significant perhaps than these figures for nine months are the figures for September which is the latest of the nine months. In that month, September, 1940, operating revenues were only one and one-half million dollars greater than last September while operating expenses in- [fol. 368] creased by nine million dollars, taxes increased by five million dollars and the net railway operating income fell off by twelve million dollars.

Q. Are you able from the figures already at hand, including carloadings, and based upon your experience as a director of the Bureau of Railroad Economics to make any forecast as the prospects for the balance of 1940?

Mr. Strouss: My objection goes to this—with the understanding we have had I haven't made any objection to this

testimony but my understanding with the court has been that my objection goes to all this testimony.

The Court: That is true, but we are getting into entirely different territory now.

Mr. Strouss: I think that they have been for quite a while.

Mr. Mason: I think the data for 1940 for the first nine months——

The Court: I will sustain the objection to the last question.

Mr. Strouss: Let me understand here now, am I supposed to make my objection from now on on each question?

The Court: No, that won't be necessary. However, this last question, it was not what the facts and figures show [fol. 369] but was calling for a conclusion or estimate of this witness as to what conditions would be over the entire year, in other words, problematical rather than being based on facts and figures.

Mr. Strouss: My objection heretofore made would go to all the testimony that has gone in.

The Court: I so understood it.

Mr. Mason: I don't want to argue the question now that the ruling has been made but I do suggest that this witness has in his position and with his experience is in a better position to make such a forecast probably more than any other person in the United States.

The Court: That is probably true but just what help that would be to the court of how material or relevant it would be is a question.

Mr. Mason: I don't intend to press the matter.

The Court: I will stand on the ruling.

Mr. Mason:

Q. Have you been able from the material already at hand to compute any indexes of efficiency of operation for the nine months of the year 1940 which are already available and completed?

A. Yes, I have them complete from the Interstate Commerce Commission's records.

Q. Will you state, having in mind the indexes of efficiency [fol. 370] on exhibit No. 22—have you figures for the year 1940, first nine months corresponding to this?

A. Yes, they show generally the first nine months of 1940 were operated at an even higher and better efficiency

level than the corresponding months of 1939 and the year 1939 as indicated in exhibit No. 22 showed the best results of any year of which we have record, and that is despite the fact that the revenues have been generally downward and expenses upward in the current year. Now, during these first nine months of 1940 the average number of freight cars per train increased by one and one-half cars or 3.1 per cent compared with the corresponding nine months of 1939. The average freight train load which on exhibit No. 22 is item 4, there shown as net tons per freight train or freight train load, the average freight train load increased by fifty-five tons this year or 6.9 per cent. Freight train speed was almost exactly the same this year as last, showing a fraction of one-tenth of one mile less per hour. The gross ton mile per freight train hour increased by 1,253 ton miles or 3.9 per cent. The net ton miles per freight train hour increased by 832 ton miles or 6.3 per cent. Taken as a whole the efficiency of railway performance, [fol. 371] freight performance during the first nine months of 1940 was at the highest level in the history of the railroads.

Mr. Strouss: May I call the court's attention, this testimony just given, is a conclusion drawn from records and figures which are not anywhere in this record.

Mr. Mason: I will ask you to identify if you will, Doctor, the Interstate Commerce Commission report or statistical issues which have been consulted by you for the purposes of the testimony relative to the year 1940.

A. They are the monthly summaries of the Interstate Commerce Commission dealing with these various factors which are shown on exhibit No. 22. In other words, the monthly summaries of the Interstate Commerce Commission which is entitled, "Freight Train Performance, Class I, Steam Railways in the United States," and another summary which is issued monthly by the Commission entitled, "Fuel and Power for Locomotives and Rail Motor Cars."

Q. You have identified on exhibit No. 22 the number 1939 and prior issues. Do I understand that these summaries are issued monthly and are accumulated by months for a calendar year?

[fol. 372] A. Yes, that is correct, so that the issue for September, 1940, is the cumulative figures for this nine-month period I have been discussing.

The Court: Do you have those pamphlets with you here in the courtroom?

A. We have here in the courtroom, Your Honor, those two monthly summaries for the month of August, 1940, which gives the summary for the first eight months of 1940. The returns for the nine months ending September 30th had not been actually published by the Commission at the time I left Washington and our figures for those nine months were copied from the worksheets of the Commission. I have the August summaries here.

The Court: Which you will make available?

A. Which can be made available, yes, sir.

Mr. Mason:

Q. The other is taken from the advance sheet worked out by the Commission's employees in the Bureau of Statistics at the Commission's office in Washington?

A. Yes, sir.

The Court: We will take a brief recess at this time.

Thereupon at 3 P. M., November 26, 1940, a short recess was taken and after which proceedings were resumed as follows:

[fol. 373] Mr. Mason: Your Honor, that concludes, unless you have some questions yourself at this time, the direct examination for the time being of Dr. Parmelee and with the concurrence of opposing counsel we propose to withdraw him from the stand at this time but return at their convenience within a day or so for cross-examination so that we may put on another witness.

The Court: That is agreeable?

Mr. Strouss: Oh, yes, it was my understanding we could use him tomorrow.

Mr. Mason: Before Dr. Parmelee leaves the stand I should like the record to show that I am furnishing to opposing counsel certain original documents or printed documents issued by the Interstate Commerce Commission bearing the designation, "Freight Train Performance, Class I, Steam Railways in the United States," for various months up to and including December, 1939, and also documents bearing the designation, "Fuel and Power for Loco-

motives and Rail Motor Cars for Class I, Steam Railways in the United States," for consecutive months up to December, 1939. Is that correct, Mr. Strouss?

Mr. Strouss: That is correct.

[fol. 374] Mr. Mason: I am also handing to Mr. Strouss for his use the August, 1940, counterparts of the statements which I have just described for the months up to December, 1939 and two statements which show official entries for the months of September, 1940 of the information available at the office of the Interstate Commerce Commission and taken from the work sheet there and placed upon these forms OSE and OSA for the month of September, 1940. Is that correct, Mr. Strouss?

Mr. Strouss: Yes.

Mr. Booth: I would like to ask Dr. Parmelee a question or two for the foundation of something I want to ask the next witness.

Q. Dr. Parmelee, I show a publication of 113 pages of statistics, the cover of which is entitled "Interstate Commerce Commission, Bureau of Statistics, Statement No. 39200, a Comparative Statement of Railway Operating Statistics of the Steam Railways in the United States, having annual operating Revenues of over $5,000,000, Years 1938, 1937 and 1936" and ask you whether or not that is an official publication of the Interstate Commerce Com-ission, Bureau of Statistics?

A. Yes, that is an official publication and is issued every year, showing figures for three years, that is the current [fol. 375] year and the preceding two years.

Q. It confines the statistics to railways having annual operating revenues of over $5,000,000?

A. Yes, sir.

Q. And the railroads are arranged by name and certain other classifications?

A. Yes.

(Witness excused.)

W. F. KIRK was called as a witness in behalf of the defendant and being first duly sworn, testified as follows:

Direct Examination.

By Mr. Booth:

Q. Will you state your name, residence and occupation?

A. W. F. Kirk, General Superintendent of Transportation, Missouri Pacific Railroad, St. Louis, Missouri.

Q. How long have you been engaged in the operation of steam railroads?

A. I have been in the service of the Missouri Pacific Railroad since 1901 as operator, dispatcher, train dispatcher, chief train dispatcher, train master, assistant superintendent, superintendent, general superintendent and [fol. 376] general superintendent of transportation, except for the period June, 1934 to June, 1935, when I was associated with the Federal Coordinator of Transportation as Assistant Regional Director in the Southwestern Region from June until December, as Assistant Regional Director in the Western Region, December to March, and as Eastern Regional Director, March until June 15. On my return to the Missouri Pacific Railroad I was assigned to special duties and given the title of Assistant General Manager in order to cover our Texas lines and served until March, 1936, when I was appointed General Superintendent of Transportation and have been in that position ever since, all of it in the operating department and having to do with train operations.

Q. In general, what are the duties of your present position as General Superintendent of Transportation?

A. The movement and loading of trains, the furnishing of equipment, passenger and freight, the allocation of locomotives to the various divisions making up the system, the making of schedules and supervising the operation of the trains over the entire railroad.

Q. You report to whom?

[fol. 377] A. The chief operating officer.

Q. Have you access to the records in the operating and accounting departments of the Company?

A. I have.

Q. Is it part of your duties to be familiar and are you familiar with the various types of locomotives operated

by the Missouri Pacific Railroad Company and with the various types of equipment, both of freight and passenger so operated?

A. Yes, insofar as the locomotives are concerned to get the most efficient locomotive on the territory where it can be operated and as to passenger equipment, that which is wanted by the people, especially our traffic people soliciting business for special parties and I have to know the types of cars and as to freight equipment, that which is ordered by the shippers of the division, people who pass it to our office for fulfilling.

Q. During your employment with the Missouri Pacific and particularly since you were train dispatcher, has it likewise been a part of your duty to know and do you know, the general types of locomotives and cars, both freight and passenger, that were in use by that Company, either through ownership or operation on its line?

[fol. 378] A. Yes, sir.

Mr. Booth: I have here a map which I will ask to have marked as an exhibit.

The Clerk: Exhibit No. 23 for identification.

Mr. Booth: Which is entitled "Missouri Pacific Railroad Company," an outline map marked Defendants' Exhibit No. 23 for identification.

Q. Mr. Kirk, does that correctly represent the railroad lines operated by the Missouri Pacific Railroad Company in the states shown in outline on the map?

A. Yes, as an outline that is very good, it covers the ten states in which we operate, into and out of.

Q. Your principal point of connection, these lines with other railroads are on what points?

A. At Alexandria on the south we connect with the Southern Pacific, Rock Island, Louisiana and Arkansas and the Texas & Pacific. At Texarkana we connect with the Kansas City Southern, the Cotton Belt and Texas & Pacific. At Omaha we connect with the Union Pacific, Northwestern, Rock Island, Great Western, Milwaukee, C. St. P. & O., M. & O. and the Illinois Central. At Memphis we connect with the N. C. & St. L., the Louisville & Nashville, the Frisco, Illinois Central and the Southern Route.

[fol. 379] Q. At Pueblo, with what railroads?

A. With the Denver & Rio Grande, Colorado & Southern

and the Santa Fe. At Kansas City we connect with ten railroads, at St. Louis with eleven.

Q. Including the eastern trunk line at St. Louis?

A. Yes, with the Pennsylvania and New York Central, the B. & O., Nickel Plate, C. & E. I., Chicago & Alton.

Q. You spoke of serving as Assistant Regional Director to the Federal Coordinator of Transportation. Was that Mr. Joseph B. Eastman, a member of the Interstate Commerce Commission?

A. Yes sir, the present chairman.

Q. Did you serve under the Emergency Transportation Act of Congress of 1933?

A. That is correct.

Q. Did you take an oath of office with the Federal Government?

A. I did.

Q. And were paid by the Federal Government?

A. That is correct.

Q. Were all of your activities while you were in such service, activities as an official of the Federal Government?

[fol. 380] A. They were.

Q. What was your first assignment and first general work as Assistant Regional Director?

A. After the passage of the transportation act, and it called for certain things, the railroads set up in each region——.

Mr. Strouss: May the record show our objection to this?

The Court: Yes.

(The witness continuing)

A. —set up in each region——.

Mr. Booth: This is all preliminary.

The Witness (continuing): —a regional board of railroad executives and through those regional boards they directed in accordance with the law a study to be made of the various terminals within their respective regions as to the feasibility and practicability of coordinating such forces and facilities without impairment to the service to bring about greater economies to the carriers. There was also set up a staff by the coordinators, of which I was a member, to assist in the making up of the studies at the various terminals throughout the territory and after the railroads had submitted their reports to the Regional Rail-

road Board, they were passed to the Regional Director [fol. 381] for his study and analysis to determine whether or not the possibilities of coordination had all been found. Then it devolved upon the Regional Director and his assistants to go to such terminals and look into them and develop whether or not the possibilities had been found, and in many instances it was necessary to call the local committee into session to develop some of the things that we did not believe had been properly brought out.

Mr. Booth:

Q. In a particular locality, what was that work called, a project?

A. It was called a project, yes.

Q. In your first assignment as Assistant Regional Director how many projects were there in your district?

A. 947.

Q. That district included what states?

A. That included from a point, including Alexandria, all of Louisiana north; Arkansas, Texas, Arizona, Kansas, Nebraska, a portion of Colorado and a portion of Missouri. The only portion of Missouri not included was Kansas City and St. Louis.

Q. And the eastern portion of Colorado, I assume, was included?

A. The eastern portion, Pueblo, yes, at Pueblo but not Denver.

[fol. 382] Q. Were these 947 projects pretty generally distributed throughout the territory you have named?

A. They were. As each project was set up, two railroads had a crossing at a certain point and they each had a station there. It was set up as a project to develop whether or not one agent or one station couldn't do all the business instead of two. So it took in some very small and some very large projects.

Q. Will you mention some of the very large projects?

A. Fort Worth, Texas; Dallas, Texas; Alexandria, La.; Little Rock, Arkansas; Pueblo, Colo.; Houston, Texas; St. Joe, Mo. I believe they were the largest in that territory.

Q. Did you visit the cities you have just named in your official capacity for the purpose of investigating and mak-

ing recommendations concerning the feasibility of the projects so-called and located in these various cities?

A. Yes, the major points, I visited all of those and at a major portion of the points I called together the local committee who had made the report and went over the report as to how they had set up the greatest possible economies from their viewpoint and then I generally [fol. 383] spent a day or two or three making observations myself as to the actual operation. The greatest tendency in the report was to consider the largest facilities of the railroads located there and many of them fell down on account of the expense that would be charged to the other lines reaching them.

Q. A matter of a line wanting to keep its place in the sun?

A. That is correct, and it was necessary to give closer observation to the capacity of the yards than anything else for the reason that the work on and with the cars after they arrived at the terminal, both for forwarding and for placements was of such importance that the railroads could run into criticism much easier by a fall-down there than through any other point.

Q. Mr. Kirk, in the work which you have just described and at the points you have either designated or referred to, did you at that time acquire a knowledge of the manner in which freight traffic was handled in and out of those terminals and on the road, including the length of trains as to the number of cars and their division into long and short trains by which the traffic so handled?

A. Yes, that was necessary. It was necessary to have [fol. 384] that information. Of course, there was a record of of it, but in order to assure myself of the fact that the record was right, I would make observations of the arrival and departure of freight trains in the various yards so that there wouldn't be any possibility of error.

Q. Will you state whether or not it was a general practice during that time you have testified and in the territory you have specified for freight traffic to be handled when and as the volume of traffic required trains of substantially a greater number of cars than seventy?

A. I do——.

Mr. Strouss: My objection goes to this evidence.

[fol. 385] Mr. Booth: I want to put in right here, if your honor please, a reference which I think applies particularly to this witness. The decision of the United States Supreme Court on the question of evidence—the decision is the case of Grayson vs. Lynch, 163 U. S. 468, 41 L. Ed. 230. An action by two private individuals in which the Government was not concerned. It was an action for loss or damage to a herd of cattle by fever claimed to have been communicated by a certain bunch of cattle from an infected herd in Texas. The Chief of the Bureau, who was in the services of the United States Government showed on the stand a familiarity of those diseases and was permitted to testify that in a particular region this fever was prevalent, although he had never been in that region, and he testified to it as the reports came to him in his official capacity. The court said, speaking of his official capacity, "In the nature of their business, in the correspondence of the department and in the investigation of such disgases, they would naturally become much better acquainted with the districts where such diseases originated or were prevalent, than if they had been merely local physicians and testified as to what came within their personal observation. The knowledge thus gained cannot properly be [fol. 386] spoken of as hearsay, since it was a part of their official duty to obtain such knowledge, and learn where such diseases originated or were prevalent, and how they became disseminated throughout the country."

Mr. Strouss: In order not to interrupt your examination, I was making the objection with the understanding that the same objection that I have heretofore made would apply to this witness' testimony.

Mr. Booth: That is perfectly agreeable, but I wanted to call the court's attention to this witness' qualifications, even though he had not been acting in an official capacity.

Q. Will you state whether as a result of your observation in your official capacity as well as in your individual capacity, it was a general practice in the terminals you have mentioned and in the territory you have mentioned to operate freight trains of substantially more than seventy cars when and as business offered?

A. That is correct. Where the business—where there is sufficient business and the physical conditions of the railroad and hauling power permit it. There were many of

these branch lines that operated very small car units and as a result they could not, but where there is business and [fol. 387] the power was sufficient to take care of it, I saw some trains that came into Lancaster and into Fort Worth with 150 cars.

Q. I refer now more particularly to the larger terminals which you have given by name, was that a general practice?

A. That is correct.

Q. During that period?

A. Yes, sir.

Q. Has that practice been continued?

A. It is continued to this day.

Q. Have you had occasion to observe the number of those terminals since?

A. Yes.

Q. Which ones?

A. Texarkana, St. Louis, Kansas City and Alexandria.

Q. Regarding your experience as a representative in the Eastern District, what would you say that was?

A. I was Director of the Eastern Region.

Q. And for how long?

A. From March 7, 1935 until June 16, 1935.

Q. During that period, how many of the so-called projects were there?

[fol. 388] A. They had at the time I left 3017 projects in the Eastern Region, which included the New England Territory. The Eastern Region took in Michigan, New York, Illinois, Ohio, Indiana, Pennsylvania, Virginia, Maryland and all of the New England States, including Maine, Vermont, New Hampshire and Connecticut, and Massachusetts, Rhode Island, New Jersey and Delaware.

Q. Would you list all of those, including the major cities in those states?

A. Philadelphia was one of the largest, New York City, Jersey, Buffalo and many of them much larger than any we have in the West.

Q. In general did you pursue the same official course in the Eastern territory that you did in the other territory, as you have described it?

A. Yes, sir.

Q. And found the same condition?

A. I found a greater volume of traffic and a greater volume of trains in excess of seventy cars.

Q. What official position in the railroad did you occupy in 1935 and 1936?

A. From June 16, 1935 until March 1, 1936 I occupied the position of Assistant General Manager of both the Missouri Pacific proper and the Texas Lines. I was assigned special work at the time and was given that title to [fol. 389] cover both territories.

Q. Did you make a special study of long-train operations on the Missouri Pacific during the Spring of 1935 for the purpose of testifying for the plaintiff, The Southern Pacific vs. Mashburn, Attorney General, which has been referred to as the Nevada train-limit case?

A. I did.

Q. At the time you made that study what was your observation as to the extent, relatively speaking, of the operation of long and short trains on the Missouri Pacific Lines and the lines connected with that system at that time?

A. The study was made more on the basis of what was taking place on the Missouri Pacific itself, and we were handling long trains at that time and they have on the average become longer since that time.

Q. What factors are determinative of the number of cars that shall be placed in a freight train, in your experience as an operating man?

A. In our actual operation it depends entirely upon the amount of tonnage available plus the necessity of maintaining the schedule. For example we have a train that is scheduled out of Kansas City at 8:30 A. M. and scheduled into St. Louis at 8:30 P. M. That is twelve hours on [fol. 390] 284 miles. If we get that train out by 9:00 A. M. we put on 125 cars. If we have to wait for some other connection we cut that to one hundred cars. The locomotive can still handle 125 cars, but the necessity of being in St. Louis in order to make the placement of perishables so that those trains can depart by 1:30 A. M., you have got to get in.

Mr. Booth: I will now offer Defendant's Exhibit 23 for identification as Defendant's Exhibit No. 23 in evidence.

Mr. Strouss: Same objection.

The Court: Same ruling.

The Clerk: Defendant's Exhibit 23 in evidence.

The Witness:

A. The black line extending from Kansas City to St. Louis is single track for 162 miles and the 284 miles is double track with the exception of the 162 miles. In other words, that curved line shows the single track and double track on the straight portion, and coming down on the east side of the river it is partially double track for 117 miles, and as we cross the river it is all single track from there to Alexandria. We branch out at the heavy line, that is single track, and it is only 35 miles of the line between Poplar Bluff and Little Rock that is double track [fol. 391] and 29 miles of the line between Little Rock and Texarkana is double track, the balance all being single.

Q. What is the mileage between Poplar Bluff and Little Rock?

A. One hundred and seventy-nine miles.

Q. And between Little Rock and Texarkana?

A. 136 miles.

Q. Over the line between Poplar Bluff and Texarkana, does your Company at the present, and has it for some time past, constantly operated trains of substantially over seventy cars in length when and as the traffic offered?

A. They have and do at the present time.

Q. And as to the line you described between Kansas City and St. Louis?

A. The same applies there. We have four trains a day between those points and there are three of them that never have less than one hundred cars.

Q. And between East St. Louis and Alexandria?

A. That is a territory that comes out of St. Louis and operates through with a train of empties of 125 cars. That is based entirely on the siding capacity between Parragould and McGehee.

Q. On a single-track road does the capacity of the siding control the length of the cars?

A. They do in some districts. In other words, if you've [fol. 392] got 80-car siding track and handling 125 cars, you only want 125 cars on the one direction, you would be limited 85 cars on the other.

Q. As to the line between Pueblo and Kansas City, is that single track?

A. That is a single track road.

Q. Do you classify that as a main line?

A. Yes, sir.

Q. Do you constantly operate more than seventy cars?

A. East bound, yes, West bound, no. East bound we handle our average train that is taking care of the perishables originating in northern California, which come to us through Pueblo, and our average length runs between 75 and 80 cars. That is also dependent upon the time of the arrival of connections, because there is very little originating business at Pueblo.

Q. Is that average due to the volume of traffic?

A. To the grade line and in some instances due to the volume of traffic. It is 627 miles and we will give them up to 80 cars if they can get out by 3:30. If the connections are late and they can't get out until 5:00, we have never felt that we should make that run in less than nineteen [fol. 393] and one-half hours.

Q. Does that limitation apply partly by reason of the grade and partly by the connection or character of locomotive power?

A. It was then controlled up until, I would say, the first of the coming month by the motive power, and due to some bridges; but they expect to have them all increased in strength by the First of December and at that time we will put locomotives out that can handle 85 cars.

Q. What other factors go to limit those trains except the ones that you have mentioned.

A. That is all.

Q. Is your line between Omaha and Kansas City that is shown on this exhibit classified as main line?

A. It is.

Q. And is it your practice to operate trains of substantially more than seventy cars?

A. It is between Kansas City and Atchison. That would be the first line branch out to the right. And from there there are very severe grades and they handle 115 empties, but west-bound we very seldom get more than 71 or 72 cars.

Q. You have a number of branch lines on your road? [fol. 394] A. Yes, over 30% of our railroad is branch lines.

Q. What class of communities do they serve?

A. With the exception of those in Arkansas they all serve agricultural.

Q. Is it your practice to operate trains longer than seventy cars along those lines?

A. No, because we do not have the business and never have had, and in addition they have never been fixed up for heavier power. About the maximum train that we can handle runs around 45 to 50 cars. There isn't sufficient future that we can see to that country to justify any expenditure for bridges, and that is what it would mean, because we have heavy rails out on those lines.

Q. Those are the feeder lines of the main line?

A. That is correct.

Q. Calling your attention to the document that was identified by Doctor Parmelee in answer to questions by myself, statement No. 39200 of the Inter-state Commerce Commission, at page 98, line 79, Missouri Railroad Company, that is the title of your company, is not not?

A. That is correct. It happens to be in the hands of the Court at the present time.

[fol. 395] Q. Column 276 gives the average number of freight cars per freight train, exclusive of the caboose for the years 1936, 1937, 1938, and for the year 1936 it is 44.7 cars, for the year 1937 45.1 cars, and for the year 1938, 46 cars, I will ask you whether those average figures as they are given are typical of what you consider to be your representative freight train on the Missouri Pacific?

A. I would say that is typical of the average cars per freight train mile on the road. There isn't any question on that. To bring that out it would run into a question, take first, we have three branch lines where we have discontinued except tri-weekly freight service. All of the mail, baggage and express are shipped by truck, and we run the train out there three days a week. Those are counted as trains and counted as train miles, and we are obligated to run three days a week if we only handle the caboose. That is under the orders of the Inter-state Commerce Commission. That goes in to make the average of 46 or 47 average of cars. Those kind of operations show that, the 46 cars as shown in 1938, is an average number of cars per train mile, but it doesn't mean the smallest train or the largest.

[fol. 396] Q. Getting at it in another way, you said about 30% of the mileage is the branch-line mileage, do the seventy-car trains run to any extent on the branch lines?

A. There isn't any on the branch lines. They are all on the main lines, because we haven't sufficient traffic to build up seventy cars.

Q. But the branch line trains get into the average just the same?

A. Yes.

Q. What is the character of the country traversed by the lines of the Missouri Pacific?

A. Outside of one crossing of the Ozark mountains in Missouri, I would say somewhat level down in Arkansas. We have a fairly even grade line. We have some 2% grades in the Ozarks. Up in Colorado we have 1.18% grades, and on the Omaha division we have as high as 1.45% line grades.

Q. Are any of your freight trains operating on any of this territory?

A. Yes.

Q. Your grades average approximately how much?

A. 1.18%.

Q. What do you understand the term "ruling grades"? [fol. 397] A. It means the grade that governs the largest amount of traffic that you can move over that particular grade.

Q. The grade on which the locomotive has to exercise the greatest effort?

A. Yes.

The Court:

Q. In other words it is the maximum grade on that particular line?

A. Yes, the maximum grade on that particular line.

Q. There may be short grades possibly which are greater than the ruling grade, but the ruling grades are those which control the tonnage?

A. That is correct. The grades you have reference to are momentum grades.

The Court: We will take our evening recess at this time. The Court will be at recess until 10: o'clock tomorrow morning.

[fol. 398] November 27, 1940. 10:00 A. M.

All parties being present as heretofore noted, proceedings were resumed as follows:

W. T. KIRK, a witness called on behalf of the defendant, resumed the stand and testified as follows:

The Court: You may proceed, gentlemen.

Mr. Strouss: If the court please, before proceeding with the taking of testimony, there is one matter in the record I would like to straighten out. I appear to have made an admission, which I certainly did not intend to make. In the statement to me, in handing these papers to me, Mr. Mason, I notice as to the sheet for September, 1940, the statement is, "that shows official entries". I do not know whether those are official entries or not. The sheet, as I think Mr. Mason will agree, is the form for making reports to the Commission, and there are certain entries in lead pencil on it. What those entries are and who put them there I have no information, and I don't want to be taken as admitting that they are official records.

Mr. Mason: What page is that?

Mr. Strouss: 374.

[fol. 399] The Court: Well, the record may show the statement this morning.

Mr. Mason: Mr. Strouss, perhaps we could satisfy you for the record of the official character of those so that you would be willing to make the same admission. Perhaps you would prefer to have us call a witness for that purpose. But I would like to discuss the matter with you during the recess.

Mr. Strouss: That is all right.

Mr. Booth: I will ask Mr. Mason to proceed with his direct examination.

The Court: I take it there is no objection to that?

Mr. Strouss: No objection.

Mr. Mason:

Q. Mr. Kirk, I think near the conclusion of your testimony yesterday you were testifying as to the operation of your trains in various territories and as to the grades that are encountered in some of these districts. Do I understand that you have grades as high as 2% on main lines on the Ozark mountains and in southern Missouri?

A. That is correct. Our main line passenger line. We operate very few freight trains over that line.

Q. You have grades as high as 1.45% on the freight line [fol. 400] between Kansas City and Omaha?

A. That is correct.

Mr. Strouss: Of course, this testimony is all subject to my objection that the records are the best evidence?

The Court: Objection overruled.

Mr. Mason:

Q. Do you have any territory in the districts you have referred to where you use more than one locomotive?

A. We use a helper locomotive out of St. Louis west and into St. Louis from the west, a distance of six miles east bound and twelve miles west bound. We use a helper between Osawatomie and Wagstaff, Kansas. That is on east bound. We use a helper between Atchison, Kansas, and Shannon, Kansas, west bound on the Kansas City to Omaha line, and east bound from Falls City, Nebraska, to Hiawatha, Kansas. In addition we help out of the yard at Falls City, Nebraska, west bound with a yard engine, and help out of Omaha east bound with a yard engine. Then on the main line between St. Louis and Little Rock, or St. Louis and Poplar Bluff, where we have the 2% grade with any passenger train over eleven cars we help from Bismarck, Missouri, to Piedmont, Mo., a distance of about 40 miles on account of mountain grades in *in* both directions.

[fol. 401] Mr. Strouss: In calling attention to my objection the last time I just stated the one ground. Of course, I intended my objection to be noted on all the grounds that we have heretofore stated.

The Court: Yes.

Mr. Mason:

Q. Does the Missouri Pacific have in its agreements with the trains of its Brotherhoods the rule relating to double-heading which has been previously testified to in other testimony?

A. It does.

Q. You are generally familiar with the agreement in effect in the western territory in effect between the railroad companies and the Brotherhoods, are you not?

A. Yes.

Q. And is that helper rule or double-header rule a standard rule in territory west of the Mississippi River generally?

A. An agreement, a standard agreement.

Q. Are you familiar with the code of operating rules of the Association of American Railroads?

A. I am, and the Missouri Pacific has adopted that code. [fol. 402] Q. And your operating rules governing the movement of trains generally conform to the Association Code, do they?

A. They do, in fact we have just made up the book rules effective November 1, 1940, and so many of the standard rules, in fact all of the standard rules adopted by the American Association of Railroads which are adopted by the Rock Island and the St. Louis and Southwestern Railroads are incorporated in it, so that we got out a joint book of rules that governs the three lines.

Q. Mr. Kirk, are you familiar with the character of traffic handled by the Missouri Pacific, as to its classification, as between perishable and manufactured products, products of agriculture, products of mineral or other products and so forth?

A. I am.

Q. Does the Missouri Pacific handle any substantial volume of agricultural products?

A. Yes, the Missouri Pacific traverses an agricultural territory. During the months of June and July up to the 14th of August, this year, we loaded over 12,000 cars of wheat on the Missouri Pacific. In addition to that we have corn, move all of it that isn't milled. We originate perishable freight in our Colorado territory and our Louisiana [fol. 403] territory. We originate the products of mines in the Ozark territory of Missouri and in the southeastern Kansas territory, for instance, in the lead field. We originate coal in Arkansas, Illinois and Kansas.

Q. Do you participate in any petroleum products traffic?

A. To a considerable extent. We have fourteen refineries on the railroad.

Q. Do you reach the producing fields there directly or through connections in Oklahoma, Arkansas, Lousiana and Texas.

A. Yes, we do.

Q. And southeastern Kansas?

A. That is correct.

Q. Does livestock transportation constitute any substantial part of the traffic handled by the Missouri Pacific?

A. I would say in recent years it has diminished to a considerable extent, but about 1½% of our traffic is livestock moving to the markets, the Eastern markets.

Q. Does the Missouri Pacific Railroad or through its connections, serve any important livestock producing areas?

A. Well, indirectly we get livestock from the New [fol. 404] Mexico, Texas, Arizona territories and points west where it moves into the Eastern markets. Through our connections we originate considerable livestock in Louisiana, Kansas and Missouri.

Q. Now, as to the perishable traffic, and I refer particularly to vegetable products rather than meat, does the Missouri Pacific participate in the handling of perishable traffic originating in the Mountain and Pacific territory?

A. They do, to a considerable extent, through the Pueblo and Texarkana gateways. We are a party to through schedules through points originating in the far west, California and Arizona, and such points to the Atlantic Seaboard.

Q. What particular areas of production originate traffic which you receive at the Texarkana gateway?

A. That through the Imperial and Salt River Valley and Southern California.

Q. Does that include the Arizona production?

A. The Salt River Valley is included as in Arizona.

Q. Do you handle perishable products originating in south Texas?

A. Oh, yes, in the Rio Grande Valley as well as the San [fol. 405] Antonio and Laredo area.

Q. Where does that reach your lines?

A. That reaches us through Texarkana, the Rio Grande Valley both through Texarkana and Alexandria, the major portion through Alexandria. We handled 89,000 of perishables in 1939 through the connections, not originally, but through connections.

Q. Do you include in that fresh meats and perishable products as well?

A. No, just perishable fruits and vegetables.

Q. Do you participate in the handling of fresh meat and dairy products as well.

A. To a considerable extent through the packing industries at Omaha, St. Joe, Kansas City, and the East and Southeast.

Q. As Superintendent of Transportation have you become familiar with the schedules for the handling of freight in which the Missouri Pacific participates?.

A. I make them for our railroads.

Q. Will you say whether or not your company joins with other carriers in offering schedules for the handling of freight from and to the points of production and consumption?

A. We do. I happen to be chairman of the Southwestern Advisory Schedule Committee, which has the making up of [fol. 406] the schedules through the St. Louis, Omaha, Kansas City, Memphis, New Orleans, Texarkana, Pueblo and Alexandria gateways.

Q. Do you know, and if so, will you state whether the Southern Pacific is a party to any schedules with the Missouri Pacific?

A. They are, on the schedules through Texarkana and Pueblo.

Q. And those are the schedules which relate to the handling of freight east and west bound from northern as well as southern California?

A. That is correct.

Q. Do those schedules also relate to the handling of traffic originating in Arizona, as well as moving across Arizona?

A. They do.

Q. Do they relate to the handling of traffic destined to Arizona?

A. They do.

Q. Do I understand these schedules apply not only east bound but also west bound between Arizona and Eastern points?

A. That is correct.

Q. Can you state when these east and west bound schedules were first formed and what the development has been? [fol. 407] A. The east bound schedules were set up some time, as I recall it, in 1924 and 1925. That is when all of the railroads west of Chicago and west of St. Louis took on the agreement between the amount of time they would operate in connection with the—based on the miles of rail-

road involved. At that time the east bound schedules were 146 hours to Chicago.

Q. From what point?

A. From Roseville, a concentration point, which has been subsequently cut to 139 hours with a 16-hour run-off, making it about 123 hours at the present time.

Q. Roseville, California, I believe is shown on Defendant's Exhibit No. 1?

A. That is correct. That is a concentration on the Southern Pacific.

Q. That is a Northern California concentration point?

A. That is a Northern California concentration point.

Q. Has a similar schedule been maintained through, over the southern routes from Southern California concentration points?

A. That is correct.

Q. And what is the Southern California concentration [fol. 408] point on the Southern Pacific, if you know?

A. I think it is Bakersfield. I am not sure about that.

Q. That schedule applies in connection with movements across Arizona and via El Paso to the East?

A. Yes.

Q. What is the route over which this traffic moves after reaching El Paso and in order to reach your line at Texarkana, as I believe you mentioned?

A. It moves over the Texas and Pacific.

Q. That is a direct line across Texas from El Paso to Texarkana?

A. Yes, that is correct.

Q. Passing through Ft. Worth?

A. Passing through Ft. Worth, and the Santa Fe comes into Ft. Worth for some of the Southern California business, and they make deliveries there to us. The same schedule is maintained by all of the routes.

Q. Does that include the route of the Santa Fe through Northern Arizona? You say the same schedule is maintained?

A. Well, the same schedule is maintained over all of the routes to the Mississippi River crossing point.

[fol. 409] Q. Do similar schedules apply to traffic originating in the state of Arizona and moving to these Eastern destinations?

A. Yes.

Q. With allowances for the shorter haul?

A. That is correct.

Q. For example, does traffic originating in the neighborhood of Yuma and concentrating there have a schedule under which it would move?

A. That would be a fifth evening arrival at St. Louis compared with a sixth evening arrival at Bakersfield, sixth to St. Louis.

Q. And traffic originating in the neighborhood of Phoenix in the Salt River Valley, would that likewise move on a similar schedule?

A. When that season is open, a special schedule is put on by the Southern Pacific, Texas Pacific and the Missouri Pacific through St. Louis and Memphis. That is a fifth morning arrival at those points.

Q. That is approximately twelve hours less than the Yuma schedule?

A. That is correct.

Q. Or 24 hours less than the Bakersfield originating schedule?

[fol. 410] A. That is correct.

Q. Are you familiar with the station of Colton in California as shown on the map, Exhibit No. 1?

A. I am not familiar with it. Where is it located?

Q. Colton is about 58 miles east of Los Angeles.

A. Well, we maintain a block, a Colton block through both the gateways through Kansas City and the connection with the Rock Island, Santa Fe and Union Pacific, and through Texarkana over the Texas & Pacific.

Q. And I take it that the schedule that applies from Southern California, applies to the movement of this Colton block?

A. That is correct. It has a regular Colton block schedule.

Q. Do your schedules operate in connection with schedules of railroads east of the Mississippi River or Chicago?

A. Yes, from St. Louis, the Pennsylvania, Baltimore & Ohio, the New York Central and Nickel Plate, for the far east, and the Wabash and the Alton and the C. & E. I. for Chicago. They all operate on the 1:30 A. M. delivery of all of this traffic for the advertised delivery at the Eastern destinations. Now, on the Wabash and C. & E. I. and [fol. 411] the Alton to Chicago, they operate to make the same arrival at Chicago as the operations through Kansas City and Omaha gateways.

Q. You mean from those gateways direct to Chicago by the Missouri Pacific Lines?

A. That is correct.

Q. Now you say these schedules are maintained. Are they advertised or otherwise made public for the information of shippers?

A. They are extensively advertised by the traffic department of the railroad in order to secure the movement of the business via the respective lines, and are maintained. I might explain this maintenance. The reason for maintaining the schedule is that there is an agreement between the railroads, on a definite cut-off time at any of the junction points—take St. Louis, for example. At 1:30 a.m. if you don't deliver the freight by 1:30 a.m. that means that if it is delivered at 1:31 a.m. the Missouri Pacific assumes any claim that may come up on account of the failure to make these schedules and as a result of the failure of the deliveries to make the connections at the Kansas, Mississippi and Missouri River crossings we make our schedules 90 per cent of the time because we don't care to assume those claims.

[fol. 412] Q. You speak of claims. Do I understand that the railroads not only advertise these schedules to the shippers and owners of freight, but claims may arise because of failure to comply with those schedules as to delivery?

A. That is correct, that is when the claims are claimed, when we fail to comply with the schedule we advertise and guarantee.

Q. Would such claims include claims because of a decline in price and subsequent loss on account of failure to make delivery on an agreed and intended day?

A. The basis of the claim would be the failure of the carriers to give the guaranteed delivery as scheduled, yes.

Q. Do claims ever arise because of spoilage due to additional time in transit?

A. I presume so, because when we do miss out on a car, they generally have a claim for it. I have never seen the claims, but they always tell me how much they had to pay out because of my failure to give the guaranteed schedule.

Q. Then I take it that any schedule failures come right back to the Superintendent of Transportation?

A. They do. Some of the traffic boys seem to think I [fol. 413] do it personally.

Q. What is the character of the west bound traffic handled to transcontinental destinations by way of the Missouri Pacific?

A. It is practically all manufactured goods and there is a very heavy movement of automobile parts that go through the assembly plants in the far West, and manufactured goods of all kinds.

Q. Does that include manufactured goods destined to Arizona as well as beyond Arizona?

A. Oh yes, Arizona and the West.

Q. Do you know, and if so will you state whether schedules are maintained for the west bound movements of this character of freight?

A. Yes, the same as East bound, on the basis—well, on the same basis. The delivery is set up from the far Eastern points to all destinations in the West as to the exact time.

Q. Is this character of freight sometimes referred to as "manifest freight"?

A. Yes, it is all manifest freight now.

Q. I take it that your coal and crude oil perhaps may not be handled as manifest?

A. Well, some of the complaints you get, if you lay it out for 8 or 10 hours, would indicate they want it for breakfast, or take brick, for example. I might say that a certain [fol. 414] party had a contract for the construction of a brick building in Kansas City, and the brick were loaded at Ft. Scott, Kansas, the night before and they had to be placed at this building before 7:00 the following morning. But they would truck it so we placed it.

Q. Now, when were the west bound schedules first inaugurated, if you know?

A. I could not say just when, but I think about the same time that the east bound schedules were arranged. We have had greater expedition on those schedules in the last year than we had before. They have been materially reduced. In other words, there has been approximately a day taken off between Chicago and the California points. Of course, trains out of Chicago handle your intermediate business.

Q. In so far as your lines are concerned do you know what percentage of scheduled performance is made in this west bound movement?

A. In the neighborhood of 90%.

Q. Have you been supplied with copies of Exhibits No. 3 and 4, 5 and 6?

A. I have been supplied with Exhibits 2, 3 and 4.

Q. 2, 3, 4, 5 and 6?

[fol. 415] A. Yes, I have.

Q. Are you familiar with freight equipment owned and operated by the Missouri Pacific?

A. I certainly am. That is one of my main duties, to know the kinds the people want and supply them.

Q. Are you familiar with the equipment owned and operated by the Missouri Pacific during period since 1900 and particularly since 1912?

A. Well, I am acquainted with all of the equipment that we have had on our railroads since 1901, more so since 1917 when I was first appointed as Superintendent. I have seen all of the old 30-ton cars, but as a matter of fact, up until 1923 we did not have, but very few 40-ton cars on the railroad. They were all 30-ton cars of wood construction, and for revenue service at the present time all of our equipment, some 29,000 cars are either steel under frame——

Mr. Strouss: Now, if the court please, this testimony is certainly to matters of record and from which he could only get information from the records.

Mr. Booth: We submit, if the court please, that the Superintendent of Transportation of a railroad——

[fol. 46] Mr. Strouss: I would like to ask——

Mr. Booth: Pardon me.

Mr. Strouss: ——a question or two on voir dire.

The Court: You may.

Mr. Strouss:

Q. Mr. Kirk, you don't intend to say that you personally see every car on your railway, on your system to examine it to determine whether it is steel under frame or it is steel throughout, every type of improvement on that car; or do you take that from the records of your Company?

A. Well, I don't see them all, Mr. Strouss, but I do know the types of equipment that we have on the railroad. I must know for the reason that those are ordered. For

example, at the present time there is a greater demand for the larger capacity cars. I must know how many they have.

Q. How do you get that information?

A. Why, when we make up the building program and the re-building program, that is always submitted to me and I am asked what kind of cars we want. Now, as to the construction, the only thing is, I say we don't want any steel center sills or any wooden cars, but all the car construction on the Missouri Pacific is submitted to me, all the re-building program, the type of car.

[fol. 417] Q. When they are built and the cars are delivered then they come to you as a record of the Company, as to what they are actually?

A. The cars come and also the record of them come, yes.

Q. That is where you get your information as to what the actual cars are that are owned by the Company?

A. Well, I would say yes, but we must know just how many we have of the different types.

Q. And when you have cars go into the shops for repairs, what repairs are put on those cars, the information as to that you get through the records of your company, isn't that true?

A. Yes, but when they go in I tell them how high I want them and how wide I want them. I don't tell them just how they will be constructed, but I will say we don't want anything but steel under frame with a wooden superstructure, and if it is an all steel car, it must be all steel.

Q. But the car, after it leaves the shop, the condition it is in, that information comes to you?

A. It comes to me from the shop superintendent that it has been built that way.

Mr. Mason: Now, if the court please, I submit that information which the witness acquires in the regular course [fol. 418] of his duties and which is necessary for him to acquire in order for him to perform those duties at all, is a proper subject of this testimony.

The Court: I think so. Objection overruled. Go ahead.

Mr. Mason:

Q. Now, Mr. Kirk, do you make frequent trips over the Missouri Pacific System in the course of your duties?

A. I do, I am out on the road two thirds of the time.

Q. And has that been necessary as a part of your duty ever since you have been an official of that company?

A. That is correct.

Q. Do you ever, while making such trips, have occasion to see the types of equipment being used by the Missouri Pacific in their freight trains?

A. Yes, both the Missouri Pacific and foreign line equipment.

Q. That would include not only company-owned, but also equipment coming to the Missouri Pacific?

A. Moving over the railroad under the per diem payment.

Q. Now, without addressing yourself to details, state whether or not the general development of the Missouri [fol. 419] Pacific equipment has tended toward stronger, larger cars with a greater percentage of steel construction, somewhat as indicated on Exhibit No. 2?

A. It has been, yes.

Q. Does the Missouri Pacific now operate any substantial number of wooden under frame cars, to your knowledge?

A. The Missouri Pacific at the present time has sixty-nine center sill cars, wooden, in revenue service that are rack cars hauling pulpwood between the local points and the paper mill at Bastrop, La. The balance of our cars are either all-steel or steel underframe, 2,947 in local service at the present time.

Q. Those move over interchange lines, do they not?

A. They do.

Q. Does the Missouri Pacific handle cars owned by other companies or by private companies?

A. They do.

Q. Does that include cars of the Pacific Fruit Express Co.

A. That is correct.

Q. Will you say whether or not the Pacific Fruit Express Co. cars are handled by you in substantial volume? [fol. 420] A. They are, in substantial volume, yes, coming from Northern California especially.

Q. Have you received any PFE cars carrying products loaded in Southern California or Arizona, or moving through southern gateways?

A. Yes, we do.

Q. Does the Missouri Pacific have refrigerator cars of its own ownership?

A. The American Transportation Co., The American Refrigerator Transportation, A. R. T. Co. is owned by the Missouri Pacific and the Wabash. They have some 17,000, and we use those on our railroads as extensively as possible. Of course, we are always subject to the shippers demands as to the kind of car they want.

Q. You have observed these A. R. T. refrigerator cars, have you?

A. Yes.

Q. And likewise the Pacific Fruit Express Co. cars?

A. Yes.

Q. Are the A. R. T. cars of similar type to the PFE cars?

A. They are.

Q. Used for substantially the same purpose?

[fol. 421] A. That is correct.

Q. Are you familiar with the passenger train equipment owned and used by the Missouri Pacific?

A. I am.

Q. Is that part of your duties as General Superintendent of Transportation?

A. It is.

Mr. Strouss: Of course, our objection is going to all of this.

The Court: Yes.

Mr. Mason:

Q. And in the course of your duties in that position have you become familiar with the general type of construction of the Missouri Pacific passenger train cars?

A. I have. We have 457 steel cars and 51 steel under frame passenger cars at present.

[fol. 422] Mr. Mason:

Q. Do you operate any passenger train cars of wooden construction?

A. No, we do not.

Q. Have you familiarized yourself generally with exhibit No. 4?

A. I have.

Q. Will you state whether or not the developments on Missouri Pacific passenger train cars particularly since 1912 has been along the same general lines as indicated by that exhibit?

A. That is correct.

Q. Do you operate on your lines any of these types identified as being placed in service in 1937 and 1939, these so-called articulated and streamlined units?

A. We haven't any of the articulated. We have the streamlined cars, two trains operating between St. Louis and Omaha and we have another one that will be delivered within a short time to operate in the South.

Q. That is a Diesel electric operated streamlined train?

A. That is correct.

Q. Especially built for that service?

A. Yes, sir.

Q. I think in your initial qualifications you also stated [fol. 423] that in your position you have to do with the assignments of locomotives?

A. That is correct.

Q. In the assignment of locomotives do you become familiar with the construction and particularly the capacity of your locomotives?

A. Particularly the capacity and the construction, yes.

Q. I take it that it is necessary in order that the assignment may be intelligently carried out?

A. That is correct.

Q. Will you refer first to defendant's exhibit No. 5 which relates to freight locomotives.

A. On the ten wheel type 4-6-0, we have one of those left on our road.

Q. I think you have exhibit No. 6.

A. I beg your pardon. The 2-6-0 type, we have 62 of those locomotives on our line, they are used principally on branch lines.

Q. Are your Moguls of the 2-6-0 locomotives all about the same hauling capacity expressed in tractive power?

A. We run from twenty-four thousand up to twenty-nine thousand pounds of the 4-6-0. However, we don't call them Moguls, we call them Consolidations. On the Consolidations [fol. 424] the 2-8-0s, we have 234 of such locomotives with tractive effort running from 33,000 to 43,600. On the Mikados we have three classes of those, what we term the

1200, 1300, and 14-1500. The tractive effort of those runs from 54,725 to 68,675 pounds.

Q. Apparently somewhat larger than the Mikados depicted here?

A. That is correct. The 2-10-2s, we call these the Santa Fe type on our railroad and we have 28 of those that the tractive efforts runs from 72,300 to 81,600. Then we have eight of those with what we call a booster on them that handle 111,000 pounds of tractive effort. Those are used in the Omaha division exclusively on account of the severe grades up there.

Q. These locomotives other than those which have the addition of the booster correspond I take it to the 2-10-2s shown on this exhibit?

A. That is right. In addition we have 20 locomotives of the 2-8-4 type which are called the Berkshires. They have a tractive effort of 69,400 pounds. Those engines are now going through the shop and being supplied with a 75-inch driver to permit of a dual passenger or freight service. When they come out they will have a tractive effort of 71,100 pounds.

[fol. 425] Q. You say those are on 2-8-4 wheeled engines?

A. Yes, sir.

Q. And don't correspond exactly to anything shown on this exhibit.

A. That is correct.

Q. Are these larger locomotives, the 2-10-2, the Berkshires and the larger Mikados of which you have spoken recent acquisitions?

A. All of these have been purchased since 1924, that is the large Mikados and the Berkshires and the Santa Fes.

Q. Will you turn to the passenger locomotive exhibit No. 6. I think you started to refer to the 10-wheeler type.

A. Yes, we have one of those left, used on a branch line. Of the second class we have, the Pacific type is the next we have twenty of those of around 30,000 tractive effort and we have 76 second-class Pacifics 4-6-2 with 47,000 pounds tractive effort. Then we come to the Mountain type we have 26 of those that run from 63,000 tractive effort to 67,000, I say 67, that is on some what we have just rebuilt which have been equipped with roller bearings and gadgets, all the latest gadgets on it and instead of running 284 miles on the trip we run them 672 miles.

[fol. 426] Q. Those runs of 672 miles must take you across more than one state?

A. Oh, yes, take us through Missouri, through Kansas, almost within twenty miles of the Colorado line.

Q. In operating or making up the runs of your freight and passenger locomotives do you pay any particular attention to state boundaries?

A. None at all.

Q. You have no locomotives in passenger service I take it that correspond exactly to the Golden State type shown here?

A. No, the closest we have is the Mountain type with the 4-8-2.

Q. I think you mentioned that they have a tractive effort of some 63,000 pounds or more?

A. That is correct.

Q. Which would correspond in capacity to the Golden State?

A. Yes.

Q. Did you state whether these passenger locomotives as to the larger types were recent acquisitions?

A. We had 16 in 1925 and the other 10 in 1928.

Q. You spoke of having them rebuilt?

A. Yes, all of the smaller Mountain type, the 63 thousands are all being rebuilt at the present time, increasing [fol. 427] their steam pressure, the size of the wheels and equipping them with roller bearings.

Q. Mr. Kirk, do you know whether or not there are full crew laws in any of the states in which the Missouri Pacific operates?

A. Yes, we have them in Arkansas and Nebraska. In Nebraska over five cars in a passenger train you put the second man on. However, there is a recent court decision instituted in the state has permitted that second man to be a train porter rather than a brakeman. Then you have a freight train limit calling for a third brakeman on a local freight run extending over one hundred miles.

Q. A local freight run?

A. A local freight run, but I don't believe any of the railroads in Nebraska run them one hundred miles. In Arkansas we have a third brakeman for each train over 24 cars. It could be two hundred cars after it reaches the twenty-fourth but after the twenty-fourth car you must add the third brakeman and he applies only within the state.

We have one operation where we make up the train at Van Buren, Arkansas, or have one coming into Van Buren, Arkansas, a division point, that traverses 161 miles of its route in Kansas and Oklahoma and the third brakeman is put on for the additional five miles in or five miles out. [fol. 428] We have to stop the train at Greenwood Junction in order for him to board the caboose and get off the caboose.

Q. Otherwise your operations from Missouri down into Arkansas, you add the third brakeman at the state line?

A. That is correct and we have that the same eighteen miles out of McGehee, Arkansas. We can haul 125 cars with the third brakeman 618 miles and we stop and let him get off and if we come along with more than 24 cars he gets on.

Q. Do you observe any standard requirement as to crews of freight trains in Missouri, Kansas, or Oklahoma.

A. The only observance we have is an agreement with our men where we have a local freight train or a short load train, that we will provide the third brakeman. The short load train, there has been an agreement, we have taken the less than carload merchandise off the trains and put it into motor vehicles for distribution. Consequently we run what we term a short load train if we have any short loads. It is quite possible at times there is only one or two within the distance between these terminals and some through freight train can take care of that traffic and we are sub- [fol. 429] ject to no penalty unless the switch is as much as two hours. If he switches as much as two hours in doing that kind of job they are paid the local freight rate of pay instead of the through freight rate of pay but on the regular through trains that way there are only two brakemen.

Q. You just use a head and rear brakeman?

A. Yes.

Q. Conductor, engineer, and fireman?

A. That is right.

Mr. Stross: Now we are having by oral testimony the contents of an agreement brought in here.

Mr. Mason: But the witness being the superintendent of transportation certainly knows the conditions which effect his operation as the superintendent.

The Court: He seems to.

Mr. Strouss: He may know the conditions but I submit that still does not permit a violation of the best evidence

rule, where the contents of an agreement are sought to be put in evidence that the agreement itself is the best evidence.

Mr. Mason: I think the gist of the testimony was what the company does by reason of the agreement rather than what the agreement requires. At least that was the pur-[fol. 430] pose.

Q. I think you have stated, Mr. Kirk, that you make frequent trips over the railroad lines?

A. I do, very frequent.

Q. Do you make those trips exclusively on passenger trains?

A. No, I make them on all kinds of trains, freight trains, mixed trains, and passenger trains. Most of the trips made—it depends upon the urgency of my being at a certain point. Some places the urgency requires it to be made on a freight train on account of the connections at various points on the line. I make a number of trips; only last week I made a trip of 323 miles from Winn, Arkansas, to Alexandria, Louisiana, on the rear of a freight train, my office car attached behind the caboose.

Q. I will ask you whether you are able to select the freight train upon which you are to ride?

A. Well, I can always select it, it depends on when I want to leave and when I want to get there, if we have one going at that time, but if you have any reference to reducing the number of cars the answer is "No." I just say I want to go out on No. 65 or No. 61, they put me on that particular train.

[fol. 431] Q. Do they consult you how many cars they shall put in the train before putting your business car behind the caboose.

A. They do not.

Q. You spoke of a recent trip from Winn to Alexandria with your business car attached to the train. How many cars were in the train?

A. We had 101 loads and the caboose and my car making a total of 103 cars.

Q. Did you travel in that fashion behind the 101 freight cars and the caboose for the 300 miles or more?

A. I did.

Q. Have you made other trips this year with the business car behind the freight train?

A. Oh, yes, we have reduced our passenger service on many of the lines so that there are left only the night passengers, and such as that. I want to see the railroad in the daytime, see the cars at the various stations, visit the terminals, I ride the freight trains in order to do that.

Q. Have you ridden behind trains of more than 70 cars during the course of this present year?

A. Oh, yes, many of them, 96, 86, some less than 70, some high as I mentioned, 103 cars including my car and the caboose and I want to say that I got some better rides on [fol. 432] those freight trains than I did on the passenger trains.

Mr. Strouss: I object to that, Your Honor.

The Court: Yes, objection sustained, the last part may be stricken.

Mr. Mason: From "I want to say"——

The Court: Yes.

Mr. Mason:

Q. What is the character of the territory between Winn and Alexandria over which you rode?

A. From Winn to Riverton, Louisiana, generally rolling and from Riverton—that is about 90 miles—very undulating, up and down, through the hills around the Red River and the Washita River.

Q. Are you familiar with the circumstances which govern the length of the trains operated by the Missouri Pacific?

A. Yes, it is volume of traffic and the schedule requirements, we generally have the proper locomotive to handle the business.

Q. Do siding lengths enter into the picture at all?

A. They do in certain instances, yes. They don't enter into it if there isn't any train interference. With the limited number of trains it is just the same as a double track.

[fol. 433] Q. From your observations of the Missouri Pacific system will you say whether or not you have any automatic block signals on your main line?

A. Yes, we have our entire line from Texarkana, from Alexandria through Little Rock to St. Louis, St. Louis to Pueblo, Kansas City to Omaha, Kansas City to Coffeyville. We have about 2,612 miles of signals at the present time and that does not include 375 miles of centralized traffic control.

Q. Do you know, and if so, will you state what the standard weight of rail is on your main line?

A. The present standard on the primary main line is 112 pounds.

Q. Do you use any heavier rail on curves?

A. Very little.

Q. Do you have speed limits governing the operation of freight trains, I mean other than those which may be applied particularly at curves?

A. We have restrictions at various parts of the territory. It depends upon the curvature. We have in the past few years reduced our curves in many places in order to facilitate better riding but we have a freight train speed limit from Pueblo, Colorado, to Kansas City of 55 miles an hour. Passenger train speed limits from Pueblo to Hoisington, Kansas, is 85 miles an hour and from Hoisington to Kansas [fol. 434] City, 75. Between St. Louis and Kansas City, 75 miles an hour, in fact St. Louis to Omaha. From St. Louis to the bottom of the Piedmont we have a maximum of 60 miles an hour, that is due to very severe curves.

Q. These are passenger trains?

A. Yes, freight trains, 45 in that territory. From Piedmont to Texarkana the maximum speed allowable is 75.

Q. Is there a maximum speed for freights?

A. Freight trains, 50. On the streamlined trains which we call the Eagles on the Missouri Pacific they are permitted to run ten miles above the allowable speed of the steam trains.

The Court: We will take our morning recess of ten minutes at this time.

Thereupon a short recess was taken after which proceedings were resumed as follows:

The Court: You may proceed, gentlemen.

Mr. Mason:

Q. Mr. Kirk, you mentioned a trip from Winn to Alexandria with a through train. Will you state for the record the other trips, if any, made during the current year by you in your car behind through trains with the distance and the number of cars in the train?

A. I don't recall all the trips I made but I did make a [fol. 435] trip from McGehee to Alexandria, that is 190

miles with 77 cars; Hoisington, Kansas, to Osawatomie, 226 miles on a 61-car train; Alexandria to Little Rock, 293 miles in a 67-car train; Little Rock to Poplar Bluff, 178 miles with an 82-car train; McGehee to Dubo, 404 miles, 96-car train; Marquette to Osawatomie, 173 miles in a 58-car train.

Q. You also stated I think that the standard of main line construction contemplates rail of 112 pounds, weight per yard. Does that represent the replacement of lighter rail previously in the track?

A. Yes, it replaces 85-pound rail that was formerly in the track.

The Court: Do I understand that 112 pounds means for a foot or a yard?

A. A yard, that is, A. A. R. standard. That replaces steel of 85 pounds to the yard.

Mr. Mason:

Q. Mr. Kirk, the common railroad expression is to refer to rail as 85-pound rail or 90-pound rail or 112 pound?

A. 112, 113, 131 and 139. One hundred thirty-nine is the largest rail I have heard of.

Q. Those weights in pounds are the pounds per yard, ar- they?

[fol. 436] A. That is correct. We have some 131 on the curves between St. Louis and Poplar Bluff in the Ozark Mountains.

Q. Does the installation of block signals over the sum of more than two thousand miles that you mentioned represent an extension of your block signal system?

A. Yes, we had less than 400 miles in 1922.

Q. You spoke of 374 miles of centralized traffic control. Is that all in one district?

A. No, that is separated. We have 53 miles between Kansas City, Missouri, and Atchison, Kansas, and 57 miles between Leads, Missouri, and Osawatomie, Kansas; we have 124 miles between Jefferson City, Missouri, and St. Louis, Missouri.

Q. Does that centralized traffic control in those districts represent replacement of preexisting automatic block system?

A. It does.

Q. Has any mileage of the Missouri Pacific been double tracked where previously there was single track?

A. Yes, about 138 miles since 1922.

Q. Are you familiar with the operation of centralized traffic control?

A. I am very familiar with it.

[fol. 437] Q. Will you briefly describe just how centralized traffic control differs from ordinary movement over districts equipped with block signals?

A. I will explain the oldest system on the Missouri Pacific which is between Kansas City and Atchison, a distance of 53 miles. In that 53 miles we have nine sidetracks. All of the operations by any train is by the indication of the signal which is controlled by one man at a central point. In other words, he is at Leavenworth, 20 miles one way and 34 miles the other way. He opens and closes all of the switches for all trains in that particular area so when the train leaves Atchison it will be guided by the signals as he approaches them and if the signal indicates to him he must head in at the next siding, he must reduce his speed to what we call a number 20 turn-out, a long turn-out to 30 miles an hour to go in there safely and he is on the side track. No member of the crew has to handle any of the switches at all; he handles them all. When the other train passes the man at Leavenworth lets them out. We have found it to be a very good bridge between single track and double track. In other words, it takes up where there isn't sufficient traffic [fol. 438] for double track but too much for single track. It fills in that gap, and we have 116 miles more of it under construction now.

The Court: You term that centralized control?

A. Centralized traffic control, yes, sir.

Mr. Mason:

Q. Centralized traffic control as applied on the Missouri Pacific to lines where the main track is single rather than double?

A. That is correct. I will say we do have some in the double track territory where both tracks are signalled for a moment in either direction can throw them over to one track in the opposite direction and use both, that is, three tracks instead of two.

Q. Are you familiar with the bridges and bridge construction on the Missouri Pacific to any extent?

A. Well, only to the extent of the removal of wooden structures and strengthening them in order to handle the heavier power to permit of a greater train load in certain areas.

Q. Is it necessary for you to know about the strength of bridges in order to be able to assign power?

A. That is correct. We have a rating on all bridges on the railroad and you don't put an engine of heavier weight [fol. 439] than that particular rating for the bridge.

Q. Has there been any program of bridge replacement or construction?

A. We have had quite a program since 1922 and removed some 3800 bridges and changed approximately the same number from wooden to steel or concrete structure.

Q. Are there any limitations on main lines now as to weight of locomotives by reason of strength of bridges?

A. Yes, we have some on our Western territory which will be O. K. by December 1st and then between Alexandria and Little Rock they will be O. K. around the first of the year to permit the operation of heavier power.

Q. Are you familiar with the average road speed of your through freight trains over the past several years?

A. Yes, I have to be.

Q. Has there been any change in the average speed of your through freight trains as between 1922, for example, and the present or last year?

A. On our through freight trains in 1922 we averaged 16.6 miles per hour while in 1939 we have increased that to 22.4. That applies to through freight trains which handle a greater train load.

[fol. 440] Q. Those are the through freight trains in which the traffic from and to Arizona and California would be handled?

A. That is correct. Some of that speed has been increased due to the fact of augmenting the water capacity on the locomotives from their regular tank or tender of 15,000 gallons by equipping a tank car that holds 10,000 gallons and attaching it to the engine tank, avoiding the stops between terminals.

Q. That is a water car attached immediately behind the tender?

A. That is correct, and operates as part of the locomotive. It is not counted as a car in the train, it is part of the locomotive.

Q. I direct your attention to a statement of one sheet bearing title, "Missouri Pacific Railroad Company Freight Operating and Freight Transportation Expense Related to Traffic, Calendar Years 1922 to 1939." May that be marked?

The Court: It may be marked for identification.

The Clerk: Defendant's exhibit No. 24 for identification.

Mr. Mason:

Q. Have you that exhibit before you, Mr. Kirk?

[fol. 441] A. I have.

Q. You are familiar with the fact that this exhibit was prepared for the purposes of this case?

A. It was.

Mr. Mason: Your Honor, we have marked this for identification at this point in order to preserve the sequence of exhibits and associate this with the Missouri Pacific Railroad Company witness. We do not desire to offer it at this time but will undertake to establish the authenticity of the figures of the underlying document by a later witness.

Q. I will ask you, Mr. Kirk, if you will also refer to a statement of one sheet bearing title, "Missouri Pacific Railroad Company Freight Service, Operating Averages, Calendar Years 1922, etc., to 1938 and 1939." Have you that statement before you?

A. I have.

Q. Will you state whether or not that exhibit was prepared for the purpose of this case?

A. It was.

Q. You are familiar to some extent with its preparation?

A. I am.

Mr. Mason: May we have the statement just referred to [fol. 442] for identification defendant's exhibit No. 25?

The Court: It may be marked.

The document referred to was marked defendant's exhibit No. 25 for identification.

Mr. Mason: As to No. 25, Your Honor, we again make the same statement as to No. 24.

Q. I will ask you if you will please refer to a statement of one sheet entitled, "Missouri Pacific Railway Company:

Typical Examples of Freight Trains Handled between Certain Terminals, April 1-10, 1939." Have you that before you?

A. I have.

Q. Was that exhibit prepared for the purposes of this case?

A. It was.

Mr. Mason: May we have that marked No. 26 for identification?

The Clerk: Twenty-six for identification.

Mr. Mason:

Q. Did your personally prepare No. 26?

A. I personally prepared No. 26 from the train sheets over which the record is made of the trains running, and spot-checked the trip reports of the conductors, not of each of these trains but with each train's dispatcher to verify his accuracy in copying the original report onto the [fol. 443] sheet.

Q. Is this exhibit other than as to ruling grade based entirely upon your study of the train sheets and trip reports?

A. That is correct.

Q. And has been personally checked against the dispatcher's train sheet covering the districts or divisions shown in the "from" and "to" columns on the exhibit?

A. That is correct.

Q. Except as to the computations have you made any check of the computations at the foot of the exhibit?

A. Yes, I checked this before I sent it out.

Q. Those are based upon the figures appearing above, are they?

A. That is correct.

Q. What is the information on ruling grade, is that information which you yourself have personal knowledge of?

A. That is correct.

Q. Does the showing upon the exhibit of ruling grade between the points shown correspond of your own knowledge of the conditions in that territory?

A. That is correct.

Q. Are the mileages themselves taken from the dis- [fol. 444] patcher's train sheets.

A. That is correct, and the timetables.

Q. Certain types of locomotives are shown. Do those types of locomotives correspond to your descriptions heretofore made in your oral testimony?

A. They do, and the distances in miles with the exception of the first two show the actual run by one train crew as between the points. Between St. Louis and Kansas City, Missouri, the crews change at 122 and 162 miles respectively at Jefferson City. It is 122 miles from St. Louis to Jefferson City and 162 from Jefferson City to Kansas City.

Q. Does the traffic represented upon exhibit No. 26 insofar as its character, volume, and handling is concerned as shown on the exhibit, reasonably reflect conditions as they prevail in these several districts.

A. Over the balance of a year, except during the seasonal move of citrus and vegetables from the Rio Grande Valley and the coal from the Illinois fields when the train lengths and the tons will be greater. That is a seasonal move, you understand. This is a typical all-year-round move except the seasonal operation.

Q. This is typical of the normal rather than the heavier [fol. 445] traffic during those particular periods you have mentioned?

A. That is correct.

Q. Does it correspond with your own personal knowledge of the handling of traffic on the Missouri Pacific?

A. That is correct.

Q. Will you say whether or not the exhibit correctly reflects the information shown on the dispatcher's train sheets and in the conductors' train books?

A. It shows what the train sheets showed because I personally checked and drew off from one hundred train sheets this information and spot-checks that I made as to the efficiency of the train dispatcher in copying the information from the conductors' reports of which I checked each train dispatcher is substantially correct.

Mr. Strouss: They are going a long ways there.

[fol. 446] Mr. Mason: Mr. Strouss, would you like to ask any questions about Exhibit No. 26, which has been offered?

Mr. Strouss:

Q. Why was April taken as a typical month over the entire run, of the general conditions of operations, instead of some other month?

A. Because that is a typical month over the entire run of the general conditions.

Q. It is what you selected as a typical month?

A. That is correct.

Mr. Booth:

Q. Is traffic heavier in 1940 than in 1939?

A. Not appreciably, no.

Mr. Strouss:

Q. The exhibit shows a ten day period in April, 1939, I was asking the witness why that particular period was used as the basis of this exhibit. That was the reason for my question to him, Your Honor.

Mr. Strouss:

Q. Now, the information on this exhibit, of course, are matters which are taken from the records, that is mostly from the train sheets?

A. That is correct.

Q. You spoke about your own knowledge as to ruling [fol. 447] grades, ruling grades upon—which are shown upon this exhibit are the ruling grades determined by your engineering department, are they not?

A. Yes, as to the whole capacity over those grades. Of course, I know what these are.

Q. The ruling grades shown, showing 1% and .5%, those classes shown on the exhibit are grades determined by your engineering department, that is correct?

A. Yes, that is correct.

Q. And the information here shown you took from the records which were made by your engineering department?

A. That is correct.

Mr. Strouss: That is all.

Mr. Mason:

Q. Your knowledge as to these ruling grades is part of the knowledge necessary to you in your capacity as Gen-

eral Superintendent of Transportation?

A. Yes, it is very necessary.

The Court:

Q. Mr. Kirk, none of the records from which this data is taken are here in Court. You don't have any of those records with you?

A. No, I don't have them. I can get them, but they are not here.

[fol. 448] Mr. Mason:

Q. Would you say how many train sheets you have examined for the purpose of this report?

A. For a ten-day period, ten train sheets, so it took 100 train sheets to check that up.

Mr. Mason: We offer that in evidence as Defendant's Exhibit No. 26.

Mr. Strouss: Same objections.

The Court: Subject to the objections made it may be admitted. In order to be consistent I am going to admit that in evidence. I am saying to counsel, there is a real question as to these exhibits which you are preparing from books and records which are not available for the examination of opposing counsel, and as the opportunity presents itself I am going to study these authorities. I, of course, reserve the right to make such ultimate ruling on these exhibits as the law will justify. You may proceed.

The Clerk: Defendant's Exhibit No. 26, admitted in evidence.

Mr. Booth:

Q. Mr. Kirk, let me ask you this question: If this exhibit No. 26 had been prepared by anyone in your organization, without your ever seeing the train sheets or any of the underlying data to which you yourself resorted, and had [fol. 449] been presented to you, could you from your own knowledge have said that the exhibit was a typical exhibit of train movement volume and character of traffic. This is for the period in question?

Mr. Strouss: We object to that, your Honor.

The Court: Objection sustained.

Mr. Mason:

Q. Is there any particular feature not heretofore discussed to which you wish to call attention?

A. I believe not.

Mr. Mason: You may cross-examine.

Cross-examination.

Mr. Strouss:

Q. Of course, these matters to which you have testified, such as the percentage of movement of cars a week handled by your system, the bridges which were replaced or reconstructed, that type of evidence is all information which you have acquired from the records of your company, that is true?

A. The loading and the percentage of performance, all those are records that are made directly to me and compiled by me.

Q. But they are records of your company?

A. That is correct.

Q. And the information from which they are compiled are records of your company?

[fol. 450] A. That is correct.

Q. You testified with respect to the average cars on the train, of course, that is determined from the records of your company?

A. That is correct.

Q. By the way, in making your reports to the I. C. C. you are required to segregate your main lines and branch line operations?

A. I couldn't answer that question.

Q. You don't know whether or not there would be a record of your company which would show what the actual car average is on your main line operations?

A. I am of the opinion it is set into main line and branch line, and divided as to 1, 2, and 3 tracks, something like that.

Q. You spoke about your locomotives having an additional water tank, and that that permitted you to attain a greater average speed. That same result would be reached in a longer distance between terminals of the division, that is, true?

A. I don't believe I quite understand.

Q. In other words, you acquired a greater average speed because you had a larger water tank which didn't require stops to take water. Now, if your division terminals are a [fol. 451] greater distance apart, so that locomotives would operate more miles between division terminals without stops, that would have the same result would it not?

A. That is correct. We operate 161 miles without a stop on the eastern division.

Q. And you have some divisions even longer than that?

A. That is a crew division. We operate a crew division as long as 228 miles.

Q. This double-header rule, will you just explain again what that is?

A. The double-header rule on the Missouri Pacific is that we will not double head to handle more tonnage than the largest locomotive attached to the train will handle, except that you can double head at any time with forty cars. In the wheat rush in the northern Kansas territory we can't run but the smallest locomotives out there and one of them can't handle forty cars, so we put two on, but not over forty cars.

Q. You said that was a standard agreement with Western railroads?

A. Yes.

Q. You mean that same agreement is in effect with all western railroads?

A. That is right.

[fol. 452] Q. Do you know what the Santa Fe double header rule is?

A. No I don't, but it has been my understanding that it was the same with all Western roads.

Q. Have you ever heard of a double-header rule on the Western roads which has a limitation tonnage on the train?

A. No, I have not.

Q. But you wouldn't say for certainty?

A. That could be a fact. I have never heard of them.

Q. I mean, you wouldn't say as a certainty that there is a double-header rule on all Western roads?

A. No. It is my understanding that it is, and it is all I can say about it. I don't know definitely.

Q. Have you ever seen the double-header rule that is in effect on the Southern Pacific?

A. I have not.

Mr. Strouss: That is all.

The Court: You may be excused, Mr. Kirk.

The Court: Do I understand we are now proceeding with the cross-examination of Dr. Parmelee?

[fol. 453] Mr. Mason: That is true.

The Court: You may resume the witness stand, Dr. Parmelee.

DR. PARMELEE.

Cross-examination.

By Mr. Strouss:

Q. Doctor, referring to your exhibit, as I understand it is to show the expenditures made for equipment, roadway structures, in general, over the period shown; that is correct?

A. Yes, the capital expenditures. The expenditures which are charged to capital account.

Q. And under the heading of equipment, that would include improvements in existing equipment?

A. Yes. If it is charged to capital, yes.

Q. The usual accounting practice would be to charge such improvements at least as additions to the existing property as a capital investment?

A. Yes, that is a usual practice where there is an additional facility added to the equipment, that would ordinarily be a capital expenditure.

Q. Under roadway and structures, that, I take it, would include such items as grade and curve elimination, grade crossing operations, and things of that sort?

A. Yes.

Q. New bridges?

[fol. 454] A. New bridges if they are placed in somewhat better form. Improved, strengthened, enlarged, or better material; steel and concrete in place of wood.

Q. And on steel rails where the existing rails were replaced by a heavier rail, that would be included in that item?

A. Yes, that is the excess weight of the heavier rail, but not the mere replacement of the same rail. For example, if a 100 pound rail is replaced by a 130 pound rail, the 100 pounds would be charged to maintenance and the excess or thirty pounds is charged to capital investment.

Q. What is included under the heading "general" in column (d)?

A. The larger part of that consists of what is known as interest during construction, and taxes during construction, clerical work that goes on in connection with improvement work, and possibly some supervisory expense.

Q. General overhead on any items of construction which are chargeable to construction would go in that?

A. Yes.

Q. This data was taken, I believe you testified, from the statistics of railways in the United States, that is correct, [fol. 455] isn't it?

A. Yes.

Q. And the particular information here that doesn't represent a copy of reports which are filed by the Class I railroads, an exact copy of any report, does it Doctor. To make my question a little more understandable, it is in itself a computation or summary, that is, the I. C. C. document is itself a summary and computation in that it takes from the reports of each of these Class I railways the figures of that year and then by arithmetic arrives at the figures which are shown in the I. C. C. document, and which are set forth here?

A. Yes, that is correct.

Q. That is true of each of these I. C. C. reports or documents which you have used as a basis of your exhibits which have been introduced here?

A. Yes, those are all summaries of the individual reports filed by the railroads of Class I with the Commission.

Q. Now, your exhibit No. 16, as I understand it, is to show the trend of revenue as on the decline during the period which is covered here, is that correct?

[fol. 456] A. That is what it does show. That wasn't the purpose. The purpose was to show the exact trend, and that appears to be the trend.

Q. Of course, it doesn't purport to show the causes?

A. No, this is merely statement of the actual trend for these particular years and these particular averages.

Q. And exhibit No. 17, that is to show the trend of earnings of railway employees over the period?

A. All of the factors, the man-hours and total compensation and the average earnings of the employees.

Q. Is this based on columns (e) and (f), average earnings per employee per hour and per year, is that based on the man-hours paid for man-hours actually worked?

A. It is all based on man-hours paid for. I would like to say that those computations are the computations of the Interstate Commerce Commission. I think, in my testimony yesterday, I stated the computations were those made by my organization. On a later check I find they were taken from the Commission's own reports.

Q. This exhibit, course, is limited to hours worked and [fol. 457] compensation of railway employees. It doesn't purport to show what the trend is, or was, or was not in any other industry during this period, or that the trend of the railways were any different than any other industry?

A. No, it covers the railways of Class 1.

Q. And covers all employees in charge of transportation?

A. This particular exhibit includes all the employees of the railroads.

Q. Exhibit No. 18 is a similar exhibit, which is limited to train and engine service of employees?

A. Yes.

Q. And, of course, what you have said regarding Exhibit 17 would apply to 18, insofar as these particular employees are concerned?

A. Yes, including the comment I just made about columns (e) and (f). Those two are taken from the commission's own reports. They are copied item for item from the commission's report.

Q. In Exhibit No. 19, Doctor, I notice in your testimony you made some comment about the fact that item 10, return on property investment, and item 9, net railway operating income, that this return on property investment was the [fol. 458] return which is allowed by the Commission and it is before paying of interest, I didn't understand you as criticising the use of that basis for return on investment?

A. No. Perhaps I didn't make myself quite clear. I merely said that this return corresponds to the rate of return as worked out by the Interstate Commerce Commission in its attempt to arrive at, what the transportation act of 1920, called a rate on railroad value. There was no thought of making any criticisms. I simply wanted to indicate that this is the usual way of computing that particular percentage.

Q. And it is the usual thing to base the return on investment on the value of property, and that return would be determined before payment of interest charges?

A. Yes.

Q. Now, your exhibit No. 20 is to show the trend in operating expense, is that correct, Dr.?

A. That does show the trend, yes, in both the total operating expense assigned to freight and freight transportation and also the expense per unit, per ton mile in other words.

Q. It, of course, reflects deductions due to any and all causes, and not to any particular cause, speaking about the [fol. 459] exhibit itself?

A. You mean there are a number of factors involved in any year's expense. My answer to that would be yes.

Q. And they are all reflected in that?

A. Yes.

Q. Isn't it a fact, Doctor, that in 1922 there was a coal strike?

A. I don't recall whether that was 1921 or 1922. There were some coal strikes at that time.

Q. And, of course, if there were that would affect the price of coal at that time?

A. I don't know what the effect was, so far as the railroads are concerned. I assume you mean the price of coal to the railroads. I don't know what effect it did have at that time.

Q. Of course, if there was such an item reflected in the expense of 1922, you would not consider that a normal expense?

A. No, if there was such an item in that year I would agree with you.

Q. In 1922 or 1923 there was a strike of the railway shopmen, was there not Doctor?

A. That was either 1921 or 1922. I am not quite clear in my recollection as to which it was.

Q. The effects of that strike—by that I mean equipment [fol. 460] which had not been repaired during the time the shopmen were out—in that way and possibly other ways, reached the industry in subsequent years, wouldn't that be true Doctor?

A. Your question, as I understand it, is that there might have been some maintenance which would normally have

been done in that year which wasn't done on account of the strike, and that might have reverted to some later years?

Q. There might have been greater damage to the equipment while the men were out which would have affected the operating expense at that time?

A. I suppose it is possible yes. Your first alternative, if anything, would indicate that the maintenance expense particularly were lower than normal in 1922, because of those facts.

Q. You mean because the men were out, you didn't have to pay them?

A. Yes, and by the materials and all other expenses which go into maintenance accounts.

Q. But whatever the effect may have been, of course, that would not be a normal condition?

A. I think you could hardly pick a year in railroad operations where there were not some unusual factors. If you were to ask me to pick a normal year I would not be able [fol. 461] to do so.

Q. We were in a depression in 1922, at that time?

A. We were just coming out of the 1921 depression. I don't think you could call 1922 a depression year, judging by the standards of that particular period.

Q. Of course, what has been said about Exhibit No. 20 would be true of Exhibit No. 21?

A. Yes.

The Court: It is evident you won't be able to complete the cross-examination, so we will take our noon recess at this time.

[fol. 462] Wednesday, November 27, 1940. 2:00 P. M.

All parties being present as heretofore noted, proceedings were resumed as follows:

Mr. Mason: Your honor, this morning Mr. Strouss called attention to and discussed documents, I mean in regard to certain documents which were furnished to him, the record of which reads at page 374 of the transcript of yesterday's proceedings. As a result of the discussion off the record this morning, we have agreed—and I am stating this with the request that Mr. Strouss indicate his concurrence or disagreement if I am not correct—that if a wit-

ness were called, a competent witness could be called, rather, who would thereupon testify that the form OSE and the form OSA furnished to him yesterday and designated as relating to September, 1940, and reproduced in pencil figures for the first nine months of the year 1940, including September and also for the first nine months of 1939, including September, of findings which were taken by the witness from work-sheets in the Bureau of Statistics of the Interstate Commerce Commission, the work-sheets relating to the accumulated monthly summary covering the first nine months of 1940, which the Interstate Commerce Com-[fol. 463] mission are themselves are about to prepare in printed form and issue. Is that correct?

Mr. Strouss: Yes, I will stipulate that if the witness were called he would so testify.

Mr. Mason: Will you also stipulate that the witness will testify that the figures which were placed upon this sheet and which are referred to are a true and correct transcription of the information received by him from the Interstate Commerce Commission?

Mr. Strouss: Yes.

Mr. Mason: I think it was also represented to Mr. Strouss, and I think you will agree with me that the Bureau of Railway Economics works very closely with the Bureau of Statistics, and the obtaining of the information from the Bureau of Statistics of the Interstate Commerce Commission, in this fashion, is the customary and ordinary course of conduct as between the bureaus.

Mr. Strouss: I will stipulate that he will so testify.

Mr. Mason: Yes.

The Court: Proceed with your cross-examination.

J. H. Parmelee, a witness on behalf of the defendant, [fol. 464] resumes the stand and testifies further as follows:

Cross-examination (Cont'd.).

Resumed by Mr. Strouss:

Q. Doctor, referring to these Statistics of Railways in the United States, which is one of the publications of the Interstate Commerce Commission and used by you as a

basis for your exhibits and of your testimony—that is true, isn't it?

A. Yes.

Q. That publication follows very closely, does it not, in items and accounts the annual reports of the different railways?

A. To the Interstate Commerce Commission?

Q. To the Interstate Commerce Commission.

A. Yes, and those forms, of course, are specified and laid down by the Commission.

Q. And the annual report, Form A, attached as part of Defendant's Exhibit 9 in evidence, have you seen this, Doctor?

A. Yes.

Q. That is one of the forms? That is the form of annual report?

A. Yes, sir.

Q. Used in reporting to the ICC?

A. That is the form used by railroads of Class I.

[fol. 465] Q. Of Class I?

A. Yes.

Q. Now, where the item of operating expense is referred to and as taken from the Statistics of Railways in the United States, will you look at Exhibit 9 and tell me where that appears in that exhibit?

A. Are you speaking now of the total operating expenses?

Q. The total operating expenses.

A. That appears on page 300 of form A, line 4, Railway Operating Expenses.

Q. Well, it refers then to page 312 and 314 as a figure taken from that page, does it not, Doctor?

A. Yes, that is a summary of all the detailed operating expenses which are set out on pages 304 to 312, inclusive.

Q. And the item of operating expense shown in your exhibit is the summary of numerous annual reports of different railroads for that item?

A. Yes.

Mr. Booth: That is, it is the Commission's summary, is it not?

Mr. Strouss: I mean the Commission's summary.

A. Yes, I thought that was your question. It is the summary made by the staff of the Commission and pub-
[fol. 466] lished by the Commission over its seal.

By Mr. Strouss:

Q. The document to which you referred, known as Fuel Power for Locomotives and Rail Motor Cars of Class I Steam Railroads, in the United States, August, 1940, for the eight months ending August, 1940 and 1939, that includes switching and terminal companies, does it not, Doctor?

A. Yes, that is right.

Q. And it is a summary or compilation of that data from reports of 171 railroads, I believe it is shown——

A. 171 steam railroads, 161 reports, representing 171 steam railways. That includes the Class I railways, so-called, and the Class I switching and terminal companies.

Q. Now, the publication of the Interstate Commerce Commission referred to as Freight Train Performance of Class I Steam Railways in the United States for the Eighth month ending August, 1940 and 1939, that excludes switching and terminal railways, does it not?

A. Yes, that is correct.

Q. And it is a summary of how many reports for how many railroads?

A. It is 128 reports representing 138 railways.

[fol. 467] Q. Of course, these documents that you have referred to are printed publications of the Interstate Commerce Commission, not authenticated or certified copies. That is true, isn't it, Doctor?

A. I don't know quite how to answer that question. I don't know what the legal status of these documents is. My understanding has always been that anything issued by the Interstate Commerce Commission with the seal of the Interstate Commerce Commission on it is an official document, but I am not debating the legal aspects of that.

Mr. Strouss: Mr. Mason, I would like to have in the record the character of the documents submitted for examination. Do you stipulate that these are not certified copies?

Mr. Mason: Well, I believe that we can best stipulate that they are authorized publications of the Commission promulgated by it in conformity with the provisions of

the Interstate Commerce Act and not certified, nor is it necessary—or authenticated by a certificate and seal specially affixed. They do bear on their face—at least some of them do—the facsimile seal of the Commission, and as such, under the Act, they are competent evidence in all courts of the United States and of the several states without any further proof or authentication.

[fol. 468] Mr. Strouss: Of course, I am not stipulating to anything of that sort.

Mr. Mason: No, I say I am stating my view.

The Court: What Mr. Strouss wants is a stipulation covering the facts. Then you gentlemen can argue the legal effect of it, I take it, later.

Mr. Mason: Of course, we can stipulate that there is no official certificate of the Commission attached to these reports that have been used by Dr. Parmelee and furnished to you as being the documents which he has used.

Mr. Strouss: They are printed publications.

Mr. Mason: Yes.

Mr. Strouss: Which are authorized under the Interstate Commerce Commission Act.

Mr. Mason: Yes, you agree that they are printed publications authorized to be made and issued by the Commission under the act?

Mr. Strouss: Yes.

Mr. Mason: Now, our stipulation should be distinguished that these are themselves reports submitted by the Commission as distinguished from matters on file with the Commission by carriers subject to the act and required by the Act to be filed with the Commission by such carriers. These are not matters filed with the Commission by the [fol. 469] carriers. These publications we have been referring to in this last testimony are the Commissions own publications. We understand the distinction.

Mr. Strouss:

Q. And these are the publications upon which you have built your exhibits, are they not, Doctor?

A. Certain of the exhibits, yes, in particular exhibit No. 22.

Q. I am now referring not only to these two publications, the Freight Train Performance of Class I Steam Railways and Fuel and Power Locomotives and Rail Motor

Cars, Class I, Steam Railways, but including also the publication Statistics of Railways in the United States.

A. If you include the Statistics of Railways then my answer to your question is yes.

Q. These documents do not show the particular railroads that are included in the summary or compilation by the Interstate Commerce Commission.

A. I think perhaps I should answer that question this way: The Statistics of Railways is in two parts, two principal parts, the first part being a summary of the returns of Class I railways and of other classes of railways as well. Those are in separate parts of the summary. And the [fol. 470] second principal part consists of actual transcripts of the reports of Class I railways; so, the Statistics of Railways this document includes both the summaries and the individual railways returns.

Q. You mean the volume "Statistics of Railways in the United States," includes as a part of that volume a complete copy of each of the annual reports?

A. It is not complete in every detail, no, but I think it includes all the statistics which are included in my exhibits.

Q. It does, I take it, set up the railroads which are included within the different classifications, Class I, II and III.

A. Particularly the Class I railway group, yes. As to the other classes, the smaller railways, the showing is a very condensed showing, but as to the Class I railway group it is a very complete and comprehensive showing for the group.

Q. A showing for each district?

A. Yes, alphabetically arranged in each district.

Q. As I remember, you testified you had appeared before Congress in connection with some proposed legislation there with relation to the length of trains?

[fol. 471] A. Yes.

Q. Was one of those bills which you referred to a bill proposing to give to the Interstate Commission power or authority to regulate the length of trains?

A. I don't think so. I don't think I personally appeared with respect to any such a bill as that. There may have been such a bill before Congress.

The Court: You did testify, Doctor, as I recall it, that there had been some thirty-five bills introduced and that

you did appear as a witness before various committees as to some of that proposed legislation,

The Witness: May I make a statement on that, your honor?

The Court: Yes.

A. I spoke of, I think, three particular bills which had been introduced into Congress and as to which there were two hearings before the subcommittee of the Senate on Interstate Commerce, and one rather extended hearing before the House Committee on Interstate Commerce and Foreign Commerce. All three of those bills were train-limit bills, that is in the sense that they would, if enacted have put a definite limit on freight and passenger trains, or in one case on freight trains, in the United States. [fol. 472] There was no reference to the Interstate Commerce Commission, which, I take it, is what you referred to. I further testified that in thirty-five states there have been over the past seventeen years some 144 bills introduced, designed to limit the length of freight and/or passenger trains, and that none of these bills, with the three exceptions which I explained, were enacted.

Mr. Strouss:

Q. How long have you been with the Bureau of Railways?

A. I became its statistician in May, 1911. I have been with the Bureau since that date, but have been its director since 1920.

Q. And during that period will you just describe again what your work has been just in a general way?

A. Well, there are a good many phases to my activities. I don't wish to go into a tremendous amount of detail. I outlined yesterday three principal functions of the Bureau, which I stated were, first, the compilation and publication of statistics dealing with the business and operation of the railroads; second, the maintenance of an extensive library on transportation subjects. And I might say that we have built up in that Bureau the largest and most ex- [fol. 473] tensive transportation library in the world; and third; a study by the Bureau staff of all kinds of developments of importance in the field of transportation. That is a pretty broad statement, of course, and could be enlarged at considerable length.

Q. A big part of the work is devoted to a study and analysis of records and compilation made from such analysis?

A. Yes, sir, we have a statistical division within the Bureau, yes, which devotes its entire time to just that sort of thing. However, it is only a part of the Bureau's work.

Q. The information which is the basis of your testimony, Doctor, is information which is taken from records, either of the railways or of the Interstate Commerce Commission, isn't that true?

A. Principally so, yes. Of course, there are a great many other records, official and otherwise, from which information is derived, publications of other departments of the Government, for example, state reports, the reports of state legislatures, and state public utility commissions, tax commissions and so on, through many lines—highway commissions and other public bodies.

Q. And to make it more general, then, your testimony [fol. 474] is based on information taken from reports of that character?

A. That, and any other source from which transportation material may be derived.

Mr. Strouss: I think that is all.

The Court: Any re-direct interrogation?

Mr. Mason: Yes, there is some re-direct, your honor.

Re-direct examination.

By Mr. Mason:

Q. Dr. Parmelee, in your cross examination reference was made to the fact that certain of the reports upon which your exhibits are based, covers not only Class I line carriers but also certain switching and terminal companies.

A. Yes, sir.

Q. I will ask you whether or not your statistics insofar as they are taken from such reports, including switching and terminal companies, apply particularly to road freight service? Or perhaps I should reframe the question. Insofar as they apply to road freight service and to operating and to freight transportation expenses, do they include anything relating to these switching and terminal companies which do not engage in road service?

A. The only Commission publication which includes [fol. 475] switching and terminal companies, so far as my exhibits are concerned, is the one dealing with fuel and power.

Q. That is OSE report, is it?

A. Yes.

Q. And that enters into only one of the items which is shown by me in line 10 of my Exhibit 22, "Gross Ton-Miles per Ton of Fuel." Switching and terminal companies are not involved in any of the other statistics in any of the other exhibits.

Q. I will ask you to refer to Exhibits 20 and 21. As I recall, some questions were addressed to you in respect — 1922, one of the years shown on that exhibit, from the standpoint of some unusual or extraordinary condition, such as a strike in the coal fields or a strike on the railroads having had some disturbing effect upon the operations for that year. Do Exhibits 20 and 21 contain any comparison, the tendency of which is to remove any such disturbing effect if it be present?

A. Yes, both the exhibits, at the foot of each exhibit, show a comparison on a four-year basis. That is, they make a comparison between the annual average of the first four years of the period covered by the exhibit, and the annual average of the last four years covered by the exhibit. [fol. 476] And those are averaged and the percentage of change between those two periods is shown on the last line of each exhibit. By taking the four-year period, any unusual circumstances which might have occurred in any one year tend to be evened out and balanced up. That applies to both ends of the period, of course.

Q. In connection with Exhibit No. 20 or possibly one of the other exhibits—I believe it was exhibit No. 19—no, it was not that exhibit—Exhibit No. 15, I believe, some suggestion was made in your cross examination as to the disturbing effect in a supposed strike in the coal fields in 1922 upon fuel prices and the consequent effect upon costs.

A. I think it was Exhibit 20 you are speaking of.

Q. Exhibit 20, perhaps it was, and it would also apply to Exhibit 21. Have you any information as to the relative volume of coal handled in carloads in the year 1922 compared with the year 1939?

A. Yes, the total number of carloads of coal, both anthracite and bituminous, originated in the year 1922 was 7,383,715. In the year 1939 the total number was 6,264,761. In [fol. 477] other words, there was a decline between 1922 and 1939 of more than one million of carloads of coal originated on the railroads.

Q. What is the source of those figures?

A. Those figures are from the car service division of the Association of American Railroads.

Q. Some suggestion was also made, I think as to maintenance expenses, and again reference was had to the possible disturbing effect of a shopmen's strike in 1922, if such a strike took place.

Now, have you any figures to show the ratio of maintenance expense for the class I railroads compared to the amount of revenue earned for the years 1922 and 1939?

A. Yes, a quite common measure or yardstick of maintenance which is used by the railroads is the so-called the maintenance of equipment ratio, which is the ratio on a percentage basis of the expenditures for maintenance to the total operating revenues received. In the year 1922 the maintenance of equipment ratio which would have been particularly affected by the shopmen's strike was 22.6%. That means that out of every dollar of revenue received by the railways during that year 22.6 cents were spent for maintenance of equipment. In the year 1939 that main- [fol. 478] tenance of equipment ratio had declined to 19.2%. That is, there was a decline from 22.6% to 19.2% as between the two years. There was similar decline in the maintenance of way ratio, although that is not so closely related to the shopmen's strike, but has a bearing on that whole question of maintenance. The decline in the maintenance of way ratio was from 13.1% in 1922 to 11.7% in 1939. On adding the two maintenance ratios together, the decline in the total maintenance ratio was from 35.7% in 1922 to 30.9% in 1939.

Q. Reference was made, I think, in connection with Exhibit 17 and 18 to the trend of the wage cost as having a bearing upon the expense, the operating expense, shown on Exhibits 20 and 21, and I believe mention was made of the costs of materials and supplies in connection with

the wage costs. Have you any information as to the trend of the costs of materials and supplies, as well as wages, during the period shown on Exhibits 17 and 18?

A. The trend of wages in terms of average earnings per hour as between 1922 and 1939 can easily be computed from Exhibit No. 17. The increase from 1922 to 1939 was 22.3%. As to material prices we have no exact index for the year 1922 of the materials and fuels pur- [fol. 479] chased for railways. We do maintain such an index at the present time, but it was not in effect in 1922, and any statement as to the trend from 1922 to 1939 must be based on somewhat generalized figures. We know——.

Mr. Strouss: Wait a minute, Doctor. I don't remember interrogating this witness as to the trend of prices on fuel or supplies. The only question I asked with respect to fuel was whether or not those items were included under the general terms of the——.

Mr. Mason: Operating expenses.

Mr. Strouss: ——operating expenses, in order to find out what was in that item. I was not asking about any trend.

Mr. Mason: I think you went further than that, Mr. Strouss, and if your honor please, I think there was also some suggestion that because of the conditions in 1922 fuel prices may have been higher in that year.

Mr. Strouss: I asked about coal in that particular year, relating it to the question of whether there was not a coal strike in that year, but I asked no general question as to the trend of fuel prices.

The Court: No, I don't recall that you did. I will sustain the objection to it.

[fol. 480] Mr. Mason: I think that is all. Thank you, Doctor Parmelee.

Mr. Strouss: That is all.

Mr. Mason: Will you take the witness stand now, Mr. Young?

C. R. Young, called as a witness on behalf of the defendant, having first been duly sworn, was examined and testified as follows:

Direct examination.

By Mr. Mason:

Q. Please state your name and official position to the reporter, Mr. Young.

A. C. R. Young; Manager of Personnel, Illinois Central System.

Q. How long have you been Manager of Personnel of the Illinois Central?

A. Since 1935, October.

Q. And what position did you occupy immediately prior to becoming Manager of Personnel?

A. Superintendent of Transportation. I occupied that position, if it may be called a position, since 1926.

Q. Or for a period of nine years?

A. Yes, sir.

[fol. 481] Q. How long have you been in railroad service with the Illinois Central?

A. Approximately 35 years.

Q. In what capacity have you worked?

A. A train baggage man, express messenger, clerk in the chief dispatcher's office and other offices, car distributor and division chief clerk; switchman and yard master, trainmaster, division superintendent, superintendent of transportation, and my present assignment.

Q. Will you state generally what are your duties in your present assignment?

A. I have supervision over the relations between the employees and the railroad, and in my work it is my job to undertake to prevent injuries to employees and accidents of all kinds on the property, to analyze accidents and accident reports for the purpose of developing causes and supplying the remedies if they may be supplied; to travel over the property in general, inspecting yards, engine houses, train dispatchers' offices, train sheets and any other work that may be assigned to me; also to analyze the effective restrictive orders that might handicap or interfere with the operation of the property.

Q. Now, as Superintendent of Transportation, what [fol. 482] were were your general duties?

A. Generally, about the same duties that were described by Mr. Kirk, who preceded me on the witness stand.

Q. Those then include the supervision of the scheduling of the freight and passenger trains?

A. Yes.

Q. Does it include supervision over the operating rules?

A. Yes.

Q. And I take it that as Manager of Personnel, you are likewise directly concerned with the operating rules governing employees?

A. Yes, and during the time I was Superintendent of Transportation I was a member of the Committee on Operating Rules and in my present work I have been a member of the Committee on Train Accidents of the Association of American Railroads, and was Chairman of the Committee on Train Service Accidents and named as a member of the Committee of Uniform Accident Reports of the Association of American Railways.

Q. As a member of those committees did you and have you cooperated with representatives of other carriers for the purpose of furthering the common interest?

[fol. 483] A. Yes.

Q. As Superintendent of Transportation did you have anything to do with the details of the assignment of locomotives?

A. Yes, I did assign the locomotives.

Q. Did you have anything to do with the details of assignment of freight and passenger cars, or distribution of cars?

A. Yes.

Q. Does the work of Superintendent of Transportation include any supervision of the work in the yards?

A. Yes.

Q. Did you in your official assignment as Superintendent of Transportation travel over the System in freight trains as well as in passenger trains?

A. I did, and I still travel over the system on freight trains as well as passenger trains, sometimes with an office car and sometimes without.

Q. Do you sometimes occupy the caboose?

A. Yes.

Q. With the others who are traveling on the train?

A. Yes, sir, sometimes I ride the engine.

[fol. 484] Q. Do you recall the Nevada Train Limit case?

A. Yes, sir.

Q. Did you testify in that case?

A. I did.

Q. At that time were you superintendent of transportation?

A. I was.

The Court: What year was that case heard?

Mr. Mason: That case was heard in 1935 and extending into the spring of 1936.

The Witness: I testified in September, 1935.

Mr. Mason:

Q. Did you in 1935 make any study of the extent of long train operation on the Illinois Central for the purposes of the Nevada case?

A. I did.

Q. Have you made any such study of the extent of long train operation on the Illinois Central for the purposes of the present case?

A. Yes, I have.

Mr. Strouss: The objection which was made to the testimony of the previous witnesses will go to this testimony also.

The Court: May I remind defense counsel that the court is expecting to be shown a similarity of operations?

[fol. 485] Mr. Mason: Yes I have that in mind and each witness will be questioned within his qualifications as to operations on his railroad with a view to assimilating those operations to the Southern Pacific Company both in Arizona and generally.

Mr. Strouss: Of course the objection goes to the other grounds as well.

The Court: I understand, Mr. Strouss.

Mr. Mason:

Q. Has your observation of long train operation or train operation on the Illinois Central undertaken in 1935 as you have described extended through the intervening years to 1940?

A. Yes, not in as much detail as at that particular time but I still check the operation and ride the trains and make personal observations.

Q. Have you before you, Mr. Young, a document of one sheet which is in effect an outline map of the Illinois Central Railroad?

A. Yes, sir, I have.

Mr. Mason: May we have the map marked as defendant's exhibit No. 27?

The Clerk: Defendant's exhibit No. 27 for identification.

Mr. Mason:

Q. I take it that this exhibit was prepared from more detailed maps of the system supplied by you?

[fol. 486] A. Yes, sir, this is what might be termed an outline map.

Q. Is it an accurate representation as such of the extent of the operations of the system and the states within which it operates?

A. Yes, it is.

Mr. Mason: We ask that the exhibit be received as No. 27.

The Court: Is there any objection to that, Mr. Strouss?

Mr. Strouss: Yes, my objection, of course, is the same to the exhibit and the oral testimony.

Mr. Mason: I wonder if there are any further and more specific objections. I understand that the general objection goes to this?

Mr. Strouss: My objection is specific I think, it was made at the beginning of the case, that it is incompetent, irrelevant, and immaterial and for the reason it is not the best evidence and that there is no showing of similarity and it calls for a conclusion of the witness.

The Court: The objection is overruled. It may be received in evidence.

(The document referred to was received in evidence and marked defendant's exhibit No. 27.)

Mr. Mason:

Q. Mr. Young, I take it in your present position you are [fol. 487] an officer of the entire system represented on exhibit No. 27?

A. I am.

Q. And have system-wide jurisdiction?

A. That is correct.

Q. In that capacity do you receive reports covering the entire system's operations?

A. I do.

Q. What do those reports consist of generally speaking?

A. They consist of a report of the movement both of freight and passenger trains; copies of the various operating reports; reports covering the operations of the yards; all accident reports, both train, train service, and personal injury reports and such other reports as are generally made to a whole line officer.

Q. Do these regularly come to you daily, periodically or otherwise in the course of and as a part of the position that you occupy?

A. They do.

Q. And for the purposes of your position?

A. They do.

Q. What is the approximate mileage of the Illinois Central?

A. Six thousand, six hundred.

[fol. 488] Q. In how many states and in what states does it operate?

A. Fourteen states are traversed by the Illinois Central as shown on the map here. Do you care to have the states named?

Q. The principal states as I view the map and excluding states where you have comparatively little mileage are Iowa, Illinois, Kentucky, Tennessee, Mississippi, Louisiana, and Alabama, are they not?

A. That is correct.

Q. You also have branches of some extent extending into Indiana and Louisiana?

A. Yes, sir.

Q. What is the nature of the traffic generally speaking, is it devoted to one particular class of commodities or products or is it diversified?

A. It is rather generally diversified. The traffic consists of products of mines which is probably the heaviest volume; the products of agriculture, including livestock and

perishables; fruit, manufactured products; petroleum and its products and other miscellaneous traffic.

Q. Do you handle any substantial volume of perishable traffic originating in the Gulf states and moving to Northern destinations?

A. By the Gulf states you have reference to Texas, the [fol. 489] fruit belt in Texas?

Q. Texas, Louisiana, Mississippi, or Alabama.

A. Yes, the Illinois Central originates quite a volume of fruit and vegetables in Louisiana and south Mississippi. It receives a considerable volume of perishables through Shreveport which originates in the Southwest.

Q. As to that it serves as an intermediate or delivering carrier?

A. Yes, and it originates a considerable volume of banana traffic through the port of New Orleans.

Q. Do you serve as a bridge or intermediate carrier or to some extent as a delivering carrier upon perishable traffic moving transcontinentally from the Pacific Coast and Mountain states points of origin?

A. We do, we participate in the movement of those commodities through Omaha and Council Bluffs and then we participate in the movement of Florida fruit and vegetables through Birmingham which is shown on the map and also through Martin, which is not shown on the map but which is located a short distance south of Fulton, Tennessee, which is a junction point with the N. C. and St. L. Ry., Nashville Chattanooga & St. Louis.

Q. Does you line consist of double track or single track [fol. 490] or partly of each?

A. Generally speaking the line which extends from Chicago to New Orleans, that is the north and south line, is double-tracked with some exceptions. The double track extends unbroken to Memphis, Tennessee. Then from there the passenger trains are operated over the line which diverges from Memphis, on the map then it is a lighter line, while the freight traffic moves down through Gwin, Mississippi. From Jackson, Mississippi, which is at the point on the map where the three lines just above McComb, Mississippi, are indicated the main line is double-tracked thence to New Orleans.

Q. Is the line from Chicago to the Missouri River gateways, Sioux City, Omaha and Council Bluffs, is that double track or single track?

A. That is all single track.

Q. Do you maintain make-up and break-up yards at important terminals on your system?

A. The principal make-up and break-up yard is at Markham, Illinois, that is 20 miles south of Chicago within the Chicago switching district. That is a double direction hump, a very modern yard, constructed or completed about 1926 at a cost of about twelve million dollars. We have another principal make-up and break-up yard at East St. [fol. 491] Louis, which is shown on the map, that is adjacent to the Mississippi River and another principal make-up and break-up yard at Nonconnah, shown on the map, adjacent to Memphis and within the switching district of Memphis, Tennessee. We have other smaller yards which are not as modern as those three there.

Q. Upon what districts do you handle your heaviest traffic?

A. The heaviest movement is on the north and south line between Chicago and New Orleans.

Q. That is the so-called "Mississippi Valley line"?

A. Yes, that is the line that traverses the Mississippi Valley generally and is the territory in which the fruit and vegetables are originated in south Mississippi and north Louisiana, the coal in southern Illinois and in western Kentucky, which is shown on the line on the map extending from very near Fulton, Kentucky, but in the direction of Louisville, Kentucky. The manufactured products which originate on the line and come generally from Chicago, Indianapolis, East St. Louis and St. Louis and steel products from Birmingham as well as the steel mill territory adjacent to Chicago in addition to which the Eastern connections de-[fol. 492] liver manufactured products to the Illinois Central at its junctions at Chicago, St. Louis, Indianapolis and Louisville.

Q. Does the line between Chicago and New Orleans have any severe grades encountered in the freight movement?

A. There is one rather heavy grade on the freight line which I described and which is shown by the heavy line between Gwin and Memphis, Tennessee. The ruling grade there which is located south of Memphis, Tennessee, at Lake View, Mississippi, is 1.5. That is the heaviest grade that is encountered between New Orleans and Chicago on the general route of the through traffic.

Q. Otherwise what is the maximum or ruling grade rather in the district?

A. Five-tenths of one per cent. We have some grades in the other territories that run as high as two per cent.

Q. Will you state the ruling grade on the line between the Missouri River crossings and Chicago?

A. The maximum grade is 1.4. That is between Waterloo, Iowa, and Freeport, Illinois.

Q. Does the Illinois Central connect with the Southern Pacific?

A. Yes, the Illinois Central connects with the Southern [fol. 493] Pacific at New Orleans and Shreveport, Louisiana.

Q. The Southern Pacific line with which it connects is the one that is sometimes called or known as the "Texas and New Orleans Railroad Company"?

A. That is correct.

Q. Or otherwise as the Southern Pacific lines in Texas and Louisiana?

A. Yes, sir.

Q. Do you maintain schedules for the handling of perishables or other freight?

A. Yes, we are a party to the transcontinental schedules which were described by Mr. Kirk this morning.

Q. Do you handle traffic moving to and from Pacific Coast points on either of your main routes, that is, the routes to Missouri River crossings or to New Orleans, that is handled in connection with other lines on schedule to Pacific Coast points?

A. We do, we receive traffic from the Union Pacific principally at Council Bluffs and Omaha and move that traffic to the Eastern connections at Chicago.

Q. Do you receive traffic originating on the Pacific Coast or in Arizona at your New Orleans gateway?

[fol. 494] A. Very little. We get some traffic originating in that territory through Shreveport. We used to get quite a bit through Shreveport.

Q. Are you familiar with the development of the schedules for perishable and other transcontinental traffic which were referred to in Mr. Kirk's testimony?

A. Yes, I participated in the formulation of many of those schedules during the period from 1926 to 1935 and am still familiar with them.

Q. Did you as superintendent of transportation and do you today receive any reports indicating whether your company is a participant in those schedules has or has not maintained "on time" performance?

A. Yes, I do. We get those reports daily and monthly and the Illinois Central has maintained its perishable schedules considerably better than 90 per cent.

Q. Are you in your position familiar with the so-called "A.A.R. Code of Operating Rules"?

A. I am.

Q. Does the Illinois Central use a code of operating rules?

A. It does, and it uses the A.A.R. code supplemented by some individual rules.

[fol. 495] Q. I think in an earlier portion of your testimony you referred to the handling of bananas on your north and south line. Is there anything peculiar to the handling of bananas by the Illinois Central?

A. Yes, there is.

Q. I wish you would describe your handling of the banana traffic with particular reference to schedules and train units in which handled and any other characteristics of the transportation.

A. The bananas are brought into the port of New Orleans in refrigerated ships and discharged at the banana wharves. The handling of bananas has been developed through the course of years until it is very systematically operated.

Q. I want to ask you at the outset, all of this is based upon your own personal observation and knowledge gained by you in the course of years in the several positions you have occupied?

A. That is true.

Mr. Strouss: I want to add to my objection the objection to this particular testimony that I can't see any relation to testimony as to the banana operation in New Orleans to a determination of the constitutionality of the train limit law in Arizona.

[fol. 496] Mr. Mason: I will state the purpose.

The Court: Let's hear the purpose.

Mr. Mason: The testimony I am satisfied will show that the banana traffic has been and is being handled successfully with "on time" performance on rather exacting schedules in train units substantially longer than 70 cars and over

comparatively long interstate runs, thus demonstrating in our opinion that it is practicable and is a practicable operating feat, if we would like to describe it as such, although it is the ordinary course of business, except in Arizona, to handle perishable and other traffic in trains of more than 70 cars without delaying but rather expediting its arrival, precisely along the lines in the answer to which I directed Your Honor's attention early in the case.

Mr. Strouss: My original objections go to that part of the testimony without any further understanding but we are not having that type of testimony here. We are having a description of the way they are taken off the ships and put on the train in New Orleans.

Mr. Mason: That is only preliminary as to the way they are loaded into the cars.

The Court: We have no ports in Arizona.

[fol. 497] Mr. Mason: We have the station of Yuma though where we bring in a 125 car train and have to break them up into 70 car units. The description that the witness is undertaking is only preliminary.

The Court: I will overrule the objection. We will take a very brief recess.

Thereupon a short recess was taken after which proceedings were resumed as follows:

Mr. Mason:

Q. Mr. Young, I think you had undertaken a preliminary part of the description of how the banana traffic is received and handled at New Orleans and thence northward. Will you proceed with that.

The Court: We are not concerned with the boat end of it, I take it in this case, so get us on to the railroad as quickly as possible.

A. I will, Your Honor. The bananas are delivered to the railroad in lots depending on the size of the boat—I will have to mention the boat again, Your Honor—varying from 60 refrigerator carloads to as high as 125 carloads. The importers of the bananas insist that where it is possible the entire cargo of bananas be kept together. The bananas leave New Orleans unsold, they are generally billed to Fulton, Kentucky, which is shown on the map some five hundred odd miles north of New Orleans and as the bananas

[fol. 498] are sold the billing and final destination of the individual cars is telegraphed to Fulton, Kentucky, where the way bills are then issued, the complete way bills are then issued and that is the principal reason for the importers wanting to keep the bananas together. The bananas are operated on a schedule of 36 hours on the bananas which are dispatched from New Orleans at such an hour that they may arrive at Chicago between 4 P. M. and 2 A. M.

Mr. Mason:

Q. You speak of 36 hours. Do you mean for the run to Chicago?

A. For the over-all run from New Orleans to Chicago.

Q. What is that distance?

A. That is 920 miles.

Q. How does your 36-hour schedule for bananas compare with passenger train time?

A. The passenger train time is eighteen hours on one train, twenty hours on another, and twenty-one hours on another. On those trains which, based on the schedule of 36 hours, cannot arrive at Chicago between the hours of 2 A. M. and 4 P. M. the carrier is permitted to use additional time so long as it gets the banana train into Chicago to meet the objective between 2 and 4. In other words, the [fol. 499] carrier may add 12 hours to the schedule and fill out the train with other loadings. On the 36-hour-schedule trains we frequently handle from 70 to 75 cars in some instances consisting entirely of bananas. On the schedules to which the 12 hours has been added we load them up around 85 cars. The banana schedules are and must be maintained. They must arrive at Chicago within the time specified in the schedule.

Q. Is that a particular and intermittent service or is that a service regularly performed and of long standing?

A. That is an all year round service. When the bananas originally began to come in through the port of New Orleans the Illinois Central handled practically all of them. Since that time the bananas have been divided up among other railroads, but the Illinois Central is still the primary banana railroad north of New Orleans.

Q. Besides handling bananas in trainload lots as you have described is there any other commodity which you have recently undertaken to handle in trainloads?

A. Yes, in January of this year the Illinois Central in an effort to recover some of the business which it had lost to the inland waterways, which have no restriction on [fol. 500] the length of its tows, nor its tonnage, applied to the Interstate Commerce Commission for permission to publish a 14-cent rate from Chicago to Peoria.

Q. From Chicago?

A. From New Orleans to Peoria, Illinois, on black strap molasses. Black strap molasses is used as a basis for the manufacture of industrial alcohol.

Q. Does it move in large quantities?

A. It moves generally from one consignor to one consignee and moves in blocks of 30 to 40 cars.

Q. You spoke of competition on the inland waterways. Do you mean barge line competition on the Mississippi River and its tributaries?

A. Yes.

Q. Paralleling your lines?

A. Yes, the Commercial Solvent Company was considering the movement of all of its black strap by barges and indicated to the railroad that it could afford to move the traffic by rail on a rate of approximately 14 cents. The Commission granted——

Mr. Strouss: It seems to me we are going a long ways afield.

Mr. Mason: I was going to attempt to shorten this.

[fol. 501] Q. Did you publish and apply a rate on black strap molasses in trainload quantities?

A. We did, in January, 1940, publish a 15 cent rate on black strap molasses with a minimum of 38 cars.

Q. Have you since been handling black strap molasses in trainload lots?

A. We have, and I recently had occasion to check the movement of some 14 of those trains and found that the trains varied from around 70 to 124 cars.

Q. Did the I. C. C. issue a decision in connection with the proceedings brought by you to establish this reduced rate on trainload lots?

A. It did.

Q. Is that the decision in "Investigation and Suspension Docket No. 4645"?

A. 4645, yes.

Q. Reported in 235 Interstate Commerce Commission report at Page 485 and following?

A. That is correct.

Q. You spoke of participation in the handling of coal from various coal fields adjacent to your lines. Is that handled in multiple carload lots?

A. Yes, in southern Illinois there are a number of very large coal mines and those mines will pull out at the end [fol. 502] of a day's run from 60 to 120 cars. The Illinois Central uses a central type engine, 2-10-2, and for the sake of economy undertakes to pull out all of the loads which may be pulled by any one mine in one operation. These pulls will run from 60, and I have seen as many as 144 cars pulled out with one engine.

Q. Is that a regular and standard operation in your experience?

A. Not 144 cars; the average would be around 80 to 90 cars.

Q. Do you handle strawberries during the producing season from the Gulf states to the markets in Illinois and adjacent to the lakes?

A. Yes, there is quite a large strawberry producing territory fairly general around Hammond, Louisiana, that is between Macomb, Mississippi, and New Orleans, indicated on the map, and Hammond is at the point where the light line runs off to the left from the heavy black line. Those strawberries start out of the fields in the late evening and are made up or loaded into passenger equipped refrigerator cars and made up into trains of 25 cars each and handled by a passenger engine and run on a schedule of around 65 miles an hour and generally run intact to Mat- [fol. 503] toon, Illinois, which is shown on the map between Champaign and Centralia and Bluford, it is about 750 miles. At Mattoon those trains are broken up and some of the strawberries move to eastern destinations and the rest into Chicago.

Q. You say that is an express train operation?

A. Yes, it is express traffic moving passenger equipment and on passenger schedules.

Q. Do you handle any of these strawberries in so-called head end or express refrigerator cars on regular passenger trains?

A. A few, but not many. In the beginning of the season and at the close of the season a few move on the regular trains.

Q. Generally speaking what factor or factors determine the length of the freight trains to be operated by the Illinois Central?

A. The primary factor is the volume of traffic available; the secondary factor is the size of the engine and the grade.

Q. In single track territory, that is for example between the Missouri River crossings and Chicago, do siding lengths enter into the situation?

A. I should have mentioned that the siding lengths in single track territory have a considerable bearing.

[fol. 504] Q. Does the Illinois Central have its own refrigerator car equipment?

A. Yes, it owns approximately 2500 refrigerator cars.

Q. Are you familiar with the Pacific Fruit Express Company refrigerator cars?

A. Yes, sir.

Q. Do those operate over the Illinois Central?

A. Yes.

Q. Are your Illinois Central refrigerators similar in general type to the P.F.E. cars?

A. They are; they are all built along the standard of refrigerator car design.

Q. Have you been furnished with copies of defendant's exhibits Nos. 2, 3, 4, 5, and 6?

A. I have.

Q. Have you as superintendent of transportation and in the positions occupied by you prior to your appointment to this position become familiar with the types of freight and passenger car equipment and freight and passenger locomotives owned and operated by the Illinois Central?

A. Yes, I have.

Q. Is that part of the duties of the positions that you have occupied?

A. Yes.

[fol. 505] Q. Commencing with yardman and continuing through division offices to superintendent of transportation?

A. Yes, it was.

Q. I take it as yardman you would have a particularly good opportunity to use the locomotives and the freight cars owned and operated by the company?

A. Yes, I had to live with them and also while I was trainmaster and division superintendent.

Q. You not only had to live with them but now and then you had to ride those locomotives, didn't you?

A. Yes.

Q. In your present position and as superintendent of transportation do you maintain that familiarity?

A. I still do, yes, sir.

Q. Is that part of the duties of your position?

A. Yes.

Q. Now looking at exhibit No. 2, will you say whether, generally speaking and without undertaking to go into detail, the Illinois Central freight boxcar equipment has in connection a parallel improvement such as depicted on the exhibit?

A. Yes, it has in a general way. The improvements [fol. 506] have been made about the same time, the capacity increased in about the same manner as indicated on this exhibit.

Q. Has your company gone to the use of steel or steel underframe freight cars.

A. Yes, a little better than 99 per cent of the boxcar ownership of the Illinois Central is now steel and steel underframe cars.

[fol. 507] Q. Referring to Exhibit No. 4, will you say whether the passenger car and passenger train car equipment of the Illinois Central has undergone improvement through the year substantially along the lines designated by the exhibit?

A. It has. The only improvement which is listed on this exhibit which the Illinois Central has not is the electric luggage elevator on the streamline car shown on the exhibit.

Q. You do have streamline cars similar in general type to those shown in 1937 and 1939?

A. We have one train consisting of articulated cars of streamline design.

Q. Is that a named train?

A. Green Diamond, which operates between Chicago and St. Louis.

Q. Do you now operate in regular passenger service any wooden coaches, or other wooden passenger car equipment?

A. No.

Q. Now, will you refer to Exhibit No. 5, showing the freight locomotives of the Southern Pacific. You have mentioned various types of locomotives used in the past in your operations; do they correspond to those shown on the exhibit?

A. In many instances they do. We do not operate any [fol. 508] of the Consolidation 2-8-0. We are using engines developing 89,500 pounds of tractive effort, which compare with the 43,300 of the Consolidation shown on this exhibit.

Q. That is, apparently you mention larger locomotives than the Consolodation?

A. That is true. That engine has been developed primarily to work in the transfer service in the Chicago terminal. In normal times the movement is very congested and it is necessary to operate rather long and heavy trains.

Q. Do you have any corresponding to the Mikado?

A. Yes. We have various types of Mikado, the smallest type ranging in tractive effort from 54,000 pounds to 69,000 pounds; and then we have another type of the same wheel arrangement which we call the Lima Engine, this was manufactured in Lima, Ohio, which develop 68,850 to 77,578 pounds of tractive effort.

Q. When did you acquire the Mikado type or start to acquiring it?

A. We began acquiring the small type in 1911.

Q. And the larger types you call Lima?

A. That came along about 1924, and we acquired the [fol. 509] small type engine, which is a 2-10-2 wheel arrangement, in 1922. That type engine develops from 79,000 to 85,000 tractive effort. We have none of the Southern Pacific type 4-10-2, nor any of the Articulation Consolidation type. We do, however, have in our yard service at Chicago some Diesel Electric yard engines, which develop around 90,000 to around 120,000 pounds' tractive effort.

Q. Are those comparatively recent acquisitions?

A. Yes, they have been put in service within the last two years.

Q. Are any of your locomotives in freight service equipped with boosters as indicated here?

A. Only ten of the entire ownership have been equipped with boosters.

Q. Will you refer to No. 6 and state whether you have had in the past or now have types of passenger locomotives corresponding to those shown on the exhibit?

A. The Illinois Central has some ten-wheel engines still in service corresponding with the second item on the exhibit. It has a Pacific type, the smaller types on the Illinois Central, developing about eleven hundred more pounds [fol. 510] than the other shown on the exhibit. The Pacific type develop about 43,700 pounds, which is about the same as the type shown on the exhibit, and we have the larger Pacific, as well as the Hudson type, developing around 67,907 pounds, and the larger Pacific developing around 73,000 pounds.

Q. Those are the locomotives operating in use in the fast passenger service?

A. Yes. And the Mountain Type, the older mountain type corresponds with that shown on the exhibit. We have some newer Mountain types, which we have constructed in our own shop developing around 73,000 pounds. We have nothing like the Golden State type.

Q. You spoke of the Hudson type locomotive, what is the wheel arrangement of that?

A. 4-6-4.

Q. Are there block signals installed on the Illinois Central?

A. Yes sir. About one-sixth of the main line miles are equipped with block signals. About eleven hundred miles.

Q. Does that include the main lines betwen Chicago and New Orleans?

A. Chicago to New Orleans, and from Chicago on the lines West.

[fol. 511] Q. Chicago to St. Louis?

A. Chicago to St. Louis.

Q. Is the installation of these block signals a development of the last several years?

A. The block signals have been installed currently from year to year since around about 1915.

Q. Is that program of installation, is that being continued currently?

A. Not at this time.

Q. What is the standard weight of rails in your main lines?

A. The new rail which is now being placed in the main line is 112-pound section. We have some rail in the heavier traffic density territory weighing 110 pounds, and a still greater proportion of 90-pound sections.

Q. Does the 112-pound now being laid replace lighter rail formerly in the track?

A. Yes, replaces 90-pound rail.

Q. What are the lengths, the typical lengths of the passenger runs of the engines in main-line service?

A. From Chicago to Memphis, which is 528 miles, and Memphis to New Orleans, which is 480 some odd miles.

[fol. 512] Q. It is 911 from Chicago to New Orleans, is that by Memphis?

A. It is 392 miles. My answer should be 528 and 392.

Q. Do I understand then that on a through passenger there is simply the one locomotive change in Memphis?

A. That is true.

Q. The crews don't run that far do they?

A. No, the crews change five times.

Q. That run from Chicago to Memphis involves operation through more than one state, does it not?

A. Yes, that involves operation through Illinois, Kentucky and Tennessee.

Q. And from Memphis to New Orleans involves three different states?

A. Yes, Tennessee, Mississippi, and Louisiana.

Q. The engines run through from Chicago to St. Louis without changing?

A. Yes, that is three hundred and some miles.

Q. Do you operate any through passenger service between Chicago and the Missouri River, toward Omaha?

A. We operate through passenger service between Sioux [fol. 513] City and Chicago, not between Chicago and Council Bluffs.

Q. The distance to these cities is something like 460 miles?

A. Yes.

Q. Is that a single through run?

A. The engines run through; the crews change three times.

Q. And that involves operations in at least two states?

A. Yes.

Q. What are some of your typical lengths of freight engine runs in main line service?

A. From Chicago to Bluford is 250 miles; Bluford to Memphis is 258 miles. From Frogmoor, shown on the map in the lower right-hand section, to Birmingham, Alabama, is 220 miles, and from Gwin, Mississippi, to New Orleans, that is approximately 250 odd miles.

Q. Are those runs for freight locomotives that you have just mentioned in general interstate runs?

A. Generally they are, yes.

Q. I think you have just mentioned in connection with commodities, such as coal, bananas, the special movement of black-strip molasses, and perhaps others, that the trains [fol. 514] in many cases consisted of more than seventy cars, do you operate trains of more than seventy cars in connection with the handling of other types of freight over your main lines?

A. Yes, we generally operate miscellaneous trains containing miscellaneous commodities of over seventy cars.

Q. By that you mean just over seventy cars, or somewhere substantially in excess of that figure?

A. The excess will vary from seventy-five cars up to as high as 140 cars in one instance.

Q. Do you handle perishables, or other freight moving on schedule in trains of those lengths?

A. The trains handling perishables will average from eighty to ninety cars.

Q. Does that include trains handling the perishables received by you at the Missouri crossing and taken into Chicago?

A. Not often, we do not get a sufficient volume of perishables through the Missouri River crossing to make up a train of that dimension.

Q. Your statements as to the lengths of trains operating by you are taken from actual observation or information [fol. 515] reaching you in the regular course of your duties as Superintendent of Transportation previously, and now as Manager of Personnel?

A. Yes, I have seen the reports of the movement of the trains and have ridden some of the trains myself.

Q. That is independent of any special study which you have made for this case, or the Nevada train limit case?

A. That is true.

Q. I believe you testified that the practice prevailing today, did it prevail in 1935?

A. Yes.

Q. And has it continued to prevail during the last few years?

A. It has. There are more long trains being operated now than in 1935.

Q. Your company has a considerable extent of branch-line miles, does it not?

A. Yes.

Q. And I take it, performs a considerable gathering or concentrating service, which means all its branch-line operations.

A. That is true.

Q. Do your branch-line trains ordinarily attain or exceed seventy cars in length?

[fol. 516] A. Not often. Occasionally one may exceed seventy cars. Very seldom, because of the absence of traffic.

Q. Do you operate a large number of such branch-line trains of length shorter than seventy cars?

A. Quite a large number. By referring to the map may be seen to be considerable, especially in the territary paralleling the Mississippi River down in the Mississippi valley, and also in the territory of East St. Louis and Centralia.

Q. But the Memphis and New Orleans and that in southern Illinois are territories of considerable production of freight for your railroad?

A. That is true.

Q. Does your company operate trains in main line passenger service which exceed fourteen cars?

A. Yes.

Q. Is your statement likewise based upon your own personal observation, as well as the reports you have mentioned?

A. That is quite true. I ride the passenger trains very frequently, both with an office car and without.

Q. Is the operation of passenger trains exceeding fourteen cars in length on the main lines and freight trains [fol. 517] exceeding seventy cars in length on the main lines a regular, customary and normal practice in your knowledge?

A. Yes.

Q. Have you before you, Mr. Young, a statement in one sheet bearing the title "Illinois Central System, etc.," "Freight operating and freight transportation expenses relating to traffic, calendar years 1922 to 1939, inclusive?

A. Yes, I have it now.

Q. Did you prepare and assist in the preparation of this statement?

A. I did.

Q. And the sources of the figures shown thereon are indicated on the statement?

A. Yes, sir.

Q. We ask that the statement be marked for identification.

The Clerk: Defendant's Exhibit No. 28, marked for identification.

Mr. Mason:

Q. Have you also before you, Mr. Young, a statement on one sheet bearing the title: "Illinois Central System," and so forth, "Freight service operating averages, calendar years 1922" and so on to 1938 and 1939?

A. I have.

[fol. 518] Q. Did you prepare or assist in the preparation of this statement?

A. Yes, I did.

Q. And the sources from which the figures run are taken are shown on the exhibit?

A. Yes.

Mr. Mason: We ask that the statement just referred to be marked as Defendant's Exhibit No. 29, for identification.

The Clerk: Defendant's Exhibit 29 marked for identification.

Mr. Mason:

Q. Mr. Young, have you before you a statement on one sheet bearing the title, "Illinois Central System, Typical example of through freight trains handled between certain terminals, April 10th-19th, inclusive, 1939"?

A. I have.

Mr. Mason: We ask that the statement just referred to be marked as Defendant's Exhibit No. 30 for identification.

The Clerk: Defendant's Exhibit No. 30, marked for identification.

Mr. Mason:

Q. Did you prepare or assist in the preparation of this exhibit, Mr. Young?

A. I did.

Q. From what sources was the exhibit prepared?

[fol. 519] A. All of the information shown on the exhibit, except that which is captioned "ruling grade," was taken from the train dispatchers train sheets, which is a running record of every train movement during a twenty-four-hour period, and that is the base record of practically all railroad operating reports.

Q. Now the figures of "ruling grade" from what source are they taken?

A. They are taken from the profiles which are maintained in the office of the Chief Engineer of the property, and which are furnished to all officers of the railroad. That is, the percentage of the ruling grade is taken from that source.

Q. Are you familiar with the physical characteristics of the system generally?

A. Yes, sir.

Q. Do these figures of ruling grade, which are shown on these exhibits, correspond with your knowledge otherwise obtained with the grades that prevail in these several portions of the system heretofore shown?

A. Yes they do. I have ridden test trains developing engine rating in a number of territories, and the tests were run over these particular grades in order to develop the [fol. 520] proper tonnage rating for the locomotives in service in that territory. I did that both while I was train master, and also as Superintendent of Transportation.

Q. Is it necessary for the Superintendent of transportation to know the physical characteristics of the line?

A. Yes.

Q. For what purpose?

A. So that he may check the proper rating on locomotives to determine that the proper locomotive is being

used in the proper territory, and check against that the performance of the individual trains.

Q. Have you checked the information under the column "ruling grades" against the profiles, as well as your own personal knowledge?

A. Yes.

Q. And is that information true and correct?

A. It is.

Q. Did you, for the purposes of this exhibit, gather together the dispatchers' train sheets for the ten-day period indicated by the title?

A. Yes, I had the train sheets sent into my office from the various chief train dispatchers offices and compiled this information from that.

Q. How many office train sheets were there?

[fol. 521] A. About ninety.

Q. Will you describe a typical train sheet? Is it a long and bulky sheet?

A. Yes, depending entirely upon the number of trains which are normally operated in the operating district covered by the train sheet. Some of those sheets are five feet in length and the shorter ones will be probably three feet or four feet in length. Then they are about 2½ feet wide. That is rather the standard width.

Q. These ninety separate train sheets made a rather bulky group of documents?

A. Yes, quite a large volume of them.

Q. Did you go through each of those for the purpose of preparing this showing?

A. I did. I either called off the figures to those who were assisting me, or they called them to me.

Q. Did you subsequently check back?

A. We checked them after we had them set up on the master of the exhibit.

Q. I will ask you if the train sheets are maintained as permanent records of the company for at least a definite period of years?

A. Yes, they are maintained in the chief dispatchers' offices, each month's sheets, that would be thirty or thirty-[fol. 522] one, as the case may be, are bound together and filed by months.

Q. Then the train sheets for the ten days during the month of April, 1939, for each of the districts covered here

would be bound, and the documents used by you in compiling this exhibit being from April 10th to 19th, would have to be taken from that bound volume?

A. That is true.

Q. Did you determine whether the information here shown is correct according to the original sources from which it is taken?

A. To the best of my knowledge and belief it is.

Q. There are certain computations, as I check the exhibit, which appear in the block at the bottom, did you make those computations?

A. I did not make them, but I have checked them with that which appears above, and find it is correct.

Q. Why did you select a period of ten days such as were shown here?

A. The ten-day period in April was selected because April is an average month. It is neither a high month nor a low month, but it is typical of an average overall year performance.

[fol. 523] Q. Are these ten days, according to your knowledge and information, reasonably representative of a corresponding proportion of the year's business and operations?

A. I think it is.

Mr. Mason: I am about to offer the exhibit in evidence. Mr. Strouss, you may question if you wish.

Mr. Strouss: I would just as soon let it go until in the morning, my eyes are bothering me.

The Court: The Court will be at recess until 10: o'clock in the morning.

[fol. 524] November 28, 1940. 10:00 A. M.

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed, gentlemen.

C. R. Young, a witness on behalf of the defendant, resumed the stand and testified further as follows:

Mr. Mason: I think that at the conclusion of the proceedings yesterday I had about completed the testimony intended to lay a foundation for the introduction of the state-

ment marked Defendant's Exhibit 30 and had indicated to Mr. Strouss that I was about to offer the exhibit subject to any prior questioning of his own.

Mr. Strouss:

Q. Mr. Young, the columns marked 1 and 2, are those division terminals?

A. No, they are crew operating districts.

Q. Is the train between Chicago, and Champaign, is that counted as one point?

A. Yes.

Q. And the same is true of each of the other points down through the column?

A. That is true.

Mr. Strouss: I think that is all the questions I have.

[fol. 525] Mr. Mason: We offer the exhibit as Defendant's Exhibit No. 30 in evidence.

The Court: The record may show the same objections to the introduction of this exhibit as to the other exhibits, and the court at this time is overruling the objection.

The Clerk: Defendant's Exhibit 30 in evidence.

The Court: Before the day is through, I do have some remarks to make with reference to this particular type of exhibit. I have been reading your cases, Mr. Strouss, and I might possibly say to counsel in fairness at this time, both counsel for the defendant and the state, that due to the importance of this case, the fact that you gentlemen are veterans, so to speak, in this type of litigation, the court has wanted to proceed cautiously and not be making any snap rulings on the admission of evidence, particularly, the rejection of evidence that was offered, and I have been leaning backwards in an endeavor to give the defendants a full opportunity to introduce the evidence supporting their theory of the case. However, it seems to the court that the train limit law is no different than any other, this law suit is no different than any other suit; that is, I know of no rule that makes an exception in the matter of the admission of evi-
[fol. 526] dence, the admission or rejection of evidence in such a case. Really, I think there can be no question but what where voluminous books and records are concerned that experts and accountants, or others who are familiar with them, may make an examination of those records and then testify as to what those books contain. But I haven't

found any law, gentlemen, to support the proposition that such testimony can be admitted without those books and records being available to opposing counsel, and while I am admitting these, I probably won't have time before the weekend to completely satisfy myself as to the law governing the case, I think I should at this time tell you that there is a very serious doubt in my mind as to the admissibility of such exhibits as the one you are now referring to without the production of the underlying records.

Mr. Mason: May it please the Court, we have been through the trial of two train limit cases.

The Court: Realizing that, that is the reason I have been reluctant to make any snap rulings.

Mr. Mason: One in this state and the other in the State of Nevada, and both, of course, in the Federal Court. I do not understand, however, that the rules of evidence are in any respect different in the Federal Court than they would [fol. 527] be in this case. In those cases—perhaps I had better refer to the Nevada case because I did not participate in the Arizona case and Mr. Strouss did, as also did Mr. Booth—but in the Nevada case, at least, we presented testimony of the same type as Exhibit 30 prepared by the witnesses from the several railroads and testified to by them as having been prepared and taken from the dispatcher's train sheets and other documents necessarily consulted. In that connection, I might say that these dispatcher's train sheets are extremely voluminous documents and contain a great amount of data and information pertaining to the operation of railroads, which is not involved here.

The Court: There is no question but this is a concise way of presenting it and it would be more expeditious. There is no question about that.

Mr. Mason: The point I am getting to is this: they must be brought here from several points and from a considerable distance in the case of the Illinois Central and also in the case of the New York Central.

The Court: The court fully appreciates the difficulty.

Mr. Mason: To get to the point a little more definitely, [fol. 528] in the other cases while objection was made on the ground of relevancy—the same objection that Mr. Strouss has made,—that objection was disposed of, of course, by reference to the allegations of the complaint.

The Court: I might say to you, I am not concerned or in doubt as to the question of its relevancy.

Mr. Mason: I did not intend to discuss that question, except to point out that that objection was made, and the objection of competency, if it was made—and I don't recall that it was made—was not seriously urged after it was pointed out that the documents were extremely voluminous, that to bring them for a great distance would be a great inconvenience, and that the witness would say under oath that he was familiar with the details and that he had made a personal examination of the original data. When we undertook our preparation of this case, we proceeded upon substantially the same basis; that is, to have the witness personally present who was qualified to testify as to having made the examination of these voluminous documents located at a distance; and for that reason we have not up to this time arranged for the production of the train sheets and profiles which would furnish the underlying basis for an exhibit such as Number 30.

[fol. 529] If subsequent exhibits are offered, and we have prepared certain exhibits along the same lines or have had them prepared by the officials of other railroads, we shall endeavor to have the train sheets here regardless of expense and trouble in bringing them. It is only in the case of Mr. Wright, Mr. Kirk and Mr. Young, who were the first three witnesses of this type called, and as to which we did not anticipate the necessity of having the train sheets, that we are unable to produce them at this time. If we may be indulged to that extent, we will undertake to have those train sheets here, and if it be necessary to recall the witnesses after Mr. Strouss has examined those train sheets, we can possibly do that.

The Court: Counsel indicated in those previous cases that the objection which Mr. Strouss is insisting upon was not made, or if made, was not insisted upon.

Mr. Mason: It was made and an exception taken, but the master——

The Court: Was that before a master.

Mr. Mason: It was before a master appointed by the federal court, but with full authority and authority to rule upon evidence; and many exhibits which we offered were [fol. 530] rejected, of course, and they weren't considered; they weren't a part of the record at all; they were separately submitted. I say "many", not so many exhibits offered by the Attorney General were rejected; in fact, I think very few.

The Court: I am not at all certain that possibly Doctor Parmelee does not stand in a class by himself. You produced here the original records in that instance.

Mr. Mason: We produced all of the underlying records there.

The Court: From which his testimony was taken, and I realize that you gentlemen have produced here already in this court men who are outstanding in the field, who have had wide experience, who, without reference to any books or records can give a lot of testimony that is entirely competent and relevant, and it is not that which the court is concerned about. But when you get into an exhibit such as this which you are offering here, if counsel insist,—they have, vigorously insisted upon objecting to it—they have been very patient about it—that they are entitled to examine those original exhibits, gentlemen, I think they are entitled to those, as a matter of law.

Mr. Strouss: Of course, one thing that might be said [fol. 531] about this exhibit, while it has been stated by counsel as to the number of train sheets in a day, and it only purports to cover a period of ten days, as a matter of fact, it refers to a period of a year and adopts it, takes this as a typical example of train operations during the year, so that in order to examine him upon that question it would require the records for the whole year.

Mr. Mason: I think the witness being fully qualified as he is, I think that is carrying the objection a little far.

The Court: I am not going to go into details, gentlemen. I just want to tell you how the Court feels about it. I have tried to proceed cautiously and I don't want to make some snap rulings that would work an injustice or be unfair; but I am of the opinion—and you haven't shown me any law to the contrary, gentlemen—that if counsel insists upon it for the purposes of cross-examination he is entitled to those original records. He may have difficulty when he gets them, but that is his problem.

Mr. Booth: There is just one matter I would ask your Honor to take into consideration. In examining the author- [fol. 532] ities, there are many classes of records kept by railroad companies. Some of them are prescribed by the Interstate Commerce Commission, and some of them are records below the grade, or below the making of the Interstate Commerce Commission records in point of time. Now

the dispatcher's train sheet is on a form, as we shall show later, prescribed by the Interstate Commerce Commission. There can be no doubt but that that is an original record of the performance of trains on a district for the period covered by the sheet. So that when a dispatcher's train sheet is produced the person producing it is producing an original record of the transaction so far as any record is made. Now when we come to the number of miles, the number of cars in a train, the weight of cars and the point where the train was set out, the cars were set out, there is another class of records that stand on an entirely different basis. The conductor makes certain records. By the time those records get into the accounting department of the company there may be entries on those made at terminals by other employees; there may be computations placed upon them by still other employees, and finally when a single sheet—we can show all this by testimony—I am simply mentioning this [fol. 533] so that the situation may be in view when you read the authorities—when finally a single sheet gets into the records and the dispatcher makes up his record of the number of train miles, the number of car miles and the number of pieces of freight—multitudinous pieces of information that are accumulated as to that division, the original entry passes out. Indeed, in most cases it isn't even preserved. It goes onto the records of the company in the accounting department office in a summarized form, and then from that summarized form is still or may be further summarized. So the whole thing is finally accumulated in a report to the Interstate Commerce Commission in such form as that Commission may prescribe.

We all know that this rule for the production of records originated largely in the matter of books of account of merchants, and originally a merchant—I remember even in my own experience as a practicing lawyer the merchant's books of account consisted of a day book on which sales and receipts of money were entered currently, and that was known as the book of original entry. You may find that expression throughout all these older decisions. From there it was transferred to a ledger, and the thing you had [fol. 534] to do in order to prove an account against an original debtor, was to produce your book of original entry. You had to produce that book. And then gradually as the accounting system became more systemized you had the sales slip, and of course, the sales slip is the original entry

of the transaction between the merchant and the customer; and these sales slips are carried forward either to permanent books or cards of some kind which correspond to the day book, and then further onto to other cards which correspond to the old ledger. But in my examination of the authorities I have not found any case where you have to produce the original sales slips of a merchant.

Now, as another suggestion, and an almost impossible thing, in proving railroad records, such as car miles, train miles and character of commodities handled, is the bulk document situation. There are millions of what would correspond to the merchant's sales slips in the course of a year in the conduct of a railroad, such as any of these railroads whose witnesses have testified here, or any of the railroads we will call. Of course, it would be impossible for defense counsel to examine those within any reasonable time, any reasonable length of time, or even an expert ac-
[fol. 535] countant,—an examination of the cards and the sales slips of a railroad made out currently by station agents, by conductors, and so on. In the nature of things, even the Interstate Commerce Commission examiners, who are authorized by statute to examine our books, never have examined things of that kind. They examine consolidated summarized entries in the accounting department.

I mention this because sooner or later in this car the matter is going to come up, and if a case of this kind is going to be tried, as the saying is, like a murder case, if we have to get down to the original sales slips, it could be done, but it would take ten years to try even the Southern Pacific end of this case.

The Court: I assure you this court is not going to be here ten years.

Mr. Booth: I respectfully ask your Honor to have——

The Court: The court is not going to carry this to any absurd extremes. You can rest assured of that. But it seems to me that there are certain basic records from which this data is taken, and that opposing counsel is entitled to them.

Mr. Booth: This particular exhibit, the original basic record from which it was taken, is the train sheet, that con-
[fol. 536] tains everything but the ruling grade on the district, a matter which every freight conductor and every freight engineer knows on that district—every operating man knows what the ruling grade on the district is.

The Court: I will say that the Court is of the opinion that these witnesses of the type you have been producing here, where they know of their own knowledge certain things, the Court is going to permit them to testify to it. The mere fact that that same data may be of record in some book of account, or some book of the railroad, I don't consider in those cases you necessarily have to produce the records. But you take—I marked some of them yesterday—let me give you another one as an illustration. Take Exhibit 11, for instance. That is typical of some of these exhibits. There is a detailed exhibit of the New York Central Railroad Company, which is taken, according to the statement there, from the annual reports of the Interstate Commerce Commission. Now without the production of even the original reports, or a copy of the reports, or the books or records from which it is taken, you offered it in evidence and the Court admitted this exhibit which goes into detail as to the operating of the railroad, their revenue ton miles [fol. 537] and freight operating expenses, and there isn't a thing to support it so far as any original records are concerned. If counsel wants to go back to that on cross examination his hands are tied, he can't do a thing.

Mr. Mason: I will say to the court frankly we are arranging, or insofar as we can, to have either accounting witnesses or persons who are thoroughly familiar with accounting bring these annual reports in the form of OSA and OSE here and have them in the court room, and I wish counsel much joy in examining them.

As far as individual personal observation is concerned, why, as Mr. Boyle observed to me the other evening, the Mexican section foreman or a Mexican section hand down here at Picacho is competent to testify as to the character and length of trains that he sees passing on the section, and certainly a railroad official, a man with authority, who has had years of experience, is competent to testify without the aid of any train sheets about the general condition of the railroad.

The Court: You gentlemen don't want to prolong this. You don't want to shorten it up any more than I do. I assure you I would like to have this matter move along just as [fol. 538] expeditiously as possible, and not drag along. But on the other hand, counsel is entitled to certain rights here, and the court must deal fairly, of course.

Mr. Boyle: I, like your Honor, may not be a veteran in this case, but it has been very interesting to me, thus far and it is something new that we are not entirely familiar with, and I want to be clear—and I think perhaps because of the observation made by you a moment ago I am clear on this point—witnesses like Mr. Wright, Mr. Kirk, Mr. Young here have given a great deal of testimony with which they are entirely familiar growing out of their experience and life in railroading. The testimony they give has been based upon their personal observation through all that period of time. I understand that the court's comments this morning have to do merely with the documentary testimony so far as the exhibits are concerned, and all of that other testimony that can be backed up, or was backed up by personal observation and experience is a different thing.

The Court: Within reason, I agree with you, Mr. Boyle. Well, you may proceed.

Mr. Mason: Your Honor, I had this comment upon Number 11, since it was mentioned by the court, that the source, of course, there is the annual report made to the Interstate [fol. 539] Commerce Commission. Now the annual reports to the Interstate Commerce Commission, the originals are on file, of course, in Washington, and perhaps could not be withdrawn, but each company necessarily and as a matter of obligation by virtue of the orders of the Interstate Commerce Commission maintains its own counterpart copies as its own records. I take it that the production of those counterpart copies by the official of the railroad company concerned, who has charge or who has been given charge for the purposes of this case to produce them here would be sufficient to satisfy the requirement.

The Court: I would rather not commit myself, gentlemen, on the details of this. I just wanted to make some general observations. I do think, in fairness to counsel for the defendant, that a definite ruling should be made on this very shortly, and I will be prepared to do that at the beginning of our session next week, and at that time I will entertain a motion to strike certain such of these exhibits as the court feels were improperly admitted. But as to these other matters I think we had better cross those bridges as we get to them.

Mr. Mason: The production, of course, of the counterpart [fol. 540] originals or retained original copies would satisfy

all of the necessities for cross examination, because the same figures would be there available as if we had the originals from Washington.

The Court: You may proceed.

Mr. Mason:

Q. Now, Mr. Young, as to Exhibit Number 30, are those figures of ruling grade, shown for those various districts matters within your own knowledge?

A. Yes.

Q. Is it necessary for you to, or was it necessary for you as superintendent of transportation to know the ruling grades in each of the districts for the purpose of assigning locomotives?

A. That is true.

Q. And you have acquired that knowledge of ruling grades in the course of your duties and as a part of the knowledge necessary to your position as superintendent of transportation?

A. Yes.

Q. Mr. Young, I ask you to refer, if you will, to a statement in one sheet bearing the title, "Illinois Central System" maximum number of cars handled in various main line passenger trains, April 10 to 19 inclusive, 1939."

[fol. 541] Mr. Mason: I will ask that the statement just referred to by title be marked Exhibit 31 for identification.

The Court: Defendant's Exhibit 31 for identification.

Mr. Mason:

Q. Have you Number 31 before you, Mr. Young?

A. I have.

Q. Did you prepare this statement?

A. I did.

Q. From what sources? From what sources was the information therein shown taken?

A. From the train dispatcher's train sheets.

Q. They were made available to you for the purposes of this exhibit?

A. They were.

Q. And those were the dispatcher's train sheets for all of the districts between Chicago, and New Orleans, Chicago and Birmingham, St. Louis and Memphis, and Chicago and Omaha for the ten-day period covered?

A. That is correct.

Q. Now state in round numbers approximately how many dispatcher's trains sheets that would be.

A. Approximately ninety train sheets. Those were the same train sheets which were used in the compilation of Ex-
[fol. 542] hibit 30, as I remember.

Q. Does this exhibit cover train territories upon which you operate passenger trains, other than the line to St. Louis, that is main line passenger trains?

A. Yes.

Q. And these are examples of main line trains entirely?

A. Main line trains and passenger, the named trains. It does not include the local passenger trains.

Q. Is the period from April 10th to 19th, 1939, fairly typical as regards volume and character of passenger traffic of the year 1939?

A. It is typical of the year around operations. It does not include any of the rush periods which occur around holidays or various seasons. It is just a good average month.

Q. Does the exhibit accurately reflect the information shown in the dispatcher's train sheets from which it was taken?

A. It does.

Q. Has it been checked *it* by you for that purpose?

A. It has.

Q. Now, there are certain computations on the exhibit in
[fol. 543] each of the blocks, and again in the separate block at the foot of the exhibit. Did you make or check those computations?

A. I did not make them. I have checked them and they are correct.

Mr. Mason: I am about to offer the exhibit, Mr. Strouss, unless you have some questions.

Mr. Strouss:

Q. This covers the same ten-day period as the freight train exhibit, Exhibit No. 30.

A. That is true.

Mr. Strouss: In addition to the objections which I have, the running objection, so to speak, I have a further objection to this exhibit, that in permitting the witness to select

a particular period based upon his own judgment is taking evidence which is a conclusion of the witness and incompetent.

The Court: I will overrule the objection.

The Clerk: Defendant's exhibit 31 in evidence.

Mr. Mason:

Q. Now, apart from Exhibit No. 31, Mr. Young, and any study which you may have made for the purpose of comparing that exhibit, are you generally familiar with the main line passenger train operations of the Illinois Central? [fol. 544] A. Yes, I ride them frequently.

Q. Is it necessary in the course of your duty in your present position?

A. Yes, it is.

Q. Has it been necessary in the past?

A. Yes.

Q. Will you state whether or not the Illinois Central from time to time operates passenger trains consisting of more than fourteen cars as well as those consisting of less than fourteen upon its main lines?

A. Yes, it does.

Q. Upon what main lines and in what particular traffic does the operation of such trains of more than fourteen cars most generally take place?

A. Principally in the territory between Chicago and New Orleans, the north and south lines that we commented on yesterday as the heavy traffic lines.

Q. Is that also your principal passenger-carrying line?

A. Yes, it is.

Q. And from your general observation and experience and again apart from any study made for the purposes of this case, would you say approximately how frequently in proportion to the entire number, passenger trains of more than fourteen cars are operated upon your principal [fol. 545] main line that you have described?

A. In the regular passenger trains which operate from day to day, the proportion of the trains which are over fourteen cars, fourteen cars and over, are a little better than 50% of the total.

Q. Do you operate such trains of more than fourteen cars upon regular and continuous schedules and similar to those of trains less than fourteen cars?

A. Yes, where the train contains more than fourteen cars it is operated on the regular schedule which is maintained.

Q. Do I understand, then, that a particular named train bearing a particular number and operated on a particular schedule will on one day, for example, be fourteen cars or less and on the succeeding day more than fourteen cars?

A. That is right.

Q. And operate on the same schedule?

A. Yes, the point that I was trying to make was that there is no train that has a definite day in and day out concert of over fourteen cars, but it frequently handles more than fourteen cars.

Q. Upon what considerations or conditions does the length of your passenger trains depend normally?

[fol. 546] A. Generally on the ability to heat the rear car in the train. That is one limitation we have placed on the passenger trains. In severe weather we limit our regular passenger trains to not exceeding sixteen cars, undoubtedly because of our feeling that that is the maximum number of cars we can heat in severe weather.

Q. What do you mean by severe weather?

A. To below zero.

Q. Below zero?

A. Yes.

Q. Have you encountered below zero frequently in any part of your main between Chicago and New Orleans?

A. Not frequently, we do have weather that severe probably fifteen or twenty days out of the year. That is merely a guess.

Q. That is bases upon your——.

A. Observation.

Q. ——experience over the past 30 years or more?

A. Yes. In the summer time there is no limit for the passenger train and we have handled passenger trains with as many as twenty-one cars, satisfactorily maintaining the schedule.

The Court: Did I understand you to say 21 cars?

[fol. 547] A. Yes.

Mr. Mason: Q. Do you handle Pullman equipment in your passenger trains?

A. We do.

Q. Is that of the same type generally used throughout the United States?

A. Yes.

Q. Do you handle any through-Pullmans interchanged with the Southern Pacific at New Orleans or at any other points?

A. Yes, we have a Pullman car line of operations from Chicago to Houston, Texas.

Q. Over the Southern Pacific west of New Orleans to Houston?

A. Yes.

Mr. Mason: This may be a repetition, I am not certain, because I have not consulted the record.

Q. Mr. Young, if you have not already stated, will state for the record what consideration governs the length of freight trains operated on the Illinois Central?

A. My recollection is that I answered that yesterday. The first consideration is the tonnage that is available. The next is the grade, the size of the engine and the length of the passing tracks in a single track territory.

[fol. 548] Mr. Mason: As I recall, you did answer along the same lines. That is all, you may cross examine.

[fol. 549] Cross-examination.

Mr. Strouss: Q. Mr. Young, upon what information do you base the statement that over 50 per cent of your passenger trains are over 14 cars?

A. From observation and from glancing at this exhibit which I have in front of me.

Q. Mostly from the exhibit, is that not true?

A. I wouldn't say so because as I have testified previously I ride these trains and observe and when I was superintendent of transportation I actually made up the consist of the trains.

Q. At the present time of the make-up or consist of each train during the day, that information would come to you only by way of records unless you happened to ride one of the trains, you wouldn't be riding them all or seeing them all?

A. No, sir, sort of like knowing how many rooms are in your house, you don't count them every day but you know how many rooms you have by having been in the house.

Q. I don't understand what you mean by that. Your statement then is based upon the assumption that a train having a certain length of train one day would have the same length of train the next day?

[fol. 550] A. No, maybe I didn't understand your question. I understood you to ask me how I knew that these trains had these varying lengths.

Q. As I understood your testimony you said that over 50 per cent of your passenger trains during the year would carry a consist of over 14 cars. I wondered how you knew what that percentage is because it doesn't seem to me you could have seen a majority of those trains to know of your own knowledge that fact.

A. I see the movements report of the passenger trains every day which shows the number of cars in each train and then I see the train sheets when I am in the dispatcher's office out on the railroad and I observe the trains naturally when I ride on them and it is a combination of the three, the use of the records, my personal observations, and the reports.

Q. Yesterday you testified that better than 99 per cent of the boxcars owned by the Illinois Central are now steel or steel underframe cars. Did you mean by that statement that over 99 per cent of your boxcars are both steel and steel underframe or that the combination of the two makes up the 99 per cent.

A. The combination of the two.

[fol. 551] Q. How many boxcars does the Illinois Central own?

A. Approximately 44,000.

Q. How many were built in 1937 and 1936?

A. I haven't that record with me. It is my recollection there were about 2,000 cars added to our ownership in 1937.

Q. What about 1927?

A. I will again have to speak from memory. It is my recollection we bought some automobile cars in 1927. I was superintendent of transportation at that time and I believe that is the time that the so-called loading devices showed up in automobile boxcars.

Q. Of course you have in service cars that were built in years prior to that?

A. Yes.

Q. In your testimony yesterday you testified concerning the engines owned by the Illinois Central and you specified those that were similar to the engines shown in defendant's exhibits 5 and 6. Does the Illinois Central own engines of a type different than those shown by either exhibit 5 or 6?

A. Yes, I think as I recall, Mr. Strouss, I mentioned some of those differences yesterday. We haven't all of the types [fol. 552] which are shown on this exhibit.

Q. Did you mention all of the types of engines that the Illinois Central owns in your testimony yesterday?

A. No, we have some eight and ten wheel switch engines which are not shown on this exhibit and we have some Diesels which are not shown on the exhibit and we have some straight electric switch engines which are not included on his exhibit.

Q. The information contained on the exhibits which you have testified to with the exception of exhibit No. 31 reflects your complete system operations including your terminal operations, isn't that true?

A. Yes.

Q. And exhibit No. 31 is limited to main line operations on the territory shown?

A. That is true.

Mr. Strouss: That is all.

Redirect examination.

By Mr. Mason:

Q. Mr. Young, as superintendent of transportation was it your duty to order the consist of the passenger trains from day to day?

A. In a measure, yes, the superintendent of transporta- [fol. 553] tion sets up the regular consist of the train and then it was through him or his staff that cars were added to or taken from the train.

Q. I don't think we included in your direct examination reference to special trains. Does the Illinois Central from time to time operate special trains or extra sections of regular passenger trains?

A. Yes, and it was generally the special trains of troops or C. C. C. movements which go up to the 21 cars I mentioned.

Q. Do special trains of that type and special trains for other parties exceed 14 cars in length at times?

A. That is correct, and some of the special movements carrying delegations or organized parties insist that they be kept together. For instance, we have had some Shrine movements going to conventions which were kept together for that reason. They exceeded 14 cars.

Mr. Mason: That is all. Thank you.

Recross-examination.

By Mr. Strouss:

Q. In your report to the Interstate Commerce Commission, your annual report, you show the average passenger [fol. 554] train lengths for your passenger train operations for the year, do you not?

A. I believe we do. Without looking at the report I couldn't say.

Q. Do you know what that was for the year 1939?

A. No, I don't. It would be considerably less than 14 cars because it would include the one and two car trains as well as the trains which consisted of more than 14 cars.

Q. I was limiting the question to main line operation.

A. If that item appears in the report to the Interstate Commerce Commission as an individual item it can be calculated. It would refer to all passenger trains, they were not separated as between main lines and what are called secondary lines. That is my recollection of having looked at the reports.

Mr. Strouss: It is probably not a fair question to the witness if you are not familiar with the annual reports but my understanding was that the branch line and main line operations were broken down or summarized.

A. I don't think they are.

Mr. Strouss: It would show by exhibit No. 9 but if you [fol. 555] don't have the information as to your main line operations naturally you cannot answer my question.

Redirect examination.

By Mr. Mason:

Q. Your company operates a very extensive suburban service running out of Chicago through nearby points on the south side of that city, doesn't it?

A. Yes, sir, about 480 trains a day.

Q. Those are all passenger trains of course?

A. Yes.

Q. Their operation is in a sense segregated and not on the same lines as your main line steam trains?

A. That is true, the suburban tracks are separated from the main line through passenger tracks.

Q. Nevertheless all of those through passenger train operations and suburban service would enter into your total of passenger train operations?

A. I think that is correct, I am not sure.

Q. If there is any over-all average of passenger train lengths it would necessarily include suburban trains——

Mr. Strouss: If you know.

[fol. 556] A. I am not sure about that, I would have to look at that. I can look it up if you give me the time to examine the reports but I do not make those detailed mileage reports.

Mr. Booth: Those reports will be here next week.

Mr. Mason: Perhaps we can defer the question then.

Mr. Strouss: That is all right, I thought it was understood I had withdrawn my question when he announced that he didn't know.

Mr. Mason: That is all then, Mr. Young.

The Court: You may step aside, Mr. Young.

(The witness was excused.)

Mr. Mason: Before we call the next witness, Your Honor, Dr. Parmelee and ourselves have read through the reporter's transcript of his testimony and we have now certain corrections to submit which we should like to submit to the court and opposing counsel for their examination and we ask that the transcript be corrected after examination has been made in line with these suggestions.

Mr. Strouss: I was under the impression, Mr. Mason, that we were each going to more or less edit our own portion

of the record and could get together, I don't think we will [fol. 557] have any difficulty in agreeing as to the corrections, and not bother the court to see if they should be made or not.

Mr. Mason: If that is preferable I will withdraw any request for an order.

The Court: I think you better withdraw it and see if you cannot iron it out.

(Discussion off the record.)

P. G. Otterback was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Mason:

Q. What is your present employment?

A. I am assistant to the chairman of the Western Railways Committee on Public Relations at Chicago.

Q. What has been your experience in railroad service?

A. I was first employed in 1919 as statistical assistant at the Bureau of Railway Economics.

Q. Is that the same bureau described by Dr. Parmelee?

A. That is the same bureau. I later became assistant to the director of that organization. Subsequently I was [fol. 558] employed as a member of the public relations staff of the Pennsylvania Railroad and of the Association of Railway Executives as chief statistician of the National Transportation Institute, as a member of the transportation and communication department of the Chamber of Commerce of the United States and since April, 1925, or for the last fifteen and one-half years in my present capacity.

Q. What has been the scope of your duties in your present capacity generally?

A. My work throughout the entire twenty-one years has been largely of a statistical character.

Q. Has it been principally in connection with transportation statistics of railroads?

A. Entirely in connection with transportation statistics.

Q. What was your academic preparation prior to 1919?

A. I received the degree of Bachelor of Science from Colgate University.

Q. Have you prepared a series of exhibits for this hearing?

A. Yes, sir.

Q. Have you a statement in two sheets besides a title sheet entitled, "Total Number of Locomotives and Total [fol. 559] Number of Freight-Train Cars, excluding Caboose Cars, All Railways of the United States, and so forth"?

A. Yes, sir.

Q. Was that prepared by you personally?

A. It was.

Q. From what sources was it prepared?

A. The figures for the years 1890 to 1938 inclusive were taken from the official published reports of the Interstate Commerce Commission entitled "Statistics of Railways in the United States." The figures for the year 1939 were taken from the official published reports of the Intersate Commerce Commission entitled "Preliminary Abstract of Railway Statistics."

Q. Are any of these publications available in the courtroom?

A. I understand that the reports of the Interstate Commerce Commission for the period from 1922 to date are available here. As a matter of fact the Commission's current report contains a historical table which carries these figures back to the year 1890.

Q. Then these figures are available in the current report back to the year 1890 in the table to which you refer?

[fol. 560] A. With one slight exception. The figures for the period from 1890 to 1910 which cover all railway are included in this 1938 report. The figures from the period of 1911 to date cover class I railways alone. Those figures are not shown in this historical summary which covers all railways.

Q. Are those figures for Class I railways from 1911 to date otherwise shown in these statistical reports to which you refer?

A. They are shown in the statistical report for each year.

Q. Each year of the annual issue?

A. That is correct.

Q. Have you compared the exhibit against the original source to determine its correctness?

A. I have.

Mr. Mason: I should have asked previously that the exhibit be marked for identification, which would be defendant's exhibit No. 32.

The Clerk: Thirty-two for identification.

Mr. Mason: Q. I notice on the exhibit that on sheet 1 and likewise on a portion of sheet 2 the references to the years ending June 30 and thereafter, after 1916 to the years ending December 31. Will you explain how that comes about?

A. Those years changed from a fiscal year basis to a [fol. 561] calendar year basis because of a change in the classification in the accounting rules of the Interstate Commerce Commission. When the Interstate Commerce Commission first required annual reports of the railways of the country it required those reports upon the basis of the year ending June 30. That situation existed through the year ending June 30, 1916. In that year the change was made to the present basis of reporting for the calendar year.

Q. I notice also that the exhibit shows on the first sheet statistics for all railways but on the second sheet is limited to Class I railways. Why is that?

A. Prior to 1910 there was no classification made by the Interstate Commerce Commission which grouped railways in any way other than a territorial grouping. Effective in the fiscal year 1911 the Interstate Commerce Commission adopted its present system of classifying railway companies into classes I, II, and III. The companies included as Class I railways are those companies with annual operating revenues in excess of one million dollars.

The Court: We will take a brief recess at this time.

[fol. 562] Thereupon a brief recess was taken after which proceedings were resumed as follows:

Mr. Mason: Mr. Otterback, I don't know whether I made it clear or not but do I understand also that the publication for 1939 entitled, "Preliminary Abstract," and which is stated as the source of the 1939 figures is also in the courtroom and available for the examination of opposing counsel?

A. It is, yes, sir.

The Court: Let me get this straight, Mr. Witness. As to this particular exhibit, did I understand you to testify there is in the courtroom the reports from which the figures shown here were taken?

A. With the exception of the period of years beginning with the fiscal year ending June 30, 1911 and running through the calendar year ending December 31, 1921. In the 1938 Statistics of Railways in the United States published by the Interstate Commerce Commission there appears, as I have said, a historical table carrying this information back to the year 1890 and that table however covers all railways in the United States. Those figures in that table correspond to the figures shown on page 1 of exhibit No. 32.

[fol. 563] Mr. Mason:

Q. Do I understand that there are statistics for all railways in the United States subsequent to June 30, 1911, which appear in the table but not segregated as to class I railways?

A. That is correct.

Q. So that these precise figures for the approximate ten-year period that you have referred to in your answer to the court's question do not appear in that particular table?

A. No, sir.

Q. And those reports, "Statistics of Railways," are not in the courtroom?

A. They are available in the city, I understand but they are not in the courtroom at the present time.

Mr. Booth: Where are they available in the city?

A. I think at the library at the University of Arizona.

Mr. Booth: Can you verify that?

A. Very readily, yes, sir.

Mr. Mason: During the noon recess?

A. Yes, sir.

Mr. Booth: I don't think the rule of evidence outlined by Your Honor this morning applies with all strictness to the production in the courtroom of standard books of [fol. 564] reference. I think if standard books of reference are shown to be available at the place where the court is sitting, for instance, if a man says the Encyclopedia

Britannica defines Texas beaver to be so and so and it is in the library then counsel can go and look at it. I think that is the exception to the rule. However, if they are in the public library here there would be no great trouble in bringing them in. At any rate whatever is in the court-room here supports the greater part of the exhibit and the part that is most material to this case.

Mr. Mason: May I ask, Mr. Strouss, will you desire to have produced those volumes from the University of Arizona Library for the years 1911 to 1921 inclusive if they are available?

Mr. Strouss: No, I won't insist on that. Of course I have another objection to this evidence but so far as bringing those into court, if they are out there, I won't insist upon that.

Mr. Mason: Do you wish to question the witness before the exhibit is offered, Mr. Strouss?

Mr. Strouss: This data that is in the records of the Interstate Commerce Commission to which you refer, those are computations by the Interstate Commerce Commission [fol. 565] or its agents from the annual reports of the Class I railways for each of the years indicated, isn't that correct?

A. Yes, sir.

Mr. Strouss: That is all the questions I have.

The Court: Mr. Strouss, in order that the court will have it clearly in mind will you kindly restate your objection to this particular exhibit.

Mr. Strouss: I was going to state a further objection.

The Court: Probably you better offer it.

Mr. Mason: I offer the exhibit as defendant's exhibit No. 32.

Mr. Strouss: You mean the further objection I have?

The Court: Yes.

Mr. Strouss: I was going to state the objection, that in addition to the objections which I have heretofore made which may be taken as a running objection, there is a further objection to this, that the record from which this is taken is not a record which would be admissible in itself because it is a summary of other records and this is a summary from a summary and for that reason I think it is inadmissible.

The Court: The objection is overruled. It may be admitted.

[fol. 566] Thereupon the document referred to was received in evidence and marked defendant's exhibit No. 32.

Mr. Mason: Mr. Otterback, do I understand that these figures which appear on this exhibit are exact copies of the figures which appear in the underlying document as the source?

A. They are, yes, sir.

Q. They don't represent any compilation or addition of your own?

A. Not in the slightest.

Q. There are no computations on the exhibit which you have made.

A. None, whatsoever.

Mr. Mason: I think Your Honor may recall that the publication, Statistics of Railways in the United States, and the other publication, Preliminary Abstract of Railway Statistics, have both been identified as official publications of the Interstate Commerce Commission regularly and periodically issued by it in the course of its official duties and made available to all those who may be interested.

Mr. Strouss: My other objection is also made to all of this testimony by this witness.

The Court: Yes.

Mr. Mason: I understand that the objection as to the [fol. 567] non-availability of the underlying records has already been expressed.

Mr. Strouss: Yes, as far as those statistics of American railway volumes are concerned I am not insisting that they be brought into court.

Mr. Mason:

Q. Will you refer to the exhibit, and I ask you particularly to refer to sheet 2, Mr. Otterback, and call attention to the particular features of the figures shown there which you desire to emphasize.

Mr. Strouss: If the court please, I object to that. I think the exhibit speaks for itself, it shows the number of locomotives——

The Court: No, the objection is overruled.

A. Sheet No. 2 of exhibit No. 32 shows that between 1890 and 1910 there was a constant upward trend in the

number of locomotives in service, such number of locomotives increasing from 30,140 in the year ending June 30, 1890, to 60,019 in the year ending June 30, 1910. There was a similarly marked but not continuous upward trend in the number of freight train cars in service, such cars increasing in number from 918,491 in the year ending June 30, 1890, to 2,148,478 in the year ending June 30, 1910.

Mr. Mason:

Q. Did the upward trend in the number of locomotives [fol. 568] and number of cars as to Class I carriers continue after 1910?

A. As shown by the final page of exhibit No. 32 there was an irregular but marked upward trend in the number of locomotives in service from 58,071 in 1911 to a peak of 65,358 in 1924. There was a similar irregular but substantial upward trend in the number of freight train cars from a total of 2,117,644 in 1911 to a peak of 2,361,102 in 1919 and to a secondary peak of 2,357,234 in 1925.

Q. What has taken place since the two years mentioned, 1924 and 1925?

A. There has been a steady decline in the number of locomotives in service ever since 1924 and a similar steady decline in the number of freight train cars in service since 1925.

Q. Has this decline in the number of units in service of both classes of equipment had any effect upon the capacity of such units for service?

A. The aggregate tractive power of locomotives and the aggregate capacity of freight carrying cars has not declined in similar proportion to the reduction in the number of equipment units because of the increases which have occurred during the period in average tractive power per [fol. 569] steam locomotive and average capacity per freight carrying car.

Q. Does the showing of average tractive power and average freight car capacity occur later in your testimony?

A. Yes, sir.

Q. What significance do you as a statistician attach to the reduction in number of equipment units in service?

Mr. Strouss: We object to that as calling for a conclusion.

The Court: Will you read the question.

(The question was read by the reporter.)

The Court: Objection is overruled. Here is an expert statistician who can possibly aid the court in pointing out certain trends. It is true that an expert should not be permitted to draw conclusions when the court can draw them but if he can aid in that way I think he should be permitted to do so. Overrule the objection.

A. The reduction in the number of units which has occurred since 1924 in the case of locomotives and since 1925 in the case of freight train cars is an indication of increased operating efficiency on the part of the railroads. In recent years this downward tendency has been partially due to the depression and to reduced traffic but this downward [fol. 570] tendency began, as I have stated, in 1924 for locomotives and in 1925 for freight train cars in the face of rising rather than falling traffic.

Mr. Mason:

Q. Have you certain figures of locomotive miles operated in various years since the number of locomotives has declined which will illustrate your last statement?

A. Yes, sir.

Mr. Strouss: May I first ask the source of that information?

A. The official published reports of the Interstate Commerce Commission entitled "Statistics of Railways in the United States."

Mr. Mason: The same source as referred to on the exhibit?

A. The identical source.

Mr. Strouss: Our objections heretofore made go to all of this testimony.

The Court: Yes, objection overruled.

Mr. Mason: Will you proceed.

A. This increased efficiency of operation, which means in effect the ability of the railroads to do more with less, is indicated by the following figures of total locomotive mileage, which includes both transportation service and work service. This total locomotive mileage as shown on the

[fol. 571] official reports of the Interstate Commerce Commission amounted to approximately one billion, one hundred forty-two million miles in 1939; one billion, eighty-two million miles in 1938; one billion, eighty-four million miles in 1935; one billion, sixty-five million miles in 1934; one billion, thirteen million miles in 1933 and one billion, forty-three million miles in 1932. In other words, more miles were run by locomotives in 1939 than in 1938, 1935, 1934, 1933, or 1932, yet there were fewer locomotives in service in 1939 than in any of those specified prior years.

Q. Have there previously been introduced of record here the volume of revenue freight service for each of the years as measured in ton miles?

A. The previous exhibits have shown the volume of revenue freight service measured in terms of revenue ton miles and these figures are also shown in subsequent exhibits of my own.

Q. Have you certain figures of revenue ton miles which will indicate the utilization of freight equipment by the railroads for various years along the same line as your showing of relative utilization of locomotives?

A. Yes, sir. The volume of revenue freight service amounted to approximately 333 billion revenue ton miles [fol. 572] in 1939 to approximately 290 billion revenue ton miles in 1938; to 282 billion in 1935; to 269 billion in 1934; to 249 billion in 1933; to 234 billion in 1932; to 309 billion in 1931; to 307 billion in 1921; to 274 billion in 1915; to 285 billion in 1914; to 298 billion in 1913; to 260 billion in 1912; to 250 billion in 1911. Revenue ton mileage was thus greater in 1939 than in any of the years 1938, 1935, 1934, 1933, 1932, 1931, 1921, 1915, 1914, 1913, 1912, and 1911, yet there were fewer freight cars in service in 1939 than in any of those specified prior years.

Q. Does that conclude your comments on No. 32?

A. Yes, sir.

[fol. 573] Q. Have you a statement consisting of a title page and one other page, bearing the title: "Number of Steam Locomotives for which tractive power was reported, aggregate tractive power reported, and average tractive power per steam locomotive, all railways, United States, 1903-1910, Class I Railways, United States, 1911-1939?

A. Yes sir.

Mr. Mason: May we have the statement just referred to marked as Defendant's No. 33 for identification.

The Clerk: Defendant's No. 33, for identification.

Mr. Mason:

Q. Mr. Otterback, was Exhibit No. 33, marked for identification, prepared from the same sources and in the same manner as Exhibit No. 32?

A. The figures in the columns headed "Number of steam locomotives, Aggregate tractive power pounds, and Average tractive power pounds" were all taken from the same source as were the figures in the previous exhibit; that is, reports of the Interstate Commerce Commission. The figures in the last two columns of the exhibit, entitled "percentage increase over previous year, and percentage in-

[fol. 574] crease over 1903" are calculations which I made.

Q. Did you personally make the calculations in the two columns on the right-hand side?

A. Yes.

Q. And they are merely arithmetical calculations which can be checked against the figures in the preceding columns?

A. That is correct.

Q. And the other figures that appear, as here presented, were taken, as indicated in the footnote of the sheet, from the underlying sources referred to?

A. Yes, sir.

Q. Which are the same as those used in connection with the prior exhibit?

A. Identical with the prior exhibit.

Q. Have you checked the exhibit to determine whether it is true and correct?

A. I have.

Q. And will you state whether or not it is true and correct?

A. To the best of my knowledge and belief, it is.

Q. I notice that the showing commences with the year ending June 30, 1903, will you say why a showing for prior years is not included?

[fol. 575] A. The fiscal year 1903 is the first year for which these figures were compiled and published by the Interstate Commerce Commission.

Q. The figures for the years prior to and including the year ending June 30, 1910, related to all railways of the United States of the various classes.

A. The classes of railways covered are identical with those in the previous exhibit. That is, all railways are covered through the year ending June 30, 1910, while for the years 1911 to 1939, inclusive, Class I railways only are included.

Mr. Mason: Subject to the objections previously urged, and with the understanding, which I assume will extend to this exhibit, that the reports or statistics of railways of the United States for the years 1911 to 1921, inclusive, will not be insisted upon, we offer the exhibit in evidence.

Mr. Stronss: Subject to our objections.

The Court: The objection is overruled. It may be admitted.

The Clerk: Defendant's Exhibit No. 33, admitted in evidence.

Mr. Mason:

Q. I will ask you first, Mr. Otterback, in connection with Exhibit No. 33, in evidence, if there is any difference as [fol. 576] between the showing on Exhibit No. 33 and the showing of locomotives on exhibits No.—Exhibit No. 32; and if so how that difference arises?

A. There is a slight difference in the earlier years from the figures shown on Exhibit No. 32. This difference arises from the fact that in the earlier years complete reports apparently were not made of tractive power covering all locomotives in service. The volume of Statistics of Railways in the United States, fiscal year 1903, for instance, the computations of all classes for the year covered by that report, show the number of steam locomotives as 43,245, with an aggregate tractive power of 941,915,540 pounds. Since 1923, however, and for some of the earlier years the figures shown on Exhibit No. 33 are identical with those shown on Exhibit No. 32.

Q. Does the failure to report tractive power for all locomotives for the earlier years have any substantial effect upon the comparisons, the percentage comparisons, shown in the right hand column?

A. It would have some slight effect. In the same report of the Interstate Commerce Commission, previously mentioned, that is Statistics of Railways in the United States [fol. 577] for the year 1903 the commission states: The completeness of the classification for the year covered by

this report is seen from the fact that out of 43,871 locomotives the classification includes 43,245. Estimating the average tractive power of the 626 locomotives unclassified at below those of single-expansion locomotives, the aggregate tractive power of the locomotives in service on June 30, 1903 may be safely estimated at 950 million pounds. If we use this estimate——

Q. I think you said estimate——?

A. I said, using the estimate of the Interstate Commerce Commission of 950 million pounds for the aggregate tractive power of 43,871 locomotives there would be derived an average of 21,654 pounds per steam locomotive. This is somewhat below the figure of 21,781 pounds which is shown in the third column of exhibit No. 33. In other words, the omission of certain locomotives from this report would have the effect of overstating the actual average tractive power per steam locomotive in the earlier years, and consequently understating the increase which has subsequently occurred.

Q. Would the figures be an overstatement or understatement, or substantially the same?

A. It would be relatively slight, but it would be an under-[fol. 578] statement, not an overstatement.

Q. The exhibit particularly refers to tractive power, or tractive force. Briefly stated, what is tractive power, and does it accord a measure of comparing locomotives?

A. In connection with the introduction of Defendant's Exhibit No. 8, a definition of "Tractive Power" was made by Mr. Frank E. Russell. At page 95 of the record, Mr. Russell stated: "Tractive power is the effort that the locomotive exerts at the rim of the driving tire on the rail to move itself forward and backward as the case may be."

Q. Do you desire to call attention to the figures in the third column of the exhibit relating to average tractive power, as indicating any comparisons between earlier periods and the present day?

A. The figures in the third column of Exhibit No. 33, under the heading, "average tractive power" show a steady and substantial increase throughout the entire period covered by the exhibit, from an average of 21,781 pounds in 1903, to an average of 50,395 pounds in 1939, an increase, as indicated by the figures in the last column of 131.4 per cent, which means in effect that in terms of tractive power,

ten locomotives of 1939 are an equivalent of twenty-three of 1903.

[fol. 579] Q. Have you, or can you from the exhibit make a comparison between the locomotives of 1912 and those of 1939 in the same terms?

A. Between 1942 and 1939, the average tractive power per steam locomotive has increased from 28,987 pounds to 50,395 pounds.

Q. Then how many locomotives of the 1912 average power would be required to produce the same tractive power as ten average 1939 locomotives?

A. I will have to figure that out.

The Court: While the witness is making that computation, Mr. Strouss, the reason the Court is overruling your objection to the conclusions, if they may be termed such, of this witness. I take if that the rule stated in Jones' Commentaries on Evidence, Vol. 3, section 1312, has application here. It says: In a great variety of cases where the subjects under investigation are wholly unfamiliar to the jury or even to the judge, there would be no adequate mode of arriving at any satisfactory conclusion if expert testimony were rejected. In recognition of this fact the courts have adopted a rule admitting the opinions of experts whenever the subject matter of inquiry is such that inexperienced persons are unlikely to prove capable of [fol. 580] forming a correct judgment without such assistance. In other words, expert testimony is admissible whenever the subject so far partakes of the nature of a science as to require a course of previous habit or study in order to attain a knowledge of it. And where such is not the case, the general rule excluding opinions of witnesses comes into play, as shown in the opening sections of this chapter." In other words, it permitted an expert to give you the trend of these figures that might otherwise be quite meaningless to the Court.

Mr. Mason: We don't undertake to offer any opinion showing what may be termed certain or ultimate issues presented here, but only to ask the witness to draw certain inferences which to him may be obvious but to us in the legal profession may not be so obvious.

The Court: That statement seemed applicable to this situation.

Mr. Strouss: Of course, that was just one of the objections we had.

The Court: I understand. I just wanted to make my position clear, because I am frank to say that these statistics would be quite meaningless were not this witness permitted to point out the trend.

[fol. 581] Mr. Strouss: I appreciate that the rule of expert testimony is a very close one in many instances, that is, whether or not the testimony is within the rule. There is a statement somewhat different in 21 Am. Jur. 652-53. That is one statement of the rule; and again at 653-4. The rule as stated there would at least raise some question as to whether this witness' testimony was admissible. I recognize it is often a very close question.

The Court: You may proceed.

Mr. Mason:

Q. Have you those computations made now which would enable you to answer my last question?

A. Yes sir. In terms of average tractive power, ten steam locomotives of 1939 are roughly equivalent to seventeen average steam locomotives of 1912.

Q. Does that conclude your comments at this time on Exhibit No. 33?

A. Yes sir.

Q. I direct your attention, Mr. Otterback, to a chart of a single sheet, bearing the title "Average tractive power per steam locomotive, all railways, United States, 1903-1919, Class I Railways, United States, 1911-1939", have you the [fol. 582] chart before you?

A. Yes sir.

Q. May we have this statement, or chart rather marked for identification and marked as defendant's Exhibit No. 34?

The Clerk: Defendant's Exhibit No. 34, marked for identification.

Mr. Mason:

Q. Mr. Otterback, will you state whether chart, Exhibit No. 34, marked for identification, simply places in graphic form on paper the figures of average tractive power shown on the column bearing that heading on Exhibit No. 33?

A. Exhibit No. 34 is a graphic representation of the figures appearing at column 3 of Exhibit No. 33. Those figures being repeated at the top of Exhibit No. 34.

Q. Along the margin or cross section?

A. Yes, that is correct.

Q. What do the circles upon the line which crosses the chart from the lower left to the upper right, what do they indicate?

A. They indicate the exact reading for each of the years shown upon the chart.

Q. And I take it that the underlying figures from which the chart was prepared are those shown on the exhibit and taken as in the case of Exhibit No. 33 from the Interstate [fol. 583] Commerce Commission's publication mentioned by you?

A. That is correct.

Q. Did you supervise the preparation of this chart?

A. I drew the original of it. I am afraid it has subsequently been redrawn, as this one is in much better shape than mine was.

Q. This is in somewhat better shape than the original?

A. Yes.

Q. Have you made a check against the original sources to determine whether it is substantially correct?

A. I have.

Q. The scale, I take it, is shown on both sides of the chart?

A. The scale in pounds is shown on both sides of the chart at intervals of five thousand pounds, starting at the base line of 20,000 pounds.

Mr. Mason: Subject to the objections previously expressed, and if Mr. Strouss has no additional objections, we offer the exhibit as No. 34 in evidence.

Mr. Strouss: I have no additional objections.

[fol. 584] The Court: It may be admitted.

The Clerk: Defendant's Exhibit No. 34, admitted in evidence.

Mr. Mason:

Q. I take it that the purpose of No. 34 is simply to present in the form of a graph, where the picture may be readily seen, the same figures that appear on Exhibit No. 33?

A. That is correct.

Q. Have you any additional comments on Exhibit No. 34?

A. I think there is no comment necessary. It merely indicates the substantial upward trend which appears on Exhibit No. 33.

Q. Will you refer, please, to a statement in one sheet, exclusive of the title sheet, bearing the designation "Average Tractive Power by types of Locomotive Class I Railways, United States, have you that exhibit before you?

A. Yes sir.

Q. From what source was this exhibit prepared?

A. This Exhibit was prepared from the official published reports of the Interstate Commerce Commission, entitled "Statistics of Railways in the United States".

Q. And those are the same statistical reports which have [fol. 585] previously been referred to and identified in connection with preceding exhibits?

A. Yes sir.

Q. Is there any computations on this exhibit which you have personally made?

A. None whatsoever.

Q. These are all copies of entries in the original report?

A. That is correct.

Q. Has the exhibit been compared?

A. It has.

Q. Will you state whether it is true and correct?

A. To the best of my knowledge and belief it is true and correct.

Q. I notice that the exhibit commences with the year ended June 30, 1915, will you state the reason for the omission of earlier years?

A. There is an omission of the earlier years in Exhibit No. 35, and there is also a gap between the calendar year 1916 and the calendar year 1924. For a period of three years, the fiscal year 1915, the fiscal year 1916 and the calendar year 1916, the Interstate Commerce Commission compiled and published in its official reports the figures shown [fol. 586] on Exhibit No. 35 for the average tractive power of freight locomotives, of passenger locomotives and of switching locomotives separately. The classification of freight and passenger locomotives was not definitely made by the Commission in those earlier years, the classification being based rather as indicated by foot notes a and b, upon the diameter of locomotive driving wheels. After a lapse of eight years, or from 1916 to 1924, the Interstate Com-

merce Commission renewed the compilation and publication of these figures, classified the locomotives separately as freight and passenger locomotives, freight or passenger locomotives, and switching locomotives.

Mr. Mason: Subject to the objections previously expressed, we offer the statement in evidence as Exhibit No. 35. I notice it has not been marked for identification.

The Clerk: Defendant's Exhibit No. 35, marked for identification.

Mr. Mason: We now offer it in evidence.

Mr. Strouss: I have no further objections. The objections already made apply.

The Court: The objections overruled. It may be admitted.

[fol. 587] The Clerk: Defendant's Exhibit No. 35, admitted in evidence.

Mr. Mason: Does Exhibit No. 35 carry forward the story and the showing presented by Exhibits Numbers 32 and 33, as to locomotives, Mr. Otterback?

A. It carries in considerably more detail and over a shorter period of time a showing similar to that appearing in Exhibits 33 and 34. As shown by Exhibit No. 35, the average tractive power per freight locomotive has increased from 33,200 pounds in 1915 to 55,943 pounds in 1938. The average tractive power of passenger locomotives has increased in the same period from 27,811 pounds to 37,793 pounds; the average tractive power per switching locomotive in the same period has increased from 27,164 pounds to 40,327 pounds. From 1924, the earliest date for which this information is available to 1938 average tractive power per freight or passenger locomotive has increased from 29,747 pounds to 51,943 pounds. The trend toward the use of more powerful locomotives is again clearly marked in this exhibit as in the two prior exhibits.

Q. I take it that the same computation could be made for a prior year as to the equivalent locomotives of an earlier [fol. 588] year, required to produce the same tractive efforts as 10 locomotives of 1939.

A. Such compilation could readily be made.

Q. You haven't undertaken it in this exhibit?

A. No.

The Court: We will be at recess until 2 o'clock this afternoon.

[fol. 589] Thursday, November 28, 1940, 2:00 P. M.

All parties being present as heretofore notes, proceedings were resumed as follows:

The Court: You may proceed.

P. G. Otterback a witness called on behalf of the defendant, resumed the stand and testified further as follows:

Direct examination.

By Mr. Mason (Continued):

Q. Mr. Otterback, have you before you the statement consisting of the cover page and four other pages bearing the title "Oil Burning Steam Locomotives and Steam Locomotives equipped with Mechanical Stokers, with Superheaters and with Boosters, by Types of Locomotives, Class I Railways, United States"?

A. Yes, sir.

The Court: May that be marked, 36?

The Clerk: Defendant's Exhibit 36.

Mr. Mason:

Q. I take it that the basic data upon which this exhibit is based is as shown in the "source" on sheet 4 of the exhibit itself?

A. That is correct. The basic data in each instance was taken from the official published reports of the Interstate Commerce Commission, entitled "Statistics of Railways in [fol. 590] the United States."

Q. How far back does the exhibit go, just to 1924?

A. The periods covered by the various sections of the exhibit vary extensively, and go back in each instance to the earliest date for which this information was compiled and published by the Interstate Commerce Commission. In certain instances the exhibit goes as far back as the calendar year 1924. In other instances the calendar year 1930, and in still in other instances to the calendar year 1932. The figures terminate in every instance with the calendar year 1938, as that is the latest year for which the Commission's publication, "Statistics of Railways in the United States" has now been issued. This detail is not

shown in the preliminary abstract of Railways Statistics, which is the report now available for 1939.

The Court: Do I understand then, Mr. Otterback, that there are available here in the court room the basic reports from which all of these were taken?

A. That is correct, your honor, as far as the basic figures go. Certain sections of this exhibit constitute percentage calculations which I myself have made. Those percent-
[fol. 591] ages, however, are based upon figures shown in the exhibit.

Mr. Mason:

Q. Now, the figures on the exhibit which show the total numbers, or the numbers in particular classes, are themselves taken from the underlying reports, the underlying statistical reports for the several years issued by the Interstate Commerce Commission?

A. That is correct.

Mr. Booth:

Q. You read Mr. Russell's testimony, did you not?

A. Yes, sir.

Q. And he explained briefly what was meant by mechanical stokers, superheaters and boosters?

A. He explained mechanical stokers, as I recall, judge, and boosters. I don't recall whether or not he mentioned superheaters.

Mr. Mason: I recall that he did mention superheaters. Do you remember that, Mr. Strouss?

Mr. Strouss: Yes, he did.

The Court: Yes.

Mr. Mason:

Q. The percentage computations are of your own doing, are they?

A. Yes, sir.

Q. And has the exhibit been checked against the original sources and the computation also checked?

A. Both the original figures and the computations have
[fol. 592] been checked.

Q. Will you say whether the exhibit is true and correct to the best of your knowledge?

A. To the best of my knowledge and belief it is true and correct.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No. Well, just one question.

Q. Of course, these figures in the Interstate Commerce Reports are the computations by the Commission or its agents from the different reports of the Class I railroads?

A. They are a summary made by members of the Interstate Commerce Commission staff of the annual reports of the individual carriers of Class I.

Mr. Mason: We offer the exhibit in evidence as No. 36.

The Court: The record may show the same objection and that the objections are overruled.

The Clerk: Defendant's Exhibit 36 in evidence.

Mr. Mason:

Q. Now, will you address yourself to section one of the exhibit and briefly explain just what is shown there?

A. Section I of the Exhibit 36 presents figures by years from 1924 through 1938, inclusive, showing the total number of steam locomotives, the total number of oil-burning [fol. 593] steam locomotives and a percentage relationship of oil-burning steam locomotives to the total steam locomotives; such relationship increasing from 11.3% in the year 1924 to 15.1% in the year 1938.

Q. What do you present in section 2 of the exhibit?

A. Section 2 presents by years from 1930 to 1938, inclusive, figures showing the total number of steam locomotives by types, that is the separate figures for freight locomotives, for passenger locomotives, for freight or passenger locomotives and for switching locomotives.

Q. Do you carry that classification further in Section 3 with respect to oil-furning steam locomotives?

A. That is correct. I might add that these figures shown in Section 2 of the exhibit are presented primarily for the purpose of permitting the computation of subsequent percentage relationships.

Q. Does Section 4 of the exhibit present one of those computations of percentage relationships?

A. Yes sir, it does.

Q. Will you explain just what you have undertaken in Section 4?

A. Section 4 shows for the period for which such infor-
[fol. 594] mation is available, that is, for the years from 1932 to 1938, inclusive, the percentage relationship by types of oil-burning steam locomotives to total steam locomotives. That percentage during the period has increased from 13.8% to 15% in the case of freight locomotives; has increased from 15.9% to 18.3% in the case of passenger locomotives; has declined from 21.2% to 19.5% in the case of freight or passenger locomotives; has increased from 10.4% to 11.9% in the case of switching locomotives, and has increased from 13.8% to 15.1% in the case of all locomotives.

Q. Now, going to Section 5, what do you present in Section 5?

A. Section 5 presents for the same years which again represent the entire period for which this information is available, figures showing by types the number of steam locomotives equipped with mechanical stokers. Mechanical stokers, as explained by Mr. Russell, being mechanical devices attached to locomotives for the purpose of supplying coal to the grates.

Q. Are there any oil-burning locomotives included in this group having mechanical stokers?

A. No, sir.

Q. This includes only coal-burning locomotives which
[fol. 595] have applied to them this device of mechanical stokers?

A. That is correct.

Q. What do you show in Section 6, then?

A. Section 6 shows the percentage relationship by types of steam locomotives equipped with mechanical stokers to total steam locomotives. This relationship between 1932 and 1938 has increased from 33.0% to 39.8% in the case of freight locomotives; has increased from 11.0% to 21.0% in the case of passenger locomotives; has increased from 7.7% to 15.6% in the case of freight or passenger locomotives; has remained unchanged at 0.8% in the case of switching locomotives, very few of which are equipped with mechanical stokers; and has increased from 22.1% to 28.6% in the case of all locomotives.

Q. Now, does this percentage tabulation in Table 6 of that exhibit understate the proportion of stoker-equipped

locomotives to the total of locomotives which could be possibly equipped with stokers?

A. It does. In a way it is an incorrect comparison. It is based upon the total number of steam locomotives for the purposes of consistency, but that total number of steam [fol. 596] locomotives includes certain oil-burning steam locomotives which are not susceptible, of course, of the application of a mechanical stoker; and eliminating all oil-burning steam locomotives from the total and developing a percentage relationship of steam locomotives equipped with mechanical stokers to total coal-burning locomotives, that relationship has changed between 1932 and 1938 as follows: It has increased from 38.0% to 46.8% in the case of freight locomotives; it has increased from 11.5% to 25.7% in the case of passenger locomotives; it has increased from 10.3% to 19.3% in the case of freight or passenger locomotives; has increased from 0.8% to 0.9% in the case of switching locomotives; and has increased from 23.9% to 33.7% in the case of all locomotives.

Q. What do you present in table No. 7?

A. Table No. 7 presents a combination of oil-burning steam locomotives and steam locomotives equipped with mechanical stokers by types. This combination, by the way, offsets what might be termed perhaps the inexactness of the figures shown under Section 6.

Q. On table 7, then, you have combined those locomotives which burn coal and have mechanical stokers with those which burn oil and thus have the fuel fed without manual [fol. 597] action on the part of the fireman other than the turning of the valves?

A. That is correct.

Q. Have you made any computations of the proportion of steam locomotives, including those that are stoker-equipped and those which burn oil, and the total of all steam locomotives?

A. Such compilations appear in Section 8 of the exhibit No. 36, and show that the relationship of oil-burning steam locomotives and steam locomotives equipped with mechanical stokers combined to total steam locomotives has increased from 46.8% in 1932 to 54.8% in 1938, in the case of freight locomotives; in the same span of years, it has increased from 26.9% to 39.3% in the case of passenger locomotives; has increased from 28.9% to 35.1% in the case of freight or passenger locomotives; has increased 11.2% to

12.7% in the case of switching locomotives; and has increased from 35.9% to 43.8% in the case of all locomotives.

Q. Mr. Otterback, has the subject of the equipment of coal-burning locomotives with mechanical stokers been the subject of investigation and official decision by the Interstate Commerce Commission?

A. Yes, sir, it has.

Q. Can you give me the docket numbers, titles and some [fol. 598] citation of that report?

A. This is number 24049A Johnston, Grand Chief Engineer of the Brotherhood of Locomotive Engineers, et al. vs. Atchison, Topeka and Santa Fe Railway Co., et al., reported in 225 I. C. C. 519.

Q. Are you referring now, Mr. Otterback, to a published volume of the decisions of the Interstate Commerce Commission?

A. Yes.

Q. Volume 225?

A. That is correct.

Q. And that is one of the series of the published decisions of the Commission issued from time to time and available to the general public?

A. Yes, sir.

Mr. Mason: Is your honor familiar with the Interstate Commerce Commission's published decisions?

The Court: No; I am not.

Mr. Mason: Would you care to see this one?

The Court: I have had no occasion to refer to it.

Mr. Mason: I take it that you are, Mr. Strouss, to some extent?

Mr. Strouss: Yes.

The Court: Thank you.

[fol. 599] Mr. Mason:

Q. Will you state if the Commission's decision shows I am not asking you to state that is contained therein, but just whether an order was made in the case requiring the application of stokers to certain types of coal-burning steam locomotives?

A. Such an order was entered by the Interstate Commerce Commission.

Mr. Strouss: Just a minute, certainly the decision itself is the best evidence.

The Court: I will sustain the objection.

Mr. Mason: Well, if your honor please, the decision itself does not show the order. It only shows the opinion and the foundation for the order.

Mr. Strouss: Then the order itself would be the best evidence.

The Court: That is true.

Mr. Mason:

Q. Have you a copy of the order?

A. It is in the report.

Q. What does the Commission say at the conclusion of its opinion, there, Mr. Otterback?

Mr. Strouss: If any portion of the order is to be read I will ask that the whole thing be read.

Mr. Mason: I am not asking him to read the order. I am asking him to read a portion of the opinion.

[fol. 600] Mr. Strouss: Well, I take it, the whole opinion should go in, not just the parts that they might want to take their interpretation of.

Mr. Mason: I think that the Interstate Commerce Commission's decisions themselves need no authentication. They are just as much a matter of decision as the decisions of the federal and state courts.

The Court: The Court will read it.

Mr. Mason: It is only for the purpose to call attention to a particular part. It does not acquire any particularly different value because a witness reads it. It has that value already. All we now do is call attention to a particular part, and I don't insist upon this. It would only shorten the proceedings a little bit, and Your Honor would get a more ready understanding, that is all.

The Court: Well, if counsel insist upon it, the objection will be sustained. However, the Court will be very glad to read the opinion and read any orders that may be there entered.

Mr. Strouss: I have no objection to that.

The Court: I will take judicial notice of it now that it has been called to my attention.

Mr. Mason: I would like myself to call the court's atten-
[fol. 601] tion, judicial notice, of course, being taken of the entire report to the last paragraph, reading as follows: "An appropriate order amending our rules for the inspec-

tion and testing of steam locomotives and tenders and their appurtenances to give effect to these findings, will be entered." And I will also call the court's attention to the fact that no order is entered, although the findings of the Commission are entered in detail as a part of the order.

Is this your own copy, Mr. Otterback?

The Witness: A. Yes.

The Court: All right, I will return it this evening.

Mr. Mason:

Q. Do you know, Mr. Otterback, whether an order was entered?

A. It is my understanding that such an order was entered, yes.

Mr. Strouss: I move that be stricken, what his understanding is. If he doesn't know he can't testify.

The Court: Yes, the motion to strike is granted.

The Witness: May I modify my reply, your honor?

Mr. Mason:

Q. Well, I ask you, do you know whether or not an order [fol. 602] was entered?

The Court: Answer that yes or no.

Mr. Mason: Answer that yes or no.

A. I answer it yes.

Q. You do know whether such an order was entered?

A. Such an order was entered on December 30, 1937.

Mr. Strouss: "Such an order," if that means to state what the order was, or the character of the order, we object to it.

Mr. Mason: I don't intend to do that. I am only going to ask one further thing—two.

Q. Was the effective date of the order extended from time to time?

A. The effective date of the order was extended a number of times.

Q. What is the latest effective date of the order?

The Court: That is, if you know of your own knowledge.

Mr. Mason: Yes, if you know of your knowledge.

A. April 15, 1939.

Q. Mr. Otterback, was the attachment of mechanical stokers during the years prior to and including the year 1938 made in response to any order of the Interstate Commerce Commission?

[fol. 603] A. No, sir.

Q. Now, will you turn to Table 9 of your exhibit and explain what you have undertaken to show in that table or section?

A. Section 9 of Exhibit 36 shows by types for each of the years from 1932 to 1938, inclusive, the number of steam locomotives equipped with superheaters.

Q. This device, the superheater, has been previously described in the testimony of Mr. Russell, I think.

A. I so understand.

Q. Have you read that testimony?

A. Yes.

Q. And have you undertaken in Table 10 to show a percentage relationship as between those equipped with superheaters and the total of all steam locomotives?

A. Section 10 shows such a comparison, showing that the percentage relationship of steam locomotives equipped with superheaters to total steam locomotives has increased between 1932 and 1938 from 82.5% to 91.5% in the case of freight locomotives; from 83.9% to 95.5% in the case of passenger locomotives; from 82.6% to 98.0% in the case of freight or passenger locomotives; from 54.1% to 63.1% in [fol. 604] the case of switching locomotives and from 77.6% to 87.3% in the case of all locomotives.

Mr. Booth: For the convenience of the record the testimony regarding superheaters is shown on 109 and 110 of the transcript of November 19, 1940.

Mr. Mason: Q. Now, passing to Table 11, if you please, Mr. Otterback, what have you undertaken to show in that table?

A. Table 11 shows by types for each of the years from 1930 to 1938, inclusive, the number of steam locomotives equipped with boosters.

Q. And the device known as the booster has also been described in the Russell testimony?

A. That is correct.

Q. Do you also show the relationship between the number of locomotives equipped with boosters and the total number of locomotives by types?

A. That relationship is shown in Section 12 of Exhibit No. 36; that section showing that between 1930 and 1938 the relationship of steam locomotives equipped with boosters to total steam locomotives has increased from 9.3% to 11.2% in the case of freight locomotives; has increased from 6.7% to 9.8% in the case of passenger locomotives; has increased from 9.8% to 12.7% in the case of freight or passenger locomotives; has remained unchanged at 0.2% [fol. 605] in the case of switching locomotives; again relatively few of which are equipped with boosters; and has increased from 7.1% to 9.1% in the case of all locomotives.

Q. Now, finally, what do you show in Table No. 13?

A. Table 13 shows again for each of the years from 1930 through 1938, figures of average tractive power per booster by type of locomotives.

Q. That indicates that the tractive power of the booster attached to the various types remains on the average fairly constant.

A. There has been relatively very little change.

Q. Is that all you have on exhibit 36, Mr. Otterback?

A. This exhibit, as did the previous exhibits, reflects a growing proportion in recent years of steam locomotives equipped with various mechanical devices designed to increase their efficiency and economy of operation.

Q. Have you before you now a table consisting of one sheet beside the title page, designated as follows: "Number of Freight-Carrying Cars for which Capacity was Reported, Aggregate Car Capacity Reported, Aggregate Car Capacity Reported, and Average Capacity per Freight-Carrying Car, all Railways, United States, 1903-1910, Class [fol. 606] One Railways, United States, 1911-1939"?

Mr. Mason: May we have the statement just referred to marked?

The Clerk: Defendant's Exhibit 37 for identification.

Mr. Mason: Q. Was statement No. 37 prepared in substantially the same manner as Exhibit 33?

A. In identically the same manner.

Q. And from the same basic sources?

A. That is correct.

Q. The computation in the percentage columns, are those you know?

A. They are my own, yes.

Q. The other figures appearing on the exhibit in the number column, the aggregate column, and the average column, are those taken directly from the original sources?

A. Those are taken directly, for the years 1903 to 1938, inclusive, from the Interstate Commerce Commission's Statistics of Railways in the United States and for 1939 from the Commission's preliminary abstract of Railways Statistics.

Q. Has the exhibit been checked against the original sources?

A. Yes, sir, it has.

Q. Have the computations been checked?

[fol. 607] A. They have.

Q. Will you say whether it is true and correct to the best of your knowledge?

A. To the best of my knowledge I believe it is true and correct.

Mr. Mason: Subject to the objection previously expressed and also to Mr. Strouss' waiver of the production of the publication, Statistics of Railways and so forth, for the years 1911 and 1922, exclusive——

The Witness: 1911 and 1921, inclusive.

Mr. Mason: 1911 to 1921, inclusive. Is that right, Mr. Strouss?

Mr. Strouss: It would be from 1903 to 1911.

Mr. Mason: I think the figures prior to 1910 are available. We offer the statement as No. 37.

Mr. Strouss: Q. What do you mean by "average capacity," as reported?

A. That statement parallels, Mr. Strouss, in the period of years covered and in the classes of railways covered, Exhibit 23 previously presented with reference to locomotives and to locomotive tractive power. As was true in the case of locomotives for which in earlier years tractive power was not reported for a few individual locomotives, similarly in the earlier years capacity was not reported for a few [fol. 608] freight cars.

Mr. Strouss: I probably asked a question you intended to ask.

Mr. Mason: I did intend to. I think that is all right.

Q. The complete figures for all cars have been reported for same time, have they not?

A. Yes, in recent years these figures are identical with those figures, appearing in Exhibit 32, which show the total figures of car ownership.

The Court: Subject to the usual objections which are overruled, the exhibit may be introduced in evidence; it may be admitted in evidence.

The Clerk: Defendant's Exhibit 37 in evidence.

Mr. Mason: Q. Have you any particular further comment upon No. 37, any feature of the exhibit to which you wish to direct special attention?

A. The third column of exhibit No. 37, under the heading "Average Capacity" shows that the capacity of the average freight car has increased from 29.4 tons in 1903, to 49.7 tons in 1939, an increase—1939 over 1903, of 69%, reflecting again as in the case of locomotives, a constant and substantial trend toward the greater performance ability of the individual equipment unit.

Q. Now, these figures in the right-hand column, "per- [fol. 609] centage increase over the previous year," relate only to the average capacity?

A. They relate only to the figures of average capacity,

Q. Not to the number of cars or the total capacity of all cars?

A. Only to the average capacity.

The Court: Mr. Otterback, do I understand this exhibit to disclose that there are practically the same number of freight cars as of 1939 as there were in 1903, no substantial increase.

A. There has been no substantial change, a change of something less than six hundred in the number of cars, that is, for which capacity was reported.

Mr. Mason: Q. Now, as I look, Mr. Otterback, it appears to me that the aggregate capacity of the cars of the Class One carriers as of the end of the year 1939, was slightly greater than in the year 1912 when there were half a million more cars, is that correct?

A. That is correct.

Q. Have you made any comparision as between the cars of 1939 and the cars of previous years, as you did in the case of locomotives?

A. Yes, sir.

[fol. 610] Q. How many cars of the average capacity,—well, 1912, for example, would be required to be used, if they were to be used, instead of ten cars of the year 1939?

A. Ten cars of the year 1939 in terms of average capacity are the equivalent of approximately thirteen cars of 1912.

Q. Have you made any comparison, a similar comparison between the cars of 1939 and the cars of 1903?

A. Ten cars of the average capacity of 1939 have the equivalent in that regard of seventeen cars of average capacity of 1903.

Q. Anything further on No. 37, Mr. Otterback?

A. I think that is all.

[fol. 611] Mr. Mason:

Q. Have you before you a statement of two sheets in addition to the cover sheet entitled "Total Freight-Train Cars, Steel Freight-Train Cars, Steel Underframe Freight-Train Cars and Other Freight-Train Cars, Caboose Cars Excluded Class I Railways, United States."

A. Yes, sir.

Mr. Mason: We ask that the statement just referred to be marked No. 38.

The Clerk: Thirty-eight for identification.

Mr. Mason:

Q. The sources of this exhibit are shown on the first sheet, are they?

A. The figures shown on the first sheet of this exhibit were all taken from the Interstate Commerce Commission official published reports, Statistics of Railways in the United States.

Q. Those particular reports from and after the year 1922 are now available in the courtroom?

A. Yes, sir.

Q. The showing on the secoond sheet is a calculation from the showing on the first sheet?

A. Yes, sir.

Q. The figures on the first sheet are reproduced exactly from the underlying sources?

A. They are.

Q. Has the exhibit been compared and checked against [fol. 612] the underlying sources to determine whether these are a correct statement of those figures.

A. Yes, sir.

Q. Have the computations on the second sheet been checked.

A. They have.

Q. Was all this done by you personally or under your direction?

A. It was done by me personally.

Q. Will you state whether or not the exhibit is true and correct to the best of your knowledge.

A. To the best of my knowledge and belief it is true and correct.

Q. This exhibit throughout relates entirely to Class I railways, does it?

A. Yes, sir.

Mr. Mason: Subject to the usual objection, Your Honor, and also to Mr. Strouss' previously expressed waiver of the production of the annual volumes for the years prior to the year 1922, we offer the exhibit as No. 38.

The Court: It may be admitted.

The document was received in evidence and marked defendant's exhibit No. 38.

Mr. Mason:

Q. Will you take up initially the first sheet of the exhibit and point to any portions thereof that you desire to [fol. 613] call to special attention.

A. The first sheet of exhibit No. 38 shows that between June 30, 1915, and December 31, 1938, the following changes have occurred in the various construction types of freight train cars of Class I railways in the United States as a whole. The total number of such cars has declined from 2,258,855 to 1,699,689; the number of steel cars has increased from 501,309 to 891,498; the number of steel underframe cars has increased from 676,176 to 730,218; the number of steel and steel underframe cars combined, being a total of the two preceding columns, has increased from

1,177,485 to 1,621,716 and the total number of all other cars has declined from 1,081,370 to 77,973.

Q. I notice also that the number of steel underframe cars as distinguished from steel cars appears to have increased from the 1915 figure up to about the year 1930, since which time there has been a decline in the number of steel underframe cars accompanied as the exhibit indicates by a contemporaneous increase with some interruptions in the number of steel cars.

A. That is correct. There have been two distinct trends over this period in the ownership of steel underframe cars. [fol. 614] The number of steel underframe cars increased steadily from 676,176 in the year ending June 30, 1915, to a peak of 1,118,257 cars in the year ending December 31, 1930, after which there was a steady decline to 730,218 cars in the year ending December 31, 1938.

Q. Does the fact of the increase and the subsequent decline following 1930 coupled with the increase in the number of steel cars bear any significance?

A. The significance is that up to 1930 steel and steel underframe cars were replacing cars of other construction while since 1930 the tendency has further developed to replace even steel underframe cars with steel cars.

Q. You speak of other cars in the exhibit. What is the principal type of construction characteristic of these so-called "other cars"?

A. These "other cars" include of course all freight train cars on the Class I railroads other than those of steel and steel underframe construction. They include such cars as wooden cars with continuous metal center-sill construction; wood cars of not less than certain specified continuous metal center-sills; and wood cars of not less than certain specified continuous metal draft.

[fol. 615] Q. Are those the cars referred to in a rather general term as "wooden cars"?

A. Yes, sir.

Q. Will you pass to sheet 2, the tabulation on sheet 2 of the exhibit.

A. Sheet 2 of exhibit No. 38 shows by years from 1915 through 1938 the percentage relationship to total freight train cars, of steel cars, steel underframe cars, steel and steel underframe cars combined, and all other cars, percentages having changed between 1915 and 1938 in the following manner: the percentage of steel cars has in-

creased from 22.2 per cent to 52.5 per cent; steel underframe cars have increased from 29.9 per cent to 43.0 per cent; steel and steel underframe cars combined have increased from 52.1 per cent to 95.5 per cent, and other cars have declined from 47.9 per cent to 4.5 per cent.

Q. Does that conclude your comments on No. 38?

A. There is one further comment I would like to make. Both the actual figures appearing on the first page of this exhibit and the percentage figures appearing on the second page show that in addition to the increases in average freight car capacity previously discussed, that marked improvement has been made in the prevailing types of freight [fol. 616] car construction.

Mr. Strouss: May I ask a question before you leave this exhibit?

Mr. Mason: Yes.

Mr. Strouss: Does this exhibit include all cars that are owned or just cars that are in service during the particular years?

A. The Interstate Commerce Commission figures show cars in the service of the railways; that means in effect all cars owned or leased by the railways, whether they were in actual operation on that date or not. There is a distinction made between "in service" and "in the service of."

Mr. Strouss: This means all cars "in the service of"?

A. That is correct.

Mr. Booth: Would it include these refriggrator cars that have been mentioned here and belonging to the P. F. E. and Fruit Growers Express and so on?

A. No, sir, it would not.

Mr. Mason:

Q. [illegible] you before you a statement of one sheet in addition to the cover page entitled "Freight Operating Revenues, Freight Operating Expenses and Freight Operating Ratio, Class I Railways, United States"?

A. Yes, sir.

[fol. 617] Mr. Mason: May we have the statement just referred to marked No. 39 for identification?

The Clerk: Defendant's exhibit No. 39 for identification.

Mr. Mason:

Q. Will you state the sources from which this exhibit was taken?

A. The figures in the first two columns of the upper section of exhibit No. 39 under the column headings "Freight operating revenues" and "Freight operating expenses" as well as the figures appearing in the first two columns of the lower section of the exhibit under the column headings "Revenue per ton-mile" and "Revenue ton-miles" were all taken for each of the years from 1921 to 1938-inclusive from the official published reports of the Interstate Commerce Commission entitled "Statistics of Railways in the United States." The corresponding figures for the years 1939 were taken from the Interstate Commerce Commission's Preliminary Abstract of Railway Statistics. The figures appearing in the third column of the upper section under the heading "Freight operating ratio" and the figures appearing in the last two columns of the lower section under the headings "Adjusted freight operating revenues" and "Adjusted freight operating ratio" were all calculated from the basic figures appearing in the other [fol. 618] columns.

Q. I understand that the underlying sources, with the exception of the publication "Statistics of Railways in the United States" for the calendar year 1939 are available in the courtroom?

A. That is correct.

Q. Did you make these calculations yourself?

A. Yes, sir, I did.

Q. The other figures, did you transcribe those from the original sources?

A. I did.

Q. Have you checked the exhibit to determine its correctness?

A. I have.

Q. Have you checked the computations?

A. Yes, sir.

Q. Will you state whether or not the exhibit is true and correct to the best of your knowledge and belief?

A. To the best of my knowledge and belief it is true and correct.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Subject to the waiver of the year 1921 and the current objections we offer the exhibit in evidence as [fol. 619] exhibit No. 39.

The Court: It may be admitted.

The document referred to was received in evidence and marked defendant's exhibit No. 39.

Mr. Mason:

Q. Will you explain the term "Freight operating ratio" as you have used it in the upper section of the exhibit?

A. The term "Freight operating ratio" means the percentage relationship of freight operating expenses to freight operating revenues or in other words the number of cents out of each dollar of freight operating revenues which are required to pay freight operating expenses.

Q. Is the so-called "operating ratio" a rather common statistical term in the railroad industry?

A. It is a standard statistical term or measure in the railroad industry.

Q. Addressing yourself to the first section of the exhibit, will you call attention to any figures there which you desire to emphasize.

A. The last column in the upper section of exhibit No. 39 shows that the freight operating ratio of the Class I railways in the United States as a whole has been reduced from 84.3 per cent in the calendar year 1921 to 65.9 per cent in the calendar year 1939. In other words, in 1921 freight [fol. 620] operating expenses consumed 84.3 cents of each dollar of freight operating revenues which these railways received. In 1939 freight operating expenses consumed 65.9 cents of each dollar of freight operating revenues.

Q. Does this reduction in the freight operating ratio as indicated in the upper section of the exhibit take into account any fluctuation upward or downward in the rate level?

A. Yes, sir, those are actual figures based upon the actual results of operation.

Q. And not adjusted for any variations in rate level?

A. No adjustment whatsoever has been made in those figures.

Q. Is there a manner of determining the average level of rates by reference to revenue and service performance?

A. The figures of average revenue per ton-mile are generally accepted as the standard comparative measure of the level of railway rates.

Q. You have shown it here in the lower section of the exhibit?

A. Those figures are shown in the first column of the lower section of exhibit No. 39 and show that average revenue per ton-mile has declined from 12.75 mills in 1921 [fol. 621] to 9.73 mills in 1939, a reduction of 23.7 per cent.

Q. Does that figure of revenue per ton-mile mean that the public or patrons of the railroads paid 12.75 mills per ton-mile for their freight service in 1921 on the average?

A. On the average, that is correct.

Q. And less than a cent or 9.73 mills on the average for their freight service in 1939?

A. Yes, that is correct.

Q. Will you explain the purpose and result of your computations in the lower section of the exhibit and particularly the two columns to the right?

A. The reduction in the freight operating ratio from 84.3 per cent in 1921 to 65.9 per cent in 1939 shown in the last column of the upper section of exhibit No. 39 has been made in the face of a practically steadily declining average revenue per ton-mile. The figures in the next to the last column in the lower section of exhibit No. 39 under the column heading "Adjusted freight operating revenues" represent a computation designed to offset these reductions which have actually occurred in revenue per ton-mile. In other words, the figures in that column have been cal- [fol. 622] culated by applying to the figures of revenue ton mileage actually handled in each of the years from 1922 to 1939 inclusive the average revenue per ton-mile actually in effect in that year, 1921, to produce, in effect under the volume of traffic actually moved in the period 1922 to 1939, the freight operating revenues which would have been received by the railways had there been no reduction in the 1921 average revenue per ton-mile. Based upon these adjusted freight operating revenues the adjusted freight operating ratio has been reduced from 84.3 per cent in 1921 to 50.4 per cent in 1939.

Q. To get that figure of 50.4 per cent for the year 1939 as the adjusted freight operating ratio for that year you simply divide the freight operating expenses of the year 1939, two billion, one hundred forty-two million dollars

plus, by the adjusted freight operating revenue for the year 1939, four billion, two hundred fifty-one million dollars plus.

A. That is correct. The figure of 50.4 is the quotient obtained by the use of the figure 2,142,000,000 as the dividend and the figure of 4,251,000,000 as the divisor.

Q. In your experience as a statistician and analyst of [fol. 623] railway reports and railway accounts, Mr. Otterback, will you say whether or not the operating ratio is one of the indexes of relative efficiency?

A. It is considered as one of the primary indices of efficiency of operation.

Q. Which is the more efficient operation, one which produces a high operating ratio expressed in per cent or a low operating ratio expressed in per cent?

A. The lower the better.

Mr. Mason: We are about to pass to another exhibit, Your Honor.

The Court: We will take a short recess at this time.

Thereupon a short recess was taken, after which proceedings were resumed as follows:

Mr. Mason: Mr. Otterback, I wish you would turn back to exhibit No. 38. I think you stated that these figures were taken directly from the Commission's publication referred to on the face of the exhibit?

A. Yes, I wish to make a correction in that regard. The figures of total cars, all steel cars and steel underframe cars appearing in the first three columns of exhibit No. 38 [fol. 624] were taken from the published report of the Interstate Commerce Commission. The figures in the fourth column under the heading "Steel and steel underframe cars" represent the sum for each year of the two preceding columns while the figures in the fifth and final column under the heading "Other cars" represent a subtraction of steel and steel underframe cars from total cars. In other words, the basic figures were taken from the reports of the Interstate Commerce Commission but subsequent computations were made from these basic figures.

Q. I call your attention to a statement consisting of the cover page and 34 other sheets bearing the title "Steam Locomotives Ordered, 1925-1939, Railways Reporting De-

tails to Railway Age." Have you that statement before you?

A. I have, yes, sir.

Mr. Mason: May we have the statement which was just referred to marked defendant's exhibit No. 40 for identification.

The Clerk: Defendant's exhibit No. 40 for identification.

Mr. Mason:

Q. Will you state the sources of this exhibit—first of all, is this an arrangement of certain information by calendar years from 1939 back to 1925?

[fol. 625] A. It is, yes sir.

Q. And the information for each calendar year is separately shown under the heading for that year, is it?

A. Shown separately for each calendar year under the heading for that year and is also shown in detail for various types of locomotives.

Q. After the showing for each calendar year you have certain summaries in the concluding figures of the exhibit, have you not?

A. That is correct.

Q. Commencing on page 27?

A. Commencing, I think, on page 29.

Q. Yes, that is correct. The summaries being based entirely on the information shown in detail on the preceding pages?

A. That is correct.

Q. From what source was the underlying information shown on the pages preceding the summary taken?

A. The basic information contained in Exhibit No. 40 was taken from the annual review issues of the Railway Age.

Q. What is the Railway Age?

A. The Railway Age is a standard trade paper of the railroad industry. It was founded in 1856 and has maintained continuous publication for the past 84 years since [fol. 626] that date.

Q. Is it the recognized authority in the railroad transportation field?

A. It is generally recognized and accepted as an authority in the transportation field.

Q. Does it publish an annual statistical number?

A. In the early part of each year, quite often the first issue of each year, there is published what is termed "An Annual Statistical or Annual Review Issue" in which are contained various figures reviewing the details of railway operations in preceding year. Among the details contained in such annual statistical issue are details of locomotive orders and of freight car orders placed in the preceding calendar year.

Q. Were these details taken from the annual statistical numbers of the Railway Age?

A. Yes, sir.

Q. Have you available the issue of the Railway Age from which you have taken the information here shown?

A. Such issues are available for the period from 1925 through 1940, inclusive, with the exception of a single year, 1926.

Q. Where did you obtain the issues for the years 1927 to [fol. 627] 1939, inclusive, somewhere in the City of Tucson?

A. They were obtained from the Library of the University of Arizona.

Q. Are those counterparts of the issues in your own possession and from which you prepared the exhibit?

A. Yes, sir.

Q. Do you maintain the Railway Age in bound volumes as a source of statistical material in your office?

A. Yes, sir.

Q. Have you a separate copy of the statistical issue of the Railway Age which you can produce for illustrative purposes?

A. Yes sir, this is or was the current issue at the time I left Chicago.

Mr. Mason: I now produce for the examination of your honor and of counsel the issues of January 7, 1939 and January 6, 1940 which bear at the top of the outside cover the designation, "Annual Statistical and Outlook Number," handing your honor the issue for January 6, 1940 and to Mr. Strouss the issue of January 7, 1939. May the record show we have produced here in court on the counsel table the bound volume of the Railway Age for the year 1939, cov-[fol. 628] ering the months from January to June, inclusive, the other bound volumes for the first half of each of the years are likewise available in the courtroom here.

Q. Will you state whether the statement No. 40, as to the information shown therein, has been checked against the issues of the Railway Age from which the information is taken to determine whether it is true and correct?

A. It has.

Q. Have the computations and summaries, are those of your own compilation and making?

A. Yes, sir.

Q. And, predicated upon other information appearing in the exhibit which you have taken from the Railway Age?

A. They summarize the basic information appearing in the exhibit taken as stated from Railway Age.

Q. Have you checked the information against the underlying sources to determine its correctness?

A. Yes, sir.

Q. Is it true and correct, to the best of your knowledge?

A. To the best of my knowledge and belief, it is true and correct.

Q. Have you checked the computation to determine, [fol. 629] whether they correctly reflect or correspond to the underlying information upon which they are based?

A. I have.

Q. Are they true and correct?

A. To the best of my knowledge and belief.

Mr. Mason: Have you any questions prior to the offer of the exhibit, Mr. Strouss?

Mr. Strouss: I have no questions.

Mr. Mason: We offer the exhibit as No. 40.

Mr. Strouss: I have my usual objection and, of course, point out that here the so-called basic records are themselves hearsay and secondary evidence.

Mr. Mason: Your honor, we feel that while this is, of course—this publication probably does not rise to the dignity of an official report issued by the Interstate Commerce Commission, it occupies a place in the law of evidence somewhat similar to a recognized publication of authoritative standing, as for example the Wall Street Journal would be upon the current prices on a particular day upon stocks and bonds. I am sure that your honor is familiar with the instances in which reliance upon that or a similar publication has been had for information of that kind which is currently [fol. 630] published. It is in a sense hearsay and yet is an official standard publication of that character for informa-

tion which is peculiarly within its province to know and compile and has been generally recognized by the courts. I have no authorities at hand to support my statement, but I know that is generally recognized as the rule. If there be any doubt in your honor's mind as to the proper rule to be applied, the ruling might be reserved and the offer held so to speak, in suspense.

The Court: Well, there is a doubt, gentlemen. Of course, as Mr. Strouss points out this is going one step further. Here is data that this publication compiles and publishes and the witness offers a summary of the information contained therein. I will reserve ruling upon it.

Mr. Mason: I want to point out that the witness has not attempted to summarize what appears in the publication, but summarize what he has taken out of there by addition or substraction or classification of information which anyone could make from the face of the exhibit.

The Court: This is a rather new field of evidence to me and if counsel could produce, say next week, some authority [fol. 631] on this, I would feel a little safer.

Mr. Mason: We will undertake to investigate the authorities as to this particular field and either continue the offer or perhaps withdraw it.

Mr. Booth: To be perfectly frank about it, I made an effort to do so, your honor, in a rather hasty and somewhat limited excursion into the library and the closest I found to it were some cases bearing on the Wall Street Journal, but in further frankness I would say the distinction between the Wall Street Journal is that the Wall Street Journal is a record of actual sales and this is a record of actual contracts made for the acquisition of equipment, that is, a report from contracts made for the buying of equipment. To that extent the cases may be distinguished, cases of sales on the market of wheat, for instance, you have an action for damage to freight shipment of cantaloupes pending, and you can show by market quotations published in standard journals to which cantaloupe shippers and growers and jobbers resort to as to what cantaloupes were selling for on the market at that time, but that is not exactly the same as though you produced a statement of orders for cantaloupes, firm orders or contracts to buy and payable in the future.

[fol. 632] The Court: I will tentatively sustain the objection and reserve final ruling on it until you can submit some authority.

Mr. Mason:

Q. Mr. Otterback, will you refer please to a statement bearing the title, "Freight-Carrying Cars Ordered, 1922-1939, Railways Reporting Details to Railway Age," consisting of cover sheet and 32 other pages. Have you that before you?

A. Yes, sir.

Mr. Mason: May we have the statement marked Exhibit No. 41 for identification?

The Clerk: Defendant's Exhibit No. 41 for identification.

Mr. Mason:

Q. Without going into any extensive detail as to the exhibit, is the statement No. 41 similar in its make-up to the statement marked No. 40?

A. It was compiled in a similar manner and from the same source.

Q. The source material, except as to the years prior to 1925 and the single year 1926, is available in the court room.

A. That is correct.

The Court: The court will make the same ruling.

Mr. Mason: I would make the same offer and ask that the ruling be the same, simply that the matter may be before [fol. 633] the court.

The Court: All right.

Mr. Mason: I assume that you have the same objection, Mr. Strouss?

Mr. Strouss: Yes.

[fol. 634] Mr. Mason: Do you wish to go ahead with cross examination now, Mr. Strouss. That is all we have at this time of the witness.

Mr. Strouss: I would really prefer to defer cross examination. I presume I could ask a few questions. He is to be back for further discussion of these exhibits, if they are admitted in evidence.

Mr. Mason: I am willing that the Court take more time in ruling upon the admissibility of these exhibits. Of course, if they are admitted they will take some explanation from this witness. But if you are able to go ahead at this time, we will appreciate it; but I don't mean to force you to cross examine.

Mr. Strouss: I have one or two general questions that I want to ask; I can ask those. I of course would want to look the exhibits over a little before I completed my cross examination.

Mr. Strouss:

Q. I really only have one question I will ask. The statistics which are covered by your exhibits, Mr. Otterback, cover all operations of class I railways for the different years shown in the different exhibits?

A. I don't quite understand what you mean.

Q. They are not limited to main lines or anything of that [fol. 635] sort?

A. No, the equipment figures of the systems are for the entire road; the revenues, the expenses and the average revenue per ton miles are all figures for the entire roads of the systems. Not just for main line operations.

Mr. Strouss: That is the only question I wanted to ask at this time.

The Court: You may step aside. Call your next witness.

Mr. Strouss: I am going home tonight, and I am not very anxious to proceed further.

Mr. Mason: I, too am leaving tonight.

The Court: I am willing to work until 4: o'clock. You may call your next witness.

Thereupon Mr. C. L. LaFountaine was called as a witness on behalf of the Defendant, and being first duly sworn, testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you please state your residence or special headquarters of your employment, Mr. LaFountaine?

A. I am General Safety Supervisor for the Great Northern Railway Company, with headquarters at St. Paul, Minnesota.

Q. Does your jurisdiction extend over the entire system [fol. 636] of the Great Northern?

A. Yes, sir.

Q. Will you state the approximate mileage of the Great Northern railroad?

A. Eight Thousand miles plus; 8,070.

Q. Generally speaking, from and to what cities does it extend?

A. East and west from St. Paul to Seattle, Washington.

Q. And has lines extending to Portland, Oregon and to Northern California?

A. Yes, sir.

Q. And also reaches the edge of Lake Superior at Duluth?

A. Yes, sir.

Q. And has short lines extending into the Dominion of Canada at Winnipeg and Vancouver, British Columbia?

A. Yes, sir.

Q. In what states does the Great Northern operate?

A. Wisconsin, Minnesota, South Dakota, Iowa, North Dakota, Montana, Idaho, Washington, Oregon, and California.

Q. Have you a sheet before you containing an outline map of the Great Northern System?

[fol. 637] A. Yes sir.

Mr. Mason: May we ask that the map which has been distributed be marked as Defendant's Exhibit No. 42 for identification.

The Clerk: Defendant's Exhibit No. 42, marked for identification.

Mr. Mason:

Q. Addressing yourself to the map, Defendant's Exhibit No. 42, for identification, is that a reasonably accurate outline map of the extent of the Great Northern System, and the showing of the states in which it operates?

A. Yes sir.

Q. And the heavy black portions of the lines are to be explained later, are they?

A. That is correct.

Mr. Mason: We offer the exhibit in evidence as Defendant's No. 42.

Mr. Strouss: Same objections.

The Court: Objections overruled. It may be admitted.

The Clerk: Defendant's Exhibit No. 42 in evidence.

Mr. Mason:

Q. Now, I want you to refer to the dashed line extending from Spokane along the southern border of Washington to a point just north of Portland, Oregon, and bearing the designation "S. P. & S.", is that a railroad line?

[fol. 638] A. Yes sir.

Q. What railroad is that?

A. Spokane, Portland and Seattle.

Q. Is that a line affiliated with the Great Northern?

A. Yes sir.

Q. I notice another line extending from about the center of the Southern boundary of the State of Washington, down to Bend, Oregon, bearing the designation "O. T. Ry", what railroad is that?

A. It is the Oregon Trunk Railroad.

Q. Is that affiliated with the Great Northern?

A. It is affiliated with the S. P. & S., which is affiliated with the Great Northern.

Q. And that line between Bend and Beiber, Bend, Oregon, and Beiber, California, is a line of the Great Northern?

A. Yes.

Q. Between Chemult and Klamath Falls you operate by trackage rights over the Southern Pacific lines.

A. That is correct.

Q. When did you start your railroad career with the Great Northern, Mr. LaFountaine?

A. July, 1904.

Q. In what capacity?

[fol. 639] A. As a train brakeman.

Q. Were you afterwards promoted to Conductor?

A. Yes, I was promoted to Conductor in August, 1906.

Q. Did you serve on freight trains as a freight train brakeman?

A. Yes sir.

Q. And conductor?

A. Yes sir.

Q. Were you promoted from freight-train Conductor?

A. Yes sir.

Q. At what time?

A. January 1, 1918 to Train Master at Sioux City, Iowa.

Q. Did you serve also as Yard Master?

A. Yes sir, I did during the time I was trainman.

Q. Between the time you were a Brakeman and Conductor?

A. Yes.

Q. What was your next position after being Train Master?

A. On June 25, 1918, I was promoted to my present position, General Supervisor of Safety.

Q. And you have occupied that position since?

[fol. 640] A. I have constantly, with the exception of seven and one-half months during the summer of 1936, when I was back in train service.

Q. In what capacity?

A. Conductor.

Q. Where did you perform your services as a brakeman and conductor? What part of the system, as shown on the map, Exhibit No. 42?

A. Employed at Breckenridge, 214 miles west of St. Paul, Minnesota; we then held rights from Willmar, Minnesota, 102 miles west of St. Paul to Larimore, North Dakota.

Q. So that your operations as a trainman and conductor, your service was in the states of North Dakota and the central part of Minnesota?

A. That was where I held my rights, but in those years we were directed and went most any place on the railroad.

Q. You still retain your seniority as brakeman and conductor, do you?

A. Yes.

Q. Now, I understand you are a general officer of the system?

A. Yes, sir.

Q. Do you, in the course of your duties, travel over the entire system?

[fol. 641] A. Yes, I do.

Q. What means of transportation do you use?

A. I ride passenger trains generally. I do ride freight trains to some extent, and also cover the line by motor car.

Q. By motor car, do you mean a track motor car?

A. Yes a track motor car, or rail car.

Q. When you ride a freight train do you ride in the caboose?

A. Generally, but occasionally in the engine.

Q. Have you covered the entire system by freight or passenger trains, or track motor cars in recent years?

A. Frequently. A number of times each year. I might omit some of the branch lines.

Q. You particularly cover the main lines?

A. Yes sir.

Q. Do you also in the course of your duties make visits to the various yards?

A. Yes sir. That is directly in line with my duties.

Q. Do you visit the shops?

A. Yes, we hold meetings regularly every sixty days, which I attend and conduct.

Q. Do you make inspection of the shops?

[fol. 642] A. Yes, sir.

Q. Do you make inspection of the equipment, both locomotive and car equipment, in the course of your duties?

A. Yes, I do. Particularly in connection with safety matters.

Q. Do you know anything of the operating code of rules, under which your company operates?

A. Yes, I do. I helped to make them. I have been in charge of the examining board since 1927.

Q. Are you acquainted with the so-called "Standard Code of Rules in America, Association of Railways?"

A. Yes, sir.

Q. Will you say whether or not the Great Northern Rules correspond, or are similar to the Standard Code?

A. Yes, they are based on the Standard Code and use practically all of the Standard Code rules, but have additional rules to fit our own physical conditions.

Q. Does the Great Northern have any block signals on its main lines?

A. Yes, the main line from St. Paul to Seattle is all block signals.

[fol. 643] Q. Is there any double track in that territory?

A. Yes. We have on that line shown from St. Paul to Seattle 318 miles of double track at various locations, and for a short piece out of each division point. And on the mountain territories we have some more extensive lengths.

Q. Is it correct to say that the Great Northern is largely a single-track railroad, with relatively few short stretches of double track?

A. That is correct.

Q. You spoke of mountains, does your main line cross a number of mountains, or mountain ranges in the States of Montana, Idaho and Washington?

A. Yes, it crosses the Rocky mountain range in Montana and the Cascade Mountain range in Washington.

Q. Is there any of this territory in the mountains where you employ more than one locomotive for the purpose of handling trains which are elsewhere handled with a single engine?

A. Yes, sir.

Q. You designate those as "Helpers" do you not?

A. We do.

Q. Besides crossing mountainous territory does your [fol. 644] line extend for considerable distances across plains territory?

A. Yes, two lines across the plains.

Q. Is that North Dakota and Eastern Montana?

A. The one line starts at Minot, North Dakota, that would be the western part of North Dakota, and extends eastward through Bedford and Fargo, North Dakota, and on to Minneapolis. The other line from Minot to the head of the lake at Duluth, known as our wheat line.

Q. And you have an alternate line from Minot to Fargo and Breckenridge and on to St. Paul?

A. Yes.

Q. The map indicates a number of lines extending northward from Grand Forks to Minot and on west from Minot: what purpose do those lines serve?

A. Those lines serve as feeder lines to take care of the territory north of our main line.

Q. Is that territory in which grain and livestock are particularly produced?

A. Yes, that is a grain country, and quite a lot of livestock developing there now.

Q. Is there any portion of the territory along your main line where the population is comparatively sparse?

[fol. 645] A. Yes, the entire state of North Dakota and Montana.

Q. Are there any large cities upon your main line across Montana?

A. No, there is not.

Mr. Mason: This is an appropriate point to suspend, your Honor.

The Court: It is my understanding that next week, and from now on until different arrangements are made, that we will start Tuesday morning and work through until Friday night.

Mr. Mason: That is my understanding.

Mr. Strouss: Yes, that is right.

The Court: The Court will be at recess until Tuesday morning at 10 o'clock.

[fol. 646] 10 A. M., December 3, 1940.

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: What witness was on the stand?

Mr. Mason: Mr. LaFountaine was on the stand.

The Court: You may resume the witness stand. You may proceed.

C. L. LaFountaine resumed the witness stand for further

Direct Examination (Continued).

Mr. Mason:

Q. Mr. LaFountaine, I think in qualifying you I did not ask you to describe in detail your duties as general superintendent of safety, supervisor of safety I believe it is called, for the Great Northern. Will you describe those duties a little more in detail for the record?

A. My duties are principally in connection with accident prevention and in order to prevent accidents one must necessarily know the cause. I receive wire reports of all accidents regardless of whether there are personal injuries involved or not and then follow-up reports, superintendents hold formal investigations which I receive copies of, to-

[fol. 647] gether with the superintendent's write-up expressing his opinion as to the cause and responsibility and disciplinary action recommended.

Q. Do you yourself participate in investigations of serious accidents?

A. Yes, I am instructed to attend a number of investigations, participate in them and that is without regard to whether there are personal injuries involved or not. Just

recently I was instructed to be present at an investigation where there was a serious delay to a train, no injury or accident otherwise. I report to the operating vice-president and I have special duties assigned to me as the circumstances arise. I have charge of standard time on our railroad. As I said in my formal investigation I am in charge of the examining board of transportation rules.

Q. You are a member of the staff of the operating vice-president and thus in the operating department, are you?

A. That is correct, yes, sir.

Q. Have you ever served on any committees of the Association of American Railroads having to do with safety matters?

A. Yes, sir, I have served on nearly all of them, served as second vice-chairman, first vice-chairman and chairman [fol. 648] of the section and during my twenty-two years I think I have been a member of every committee. I am a member of the rules committee at the present time.

Q. When you speak of the section you mean the safety section of the A. A. R.?

A. That is correct, yes, sir.

Q. I think you have stated that you have ridden over the line frequently in the course of each year during your occupancy of your present position. Will you say whether or not you have become familiar with the grades and particularly the ruling grades upon the various portions of the line?

A. Yes, I have.

Q. Does the Great Northern handle various kinds of freight traffic?

A. Yes, sir.

Q. It is not particularly devoted to the handling of one single type of commodity, is it?

A. No, sir.

Q. For example, I think you spoke of serving grain territories. Do you handle a considerable volume of grain?

A. Yes, we do, out of Montana, North Dakota, South Dakota, and Iowa.

Q. Do you originate grain as well in Washington?

[fol. 649] A. Yes, we do, we have quite extensive grain territory in Washington.

Q. Is grain handled in both directions over your main line to mills and points of transfer?

A. Yes. Of course, the bulk of the grain moves east but we move some grain from the Montana country to the western mills and the Washington grain moves to the western coast.

Q. Does your company handle any substantial volume of lumber traffic?

A. Yes, our eastern freight business out of the West coast is largely lumber, from Seattle.

Mr. Strouss: If the court please, our objection is going to all of this testimony.

The Court: Yes, the objection is overruled.

Mr. Mason:

Q. Does the Great Northern handle any perishable traffic by which I mean particularly fresh fruits and vegetables?

A. Yes, we handle fresh fruit out of the Seattle territory, perhaps twenty thousand carloads of apples out of the Wenatchee Valley.

Q. Is that Wenatchee Valley perishable traffic moved from Eastern Washington to your Eastern terminals?

A. Yes, the bulk of it moves from eastern Washington [fol. 650] to the Eastern terminals.

Q. Does that move in refrigerator cars?

A. Yes, sir.

Q. Do you have a particular type of refrigerator cars that you use on the Great Northern?

A. Yes, we use the W. F. E. refrigerator cars.

Q. I take it you have observed the P. F. E. refrigerator cars?

A. Yes, sir.

Q. Do they move over the Great Northern from time to time?

A. Yes, sir.

Q. Is the W. F. E. car that you just mentioned similar in general characteristics to the P. F. E. car?

A. Yes, sir.

Q. Does your company handle merchandise and manufactured products to any extent in its freight trains?

A. Yes, sir, the westbound business is largely the manufactured products.

Q. Do you have any volume of livestock movement from the agricultural territory along your lines?

A. Yes, we do, in trainload shipments out of Montana, sheep and cattle.

[fol. 651] Q. Does your company serve any districts originating ore or mineral products?

A. Yes.

Q. Will you state where those are located generally?

A. Our largest ore mines are in the Mesabi range in northern Minnesota. We have some ore movement from the Anaconda Copper Company down to the smelter at Great Falls.

Q. Does your company handle any substantial volume of dairy products?

A. I wouldn't say that they are extensive; we handle some but it is not an extensive movement.

Q. Your company has a substantial passenger traffic, does it not?

A. We have one coast train in either direction which handles a good train of passengers especially during the summer months. I wouldn't say that we are getting any more than our share of the passenger business.

Q. But you do have passenger trains regularly operating?

A. Oh, yes.

Q. Are you familiar with the equipment, that is to say the cars and engines owned and used by the Great Northern [fol. 652] A. Yes, sir.

Q. Is it part of your duty as general supervisor of safety to become familiar with such equipment?

A. Yes, it is.

Q. Have you heretofore been furnished with copies of the defendant's exhibit 2, 3, 4, 5, and 6?

A. Yes.

Q. I wish you would refer to exhibit No. 2 first, showing the chronology of the Southern Pacific Company's freight boxcars and without going into detail will you say whether from your own observation and knowledge the development of Great Northern boxcars has proceeded along the same general lines?

A. Yes; they have.

Q. Does your company now operate predominately with steel or steel underframe boxcars?

A. Yes, better than 95 per cent of our cars are steel or steel underframe construction.

Q. Looking at the passenger car exhibit which is No. 4, will you say whether from your observation and personal knowledge the development of the passenger car equipment of the Great Northern has proceeded along some- [fol. 653] what the same general lines as shown on that exhibit?

A. Yes, they have, with the exception that we have no streamlined cars, articulated cars.

Q. That is the types for 1937 and 1939 shown thereon?

A. Yes.

Q. Does your company operate predominately with steel passenger train cars at present?

A. Yes, sir.

Q. Will you refer please to exhibit No. 5, the chronology of freight locomotive types of the defendant's compan Does your company have types of locomotives somewhat similar to those shown on exhibit No. 5?

A. Yes, we have locomotives similar to all the types shown on this exhibit. The Mogul engine here, there are not very many of those left.

Q. That is an older type now largely displaced, is it?

A. Yes, we have two of those left. The Consolidated 2-8-0, we have a number of those Mikado type engines.

Q. Are your Mikados in present use?

A. Yes, sir.

Q. In main line freight service?

A. Yes, sir.

[fol. 654] Q. What is their tractive effort as compared to the fifty-one thousand pounds shown here for these Mikados?

A. Our lightest Mikado engine has a tractive effort of 64,000 pounds and the heaviest one 78,000 pounds.

Q. You have a freight type similar to the 2-10-2s large shown there?

A. Yes, we have two different sizes, we call them the Santa Fe locomotives 2-10-2.

Q. Do they have greater or less tractive effort?

A. They have greater tractive effort than shown on your locomotives. The larger Santa Fe engines have a tractive effort of 87,000 pounds and there are twelve of those equipped with boosters that give them a tractive effort of 99,000 pounds.

Q. Do you have the Articulated type bearing some resemblance to the Articulated Consolidated locomotive shown on exhibit No. 5?

A. Yes, we have a number of those similar to the one shown, that AC-9.

Q. That is with the stack in front and the cab in rear?

A. That is right, but they are 2-8-8-2 locomotives.

Q. Are they coal or oil burning?

A. Both, some coal and some oil.

[fol. 655] Q. You operate with both coal and oil?

A. That is correct.

Q. What is the tractive effort of your 2-8-8-2 locomotives or do you have those by class?

A. We have those by class. The N2's have a tractive effort of 100,000 pounds; the N3, 118,000; the R1's have 127,000 pounds and 136,000, two different sizes and the R2's have a tractive effort of 146,000 pounds.

Q. Those are in use in what districts largely?

A. The N2's and N3's are largely used in the ore service on the Iron Range. The R1's, the smaller ones, are on the Minot Division; the larger R1's are on the Spokane Division, and the R2's are working between Hilliard and Havre on the Kalispell Division.

Q. The Kalispell Division is the division between Spokane, Washington, and Havre, Montana?

A. Yes.

Q. Over the Rocky Mountains and the Bitter Root Range?

A. Yes, sir.

[fol. 656] Now, will you refer to the exhibit showing the chronology of passenger locomotive types of the defendant's lines, being Exhibit No. 6. Do you have types of passenger locomotives which correspond with those shown on that exhibit?

A. Yes, we have passenger locomotives that correspond with all the numbers shown on the exhibit.

Q. Has your passenger locomotive development followed along somewhat the same lines as shown here?

A. Yes, sir.

Q. Does your company maintain schedules for the transportation of freight over its main line?

A. Yes, we do have our symbol freights.

Q. Do you have an east-bound schedule, for example, from Seattle and other Pacific coast ports to St. Paul and Minneapolis?

A. Yes, sir.

Q. What do you call that schedule?

A. Well, it is 402, a symbol schedule, 111 hours and 30 minutes, 111 hours and 30 minutes from Seattle to Minneapolis.

Q. That calls for the delivery of freight in 111 hours and 30 minutes from Seattle to arrival in Minneapolis?

A. That is correct.

Q. Do you have a west-bound schedule?

[fol. 657] A. Yes, we have a similar schedule 90 hours from Minneapolis to Seattle, or Interbay, that is four miles this side of Seattle King Street Station.

Q. Now, is perishable freight handled on this 402 symbol schedule you spoke of, the east-bound schedule?

A. Yes, all of our freight is handled on the same 402 schedule.

Q. Are manufactured products handled on that, on that west-bound numbered schedule?

A. Yes, sir.

Q. Does that have a symbol by way of number attached to it?

A. No. 401.

Q. Do I understand that the train or trains moving on the east-bound schedule are identified by symbols 402 over the entire main line?

A. That is right.

Q. Do they take actually different train number designations on various divisions?

A. No, they carry the same train number over the entire system.

Q. The west-bound train number schedule carries 401 over the entire system?

A. Yes, sir.

Q. Are you familiar from your knowledge with the extent [fol. 658] to which your company makes delivery in accordance with these schedules?

A. No I am not. May I hear that question?

Q. Do you know of your own knowledge the extent of your on-time performance measured in percentage?

A. No I do not.

Q. Does your company interchange freight with the Southern Pacific?

A. Yes we do.

Q. You have at least 2 different connections with the Southern Pacific have you not?

A. We have 3 I believe, Portland, Chemult, Klaimuth Falls.

Q. Referring to exhibit No. 1, the large copy of which is shown on the easel, Portland is shown at the extreme upper left-hand corner of the map?

A. Yes sir,

Q. That is one of the western termini of the Great Northern, is it, Portland?

A. Yes.

Q. And in addition to that you have the line which you have previously described extending southward into Central Oregon, which reaches the Southern Pacific at Chemult?

A. Yes.

Q. Then operates over joint trackage with the Southern [fol. 659] Pacific to Klamath Falls?

A. Yes.

Q. Your line extends southward into Northern California?

A. Yes sir, to Bieber.

Q. To a junction with the Western Pacific at Bieber?

A. Yes sir.

Q. Have you seen cars of Southern Pacific ownership move in freight trains on the Great Northern?

A. Yes sir.

Q. I will ask you Mr. La Fountaine, to refer please to a statement of one sheet bearing the title "Great Northern Railway Company Freight Trains Operated on Kalispell Division During 10 day Period August 19 to 24 inclusive, 1939." Have you that statement before you?

A. Yes sir.

Mr. Mason: May we have the exhibit marked for identification No. 43.

(Thereupon the document referred to was marked Defendant's Exhibit No. 43 for identification.)

Mr. Mason: Was exhibit No. 43 for identification prepared by you or under your direction Mr. La Fountaine?

A. Yes sir, it was.

[fol. 660] Q. From what sources was the information taken?

A. From the train sheets.

Q. Are those the designated train sheets covering the districts depicted on the Kalispel division?

A. Yes sir.

Q. Are those train sheets available now in the Court Room?

A. Yes sir they are.

Mr. Mason: Your Honor in connection with the tender of this exhibit, when it is tendered, we will also tender the despatchers train sheets mentioned by the witness for examination by opposing counsel.

Q. Have you compared the exhibit with the original source, that is to say, the train sheets, to determine whether it is a true and correct transcription, Mr. La Fountaine?

A. Yes sir.

Q. And is it true and correct?

A. To the best of my knowledge and belief.

Q. As to lines 32, 33, and 34 of the exhibit at the bottom, were those computations and additions made by yourself?

A. Yes sir.

Q. And they are a summary of the information appearing on lines 1-31 inclusive?

A. Yes sir.

[fol. 661] Q. Now, as to the column headed "Ruling Grade," being column E, I'll repeat, column E, is that information in line with your own knowledge of the district?

A. Yes sir.

Q. Will you say whether that is true and correct according to your knowledge independent of any document?

A. Yes sir.

Q. Do you have profiles furnished by the Engineering Department of the Great Northern which show the information as to Ruling Grades appearing on the exhibit?

A. Yes sir.

Mr. Mason: I may say, Your Honor, that we will likewise tender those profiles for the examination of opposing counsel.

Q. Now referring to the heading "Type of Locomotive," which appears in several columns, Columns G, U, and BB

are those the types of locomotives owned by the Great Northern which you have just discussed in connection with your reference to Defendant's exhibit No. 5, that is, the consolidation, the Mikado, and 2-8-8-2?

A. The Mikado and the 2-8-8-2 and the Pacific type as shown on your exhibit; I am not sure that that consolida-
[fol. 662] tion engine was shown on your exhibit, which was 2-8-0.

Q. Look at the exhibit.

A. You have a consolidation.

Q. Exhibit 5 does not show a Pacific type locomotive. Look at Exhibit 6. Does the locomotive in line 30 correspond to one of the Pacific types in No. 6?

A. Yes sir.

Q. Now, the heading of your exhibit, Mr. La Fountaine, is as to freight train operation during a 10-day period. I will ask you if the 10-day period August 19 to 24 represents the peak of traffic on the Kalispell division of the Great Northern?

A. No sir.

Q. Does it represent a period of unusually light traffic?

A. No sir.

Q. Would you say from your knowledge of the traffic of the Company whether it is a period of fairly average traffic?

A. That is my judgment, that it is an average period of traffic on our railroad, freight traffic.

Q. Are all of the trains shown on exhibit 43 for identification through trains or some of them local trains?

[fol. 663] A. No, they are both through trains and local trains.

Mr. Mason: I have further questions on the exhibit, but they necessarily should be deferred until after the exhibit is in evidence, if it be received. I am about to offer the exhibit unless you have some questions before it is offered.

Mr. Strouss: I have some questions. I haven't made any objections to the questions for the reason I have assumed my objection made heretofore is a running objection.

The Court: That is true Mr. Strouss and the Court will consider your objection to the evidence. For the first time we now have presented the original documents from which

this exhibit 43 is compiled. I wish you would re-state your objection in the light of the present record.

Mr. Strouss: Of course we have, as the Court has stated, the original records for a 10-day period, but when the witness testifies concerning a typical period during the year's operation, of course, then we are going into matters which are not limited to that 10-day period, but which covers a period of a year, and of course the records of the 10-day period doesn't give me anything to cross-examine him on with respect to that particular question. The testimony [fol. 664] as to typical operation, as to that part of the testimony at least there hasn't been any improvement here. I would like to ask the witness a question or two here at the present time.

Q. Mr. La Fountaine who prepared the original data from which this exhibit was made? Did you do that?

A. Yes sir, I aided in doing it; it was prepared in my office.

Q. The train sheets were there?

A. Yes sir.

Q. Who selected the period that would be covered by this exhibit?

A. I selected the period.

Q. How did you determine that period?

A. Well I gave it considerable consideration. Our Fall business, our grain business and apple movement is not started at this time of the year, and I thought business was better than during the slack period of May, June or April, when our business is at its lowest ebb, and after giving it some thought and from my years experience there, I figured it was a normal period of the year.

Q. Of course your movement of trains does depend to a great extent on traffic?

A. Yes sir.

[fol. 665] Q. And that, at least as to some types of traffic, is seasonal; that is true isn't it?

A. Yes sir.

Q. Your wheat movement is a seasonal movement?

A. Yes sir.

Q. How about lumber?

A. Well I wouldn't say lumber was so seasonal. That depends on how the market is and the trouble they have on the Pacific Coast.

Q. It varies?

A. Yes, that is not so seasonal, but this precedes any wheat movement in their country, which is at a peak in September, October and November, our freight operation is then much heavier than in August.

Q. Of course the apple traffic is a seasonal traffic?

A. Yes, pretty much so, although we have large storage capacity at Wenatchee now, and there will be apples moving more or less all along.

Q. You have, due to the different conditions which will govern the movement of traffic, you will have periods during the year when there is greater volume of traffic and periods when the traffic is of a lesser volume?

A. That is true.

[fol. 666] Q. And this exhibit is your opinion or judgment of what is the average day's traffic during that year?

A. Yes sir.

Mr. Strouss: Average 10-day traffic I mean.

The Court: I notice that some of the other witnesses representing other lines have apparently selected a period in April as being a normal period of operation. That is not true on your line?

A. No, I wouldn't say so, Your Honor.

Mr. Strouss: Well, our objection, is first, that it is not the best evidence, that the records themselves are the best evidence, that insofar as the testimony goes to this being a typical operation, that it is not the best evidence because the records for the whole year are not present, that the evidence, all of it calls for a conclusion of the witness, is irrelevant and immaterial because there has been no showing of similarity of conditions and is evidence with reference to operations which are without the State of Arizona and have no relevancy or materiality to the question of the operations in Arizona and the application of the Arizona Train Limit Law to those operations.

The Court: Mr. Strouss if you desire, in fairness to the State in order that you can question the judgment of [fol. 667] this witness as to what is a typical period, if you designate any particular 10-day period, I think the Court might require the defendant here to produce the records for that period.

Mr. Strouss: Of course that wouldn't mean a thing. I haven't any information as to what the witness has testified to here with respect to the traffic on the Great Northern. As the witness has testified, the question of what is a typical operation there depends upon the traffic and when the volume of traffic occurs on that railroad, when there is a lack of volume, and there is no way for me to designate any period which would mean anything if it were brought into court. It is a question of comparison of the records as a whole for the year to determine what is their average volume of traffic for the movement of trains.

The Court: The objection will be over-ruled. The exhibit may be admitted in evidence.

(Thereupon the document referred to was received in evidence and marked "Defendant's exhibit No. 43.")

The Court: While we are on this subject, if the Court might say to counsel that it seems to the Court that the rules of evidence regarding the introduction of certain of these exhibits has now in this particular instance been reasonably complied with, and I am going to, after a confer- [fol. 668] ence with counsel, on my own motion strike certain of these other exhibits from the record.

Mr. Booth: We intend to put Mr. C. R. Young on the witness stand, and he now has the train sheet in support of the exhibit that was submitted during his testimony, and we will have later on in the case either the train sheets or the conductor's wheel reports, which are equally original, contemporaneous records, for the Missouri Pacific, and we will also supply that deficiency either by wheel reports or by train sheets in the case of the New York Central. Now, all of the witnesses from now on, there are some ten or twelve of them from other lines, will have either the train sheets or the wheel reports. When we get to the question of wheel reports, that is something that will have to be explained. The wheel reports are, in our opinion, of equal authenticity, containing all of the information necessary to make up an exhibit similar to this; so I would ask Your Honor to defer any action on these exhibits until this branch of our case is closed. It is a distinct branch of the case and we hope to finish it before the Christmas vacation and I think we can.

The Court: I just wanted counsel for the State to know [fol. 669] that after an examination of your authorities the Court is convinced that your objection is well taken that the summaries of records are not admissible unless the records themselves are available. In the future, the Court will adhere a little more closely to the rule of evidence announced by Wigmore, wherein he states—I am reading from Wigmore on Evidence, Page 1472, Paragraph 1130, which is quoted in probably your leading case of Hooven v. First National Bank; 273 Pac. 257, an Oklahoma case. In that case, quoting from Dean Wigmore, the Court says, "Most courts require, as a condition, that the mass thus summarily testified shall, if the occasion seems to require it, be placed at hand in the court or at least be made accessible to the opposing counsel in order that the material for cross-examination may be available." The Court intends to adhere to that rule.

Mr. Booth: I would like to add, if your Honor please, that while the general rule is as stated by Dean Wigmore, there are certain variations and exceptions to that rule which are applied according to the circumstances of the case and the issues to which the evidence is directed. For example, the multiplicity of records rule is used in some cases to mitigate the strictness of the rule your Honor has [fol. 670] just read, and in other cases where the bulk records have been destroyed and there is in existence a summary of those records made, not for the purposes of the case, but in the ordinary course of business, and it is testified to by a credible witness, in such cases the production of the original records is out of the necessity of the case and to prevent a miscarriage of justice, waived.

The Court: The court will pass on any of those exceptions to the general rule when they arise. I do propose to take a common-sense view of this, I don't intend to make any rulings that would tend to smother justice in her own robes, as Corpus Juris says, but in the meantime I will require you to comply with this rule.

Mr. Strouss: Justice can be smothered in the other way by using summaries made by the other parties, stating their conclusions as to what the original records mean.

The Court: You may proceed.

Mr. Mason: I take it that the Court's ruling indicates that this witness at least is sufficiently qualified to express

his view from his experience as to what is a reasonably representative operation. It must be remembered that we do not offer Exhibit 43 as reproducing exactly one-thirty-[fol. 671] sixth of the traffic carried on this particular division over a 12-months period, but rather as representative of operations in what is neither the peak period nor a slack period.

The Court: That is what the Court understands.

Mr. Mason: I take it opposing counsel are not deceived as to the purpose.

Q. Now Mr. La Fountaine will you refer to exhibit No. 43 and I will ask you to refer to the trains shown in lines one to four inclusive. Are those through trains or local trains?

A. Those are local trains.

Q. Now referring to the trains in lines seven and eight, generally speaking, are those through or local trains?

A. Those are through trains.

Q. Is Havre one terminal and Blackfoot another terminal of an operating subdivision of the division?

A. Yes sir.

Q. Again in lines 19 and 16, the trains between Blackfoot and Whitefish, may also refer to lines 17 and 18; are those through or local trains?

A. Those are through trains.

Q. And are Blackfoot and Whitefish terminals of operating subdivisions?

A. Yes sir.

[fol. 672] Q. Then proceeding to lines 21 to 25 inclusive, the trains operating between Troy and Whitefish, are those two points terminals of operating subdivisions?

A. Yes, sir.

Q. And are those through trains or local trains?

A. Well there are local trains included. They are principally through trains; there is a tri-weekly local included.

Q. On lines 27—it should be 26 to 31 inclusive, trains between Troy and Hilliard, are those through or local trains?

A. The local trains are included, but the preponderance of those trains are through trains.

Q. Are Troy and Hilliard terminals of operating subdivisions?

A. Yes, sir.

Q. Between what points does the entire Kalispell division extend?

A. From Hilliard, Washington to Havre, Montana.

Q. And it is divided into four subdivisions at the points you have mentioned?

A. Yes, sir.

Q. Then you have included on this exhibit both local trains operating short distances and with a smaller number of cars, and the through trains operating over the en-
[fol. 673] tire subdivision with the larger number of cars; have you?

A. Yes, sir.

[fol. 674] Q. Have you before you, Mr. LaFountaine, a statement in one sheet entitled "Great Northern Railway Company, Ore Trains Operated on Mesabi Division, August 15-24 inclusive, 1939:"

A. Yes, sir.

Q. Was this prepared by you or under your supervision?

A. Yes, sir.

Mr. Mason: May we have the statement just identified by title marked No. 44?

The Clerk: Defendant's exhibit No. 44 for identification.

Mr. Mason:

Q. From what particular document or records was the information shown on this exhibit taken?

A. They were taken from the dispatchers' train sheets.

Q. Do you have in the courtroom with you the dispatchers' train sheets covering the districts referred to on the face of the exhibit?

A. Yes, sir.

Q. For the period August 15 to August 24, 1939, inclusive?

A. Yes, sir.

Q. Are they available for the examination and use of opposing counsel?

[fol. 675] A. Yes, sir.

Q. As to the ruling grade, are you familiar with the territory covered by this exhibit?

A. Yes, sir.

Q. You have traveled over it frequently, have you?

A. Yes, sir.

Q. Are these figures showing ruling grade in accordance with your own knowledge?

A. Yes, sir.

Q. Do you have a profile furnished you by the engineering department of your railroad which shows these ruling grades?

A. Yes, sir.

Q. Is that likewise here in the courtroom available for the use of opposing counsel?

A. Yes, sir.

Q. Have you compared the information shown on No. 44 with the dispatchers' train sheets to determine whether it is true and correct?

A. Yes, sir.

Q. As to the computations shown at the foot of the exhibit, did you check those?

A. Yes, sir.

Q. Will you state whether or not the exhibit truly and correctly reflects the underlying records from which it was [fol. 676] prepared?

A. To the best of my knowledge and belief it does.

Q. As to the ore operation, is the showing for the period August 15 to August 24 reasonably typical of the operation as it is carried on during the period when ore is moving?

A. Yes, sir.

Q. During what period of the year does the Great Northern handle ore on the Mesabi Division?

A. Starting about the first of May to the fifteenth of November.

Q. That is the extent of the season each year?

A. Yes, sir.

Q. What consideration determines when the operation shall start and how long it will continue?

A. It is our ability to get boats through the Great Lakes up to the docks.

Q. It is the condition of navigation on the Great Lakes?

A. Yes, sir.

Q. Is your operation the delivery of ore from the fields to the docks of the Great Lakes where it is shipped?

A. Yes, sir.

Q. Will you refer to your exhibit No. 42 which is a map [fol. 677] of the Great Northern lines?

A. Yes, sir.

Q. Will you point out on that map the district to which the showing on exhibit No. 44 for identification relates. Is it outlined on this map in any particular way?

A. Yes, sir, it is outlined here, the ore line with this dark heavy mark.

Q. Is that the line between Gunn, Minnesota, and Allouez, Wisconsin?

A. That is correct.

Q. And also extending from Virginia, Minnesota, down to the main line and thence to Allouez?

A. Yes, sir.

Q. Is the district referred to on your exhibit No. 43 shown in the black line on exhibit No. 42?

A. I don't understand that question.

Q. The preceding exhibit relating to the Kalispell Division?

A. Oh, yes, that is the heavy dark line from Pacific Junction—Havre to Hilliard, Washington.

The Court: If I understand you, referring to exhibit No. 42, the so-called "ore line," the lines over which your ore is hauled is shown on the heavy dark line on exhibit No. 42, the one area being over Idaho, Montana, and across [fol. 678] Washington and the other in Wisconsin and Minnesota?

Mr. Mason: I don't think that was the purport of the question. The district shown on exhibit No. 44 as representing the ore haul is entirely at the eastern end of the line, is it not?

A. Yes, sir.

Mr. Mason: Perhaps I confused the record a little bit by trying to tie exhibit No. 43 which is a typical main line operation to the Kalispell Division in Montana, Idaho, and Washington.

The Court: I see.

Mr. Mason:

Q. The mileage of the ore lines as shown on exhibit No. 44 is slightly in excess of 120 miles, is it not?

A. The distance from Allouez to Gunn is 100 miles.

Q. What is the total mileage covered by the black line on exhibit No. 43 at the east end of your railroad?

A. It is approximately 200 miles.

Q. Is the showing on exhibit No. 44 for identification typical as to the lengths of the trains in which the ore is handled as well as the volume of the operation?

A. Yes, sir.

[fol. 679] Mr. Mason: We offer the statement in evidence as exhibit No. 44. Your Honor, I should say in explanation of the offer that the purpose of the exhibit is not necessarily to show that train operations of units of 180 cars are practical in the operation in Arizona or anything of the kind but this shows one of the typical long-train operations in the United States under a particular condition and we shall show when we come to the Southern Pacific branch of the case that there are places in Arizona where if traffic were offered it would be feasible to conduct a similar operation. The purpose of the exhibit, in other words, is to show along the lines of our general allegation that long-train operation under particular circumstances is regularly carried out as a standard practice in other parts of the United States and to continue the allegation there are no reasons from the standpoint of safety or otherwise why a similar operation might not be conducted in Arizona if it were not for the law.

Mr. Strouss:

Q. Did you prepare this exhibit, Mr. LaFountaine?

A. I aided in preparing it, I supervised it.

Q. Who did the actual work on it?

A. My office force and myself.

Q. Your method in selecting this period covered was [fol. 680] the same as with respect to Exhibit No. 43?

A. There was no particular reason for selecting any period for this operation because it is uniform from start to finish, it is a summer operation only. I took the same dates I had on the freight train exhibit.

Q. These ruling grades, I take it they are the ruling grades against traffic in the direction that it is moving as shown on the exhibit, is that correct?

A. No, the grade is shown there—which one do you have in mind, from Kelly Lake to Allouez?

Mr. Strouss: Yes.

A. No, that is the ruling grade, two-tenths of one per cent.

Q. It is in the direction that traffic is moving?

A. Yes, sir.

Q. And that is true of each one?

A. That is right.

Mr. Strouss: That was my question, I guess I didn't make it clear.

A. I didn't understand your question.

Mr. Mason:

Q. What you meant was, I think, Mr. Strouss, and I will ask the witness, that is to say, a train going from Kelly [fol. 681] Lake to Allouez by Casco must travel over a two-tenths grade?

A. That is correct.

Q. And a train going from Allouez to Kelly Lake by Casco must move against a six-tenths grade with the exception noted at the foot of the exhibit?

A. That is correct.

Mr. Strouss: This is practically all a double track operation, isn't it?

A. It is double track from Allouez to Swan River, 84 miles.

Q. It is only approximately 16 miles from there into Gunn that is not double track in that direction?

A. In that direction, yes.

Q. How far is it up to Kelly Lake?

A. Twenty-five miles from Swan River.

Q. This map is not drawn to scale, is it?

A. No; it operates there similar to a double track because the empties go from Swan River to Kelly Lake and the loads come from Kelly Lake via the Casco line to Brookston, there again entering double track.

Mr. Strouss: I make the same objection as was made to exhibit No. 43.

The Court: The objections are overruled and the exhibit may be admitted in evidence.

[fol. 682] The document referred to was received in evidence and marked defendant's exhibit No. 44.

The Court: We will take a brief recess at this time.

Thereupon a short recess was taken after which proceedings were resumed as follows:

The Court: You may proceed.

Mr. Mason:

Q. Mr. LaFountaine, you show all of these trains as having been handled with Mallet locomotives. What is the wheel arrangement of those Mallets?

A. 2-8-8-2.

Q. Are those the large R type that you referred to in your previous testimony?

A. No, those are the N2 type engines.

Q. The exhibit indicates that you handle 182 loaded cars on the average in 32 trains from Kelly Lake, line 1. Are those handled with one locomotive?

A. Yes, sir.

Q. Is that Mallet type locomotive shown on this exhibit, is that the locomotive that corresponds to the coal burner?

A. AC-9 type.

Q. On exhibit No. 5?

A. Yes, it corresponds in general design with the AC-9 [fol. 683] locomotive shown on No. 5 with the exception that our engine is a 2-8-8-2 and yours is a 2-8-8-4.

Q. I think in answer to questions of counsel you said that the trains loaded with ore come from the points of origin down one line to where the double track commences and thence down the double track to the head of the Lakes, isn't that correct?

A. The preponderance of the tonnage moves in that manner.

Q. In returning what is the operation?

A. The empties move by the double track to Swan River, then go from Swan River to Kelly Lake.

Q. Are they then distributed from Kelly Lake to the actual points of the mining operation and loaded?

A. Yes, sir, Kelly Lake is the assembling yard where the transfers bring the ore from the mines into the yard and make up the trains.

Q. Do I understand that this is a regular back and forth operation of loads from the assembly points down to the head of the Lakes and empties back to the assembly points for distribution?

A. Yes, sir, that is correct.

Q. This shows an average of 182 cars and a maximum of 185 cers per train. I would infer from that that the [fol. 684] minimum is around 180 cars or 178 cars, is that correct?

A. There is seldom a train that doesn't have 180 cars.

Q. Of loads?

A. Of loads or empties, either one. We aim to have 180 or more.

Q. Have you ever seen any of these Mallet locomotives in the shops undergoing repair or refitting?

A. Yes, sir.

Q. Are you familiar with the type from that standpoint?

A. Yes, sir.

Q. Have you seen these ore trains in operation personally?

A. Yes, sir.

Q. Ridden on them?

A. Yes, sir.

Q. When you rode on them, what point on the train did you ride?

A. I rode the caboose.

Q. Have you ridden trains of empties as well as trains of loads?

A. Yes, sir.

Q. Have you seen these ore cars that are used in these operations in the shops?

[fol. 685] A. Yes, sir.

Q. Are you familiar with their construction?

A. Yes, sir.

Q. Approximately what is the capacity of these ore cars in pounds or tons?

A. Seventy-five ton cars.

Q. That means they will hold 75 tons of ore?

A. Yes, the large cars. We still have a few 50 ton cars but they are not in use this year. They were at the time this report was made.

Q. Are you familiar with the loading of these cars? Are they loaded to full capacity at all times?

A. They will average about 92 tons per car gross, about 71½ tons of ore per car on an average throughout a given period.

Q. I take it your familiarity with the cars and having seen them in the shops extends to other types of cars that your company operates?

A. Yes, sir.

Q. Is that a part of your duty as general supervisor of safety to visit the shops and inspect the operations there?

A. Yes, sir.

Q. Mr. LaFountaine, will you refer please to a statement in one sheet entitled "Great Northern Railway Company, [fol. 686] Maximum Number of Cars Handled in Main Line Passenger Trains Nos. 1 & 2, Total for the 10-Day Period, June 1-10, Inclusive, 1939." Have you that exhibit before you?

A. Yes, sir.

Mr. Mason: May we have that marked No. 45, if Your Honor please.

The Court: It may be marked:

The Clerk: Defendant's exhibit No. 45 for identification.

Mr. Mason:

Q. Did you prepare the statement identified as No. 45?

A. I assisted in doing so.

Q. It was prepared in your office?

A. Yes, sir.

Q. From what sources was the information shown thereon taken?

A. From the dispatchers' train sheets.

Q. Are the dispatchers' train sheets for the ten-day period indicated by the exhibit?

A. Yes, sir.

Q. Are those dispatchers' train sheets which form the source of this exhibit available in the courtroom?

A. Yes, sir.

Q. Available for the examination and use of coun- [fol. 687] sel?

A. Yes, sir.

Mr. Mason: Your Honor, those are likewise tendered for counsel's use for the purposes of this exhibit.

Q. There are certain computations which appear between the blocks on the exhibit. Did you make those computations?

A. Yes, sir.

Q. Did you yourself make the recapitulations?

A. Yes, sir.

Q. Are those made from the information shown on the face of the exhibit itself?

A. Yes, sir.

Q. And capable of check on the exhibits, are they?

A. Yes, sir.

Q. Has the exhibit been checked against the dispatchers' train sheets?

A. Yes, sir.

Q. Will you say whether or not it is true and correct?

A. To the best of my knowledge and belief it is correct?

Q. Did you select the period shown on the exhibit?

[fol. 688] A. Yes, sir.

Q. What governed that selection?

A. Well, our two heaviest passenger traffic seasons are during the Glacier Park season which opens on June 15 and closes on September 15 and during our holiday periods, so in going over the matter of preparing this exhibit I figured that my judgment indicated to me to select this period in June previous to the movement of the park season would be a very typical period of normal performance of this train.

Q. Would the traffic be heavier during the park's season?

A. Yes, sir.

Q. Would that result in longer or shorter trains in the territory covered by this exhibit?

A. Both. In some cases we would be able to handle the business in one long train and in other cases we would be required to run two sections of the same train.

Q. What is about the maximum length of the passenger train that you operate in regular service?

A. Twenty cars.

Q. What determines the length of the passenger train?

[fol. 689] A. Ability to maintain our schedule.

Q. Do you operate trains of that length during the holiday season?

A. Yes, we do.

Q. Is that a period of possibly cold weather in the territory through which the Great Northern runs?

A. It gets pretty cold up there in the winter months. During the holiday season we might have a warm period.

Q. Do you have any difficulty in heating the rear cars of your trains during the period of heavy traffic in the holiday season?

A. No, sir.

Q. Will you say whether or not the ten-day period shown on exhibit No. 45 for identification is reasonably representative according to your best information and judgment of passenger traffic of your trains Nos. 1 and 2 over the twelve months?

A. It is, in my judgment.

Mr. Mason: Have you any questions, Mr. Strouss, before we offer the exhibit.

Mr. Strouss: No, I think not.

Mr. Mason: Accompanying the offer with the tender of the train sheets we now offer the exhibit as exhibit No. 45 in evidence.

[fol. 690] Mr. Strouss: The same objection.

The Court: Same ruling, the exhibit may be admitted in evidence.

The document referred to was received in evidence and marked defendant's exhibit No. 45.

Mr. Mason:

Q. Referring to exhibit No. 45, Mr. LaFountaine, you have shown the trains east and westbound under the same name and number but for four separate districts. Will you explain briefly why you have done that?

A. I blocked them out in this manner because we do on certain occasions set out and pick up cars at Fargo, North Dakota; then from Fargo to Havre I made this block because we always have a set-out sleeper for Great Falls and Helena, train No. 1, and have a sleeper to pick up going east on No. 2 coming from Helena and Great Falls.

Q. That is set out or picked up at Havre, is it?

A. Correct. Then I block out the Havre to Spokane because there again we set out cars for Portland, Oregon, and pick up sleepers for Seattle and coming out of Seattle on No. 2 we have a regular Spokane set-out sleeper and we also pick up sleepers from Portland.

Q. So that these are the points where the normal operation or consist changes or may change?

[fol. 691] A. Yes, sir, that is correct.

Q. Is the Empire Builder No. 1 and 2 your principal main line passenger train between the Twin Cities and the Pacific Coast.

A. It is the only train we have between the Twin Cities and Seattle, through passenger train.

Q. You have of course other local trains operating in various parts of the territory, both main and branch lines?

A. Oh, yes.

Mr. Mason: I think that is all. You may cross-examine if you wish at this time, Mr. Strouss.

Mr. Booth: As to the train sheets, counsel stated during the recess he wanted to make some examination of them and I will state in regard to them they are the records of the company which are required by the order of the Interstate Commerce Commission relating to destruction of records, a certified copy of which is on file as the last exhibit in exhibit No. 8, and this regulation of the Interstate Commerce Commission requires the dispatchers' train sheets to be preserved permanently, so I may say with some considerable reluctance I asked the operating managements to send these train sheets and if for counsel's convenience [fol. 692] he wants to take them to his hotel or office to examine them he has that right but I implore counsel to be very careful that none of them are lost.

Mr. Strouss: I appreciate that those are records which are required to be kept as a permanent record by the Interstate Commerce Commission.

Mr. Booth: I have the utmost confidence that none of the railroad men who examine them will make any alterations on them because they are as careful about them as a bank cashier is about his records.

The Court: If you require time in which to examine them before examining this witness the court will give you whatever reasonable time is necessary.

Mr. Mason: We are wholly agreeable to any time that Mr. Strouss may ask for.

Mr. Strouss: I have some questions which I can ask this witness without first examining the exhibit.

The Court: Well, go ahead with that line of cross-examination.

Cross-examination.

By Mr. Strouss:

Q. Mr. LaFountaine, I think you testified that about 318 miles of your railroad are double tracked, is that right?
[fol. 693] A. That is correct.

Q. Where is that double tracking located?

A. Starting out of St. Paul going westward we have double tracks from St. Paul to Delano, 38 miles; Atwater to Willmar, 14 miles; Willmar to Pennock, 7 miles; Campbell to Breckenridge, 15 miles; Surrey to Minot, 7 miles; Wheelock to Williston, 23 miles; Williston to Snowden, 25 miles. We have 14 miles starting at Havre going east.

Q. Fourteen miles east of Havre into Havre?

A. That is right. From Shelby to Blackfoot, 50 miles; from Summit down to Red Eagle, 34 miles; Columbia Falls to Whitefish, 9 miles; Kootenai Falls to Troy, 7 miles; Dean, Washington, to Hillyard, 13 miles; from Hillyard to Fort Wright, 7 miles; Bluestem to Lamona, Washington, 18 miles; Everett to Seattle, 32 miles.

Q. This double tracking, how is it operated?

A. As double track under standard rules.

Q. In conjunction with your single tracking do you operate so as to have as many passes as possible where you have double tracks?

A. Oh, yes, we build those out of terminals so as to get your trains started out of terminals, get them moving and at locations where it would be to our best advantage.

[fol. 694] Q. Those are located where traffic is apt to bunch so as to move the traffic along on the double tracking and avoid the bunching?

A. We would like to make use of it for that purpose, yes.

Q. That has been your effort in locating that double tracking, hasn't it?

A. That is one reason, yes, to keep the traffic moving.

Q. Some of it is operated by electric buttons, that is, the switches are opened automatically?

A. Some of them are, yes.

Q. So that the traffic can continue moving without stopping to open the switch?

A. Yes, sir.

Q. What is the average speed of your freight trains?

A. On the Kalispell Division we have a maximum speed of 50 miles an hour; between Havre and Blackfoot up the east slope of the mountains from Blackfoot to Summit, it is 35 miles an hour; from Summit to Walton, 25 miles an hour, on the west slope of the Rocky Mountains from Walton to Whitefish it is 30 miles an hour.

Q. I was asking if you know what is the average speed [fol. 695] which your freight trains make?

Mr. Mason: Your Honor, we will have an exhibit which will show that figure exactly as taken from the records of the company.

Mr. Strouss: Very well.

Mr. Mason: Of course that will not be restricted to main line trains, it will be the figures shown on the O. S. A. Reports.

Mr. Strouss: Will that also show your average train lengths?

Mr. Booth: Yes, the whole system, main and branch lines.

Mr. Strouss:

Q. You don't have it for the main line only, that is, from St. Paul to Seattle?

A. The schedule running time of 401 is 90 hours. I can have that information available if you want it.

Q. These locomotives that you testified to as being similar to those shown on the exhibit, the Southern Pacific locomotives shown on the exhibit correspond to as similar. Do you mean under the Whyte classification?

A. I don't know what classification you refer to. I had in mind the design, the wheel base construction, and the tractive effort of the locomotive.

Q. As tractive effort increases, there is an increase in [fol. 696] weight on drivers, isn't there?

A. I wouldn't say.

Q. I notice there was no reference made to weight on drivers or boiler capacity.

A. May I hear your question again? I thought you said "speed." Will you ask me that question over again?

Q. Where there is an increase in tractive effort, there is usually a corresponding increase in weight on drivers?

A. I would say "yes." That is not one-hundred per cent true, the engine may be made more powerful through other

methods, but the weight on drivers is a big factor.

Q. Did you intend by your testimony to say that the locomotives which you referred to as owned by the Great Northern corresponding to those of the Southern Pacific were the only locomotives that the Great Northern owns?

A. No, I didn't mean to infer that.

Q. Are there other types of locomotives which the Great Northern owns which are not similar to those of the Southern Pacific Company?

A. Yes, sir.

Q. What are those?

A. We have the N-2 engines, which are 2-6-8-0.

[fol. 697] Q. You have electric locomotives too, don't you?

A. Yes, sir.

Q. Traffic does not take the same tariff, does it, all freight traffic?

A. I believe not.

Q. There would — some difference in tariff according to whether it was expedited movement or moved with so-called "drag" freight?

A. Did you ask the difference in the tariff?

Q. I say there would be a difference in tariff based upon the difference in type of movement.

A. I don't understand that the speed with which you move the commodity would have any bearing on the tariff.

Q. There is as to the type of traffic?

A. That is correct.

Q. One would take a different tariff than apples, for example?

A. Yes, sir.

Q. That might have some bearing upon the tonnage that was placed into a train?

A. Because of the schedule that we wanted to maintain?

Q. The schedule along with the rate or tariff that the traffic pays for the movement.

[fol. 698] A. I am sorry but I don't have your question clear. We maintain a different schedule certainly with perishable food, apples, than we do with ore but there is a stipulated tariff for moving this commodity in either case.

Q. I mean if the tariff were lower you might attempt to get a greater tonnage into a train?

A. As an operating man I don't know that we know much about the tariff governing the commodity in the cars.

Q. Of course volume of traffic available has considerable to do with the movement of trains both as to tonnage and train length?

A. Yes, that is the first factor, you have to have the tonnage first.

Q. And your schedule?

A. Yes, that would be second, I would say.

Q. Time would be an element of course.

A. Which is the schedule, yes.

Q. It might be that in instances at least it would be the better policy to move faster than with a slower and longer train, isn't that true?

A. We do that.

Q. That would depend somewhat on the type of traffic you are moving?

A. Yes, sir.

[fol. 699] Q. Do you have any "hot shots" on your system?

A. This 401 and 402 are the hottest we have.

Q. They correspond with the so-called "over-night" movement?

A. I don't know what you mean.

Q. Are you acquainted with the overnight trains which are operated on the Southern Pacific, the so-called "hot shots"?

A. No, I am not.

Q. If traffic were being lost by reason of a faster movement by competitors of course that would have some effect upon the policy of a railroad company in meeting that competition by determining—by shorter and faster trains than longer and slower trains?

A. I would say that would have a direct bearing on the schedules or when they are preparing them.

Q. Of course other things being equal it would be possible to move the shorter train faster than a longer train?

A. There is a certain length train when you take into consideration the power you got that you can move perhaps as fast as you could move the engine light. We have a safety restriction of 50 miles an hour for freight trains and we haul a pretty lengthy freight train at that speed [fol. 700] over our railroad.

Q. You have quite a few branch lines?

A. Yes, nearly 50 per cent of our railroad is branch lines.

Q. A good part of them are located in the so-called "wheat belt"?

A. Yes, quite a few of them throughout North Dakota and Montana.

Q. They feed considerable traffic to your main line movement?

A. Yes, sir.

Q. You testified as to similarity of freight cars on the Great Northern with those on the Southern Pacific and mentioned particularly that 95 per cent of the Great Northern freight cars were steel or steel underframe cars. You don't mean 95 per cent are all steel and steel underframe. They are either steel or steel underframe?

A. That is correct.

Q. In what other respects are they similar to the Southern Pacific's?

A. In addition to the steel underframe they have steel posts, steel roof, steel ends.

Q. That is covered by the description "steel" isn't it?

A. We use the same kind of couplers, Type D and E [fol. 701] Couplers, A. A. R. standard couplers. Their cars are all pretty generally designed in standard with recommendation practices with the mechanical section of the American Association of Railroads.

Q. That is the Great Northern?

A. The Great Northern and other roads.

Q. Where you say the improvements have developed the same as on the Southern Pacific, except as to the percentage of steel and steel underframe cars, you wouldn't mean to give in percentage all cars they have that have added the different improvements as shown on that exhibit?

A. I made a general statement that in my opinion better than 95 per cent of our cars were of that construction.

Q. Steel and steel underframe?

A. Yes.

Q. On the exhibit are shown a lot of other improvements in freight cars over that period. You don't mean to say that your cars have, 95 per cent of them have all these other improvements?

A. I will make that statement because I have checked them over.

Q. Take for example the air brakes. Had you 95 per cent A. B. brakes on the cars owned by the Great Northern at the present time?

[fol. 702] A. No, sir.

Q. Then you don't mean to say that each of these different improvements that you have, 95 per cent of your cars have all these different improvements?

A. No, 95 per cent of them are either steel or steel underframe construction.

Q. Probably the bigger percentage of your cars still have the K triple valve?

A. No, the first of July we had 20 per cent A. B. brakes and I am confident now that by the end of the year we will have 29 per cent A. B. brakes on our freight equipment.

The Court: What does that expression mean?

A. That is a type of brake.

Mr. Mason: It is a brake valve properly speaking, isn't it?

A. Triple valve, brake valve. It is a newer or more modern triple valve.

Mr. Strouss: This territory around Mesabi, on the Mesabi Division, that is not undulating territory in there, I mean with dips and hog-backs?

A. No, not generally speaking, it is not. We have some that is rolling from Swan River to Kelly Lake and some little roll to the grade from Kelly Lake down to Brookston.

[fol. 703] Mr. Strouss: Are you going to have, with the witness that is coming later, also the passenger train average passenger train car lengths, and that information, or is it limited to just freight?

Mr. Mason: I think it is limited to freight trains entirely. I don't think there is contemplated any showing as to average passenger train lengths.

Mr. Strouss:

Q. Do you know what the average passenger train length is on the Great Northern operating between Seattle and Minneapolis or St. Paul?

A. The average passenger train?

Q. Yes.

A. That is trains number 1 and 2; those are the only ones we have.

Q. What is the average length of those trains over the year?

A. In cars?

Q. In cars.

A. Well, I believe that around 40 per cent or a little better exceed 14 cars, and they vary from there, from 15, 16, 17, 18 cars.

Q. You mean operating the complete distance between Seattle and Minneapolis?

A. No, I don't. That is the reason I broke this down, to make a fair statement, but some place enroute between [fol. 704] Seattle and St. Paul either train 1 or 2 will have that number of cars in the train over a given territory.

Q. That doesn't necessarily mean then it operates the full distance between Seattle and Minneapolis with that consist.

A. No.

Q. And these trains that are shown on Exhibit 45, that exhibit does not mean that those particular trains operated the full distance between Minneapolis and Seattle with that consist?

A. No, sir, that is not on the exhibit in that manner.

The Court: Do I understand, Mr. La Fountaine, that the Great Northern only operates the one train each way, the two passenger trains, on your line there?

A. That is the only through passenger train that carries passengers from St. Paul to Seattle.

Q. Number 1 going one way and Number 2 going the other?

A. Going eastward, yes, sir.

Mr. Strouss: You say the Glacier Park period begins about the 15th of June?

A. June 15th.

Q. That is when the park opens?

[fol. 705] A. Yes, sir.

Q. You don't think that traffic shown June 1st to 10th would in any way reflect the tourists moving west in anticipation of that opening?

A. No, I am sure it wouldn't, because the roads are not opened into the park usually until the 30th of June. We don't get our park travel that early.

Q. There is some tourist movement that early in the year, isn't there?

A. Tourist movement?

Q. June 1st to 10th?

A. No, we don't enjoy it.

Mr. Strouss: I think that is all I have to ask.

Redirect examination.

By Mr. Mason:

Q. Now, Mr. La Fountaine, referring to trains number 1 and 2, do these trains operate with a substantial portion of the consist consisting of Pullman cars?

A. About fifty per cent Pullman cars.

Q. You are familiar with the types of Pullman cars operated on other railroads in the United States, including the Southern Pacific?

A. Yes, sir.

[fol. 706] Q. Are the Pullman cars operated in the Empire Builder much the same as on those other railroads?

A. Yes, sir.

Q. They are so-called Standard Pullmans, not designed for the Empire Builder, are they?

A. No, Standard Pullman sleepers.

Q. As I look at Exhibit 45, does that mean you were able to operate or did operate the eastbound train Number 2 on ten different days, June 1st to 10th, 1939, with fifteen cars or more for 262 miles from Fargo to St. Paul?

A. Number 2? They have fifteen cars or more through the ten days period on each one of the trains from Fargo to St. Paul.

Q. For the entire distance, 262 miles?

A. Yes, sir.

Q. And similarly showing that Number 2 during that ten day period had 15 cars or more the entire distance from Havre to Fargo for seven of the ten days.

A. Yes, sir.

Q. That is a distance of 663 miles eastward, is it?

A. Yes, sir.

Q. Now, looking at your Exhibit No. 43, operations on the Kalispel Division, I think you identified some of these [fol. 707] trains on the particular lines as being through trains.

A. Yes.

Q. Are those through trains the ones including Numbers 401 and 402?

A. Yes, sir.

Q. Then you have on this exhibit symbols of your other scheduled symboled trains.

A. Yes, sir.

Q. Are those the trains that contained on the occasions indicated seventy-one or more cars?

A. Yes, sir.

Q. Will you say whether in your experience trains 401 and 402 operate with seventy-one or more cars and maintain their schedules?

A. Yes, sir; the normal train for 401 over this territory is 75 cars on account of the schedule.

Q. Westward that is 401?

A. Yes, sir.

Q. Eastward, what is the normal on 402?

A. 5,000 tons on 402; that will run about 95 cars if all are loads; if there are a few empties mixed in, you might have 90 loads and 10 empties.

Q. Do you make that 90 hour and 111 hour time on that schedule?

A. We have a very good on-time record; I couldn't give [fol. 708] you the percentages.

Q. This is typical of the operations on the Kalispel Division. Would you say whether or not on the balance of your main line, train lengths correspond with those depicted on the Kalispell Division?

A. Yes, sir. 402 starts out of Inter-bay, Seattle, with a 5,000 ton unit and goes right through to Minneapolis with that tonnage, and 401, because of their scheduled time, operates with approximately a 75 car train.

Q. Does it ever carry more than 75 cars?

A. Yes, it has carried more than seventy-five. It has at certain locations and times, but they try to maintain a 75 car, 3,000 ton train.

Q. I think you were asked about the effect of cutting down tonnage in order to attain train speed. In your ex-

perience and with your type of locomotives that you operate on your main line, is it necessary as a general rule to cut train length below 70 cars, in order to enable schedules to be maintained?

A. No, it is not.

Q. Will you say whether or not it is possible with the types of equipment that you use on your through trains to operate up to maximum speeds, loaded, as readily with [fol. 709] more than 70 loads as with less than 70 loads?

A. Yes, sir, it is.

Q. You were cross-examined as to the locations and extent of your double track. Do I understand your double track is largely in the neighborhood of the principal division terminals and freight terminals?

A. With the exception of from Shelby to Blackfoot, which is a subdivision terminal, that is a 50 mile stretch of double track from Summit to Red Eagle, the Western slope of the Rocky Mountains, that is apart and away from any terminal, that is 34 miles of double track, from Lamont, Washington, to Blue Stem, are the only three pieces of track that are not built right out of a division point for the use of getting trains out of the terminal.

Q. That is to avoid congestion due to meets in the immediate neighborhood of terminals?

A. Yes, sir.

Q. Mention was made of electric locomotives. Are those confined to a particular district of the railroad?

A. Yes, sir, between Wenatchee, Washington, and Skikomish, Washington.

Q. Is that over the Cascade Mountains?

A. Yes, sir.

[fol. 710] Q. And what particular feature of your operation across the Cascade Range makes the use of electric locomotives advisable or necessary?

A. Well, the grade and their tunnel, they have a long tunnel there, longest on the Western Hemisphere.

Q. What is the length of the tunnel?

A. 7.79 miles I believe.

Q. That is the Cascade tunnel?

A. Yes, sir.

Q. You use electric locomotives instead of coal or oil burning locomotives because of the smoke nuisance?

A. Yes, sir, and gas.

Q. What is the grade in there?

A. The grade up to the tunnel, from Skikomish to the west portal of the tunnel, is 2.2, and through the tunnel is 1.56 per cent.

Q. Now, you were speaking of the grade within the tunnel.

A. The grade within the tunnel is 1.56 percent.

Q. Against the eastward traffic?

A. Yes, sir.

Mr. Strouss: This is hardly proper redirect examination. I didn't go into this.

Mr. Booth: You went into electric locomotives.

[fol. 711] Mr. Strouss: I asked him if he testified to all the different types that he had.

The Court: Well, it is true that some of this may go beyond the scope of redirect. I will overrule the objection.

Mr. Mason: Some reference was made, I think, to the use of remote control switches in some of the double tracked territory. Do you have so-called centralized traffic control in any of your double tracked territory?

A. Nowhere on the railroad.

Q. Do you have spring switches which will go back into place upon leaving a siding or leaving double track for single track?

A. Yes, sir.

Q. Is that the type of switch you had in mind in answering the question of opposing counsel.

A. Not exactly; we have remote control switch operation, too.

Q. Tower operation?

A. Tower operation, operator in a tower, train dispatcher in some cases.

Q. Are those primarily in the neighborhood of large terminals such as St. Paul or Seattle?

A. No, they are more generally located along the railroad.

[fol. 712] Q. You have tower operated switches elsewhere?

A. Yes, sir.

Q. You were questioned also as to the locomotive, or mentioned the locomotive of the 2-6-8-0 type.

A. Yes, sir.

Q. What is the tractive effort?

A. 95,000 pounds.

Q. Is that an articulated locomotive?

A. Yes, sir.

Q. Used in freight service?

A. Yes, sir.

Q. Then I take it a little smaller than the AC-4 type shown on Exhibit No. 5, which has a tractive effort of 117,000, approximately.

A. Yes, sir.

Mr. Mason: I suppose we had better suspend for the lunch hour.

The Court: The court will be at recess until two o'clock.

[fol. 713] December 3, 1940, 2:00 P. M.

All parties being represented as heretofore noted, the following proceedings were had:

The Witness, C. E. La Fountaine was recalled to the stand.

Mr. Mason: I have no further questions of the witness on redirect examination, Mr. Strouss.

Recross-examination.

By Mr. Strouss:

Q. How many head-end cars are there on the Empire Builder?

A. There is one head-end car on the no. 1 westward and two head-end cars on no. 2 eastward.

The Court: What is the meaning of that term?

A. Combination of baggage and mail, we have a full mail car and a baggage car.

Mr. Strouss: I notice the distances shown on exhibit 45 between Fargo and Havre going west is 715 miles and east 663 miles. That is because they use different tracks?

A. Yes, two different routes. No. 1 going westward goes from Fargo to Grand Forks and thence to Minot, and goes from Minot west, No. 2 leaves Minot going eastward over what is known as the Fargo-Surrey a more direct [fol. 714] route to Fargo.

Q. Now, the statistics of railways of the United States, issued by the Interstate Commerce Commission for the year

1938 gives the revenue freight originated by the Great Northern, products of agriculture $4,944,077; animals and products, $325,598; products of mines, $8,825,245; products of forests, 1,939,900; manufactures and miscellaneous, 1,794,988. Would you say that represents accurately the tonnage of the Great Northern as to types?

A. Well I couldn't say of my own knowledge.

Mr. Strouss: You don't know.

Mr. Mason: May I understand, Mr. Strouss, the figures you read were the figures of revenue in dollars?

Mr. Strouss: Yes, in dollars.

Mr. Mason: They weren't tonnage figures at all then?

Mr. Strouss: No, this is revenue freight tonnage—tons of 2000 pounds, it is tonnage.

Mr. Mason: And not dollars.

Mr. Strouss: That is right.

Q. You wouldn't know as to that?

A. No, I wouldn't know.

Mr. Strouss: That is all.

The Court: Any further examination of this witness?

[fol. 715] Mr. Mason: No I have no further questions?

Mr. Strouss: I may have some further examination after I have examined these train sheets.

Mr. Mason: When will that be Mr. Strouss?

Mr. Strouss: I am having an examination made of them at the present time, and I want to check them tonight.

The Court: It is understood that this witness will not be permanently excused until after Mr. Strouss has had an opportunity to examine the sheets.

Mr. Mason: We will ask Mr. Young to resume the stand. Your Honor will recall Mr. Young having testified previously, the manager of personnel, Illinois Central.

Mr. Strouss: Does Mr. La Fountaine have any schedules, any of the train schedules of the Great Northern?

Mr. La Fountaine: What do you mean by that?

Mr. Strouss: Well, the train time-tables.

Mr. Mason: Do you wish those as well?

Mr. Strouss: Yes, if I may have them.

Mr. Mason: Are those current operating tables, current operating time-tables Mr. La Fountaine?

A. Yes sir.

Q. Will you identify them by divisions and States and

[fol. 716] then hand them to Mr. Strouss?

A. Between city terminals, time-table No. 216, effective September 29, 1940; Willmar division timetable No. 49, effective 12:01 A. M., June 25, 1939; Minot division time-table No. 48, effective 12:01 A. M., Sunday, April 1, 1939; Butte division time-table No. 48, effective 12:01 A. M., Sunday, May 12, 1940; Kalispell division time-table No. 45, effective 12:01 A. M., Sunday, May 12, 1940; Spokane division time-table No. 92, effective 12:01 A. M., Sunday, September 24, 1939. Now, that is the main line. Do you want these side-issues?

Mr. Strouss: No.

Mr. Mason: I think it might be well to supply the one for the Mesabi division.

A. Mesabi division time-table No. 46, effective 12:01 A. M., Sunday, June 25, 1939.

Mr. Mason: I think we should also understand that the operating time-tables which you have handed to Mr. Strouss do not show the schedules or times of extra trains, but only goes to the regular schedules.

A. That is right. Dakota division time-table No. 61, effective 12:01 A. M., Sunday, June 25, 1939.

Mr. Strouss: Thank you.

[fol. 717] C. R. Young was recalled to the stand and testified further as follows:

Direct examination (continued).

By Mr. Mason:

Q. Mr. Young I will ask you to refer to exhibits Nos. 30 and 31, concerning which you testified in your other appearance on the stand.

A. Yes, I have them here.

Q. I will ask you if you have the dispatcher's train sheets now present in the courtroom which were testified to as furnishing the foundation for the information shown on exhibit 30?

A. Yes I have.

Q. Do you also have engineering profiles showing the ruling grades indicated on that exhibit?

A. Yes.

Q. Are they available for examination of opposing counsel?

A. They are.

Q. Do you also have the underlying documents which were used in compiling information shown on exhibit 31, the passenger train exhibit?

A. That exhibit was prepared from the train sheets also.

[fol. 718] Q. The same train sheets?

A. The same train sheets, which were used in compiling exhibit No. 30.

Mr. Mason: Now Your Honor when the exhibits were previously tendered they were received subject to objection, including the objection as to competency because of the absence of original documents from which they were prepared. In order to obviate any possible errors in the record, we tender the exhibits and tender to opposing counsel the underlying documents which have been testified to by the witness.

The Court: You are referring to exhibits 30 and 31?

Mr. Mason: Yes, 30 and 31.

Mr. Strouss: And we make the same objection that we did to exhibits 43, 44, 45.

The Court: The Court will over-rule the objections to the new offer of these exhibits in evidence for the reason that the original data from which these exhibits were compiled now appear in court. However, the Court will require, in fairness to counsel that this witness be cross-examined at some time when counsel has had an opportunity to investigate this data.

Mr. Mason: We agree that that is fair and should be understood.

[fol. 719] (The documents referred to were received in evidence and marked "Defendant's Exhibit No. 30" and "Defendant's Exhibit No. 31", respectively.)

Mr. Mason: That is all.

Cross-examination (continued).

By Mr. Strouss:

Q. Do you have the time-tables for this same operation?

A. I think I have, Mr. Strouss. I have, yes sir.

Mr. Strouss: May I have those also to work with?

Mr. Mason: No objection.

Mr. Strouss: Do you want to identify them in the record?

Mr. Mason: Will you identify them Mr. Young?

A. Chicago terminal division through train time-table No. 45, taking effect 12:01 A. M. September 29, 1940; Chicago-Champaign districts, Illinois division, time-table No. 23, taking effect 12:01 A. M. September 29, 1940; Eldorado, Zeigler, Carbondale, Golconda, Bluford district, Brookport, branch, St. Louis division, time-table No. 16, taking effect 12:01 A. M., September 29, 1940; Fulton, Hickman districts of Kentucky division time-table No. 7, taking effect 12:01 A. M. September 29, 1940; Birmingham district, Mississippi division, time-table No. 20 taking effect 12:01 [fol. 720] A. M. April 21, 1940; Memphis division time-table, except Memphis terminal district No. 12, taking effect 12:01 A. M., Sunday, August 11, 1940; Yazoo, Canton and McComb districts of the Louisiana division, time-table No. 9, taking effect 12:01 A. M. Sunday, November 24, 1940; Freeport, Dubuque, Waterloo, Madison, Dodgeville, Cedar Rapids, Albert Lea districts, Iowa division, time-table No. 3, taking effect 12:01 A. M., September 29, 1940. These tables have been re-issued since the exhibit was prepared, but there has been very little change in the basic schedules shown in the time-tables, and these time-tables do not show the schedules of those trains which are operated as extra or symbol trains.

Mr. Strouss: Are extra trains symbol trains?

A. Some of the symbol trains are also operated as extras.

The Court: So that I may keep my part of the record straight here, as I have it there was introduced in evidence, or I should say was offered and marked for identification five exhibits during the testimony of Mr. Young, 27 to 31 inclusive. You have re-offered exhibits 30 and 31. No. 27 of course is the map, and No. 28 and 29, as I recall it, were only marked for identification; is that true?

[fol. 721] Mr. Booth: There will be an accounting witness here Your Honor who is due on Wednesday of next week, in order to testify——

The Court: I say they are only marked for identification?

Mr. Mason: I believe that is correct, they were only marked for identification.

Mr. Strouss: That is all.

[fol. 722] W. M. Burn was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Booth:

Q. Will you state your name and residence to the reporter?

A. My name is W. M. Burn. I reside at St. Paul, Minnesota where I am employed as statistician in the general office of the Great Northern Railway Company.

Q. How long have you been employed by the Great Northern Railway Company?

A. Since April 1, 1920.

Q. All of the time in statistical work?

A. Yes.

Q. Prior to April 1, 1920, were you in the railroad's employ?

A. Prior to April 1, 1920, for about two years I was with the operating statistics section of the United States Railroad Administration at Washington, D. C. I was employed as a statistician in that body.

Q. And prior to that time?

[fol. 723] A. Prior to that time I was employed by the Pennsylvania Railroad for about ten years at Harrisburg, Pennsylvania, as clerk and accountant in the division engineer's office.

Q. The Great Northern is a Class I railroad, is it not?

A. Yes, sir.

Q. Have you prepared an exhibit entitled "Great Northern Railway Company. Freight Operating and Freight Transportation Expenses Related to Traffic, Calendar Years 1922 to 1939, Inclusive"?

A. I have.

Mr. Booth: We offer this for identification as the next exhibit.

The Clerk: Defendant's exhibit No. 46 for identification.

Mr. Booth:

Q. The footnote to the exhibit states "Source: Annual Reports to Interstate Commerce Commission." To what annual reports do you refer?

A. I refer to the form "A" filed by Class I railway companies annually with the Interstate Commerce Commission.

Q. Is that the same form A which is attached to the certificate of the secretary of the Interstate Commerce Com-[fol. 724] mission filed as an exhibit in this case and is the bottom document in defendant's exhibit No. 9?

A. Yes, sir.

Q. Those reports are printed and furnished to the carriers, are they not, in triplicate?

A. Yes, the forms are furnished to the carriers.

Q. The carrier fills them out, verifies two duplicate originals, and files them with the Interstate Commerce Commission, retaining one copy for its files?

A. That is correct.

Q. Take the 1939 report. I will ask you to read paragraphs 1 and 6 of the first column of the notice printed on the inside cover page of the exhibit.

A. Paragraph 1 of the notice states, "This form for annual report should be filled out in triplicate and two copies returned to the Interstate Commerce Commission, Bureau of Statistics, Washington, D. C., by March 31, 1940. Attention is especially directed to the following provisions of the Interstate Commerce Act." Paragraph 6, "Each respondent should make its annual report to this Commission in triplicate, retaining one copy in its files for reference in case correspondence with regard to such report be [fol. 725] comes necessary. For this reason copies of the form are sent to each corporation concerned."

Mr. Booth: At this point I desire to interpolate from the extract to govern the destruction of records of steam railroads prescribed by the Interstate Commerce Commission in accordance with section 20 of the Act to regulate commerce and to page 30 of the certified copy which is attached as the bottom document of defendant's exhibit No. 8 introduced in evidence in this case, I call attention to the portion of page 30 which reads, "Statistics 219. Reports to Interstate Commerce Commission and other regulating bodies.

(A) Annual financial, operating and statistical reports, filed copies of and supporting papers." Then in the column immediately adjoining, which column is headed "Period to be retained" is the word "permanently."

Q. Is it your understanding as a statistician that these filed copies which you used in making this report are the filed copies which the section of the regulations I have just read require to be retained permanently by the carrier?

A. That is my understanding, yes, sir.

Q. Have you with you and in the courtroom and available for the inspection of the plaintiff's counsel the file of [fol. 726] annual reports of the Great Northern Railway Company to the Interstate Commerce Commission on form A beginning with the year 1922 and including each year thereafter to and including the year 1939?

A. I have.

Q. Those are the calendar years, are they not?

A. Yes, sir.

Q. Those reports according to the footnote on defendant's exhibit No. 46 for identification are the source of the items shown in columns b, c, and d, is that correct?

A. That is correct.

Q. And columns e and f are averages which you statistically prepared, prepared as a statistician?

A. Yes, sir, the averages are computed on the basic figures shown in columns b, c, and d.

Q. The first five items appearing opposite the words in the first column "Total 1936-1939" and the five items appearing opposite the words in the first column "Total 1922-1925" are computations made by you from the figures above, are they not?

A. Yes, sir.

Q. And the percentage of improvement appearing in the last horizontal section of the exhibit headed "Per cent. of improvement" are also prepared by you?

[fol. 727] A. Yes, sir.

Q. Is this exhibit true and correct to the best of your knowledge?

A. It is.

Mr. Booth: Before I offer it are there any questions, Mr. Strouss?

Mr. Strouss: This is for the system as a whole?

A. Yes, sir.

Mr. Booth: We offer this in evidence as defendant's exhibit No. 46.

Mr. Strouss: We make the same objection.

The Court: The same ruling, the objection is overruled; it may be received in evidence.

The document referred to was received in evidence and marked defendant's exhibit No. 46.

Mr. Booth:

Q. Mr. Burt, have you prepared an exhibit headed "Great Northern Railway Company, Freight Service Operating Averages, Calendar Years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938, and 1939"?

A. I have.

Q. I will ask you first whether those years were selected by you or whether this form was sent you by counsel for the defendant, either directly or through one of your gen- [fol. 728] eral offices, with the request that those years and no others be shown, or rather that those years be shown and without a request that any other years be shown?

A. Yes, sir, these are years we used at the request of counsel.

Q. You didn't select the years?

A. No, sir.

Mr. Booth: I will state for the information of the court that both exhibit No. 46 and this exhibit are on the same form as the preceding exhibit of the same character and as the exhibits which will follow and that we drew the form and selected the years and will show the relevancy of the years either later in the case or by argument. We didn't think it was necessary and I will say at this time we have an exhibit embracing the entire spread because it is merely a trend exhibit. We ask that this be marked as defendant's exhibit No. 47 for identification.

The Clerk: Defendant's exhibit No. 47 for identification.

Mr. Booth:

Q. I show you attached to defendant's exhibit No. 9, on top of which is a certificate of the secretary of the Interstate Commerce Commission, two forms, one printed in the upper right-hand corner "Form OS-A."

[fol. 729]. The Court: What do those letters stand for?

Mr. Booth: Operating statistics, form A, is that correct?

A. Yes, the title of the statement is "Freight Train Performance."

Mr. Booth:

Q. What do the letters "OS-E" on the other form stand for?

A. That is operating statistics, form E, entitled "Fuel and Power for Locomotives and Rail-Motor Cars."

Q. I call your attention to the footnotes on defendant's exhibit No. 47 for identification and ask you whether they correctly state the sources from which you derived the items in the exhibit as shown in the footnotes?

A. Yes, they do.

Q. Have you with you in the courtroom and available for counsel's inspection if he desires the forms OS-A and OS-E used in making up this exhibit No. 47?

A. I have.

Q. You have already testified that you have the annual reports which form the basis for items 5 and 6 of this exhibit?

A. I have, yes, sir.

Q. Item 10, "Gross ton-miles (Exclusive of locomotives [fol. 730] and tenders) per ton of fuel" is a computation, is it not?

A. Yes, sir, as described in the note at the bottom of the page.

Q. Is this exhibit true and correct and correctly represent the information contained in the sources stated and the computations made as described to the best of your knowledge and belief?

A. It is.

Q. This exhibit you personally prepared?

A. Yes, sir.

Mr. Booth: We tender the annual reports and the forms OS-A and OS-E as described in the exhibit to counsel for his examination at his convenience. They are here in the courtroom and we offer the exhibit subject to that tender in evidence as defendant's exhibit No. 47.

Mr. Strouss: The same objection as to the previous exhibit.

The Court: The objection is overruled, it may be admitted.

The document referred to was received in evidence and marked defendant's exhibit No. 47.

The Court: Mr. Strouss, you are not raising the precise objection that this is a triplicate copy rather than a dupli- [fol. 731] -cate original filed with the Interstate Commerce Commission?

Mr. Strouss: Oh, no, I don't think that would be sound, if the court please, because this is a true record of the company.

The Court: Which they are required to keep under the law.

Mr. Strouss: Yes, I don't make any point of it being one of a triplicate.

Mr. Booth: The reason I had him read the inside cover and the reason I read the rules governing the destruction of records is that the Interstate Commerce Commission regards it as a record of the company.

The Court: All right.

Mr. Booth:

Q. Mr. Burn, will you return to exhibit No. 46. Have you some computations you have made showing some percentage relationships of figures in that exhibit and if so will you read them?

A. I have made the following additional computations, referring to column (b) it will be noted that the revenue ton-miles in 1922 were 6,882,464,797 and in 1939——

The Court: (Interrupting) Mr. Burn, may I suggest that you just read the first four figures leaving off the last six, [fol. 732] I think it will be more readily followed.

A. (continuing) In 1939 the revenue ton-miles were 8 billion, 681 million plus, an increase of one billion, 797 million or 26 per cent; in column (c) the freight operating expenses for 1922 were 57 million, 943 thousand dollars, and in 1939 46 million, 396 thousand dollars, a decrease of 11 million, 547 thousand dollars or 20 per cent; in column (d) freight transportation expenses, in 1922 were 30 million, 859 thousand dollars and in 1939, 22 million, 055 thousand dollars, a decrease of eight million, 804 thousand dollars

or 29 per cent; referring to column (e) freight operating expenses for one thousand revenue ton-miles in 1922 this average was $8.42 and in 1939, $5.34, a decrease of $3.08 or 37 per cent, and in column (f) the freight transportation expenses, in 1922 were $4.48 and in 1939 $2.54, a decrease of $1.94 or 43 per cent.

Mr. Booth:

Q. Mr. Burn, will you take your copy of the annual report to the Interstate Commerce Commission for the year ending December 31, 1939, and let me have your photostatic duplicate of it please. You have a photostatic duplicate of it, have you not?

A. Yes, I can use either one.

Q. Well, suppose you take the original. There is a part [fol. 733] of this report, a form prescribed by this report beginning at Page 512 of this report, and as a part of the form furnished by the Commission, Schedule 541, which runs through and including Page 519 and that is headed "Revenue Freight Carried during the Year"; into what groups is that revenue freight classified?

A. It is classified according to the following general groups: Products of Agriculture; Animals and Products; Products of Mines; Products of Forests and Manufactures and Miscellaneous", that relates to carload traffic and then another group is given for less-than-carload freight.

Q. Less-than-carload freight is not and cannot be measured by cars, can it?

A. No sir.

Q. That is measured in tons?

A. That is correct.

Q. Will you first read in carloads the total revenue freight carried during the year from Line 850 on Page 519 and the number of carloads?

A. The number of carloads of freight carried in 1939 were 783,289.

Q. Follow me and correct me if I am wrong. In Group 1, Agriculture, the number of carloads was 159,944?

A. That is correct.

[fol. 734] Q. Group #2, Animals and Products, the number of carloads was 34,856 and in Group No. 3, Products of Mines, 336,636 of which how many carloads were iron ore?

A. Under "Products of Mines" the Great Northern reported in 1939, 226,431 carloads of ore handled.

Q. With a total tonnage of how much?

A. As compared with the total tonnage of Products of Mines——

Q. No, pardon me, what is the total tonnage of the iron ore?

A. The total tonnage of the iron ore was 15 million, 118 thousand 701.

Q. Without taking the time to do it, it is true, is it not, if you divide the 15 million figure just given by the 226 thousand figure you have the average loading per car?

A. Yes sir, approximately 70 tons.

Q. Group No. 4, Products of Forests, how many carloads?

A. A total of 93,579.

Q. Group 5, Manufactures and Miscellaneous?

A. Total of 158,274 cars.

Q. And less-than-carload freight in tons?

A. 279,060 tons.

Mr. Booth: You may take the witness.

[fol. 735] Mr. Strouss: Do those include freight which originated on roads other than the Great Northern?

A. Yes, sir, it would.

Mr. Booth: This report is sub-divided, is it not, into revenue freight originating on respondent's road and revenue freight received from connecting carriers?

A. Yes sir.

Q. And each of those classifications is again divided into revenue freight terminating on the line and revenue freight delivered to the connecting carriers?

A. Yes sir.

Mr. Booth: Here is the report, Mr. Strouss.

Mr. Strouss: I just wanted to ask that one question as to whether it was freight originating on the line or on lines other than the Great Northern. I have one or two general questions and I would like to have a chance to look at these annual reports.

The Court: Were you through with the Direct Examination, Mr. Booth?

Mr. Booth: Yes, Your Honor.

[fol. 736] Cross-examination.

Mr. Strouss:

Q. You were with the United States Railway Administration you testified?

A. Yes sir.

Q. When were the railroads returned to the companies, do you remember?

A. I think it was about March 1st, 1920.

Q. A month after that you went with the Great Northern?

A. That is right.

Q. For a period of about seven months I believe the railroads were operated under a guarantee from the Government?

A. That is correct.

Q. The period of government ownership was a period of rather high operating expenses, wasn't it?

A. Yes, I would say it was, due to the war.

Q. And the effect of that carried over into the first year or two years following the return of the railroads to private ownership?

A. We probably were feeling some of the effects one or two years later. However, may I say one thing in regard [fol. 737] to Exhibit No. 46. In order to overcome any abnormal conditions in one year we have taken the four years, 1936 to 1939 inclusive and compared them with the four years 1922 to 1925 inclusive.

Mr. Strouss: Perhaps I should have withheld that question to some witness who had not been in the government railroad administration.

Q. I notice here that the reduction in mileage as shown by Exhibit No. 47 and I was rather interested in knowing what the cause of the reduction in mileage operated. Is that due to abandonment of unprofitable branch lines in part or in whole?

A. I would say that a good percentage of that decrease was due to the abandonment of unprofitable mileage in accordance with the permission granted by the Interstate Commerce Commission.

Mr. Strouss: I think those are all the questions I wish to ask at this time.

Mr. Booth: No further questions.

The Court: You may be excused, not permanently but subject to further cross-examination.

[fol. 738] C. G. GREGORY was called as a witness in behalf of the defendant and being first duly sworn, testified as follows:

Direct examination.

Mr. Booth:

Q. Will you state your name and residence to the Reporter please?

A. C. G. Gregory, St. Paul, Minnesota.

Q. Are you employed by the Northern Pacific Railway Company?

A. Yes, sir.

Q. In what capacity?

A. Assistant Statistician.

Q. How long have you been employed in that capacity?

A. About 12 years.

Q. As part of your duties as Assistant Statistician do you customarily resort to source data and prepare exhibits for presentation here and testify before courts and commissions.

A. Yes, sir.

Q. Do you have access to the files and records of the Northern Pacific?

A. Yes, sir.

Q. Before that time in what capacity were you employed [fol. 739] by the Northern Pacific.

A. I was Chief Clerk in the Statistical Department for nine years.

Q. And immediately prior to that time?

A. I held various positions in the Accounting Department for about ten years I should say.

Q. Did you hear the testimony of Mr. Burn who preceded you on the stand?

A. Yes, sir.

Q. Are you familiar with the system of annual reports described by him?

A. Yes, sir.

Q. Are you familiar with the system of operating statistical reports described by him?

A. Yes, sir.

[fol. 740] Q. And do you agree with his testimony in that respect?

A. Yes, sir.

Mr. Booth: I take it, Mr. Strouss, it will be unnecessary to go all over this.

Mr. Strouss: No, I am raising no question as to that.

Mr. Booth: Have you prepared an exhibit entitled "Northern Pacific Railway Company, Freight Operating and Freight Transportation Expenses Related to Traffic, Calendar years 1922 to 1939, inclusive"?

A. Yes, sir.

Q. And is the source of that exhibit stated in the bottom line of that exhibit?

A. That is correct.

Q. And the source is the annual reports of the Northern Pacific Company to the Interstate Commerce Commission?

A. Correct.

Q. That has also been referred to as Form A.

A. Yes, sir.

Q. Have you the reports of the Great Northern Railway, the Northern Pacific Railway Company to the Interstate Commerce Commission for the years 1922 to 1939, both [fol. 741] years inclusive, here in the court room?

A. They are in the court room.

Q. And on the table beside you?

A. Yes, sir.

Q. And available for examination?

A. Yes, sir.

Q. Are those books and reports I have just mentioned on the form prescribed by and furnished by the Interstate Commerce Commission for the Northern Pacific Railway Company?

A. That is right.

Q. And they are the file copies of the Northern Pacific Railway Company's annual reports for those years?

A. They are.

Mr. Booth: We ask that this exhibit be marked.

(The document referred to was marked "Defendants' Exhibit 48 for Identification.")

Q. This Exhibit 48 for Identification, you say was prepared by you?

A. It was.

Q. Were the entries in Columns B, C and D in this exhibit opposite the years 1922 to 1939, respectively, entirely taken without change from the corresponding figures in the Northern Pacific Railway Company's annual reports [fol. 742] to the Interstate Commerce Commission for the years named?

A. Correct.

Q. Are the computations in the three horizontal columns beginning immediately under the line preceded by the figures 1922, and also in Columns E and F, computations made by you?

A. That is right.

Q. Are those computations true and correct?

A. Yes, sir.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Booth: We offer the exhibit in evidence as Defendants' Exhibit No. 48.

The Court: The same objections I presume?

Mr. Strouss: Yes.

The Court: The same ruling.

(The document referred to was received in evidence and marked "Defendants' Exhibit No. 48.")

Mr. Booth: Mr. Gregory, you heard Mr. Burn's testimony as to Forms O. S. A. and O. S. E., did you not?

A. I did.

Q. Have you in part from those forms and in part from the annual reports I have referred to for 1922 to 1939, prepared an exhibit entitled "Northern Pacific Railway Com- [fol. 743] pany, Freight Service Operating Averages, Calendar Years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 and 1939."

A. I have.

Q. Were those years selected by you or by any official of your company, or were they the years for which those figures were requested by counsel for the defendant in this case?

A. They were the years as requested by counsel for defendant in this case.

Q. The form being furnished to you by them?

A. That is right.

Q. Are the sources which you drew from for this exhibit correctly stated in the five foot-notes at the bottom of the exhibit?

A. Yes, sir.

Q. And is the formula by which you have calculated Item 10 correctly stated in the bottom foot-note?

A. Yes, sir.

Q. Have you with you present in the court room and on the table beside you the forms OS-A and OS-E, file copies of the Northern Pacific Railway Company of the forms OS-A and OS-E, which were used in the preparation of this exhibit?

A. Yes, sir.

Q. Those are reports required by the Commission to [fol. 744] be made annually?

A. That is correct.

Q. You are quite familiar with the method of preparing them and the reports themselves?

A. I am.

Q. Are the figures shown—I don't think I have offered this for identification. We offer it.

(The document referred to was marked "Defendant's Exhibit 49 for Identification.")

Q. Are the figures shown in Defendant's Exhibit 49 for Identification correctly abstracted without change from the sources shown in the footnotes to that exhibit?

A. Yes, sir.

Q. And are the computations made in the exhibit correct computations from those figures?

A. They are.

Q. Column M is a computation made by you, is it not?

A. Yes, sir.

Q. Column 10 is a computation made by you, is it not?

A. As indicated in the foot-note.

Q. Line 10 I should say, that is a computation made by you?

A. Yes, that is right.

[fol. 745] Q. Otherwise the figures shown in Columns C to L, inclusive, are taken without change from the sources indicated?

A. They were except where it was necessary to make calculations as indicated in the foot-notes.

Q. That would relate to items 5, 6, 9 and 10?

A. Yes, sir, that is right.

Mr. Booth: We offer to allow inspection and examination of these forms OS-A and OS-E in addition to the reports, and ask counsel if he has any questions before offering the exhibit.

Mr. Strouss: This question I would like to ask. It probably doesn't go to the matter of the admissibility of the exhibit. I just want to find out the variation in mileage, if you don't mind, here. I notice in 1926, mileage was 6,510, and then in 1932 came down to 6,397, and then you have an increase again. Do you know why that was, Mr. Gregory?

A. Well, part of that change is due to abandonments, and there has been some increase—I just cannot now recall what that increase is—in between 1932 and 1939, increase of approximately 26 miles. Yes, that covers trackage rights which we acquired over a certain piece of track from another carrier.

[fol. 746] Q. Main line operation?

A. No, branch line.

Mr. Booth: This mileage includes miles leased and operated as well as miles owned, does it?

A. Yes, that includes all the mileage operated in freight train service whether owned or leased from others.

Mr. Booth: We offer this in evidence as Defendant's Exhibit 49.

Mr. Strouss: The same objection.

The Court: Same ruling. It may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 49.")

The Court: We will take a brief recess at this time.

Thereupon, a short recess was taken, after which the witness Gregory was recalled to the stand and proceedings were resumed as follows:

Mr. Booth: Will you take the Annual Report on Form A of the Northern Pacific Railway Company for 1939 and turn to Schedule 541, beginning on page—what is it, 512?

A. 512.

Q. 512, being the same schedule about which I questioned Mr. Burn. I will ask you first to turn to the end [fol. 747] of the schedule on page 519, and give me the total number of tons of carload traffic carried in the year 1939, total number of carloads of revenue freight carried in the year 1939.

A. Total number of carloads of revenue freight carload traffic only, is 518,457.

Q. And the total number of tons represented by those carloads?

A. 16,918,783.

Q. What total number of tons of less than carload freight?

A. 210,248.

Q. Now, turning back to page 512, and what was the total number of carloads of revenue freight under Group 1, Products of Agriculture?

A. That figure is found on page 513, and is 116,896.

Q. Will you take the report and add up the number of carloads of lemons, limes and citrus fruits, fresh apples, bananas, berries, fresh, cantaloupes and melons, grapes, fresh, fresh peaches, watermelons, fruits, fresh, domestic, fruits, fresh, tropical, potatoes other than sweet, cabbage, onions, tomatoes, and fresh vegetables, and oranges and grapefruit, in lines 110 to 143; and tell me how many car- [fol. 748] loads of perishables moved in 1939 over your line?

The Court: I presume, Mr. Booth, there will be offered in evidence a map showing the territory served by the Northern Pacific.

Mr. Booth: They are of record here by the witness W. W. Judson, our general manager, who was here this morning and received a telegram that his mother was very seriously ill and he had to leave on the plane. I will introduce it now by this witness, if you have it.

The Court: Well, it is a little easier to understand the testimony if we know what territory they operate in.

Mr. Booth: Have you made the computations?

A. Yes, sir. The total number of carloads handled, classes 110 to 143, inclusive, was 32,206.

Q. Those classes are shown on page 512 of Form A attached to Exhibit 9, already in evidence?

A. May I correct you on that, Mr. Booth. The classes are shown on 512, but the figures I read are shown on page 513.

Q. I will show you an exhibit, Mr. Gregory, which consists of a map entitled, "Northern Pacific Railway Company," and will ask you to examine it and state whether that is an outline map of the territory served by the North-
[fol. 749] ern Pacific Railway Company, and the main and branch lines of that company, to the best of your knowledge and observation.

A. Yes, that appears to be substantially correct.

Q. That is a reasonably accurate presentation?

A. Yes, sir.

Mr. Booth: We offer that in evidence as Defendant's exhibit, the next number for identification; we will prove it by our operating witness of the Northern Pacific.

Q. Did you give the total number of tons of products of agriculture carried during the year?

A. No, I didn't. The total number of tons of Agricultural Products is 3,702,907.

Q. Will you give the total number of cars and tons in Group 2: Animals and Products?

A. Animals and Products, total carloads, 26,995; tons, 343,975.

Q. And the predominating movement of animals is that of cattle and calves, is it not?

A. Yes, sir.

Q. Will you give the total number of tons of Products of the Mines, and the total number of cars?

A. Total number of carloads of Products of the Mines: 99,058, the corresponding tons being 4,206,279.

[fol. 750] Q. What is the predominating mineral product that was carried during that year?

A. Bituminous coal.

Q. What did that amount to in carloads?

A. 55,815.

Q. Did that originate on your lines?

A. A little less than half of it originates on our lines, the balance being received from connections.

Q. Group 4, what were the tons and cars, Group 4, Products of Forests, cars and tons?

A. Total number of cars under Products of Forests, 134,458, and the number of tons 4,658,777.

Q. And the predominating product of the forests was what?

A. As to cars and tons, the predominating commodity was logs.

Q. How many cars?

A. 69,364.

Q. And the next predominant?

A. Lumber, shingles and lath, account for 46,064.

Q. Group 5, Manufactures and Miscellaneous, what were the cars and tons in that group?

A. Total number of cars, 141,050; tons, 4,006,845.

[fol. 751] Mr. Booth: That is all. You may cross-examine.

Mr. Strouss: I have no questions until I have examined those books. What was the tons of products of mines?

A. Total products of mines?

Q. Yes.

A. Tons did you say?

Q. Yes.

A. 4,206,279.

W. M. Burn was recalled to the stand and testified further as follows:

Direct examination (Continued).

By Mr. Booth:

Q. Mr. Burn, will you take your Great Northern Railway Company Annual Report for 1939, and state the total number of carloads of fresh fruits and vegetables in lines 110 to 143, inclusive, on page 512, the number of cars of those handled in 1939 according to Column J on page 513?

A. I have just made the total of those items and it amounts to 45,024 cars.

Q. Now, what is the predominant item handled and how many carloads was handled?

A. According to the Annual Report, the predominant item is potatoes, other than sweet, amounting to 18,624 cars; [fol. 752] and the next most important item is apples, amounting to 15,059 cars.

Mr. Strouss: How many cars of potatoes, Mr. Burn?

A. 18,624.

Mr. Booth: And oranges and grapefruit?

A. Oranges and grapefruit amounted to 2,990 cars.

Q. And, finally, for the purpose of this question, would the next one be peaches?

A. The next important would be fruits, fresh, domestic, 2,717 carloads.

Q. How many carloads of apples originated on your line?

A. There was a total of 14,425 carloads originated.

Mr. Booth: That is all. Any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Booth: I will ask Mr. Siddall to take the stand.

[fol. 753] H. H. SIDDALL was called as a witness on behalf of the defendant and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Booth:

Q. Will you state your name and residence to the reporter?

A. H. H. Siddall. Chicago, Illinois.

Q. And your position with what railroad company?

A. I am Assistant Statistician in the office of the General Auditor of the Trustees of the Chicago, Rock Island and Pacific Railway Company.

Q. Were you connected with the company before its trusteeship? If so, in what capacity?

A. Yes, sir, I was assistant statistician from 1935 to 1940, and prior to that held various positions in the Statistical Department back to 1922, and from 1919 to 1922 I was traveling accountant in the corporation office as distinct from the railroad administration. Prior to 1918, I was in the real estate and tax department and the tie and timber department of the Rock Island.

Q. When you say you were traveling auditor for the corporation, you mean the corporate structure was maintained during public control of railroads, and instead of going with [fol. 754] the Director General of Railroads you remained with the railroad.

A. That is correct; audited various matters between the railroad and the corporation.

Q. Your headquarters also covers the operations of the Chicago, Rock Island and Gulf Railway?

A. They do, since September 1, 1939, when the properties of the Chicago, Rock Island, Gulf Railway Company were leased and operated by the Chicago, Rock Island Pacific Railway Company.

Q. As assistant statistician for the trustees of the Rock Island, and also when you were assistant statistician for the corporate owner and operator, were you required and did you make studies of operating statistics?

A. Yes, quite frequently.

Q. Are you familiar with the reports to the Interstate Commerce Commission and their method of construction?

A. I am, yes, sir.

Q. May I ask you here, is the report to the Interstate Commerce Commission on Form A made out by one man or the product of a number of departments?

A. The information comes from various departments and is assembled in the book, and there are quite a few men em-
[fol. 755] ployed assembling the information in the various departments of the railroad.

Q. The same is true of the OS-A to a more limited extent?

A. The OS-A's are taken from several departments, yes.

Q. Did you hear the testimony of Mr. Burn, who was on the witness stand this afternoon here, regarding the character of records afforded by the office file copies of the Form A and Forms OS-A and Form OS-E?

A. I did.

Q. Did you agree with him in his statements regarding them?

A. Yes, I do.

Q. Have you prepared an exhibit for the purposes of this case, entitled "Rock Island Lines (The Chicago, Rock Island and Pacific Railway Company) (The Chicago, Rock Island Gulf Railway Company) Freight Operating and Freight Transportation Expenses Related to Traffic, Calendar Years 1922 to 1939, Inclusive"?

A. Yes, sir, I have.

Q. Have you that exhibit before you?

A. I have.

Mr. Booth: We ask that this be marked Exhibit 51 for
[fol. 756] Identification.

(The document referred to was marked by the Clerk "Defendant's Exhibit No. 51 for Identification.")

Q. Now, from what source or sources were the figures in Columns B, C and D for the years 1922 to 1939, inclusive, as shown on this exhibit, secured by you?

A. They were taken from the Annual Report, Form A, of the two companies separately, the Chicago, Rock Island and Pacific Railway Company, and, separately, the Chicago, Rock Island Gulf Railway Company. The figures shown thereon are the combined figures for each year.

Q. Was there a report for each of those companies on Form A to the Interstate Commerce Commission for each of the years 1922 to 1939, inclusive, or only during part of those years?

A. There is a separate report for each company for each of the years. The year 1939, report for the Chicago, Rock Island Gulf Railway Company includes only the first eight months of 1939 because September 1, 1939, they leased their properties to the Chicago, Rock Island and Pacific Railway Company.

Q. But the entire operations on those rails for the re- [fol. 757] maining four months are included in the lessee company's report?

A. They are included in the report of the Chicago, Rock Island and Pacific Company, so the name Rock Island Lines covers the operations of the entire system.

Q. Are both of those companies in trusteeship?

A. Both are in trusteeship, yes, sir.

Q. With the same trustee?

A. With the same trustee.

Q. And the same operating, accounting and other organizations?

A. That is correct.

Q. Have you with you all of the Annual Reports of those two companies to the Interstate Commerce Commission on Form A for the years 1922 to 1939, inclusive?

A. I have them here in the court room.

Q. Are the figures in Columns B, C and D, to which I have referred in a previous question, correct consolidations of the corresponding items in the two reports of the two companies for the years shown?

A. Yes, sir, they are correct.

Q. That is, none of these figures appear in any one report, but each set of figures is a consolidation from the two re-
[fol. 758] ports?

A. That is correct.

Q. Were the averages shown in Columns E and F computed by you?

A. They were.

Q. Are those correct?

A. Those are correct, yes, sir.

Q. Were the computations in the three horizontal blocks beginning with the totals of 1936 and 1939, made by you?

A. Yes, sir.

Q. Are those correct?

A. Those are correct.

Mr. Booth: We offer this in evidence as Defendant's Exhibit 51, and tender examination of the source data of it, Forms A, to counsel as in the case of the other exhibits.

Mr. Strouss: The same objection.

The Court: The same ruling. It may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 51.")

Mr. Booth: Have you prepared and have you with you an exhibit entitled "Rock Island Lines (The Chicago, Rock Island and Pacific Railway Company) (The Chicago, Rock Island and Gulf Railway Company) Freight Service Oper-
[fol. 759] ating Averages, Calendar Years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 and 1939."

A. I have.

Q. Are the sources from which the figures in this exhibit other than computations in Column M, correctly stated in the five foot-notes at the bottom of the exhibit?

A. Yes, sir, that is the correct statement of the source of the figures.

Q. In preparing this exhibit, according to the foot-notes, you had, according to Items 1, 2, 3, 4, 7 and 8, Reports of Freight Train Performance, Form OS-A, filed with the Interstate Commerce Commission?

A. That is correct.

Q. Were those reports filed separately for the years shown on the exhibit by the two companies named?

A. No, they are a combined report filed with the Commission, which, with the permission of the Commission, we have been doing for some years.

Q. Including the year 1922?

A. That is correct, including 1922, all those will have one figure for the combined two roads, and will be found on file with the Commission on Form A.

[fol. 760] Q. So that the items mentioned in the first line of the foot-note are taken verbatim from the form OS-A filed as the one report, you mean?

A. That is correct.

Q. Item 5, is that taken from the separate reports of the companies to the Interstate Commerce Commission for each of the years?

A. Yes, the total tractive effort of each company is taken from each of the two reports and added together, and then total steam locomotives available for service at the close of the year is taken from each of the two Annual Reports, added together and the first figure divided by the second figure to arrive at the amount shown on Item 5, so that in effect it is an average for both companies.

Q. Was the same method pursued as to adding items in the report when you prepared the figures shown in Item 6?

A. Well, in the same identical manner.

Q. The formula is stated correctly there as to equipment?

A. Yes.

Q. Item 9, does that also come from the consolidated Form OS-A by the formula you describe?

A. Yes, sir.

Q. Take the net ton-miles and divide them by train [fol. 761] hours and the product is Item 9?

A. That is right.

Q. Item 10, the formula is given there, and that has been applied in part to Form OS-A, items down to and including the year 1934, and for the years 1936, 1938 and 1939, two items in the Annual Report, is that correct?

A. That is correct, yes, sir.

Q. Have you all of the Form OS-A's with you that were used in making up this report?

A. Yes, I have all of the OS-A forms here.

Q. The file copies of the company?

A. Yes, sir.

Q. From the accounting records of the company?

A. Yes, sir. I would like to state one thing here in regard to this report.

Q. Do you desire to make a correction on the face of the exhibit as it has been handed to the Clerk?

A. Yes. I would like to correct three figures there on Item 10 in Column K under the year 1938. The entry now reads 13,253. That should be changed to 13,331. The same line, No. 10, Column L, for the year 1939, the figure now reads 14,049, should be changed to 14,140. The last column on Item 10, Column M, showing per cent of increase of [fol. 762] 1939 over 1922, now reads 43.9, should be changed to 44.8.

Q. You discovered this in rechecking the exhibit, did you?

A. Yes, we discovered this in a recent rechecking of the exhibit.

Q. You can explain, if counsel desires, the reason for the change?

A. Yes, sir.

Mr. Booth: We ask the Clerk to make the correction on the face of the exhibit and put your initials on it, please, Mr. Clerk.

The Court: You may make the correction on the face of Exhibit 52 for Identification.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: I was going to ask Mr. Siddall the same question about mileage.

Mr. Booth: Suppose you let me offer it first.

Q. Mr. Siddall, is this exhibit, with the correction you have made, true and correct to the best of your knowledge and belief?

A. It is.

Q. Both in the absolute figures shown and in the computations there contained?

A. That is correct.

Mr. Booth: We offer this in evidence as Defendant's Exhibit 52.

[fol. 763] Mr. Strouss: The same objection.

The Court: It may be admitted in evidence. Objection overruled.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 52.")

Mr. Booth: Perhaps Mr. Strouss could ask the same questions about this exhibit before I pass on to the tonnage.

Mr. Strouss: I just wanted to ask about the mileage. I notice in line 1 you had an increase in mileage up to 1932, and then there has been a decrease; that is correct, is it?

A. Yes, that is correct. A decrease since 1932 has been due largely to abandonment of branch lines or shortenings of main line through cut-offs, new cut-offs built.

Q. The abandonments were under the permission of the Interstate Commerce Commission where the lines were unprofitable, I take it.

A. Yes; we have had hearings on the subject and permission was given.

Mr. Booth: We have an operating witness in the court room for this company, assistant superintendent of transportation, whose testimony may not come on until tomorrow or the following day, but so the exhibits may be together, [fol. 764] I will ask to have marked for identification an outline map of the Chicago, Rock Island and Pacific Railway Company.

The Court: It may be marked.

(The document referred to was marked "Defendant's Exhibit No. 53 for Identification.")

Mr. Booth: Now, Mr. Siddall, will you take your 1939—I think I will ask this witness——

The Witness: I have added the figures together on commodities.

Mr. Booth: You have? Let me see it.

The Witness: The red figures are the combined totals of groups.

Mr. Booth: I assume that counsel will want the same privilege of time for preparing for cross-examination that he desired in the case of the other witnesses?

Mr. Strouss: Yes.

Mr. Booth: And I want to put in some figures on commodities just taken from the report, and I prefer to do it in the morning. I can put them in in a more condensed form. Mr. Siddall just got here today. The figures are all in the reports and you can verify them as they go in from the reports. With that exception I will close my direct examination, with the privilege of recalling him in the morning.

[fol. 765] The Court: No cross-examination at this time?

Mr. Strouss: Not at this time.

The Court: Step aside. Call your next witness.

Mr. Booth: Let the record show that we have tendered to counsel for the plaintiff the reports used by the witness in preparing these two exhibits.

[fol. 766] G. W. Oakley was called as a witness in behalf of the defendant and being first duly sworn, testified as follows:

Direct examination.

Mr. Booth:

Q. Will you please state your name and residence to the Reporter?

A. G. W. Oakley; Cleveland, Ohio.

Q. By what railroad company are you employed?

A. Erie Railroad Company.

Q. In what capacity?

A. General Accountant.

Q. How long have you been employed in that capacity?

A. Since September 1st, 1936.

Q. In the office of the General Auditor?

A. In the office of the Comptroller.

Q. Prior to your occupying that position in what capacity were you employed and by whom?

A. Three years prior to that date I was employed as Chief Clerk to the President of the Erie Railroad Company and prior to that back to 1911 in various capacities in the Accounting Department of the Erie Railroad Company.

Q. In your present capacity is it your daily and constant [fol. 767] work to have to do with the preparation, inspection and comparison of statistical summaries of various kinds?

A. It is.

Q. Including summaries of operating expenses?

A. Yes sir.

Q. Performance of various units of operation?

A. Yes sir.

Q. Are you familiar with the system of reports by companies to the Interstate Commerce Commission which

have been described here as the Annual Report Form A, and forms OS-A and OS-E?

A. I am.

Q. Have you used them frequently in your own work?

A. I have.

Q. Did you hear the testimony of Mr. Burn given today?

A. I did.

Q. Regarding the annual reports of OS-As and OS-Es and their maintenance as a filed copy in the general office of the company?

A. I did.

Q. Confining your agreement to that general testimony do you agree with his testimony?

A. I do.

[fol. 768] Mr. Booth: I hope counsel will accept that as a qualification.

Mr. Strouss: Yes, that is all right.

Mr. Booth:

Q. Is the Erie Railroad Company in trusteeship?

A. It is.

Q. Is the Chicago and Erie Railroad Company in trusteeship?

A. It is not.

Q. Does the same comptroller and the same accounting office handle the accounts of both of those companies?

A. He does.

Q. How long has the Erie Railroad been in trusteeship?

A. Since January 18, 1938.

Q. Prior to that time did it report annually to the Interstate Commerce Commission on Form A?

A. It did.

Q. Have you copies of those reports in the courtroom with you?

A. I have.

Q. Do you know and if not can you ascertain by looking at the report, by whom the 1937 report was prepared? Was it by the trustees or by the corporate officials?

[fol. 769] A. I would have to examine the report on that.

Q. Perhaps you can do so over night and tell us in the morning?

A. I will.

Q. But since the trusteeship the accounting officer for the trustees, chief accounting officer for the trustees has made these reports, has he?

A. He has.

Q. The trustees are trustees under an order of the Federal Court?

A. Yes sir.

Q. The Chicago and Erie Railroad Company you say is not in trusteeship?

A. No sir.

Q. Has that company each year from and including the year 1922 to and including the year 1939 filed annual reports on Form A?

A. On Form A they filed reports to and including the year 1933.

Q. And after that year?

A. Effective January 1st, 1934 a consolidated report was filed for the Erie Railroad Company including the Chicago and Erie Railroad Company.

Q. In the trusteeship do the trustees and the Chicago and Erie Railroad Company continue to file a consolidated report?

A. They do.

[fol. 770] Q. One as a corporation and the other as officers of the court, that is, the trustees file it as officers of the court and the Chicago and Erie Railroad Company files it as a corporation?

A. It is a joint report.

Q. As to Forms OS-A and OS-E what is the history of those forms from 1922 to 1939 inclusive?

A. They have always been filed as one report for the Erie Railroad Company including the Chicago and Erie Railroad Company.

Mr. Booth: I offer for identification only and ask to have it marked as Exhibit No. 55 the map showing in outline the territory and the lines of the Erie Railroad Company which will be fully identified and testified to by a subsequent witness, merely for identification.

The Court: It may be marked.

(Document marked Defendant's Exhibit No. 55 for identification.)

Mr. Booth:

Q. Showing you this map I will ask you which of the lines shown on that map are the lines of the Chicago and Erie Railroad Company if you know?

A. The line extending from Marion, Ohio to Hammond, Indiana.

Q. And the other is the Erie Railroad Company proper?

[fol. 771] A. Yes sir.

Q. Referring to Exhibit No. 54 for identification, this exhibit insofar as concerns the figures in columns B, C and D which appear opposite the years 1922 to 1939 inclusive, was taken entirely, was it not, from the annual reports you have described and which you say you have in the court room here with you?

A. They were.

Q. And the computations in the vertical columns E and F and in the three horizontal blocks at the foot of the exhibit were made by you, were they not?

A. They were.

Q. Were the figures which were taken from the reports correctly transcribed by you from the reports?

A. They were.

Q. Were the computations you have made,—have they been correctly made by you?

A. To the best of my knowledge, yes.

Mr. Booth: We offer this in evidence as Defendant's Exhibit No. 54.

Mr. Strouss: The same objection of course.

Mr. Booth: We tender for examination the annual re-

[fol. 772] ports referred to by the witness in the same manner as the other reports have been tendered.

The Court: The objection is overruled and the exhibit may be admitted in evidence.

(Document received in evidence and marked Defendant's Exhibit No. 54.)

Mr. Booth:

Q. Have you also prepared a report entitled, "Erie Railroad Company, Robert E. Wiechmann and John A. Hadden, Trustees, Chicago and Erie Railroad Company, Freight Service Operating Averages, Calendar Years, 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 and 1939"?

A. I did.

Q. Do you have that before you?

A. I have.

Q. That was prepared by you, was it?

A. It was prepared under my direction, and I re-checked all of the figures.

Q. The form and the years for which the form was to be filled out were furnished by the defendant as you understand it?

A. That is correct.

Q. You had no selection of the years?

A. No sir.

Q. And expressed no opinion concerning them?

[fol. 773] A. No sir.

Q. As to Items 1, 2, 3, 4, 7 and 8, does the first foot-note show the source of those items?

A. It does, Freight Train Performance, Form OS A.

Q. Have you those forms from which those items were taken in the courtroom with you?

A. I have.

Q. Item 5, Average tractive power per locomotive in pounds, was that prepared according to the formula and from the annual report as indicated in the foot-note?

A. It was.

Q. Item 6, Average capacity per freight car in tons, was that prepared according to the formula and from the schedule 417 in that report?

A. It was.

Q. Item 9, net ton-miles per freight train-hour. Was that prepared from the formula there stated, net ton-miles divided by train-hours as reported on Form OS-A to the Interstate Commerce Commission?

A. It was.

Q. And finally Item 10, was that prepared from the two respective sources described in the last foot-note on the exhibit?

[fol. 774] A. It was.

Q. The computations of percentages in column (m), are those true and correct?

A. To the best of my knowledge and belief they are.

Q. Is the exhibit to the best of your knowledge and belief true and correct?

A. It is.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Booth: We offer this exhibit in evidence as Defendant's Exhibit No. 56.

Mr. Strouss: Same objection.

The Court: Same ruling; it may be admitted in evidence.

(The document referred to was received in evidence and marked Defendant's Exhibit No. 56.)

Mr. Strouss: Your deduction in miles of road operated I assume was due to the abandonment of branch lines or something of that sort?

A. It is; on account of no business the branch lines were abandoned.

Mr. Booth:

Q. Will you let me have the report for 1938, Form A, and you take the report for 1939 and turn to Schedule 541 beginning at page 512. Will you turn to Page 519 Column [fol. 775] J and state for the record the total number of carloads of revenue freight handled by the Erie Railroad Company and the Chicago and Erie Railroad Company on the combines report during the calendar year 1939?

A. 957,123 carloads.

Q. Tons, how many?

A. 32 million, 110 thousand plus.

Q. Tons of less than carload freight?

A. 722,043.

Q. The products of agriculture, Group 1, total number of carloads handled and tons handled?

A. Carloads 106,818; tons of two thousand pounds 2 million, 368,955.

Q. Group 2, animals and products?

A. Carloads 61,267; tons 871,034.

Q. The same information for Group 3 please?

A. Products of Mines, carloads 352,017; tons 18 million, 157,645.

Q. And the next group?

A. The next is Group 4, Products of Forests, carloads 29,872; tons 764,361.

Q. In the Products of Mines in Group 3 what was the predominating movement?

A. The predominating movement was anthracite coal, 132,596 cars.

Q. Next to that was what?

[fol. 776] A. Bituminous coal, 126,386 cars.

Q. And car loadings fell very rapidly to the third largest which was what?

A. Coke, 23,594 cars.

Q. And iron ore?

A. Iron ore 21,731 cars.

Q. Do you know from your experience and observation in the offices of the president and comptroller of the respective Erie whether that road is a very large carrier of perishables from Chicago to eastern distributing termini?

A. It is.

Mr. Booth: I think I can really save time by asking the witness to make some computations tonight which I can put in in the form of a total in the morning and have copied in the record and present it in a much more presentable form and much more graphic and I will do that during the adjournment. I merely want to ask as to the manufactures. What was the predominating carloading in manufactures?

Mr. Strouss: We don't have the totals on that, Mr. Booth.

Mr. Booth: What was the tons and cars on manufactures?

A. Manufactures, cars 407,149; tons, nine million, 947,533.

[fol. 777] Q. What was the predominating car loadings of cars handled in manufactures during that year? How was it classified?

A. Iron and steel, rated fifth class in the official classification. I assume you mean other than miscellaneous manufactures?

Q. Yes. That would be how many carloads?

A. 51,799.

Mr. Booth: I think that is all for the present.

The Court: The Court will be at recess until ten o'clock tomorrow morning.

(Thereupon at 4:15 p. m. December 3rd, 1940 the Court was at recess until 10:00 a. m. December 4, 1940.)

[fol. 778] 10 A. M., December 4, 1940.

All parties being present as heretofore noted, proceedings were resumed as follows:

G. W. Oakley resumed the witness stand for further

Direct examination.

Mr. Booth:

Q. Mr. Oakley, have you prepared overnight from the 1939 annual report of the Erie Railroad and Chicago and Erie Railroad to the Interstate Commerce Commission an excerpt from schedule 541?

A. Schedule 541, yes, sir.

Q. Showing the products of agriculture by classes or items 110 to 143 inclusive?

A. I did.

Q. These items 110 to 143 inclusive are continuous, are they not? In other words, you have not left out anything between 110 and 143?

A. No, sir.

Q. Is this correctly taken from your annual report?

A. It is.

Q. It shows, does it not, to what extent the Erie handles [fol. 779] freight received from connecting carriers either for delivery on its own line or to deliver to another railroad for transportation to the ultimate consignee?

A. It does.

Q. It also shows the tons of freight originating on the Erie road and either terminating on its own line or delivered to a connecting carrier for hauling beyond?

A. It shows the carloads, not the tons.

Q. Is this statement true and correct and are the items exact copies of the items in your report as they purport to be?

A. They are.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Booth: We offer this in evidence as defendant's exhibit No. 57 and ask permission to have this photostated and substitute a photostat of the exhibit. Is there any objection to that?

Mr. Strouss: No.

Mr. Booth: We would like to have our exhibits uniform as far as possible and we only had time to make up a few copies last night.

Mr. Strouss: The same objection.

The Court: Objection overruled, it may be admitted in evidence.

[fol. 780] The document referred to was received in evidence and marked defendant's exhibit No. 57.

Mr. Booth: That is all, Mr. Oakley.

Mr. Strouss: I haven't had an opportunity yet to go over the reports. I will try to do that at noon.

Mr. Booth: We can call Mr. Oakley tomorrow.

Mr. Strouss: You beat me to one question I had in mind.

Mr. Booth: That is all, Mr. Oakley.

(Witness temporarily excused.)

F. H. Millard was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Booth:

Q. Will you please state your name and residence to the reporter?

A. F. H. Millard, St. Louis, Missouri.

Q. What position do you occupy with the St. Louis and Southwestern Railroad?

A. Comptroller and assistant to the chief executive officer.

Q. How long have you been connected with the company?

[fol. 781] A. A little over twenty years.

Q. In what capacities?

A. As assistant to the president and as comptroller and assistant to the chief executive officer.

Q. During the whole twenty years?

A. During the whole twenty years; yes.

Q. Prior to that time in what railroad service were you?

A. I was the assistant manager of statistical bureau, Western Railroads, in Chicago for five years, except that during Federal control I was in Washington as assistant to the director of traffic.

Q. Of the United States Railroad Administration?

A. Yes.

Q. Your railroad experience has extended over how many years?

A. About thirty. I was bridge engineer on the Chicago, Milwaukee, and St. Paul before going into the statistical bureau.

Q. What academic degree, if any, do you hold?

A. I have a degree of civil engineer, Master of Science, Bachelor of Arts.

Q. What college?

A. The civil engineer and Bachelor of Arts degrees at [fol. 782] the University of Colorado and Master of Science at the University of Illinois.

Q. Is the St. Louis and Southwestern Railroad frequently referred to as the "Cotton Belt"?

A. Yes, sir.

Mr. Booth: We offer for identification an outline map and ask that it be marked.

The Clerk: Defendant's exhibit No. 58 for identification.

Mr. Booth: This map, if the court please, will be further identified and offered during the examination of the operating witness for the road. I merely want to have the witness identify it as the road of which he is comptroller.

Q. I show you this outline map marked defendant's exhibit No. 58 for identification and ask you whether that shows an outline of the territory traversed and the lines of the St. Louis Southwestern Railroad?

A. Yes, it does.

Q. Have you prepared an exhibit entitled "St. Louis Southwestern Railway Lines, Berryman Henwood, Trustee, Freight Operating and Freight Transportation Expenses Related to Traffic, Calendar Years 1922 to 1939, Inclusive"?

A. Yes.

[fol. 783] Q. By the way, the St. Louis Southwestern is in trusteeship in the Federal court?

A. That is true.

Q. And Mr. Henwood is the trustee?

A. Yes.

Q. From what sources was this exhibit prepared?

A. It was prepared from the annual reports to the Interstate Commerce Commission on what is known as form A. For the years 1934 and subsequently the system report has been filed with that Commission, including both St. Louis Southwestern and St. Louis Southwestern Texas. Prior to that time two reports were prepared and the figures for 1933

and prior years were prepared on this exhibit by adding together the figures for the two reporting companies.

Q. I notice that the source note at the foot of the exhibit says, "Accounting records of the Company to and including year 1933." Are those accounting records the two sources of annual reports to the Interstate Commerce Commission which you have just described?

A. Yes.

Q. And have you those reports with you here in the courtroom?

A. Yes.

Q. They are on the table beside you?

[fol. 784] A. They are.

Q. Have you the annual reports to the Interstate Commerce Commission after the year 1933 and to and including the year 1939 with you and on the table beside you?

A. Yes.

[fol. 785] Mr. Booth: We offer this exhibit for identification.

The Court: It may be marked.

(Thereupon the document referred to was marked "Defendant's Exhibit 59 for Identification")

Mr. Booth: Now, are the figures in the columns B, C, and D which appear opposite the years 1922 to 1939, inclusive, either taken without change from the reports you have described, or the result of additions of figures taken without change from the reports you have described?

A. Yes, they are.

Q. They are correctly so transcribed?

A. Yes.

Q. And are the figures in columns E and F and in the three horizontal boxes at the bottom exhibit additions or computations as shown on the face of the exhibit?

A. Yes.

Q. And are those additions and computations correct to the best of your knowledge and belief?

A. Yes.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No, no questions.

Mr. Booth: We offer the exhibit in evidence as Defendant's Exhibit 59.

[fol. 786] Mr. Strouss: The same objection.

The Court: The same ruling. It may be admitted in evidence.

(Thereupon the document referred to was received in evidence and marked "Defendant's Exhibit No. 59")

Mr. Booth:

Q. Have you, Mr. Millard, prepared an exhibit entitled, "St. Louis Southwestern Railway Lines, Berryman Henwood, Trustee, Freight Service Operating Averages, Calendar Years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 and 1939?"

A. Yes.

Q. And is this exhibit I hold in my hand the exhibit you refer to?

A. Yes, it is.

Mr. Booth: We ask that this exhibit be marked Defendant's Exhibit 60 for identification.

(Thereupon the document referred to was marked Defendant's Exhibit No. 60 for identification.)

Mr. Booth: Do the five notes at the foot of the exhibit correctly show the sources from which this exhibit was taken?

A. Yes.

Q. Did the railroads referred to in the title to the exhibit make reports to the Interstate Commerce Commission on that Commission's form OSA for the years shown in the exhibit?

[fol. 787] A. Yes.

Q. Were those OSA reports separate for the two roads or consolidated, or partly one and partly the other?

A. Partly one and partly the other. There were separate reports for the St. Louis & Southwestern and St. Louis & Southwestern of Texas for 1933 and prior. Subsequent to that time there was a system report filed, including both companies.

Q. Are the file copies of those reports in your custody as Comptroller of the Company?

A. Yes, sir.

Q. Did you bring with you the OSA reports referred to insofar as they relate to show the figures used for preparing this exhibit and the figures shown on the exhibit?

A. Yes, I have them all.

Q. Will you show the court by reference to the map marked 58 the identification of the lines of the St. Louis Southwestern of Texas?

A. All lines within the state of Texas are operated by the St. Louis Southwestern of Texas. All the rest is operated by the St. Louis Southwestern Railway Company.

Q. That, I assume, is because of a Texas law which requires the railways of Texas to be domestic corpora-
[fol. 788] tions?

A. I so understand.

Q. Turning to Defendant's Exhibit 60 for identification, do the notes to the exhibit correctly show the sources of the figures shown in the exhibit and the formula by which items 5, 6, 9 and 10 were computed?

A. Yes.

Q. Column M is a computation, is it not?

A. Yes, sir.

Q. Are the figures in the exhibit correctly abstracted where there are figures appearing as such on the face of the reports described in the footnotes, and have the computations been correctly made?

A. Yes.

Q. Is that true and correct to the best of your knowledge and belief?

A. Yes.

Q. I will ask you, were these years shown in the exhibit selected by you or used at the request of the defendant?

A. They were used at the request of the defendant.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No questions.

[fol. 789] Mr. Booth: We offer this in evidence as Defendant's Exhibit No. 60.

The Court: The same objections, I take it?

Mr. Strouss: The same objections.

The Court: It may be admitted. Objections overruled.

(Thereupon the document referred to was received in evidence and marked "Defendant's Exhibit No. 60")

Mr. Booth: Mr. Millard, will you take the annual report, Form A, which you used in the preparation of the two exhibits, your exhibits, which have been introduced in evidence, Annual Report for the Year Ending December 31,

1939, and turning to schedule 541, beginning on page 512, Revenue Freight Carried during the year, will you please read from page 519 the grand total of car-load traffic carried during that year by cars and tons?

A. The total is 197,188 cars, and 5,108,026 tons of car-load traffic.

Q. And the tons of less than car-load freight?

A. 96,097 tons of the less than car-load freight, not included in the former total.

Q. Spread out kind of thin, isn't it?

A. Yes.

Q. I guess the trucks have it?

A. Our own trucks.

[fol. 790] Q. You have your own trucks?

A. Yes.

Q. Now, will you read, please, the number of cars and tons by the groups, beginning with group one, products of agriculture?

A. Products of agriculture, 46,054 cars; products of animals, 4,330 cars; products of mines, 20,056 cars; products of forests, 28,762 cars; manufacturers and miscellaneous, 97,986 cars; total, 197,188 cars.

Q. Can you give some percentages illustrative of the quantity of freight originating in your lines and quantity handled by connections and so on?

A. Yes, based on line 850 on pages 518 and 519, cars originating on the line and terminating on the line, 21,814, or 11%; cars originating on the line and delivered to connections, 63,094 cars, or 32%; cars received from connections terminating on the ling, 38,606 cars, or 20%; cars received from connections and delivered to other connections beyond, 73,674 cars, or 37%.

Q. So your road acts as a bridge for about 37% of the cars it handles?

A. Yes, it does.

Q. What is the principal commodity, stated by carload lots, that is handled according to those statistics, on the St. [fol. 791] Louis Southwestern in 1939?

A. Considering perishables as a single commodity, that commodity was 17,902 cars, gasoline 22,543 cars, lumber 16,982 cars, cotton 7,451 cars, would be the most important commodities.

Q. Have you, Mr. Millard, prepared a statement from Schedule 541 of your 1939 report showing in detail the perishables, movement for that year in carloads on your line?

A. Yes.

Mr. Booth: We ask that this be marked for identification.

(Thereupon the document referred to was marked "Defendant's Exhibit No. 61 for identification.")

Mr. Booth:

Q. This statement is a copy, is it not, of certain numbered lines in Schedule 541 as shown in the schedule?

A. Yes, it is.

Q. It is not a summary, but a copy of those lines, it is not a summary made by you, but it is a copy of those lines?

A. That is true.

Q. It is a correct copy of the lines referred to?

A. Yes, except that the line "Total Perishables" is a computation based upon the lines just above.

[fol. 792] Q. Now, you have lines 110 to 143, inclusive. There are no lines between those in the schedule 541?

A. No.

Q. Why is that; do you know?

A. Yes, the committee on statistics in cooperation with the Interstate Commerce Commission have left blank numbers so that future commodities could be assigned numbers within this group. I know that from being on the committee on statistics.

Q. As a matter of fact, that has been done in past years from time to time, has it not?

A. Yes, there are several instances of that on this page. 110 was formerly combined with 111 as separate fruits, then a separation made as shown, 110 oranges, and grapefruits, 111, lemons, limes and other citrus fruits.

Q. Cabbage has always been 140 and will always be 140 as long as this system is kept up?

A. Yes.

Q. If you wanted to specify red cabbage, you might make it 140A or some number?

A. Yes.

Mr. Booth: Any questions, Mr. Strouss:

Mr. Strouss: No.

Mr. Booth: We offer this in evidence as Defendant's Ex-
[fol. 793] hibit 61.

Mr. Strouss: The same objections.

The Court: It may be admitted. Objections overruled.

(Thereupon the document referred to was received in evidence and marked "Defendant's Exhibit No. 61.")

[fol. 794] Mr. Booth: As soon as we can get these photostated we will ask the privilege of substituting one standard form.

The Court: The photostatic copies may be substituted.

Mr. Booth:

Q. This was prepared by you since yesterday afternoon, was it?

A. Yes, sir.

Q. Exhibit No. 61 shows, does it not, that of 17,902 carloads perishables handled only how many originated on your line?

A. 4,579 originated on the line. That is the sum of the figures in the first two columns on the line marked "Total perishables."

Q. How many of those carloads did your company handle as a bridge between one railroad and another?

A. 14,945 carloads out of a total of 17,902 were handled in bridge traffic.

Mr. Booth: You may cross-examine. We wish to tender in connection with the exhibits received in evidence during the examination of Mr. Millard the annual reports and forms 08-A referred to by him and which are here in the courtroom.

[fol. 795] Cross-examination.

By Mr. Strouss:

Q. These accounting records prior to and including 1933, are they records in the same form as the annual reports?

A. Oh, yes, they are the annual reports to the Interstate Commerce Commission and the reason that I cannot say the exhibit is formed directly from a single report is that two reports were filed, one covering the operations in Texas and the other covering the operations outside of Texas but a form A report was filed in all particulars for each one of the two companies.

Q. These reports or records that you have here, is that what they are, your copies?

A. Yes, the office copies.

Q. It follows the items the same as form A?

A. Oh, yes, in every respect.

Q. These operating expenses as shown in column C of exhibit No. 59, that amount represents, does it not, a total of the different items of expense beginning with item 201 on page 304 of form A and extending over to item 462 on page 312. Is that correct?

A. Yes, for the expenses shown in column C on exhibit [fol. 796] No. 59 but not for the expenses shown in column D on exhibit No. 59.

Q. No, I was just asking about column C.

A. That is true with respect to column C. The numbers which you used are the account numbers prescribed by the Interstate Commerce Commission for operating expense accounts.

Q. And shown in form A which is part of exhibit No. 9 in this case?

A. Yes.

Q. Any changes from year to year as reflected in the figures that you have set out here on your exhibit are the over-all changes for those different items for that year as compared with the previous year?

A. The figures were in each case taken from the reports for the year to which they pertain. There are no comparisons with one year and the other in the form. Perhaps I don't understand your question?

Q. This figure is the grand total of all of those items preceding it, that is, 201 to 462?

A. In column C, yes.

Q. And any changes that are reflected in that figure from the previous year, any change in operating expense would be the over-all change for all of those items, it doesn't [fol. 797] reflect any change in any particular item?

A. No, it is as the face of the exhibit shows the total freight operating expenses.

Q. And the same would be true of freight transportation expenses which include items 371 to 462?

A. No, items 371 to 420.

Q. Yes, that is right.

A. That should really be designated as accounts 372 to 420.

Q. That is in form A?

A. Yes.

Q. On exhibit No. 60 your miles of line operated in freight service, there has been a reduction. Is that due to abandonment of unprofitable branch lines?

A. We have added some lines and abandoned others with a net decrease as shown on the first line of exhibit No. 60.

Q. The lines that were abandoned were with the permission of the Interstate Commerce Commission and for the reason that they were unprofitable?

A. Oh, yes, in all cases.

Mr. Strouss: I think that is all the questions I have.

[fol. 798] Redirect examination.

By Mr. Booth:

Q. In view of counsel's questions about the detail of the expense account I want to ask you a few questions about the construction of the annual report, not the legal construction but the mechanical construction of the annual report to the Commission which is attached to exhibit No. 9. I am handing His Honor a blank so he can follow the testimony. If you will take one of these annual reports of the Commission, Mr. Millard, and go over the railway operating expenses, say for example, schedule 320, Maintenance of Way and Structures.

Mr. Strouss: Page 304.

Mr. Booth:

Q. The items beginning with superintendence on that page and ending with ballast are numbered 201 to 218 inclusive. Is that correct?

A. Yes, sir.

Q. I now show you our exhibit No. 8 in this case and ask you whether you can find in the official classification of the Commission, which is one of the documents certified to in that Commission, these same account numbers.

A. Yes, in the document entitled "Classification of Oper-
[fol. 799] ating and Revenues and Operating Expenses of Steam Roads Prescribed by the Interstate Commerce Com-

mission in Accordance with Section 20 of the Act to Regulate Commerce, Issue of 1914," on page 25 at the bottom of the page under a center heading reading: "Primary Accounts," is the title "I. Maintenance of Way and Structures" and then indented under that heading the first line is 201 superintendance and the numbers continue for the rest of page 25 and on to about a third of page 27, prescribing numbered accounts for maintenance of way and structures. The numbers preceding these accounts on the pages I have just quoted are the same as the numbers in parentheses on page 304 of the form A.

Q. So without going into great detail the items, the numbers in the annual reports correspond with the numbers in the classification of accounts of the Interstate Commerce Commission?

A. Yes, in all cases.

Mr. Strouss: I think those exhibits speak for themselves. I think we are wasting quite a bit of time on matters that the court can read from the exhibit as well as having the witness read them to him.

Mr. Booth: There has been a certain amount of haziness [fol. 800] about these railroad records and I want to show how meticulously they are kept and prescribed. The Interstate Commerce Commission prescribes the classification of accounts and says that the railroad cannot keep any other kind of accounts. Is that correct?

A. Yes.

Q. And it has a force of examiners who go around and examine the accounts to see if they are keeping the accounts that way?

A. Yes, it has.

Q. The whole system of accounting and reports tie up together by a common classification on all railroads of a given class, is that correct?

A. That is correct.

Mr. Booth: I also want to call attention to the fact that in this same exhibit there is a document called "Accounting Bulletin No. 15" which gives the interpretation by the Interstate Commerce Commission of its accounting classifications. That is all. May Mr. Millard be excused or do you wish to recall him?

Mr. Strouss: No, I think that is all for this witness.

The Court: Mr. Millard may be excused.

(Witness excused.)

[fol. 801] BERNARD M. SNELL was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Booth:

Q. Will you state your name and residence to the reporter, please?

A. Bernard M. Snell, Chicago, Illinois.

Q. What is your position with what company?

A. Engineer statistician, Chicago and Northwestern Railway Company, Charles M. Thompson, trustee.

Q. That is another company that is in trusteeship in the Federal court?

A. Yes, sir.

Q. How long have you occupied that position with the company?

A. Since June, 1936.

Q. And prior to that time what position, if any, did you occupy with that company?

A. Prior to that time for about ten years I was cost engineer in the engineering and valuation departments.

Q. Of the same company?

[fol. 802] A. Yes, sir.

Q. And prior to that time what position did you hold?

A. I was in various positions from roadman to assistant engineer from the year 1909 up to about 1921 or 1922, except during the time I was with the construction division of the Army during World War I.

Q. Overseas?

A. No, I was on the Charleston Army supply base, Charleston, South Carolina, as engineer on railroads and I was also on fortification work in the Panama Canal Zone.

Q. What degree, if any, do you hold and from what institution?

A. I do not hold any degree. I was a special student for a number of years at Northwestern University and

I also had early engineering schooling in a small school in Virginia, M. A. L., it is out of existence now.

Q. I show you an outline map purporting to show the territory traversed by and the lines of the Chicago Northwestern Railway Company and ask you if that represents in a general way at least the railroad lines of that company and the states it serves?

A. Yes, sir, it does.

[fol. 803] Mr. Booth: We ask that this be marked for identification.

The Clerk: Defendant's exhibit No. 62 for identification.

Mr. Booth: It will be offered on the testimony of the operating witness for that company.

Q. In the course of your employment, particularly your present employment, have you become familiar with the accounting requirements and the reports made pursuant thereto as required by the Interstate Commerce Commission of Class I railroads?

A. Yes, sir.

Q. Your company is a Class I railroad, isn't it?

A. Yes, it is.

Q. Have you for the purposes of this case prepared or personally checked from the original sources the statement entitled "Chicago and Northwestern Railway Company, Freight Operating and Freight Transportation Expenses Related to Traffic, Calendar Years 1922 to 1939 Inclusive"?

A. Yes, sir.

Q. You have that in your hand?

A. Yes, sir.

Q. Have you with you in the courtroom and on the table beside you the annual reports of the Chicago and [fol. 804] Northwestern Railway Company to the Interstate Commerce Commission on form A for the years 1922 to 1939 inclusive?

A. Yes, sir, I have them with me here.

Q. What do you mean by the expression "Accounting records" of the company to and including the year 1935 as stated in the footnote?

A. In compiling this exhibit we used certain records in our office which totaled those expenses. However, these reports merely by addition give the same figures. It was really unnecessary to make that statement.

Q. Could you truthfully make the statement that all of the figures contained in columns B, C, and D in this report opposite the years 1922 to 1939 can be obtained from the annual reports of the company to the Commission irrespective of any records which are in your office and which have not been produced here?

A. That is correct, merely by addition during those years the figures can be verified or supported.

Q. The accounts of the company were kept during those years in accordance with the accounting regulations of the Commission?

A. Yes, sir.

Q. And the reports were prepared in accordance with the [fol. 805] instructions in preparing reports and on the forms furnished by the Commission?

A. Yes, sir.

Mr. Booth: Pardon me for using the word "truthfully," I thought I was talking to a lay witness in a crossing accident case or something of that kind. We ask that this be identified as exhibit No. 63.

The Clerk: Defendant's exhibit No. 63 for identification.

Mr. Booth:

Q. The columns E and F under the three blocks; horizontal blocks at the bottom of the exhibit are respectively computations or additions made by you, are they not?

A. Yes, sir.

Q. Are those true and correct?

A. They are to the best of my knowledge.

Q. You have checked them?

A. Yes, sir.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Booth: We offer this in evidence as defendant's exhibit No. 63.

Mr. Strouss: The same objection.

The Court: It may be admitted.

The document referred to was received in evidence and [fol. 806] marked defendant's exhibit No. 63.

The Court: Gentlemen, we will take a brief recess at this time.

[fol. 807] At the conclusion of the recess, the witness Bernard M. Snell was recalled to the stand, and proceedings were resumed as follows:

The Court: You may proceed.

Mr. Strouss: I have excused Mr. Millard, so far as I am concerned.

Mr. Boyle: And with his records?

Mr. Strouss: Yes.

Mr. Booth:

Q. Have you prepared an exhibit entitled, "Chicago Northwestern Railway, Freight Service Operating Averages, Calendar years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 and 1939?"

A. Yes, sir.

Q. Have you the exhibit before you?

A. Yes, I have.

Mr. Booth: We ask that this exhibit be marked.

(Thereupon the document referred to was marked, "Defendant's Exhibit No. 64 for identification.")

Mr. Booth:

Q. On this exhibit are there shown on the footnotes consisting of five short paragraphs, the sources from which the exhibit was taken?

A. Yes, sir.

Q. You are familiar with the forms OS-A filed by the Northwestern with the Interstate Commerce Commission?

[fol. 808] A. I am.

Q. And does the Northwestern maintain its file copies of those forms as filed with the Interstate Commerce Commission?

A. Yes, sir.

Q. And have you those forms OS-A insofar as they relate to the exhibit 64 or were used in its preparation?

A. I have them here with me now.

Q. Were the figures used in this Exhibit 64, which are either set forth identically in the exhibit or form the bases of computations shown in the exhibit, taken from any other source than forms OS-A and the annual reports?

A. The basic figures are from the OS-A and annual reports.

Q. And no other source?

A. And no other source?

Q. Those supplies for the basic figures you have with you in the court room?

A. Yes.

Q. Do the items in the source-note correctly describe the sources and the formula for the respective items in the exhibit?

A. Yes, sir.

Q. On lines in the exhibit. And have the computations in [fol. 809] lines 3, 4, 7 and 8 been correctly made?

A. Yes, sir.

Q. By the way, how do you arrive at the items in line 10, is that an absolute figure or the result of a computation?

A. That is the result of the computation in our offices in Chicago.

Q. Computation from figures contained in the annual report?

A. Yes, sir.

Q. Can you give the formula for that computation?

A. That is covered by item 8 at the bottom in the source statement.

Q. Oh, that is covered by item 8. Mr. Mason supervised the preparation of these exhibits. I would like to have him straighten this out.

Mr. Mason:

Q. Isn't there a slight misstatement in the footnote at the bottom of the sheet? Item 9 is the division of net ton-miles by train-hours instead of item 7?

A. Yes, that is correct.

Q. And the figure at the footnote, item 7 should be changed to item 9 for the sake of correctness?

A. Yes, it should.

Mr. Mason: May we have that change made on the copy? [fol. 810] The Court: Yes, the change may be made. That is, under the source items. Item 7 should be changed to item No. 9.

The Witness: Are we not confusing items and line numbers?

Mr. Mason: Item and line numbers are the same in the body of the exhibit. Refer to item 10, Gross Ton-Miles per Ton of Value.

The Court: When you say Item 10 you mean Line 10?
Mr. Mason: Yes.

Q. Isn't that actually the result, rather, shouldn't the reference under the heading, "Source to Item 8" properly be "to Item 10?"

A. It should be to Line 10.

Q. Line 10?

A. Yes.

Q. So that the figure 8 in the source should be changed to 10, so it should read, "Item 10, Gross Ton-Miles" etc.. The last statement on the exhibit?

A. Yes.

Mr. Mason: May we have that change likewise made?
The Court: The change may be made by the Clerk.
Mr. Mason: That leaves us without any references to items 7 and 8. I will ask you if those weren't taken directly [fol. 811] from the forms OS-A, Freight Train Speed, and Line 8, Gross Ton-Miles per Freight Train Hour?

A. Yes sir, that is correct.

Q. Then isn't it correct that we should insert reference to Lines 7 and 8 in the first note under the heading, "Source" at the foot of the exhibit?

A. Yes.

Mr. Mason: May we have that reference added in the record copies of the exhibit so it will read. "Items 1, 2, 5, 6, 7 and 8, Reports of Freight Train Performance?"
The Court: Yes, that may be added.

Mr. Mason:

Q. Mr. Snell, my attention has been called to two other changes that should be made in those footnote references. As I read the exhibit, lines 3 and 4 are items which are taken from the form OS-A reports?

A. That is correct.

Q. And lines 5 and 6 are the results of divisions as expressed in the second and third footnotes at the foot of the exhibit?

A. Yes, that is right.

Q. In other words, the first line opposite the word "source" should correctly — "Items 1, 2, 3, 4, 7 and 8," in-

dicating that those are directly taken from forms OS-A; [fol. 812] am I correct?

A. I would like a moment to check this now.

The Court: May I suggest that you correct this original exhibit to speak the truth here, then we will admit it in that manner?

Mr. Mason: We will do that. We will return to this exhibit later.

The Court: I take it, Mr. Mason, that there are no changes in the basic data contained in lines 1 to 10, it is merely the source from which this data was obtained that you are seeking to correct.

Mr. Mason: The change is not even as extensive as that. There are no changes in the text or face of the exhibit so far as the information which it shows is concerned, it is merely a slight mistake in the references at the foot of the sheet. The underlying documents are as shown, but there was a failure to connect the footnotes with the correct items in the body of the exhibit.

The Court: I suggest you examine the witness on the exhibit. The court, during the noon recess, will permit you to make such changes as are necessary in your source notations.

Mr. Booth:

Q. Are the figures shown in the exhibit, other than computations, correctly abstracted from the sources shown? [fol. 813] A. Yes, sir.

Q. And are the computations correctly made from the source shown?

Mr. Booth: We offer the exhibit in evidence as Defendant's Exhibit 64.

Mr. Strouss: The same objection.

The Court: It may be admitted. Objection overruled.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 64")

Mr. Booth:

Q. Have you the forms OS-A with you?

A. Yes, sir, I have them here now.

Mr. Booth: We tender for the examination of counsel the annual reports and forms OS-A so far as those forms

were used, or such of the forms as were used in making this exhibit.

Q. Will you take your annual report of the Chicago Northwestern Railway Co. for the calendar year 1939 and turn to Schedule 541 and read from page 119 the grand total of carloads traffic?

A. Carloads?

Q. Carloads and tons.

A. 1,105,259 carloads; 35,100,136 tons.

Q. And the tons of less than carload freight?

[fol. 814] A. 810,525.

Q. Will you read by groups, stating the groups, the number of carloads of each group in schedule 541?

A. Products of agriculture, 178,632 carloads; animals and products, 121,032 carloads; products of mines, 286,056; products of forests, 104,415 carloads; manufacturers and miscellaneous, 415,124 carloads.

Q. Have you prepared from this annual report for 1939 an exhibit in typewriting consisting of one sheet and showing by carloads items 110 to 143, inclusive, and certain other totals of the agricultural group?

A. I have.

Q. Is this it and is it correct?

A. Yes, sir, this is it and it is correct.

Q. That doesn't involve any computation, does it, other than the totals in the line headed, "Totals, 110 to 143, inclusive," that you computed yourself?

A. Yes, the total for perishables I added; the other figures are from the annual report.

Q. Will you take items 110 to 128, inclusive, beginning with oranges and grapefruits and ending with Fruits, Fresh and Tropical, and say how many carloads of that revenue freight originated on the Northwestern Railroad.

[fol. 815] A. 3,683 cars originated on our road.

Q. I don't think I made myself clear. I am talking about lines 110 to 128, inclusive. That is, oranges, grapefruits, lemons, apples and so on.

A. But exclusive of potatoes, cabbage, onions?

Q. Yes.

A. Oh, I beg your pardon. Items 110 to 128, inclusive, a total of 83 cars originated on the Chicago Northwestern Railway during the year 1939.

Q. And as to the other cars in those items, the railroad was merely a bridge between connecting lines at either end, is that correct, or delivered at Chicago?

A. Yes, as to the other cars, we either hand them to other carriers or terminate.

Mr. Booth: You may cross-examine.

Cross-examination.

By Mr. Strouss:

Q. Mr. Snell, the figures which are shown on your exhibit 63 in column C——

Mr. Booth: I don't think I offered this Exhibit in evidence, did I.

The Court: That is true, you didn't.

Mr. Booth: I offer this commodity statement about [fol. 816] which I was questioning the witness immediately prior to concluding the direct examination, I offer this in evidence as Defendant's Exhibit 65.

Mr. Strouss: The same objection.

The Court: The same ruling. It may be admitted.

(Thereupon the document referred to was received in evidence and marked "Defendant's Exhibit 65.")

Mr. Booth: We will desire to substitute a photostatic copy.

Mr. Strouss: The items shown in column C of Defendant's Exhibit 63, those are the totals of the different items of operating expense shown in form A, the annual report, representing accounts 201 to 462?

A. Did you say 462?

Q. Account 462 on page 312, the totals shown just below that?

A. Yes, that is correct.

[fol. 817] Mr. Strouss: The items in column D represent the accounts beginning with account 371 on page 308 of the annual report and continuing over to account 420?

A. Yes, sir.

Mr. Strouss: That is all.

Mr. Booth: No further questions.

The Court: May this witness be excused now, gentlemen?

Mr. Strouss: Yes.

The Court: And the records which he has produced here in court released?

Mr. Strouss: Yes.

The Court: It is so ordered.

(Witness excused.)

E. M. Albert was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Booth:

Q. Will you state your name and residence to the reporter, please?

A. E. M. Albert, Philadelphia, Pennsylvania.

Q. What is your official position with the Pennsylvania [fol. 818] Railroad Company?

A. Chief statistician, office of vice-president and comptroller.

Q. How long have you been employed by the Pennsylvania Railroad Company?

A. Thirty-eight years.

Q. All of that time in the accounting department?

A. Yes, sir.

Q. How long have you occupied your present position?

A. Since May 1, 1931.

Q. Are you familiar with the requirements and accounting practices of Class I railroads required by the Interstate Commerce Commission?

A. Yes, sir.

Q. Are those practices followed by your railroad?

A. Yes, sir.

Q. Does your railroad render a report on forms OS-A and OS-E and the annual report on form A to the Commission?

A. Yes, sir, it does.

Q. Has it done so at least since the year 1922?

A. Yes.

Mr. Booth: We ask to have marked for identification a [fol. 819] map of the Pennsylvania Railroad

The Clerk: Defendant's exhibit No. 66 for identification.

Mr. Booth: We will further identify and offer it during the examination of another witness.

Q. Mr. Albert, does this show in a general way the territory served by the Pennsylvania?

A. Yes.

Q. Did you bring with you and have you here in the courtroom the filed copies of the annual reports of the Pennsylvania Railroad to the Interstate Commerce Commission for the calendar years 1922 to 1939 inclusive?

A. Yes.

Q. They are on the table beside you?

A. They are.

Q. What form OS-A report did you bring with you?

A. I brought form OS-A reports for the years 1922 to 1939 inclusive.

Mr. Booth: I have handed the clerk a proposed exhibit which I ask to have marked defendant's exhibit No. 67 for identification.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 67 for identification.

Mr. Booth:

Q. Defendant's exhibit No. 67 for identification is en [fol. 820] titled, "The Pennsylvania Railroad, Freight Operating and Freight Transportation Expenses Related to Traffic, Calendar Years 1922 to 1939 Inclusive." From what sources were the figures in this exhibit other than the computations taken?

A. From the annual report form A of the Pennsylvania to the Interstate Commerce Commission.

Q. And solely from that source?

A. Yes, sir.

Q. Those reports are those that you have with you and are on the table beside you?

A. Yes, sir.

Q. Are the figures in columns B, C, and D opposite the years 1922 to 1939 inclusive shown as such figures in the reports?

A. Yes.

Q. They are not the result of computation?

A. They are not.

Q. Are those correctly transcribed from those reports?

A. They are.

Q. The figures in columns E and F and in the three horizontal blocks at the bottom of the exhibit are computations, are they not?

A. They are.

Q. Are they true and correct to the best of your knowl-
[fol. 821] edge?

A. Yes, sir, I checked those.

Q. Is the exhibit as a whole true and correct to the best of your knowledge and belief?

A. It is.

Mr. Booth: Any questions?

Mr. Strouss: I have no questions.

Mr. Booth: I offer this in evidence as defendant's exhibit No. 67.

Mr. Strouss: The same objection.

The Court: It may be admitted, the objection is overruled.

The document referred to was received in evidence and marked defendant's exhibit No. 67.

Mr. Booth: The clerk has been handed a sheet of one page which I ask to have marked as defendant's exhibit No. 68 for identification.

The Clerk: Defendant's exhibit No. 68 for identification.

Mr. Booth:

Q. This exhibit is headed, "The Pennsylvania Railroad, Freight Service Operating Averages, Calendar Years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 and 1939." Did you prepare this exhibit?

A. It was prepared under my supervision, yes, sir.

[fol. 822] Q. Have you checked it to determine its correctness?

A. Yes, sir, I have.

Q. Are the figures shown in this exhibit or used as the bases for the computations made as shown on the face of the exhibit taken in part from the annual reports of the railroad to the Interstate Commerce Commission for the years mentioned in the exhibit?

A. Yes, sir.

Q. And in part from what other sources are those figures taken?

A. Form OS-A and also form OS-E.

Q. Are the figures used in preparing this exhibit, either those appearing as such on its face or used in the computations, taken from any other source than the annual report and the forms OS-A and OS-E of the railroad company?

A. No.

Q. Do the paragraphs in the footnote entitled "Source" at the foot of the exhibit correctly state the source of the figures shown on the exhibit and where computations have been made the method of computation and the basic data for the computation?

A. Yes, sir.

[fol. 823] Q. You have checked this exhibit to determine its correctness?

A. I have.

Q. Is it true and correct to the best of your knowledge and belief?

A. It is.

Q. The years shown in this exhibit were not selected by you or so far as you know by any Pennsylvania Railroad official?

A. They were not.

Q. The years were requested by the Southern Pacific Company?

A. Yes, sir.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: Yes, I have one question. I notice on the bottom of the exhibit a star referring to item in line 2, "Excludes light train miles." Would that include helper engines running light on their return trip?

A. No, that is my understanding.

Q. Are you sure of that?

A. I am not positive, but the reason we made that note was prior to 1936 the OS-A made no separation of the freight train miles as between ordinary and light and beginning in 1936 we eliminated the light train miles.

[fol. 824] Q. A helper engine returning is classified as "light," isn't it?

A. That is right, that is my understanding.

Mr. Booth: I will bring that out in the examination of another witness regarding the operating practices of the

Pennsylvania which may clear this up. We offer this in evidence as defendant's exhibit No. 68 together with a tender of the reports and forms OS-A and OS-E referred to by the witness.

Mr. Strouss: The same objection.

The Court: The same ruling, it may be admitted in evidence.

(The document referred to was received in evidence and marked defendant's exhibit No. 68.)

Mr. Booth:

Q. Mr. Albert, will you turn to your annual report for the calendar year 1939 on form A, schedule 541, on page 519 and will your give us for the record the grand total of carload traffic for that year in cars and tons?

A. 3,848,237 cars; 145,643,815 tons.

Q. And the less than carload in tons?

A. 3,151,062.

Q. Will you turn back, beginning with page 512 and call off the number of carloads handled in each group, naming the group?

A. Products of agriculture, 411,293 cars; animals and [fol. 825] products, 127,978; products of mines, 1,636,881; products of forests, 134,486; manufactures and miscellaneous, 1,537,599.

Q. What is the predominating carload figure in the item "products of mines"?

A. Bituminous coal.

Q. That is how many carloads?

A. 1,012,250.

Q. What comes next in the number of carloads in the products of mines?

A. Anthracite coal.

Q. That is how many carloads?

A. 185,523.

Q. Have you prepared from that report a statement showing among other things items 110 to 143 inclusive of the products of agriculture? I hand a copy of a typewritten exhibit consisting of one sheet to the clerk and ask it be marked defendant's exhibit No. 69 for identification.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 69 for identification.

Mr. Booth:

Q. Referring to defendant's exhibit No. 69 for identification, does this exhibit correctly show items 110 to 143 inclusive of the annual reports from which you have been testifying?

[fol. 826] A. It does.

Q. That is in the commodities statement under Class I?

A. Yes, sir.

Q. Does it also show in line 800 the total products of agriculture handled by carloads?

A. Yes.

Q. And the grand total of all carload traffic in item 850?

A. Yes, sir.

Q. The only computation on this exhibit is the line headed, "Total 110 to 143 inclusive"?

A. That is correct.

Q. And that is made by you and is correct?

A. Yes, sir.

Mr. Booth: Any questions on this, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Booth: We offer this in evidence as exhibit No. 69.

Mr. Strouss: The same objections.

The Court: It may be admitted. Objection overruled.

(The document referred to was received in evidence and marked defendant's exhibit No. 69.)

Mr. Booth: That is all, thank you, Mr. Albert.

[fol. 827] Cross-examination.

By Mr. Strouss:

Q. Mr. Albert, the figures shown in column C of exhibit No. 67, "Freight Operating and Freight Transportation Expenses Related to Traffic," represent the total of accounts 201 to 462 of Form A, the annual report to the Interstate Commerce Commission, page 304 to 312, accounts 201 to 462, is that correct?

A. That is correct.

Q. And the item in column D represents accounts 371 to 420, the total of those two?

A. Yes, that is correct.

Q. On your exhibit No. 68, line 1, "Miles of line operated in freight service," I notice quite a reduction in miles of line operated. Was that due to abandonment of branch lines that were unprofitable?

A. That is right.

Mr. Strouss: That is all.

Mr. Booth: May Mr. Albert be excused and take his books with him?

Mr. Strouss: He may.

The Court: He may be excused. We will take our noon recess at this time. The court will be at recess until 2 o'clock.

[fol. 828] Wednesday, December 4, 1940, 2:00 P. M.

All parties being represented as heretofore noted, proceedings were resumed as follows:

Mr. Booth: I will call Mr. Gregory for cross-examination. Before we enter on the cross-examination, I have arranged with counsel for plaintiff to put in some commodities by the accounting witnesses who have not yet put them in, similar to the commodity statements put in this morning.

C. G. Gregory was recalled to the stand and testified further as follows:

Direct examination.

(Continued) by Mr. Booth:

Q. Mr. Gregory, you have heard the testimony of Mr. Albert of the Pennsylvania Railroad Co.

A. I wasn't in court this morning.

Q. Well, I will take this another way. Did you prepare this morning or last night from the annual report of the Northern Pacific Railway Co. to the Interstate Commerce Commission for the Calendar year 1939, the statement showing from Schedule 541 of that report the agricultural products by cars, shown in items 110 to 143, inclusive, of the report?

[fol. 829] A. Yes, sir.

Mr. Booth: We ask to have this marked for identification.

The Court: It may be marked.

The Clerk: Defendant's Exhibit 70 for identification.

Mr. Booth: And aside from the totals opposite the word "total" are all of the figures on this statement, Exhibit 70 for identification, correctly transcribed and taken bodily from that report?

A. They are.

Mr. Booth: We offer the exhibit in evidence if counsel has no questions.

Mr. Strouss: No questions.

The Court: The same objections?

Mr. Strouss: The same objections.

The Court: The same ruling.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 70."

Mr. Booth: That is all.

Mr. Mason: Your honor, before the cross-examination, in connection with Exhibit 64, this morning there were certain changes in the references in the footnote entitled "source" which we made by reference, but after further consideration of your honor's remarks, we have retyped [fol. 830] and now present retyped copies of the exhibit, which we would like to substitute for those previously distributed.

The Court: If there is no objection, that may be done.

Mr. Strouss: I have no objection.

Mr. Mason: There is no change in the basic material, just a change in the reference. I will ask that the other copies be destroyed, whether in the possession of the clerk or opposing counsel.

The Court: Just destroy those. You may proceed.

Cross-examination.

By Mr. Strouss:

Q. Mr. Gregory, will you refer to Defendant's Exhibit No. 48, Northern Pacific Railway Co., Freight Operating and Freight Transportation Expenses related to traffic,

column C of that exhibit, the figures set out in that column are the total of items or accounts 201 to 462?

A. Yes, sir.

Q. Of the annual report for May?

A. That is true, and they also include an allowance for transportation investment, which is a credit that comes in below account 462.

Q. And the items or amounts shown in column D are the total of accounts 371 to 420?

[fol. 831] A. Yes, sir.

Mr. Strouss: That is all.

Mr. Booth: No further questions. May Mr. Gregory now be excused and take his reports with him?

Mr. Strouss: No objection.

The Court: Mr. Gregory may be permanently excused.

H. H. Siddall was recalled to the stand and testified further as follows:

Direct examination (continued) as follows:

Mr. Booth: A document of one sheet is being handed to the Clerk and we ask that it be marked Defendant's Exhibit 71 for identification.

The Clerk: Defendant's Exhibit No. 71 for identification.

Mr. Booth: Mr. Siddall, referring to Exhibit 71 for identification, did you prepare this personally?

A. Yes, I did.

Q. Was it prepared from the annual report of the Chicago, Rock Island, Pacific Railway Co. to the Interstate [fol. 832] Commerce Commission for the calendar year 1937?

A. Yes, sir.

Q. The same report to which you have referred in your direct testimony previously?

A. That is correct.

Q. Was this exhibit, with the exception of the line of totals, the fifth line from the bottom of the exhibit, entirely taken verbatim without alteration from the Schedule 541 of that report?

A. That is right, yes sir.

Q. And is it true and correct?
A. True and correct.
Q. You prepared it personally?
A. I prepared it personally.
Q. The totals are correct?
A. The totals are correct.

Mr. Booth: Any questions?
Mr. Strouss: No questions.
Mr. Booth: I offer this in evidence as Defendant's Exhibit 71.
Mr. Strouss: The same objections.
The Court: Overruled. It may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 71.")

Mr. Booth: That is all.

[fol. 833] Cross-examination.

By Mr. Strouss:

Q. Mr. Siddall, referring to Defendant's Exhibit 51, Rock Island Lines, Freight Operating and Freight Transportation Expenses related to traffic, the amounts set out in column C represent, do they not, the total of accounts 201 to 462 of the annual report for May?
A. Well, it goes a little further than that, it goes to the line, Grand Total Operating Expenses, which includes transportation for investment credit. That is on page 313 and it refers to the total freight expense only in column E.
Q. Is that line 247?
A. Yes. That refers to column C on the exhibit.
Q. Column D?
A. Column E here on the ICC report.
Q. I mean your column D on your exhibit is Accounts 371 to 420, I guess?
A. Yes, column D in the exhibit.
Q. Now, referring to your exhibit 52, the reduction in mileage as shown in line one, I don't remember whether I asked you about that before, but does that represent mileage abandoned as unprofitable?
[fol. 834] A. Yes. I believe you did ask me that, I remember answering it.

Mr. Strouss: It seems to me I did, too. That is all.

Mr. Booth: No further questions. May Mr. Siddall be excused?

Mr. Strouss: No objections.

The Court: He may be excused.

[fol. 835] W. M. Burn was recalled as a witness on behalf of the defendant and having been previously sworn testified further as follows:

Direct examination (Continued):

Mr. Booth: The clerk has been handed a document which we ask to be marked as defendant's exhibit No. 72 for identification.

The Clerk: Defendant's exhibit No. 72 for identification.

Mr. Booth:

Q. Mr. Burn, have you prepared from the 1939 annual report to the Interstate Commerce Commission of the Great Northern Railway Company an exhibit which has been handed to the clerk here and marked exhibit No. 72 for identification and which shows from schedule 541 of that report items 110 to 143 inclusive of the carload movement of agricultural products?

A. I have.

Q. And which also shows item 800, total products of agriculture by carloads and classified in four accounts as shown on the exhibit and item 850, the grand total of carload traffic which is already in evidence.

[fol. 836] A. I have.

Q. Aside from the line headed "Total of fresh fruits" and so forth, which is a line of additions, are these figures in this exhibit taken without change or alteration from that report?

A. They are.

Q. Are they correctly set forth on the exhibit?

A. They are.

Mr. Booth: Any questions?

Mr. Strouss: No questions.

Mr. Booth: We offer this in evidence as defendant's exhibit No. 72.

Mr. Strouss: The same objections.

The Court: Objection overruled, it may be admitted in evidence.

(The document referred to was received in evidence and marked defendant's exhibit No. 72.)

Mr. Booth: You may cross-examine.

Cross-examination.

By Mr. Strouss:

Q. Mr. Burn, referring to exhibit No. 46 of the Great Northern Railway Company, "Freight Operating and Freight Transportation Expenses," the amounts set forth in column C of that exhibit represent the total of accounts [fol. 837] 201 to where in the annual report form A?

A. It represents the accounts from 201 to 462 inclusive and from the amounts shown is deducted the item of transportation for investment credit which is shown on page 313 of our annual report to the Interstate Commerce Commission, column E, and one thing further, the figures shown on my exhibit exclude the cost of truck operation which is shown on page 322 of our annual report to the Interstate Commerce Commission for the year 1939.

Q. Column D of your exhibit, that represents the total of accounts 371 to 420 of the annual report?

A. From account 371 to 413 inclusive, exclusive of course of cost of truck line operations.

Q. Defendant's exhibit No. 47, you show a reduction in mileage. Was that due to abandonment of branch lines which were unprofitable?

A. Yes, sir, I gave that answer yesterday.

Mr. Strouss: That is all.

Redirect examination.

By Mr. Booth:

Q. The figures of freight operating expenses represent the freight proportion of operating expenses, do they not? [fol. 838] A. That is right, freight proportion only as the exhibit states.

Q. In other words, for example, superintendence, is that assigned on some basis to freight and passenger?

A. Yes, superintendence, transportation, a very small proportion of that is assigned direct. The balance of the charge is apportioned on a basis prescribed by the Interstate Commerce Commission.

Mr. Strouss: It would be column E of the annual report.

A. Column E of the annual report is the freight proportion.

Mr. Booth:

Q. And the account numbers about which Mr. Strouss has questioned you, are they the same account numbers that are assigned to accounts by the classification of accounts of the Interstate Commerce Commission which has been referred to here in the examination of Mr. Siddall.

A. They are.

Q. In other words, the Commission gives the number of the account and uses the same numbers in both the classification and the annual report, is that right?

A. Yes, sir.

Mr. Mason: I think you stated in answer to a question [fol. 839] from Mr. Strouss that the total of transportation accounts as shown is shown in accounts 371 to 413?

A. Yes, sir.

Q. Have you in mind the accounts 414 to 420 inclusive on page 310 of your annual report which are actually placed ahead of account 413?

A. Yes, sir, accounts 371 to 420 inclusive include the charges before allowance for so-called "joint facility accounts" which are 390, 391, 412, and 413. Charges to those acounts are also included in the transportation rail line expenses.

Q. They are physically placed ahead of account 413 although numerically after it?

A. That is right.

Mr. Mason: I didn't want any mistake to be made.

Mr. Strouss: I was a little confused myself, I didn't quite understand what was meant.

Mr. Mason: I think it should be understood and I think you will agree with me that in each case where the figures are shown opposite certain accounts it is understood only the freight proportion as kept in accordance with the ap-

portionment prescribed by the Interstate Commerce Commission is included.

[fol. 840] Mr. Strouss: Yes, my questions didn't intend to be taken as meaning that he was taking the figures of both passenger and freight.

The Court: Any further examination of this witness?

Mr. Strouss: No.

The Court: If there is no objection he may be excused and take his records with him.

(Witness excused.)

C. L. LaFountaine was recalled as a witness for further examination as follows:

Cross-examination.

Mr. Strouss:

Q. Mr. LaFountaine, I neglected to ask you the other day how far is it from Minneapolis to Seattle.

A. The freight line is 1,777 miles.

Q. In looking over your timetables there appears to have been some changes in the designation of trains on one or two divisions, probably by time-tables issued after your exhibit was made. Could you take your timetable and trace trains 401 and 402 from Seattle to Minneapolis and Minneapolis to Seattle. Let me ask you first, elapsed time [fol. 841] on a division means the time between division terminals, does it not?

A. The dead time at the terminal between arriving time of the train and the departing time of the train, it means the dead time assigned to that division point for making up the train, switching and servicing it.

Q. The elapsed time between division points does not include time at the terminal?

A. No, I understand your question correctly now. From the time they are due to depart from one terminal to the arriving time at the next terminal is the actual time on the road.

Q. Where time on the road is shown between points, would that include the time at terminals?

A. No, it would not.

Q. Will you take your timetables and read into the record trains 401 and 402 between Seattle and Minneapolis, giv-

ing the elapsed time as shown at the bottom of the time-table for each division?

A. Neither 402 nor 401 schedule is maintained by that number on our timetables from Seattle to St. Paul or from St. Paul to Seattle. Over certain divisions this 402 symbol train will be run on a different numbered schedule, so it would not be possible for me to show you just which sched-[fol. 842] ules they might assume. The dispatcher in giving them the orders will run them as 428 quite likely out of Hillyard. I could explain the reason to you for making that kind of timetable on the Kalispell Division if you wish.

Q. You don't have the same schedule every day for that train?

A. You mean by schedule, the same time between Seattle and St. Paul and the same terminal time or do you mean do we have the same schedule number in the timetable?

Q. Do they run at the same leaving time?

A. Yes, we do, regularly. They have a regular time and they are allotted a certain amount of terminal time at each division point.

Q. But that is not shown on your timetable?

A. No, it is not. I couldn't give you that information from the timetable.

Q. It is as to some division?

A. Yes, I could give you this on the Spokane Division.

Q. Is that the only division where this is shown?

A. No, the Minot Division also shows it. 402 is due to leave Interbay, Washington, at 12:01 A. M. and due to [fol. 843] arrive at Wenatchee at 9:20 A. M. same date.

Mr. Booth: That Interbay is Seattle, is it not?

A. Yes, that is the freight terminal four miles east of King Street Station, Seattle.

Mr. Strouss: I wanted to get it in the complete way.

A. We don't have the same numbered schedules on certain divisions.

The Court: I am wondering if this witness were given time if he might furnish you that information from the schedules even though he cannot read it from them.

Mr. Strouss: I understand you Mr. LaFountaine to say that they don't operate that way.

A. Oh, yes, we do. The general superintendent of transportation will prepare a schedule for them to maintain,

allotting them certain running time between each division point and a certain dead time as we call it for preparing the train at the terminal and whether they run the train on 402 schedule as shown in the timetable or as an extra is immaterial to the management.

Mr. Strouss:

Q. But you have a certain fixed time between different terminals?

A. Yes, sir.

Q. Could you prepare that?

[fol. 844] A. I could.

Q. You could probably prepare that before you leave?

A. Yes.

The Court: That train does maintain its identity even though it does not carry the same number?

A. Yes, Your Honor. You will notice even though the train may be run out as 428 it will show the symbol 402, on the 18th or 19th or whatever date it was due to leave its initial station, Seattle in this case and 401 Minneapolis. It is followed on the train sheet all along so the dispatcher and superintendent knows he is handling 402 symbol train through.

Mr. Strouss: If you will do that after you leave the stand, that will be all right.

The Court: It might save a little time for you to make those computations and you will be called back to furnish that information.

Mr. Mason: May the record show the witness has handed to Mr. Strouss a document bearing a designation "Schedule Train 401 and Connections, Effective October 24, 1940" and showing a departure from Minneapolis and times at intermediate points and arrival at Interbay on the fourth date [fol. 845] from the departure from Minneapolis. Is that correct, Mr. Strouss?

Mr. Strouss: Yes.

Mr. Booth: That is what you want, isn't it?

Mr. Strouss: Yes. I offer this in evidence.

Mr. Booth: We have no objection to having it copied into the record.

The Court: You are offering it in evidence as state's exhibit?

Mr. Strouss: If there is no objection, we will have it copied into the record.

Mr. Mason: We have no objection to having it copied into the record at this point. Do you want the connections shown as well?

Mr. Strouss: I don't care about the connections.

The Court: Mr. Reporter, you may copy this particular sheet into the record.

[fol. 846] Schedule Train 401 and Connections

(Effective October 24, 1940)

	Terminals		Schedule	Date	Running Time	Average M. P. H.	Terminal Time
Lv	Minneapolis		7:00 AM	1st			
	91.62				3'45"	24.43	
Ar	Willmar		10:45 AM	1st			30"
Lv	Willmar		11:15 AM				
	112.67				4'45"	23.72	
AR	Breckenridge		4:00 PM	1st			30"
Lv	Breckenridge		4:30 PM				
	167.46				7'00"	23.92	
Ar	New Rockford		11:30 PM	1st			15"
Lv	New Rockford		11:45 PM				
	108.81				4'15"	25.60	
Ar	Minot		4:00 AM	2nd			30"
Lv	Minot		4:30 AM				
	120.32				5'00"	24.06	
Ar	Williston	C.T.	9:30 AM	2nd			30"
Lv	Williston	M.T.	9:00 AM				
	309.38				13'00"	23.80	
Ar	Havre		10:00 PM	2nd			
Lv	Havre		1:30 AM	3rd			3'30"
	104.67				4'45"	22.02	
Lv	Shelby		6:15 AM	3rd			
	50.52				2'15"	22.41	
Ar	Blackfoot		8:30 AM	3rd			15"
Lv	Blackfoot		8:45 AM				
	101.06				6'00"	16.84	
[fol. 847]							
Ar	Whitefish		2:45 PM	3rd			1'00"
Lv	Whitefish		3:45 PM				
	134.55				6'00"	22.42	
Ar	Troy	M.T.	9:45 PM	3rd			15"
Lv	Troy	P.T.	9:00 PM				
	134.67				6'00"	22.44	
Ar	Hillyard		3:00 AM	4th			1'00"
Lv	Hillyard		4:00 AM				
	177.08				8'00"	22.14	
Ar	Appleyard		12:01 PM	4th			1'00"
Lv	Appleyard		1:00 PM				
	153.16				10'00"	15.32	
Ar	Interbay		11:00 PM	4th			

For 5th AM delivery at Seattle from Twin Cities

[fol. 848] Mr. Strouss: Now in looking over your train sheets I notice that the west-bound train 401 during the days covered, that the number of cars in the train at no time exceeded seventy-five and were between sixty-two and seventy-five, while it appeared on the other divisions that they were somewhat larger. What is the reason for that, that you reduced at that point?

A. At what point?

Q. This was on the third division of the Kalispell division?

A. There would be no reason for reducing over that subdivision if we had the tonnage available for the train.

Q. Our checking of your train sheets show that on these days train 401 on the fifteenth, seventy-four cars, on the 16th, 70 cars, on the 17th, seventy-three cars, on the 18th, 75 cars, on the 19th, seventy-three cars, on the 20th, seventy-one cars, on the 21st, seventy-two cars, on the 22nd, sixty-two cars, on the 23rd, seventy-three cars, and on the 24th, seventy-two cars?

A. What was the question?

Q. I wondered if there would be any reason for reducing going over that subdivision?

A. I think I stated in my direct testimony that we had [fol. 849] been holding that train to about seventy-five cars, 3000 tons, in order to maintain our 90-hour schedule.

Q. Our check of your train sheets for that period also showed that during these days over each of three subdivisions there were three passenger trains a day and in no instances did those trains exceed fourteen cars, and in only two instances there were fourteen car trains, and in one instance thirteen car trains.

Q. What passenger trains were they? Can you tell me, please?

Q. I don't have the symbol numbers on these work sheets.

A. Well, I know of my own knowledge we only have two scheduled trains, that is No. 1 and No. 27 westward, and No. 2 and No. 20 eastward; No. 27 and 28 are mail trains, they seldom have fourteen cars so if you have two trains in addition to No. 27 and 28, it would necessarily mean we were running extra sections of trains No. 1 and 2, that being the park season, we were doing that very thing. That is the reason No. 1 and 2 were fourteen cars and under during that period.

Q. I didn't mean there were four trains, three trains.

[fol. 850] A. Three trains in either direction, two sections of Nos. 1 and 27 westward and two sections of No. 2 and No. 28 eastward.

Q. Well, I can give you the number of cars by days. That might indicate a little more clearly. On the 15th, on the first division, there were, west, twelve, twelve and seven cars, and east, six, ten and nine.

A. Well, now——.

Q. That is the number of cars in the three trains?

A. You haven't got the consist?

Q. No, just the total number of cars. On the 16th, eight, eight and seven, that is west, and east, six, nine and nine; on the 17th, eight, eight and seven, west, six, eleven, eleven, east; on the 18th, nine, nine, eight, west, seven, twelve, fourteen, east; on the 19th, ten, eight, five west, six, eleven, ten, east; on the 20th, eight, nine, [illegible] west, seven, nine, eight, east; on the 21st, nine, nine, eight, west, five, nine, nine, east; on the 22nd, eight, ten, eight, west, six, nine, eight, east; on the 23rd, eight, eight, six, west, seven, eleven, nine, east; on the 24th, eight, eight, eight, west, eight, thirteen and eleven, east.

[fol. 851] A. Well, that is right in the middle of the park season and no doubt we were running two sections of trains, one and two, at that particular time, because that would be a little heavier than we would run any of the single trains. We have no through passenger trains in there, it would necessarily have to be two sections of numbers one and two.

Mr. Strouss: That is all.

Mr. Mason: No questions on re-direct.

The Court: May this witness be excused?

Mr. Strouss: Yes, he may, with the records.

The Court: With the records, you may be excused.

Mr. Mason: We will call Mr. Fertig.

[fol. 852] H. R. FERTIG was called as a witness on behalf of the defendant and being first duly sworn, testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you please state your name and residence to the reporter, Mr. Fertig?

A. H. R. Fertig, Assistant Superintendent of Transportation for the Trustees of the Chicago, Rock Island, Pacific Railway Co., Chicago, Illinois.

Q. What has been your experience in railroad service, Mr. Fertig?

A. I have been in my present position since June, 1936. Prior to that time, from April, 1924 to June, 1936, I was chief of yard and terminal operations for the Rock Island Lines, in charge of freight train and terminal operations. Prior to that time I was supervisor of transportation from 1917 to 1924. Before that time I was a Division Car Distributor Supervisor of transportation on the Rock Island Division and also in the same capacity on the Missouri Pacific and the Ann Arbor Railroad from 1907 to 1917.

Q. What was your first railroad employment, Mr. Fertig? [fol. 853] A. Well, my first railroad employment was in the track work on the Santa Fe, but I was made Chief Yard Clerk in 1905 on the Rock Island at Shawnee, Oklahoma, for two years, and then went to the Arkansas Division of the Rock Island in 1907 in a Division position as Car Distributor on the Arkansas Division.

Q. You have been in railroad employment since 1905, then, 35 years?

A. Really since 1901, but in 1905 I went into the supervisory work of the railroad.

Q. As Assistant Superintendent of Transportation what are your duties, briefly stated?

A. Now I have general supervision over transportation, more directly in charge of handling of freight train schedules, the handling of perishable freight and livestock, and the general supervision over merchandise, and coordinated truck operations from the railroad side, not the truck operation as a truck, but the railroad portion of the truck operation.

Q. Do you in the course of your duties have anything to do with the assignment of locomotives?

A. No, that is not at the present time a function of the Superintendent of Transportation. That is handled by the [fol. 854] Superintendents of Motive Power on the three operating districts.

Q. Do you become familiar with the assignments of power?

A. Well, only in a general way that we see on our daily reports of freight train operations.

Q. Do you have anything to do with the distribution and assignment of freight equipment for loadings, for transportation on your lines?

A. No, that is not part of my direct work. We have that in charge in our department, but in charge of regular freight car distributors.

Q. You are familiar with the manner in which that is done?

A. Yes, that was my work for a number of years.

Q. Are you familiar with the different types of equipment, both locomotive and passenger cars, owned and used by the Rock Island Lines?

A. Yes.

Q. Is that necessarily a part of your duties as Assistant Superintendent of Transportation?

A. I wouldn't say it was so much a part of my duties but it is common knowledge that in the transportation department we become familiar with those elements.

Q Are those matters that come under your own observation?

A. Yes, sir.

[fol. 855] Q. Do you have to travel over the system from time to time in the course of your duties?

A. Yes, I travelled very extensively up to a few years ago, not so much now, I am more interested in the reports.

Q. You have made frequent trips over the system?

A. Yes, for 20 years.

Q. You continue to make trips from time to time over the system?

A. Yes, when needed.

Q. I take it that in your experience as an officer on the Division, as well as a general officer on the system you

would become familiar in a general way with the manner in which operations are conducted, trains are operated?

A. Yes, I have direct supervision over and the making of the time freight train schedules, their operations.

Q. Do you know whether the transportation department operates under a set of printed rules?

A. Standard book of rules, yes sir.

Q. You are familiar with that rule book?

A. With the rule book, not so much with the rules; I have no direct contact with the rules.

Q. Do you know anything about the standard code of rules of American Railroads?

[fol. 856] A. No, very little.

Q. Is the Rock Island System equipped with block signals on its main lines?

A. Largely, yes sir, on the more principal rail main lines, it is.

Q. Is there any part of the main lines that you are familiar with which has not block signals?

A. Yes, there is the territory between Memphis, Tenn., and Tucumcari, New Mexico, the Choctaw line, which is a main line under the classification of the commission, that is not automatically equipped.

Q. By the way, what is the total mileage, approximately, I think it is in the record already?

A. About 8,400 miles, I think.

Q. Do you know how much of that is double track or multiple track?

A. Well, only indirectly. No, I couldn't state definitely; I could figure it out mentally in a little while.

Q. The double track is largely in and near terminals or at the eastern end of the System, isn't it?

A. Largely between Chicago and Harrington, Kansas, that is practically all double track but, probably two hundred miles, and it is all double track from Omaha, Nebraska [fol. 857] to Davenport, Iowa, where that line leaves the Chicago to the Texas Lines. It is largely on the eastern portion of the system.

Q. Your company also operates suburban service in and near Chicago, doesn't it?

A. Yes sir, as far as Joliet, 40 miles.

Q. Have you seen the map which was marked for identification, Exhibit 53?

A. The Rock Island map?

Q. Yes.

A. Yes sir, I furnished the information for the detail in the map.

Q. You have seen the map since it was prepared and offered for identification?

A. Not since it has been offered, but I had a copy of it before I came here.

Q. You are familiar with that map, are you?

A. Yes, sir.

Q. Will you say whether or not that is a reasonably correct outline map of the Rock Island System and the territory in which it operates?

A. Yes, that is reasonably correct as a sketch map. It is very probably not correct as to contours and scale, but it is representative.

Mr. Mason: We offer the map in evidence as Defendant's Exhibit 53.

[fol. 858] Mr. Strauss: The same objections.

The Court: Objections overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 53.")

Mr. Mason?

Q. Mr. Fertig, were you furnished in advance of your appearance on the stand with copies of Defendant's Exhibits Nos. 2, 3, 4, 5 and 6?

A. I was furnished copies of the proposed exhibits at the time they were prepared, but not since they have been entered here, the one showing the development of freight equipment, passenger equipment and power.

Q. Those are the exhibits to which I refer.

A. Yes, I have copies.

Q. Now, will you just look at your copy of Exhibit No. 2, which bears the title "Chronology of Freight Boxcars, Southern Pacific Co."

A. Yes sir.

Q. Will you state whether from your observation of Rock Island equipment the development of boxcars owned and used by the Rock Island has generally been along the same lines as indicated by the exhibit?

A. Yes sir, our equipment has been developed practically along the same lines as the sketch has outlined here. [fol. 859] Q. Will you say whether or not your Company now uses largely steel or steel underframe boxcars in the handling of freight?

A. We use entirely, when using cars of our own, our own ownership, the steel underframe, steel superstructure cars. We don't own any solid steel cars.

Q. Do you have any cars of wooden center-section construction?

A. Not in revenue service, we haven't.

Q. All of the cars of your ownership in revenue service are either steel underframe or the other steel characteristics that you have just stated?

A. That is right. We found the last wood underframe car on our line in revenue service a short time ago and withdrew it, the last car.

Q. Will you refer to Exhibit No. 4, which is the exhibit showing the chronology of Southern Pacific coach and chair-car designing and improvement. From your observation of Rock Island passenger equipment, would you say whether or not it has been developed along somewhat the same line as indicated by this exhibit?

A. I would say that represents the development of the Rock Island passenger equipment.

Q. Do you have any wooden passenger equipment now [fol. 860] in service?

A. No, I don't believe we have a single car; the last wood frame equipment in passenger service was in a mine train between Peoria and Pekin, Illinois, which has been abandoned about six or seven years. There was none in revenue passenger service for a considerable length of time.

Q. Do you use any wooden passenger cars in the suburban service at all?

A. Not at all; they are solid steel.

Q. Do the developments of passenger car equipment on your line include cars similar in appearance to the Articulated units shown for 1937 and 1939?

A. Yes, we have the Articulated equipment in our rocket trains operating from Chicago to Denver, from Minneapolis to Houston, Texas.

Q. The Rock Island operates certain passenger trains in through service with the Southern Pacific, does it not?

A. Yes, sir.

Q. Will you identify those trains by name?

A. The Golden State Limited, Nos. 3 and 4; the Californian, Nos. 1, 12 and 13, I believe; we call them the Californian.

Q. Isn't it numbered 43 and 44?

A. 43 and 44. They were at one time numbered 1 and [fol. 861] 2.

Q. Are those the same trains bearing the same names and perhaps the same numbers, which operate across the state of Arizona, including the city of Tucson?

A. They are, yes. We will have another one the fifteenth.

Q. What will that be?

A. The Phoenix Rocket.

Q. Also called the Arizona Limited?

A. The Arizona Limited. That will be a Rocket.

Q. Not a steam train?

A. No.

Q. That is not a steam train on the Rock Island?

A. No.

Mr. Strouss: I am trusting to my understanding that my objections heretofore made went to the oral testimony as well as to the exhibits?

The Court: The record may so show and it is overruled.

Mr. Mason:

Q. Does you Company handle Pullman equipment in its through passenger trains?

A. Yes, sir.

Q. Is that in many cases the same Pullman equipment which is handled in the through Southern Pacific Passenger trains operated jointly with your Company?

[fol. 862] A. Yes, there are through-Pullman cars from Chicago to the Pacific Coast and from the Pacific Coast to Chicago in connection with the joint operation of the through-service.

Q. Those are Pullman cars of standard type?

A. Standard Pullmans, yes sir, and also standard tourists on the Californian.

Q. Will you refer to Defendant's Exhibit No. 5, the chronology of freight locomotives on the Southern Pacific and, looking at that exhibit, state whether there are types of locomotives now used by the Rock Island which correspond to any there shown?

A. The development of the locomotive has been practically the same as that outlined in this exhibit, except we do not go as far as the Southern Pacific in the development of the Articulated Consolidation Engine. We don't own any of those. The 2-10-2 is the largest engine we operate in freight service, largest engine we own.

Q. If you recall, what is the approximate tractive effort of the largest types of 2-10-2 freight locomotives that the Rock Island now owns and uses?

A. About 84,000 pounds tractive effort.

Q. That would be slightly larger than the 2-10-2 shown on exhibit 5?

[fol. 863] A. Yes; I think 75,150 lbs. is the standard tractive effort of the 2-10-2, but through additions and betterments on them, we have increased our present 2-10-2 from 82,000 to 84,000 pounds.

Q. Do you use a Mikado type of locomotive in freight service?

A. Yes, we have some Mikado type, but it is being displaced largely by the 4-8-2 the 5,000 class engine on our line.

Q. The 4-8-2 is a type not shown on this exhibit?

A. You show a 4-10-2. We have a high speed, high wheeled freight locomotive, 4-8-2, which is interchangeable in freight and passenger service.

Q. I will ask you to look at exhibit No. 6, showing the passenger locomotives, and tell me whether the 4-8-2's, to which you have just referred correspond to any locomotive shown on that exhibit?

A. The 4-8-2 Mountain type is the 4,000 class of the Mountain type engine of the Rock Island. That engine is identical with our largest passenger engine.

Q. And that is the engine that is also interchangeable with freight service?

A. No, that is strictly a passenger engine.

Q. Your 4-8-2, used in both freight and passenger serv-
[fol. 864] ice, then is a more powerful locomotive than the Mountain type shown on Exhibit 6?

A. It is; and if I may correct my statement, it is not a 4-8-2 engine, it is a 4-8-4 engine, the freight engine.

Q. What nominal classes do you use? Do you call it the 4-8-4?

A. Yes, the 4-8-4.

Q. You do have a Mountain locomotive?

A. Yes, that is the type that corresponds to your 4-8-2.

Q. You use a Consolidation type in freight service to some extent, do you?

A. On the lighter divisions and on local trains, not the heavier, denser territories.

Q. Do you have a Pacific type locomotive on the Rock Island?

A. Yes, we have a Pacific type on the lighter passenger trains.

Q. Used at times in freight service also?

A. Not regularly, just occasionally in case of breaking them in; they are not regularly assigned to both freight and passenger, they are strictly a light passenger engine.

The Court: Mr. Mason, we will take a 10-minute recess at this time.

[fol. 865] (Thereupon the Court stood at recess.)

[fol. 866] Mr. Mason: Mr. Fertig, do you know and if so will you state whether the Rock Island maintains or participates in schedules for the transportation of freight over its main line.

A. Yes, we do; between Tucumcari, New Mexico, and Chicago, Illinois; between Denver, Colorado, and Chicago and between Minneapolis and St. Paul and Chicago.

Q. Do you also have schedules for freight originating in south Texas and coming to you at your north Texas gateways?

A. Yes, we have schedules out of Fort Worth, beginning at Galveston, Texas, but striking our main operation at Fort Worth, Texas; but there are not as many through schedules as the more prominent gateways of Tucumcari and Denver from the West.

Q. You speak of Tucumcari and Denver. Are those your gateways with other railroads at which you interchange the so-called "transcontinental" traffic?

A. Yes, those are the two important gateways. We also interchange some north Pacific Coast traffic through the Twin Cities, Minneapolis and St. Paul.

Q. By "transcontinental traffic" you understand I mean traffic moving to and from Pacific Coast and related terri-
[fol. 867] tory?

A. That is right, in central and southern California territory.

Q. That would include Arizona, wouldn't it?

A. Yes, the Salt River Valley and the Yuma territory as we designate it.

Q. You speak of the Tucumcari gateway. With what railroad do you connect at Tucumcari?

A. The Southern Pacific.

Q. Do you maintain through schedules with the Southern Pacific eastward and westward between Chicago and related points on the one hand and California and Arizona points on the other?

A. Yes, we do, and also between the Memphis territory and the Southern Pacific connection at Tucumcari.

Q. That is to say, you have east and westbound schedules between the southeastern United States through the Memphis gateway and the Pacific Coast and Arizona?

A. Yes, we have.

Q. What type of traffic predominates in the eastbound movement through the Tucumcari gateway?

A. Perishable freight.

Q. What type of equipment does that perishable freight carry?

[fol. 868] A. Standard refrigerators, practically all Pacific Fruit Express.

Q. Do you operate those Pacific Fruit Express cars over the Rock Island to and through Chicago?

A. Yes, we handle them over our line. We are not a party to the ownership but we handle the cars.

Q. You receive those cars from the Southern Pacific at Tucumcari, do you?

A. Yes, sir.

Q. Do you return the empties through that point to the Southern Pacific?

A. Very much so, yes, we do.

Q. What type of traffic do you handle in westward movement through the Tucumcari gateway jointly with the Southern Pacific?

A. Largely manufactured products, merchandise and an increasing amount of livestock for the Arizona-Phoenix territory and the Coast.

Q. What is the schedule expressed in hours and from what point or points does it apply relating to the movement of the perishable traffic eastward handled jointly as you describe by the Southern Pacific and the Rock Island?

A. The through schedule from the Colton, California, territory to Chicago has always been expressed as the 146-

[fol. 869] hour basic schedule with 16 hour run-off. On the 25th of July, 1940, we shortened that schedule by 6 hours and 30 minutes, making it 139 hours and 30 minutes schedule.

Q. It still contains the provision for the 16 hour run-off, doesn't it?

A. Yes, it includes the provision for the 16 hour run-off but in effect for the last two or three years on account of the situation in the Colton territory as to pre-cooling and other requirements it has been more of a 19 hour run-off than it has been a 16-hour.

Q. Was that schedule always at 146 hours or was it originally some greater figure?

A. As I recall, the build-up of the schedules, that schedule started out with something like 171 hours.

Q. That was around 1920 or 1922, wasn't it?

A. I would have to be corrected on that.

Q. If you don't recall precisely——

The Court:

Q. Mr. Fertig, when you say a run-off of 16 or 19 hours, do you mean you have that much latitude on your schedule?

A. No, it is not what you would term "latitude," Your Honor. The basic schedule is due out of Colton at 3 A. M. the first morning after the loading day, but shipments are [fol. 870] accepted up to 7 P. M. or 16 hours later than the basic 3 A. M. and that 16 hours is required to be run off by the carriers so that that car will make the same 146 hour delivery in Chicago as the car which left at 3 A. M.

The Court: It means expediting the schedule on the cars that come in late?

A. That is right, and yet really it is a schedule 16 hours faster than the first train which was scheduled out at 3 A. M. The situation as to the Imperial Valley and the Yuma district, that schedule is shorter by 13 hours than the schedule from Colton. That territory as I recall has a 9-hour run-off.

Mr. Mason:

Q. That is to say shipments will be accepted so as to leave Yuma 9 hours later than the starting hour from which the schedule operates?

A. That is right. In other words, the basic schedule is due out of Yuma at 10 A. M. and they will accept cars

up to 7 P. M. at Yuma and put them into Chicago on the same arrival hour as the basic schedule leaving at 10 A. M. in the morning.

Q. Is there a schedule also from the Salt River Valley?

A. The basic schedule from the Salt River Valley is due out of Phoenix at 12:01 A. M. the first day after the loading [fol. 871] date with a 3-hour run-off, that is, up to 3 A. M. cars will leave and overtake and make the same arrival at Chicago.

Q. Then to answer His Honor's question succinctly, the run-off means that the later cars will be so run in their trains as to run off the time interval between their departure and the departure of the first schedule of that day?

A. That is true, and that is brought about by the fact that all perishable freight in these three main producing territories is not all produced close to the departing terminal. In other words, that gives the shipper at the outskirts the same privilege in Chicago as the men who may have his orange groves close to Colton terminal. It puts the consignee on the same basis and therefore it is necessary for the trains leaving after the basic hour to run that much faster than the basic schedule.

Q. From the standpoint of the marketing of fruit at Chicago what is the effect of this run-off upon the various producers which you say are located at different distances from the concentration point?

A. It puts them all on a parity. They all have the same market privilege. The guaranteed schedule provides that [fol. 872] Chicago traffic will be available for 7 A. M. delivery the seventh day from Colton, the sixth day from the Imperial and Yuma districts and the fifth day from the Salt River Valley district.

The Court:

Q. Is there a penalty for failure to maintain that schedule?

A. There is this penalty, Your Honor, that it is always subject to a market loss in the form of a claim, a claim for a market loss. There is no penalty in the sense that sometimes the extra fare train carries a refund if it doesn't make its schedule, but you are subject to a claim without recourse because it is a guaranteed schedule.

Mr. Mason:

Q. You mean, for example, if the oranges were worth five dollar a box on the date when they should have been delivered and only four dollars a box on the date when they were delivered, the carrier might be subject to a claim for the difference because of loss of market.

A. He is, yes, and he has very little ground to stand on to void such claim because that is an agreed guaranteed schedule by the Association of Railroad Executives.

Q. Is the Southern Pacific a party to that schedule with the Rock Island through Tucumcari?

A. Yes, I am sure they are, all of the western railroads [fol. 873] are parties to the schedule.

Q. You speak of the run-off time. Is a portion of that time assigned to the Rock Island to be run off?

A. Yes, it is. Up to 9 hours from Colton. The Rock Island and the Southern Pacific or reversed, the Southern Pacific and the Rock Island divide the run-off, each line running off—that would be 6 hours—3 hours and one-half. After the 9 hours the Southern Pacific runs off a little more than the Rock Island because of the greater distance they haul the freight as compared with the limit of the run-off territory which is Herington, Kansas only about 400 miles beyond the junction point between the Southern Pacific and the Rock Island.

Q. When you speak of the limit of the run-off territory, does that mean the time which must be run off must all be accomplished by the time the traffic reaches Herington?

A. That is true, is must all be run off before the train leaves the last terminal, before the arrival at Kansas City.

The Court: Why is that, Mr. Fertig, because of the densely populated area there slows you down?

A. Your Honor, as near as I can answer that is by saying that Kansas City is a very important distributing center for [fol. 874] perishable freight and if we did not give the Kansas gateway the same benefit of the on-time performance on perishable freight as Chicago would get, or St. Louis, which is also one of the guaranteed points, then freight could move by Kansas City so late that Kansas City lines would not be able to compete in the business on the through haul while we might have the business on time at St. Louis and Chicago, so to protect the important trade

center we give Kansas City on-time performance on the same basis as we do Chicago or St. Louis.

Mr. Mason:

Q. That also enables your company to compete for traffic which may be destined for Kansas City instead of Chicago or St. Louis?

A. Yes, it does that, but on the other hand it also enables the Kansas City-Chicago-St. Louis lines to compete with traffic which we could handle through to Chicago and St. Louis and which we would very much like to have.

Q. You mean lines like the Alton?

A. The Wabash has been probably more aggressive, probably they get about half of the perishable freight from Chicago that we bring into Kansas City. I simply state that so elaborately to show that the eastern bound freight schedules are largely controlled by the interest of the pro-
[fol. 875] ducer and receiver of perishable freight.

Q. Now as to the westbound, do you have a guaranteed or an advertised schedule held out to the shipper for the movement of westbound freight?

A. Yes, all lines now guarantee a six-morning delivery on the Pacific Coast with an arrival not earlier than 11:30 P. M. on the fifth night.

Q. Does that mean that freight loaded at Chicago will be delivered in Los Angeles on the sixth morning?

A. The sixth morning up to I think it was the fifth of July, 1940, it was the seventh morning guaranteed delivery but on account of the fact that the carriers did arrive on the fifth night there was nothing to be gained by holding the freight over and it was opened up for sixth day delivery.

Q. Does that guarantee of the sixth morning delivery represent any reduction in the scheduled delivery time as compared to earlier years?

A. Yes, that represents at least two days' better service from the Middle West to the Pacific Coast than they have had in previous years. It is one day better than they have had for the last five or six years.

Q. Prior to that was there a longer schedule?

[fol. 876] A. As I recall, in the earlier days westbound schedule it was the eighth day.

Q. That was about 1930 or 1932?

A. Something like that. I didn't come into the direct handling of freight schedules until 1936 but it was largely the westbound movement of the automobile and accessories which brought about the better schedule westbound.

Q. Does the schedule contemplate corresponding deliveries at points in Arizona to correspond to the shorter haul?

A. Yes, it produced a four day delivery at Phoenix and correspondingly shorter time to Tucson and El Paso, Texas, than in previous years.

Q. Are you familiar with the extent to which your company makes delivery of the eastbound perishables in accordance with the schedule requirements.

A. At the eastern gateways?

Q. Yes, or at Chicago.

A. Yes, sir.

Q. What is the approximate percentage according to the knowledge gained by you in your position of on-time deliveries in accordance with this schedule for any typical recent period.

A. Speaking of our own line, I say that our on-time per-
[fol. 877] formance represents 100 per cent from the Colton territory and not less than 98 per cent from the Salt River Valley and the Imperial Valley.

Q. Do you have corresponding on-time performance on traffic destined through the Memphis gateway?

A. Well, I wouldn't say that it is nearly as 100 per cent on time on account of the light traffic over that particular territory. The trains handling the eastbound perishable freight also are required to handle the ordinary freight so I would say that the on-time performance through the Memphis gateway would be about 85 per cent.

Q. Does your line handle this perishable traffic or interchange with eastern connections at or near Chicago?

A. Yes, we take it into the outer yard at Chicago, indicated as our Blue Island yard, where the greater portion of it is delivered to the eastern lines through the Indiana Harbor Belt.

Q. That is a local terminal line around Chicago is it?

A. Yes, that is an intermediate and switching line.

The Court: Do I understand you to say that you had a westward movement of livestock through the gateway of
[fol. 878] Tucumcari?

A. Yes, Your Honor, there is a very extensive movement of hogs to this Tovrea—if that is the name—at Phoenix, and also to Los Angeles. There is a substantial movement of hogs from the Oklahoma City market.

The Court: But not cattle.

A. No, not cattle, it is practically all hogs. I don't know of any westbound cattle movement.

Q. I didn't think it was possible that cattle were moved westward?

A. No, neither cattle nor sheep. We get a great many cars of sheep from the Colton territory in California for eastern pastures and markets.

Mr. Mason:

Q. You have quite a movement of lambs to mid-western markets out of Arizona every spring?

A. Yes, we do, they are lambs rather than sheep I would like to add to my statement of on-time performance that St. Louis is an important eastern gateway on perishable freight and I would say that the on-time performance into the St. Louis distance would be 100 per cent on all California and Arizona perishable freight.

Q. You spoke of the interchange with the Indiana Harbor Belt at Blue Island near Chicago?

[fol. 879] A. Yes, sir.

Q. Does the Indiana Harbor Belt hand that traffic over within your knowledge to eastern trunk lines?

A. Yes, they do. They have a set schedule of deliveries on all eastern perishable freight and have what is termed a "cut-off hour" after which they will not guarantee a connection with the eastern line train.

Q. What are these eastern lines by name?

A. The principal perishable freight lines are the Erie first, the Pennsylvania, the B. & O., the New York Central, the Michigan Central, the Grand Trunk. I don't infer that that is in the order of their importance but I do place the Erie first. The others are just responsible eastern perishable freight carriers and also in connection with that movement there is a guarantee on the part of western lines which is not participated in by the eastern carriers, a guarantee that we will make this train. The eastern line does not guarantee that we will make it.

[fol. 880] Q. That is the same character of guarantee that you hold out for delivery to the Chicago Auction?

A. On the team-track and on the Chicago Produce Terminal Auction.

Q. Suppose you failed to make this guaranteed delivery to the eastern connection, does any claim arise on behalf of the receiver at the point of delivery on the eastern seaboard?

A. I will answer that from a transportation standpoint only, that I handle a large number of claims which are the result of a failure to make the New York and Boston markets, and we are called upon to support our on-time delivery to the eastern line at Chicago. If, for any reason, we are late on our cut-off and the car doesn't move on the designated so-called seven A. M. train, then we are responsible for the claim. If the car has made the seven A. M. train and the delay is on the eastern line, then it is their responsibility.

Q. Have you the figures to show the total volume of the perishable traffic received by you from the Southern Pacific at the Tucumcari gateway during 1939?

A. We had approximately 43,000 cars of eastbound perishable freight through Tucumcari during the year 1939 and [fol. 881] up to the first of December, 1940 the total has been 42,500 cars so that when December is in the figure for 1940, it will probably be a little better than it was last year.

Q. Those 43,000 cars in each of these last two years, including the current year, represents perishable freight originating largely and almost entirely in California and Arizona, and handled by the Southern Pacific to your line at Tucumcari, is that correct?

A. Yes, practically all of it. There is some movement through the Nogales gateway of Mexican perishables, which is a very small proportion of the total.

Q. When the perishable freight comes to you from the Southern Pacific, are the cars grouped in trains, or by blocks, and, if so, how are they designated?

A. The Southern Pacific has a system of block identification, which is not carried out on the Rock Island beyond Tucumcari.

The Court: What do you mean by a "block"?

A. A block, your Honor, identifies the time that particular bunch of cars left the point of origin, and which determines how much run-off there is. They number those blocks—I [fol. 882] will not state definitely, a Southern Pacific man

can better state, but I know the blocks are running as high as 674 and 675. Block 674 may have left Colton at three A. M., which Block 675 might not have left until ten o'clock, but they would all come into Tucumcari in the same train. They maintain the identity of the cars in those individual blocks; we don't do that.

Q. Do you identify the cars in any other way on your line?

A. Yes, we have a system of symboling each individual car. We have assigned to the different stations on our line of such importance as to originate high-class traffic, a series of numbers and identifying code, and whenever a car of that class of traffic is loaded and billed at that station it is given a code and a number, so at Tucumcari the Tucumcari station symbol CA is stamped on each waybill and a consecutive number is given to the cars in that train. That is our identification of the car.

Q. That is how you follow it along the line?

A. Yes, that is telegraphed to Chicago with the car number and the contents, the point of origin, consignee, destination, and routing. That is the way we maintain our records [fol. 883] in Chicago by the individual car, although we do keep a record of the block, but not from an operating standpoint. We carry that record through to Chicago on our daily reports, but nothing to do with the individual car in the block.

Q. That is for the purpose of informing the shipper and perhaps the Southern Pacific of the progress of the block, isn't it?

A. That is right, we make a back report to the Southern Pacific and our Pacific coast representative, showing the time the individual blocks arrive at Kansas City, Chicago and St. Louis.

Q. Did you for the purposes of this case make a study of the handling of freight trains between certain terminals during the first ten days of April, 1939?

A. Yes, we were requested to make a survey and an exhibit of the movement of freight trains in each direction over a representative portion of our railroad during a normal period of ten days. In order to do this, we arrived at the first ten days of April as being a representative average period of operation.

Q. Did you prepare a statement entitled "The Chicago, Rock Island and Pacific Railway Company, Typical Ex-

amples of Freight Trains Handled between Certain Ter-
[fol. 884] minals, April 1st to 10th, inclusive, 1939."

A. We did, we prepared that statement under my supervision.

Q. Was it prepared in your office?

A. No, it wasn't prepared in our office. It was prepared in the office of Record of Car and Train Performance by the auditor of car accounts in Chicago, who has the wheel reports of all trains on file.

Q. Did you supervise its preparation in that office?

A. I supervised the preparation of it to the extent of knowing the source of the information and checking the record to see that it was properly compiled on the basis of the requested detail.

Q. Do you know the method followed in preparing it?

A. Yes, sir, we outlined how it would be determined so we would get all of the record.

The Court: Who selected this period April 1st to 10th?

A. We selected this period by taking all of the operating records, that is, the operating sheets as we term them, for the divisions over which these trains operated for the year 1939, and took the high and low periods and arrived [fol. 885] at this as being an in-between or average period of time, not a low, or not a high. If we had chosen the first of May, we would have probably distorted the record by the fact that then we would be developing our grain car supply for our June and July grain movement, which would have a tendency to show an abnormal train haul. We took this particular period because the winter vegetable movement had been dropping off so we were about normal over this particular territory.

Mr. Mason: Irrespective of your inspection of the records, and relying solely upon your own knowledge, would you say the month of April, and particularly the first ten days of April, are reasonably representative of the average year, generally speaking, on the Rock Island?

A. Yes, I would say they were reasonably representative of the average performance. Our railroad is one of high peaks, and this would be representative of the average business we handle for the railroad.

Q. And representative likewise of the average movements of long as well as short trains?

A. Yes, it would.

Mr. Mason: I should like to have this statement marked for identification.

[fol. 886] The Clerk: Defendant's Exhibit No. 73 for Identification.

Mr. Mason: From what sources was the information upon Defendant's Exhibit 73 taken?

A. They were taken from the original records of the conductor handling the individual trains over the several divisions and subdivisions included in the exhibit.

Q. Are those the so-called Conductor's Wheel Reports that you referred to?

A. They are the conductor's wheel report, the original record.

Q. Has any check of this information been made against the dispatcher's train sheets?

A. It was made against the dispatcher's train sheet to the extent of determining the engine number on the train over each subdivision so that we would know that we had taken the total number of trains operated over the district.

Q. Then this represents all trains operated over these particular districts during the period studied?

A. All trains except light engines without cabooses.

Q. What is the source of the information of ruling grade, Column F?

[fol. 887] A. That was taken from the condensed profile of the line between the points indicated in the second and third columns of the exhibit.

Q. Do you have in the court room the conductor's wheel reports which were used in the preparation of this exhibit?

A. I have.

Q. Do you have the dispatcher's train sheets?

A. I have.

Q. Do you have the condensed profiles which were used in obtaining this ruling grade?

A. I have the condensed profiles between Chicago, Illinois, and Tucumcari, New Mexico, the territory covered by this exhibit.

The Court: May I interrupt with a question. The exhibit shows that it is between certain terminals. In your state-

ment a moment ago you said between Chicago and Tucumcari. Do I understand it covers the entire operation between Chicago and Tucumcari, or just certain sections?

A. No, sir, this exhibit covers the entire territory between Chicago and Tucumcari in both directions.

Mr. Mason: You have a number of intermediate terminals in that territory?

A. Yes, the Rock Island like, I presume, all other [fol. 888] railroads, is broken up into operating divisions, and those divisions are likewise broken up into subdivisions which represent ordinarily the train mileage as between terminals. In some cases, as may be brought out, the train was operated even between points, which are not both subdivision terminals. For instance, if the train came down the Chicago to Tucumcari line to Bureau, which is west of Chicago, and continued on down an auxiliary line to Bureau, Illinois, the mileage on this exhibit only shows between the main line operated points, or Blue Island Yard, and Bureau.

Q. I notice you have referred in your testimony to the entire line between Chicago and Tucumcari, whereas the exhibit refers to Blue Island, as I see it, the most easterly point.

A. Of course, Blue Island is not Chicago, but it is only separated from Chicago by a street, and we term everything Chicago. Blue Island and, in fact, our yard, Burr Oak, which we more usually refer to, is in Blue Island, and all of them go to make up the Chicago territory.

Q. Is it correct that Blue Island is the location of your terminal yard, at which your through freight trains carrying freight to and from Chicago originate and terminate?

[fol. 889] A. They originate and terminate at Blue Island, lying in Burr Oak yard.

Q. Will you refer to Exhibit 53 in evidence. You show in heavy black line a portion of the system between Blue Island and Tucumcari. That is the district to which this freight train operating exhibit relates, is it?

A. That is true. Blue Island is 17 miles from the La Salle Street terminal in Chicago, which is the terminus of the Rock Island Railroad. The freight operation begins and ends at Blue Island. Everything east of Blue Island in Chicago is handled in yard transfer service and not by train.

Q. That was not a transfer operation from Blue Island?

A. Purely a terminal transfer operation.

Q. You say you have all of these underlying documents present in the court room. Are they available for the use of opposing counsel?

A. They are, separated as between operating divisions and days from April 1st to 10th, inclusive.

Q. You spoke of the conductor's wheel report. Will you take one of those out of the package. Is the conductor's wheel report a record of the cars in the train in their order from the caboose to the engine?

[fol. 890] A. Yes, it is. The wheel report originates in the dispatching terminal, where it is set up in that order from the caboose to the head car in the train.

Q. And lists each of the cars by initial and number and whether loaded or empty?

A. That is right, and contents and destination is put in by the yard. The conductor fills out the distance hauled and the point where he set the car out, and if he picks up cars on the line he adds those to the original wheel report which he had leaving the terminal.

Q. Does the conductor make any check of the wheel report against any other documents in his possession?

A. He has to have under our operating requirements the waybill for each loaded car or empty tank car, and an empty slip bill for each other car in his train which is empty. As soon as he can, if he does not do it before he leaves the terminal, he must do it at some point after leaving the terminal check his wheel report against the date for forwarding the car, either the waybill or the empty slip bill to determine that he has authority for handling the car in his train.

Q. Does the wheel report also show the time of departure at the original terminal?

[fol. 891] A. It does. It shows the time of departure from the original terminal and the time of arrival at the final terminal, but no other intermediate information unless he handles livestock; then he very properly makes a record as to the requirements under the 28-hour or 36-hour law.

Q. Does it show the miles from terminal to terminal?

A. Yes, he shows the miles and it shows the miles that he handles the car either loaded or empty.

Q. Does it show the name of the conductor?

A. Yes, and the engineer.

Q. And the number of the locomotive?

A. Yes.

Q. Does it show the number of the train if there is a different designation than the number of the locomotive?

A. Yes, it does if he operates as a regular schedule train. Otherwise, he simply writes "Extra" in front of the engine, or makes an "X" to indicate extra. I might say in connection with the importance of that record on our railroad, that is the source from which the auditor of car records secures his information as to the gross and net ton-miles and loaded and empty car-miles.

Q. Did you from the use of the wheel report determine [fol. 892] which were perishable loads and which were other loads in the train which you studies and which are shown on Exhibit No. 73?

A. Yes, in order to determine that separation which was requested as between perishable freight and non-perishable freight it was necessary to go to the wheel report to determine that information, as the train sheets do not separate as between classes of commodities in cars.

Q. Has Exhibit 73 for Identification been checked as to its details of these underlying sources to determine its correctness?

A. Yes, it has been checked.

Q. Did you participate in that check?

A. Yes, I did.

Q. Will you say whether or not from that check the exhibit is true and correct?

A. To the best of my knowledge and belief it is correct.

Q. I notice on the second sheet in a block at the foot of the sheet there are certain computations. Were those computations made from the other data appearing on the face of the exhibit?

A. They are the reduction to percentages and the total number of trains in each separation in the exhibit.

[fol. 893] Q. Were those computations made by yourself or under your direction?

A. They were made under my direction, but not by me personally, because this was prepared by the force of the auditor of car accounts as to the detail and the original typing was done by the general auditor.

Q. Has the computation been checked to determine its correctness?

A. Yes, the computation has been checked to determine the accuracy of the percentages and the number of trains?

Q. These computations are capable of check from the face of the exhibit, are they not?

A. Yes, they are. The individual record, A, B, C, D columns, could only be determined by a check of the wheel reports, of which there are 1,021. I think we were rather elaborate in our preparations, but at least we have a comprehensive picture.

Mr. Mason: We offer the exhibit as Defendant's Exhibit 73.

Mr. Strouss: Mr. Fertig, in response to the question of counsel or the Court as to how you happened to take this period, you stated, "We took this period." Who do you mean by "we"?

[fol. 894] A. I mean by "we" those who were designated to determine the proper period of time to cover by the exhibit.

Q. Who was designated?

A. Mr. Siddall was the officer in charge of determining that information. At the time the request came for this detail, I was not available in Chicago and in order to expedite the record the general auditor assigned Mr. Siddall to work on the matter until I returned to Chicago. On my return to Chicago, he and I worked together on the matter, and I approved of taking this particular ten days from my personal knowledge and perusal of the records, which had been gone into to determine the proper data.

Q. You say your road is a road of peak movements, high and low. Of course you mean by that, volume?

A. Yes, car volume as well as tonnage volume.

Q. In arriving at this average, do you mean the average taken of the volume traffic to arrive at your typical ten-day period?

A. Well, I would say that would be a reasonable statement, yes.

Q. You didn't then go into it to determine the typical train movement rather than the volume of traffic [fol. 895] moved?

A. Only to the extent that we are conversant with the fact that during our peak movements we have a longer train haul than we do during a slack period of business.

Q. These wheel reports, of course, only refer to the particular train. They don't purport to show all of the trains that were moving at that time, or to show how many trains may have been moving on that division at that time, or on any division?

A. I hope I understand what you mean, but I will say this, that it does include during that ten-day period all freight trains that were moving on any one or all of the ten days.

Mr. Mason: You mean Exhibit 73?

A. Yes.

Mr. Strouss: The wheel report upon which that is based. There are a number of wheel reports?

A. Yes—for that day?

Q. Yes.

A. This one I handed counsel contained all of the wheel reports for that particular division for that day and in that number are all of the trains over this particular territory which operated in both directions on that day.

Q. Except light trains?

[fol. 896] A. Except light engines returning from helper service, or braking engines over the road which are not in charge of train crews.

Q. When you stated that it showed the movement from Chicago to Tucumcari, you don't mean that it showed the train moving all the way from Chicago to Tucumcari, but you mean different trains that were operating on different divisions during that particular day?

A. Yes, sir, that is true. It is all trains over all subdivisions on all days, not the individual train identified through from the point of origin to its final destination.

Q. And each train on its subdivision is counted as a train?

A. That is true. That is a train until it is released by the crew.

Q. And it is a train for each subdivision through which it passes?

A. That is true, or for any distance over the line if it comes under the designation of a train.

Q. What I was trying to bring out is, if you start a train from Chicago and it passes through several divisions, it

would be counted—if it passed through four divisions, it would be counted as four trains?

[fol. 897] A. Yes, four divisions to make it more definite, but also if it operated from one subdivision terminal to another subdivision terminal only, it would be one train.

Mr. Strouss: We have the same objection.

The Court: The objection is overruled. It may be admitted in evidence.

Mr. Strouss: And the further objection to this exhibit that we made to the others of the same type, that it is a selection of typical days and is calling for a conclusion.

The Court: That objection is also overruled.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 73.")

Mr. Mason: Referring to Exhibit 73, the types of locomotives which you show here in various columns, are those the same types to which you referred in your testimony in discussing Defendant's exhibits 5 and 6 and your own locomotive equipment?

A. Yes, those are the types of engines I referred to; the Mikado, the Mountain type, the 4-8-4, the Consolidation engine over the territory until we reach Dalhart, Texas, and there it takes up the 2-10-2. That is the only division or subdivision on the railroad where the 2-10-2 engines are used so they do not show in any train records east of Dalhart, Texas.

[fol. 898] Q. You have included trains performing local service as well as through trains on this exhibit.

A. Yes, all trains which were handling cars.

Q. I notice here, for example, a train operating, a number of trains, eight altogether, operating 57 miles between Silvis, Illinois, and Columbus Junction, Iowa. Is that distance of 57 miles an entire subdivision?

A. That doesn't happen to be a subdivision, as I stated, that is a local subdivision. In other words, that record indicates the local trains operating between Silvis and Columbus Junction, which was the terminus of the local. You will find several cases of that kind, and in the opposite direction you will find Columbus Junction to Silvis. That is the eastward movement of the same local trains.

Q. Is there another example in the operation over 46 miles between Washington, Iowa, and Elden, Iowa?

A. That is a continuation. Now, that operation of those two trains in there cover the one subdivision between Silvis, Illinois, and Elden, Iowa. The first local operates between Silvis and Columbus Junction in both directions, in each direction, then there is a local operates from Elden, [fol. 899] Iowa, east to Washington, Iowa, 46 miles, turns at Washington and runs from Washington back to Elden. That is his day. There is a territory between Columbus Junction and Washington, about 23 miles, where there is no local service, because there is only one unimportant station in there and it doesn't require any local train in there.

Q. If any service is required, it can be done by a through train?

A. By trains operating between Elden, Iowa, and Silvis, that distance of 120 miles.

The Court: The Court will be at recess until ten o'clock tomorrow morning.

(Thereupon, the Court stood at recess until Thursday, December 5, 1940, at 10 o'clock A. M.)

[fol. 900] December 5, 1940. 10:00 A. M.

All the parties being represented as heretofore noted, proceedings were resumed as follows:

The Court: I believe you were still on the direct examination of Mr. Fertig?

Mr. Mason: That is correct, yes sir.

The Court: You may proceed.

H. R. Fertig, a witness called on behalf of the defendant, resumed the stand and testified further as follows:

Direct examination (Cont'd).

By Mr. Mason:

Q. Mr. Fertig, in the course of your testimony you spoke, I believe, of the receipt of perishables from the Southern Pacific to be delivered to your line at Tucumcari, New Mexico, for continued eastward movement. Now, does the perishable traffic come to you in solid train loads at Tucumcari during the busy season?

A. It comes to us in practically solid train loads. Not all of it for the main line territory covered by the exhibit, that is, between Chicago and Kansas City and Tucumcari. Part of it goes out over the Texas and Mexico Lines, but it is largely in solid trains.

[fol. 901] Q. You continue to handle it in solid trains from Tucumcari eastward?

A. Yes, our movement out of Tucumcari is entirely governed by the trains into Tucumcari.

Q. Well, for example, if the traffic moving to Kansas City and points beyond via the main lines through Dalhart and Harrington is in a block of 70 cars, do you carry it forward in a block of 70 cars?

A. Yes, we do, we take the main line business in the one train.

Q. Now, do you ever consolidate trains turned over to you at Tucumcari, or blocks turned over to you at Tucumcari, into larger trains?

A. We are not able to consolidate the trains at Tucumcari for the reason that the grade between Tucumcari and Obar, about 50 miles out of Tucumcari, is such that 3,500 tons is the load limit over that grade, so therefore, when the Southern Pacific brings in two trains we are required to operate two trains out of Tucumcari, but when those trains are so operated into Tucumcari that they can be consolidated at Dalhart, Texas, the first terminal out of Tucumcari, then we can consolidate two of the Southern Pacific trains into one consolidated train beyond Dalhart.

[fol. 902] Q. How far is it from Tucumcari to Dalhart?

A. Ninety-three miles.

Q. Then you do consolidate trains at Dalhart in some cases?

A. We do our consolidating at Dalhart. If and when the Southern Pacific brings three trains into Tucumcari, then we can consolidate the three trains into two 3,500-ton trains at Tucumcari.

Q. Do you hold part of the tonnage then at Tucumcari in order to make that consolidation?

A. No, we cannot do that, because there would be nothing gained in making one 3,500-ton train and then running the balance of the traffic in a train of probably 1,000 tons. So therefore, we include the two trains at different

tonnages into Tucumcari for the main line at 2,000 tons per each train.

Q. What is the load limit, the practical limit of the train from Dalhart eastward?

A. That tonnage starts out of Dalhart at 4,500 tons and gets up to as high as 5,800 tons between Dalhart and Pratt, Kansas.

Q. What length of train of loaded cars of perishables has the 4,500-ton limit loading?

A. The 4,500-ton limit would load between ninety and one hundred cars. It would depend altogether on the [fol. 903] traffic in the train. It is not always a solid train of refrigerator cars or heavier commodities. Therefore, we handle out of Dalhart in our consolidated expedited train from 110 to 115 cars of fruit and box car freight.

Q. Do I understand you to say that if three Southern Pacific trains are brought over to Tucumcari and turned over to you that you can consolidate them to 3,500 tons per train for a movement eastward from Tucumcari?

A. Yes, we can do that.

Q. Does that often happen?

A. No, it does not, on account of the way the fruit reaches Tucumcari. It is not always advisable to hold the first train for the second train, on account of the fact, as I stated yesterday, that trains do not always operate on first schedule.

Q. In other words, they come into Tucumcari at intervals far enough apart so that you do not feel able to hold them, is that it?

A. That is true. We do not always feel able to do that on account of the fact it would delay the first block. But if the trains were so regulated across the block that the heavier trains could arrive at Tucumcari as the now single trains arrive, then those consolidations would be possible. [fol. 904] Q. Does this consolidation at Tucumcari, when you are able to do it, or at Dalhart, result in any delay to the fruit as regards its arrival on schedule at Kansas City or points east?

A. No, on the contrary, we find that the consolidated train will make a better movement over the entire section of the railroad than the same amount of freight operated in two trains, for the reason that it reduces the number

of meeting points and the operating delays of the section, or the first section of the train.

Q. Does it reduce in any respect the amount of the terminal delays, the switching delays at the terminals?

A. Yes, very materially, for the reason it is operated on through-schedules, and reduces the units to be handled, it reduces the number of engines to be handled in round houses and the number of cabooses to be entrained and detrained, and as a general thing it is very much easier to operate a consolidated train from an operating standpoint.

Q. You spoke of entraining and detraining cabooses at terminals. Is that the changing of the caboose made at each freight division, freight subdivision terminal?

A. Not at each subdivision terminal, but at each division [fol. 905] terminal. We have some subdivision terminals which are not terminals for the through trains.

Q. Is it made at each terminal where the crew is changed?

A. It [illegible] We change all our caboose at crew-change points.

Q. Does each crew have its own assigned caboose?

A. Yes.

Q. And the change is made because of this caboose assignment?

A. Yes, we very much prefer handling cabooses through that plan.

The Court: Locomotives change at the same points the cabooses do?

A. Not always, your Honor. The locomotives are often run through and for that reason there is a terminal detention to the train when you have to service the engine and move it out on the connecting train. When you have a solid train you have but one engine to service at the terminal. Where you have two sections of this train, you have two or three engines to service, so that by the time the third section has finally left the terminal it tends to lose time instead of making up time, as compared with the heavy train.

Mr. Mason: Do you desire to cross-examine now, Mr. [fol. 906] Strouss?

Mr. Strouss: No.

Mr. Mason: Will it be satisfactory to defer the entire cross examination, then?

Mr. Strouss: Yes, I would prefer to.

The Court: You may step aside, then. Cross examine later.

[fol. 907] C. R. Young was recalled to the stand and testified further as follows:

Cross-examination:

By Mr. Strouss:

Q. Mr. Young, who selected the particular divisions of your railroad that were used in making up your exhibit No. 30 that is entitled "Typical Examples of Through Freight Trains Handled"?

A. I did.

Q. What was the reason for taking the particular divisions that you did take?

A. We undertook to set up a picture that would give a fairly concise conception of all phases of the operation of the Illinois Central. You will notice that in some of those territories the grade was heavy and in other territories it was almost level.

Q. Now, in going over your train sheets, I notice that during this ten-day period you had eight trains with either a broken knuckle or pulled draw bar. All were over 60 cars and six were over 70 cars. I wonder if you can state whether that is true?

[fol. 908] A. I didn't examine the train sheets, Mr. Strouss, for that detail, but I suspect that in that period there would be as many broken knuckles and draw bars pulled out in trains of less than 70 cars as there was.

Q. Wait a minute. Not what you suspect. I would like to have you examine the train sheets and testify to what the train sheets actually showed and see whether my statement was correct or not.

Mr. Booth: We think that is not proper cross-examination. We didn't ask him about anything about accidents happening on the train. To ask the witness to go over a number of train sheets is going entirely outside the scope

of direct examination. There is a safety feature of this case which is a branch of our case, which, except in the most incidental manner, we haven't approached in this branch of the case and don't intend to approach. We submit it is not proper cross-examination.

The Court: I understand that this data you are asking about is contained in the books and records produced here by this witness?

Mr. Strouss: On the train sheets that were produced, yes, sir.

The Court: Overrule the objection.

Mr. Strouss: I would like to have Mr. Young check that [fol. 909] later.

The Witness: You can give me the dates and the trains that you selected.

Mr. Strouss: Yes.

The Witness: I will be very glad to do that.

The Court: Now, Mr. Strouss, if this is going to take some little time for the witness to check that, we might defer his making that examination until recess.

Mr. Strouss: Well, that is the last question I wanted to ask Mr. Young.

Mr. Booth: I doubt if he can make it this morning, or even this afternoon.

The Court: How long would it take, Mr. Young?

A. I think I can do that in thirty minutes, Your Honor.

Mr. Booth: Your Honor, we might want to ask him, with such assistance as we might furnish, to check all the train sheets. Counsel picks out some of the train sheets.

Mr. Strouss: My question covered the whole division for the ten-day period.

Mr. Mason: It is only the Illinois division.

Mr. Strouss: Yes. If you want to check, I would be glad for you to put that in.

Mr. Booth: It would be proper re-direct examination [fol. 910] when a witness is asked that question to ask him what he found about the other divisions.

The Court: We will cross that bridge when we come to it, gentlemen.

Mr. Booth: Suppose we leave it this way, that Mr. Young will make whatever check is necessary to answer the question, but if we desire to make an additional check we will recall him when that check is made.

The Court: You may do that. You may proceed.

Mr. Strouss: That is all.

The Court: Is it understood that Mr. Young will check this data and then you will use him as soon as an opportunity presents itself?

Mr. Strouss: Yes.

G. W. Oakley was recalled to the stand and testified further as follows:

Mr. Booth: Mr. Oakley is called for cross-examination.

Cross-examination:

By Mr. Strouss:

Q. Mr. Oakley, referring to exhibit No. 54, the amounts shown in column C are the totals of accounts 201 to 462 of [fol. 911] the annual report, form A, and credits as shown on page 313, is it?

A. 313. It is. It is correct.

Q. The amounts shown in column D are the totals of accounts 371 to 420 inclusive?

A. That is correct.

Q. The reduction in miles of road operated shown on exhibit No. 56, was that due to abandonment of unprofitable branch lines?

A. You asked that question the other day and I said "Yes."

Mr. Strouss: That is all the questions.

Mr. Booth: No further questions. May Mr. Oakley be excused and be permitted to take his underlying exhibits with him?

Mr. Strouss: No objection.

The Court: There being no objection, Mr. Oakley may be excused, and he may take his records with him.

[fol. 912] F. W. Green was called as a witness in behalf of the defendant and, being first duly sworn, testified as follows:

Direct Examination.

By Mr. Mason:

Q. Where do you reside, Colonel?

A. St. Louis, Missouri.

Q. What is your position?

A. Chief operating officer for the trustees of the St. Louis Southwestern Railway Lines.

Q. You have quite a long experience in the railroad business, haven't you, Colonel?

A. Yes, sir, over forty years.

Q. Will you describe your experience from the start, including your educational qualifications prior to entering the railroad business?

A. Well, I was a high-school graduate, Rock Island High School, Illinois, in 1893. I entered the railroad service in 1893 as yard clerk, and I worked on construction in 1894 for a firm called Nogle, Hokum & Company, then in the fall of 1894 I went to work for the Chicago and Alton Railroad as trucker in the freight house. I worked nine months. I was promoted to yard clerk. The year after that I was [fol. 913] made operator-agent about two years. After that I was made yard master at Bridgeport yard, Chicago. Later on, summarizing very briefly, I went as a train dispatcher on the Alton road, as an extra dispatcher on the Fitchburg Railroad, Boston, Massachusetts, as train dispatcher on two divisions of the Missouri Pacific Railroad, superintendent on three divisions of the Missouri Pacific Railroad, train master, incidentally, on the Great Northern Railroad, Willmar division, Sioux City, Iowa, superintendent on the Missouri Pacific Railroad at Little Rock of the Arkansas division; later on the White River division, and then at Wynne, Arkansas, on the Memphis division; then from 1906 until 1916 I was—well, from 1906 to 1911 I was general superintendent of the Louisiana and Arkansas Railroad; 1911 to 1916, general manager, Louisiana and Arkansas Railroad; 1916 to May, 1917, assistant to the president of the St. Louis Southwestern Railroad; from May 5th, 1917, until March 13, 1919, I was in the military service nearly 19 months in France. I returned to the St. Louis Southwestern as assistant to the president on April 1, 1919, and on July 15, 1919, I was elected vice-president in charge of operation and have continued in that capacity [fol. 914] for the corporation since, and since December 12, 1935, when our road went into bankruptcy under section 77-B, I have been chief operating officer for the trustees of the St. Louis Southwestern operating lines.

Q. In your military service, were you an officer in the railroad operating department? I may not state the division correctly.

A. I was commissioned in the Combat Engineers and served five months with the Third British Army in France in combat engineering service, after which I was detached from my regiment and sent to Brest in November, 1917, where I was appointed superintendent of army transport service and opened up the port of Brest, continuing in that capacity until July 1, 1918, when I was transferred to St. Nazaire branch, where I was superintendent of army transportation service until October 1, 1918. I was then promoted to the grade of lieutenant colonel in command of all the transportation corps troops there, where I continued until I was relieved on February 24, 1919.

Q. You have been with the St. Louis Southwestern in the executive capacities you have mentioned now for over twenty-one years, haven't you?

A. Yes, sir. I forgot to mention—you asked about an [fol. 915] educational qualification—I have a degree from the Missouri State University. I didn't put that in.

Q. In your experience with the St. Louis Southwestern and other railroads, I take it you have become rather closely familiar with railroad operations generally, and particularly as carried on by your own railroad?

A. Yes, sir.

Q. And you are the responsible operating officer of the Cotton Belt at the present time and have been for a good many years past?

A. Yes, sir.

Q. Have you seen the map which has been marked for identification exhibit No. 58?

A. That is the St. Louis Southwestern map?

Q. Yes.

A. Yes, sir.

Q. Will you say whether or not exhibit No. 58 for identification is a reasonably accurate outline of the lines of railroad of the St. Louis Southwestern system?

A. It is.

Q. And shows the territory and the states in which you operate?

A. It does.

[fol. 916] Q. And the principal points and stations on the line?

A. It does.

Q. And the heavy black line will be explained later in connection with another——

A. Yes, sir.

Mr. Mason: We offer the exhibit in evidence as No. 58.

Mr. Strouss: The same objection.

The Court: It may be admitted. Objection overruled.

(Thereupon the document referred to was received in evidence and marked "Defendant's Exhibit No. 58.")

Mr. Strouss: My objection goes also to all the oral testimony.

The Court: Yes.

Mr. Mason: I take it that the objection is that one expressed on the second day of the trial, that is, as to the relevancy and materiality. I take it you have no objection to the competency of the exhibit in view of the witness's qualifications and identification.

Mr. Strouss: Well, of this particular exhibit that would be true, yes.

Mr. Mason: That is what I mean.

[fol. 917] Mr. Strouss: But in order to keep the record clear as to my objection, I make the complete objection, recognizing that that one ground would not be good as to this particular exhibit.

Mr. Mason: Colonel, I take it that in your position you have to make frequent trips over all of the lines of the St. Louis Southwestern?

A. I do.

Q. You generally make those in your business car?

A. Ordinarily, although on several occasions where I have a short trip I go without a car.

Q. Do you always travel with the business car attached to a passenger train?

A. No, quite frequently it is attached to a freight train.

Q. Why do you use freight trains?

A. Because we don't handle very many passengers on our railroad, we are principally a freight railroad, and too much time is lost in waiting for a passenger train. If a freight train comes along it becomes convenient to move off on the freight train. Also it gives an opportunity to ob-

serve what the freight train is doing while it is being moved over the railroad.

Q. As between the use of a passenger train and a freight [fol. 918] train for these inspection trips, which in your observation results in the better view of the railroad and a better view of its operations?

A. Well, I think that riding on a passenger train, one can get a fairly good view of the track and that feature of the railroad, but from the view of inspection of operations of terminals and the trains and the observance of rules by trainmen, I think it is better to travel on the freight trains, it gives a better idea.

Q. When you have your business car attached to the freight train, where is it placed?

A. Next behind the caboose usually.

Q. Have you ever placed it next behind the engine?

A. No, sir, never.

Q. Do you select trains of particular length to which to attach the business car?

A. No, when we get ready to go we take the first train.

Q. Do you ever attach your business car to a train exceeding 70 cars, exclusive of caboose?

A. Oh, yes, quite frequently.

Q. As frequently as with shorter trains?

A. Well, our moves on freight trains are usually up on the main line, because branch line movements are usually [fol. 919] on local trains, and the usual length of the train on the main line, I think the going average is 70 cars or more on the main line movements in the direction of heavy traffic particularly.

Q. Is it correct that your trips with your business car attached to the freight train on the main line will be more often with trains of more than 70 cars than with trains of less than 70 cars?

A. Yes, I think that is true.

Q. Are you familiar with the code of rules employed in your transportation department.

A. Yes, sir.

Q. Is that a regular book of rules?

A. Yes, sir, standard bound code of rules of the American Association of Railroads.

Q. Does your code of rules conform to the A.A.R. standard?

A. Yes, sir.

Q. Is the St. Louis Southwestern equipped with block signals in any part of the territory?

A. We have block signals between 11A Junction and Shreveport, Louisiana; we have electric automatic block signals that are now being installed on a 47-mile stretch between Illmo and Dexter Junction, which we expect to have completed about the middle of January of next year, [fol. 920] and we have a short stretch of block signals between Camden, Arkansas, and Herbert, Arkansas, about 3 miles. On the Illinois division, that is practically all block signals, there is 2 miles not block signals.

Q. Do you have any substantial extent of double track?

A. Well, on the Illinois division there is 83 miles of double track that is operated by the Missouri Pacific, that is, they are the operating company, and on the Illmo subdivision we have 16 miles of double track.

Q. Is the balance of the railroad single track?

A. The balance of the railroad is single track, yes.

Q. What is the standard weight of rail in the main line?

A. All the new rail we have laid in the last five or six years is 112 pounds.

Q. Do you use any heavier weight on grades or curves?

A. No, sir.

Q. Is the 112-pound rail replacing lighter weight rail?

A. Replaces 85-pound rail, yes.

Q. What is the standard of ballast?

A. Our standard of ballast, our rock ballast is 2500 cubic [fol. 921] yards of crushed rock per mile. Our washed gravel ballast is 2000 cubic yards of gravel per mile.

Q. Is the entire road ballasted with crushed rock or gravel up to the standard, that is, the main line?

A. All the main lines are ballasted with washed gravel except about 60 miles on the Illmo subdivision, which is crushed rock.

Q. Do you have any bridges as to which there are restrictions governing the weight of locomotives that may be used over them?

A. Not on the main lines.

Q. You have one crossing of the Mississippi River below St. Louis beside the crossing at St. Louis, do you not?

A. Yes, sir, that is at Illmo. That is a double track, very heavy bridge built in 1903, Cooper's E-65 cord system and E-70 floor system.

Q. Has that been maintained and brought up to date so as to carry locomotives of modern type and weight?

A. It can carry the heaviest locomotives made or any number of them coupled together.

Q. Now, with the crossing between East St. Louis and St. Louis, what bridge is used there?

[fol. 922] A. There is the Merchants bridge, which has a limitation of Cooper's E-43; there is the Eads bridge, which is owned by the Terminal Railroad Association, which has a Cooper's rating of E-38; there is the Municipal bridge owned by the City of St. Louis, which is capable of handling any locomotive, but the only railroads using it presently are the Pennsylvania, the Illinois Central, the Alton and Southern, the B. & O.

Q. Your principal freight terminal is at East St. Louis?

A. It is.

Q. And traffic for St. Louis is handled into the city by transfer engines across one of these two bridges other than the Municipal bridge?

A. Yes, sir, that is true.

Q. Is East St. Louis the point at which you interchange traffic destined for the state of Illinois and points and states east of Illinois?

A. It is.

Q. I take it, Colonel, that in your capacity as chief operating officer, you are familiar with the grades encountered at various points on your system?

A. Yes, sir.

Q. You know those grades of your own knowledge inde-

[fol. 923] pendent of any profiles?

A. Yes.

Q. Do you have any helper districts on the system.

A. Not in the strictly technical significance of the term. Our northbound tonnage trains out of Illmo has to go up against a five-tenths ascending grade about two miles, and they are shoved up that grade by the Illmo switch engine, but it is within yard limits and it is not strictly a helper.

Q. Do you have to adjust tonnage to grades at other points on the system?

A. Yes.

Q. Is it correct to say that five-tenths per cent is the maximum ruling grade encountered at any point on the main line?

A. Five-tenths is the maximum grade to be encountered. Between Pine Bluff and East St. Louis, actually it is five-tenths; between Pine Bluff and Illmo in either direction, three-tenths; between Illmo and East St. Louis south of Pine Bluff the grade uniformly is a maximum of one per cent, between Pine Bluff and Corsicana.

Q. Corsicana is one of the important western terminal points of the system, is it not?

A. It is our most important junction point in interchange [fol. 924] of traffic with the Southern Pacific.

Q. Are you familiar, Colonel, with the freight and passenger car equipment and the freight and passenger locomotives used by the Cotton Belt?

A. Yes, sir, I am.

Q. That is a necessary part of your knowledge in order to discharge your duties as chief operating officer, is it not?

A. That is true.

Q. Have you been furnished with a copy of defendant's exhibit No. 2, being the exhibit showing the chronology of freight cars?

A. Yes, sir.

Q. Will you say from your knowledge of the freight car equipment of the Cotton Belt whether the development of your equipment has proceeded along the same general lines as are depicted upon this exhibit?

A. I have studied this exhibit and find that in general these changes and developments from 1900 on up to 1940 in the design and capacity of freight equipment follow essentially the developments in the standards, changes in the standards of the American Association of Railroads. On the Cotton Belt railroad we have experienced this change, but not in exactly the same years. We are from [fol. 925] three to seven years behind the dates shown here on this exhibit No. 2.

Q. That is to say that you have gone to the 750 pound castiron wheel, for example, a little later than 1924?

A. On that particular item we went into it about 1926. The type B couplers we went into in 1919, the same year you did, but the castiron single plate wheel, which you went into in 1927, we didn't go into until 1935.

Q. Is the castiron single plate wheel now standard for all Cotton Belt boxcars?

A. I wouldn't say it was our standard, Mr. Mason, because on certain of the boxcars that we are now acquiring

in 1941, we are using some single wear steel wheels, and on 50 automobile cars we built in 1940 we are using single wear steel wheels in place of the castiron single plate wheel.

Q. Does the Cotton Belt now use in revenue service any boxcars not having all steel or steel underframe construction?

A. No, we do not own any wooden underframe boxcars, they are all steel underframes.

Q. Have you been furnished with a copy of exhibit No. 4 showing the development of passenger cars?

[fol. 926] A. Yes, sir.

Q. Does the development of passenger car equipment of the Cotton Belt correspond generally to that shown upon Exhibit No. 4?

A. We bought in 1937 ten chair cars of the single unit type very similar to the chair car you show in 1937 on this exhibit. That is the only passenger equipment we have purchased in the last few years. The rest of our equipment in passenger service conforms quite generally to the equipment shown here in your line for the years 1923 and 1927.

[fol. 927] Mr. Mason:

Q. Do you have any wooden passenger coaches in service, that is, in main line service?

A. No, the only wooden passenger coaches we have are used in work service, in bridge building, etc. We do not use any wooden underframe passenger coaches. We don't own any, except that which is in work service.

Q. These are cars that are used in work service and moved from point to point in work trains or at the rear-end of freight trains, aren't they?

A. Yes, usually moved in local trains.

Q. Are not used in revenue service?

A. No, never.

Q. Does the Cotton Belt handle Pullman cars?

A. Yes.

Q. Are those the standard type of Pullman cars commonly used by the American railroads?

A. They are all standard steel cars, of standard Pullman type that came out about ten of fifteen years ago. They are not the stream-lined latest Pullman type.

Q. Does the Company handle refrigerator cars of PFE ownership?

A. Yes.

Q. As many as possible, I suppose?

A. Yes sir, a good many thousand in the course of a [fol. 928] year.

Q. You handle refrigerator cars of other ownership as well?

A. We handle a few, but the great bulk of the refrigerator traffic we handle comes in PFE cars.

Q. Now, referring to Exhibit No. 5, and perhaps we should also consider Exhibit No. 6 as well, those being the exhibits showing the types of freight and passenger power on the Southern Pacific, does your Company have locomotives corresponding to those shown on those two exhibits? I mean as to general physical wheel arrangement and particularly as to tractive effort?

A. We have locomotives of the 2-8-0 Consolidation type, locomotives of the 4-6-0 ten-wheel type, the 4-8-2 Mountain type and the 4-8-4 Golden State, which are used regularly. We also have a few of the Mogul type engines which are used on branch line service 2-6-0's.

Q. What type of locomotive is principally used in your main line service?

A. The 4-8-4 Golden State type and the Consolidation, 2-6-0 type and the Mountain type 4-8-2?

Q. Consolidation 2-8-0?

A. 2-8-0.

Q. Does the tractive effort of those several types owned [fol. 929] by the Cotton Belt correspond to the types that are shown here or are they larger or smaller?

A. The Southern Pacific Mountain type shows a tractive effort of 57,510 pounds and our Mountain type shows 44,079 pounds. Ours is a lighter engine. On the Golden State type the Southern Pacific tractive power is 62,200 pounds on that exhibit, and our tractive power is 61,560 pounds. We are slightly lighter than your Golden State type.

Q. What about the Consolidation? I think that is the other type you mentioned?

A. The Southern Pacific Consolidation is of 43,300 pounds and our Consolidation is quite a little bit heavier, 52,254 pounds.

Q. Are your locomotives equipped with superheaters?

A. Yes, sir.

Q. With feed water heaters in some instances?

A. Superheaters, feed water heaters, all our modern power is equipped with feed water heaters.

Q. Has the later type braking devices?

A. The latest Westinghouse type of braking equipment.

Q. Do any of these larger locomotives have double air compressors on them?

A. The Consolidation types do. All of the Consolidation [fol. 930] type that are used on this fast service I am speaking of.

Q. You mean fast freight service?

A. Fast freight service, equipped with disc cast steel wheels, and others have lubricators alemite greasing arrangements. All our modern power has alemite greasing equipment.

Q. That permits the grease to be forced to the bearings under high pressure?

A. That is right; and the 4-8-4 locomotives, five of them are equipped with roller bearings on the engine and trailer trucks and driving wheels, and by next September we will have ten more equipped with roller bearings throughout.

Q. Does the Cotton Belt maintain or participate in schedules for the movement of freight?

A. It does.

Q. In one or both directions?

A. In both directions.

Q. I take it that you use the terms west bound and east bound to refer to the movements?

A. Yes.

Q. West bound away from St. Louis?

A. Right.

Q. Do you participate in schedules for the handling of perishable traffic?

[fol. 931] A. We do.

Q. What is the principal at which perishable traffic is originated or received on the Cotton Belt?

A. East bound perishable traffic which we receive from the Southern Pacific at Corsicana originates in California, from the Imperial Valley and in the Salt River Valley of Arizona. That which we receive from the Southern Pacific

at Shreveport, Louisiana, originates principally in the Rio Grande Valley.

Q. That is the South Texas production?

A. That is the South Texas production, yes sir.

Q. How do you handle that?

A. On guaranteed schedules.

Q. On guaranteed schedules?

A. Yes, sir.

Q. Are those a portion of the through schedules from concentration points to ultimate destination?

A. Ultimate destination.

Q. As to that traffic the Cotton Belt serves largely as a bridge or overhead carrier?

A. That is quite true.

Q. Do you make connections at East St. Louis with lines going to Chicago and to eastern points?

A. With the exception of the Alton and Southern and [fol. 932] the Illinois Central, all of the deliveries of east bound traffic to the eastern lines is effected through the terminal railroad at St. Louis, or the Alton & Southern, principally the terminal.

Q. What point?

A. At East St. Louis.

Q. Speaking of the movement from Corsicana to East St. Louis, what is the time allowance for the traffic originating in California or Southern Arizona and apportioned to the Cotton Belt?

A. Well, we have three schedules. The first one known as the Colton block.

Q. That refers to traffic concentrated at Colton, California, does it?

A. That is the Colton concentration, yes sir. That must arrive at East St. Louis at 9:30 P.M. the sixth evening and make the 2:00 A.M. connections with the eastern trains and the Chicago trains. The traffic originating in the Imperial Valley and concentrating at Brawley must arrive at East St. Louis at 9:00 P.M. on the fifth evening. Traffic which originates at Phoenix, which we call the Salt River Valley block, must arrive at East St. Louis at 9:00 or 9:30 P.M. the fourth evening.

Q. Now, there is a certain amount of traffic, as I understand it, which originates at Yuma. Do you participate in [fol. 933] moving any of that?

A. Not very much; that mostly moves over the Rock Island. We handle some, not a great deal.

Q. Does that move on the Imperial Valley schedule?

A. That moves usually on the Imperial Valley schedule or sometimes it moves on the freight schedules.

The Court: We will take a brief recess at this time.

(After recess.)

The Court: You may proceed with your direct examination.

Mr. Mason:

Q. Colonel, I think you said you received this refrigerator traffic at Corsicana from the Southern Pacific?

A. That is right.

Q. Is there a definite scheduled hour of the day at which the deliveries are made to the Cotton Belt at Corsicana?

A. There is an agreed schedule as between the participating lines and these guaranteed new schedules, and the Cotton block traffic, for instance, must be delivered by the Southern Pacific to us at Corsicana at 9:00 A.M. The [fol. 934] Imperial Valley traffic not later than 2:00 P.M., the Salt River Valley traffic not later than 3:00 P.M. when it is delayed at Phoenix account precooling, which it frequently is.

Q. Then what time do you use up in making the run from Corsicana to East St. Louis?

A. In the last instance mentioned, 30 hours for 752 miles.

Q. That gives you an average speed of——

A. A little over 25 miles per hour.

Q. Including all terminal delays?

A. Yes, sir.

Q. And the delay, if any, of assembling the cars into the train at Corsicana?

A. Yes, sir.

Q. Does that 30 hours include the time of breaking up the train at East St. Louis for the delivery to the connections?

A. No, sir, that only includes the arrival time at East St. Louis.

Q. You heard Mr. Fertig's testimony, did you not, as to the schedules from California and Arizona points to Chicago?

A. Yes, sir.

Q. Are the schedules of which you speak in which the Cotton Belt participates, the same as those in which the [fol. 935] Rock Island participates?

A. They are the same schedules, yes, sir.

Q. But over a different route?

A. Over a different route.

Q. What is that route?

A. The Rock Island make their schedule, make this schedule which is common to all the competing lines over what is known as the Golden State route. The schedule in which we participate is via the Southern Pacific via El Paso to Corsicana and the Cotton Belt from Corsicana to East St. Louis, and then the various connections east to the Atlantic Seaboard or whatever the destination of the traffic may be.

Q. Chicago taken as a representative point is the point to where the 138 hours or 39 hours and 30 minutes apply?

A. The 136-hour basic schedule rule, yes.

Q. It 136 hours basic to Chicago now?

A. Yes.

Q. Does the 16-hour run-off apply?

A. Yes, sir.

Q. In connection with your Company?

A. Yes, sir.

Q. How much time do you take to run off out of those 16 or 19 hours mentioned as being agreed upon?

[fol. 936] A. We run off one-third.

Q. You run off as much as five hours and twenty minutes?

A. When necessary, yes sir.

Q. Is there any one railroad out of East St. Louis that receives the bulk of the perishable traffic from you?

A. Yes, I should say the Wabash, the Nickel Plate and the Pennsylvania. They balance back and forth. One leads the procession one month and the other the next, but they are the three principal carriers, at least, of the perishables.

Q. Does that include traffic destined to Chicago as well as that destined to eastern seaboard points?

A. It is practically all traffic going to eastern seaboard points. The Chicago traffic I think moves principally over the Golden State route.

Q. You don't participate much on Chicago traffic?

A. Not much.

Q. How does the mileage of the route that you have described in which your line is—of which your line is a part, as between Arizona and California points of origin and St. Louis, compare with the mileage over what you have described as the Golden State route?

A. Traffic from El Paso to East St. Louis via Corsicana [fol. 937] has to move 404 miles farther to reach East St. Louis than if the same traffic should leave El Paso and move through Tucumcari and the Golden State route.

Q. That would be the Southern Pacific to Tucumcari, thence Rock Island via Kansas City to St. Louis?

A. That is right, yes sir.

Q. Is there another competing route from El Paso across Texas?

A. The Texas Pacific and Missouri Pacific, yes sir.

Q. Is that operated via Texarkana?

A. Yes, sir.

Q. What are some of the significant junctions on the routes, or train points?

A. Our train point of interchange with the Texas & Pacific is at Big Sandy, Texas.

Q. I mean referring to the Texas Pacific and the Missouri Pacific routes, through what cities in North Texas and Arkansas do they run?

A. The Texas Pacific runs through Ft. Worth and Dallas and Texarkana; the Missouri Pacific through Little Rock, Poplar Bluff, Illmo, East St. Louis.

Q. How does the mileage over that route from terminal [fol. 938] points compare with the mileage via the Corsicana route?

A. They are 207 miles shorter than we are.

Q. Are you able to operate in connection with the Southern Pacific so as to make deliveries at the same time as these other shorter routes that you have described?

A. Yes sir, we do.

Q. Do you operate these east bound trains containing perishables in lengths of more than seventy cars over any part of the Cotton Belt?

A. Yes sir, I think that as a rule, rather than the exception, we do operate over seventy cars.

Q. Over what part of the line?

A. From Pine Bluff to East St. Louis. That is, three freight divisions where the grade is five tenths of one per-cent or less.

Q. Do you operate any units of more than seventy cars west of Pine Bluff?

A. It is the rule, rather than the exception, on the west bound trains to handle more than seventy cars. When the empty refrigerators are moving, we sometimes move as many as 90, 95 and 100 cars, empty refrigerators.

Q. But eastward, do you move the traffic in units of more than seventy cars loaded?

A. Occasionally, but the grades sometimes require the [fol. 939] number of cars to be a little less than that because of the ruling grade.

Q. The tractive effort of your locomotives used in those districts between Corsicana and Texarkana do not permit of the handling of more than seventy loads, is that correct?

A. Well, it runs between sixty and seventy loads, depending upon the weight of the car.

Q. Now, is there any reason from the standpoint of the schedule to be maintained why more than seventy cars could not be handled between Corsicana and Texarkana if larger power were available?

A. If larger power were available and the schedule, the guaranteed schedule would permit the heavier train to be handled, there would be no reason why it could not be handled.

Q. When you speak of the schedule permitting, you mean permitting the whole tonnage at Corsicana to be built up into longer trains?

A. No, this is what I had in mind; if you have thirty hours to get from Corsicana to East St. Louis, that means that the tractive power of the locomotive is the ruling factor in the number of cars or the number of tons that the locomotive can handle in that given time. If you had an hour or two more, then you could handle 4, 5, 8 or 10 more cars. [fol. 940] All of those things have to be balanced or taken into consideration in determining what the length of the train will be.

Q. Now, in the territory north of Pine Bluff do you have sufficient tonnage to permit you to handle more than seventy cars as a regular thing?

A. Yes, quite often, north of Pine Bluff we handle more than seventy cars.

Q. Is there any grade there which affords a limiting factor?

A. No, sir.

Q. What is the ratio of on-time deliveries to the total number of trains of perishables units handled by the St. Louis & Southwestern, according to your best knowledge?

A. I haven't got the figures with me, but I am sure it runs well over 90% of the total cars we handle. Under the schedule we have to pay claims if we fail to handle the schedules and naturally we are very careful to make them.

Q. I think we referred briefly to west bound schedules. Do you have schedules for the movement of traffic west bound?

A. Yes, sir.

Q. Do they contemplate the delivery at Pacific Coast points of traffic handled by your Line to Corsicana?

[fol. 941] A. Yes sir, they do.

Q. You heard the testimony of Mr. Fertig as to these west bound schedules, yesterday?

A. No sir, I didn't hear that yesterday.

Q. Well, what is the west bound schedule via your line of traffic loaded, for example, at Chicago or St. Louis?

A. Traffic moving from St. Louis is due to be delivered at Los Angeles at 4:00 on the morning of the sixth day from East St. Louis. That is on what we call the Los Angeles special train, a train known as the Motor Special which handles automobile parts, traffic of that sort. That moves on a faster schedule. We handle it from East St. Louis to Corsicana on a 28 hour schedule.

Q. Does that run in units of more than seventy or less than seventy cars?

A. North of Pine Bluff it moves in units frequently in excess of seventy cars.

Q. Do you have any difficulty in maintaining that 28 hour schedule?

A. Well, our difficulty primarily is in getting the business from the connections at East St. Louis, getting a train out on time. It is due to leave at 4:30 P. M. and frequently does not get out until 5:30 or 6:00 and we do have [fol. 942] difficulty in making that schedule.

Q. The difficulty is because of the late deliveries from connections?

A. Because of the late deliveries from connections, yes sir.

Q. Do you have any difficulty in making the route?

A. No, if we can get out of St. Louis anywhere near on time we can get to Corsicana on time.

Q. Isn't a schedule which contemplates only 28 hours for 752 miles rather a bad schedule for the handling of freight?

A. Yes, it is bad.

Q. Exhibit 28 indicates that you have quite a number of branch or auxiliary lines. These lines, for example, in northeastern Arkansas, and extending to Cairo, Illinois, are those branch lines?

A. Those are all branch lines, yes sir.

Q. The line from Luskin to Tyler, Texas, is that a branch?

A. Yes.

Q. Then the three certain just easterly of Pine Bluff, are they branch lines or main lines?

A. Well, the line leading into Memphis, we count as a main line. We use 69 miles from ——— into Memphis. [fol. 943] We count that as a main line.

Q. And your line from Cairo?

A. No sir, that is a branch.

Q. From Ft. Worth west to the junction at Texarkana, some of that counts as a main line?

A. Yes sir, that is a main line.

Q. From Shreveport north into Arkansas?

A. That is a main line.

A. Does the volume of traffic and the length of the train in which it is operated on these auxiliary lines correspond to the train lengths on the main lines?

A. No, sir.

Q. You have a good many short trains there, do you?

A. Because there is no traffic to move on them. If we had the traffic to move we could move longer trains.

Q. What factors in general determine the number of cars in freight trains that you operate on your main or branch lines?

A. The competitive schedule which must be met under these guarantees, the amount of traffic which has to be moved, the length of time available for moving them, sometimes the temperature conditions, the character and kind

of motive power available, the hour of the day which the [fol. 944] train has to be run—all of those things have more or less influence in determining the length of the train which can be run if traffic is available for it.

Q. Do your have any limitations on train lengths because of the limited siding capacity?

A. No, sir.

Q. You speak of the necessity of making schedules. Does that mean that you cannot hold the cars at terminals in order to build up trains because of the necessity of departing?

Mr. Strouss: If the court please, I do not like to make an objection on leading questions, but——

Mr. Mason: I agree with counsel, that is going too far.

The Court: Yes, objection sustained.

Mr. Mason: I will withdraw the question.

Q. Will you state whether or not you hold the traffic at terminals in order to build trains?

A. No, we don't. We have these guaranteed schedules to make and we must make them, so we run the trains on what traffic there is to run them with.

Q. I think you referred in your testimony to the handling of motor parts and automobiles and perishable traffic. Do you handle any other types of traffic?

[fol. 945] A. We run a solid merchandise train out of St. Louis every night, called the Blue Streak. It handles nothing but merchandise. Usually we handle it with a passenger engine.

Q. What kind of business is handled in that train? Is that carload or less than carload lots?

A. Nothing but merchandise. It is LCL traffic.

Q. Less than carload lot traffic?

A. Less than carload lot traffic.

Q. Does that train operate in connection with motor carriers?

A. Yes, our Company owns, wholly owns a subsidiary called the Southwestern Transportation Co., and at key points merchandise is sent out by the Blue Streak and is then fanned out to nearby destinations by this truck line.

Q. How do you gather the traffic at St. Louis?

A. We move it first from the connecting line. The bulk of it comes from connecting lines east. The traffic com-

ing from St. Louis proper is assembled by the Columbia Terminals Co. and then delivered by them to the freight house where our source is and loaded into the proper cars.

Q. How far south or westward from St. Louis does the Blue Streak operate?

[fol. 946] A. The Blue Streak operates 404 miles from St. Louis to Pine Bluff as a freight merchandise train, but will handle anywhere from 35 to 51 or 52 cars. At Pine Bluff, out of that merchandise and merchandise which comes in another train from Memphis and points north of Pine Bluff, two trains are made up, one going to Shreveport which we call 843 and the other one going to Dallas and Ft. Worth, which we call 43. Merchandise leaving St. Louis Monday night is delivered at Dallas at 10:00 P. M. Tuesday night, at Ft. Worth about 11:00 P. M. Tuesday night and at Shreveport at about 2:45 or 3:00 P. M. Tuesday afternoon.

Q. What does the Blue Streak make arrival at Pine Bluff?

A. It is due to arrive there at 6:30 in the morning. It usually gets there, because of late departure from St. Louis, it usually gets there about 7:45 to 8:50.

Q. You speak of handling this train as far as Pine Bluff with between 35 and 50 cars, more or less. Is there any particular reason, and if so, will you state what it is, why the train does not exceed fifty cars?

A. Because that is all the business there is.

Q. Does the operating department of the Company put [fol. 947] any limit upon the number of cars which may be handled in that train?

A. No, sir.

Q. Colonel, have you ever had any rule on the Cotton Belt as to the number of cars which would or might be handled in a freight train?

A. We have never had a rule. There have been occasions when the Superintendent has put out instructions. The last one I recall was in 1921 or 1922.

Q. What was the reason for the rule, if you remember?

A. They have three passing tracks on the Illmo subdivision which would only hold eighty-five cars and a passenger train, and the Superintendent issued instructions that south bound would be limited to 85 cars at certain hours of the day where they would meet north bound trains.

at these particular sidings. But when the sidings were extended, that was discontinued.

Q. Do you have any such rule nowadays?

A. No, sir.

Q. Are you familiar, Colonel, with the statement bearing the title, "St. Louis Southwestern Railway Lines, Berryman Henwood, Trustee, Typical Examples of Freight Trains Handled Between Certain Terminals, April 12-21, [fol. 948] Inclusive, 1939?"

A. Yes, sir.

Mr. Mason: May we have the statement marked?

The Clerk: Defendant's Exhibit 74 for identification.

Mr. Mason:

Q. Did you prepare or supervise the preparation of this exhibit, Colonel?

A. I personally prepared this one.

Q. From what sources?

A. From the train sheets.

Q. Do you have the train sheets from which this was prepared present in the court room?

A. Yes, sir, they are here.

Q. Are they available for the examination of opposing counsel?

A. Yes, sir.

Q. Is all of the information shown hereon other than that relating to the ruling grade taken directly from the train sheets?

A. It is, except the computation down in the box at the bottom. Those are computations which are based upon the information.

Q. The computations from the face of the exhibit?

A. Yes, sir.

Q. As to ruling grade, are those ruling grades matters within your own knowledge?

[fol. 949] A. Yes, sir.

Q. Are the ruling grades here shown true and correct?

A. They are.

Q. Do you have the engineering profiles of this portion of the line available here?

A. I have that one copy. I have got my own office copy of the profile if you want to see it.

Q. Will that be available also for the examination of counsel if needed?

A. Yes, sir.

Q. Has the exhibit been checked against the underlying sources?

A. It has.

Q. Did you participate in the check?

A. I personally checked it.

Q. Will you state whether or not the exhibit correctly reproduces the information contained in the original sources?

A. Yes sir, I am sure it does.

Q. The exhibit refers to a period of ten days, April 12 to 21, inclusive. Who selected that period?

A. Well, the defendant stated that they wanted a typical period of ten days in the year 1938.

Q. 1938 or 1939?

[fol. 950] A. 1939. And so the year was selected by the defendant. I then had a statement worked up by months, showing the ton-miles handled each month during the year 1939.

Q. Was that made up from the Form OS-A reports?

A. Yes sir, that was made up from the OS-A reports and for the northern division. That is the division which comprises from Pine Bluff to East St. Louis. The gross ton-miles average for the whole year 320,738——

Q. The figures, then, that you express are really millions?

A. That is millions. Three-hundred and twenty million and some odd. Then I took the month which came nearest to that and the nearest month was the month of April, which had 324,000,000, and that was the way the month of April was selected.

Q. Now, apart from your reference to the Form OS-A reports and the computations you have referred to, will you say whether or not the month of April is reasonably representative and typical of the average of the year?

A. The month of April is the most representative month in the whole year. The volume of traffic is about an average for the whole year. The operating conditions are about the average for the whole year and that is the reason [fol. 951] the month of April was selected.

Q. Does the use of the month of April avoid either the peak or the slack of business?

A. It does.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: Just as a matter of information, Colonel, I see that Jonesboro, Arkansas, is one of the points. Is that a division terminal between Illmo and Pine Bluff not shown on the exhibit?

A. The map does not show it, but it is a division terminal, 142 miles north of Pine Bluff and 131 miles south of Illmo.

The Court:

Q. Colonel, do I understand this particular exhibit embodies only the trains operated between Pine Bluff and East St. Louis?

A. This exhibit here?

Q. Yes.

A. Yes, sir. This exhibit does not include local trains or work trains or short trains, short turn-around trains. It includes only the through freight trains between Pine Bluff and East St. Louis for the period here covered.

Mr. Booth:

Q. Those local trains, however, are shown on the train sheets?

A. Yes sir, all trains operated are shown on the train [fol. 952] sheets.

Mr. Mason: Is there any point on the map, Exhibit 58, where a branch line leaves the main line, which will indicate the location of Jonesboro?

A. The short branch, first north branch line running into Memphis is the Blytheville branch, running from Paragould through Blytheville. At its junction with its main line is a point called Paragould. Twenty-one miles south of Paragould is Jonesboro.

Mr. Strouss: We make the same objections.

Mr. Mason: I offer the statement in evidence as No. 74.

Mr. Strouss: The same objections.

The Court: The same ruling. Objection overruled.

(Thereupon the document referred to was received in evidence and marked, "Defendant's Exhibit 74.")

Mr. Mason: In handing over that exhibit, we also tender a train sheet for the examination of opposing counsel, and I will ask if you wish the profile as well?

Mr. Strouss: No, I do not care for that.

Mr. Mason: You have already examined, I think, the form OS-A reports?

[fol. 953] Mr. Strouss: Yes, I have.

Mr. Mason:

Q. Colonel, do you have centralized traffic control in operation on any part of the Cotton Belt?

A. It is on a part of our operative mileage, but the Missouri Pacific is operating it.

Q. That is the joint trackage between East St. Louis and Illmo?

A. That is the joint trackage between East St. Louis and Illmo. They have central traffic control.

Q. Your trains, of course, use it?

A. Yes, sir.

Q. Do you use electric locomotives or diesel locomotives anywhere?

A. No diesel, no electrics.

Mr. Mason: That is all at this time, Mr. Strouss. Do you wish to cross-examine now or defer your cross-examination?

Mr. Strouss: No, I will wait until we have had a chance to examine the exhibits.

The Court: You may step aside, then, subject to a later cross-examination.

(Witness withdrawn.)

[fol. 954] William A. Kraemer called as a witness on behalf of the defendant, and having been first duly sworn, was examined and testified as follows:

~~Direct~~ examination.

By Mr. Mason:

Q. Will you please state your residence and employment, Mr. Kraemer?

Mr. Strouss: What is the gentleman's name?
Mr. Mason: Yes.

Q. Yes, your name, residence and employment?
A. William A. Kraemer.

The Court: How do you spell it?

A. K-R-A-E-M-E-R, residence Chicago, Illinois, employed as Assistant General Manager of the eastern district of the Chicago Northwestern Railroad Co.

Mr. Mason:

Q. Will you state your experience in railroad service, please, Mr. Kraemer?

A. I started in July, 1903 to 1909 as telegraph operator and agent at various stations.

Q. With the Northwestern?

A. With the Northwestern Railroad. From 1909 to 1919 as train dispatcher and chief train dispatcher of the Wisconsin of the Northwestern Railroad. From 1919 to 1925 [fol. 935] as train master of the Northwestern Railroad. From 1925 to 1935 as Assistant Superintendent of the Northwestern Railroad. From 1935 to 1938 as Superintendent: from 1938 to April of this year as Assistant General Superintendent: and since April 1st of this year as Assistant General Manager of the Eastern District.

Q. Has your experience as a division officer and as a general officer of the Northwestern System included experience over a large part of the system?

A. It did.

Q. Have you seen Exhibit No. 62 for identification heretofore presented in connection with the testimony of Mr. Snell?

A. I have, yes sir.

Q. Will you state whether that exhibit is a reasonably accurate outline map of the territory served by the Northwestern and the location of the lines of the Chicago & Northwestern Railway Co.?

A. It is.

Q. It does not included the affiliated Company, the Chicago, St. Paul & Minneapolis & Omaha, does it?

A. It does not.

Q. Does that Company operate in certain of the territory shown on this exhibit?

[fol. 956] A. No, it does not.

Q. It does not operate in Minnesota, Iowa and South Dakota?

A. It operates in the territory, but not on any of the lines shown on the exhibit.

Q. Your testimony relates entirely to the Chicago and Northwestern, so-called?

A. That is correct.

Mr. Mason: We offer the map in evidence as Defendant's Exhibit No. 62.

Mr. Strouss: The same objection.

The Court: Objection overruled. It may be admitted as Defendant's Exhibit 62 in evidence.

(Thereupon the document referred to was received in evidence and marked "Defendant's Exhibit 62.")

Mr. Mason:

Q. Now, as Assistant General Manager over what portion of the system does your jurisdiction extend at the present time?

A. All of the lines in the state of Michigan, Wisconsin, Illinois, Iowa, and the eastern part of Minnesota.

Q. Does it include the lines as far west as Council Bluff, Iowa?

A. It does.

Q. And the lines from Chicago westward to the central part of Minnesota?

[fol. 957] A. That is correct.

Q. And all of the lines east of the Mississippi River?

A. In the state of Iowa, yes, not in Minnesota.

Q. No, I say all of the lines east of the Mississippi River, not the Missouri.

A. Yes.

Q. That would include the states of Illinois, Wisconsin and Michigan?

A. Correct.

The Court: Mr. Kraemer, referring to the map, exhibit 62, do I understand that all the lines shown on this exhibit are operated by the Chicago Northwestern Railway?

A. That is correct.

Q. And it is merely the lines designated with the heavy line, that is, what you indicate as a typical freight train

exhibit—but all of the lines shown here on this exhibit are operated by your railroad.

A. That is correct.

Mr. Mason: This map shows branch lines as well as main lines, does it not?

A. Yes sir, it does.

Q. Which is your principal east and west main line?

[fol. 958] A. From Chicago to Council Bluffs, Iowa.

Q. Do you have occasion in the course of your duties, Mr. Kraemer, to make trips over the system or any part of it?

A. I do.

Q. Particularly over the lines subject to your jurisdiction, I take it?

A. Yes.

Q. And do you make those trips in a business as well as on a passenger train?

A. Both, yes sir.

Q. Do you ever attach that business car to a freight train, as well as to passenger trains?

A. Yes.

Q. When you travel with the business car on freight trains, where do you have it placed on the train?

A. On the rear of the train, behind the caboose.

Q. Do you make any selection of trains on which the car is to be placed with regard to the number of cars in the train?

A. No.

Q. Do you ever ride in your business car on the rear of trains of more than seventy cars?

A. Yes, sir.

Q. Does the Northwestern have a book of rules for the [fol. 959] guidance of the employees in the transportation department.

A. They do.

Q. Is that a regular code made up into a book?

A. Yes, sir.

Q. And are you familiar with the standard code of rules of the Association of American Railroads?

A. Yes, sir.

Q. Does the Northwestern code bear any resemblance to the standard code?

A. The Northwestern uses practically the entire standard code.

Q. Is any part of the main line of the Northwestern, and in particularly in your territory, equipped with block signals?

A. Yes, sir.

Q. To what extent are the main lines equipped with block signals?

A. We have 899 miles of automatic block signals on the railroad; all of which is on the eastern district, except eleven miles in the western district.

Q. Do you have any portion of the main line equipped with automatic train control?

A. Yes, we have the entire district from Chicago to Council Bluffs, Iowa.

Q. Any portion of your line north toward Milwaukee is [fol. 960] also so equipped?

A. No, automatic signals.

Q. Does any part of the main line consist of double track?

A. Yes, we have 963 miles of double track. Practically all of it is in the eastern district, except about four miles in the western district.

Q. Your line from Chicago to Council Bluffs, is that single or double track?

A. Double track.

Q. And your line from Chicago to Milwaukee, is that double track?

A. Double track.

Q. Does the double track extend beyond Milwaukee toward the Twin Cities?

A. Yes, it does to Clyman Junction.

Q. Do you have more than one main line between Chicago and the twin cities?

A. Yes, we have two sections, one main line by the way of Madison, Wisconsin, and the other by the way of Clyman Junction, Wisconsin.

Q. Is the Madison line double track in any part?

A. It is all double track with the exception of fourteen miles between Janesville and Evansville, Wisconsin.

Q. Your Company operates a considerable suburban serv- [fol. 961] ice in and around Chicago, does it not?

A. Yes, a great deal.

Q. That is entirely passenger train service, of course.

A. Yes, sir.

[fol. 962] Q. In your position as assistant general manager, Mr. Kraemer, are you familiar with the extent of the

helper service, if any, performed in connection with freight train operation?

A. Yes; we have very little helper service in the eastern district, we have one case between St. Francis and Butler, Wisconsin, which is the Milwaukee outer belt, where we have a one per cent grade up West Allis Hill, where we have helper serivce westbound, and then coming east out of Waukegan, Illinois, we are right at the foot of a grade, and the yard engines shove trains out of the yard within yard limits. That is all the helper service we maintain in that territory.

Q. Do you, Mr. Kraemer, in your capacity as assistant general manager become familiar with the ruling grades upon that part of the system subject to your jurisdiction?

A. Yes, sir.

Q. What sort of territory or territories does the Northwestern serve? I mean, are they mountainous or lumbering regions, or agricultural, or industrial, or what?

A. Mostly agricultural and industrial, and some mining in the Lake Superior region, during the ore season from about April 15 to November 15, we handle a considerable [fol. 963] volume of ore to the Ashland dock on Lake Superior and to the Escanaba dock on Lake Michigan.

Q. What sort of region, generally, is Wisconsin? Is that industrial or agricultural?

A. Mostly agricultural.

Q. And northern Illinois?

A. Mostly agricultural, and some industrial, especially along the lake shore at Waukegan, Kenosha, Racine, and Milwaukee, they are industrial towns.

Q. Do you serve any coal producing areas?

A. Yes, we do down in the southern Illinois teritory, the towns called Benld and DeCamp.

Q. Your line across Iowa, what sort of area is that?

A. Mostly agricultural.

The Court: We will take our noon recess. We will be at recess until 2 o'clock.

(Thereupon the court stood at recess until 2 o'clock P. M., December 5, 1940.)

[fol. 964] 2 P.M., December 5, 1940.

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed with your direct examination of Mr. Kraemer.

The witness, William A. Kraemer, was recalled to the stand and testified further as follows:

Mr. Mason: Mr. Kraemer, does the Northwestern handle a considerable volume of traffic originated by other carriers and interchanged at junction points?

A. They do.

Q. Will you indicate, with reference to exhibit No. 62, some of the more important junctions at which traffic is received from connecting lines or delivered to connecting lines?

A. At Council Bluffs, Iowa, we interchange a considerable volume of traffic in both directions with the Union Pacific and other western railroads, principally the Burlington and the Missouri Pacific. At Des Moines, Iowa, we interchange with the Rock Island and the Great Western, and at Proviso, of course, we interchange with all the eastern and southern lines radiating out of Chicago principally through belt lines. At Milwaukee we interchange [fol. 965] with the Milwaukee Railroad. Those are our principal interchange points. Of course, we have many others.

Q. Where does traffic from the north Pacific Coast, handled into the Twin Cities, reach the lines of the Northwestern, generally speaking?

A. At Wyeville, Wisconsin.

Q. Is Wyeville a point of connection with your railroad, the C. St. P. M. & O.?

A. It is.

Q. Now, is Proviso the interchange point at Chicago or for the Chicago district?

A. It is.

Q. Just what is Proviso?

A. Proviso is Northwestern's large freight terminal into which all of the freight trains from the north, northwest, and west arrive, and from which traffic destined to eastern lines is delivered to the connecting Belt lines, and also all traffic originating from the south and east routed via the Northwestern Railroad is delivered into Proviso yard by

transfers from connecting lines, and it is from this yard that all freight trains for the west, north, and northwest are made up, and they start from that yard.

Q. You heard the testimony of Mr. Fertig as to the Blue [fol. 966] Island terminal of the Rock Island, did you not?

A. I did.

Q. Does Proviso on your line correspond more or less to the Blue Island terminal as he described it in the Rock Island?

A. It is. Proviso terminal is 14 miles from the heart of the city of Chicago.

Q. What eastern lines do you connect with by way of the Belt line as you have described it?

A. Erie, Pennsylvania, New York Central, Michigan Central, Baltimore and Ohio, the Grand Trunk, Pere Marquette.

Q. Are you familiar with the types of equipment, freight and passenger, both cars and engines?

A. Yes, sir.

Q. Used and owned by the Northwestern?

A. Yes, sir.

Q. I will ask you to refer to exhibit No. 2. Have you a copy of No. 2 showing the freight boxcars?

A. Yes, I have it here.

Q. Will you state from your knowledge of the freight boxcar equipment of the Northwestern whether, in general, it has developed along lines similar to those indicated by exhibit No. 2?

[fol. 967] A. It has.

Mr. Strouss: Of course, our objections go to the testimony of this witness.

The Court: The record may show the objection. It is overruled, a running objection to all this line of testimony.

Mr. Mason: Do you presently operate any freight boxcars in revenue service that are not all steel construction or steel underframe construction?

A. We do not.

Q. Now, as to passenger train cars, will you look at exhibit No. 4 and state whether or not the passenger equipment of the Northwestern has been developed along the lines indicated by that exhibit?

A. It has. In fact, we have a number of coaches that are identical to the coaches of the Southern Pacific that operate in through service between Chicago and San Francisco over the Southern Pacific, the Union Pacific, and Northwestern.

Q. In the so-called "Overland Route"?

A. In the so-called "Overland Route."

Q. Do they correspond in general design—well, are they in general design the cars shown here for 1937?

A. They are.

Q. Do you have any passenger cars in main line revenue [fol. 968] service of other than steel construction?

A. We have none.

Q. Does that include passenger cars in use in your suburban service, are they also of steel construction?

A. They are all steel construction.

Q. Does your company operate cars owned by the Pullman Company in its main line passenger trains?

A. They do, regular standard Pullman cars, the same as operated on all other railroads.

Q. You spoke of through line service of the Southern Pacific. Do some of these Pullmans operated on your lines operate over the Southern Pacific?

A. They do.

Q. What trains particularly?

A. Trains Nos. 27 and 28, and Challenger trains Nos. 87 and 88.

Q. Trains Nos. 27 and 28 are designated as the San Francisco Overland Limited, are they not?

A. Yes, sir.

Q. How about trains Nos. 14 and 21?

A. Also trains Nos. 14 and 21, the Pacific Limited.

Q. Does your company operate jointly with the Union Pacific and the Southern Pacific a Diesel-electric train of [fol. 969] special design?

A. They do.

Q. What is the name of that train?

A. The City of San Francisco.

Q. Do you recall any other passenger train operated on through schedules with the Southern Pacific and Union Pacific?

A. Yes, called the Forty-Niner trains Nos. 48 and 49, extra fare trains between Chicago and San Francisco.

Q. Is that an all-Pullman train?

A. All-Pullman train.

Q. Now, will you refer, please, to exhibits 5 and 6, No. 5 being the exhibit which shows the chronology of freight locomotive design on the Southern Pacific. Does your company have freight locomotives corresponding in general to the locomotives indicated on the exhibit?

A. We do. So far as the Consolidation locomotive is concerned, our tractive effort is a little larger than that of the Southern Pacific. Our Consolidation locomotives have a tractive effort of 51,600 as compared with the Southern Pacific 43,300.

Q. Are your Consolidation locomotives of the tractive effort you have just stated in main line freight service at the present time?

[fol. 970] A. Yes, sir.

Q. Do you have any Mikados in service?

A. Yes, sir. The preponderance of our freight locomotives are Mikados. The tractive effort of our Mikado is 60,100 as compared with the Southern Pacific 51,080.

Q. Are those Mikados of yours of comparatively recent acquisition or older locomotives?

A. They are the older locomotives. About 50 of them have been rebuilt though and stokers have been added to them.

Q. Do you use coal burner locomotives entirely or predominately?

A. Predominately, all freight locomotives east of the Missouri River are coal burning, and those west of the Missouri River are oil-burning.

Q. Do you have the larger types such as the 2-10-2 type, or a type corresponding to the Southern Pacific type?

A. We don't have a 2-10-2, but we have what we call the "Northern" type, 4-8-4, with a tractive effort of 71,800 pounds, which compares with your 2-10-2 of 75,150 pounds.

Q. Is your 4-8-4 Northern type used primarily in freight service?

A. Entirely in freight service. Then we have the type [fol. 971] called the "Berkshire," which compares favorably with your small 2-10-2, except that ours is a 2-8-4, with a tractive effort of 67,200, as compared with yours of 65,300.

Q. Are those more recent acquisitions, the Berkshire and the 4-8-4?

A. About ten or twelve years old. Let's see, the Berkshires were acquired in 1927 and the Northern in 1929.

Q. Now, do you limit the runs of those locomotives to one freight district or do you run them through freight terminals?

A. No, we run them through between Proviso and Council Bluffs, Iowa, and between Proviso and Wyeville, Wisconsin, by the way of Milwaukee, and between Proviso and Fond du Lac, Wisconsin.

Q. Will you refer to exhibit No. 6, the passenger train locomotive exhibit. Do you have locomotive types in service corresponding to any of those shown there?

A. Yes, we have the 4-6-0 type locomotives of 26,700 pounds tractive effort as compared with your 25,260 pounds.

Q. Are those used in main line service or surburban service?

A. Those are used primarily in local way-freight or [fol. 972] switch service.

Q. They are not used in passenger service at all?

A. No.

Q. As to main line passenger service, is the Pacific type in use?

A. Yes, we have several types of Pacific type, one with tractive effort of 28,700. That is used exclusively in suburban service; another with tractive effort of 33,600, which compares favorably with your Pacific 4-6-2 of the 29,920 pound tractive effort; then we have another Pacific type with tractive effort of 45,800 compared with your Pacific type of tractive effort of 43,660.

Q. Do you use any of these larger types, the Mountain or Golden State, in passenger service?

A. We have a type that compares somewhat to your Mountain type called "Hudson" locomotive, a 4-6-4, with tractive effort of 55,000 pounds, which compares with your Mountain 4-8-2 type of 57,510 pounds tractive effort.

Q. Are those Hudson locomotives and the large Pacific type locomotives of which you have spoken recent acquisitions?

A. The Hudson type locomotives are, they were acquired in 1938, and the larger Pacific type locomotives were [fol. 973] acquired in 1923

Q. Are these locomotives, and I refer particularly to the later acquisitions, equipped with super-heaters?

A. They are.

Q. Feed water heaters?

A. They are.

Q. What is the character of braking equipment and the air compressor equipment on them?

A. They have compound air compressors. I can't tell you the type of braking equipment, Mr. Mason.

Q. Are the same characteristics true of your freight locomotives, that is to say, as to their being equipped with super-heaters and feed water heaters?

A. They are.

Q. Does your company handle Pacific Fruit Express Company cars?

A. They do.

Q. To what extent, speaking very generally?

A. Well, the great majority of the fruit and vegetable shipments from the western and northwestern territory are in P. F. E. cars.

Q. At what junction point do you receive those P. F. E. cars carrying the perishable loads you have mentioned?

[fol. 974] A. At Council Bluffs and at Wyeville from the Omaha line, those routed via the Twin Cities from the northwestern territory.

Q. At which of these two points does the greater preponderance of this perishable traffic come to you?

A. Council Bluffs from the Union Pacific.

Q. Does your company participate in schedules for the handling of perishable traffic?

A. It does.

Q. Does it participate in schedules for the handling of through traffic?

A. It does.

Q. In which direction do the perishable schedules apply?

A. Eastbound.

Q. Where do the perishables moving on those schedules principally originate?

A. California points, Sacramento, Rosedale territory.

Q. You mean Roseville?

A. Roseville.

Q. Does that include traffic originating also in Oregon?

A. Yes; the majority of the traffic originating in Oregon comes to us through the Twin Cities gateway.

[fol. 975] Q. This traffic coming from California and received by you at Council Bluffs, are you familiar with the routing?

A. Yes, sir.

Q. Over what routes and railroads does it generally move?

A. We receive it from the Union Pacific railroad and we deliver it to Belt lines at Proviso for delivery to various eastern railroads, depending upon how it is routed. It may be routed over any of the eastern railroads from Chicago, primarily the Erie, the Pennsylvania, and the New York Central.

Q. Can you say upon what railroad lines the traffic originates in the Pacific Coast territory?

A. The Union Pacific and Northern Pacific and Great Northern.

Q. Does any of it originate on the Southern Pacific or Western Pacific?

A. Some on the Western Pacific, and some on the Southern Pacific.

Q. Does your company also make deliveries to consignees at Chicago as well as to connecting lines?

A. They do.

[fol. 976] Q. Are you familiar with the schedules which contemplate delivery at Chicago?

A. I am.

Q. From what points do the eastbound schedules for the movement of perishables apply when the movement is to Chicago or to connections at Chicago? By that I mean from what points of origin?

A. From California and Oregon points.

Q. Is there any particular locality in California which forms the starting point of the schedule?

A. Only the Sacramento and Roseville territory.

Q. And as a participant in those schedules, does your company have a particular time period assigned to it?

A. Yes, we have a proportion of the time on the through schedule, predicated on the mileage we operate.

Q. You have heard reference made by Mr. Fertig to run-off time in connection with eastbound schedules?

A. Yes, sir.

Q. Will you say whether or not the schedules in which you participate contemplate run-off time?

A. It does.

Q. Does your company participate in the run-off time? [fol. 977] A. We do.

Q. Now, as to westbound schedules, from what points do those apply and to what destinations?

A. From Proviso to various points in the western territory west of Omaha, principally on the Union Pacific and the Burlington railroads.

Q. For example, are there schedules for delivery of freight originating in Chicago and east for delivery at Denver and Salt Lake?

A. Yes, sir.

Q. San Francisco?

A. Yes, sir.

Q. Los Angeles?

A. Yes, sir.

Q. Do you participate in all those schedules?

A. We do.

Q. And on the same basis as to apportionment of time as with the eastbound?

A. Yes, sir.

Q. Do you know and, if so, will you state whether your company makes delivery at Chicago or to connections at Chicago in conformity with the schedules, or what the percentage of performance may be?

A. Yes, sir, we make delivery at Chicago to connecting [fol. 978] lines in accordance with the agreed-to schedules, and from my knowledge I would say that our on-time performance will average 98 per cent.

Q. Are there other lines operating between Omaha and Chicago which participate in the handling of eastbound traffic through that gateway?

A. There are.

Q. Will you name some of them.

A. The Illinois Central, the Milwaukee Railroads, the Burlington, the Rock Island.

Q. Now, is there competition between these several lines, or do they apportion the traffic on an agreed basis?

A. There is competition between the Northwestern and the other lines.

Q. What is the nature of that competition?

A. Well, every one of the lines tries to perform the same service that the Northwestern does.

Q. Do you know whether or not there is active traffic solicitation for this business?

A. There is.

Q. Have you before you, Mr. Kraemer, a statement consisting of one sheet and bearing the designation "Chicago and Northwestern Railway Company, Typical Examples of Freight Trains Operated on Wisconsin, Galena, Iowa, Divisions, August 1-10, Inclusive, 1940"?

[fol. 979] A. I have.

Q. Was the statement prepared by you, Mr. Kraemer, or under your direction?

A. It was prepared under my direction.

Mr Mason: May we have the statement just referred to marked for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 75 for identification.

Mr. Mason: From what sources was the information shown on the exhibit originally taken?

A. From the dispatcher's train sheets.

Q. Does that include the information as to ruling grade, or is that taken from some other source?

A. The information as to ruling grade is taken from the chief engineer's condensed profile.

Q. Are the dispatcher's train sheets which, as you state, form the foundation for this exhibit, available in the court-room?

A. They are.

Q. Are the profiles to which you have just referred also available?

A. They are.

Q. I take it that the computations where computations are indicated by the exhibit, have been made by you or [fol. 980] under your direction?

A. It has.

Q. And from the other information which shows upon the face of the exhibit?

A. Correct.

Q. Has the exhibit been checked against the underlying sources to determine its correctness?

A. Yes, sir, it has.

Q. Was that check made by you or in your office under your supervision?

A. It was made under my supervision.

Q. Will you state whether or not the exhibit is true and correct to the best of your knowledge and belief?

A. It is.

Q. These types of locomotives shown under the various appropriate columns on the exhibit, are those the types owned by the Northwestern, concerning which you have testified?

A. They are.

Q. I notice that the title contains the words "Typical examples." Did you select the period covered by this exhibit yourself?

A. I did.

Q. Will you say whether or not the month of August, and particularly the period August 1 to 10, represents a [fol. 981] fair average of the year's business, predicating your answer upon your own experience and knowledge of the company's business?

A. It does.

Q. This I take it then is neither the peak of the Northwestern's traffic nor the slack period?

A. It is not, it is a typical average. I selected a period in the middle of the year when the traffic would be about the average. The first four months of the year our traffic is usually light, and the second four months it is about the average, and the last four months it is considerably heavier, especially during September, October, and the fore part of November, when we move agricultural products and fruit and vegetables and ore and so forth.

Q. Now, relating this exhibit to No. 62, have you by any special means indicated on exhibit No. 62 the districts which are referred to on the statement marked No. 75 for identification?

A. I have. The districts that are referred to on exhibit marked No. 75 are shown on the map in heavy black line to distinguish that part of the Northwestern railroad from the other part, which is not covered by exhibit No. 75.

Mr. Mason: Have you any questions, Mr. Strouss?

[fol. 982] Mr. Strouss: Yes, I have one or two, just as a matter of information.

Q. In column B and C, are those division terminal points?

A. They are.

Q. I notice that there is one operation between Butler and Proviso, and another operation between Butler and Great Lakes. Are those over the same track?

A. They are not, they are for the first 14 miles, they are over the same track, but the tracks diverge at St. Francis. Looking on the map, St. Francis is just south of Milwaukee, and the territory from Butler to Great Lakes is along the lake shore route, while from Butler to Proviso it is along the tracks to the left of the lake shore route.

Mr. Mason: We offer the exhibit now as defendant's exhibit No. 75.

Mr. Strouss: The same objection.

The Court: Overrule the objection. It may be admitted.

(Thereupon the document referred to was received in evidence and marked "Defendant's Exhibit No. 75.")

Mr. Mason: In connection with the exhibit, of course, it [fol. 983] is understood that we tender the train sheets and the profiles for examination of opposing counsel.

The Court: Yes, the record may show that tender.

Q. Mr. Kraemer, how many miles do you have on your Northwestern lines, approximately?

A. 8,326.

Q. And this portion that shows the heavy dark line, approximately the mileage of that, please?

A. 770.

The Court: Thank you.

Mr. Strouss: Does the 8,326 include branches?

A. It does.

Mr. Mason: I take it, Mr. Kraemer, that the lines shown on exhibit No. 75 are your principal main lines of heavy freight traffic?

A. They are.

Q. And are these all lines which are subject to your own jurisdiction as assistant general manager?

A. Yes, sir.

Q. Now, in answer to a question from opposing counsel a moment ago, you said that these points shown in columns

B and C were all freight terminals. I notice, and I want to call your attention to line 23 and also to line 24, operations from Caledonia to Harvard, and from Harvard to Janesville. Just what is the nature of the operation be-
[fol. 984] tween those points?

A. Janesville is a destination terminal of the Wisconsin division in the direction to Twin Cities. Harvard is an intermediate terminal between Proviso and Janesville.

Q. Now, does this exhibit show all of the trains which were operated between the points referred to during the period covered by the exhibit other than light locomotives, or locomotives and cabooses without other cars?

A. No, it doesn't show the way freights or locals.

Q. It shows the trains operating through between these points?

A. It does.

Q. As through trains?

A. Yes, sir.

Q. Would the way freights and locals appear on the same train sheets?

A. They do.

Mr. Strouss: What about light engines?

A. Yes.

Q. They are shown on here?

A. No.

Mr. Mason: Light engines, of course, are shown on the
[fol. 985] train sheets?

A. They are.

Q. Mr. Kraemer, what is the standard weight of rail on the main lines of the Northwestern, particularly in your district?

A. 112 pounds.

Q. Do you have any main line districts, particularly those referred to on exhibit No. 75, where there is lighter rail?

A. Very little 100 pound rail, the vast majority is 112 pound rail.

Q. Is the 112 pound of recent installation in the track?

A. Within the last ten years.

Q. Did it replace lighter rail?

A. It did.

Q. Now, as to the bridges, you have numerous bridges in your main lines?

A. We have.

Q. You have at least two crossings of the Mississippi River, haven't you?

A. Yes, we have.

Q. Are there any of those bridges as to which the weight of the locomotive or the weight of the train crossing it must be limited because of the construction of the bridge? [fol. 986] A. Not to my knowledge. The Mississippi River bridge at Clinton, Iowa, will take any class of locomotive that we have, or even that the Union Pacific has, because a great many of those locomotives when they come from the factory are routed over our line, those of their recent acquisition. With respect to the Mississippi River bridge at Winona, Minnesota, it would take our Mikado type locomotives. We have never attempted to operate any larger locomotives in that territory.

[fol. 987] Mr. Mason:

Q. Are there any main line bridges where any limitation is observed?

A. Not to my knowledge, not in my territory.

Q. Exhibit 62 indicates that the Northwestern has a considerable branch line mileage. Do you operate freight trains on those branch lines?

A. Yes, primarily over what we call strictly branch line that our stub lines radiating from the main line, as a general proposition all we operate is way freights. However, there are a good many other lines there that we call secondary main lines for a typical example, from Milwaukee up to Ishpeming, Michigan. We call that our secondary main line.

Q. Now, do the trains on your branch lines and secondary main lines exceed seventy cars in length or are they of shorter length?

A. In our secondary territories, on secondary main lines, they exceed 70 cars in length, but on none of the branch lines do they exceed 70 cars.

Q. What considerations, Mr. Kraemer, in your experience as an operating man, determine the length of freight trains operated by the Northwestern?

A. Primarily the volume of business and the schedule requirements, and during the winter months the weather conditions.

Q. When you speak of schedule requirements, just what [fol. 988] do you mean?

A. Where we are required to make certain guaranteed schedules, where there is a penalty involved when we don't make the schedules, in such cases we do not handle as many cars as we do where we do not have to maintain guaranteed schedules. For example, between Denver and Chicago, we have guaranteed livestock schedules of 36 hours. We agree to take that stock through from Denver to the Union Stock Yards within the 36-hour confinement limits. If we don't and the stock is unloaded enroute for feed, water and rest to comply with the law, and it is late arriving in the market, we are subject to a claim for any market loss there might be.

Q. Do you have regular scheduled departures for freight trains?

A. We have.

Q. When the connection for one of these scheduled departures is late, do you customarily hold for connection, or do you leave on schedule?

A. We customarily hold a reasonable amount of time. Tak our west-bound schedules from Chicago, it is nothing unusual to leave Proviso from an hour and a half to two hours late, waiting for connections.

Q. When you speak of running these livestock trains which maintain a particular schedule, do you or do you not [fol. 989] run trains greater than seventy cars in length on schedule, similar to the livestock schedules?

A. We do.

Q. Mr. Kraemer, have you before you a statement in one sheet bearing the title, "Chicago & Northwestern Railway Co., Maximum Number of Cars handled in Various Main Line Passenger Trains between Chicago and Omaha during the period August 1-10, Inclusive, 1940?"

A. I have.

Mr. Mason: May we have the statement marked Defendant's Exhibit 76 for identification?

The Clerk: Defendant's Exhibit 76 for identification.

Mr. Mason: Was this statement prepared by you, Mr. Kraemer?

A. It was prepared under my direction.

Q. Did you supervise its preparation?

A. I did.

Q. From what sources was it prepared?

A. From the dispatcher's train sheets.

Q. Are those the same dispatcher's train sheets which were used in the preparation of exhibit 75?

A. They are.

Q. And the exhibit relates, as its title indicates, to the [fol. 990] same period?

A. Correct.

Q. Is that period from August 1st to 10th, inclusive, a period of heavy or was it a period of unusually heavy passenger traffic or of light passenger traffic, or how was it characterized?

A. It is really heavier than the normal traffic, due to the summer tourist business between Chicago and California. Other than that, it is normal performance.

The Court: Mr. Kraemer, I notice that a number of the other witnesses say that they selected a period in April as being a normal period. That is not true with your line? I notice you have taken August in both of these.

A. Yes. No, it isn't in so far as our passenger traffic is concerned. August would be a little bit heavier than April, probably about 10 per cent. The same is also true in so far as our freight traffic is concerned. However, if we had selected a later period, say September, our freight traffic would have been considerably heavier. I was not told what period to select. I got the request in September and I selected as recent a period as I thought we could and have the records available.

Mr. Mason:

Q. Has the exhibit been checked against the train sheets [fol. 991] to determine whether the showing here is correct?

A. It has.

Q. And will you say whether it is correct?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss:

Q. Of course, in subsequent months, during the winter, your passenger traffic would not be as heavy as through August, would it?

A. No, I said that August is about 10% heavier, but even during the subsequent months when the passenger traffic isn't so heavy, we make some consolidations of trains so that the length of trains over all is probably a little greater right now than it would be in August.

Q. Do you have any tourist trade to the parks, the Yellowstone Park and the Colorado?

A. We have.

Q. And that, of course, would be reflected in this exhibit?

A. Yes.

Q. The mileage is given as 488. Between what points is that?

A. That is between Chicago and Omaha.

Q. And the exhibit, as I take it, means that at some point during that trip, not necessarily all the way through, the [fol. 992] train carried the number of cars shown?

A. That is correct, although we have very little intermediate dropping off of cars, so that for the most part the consist of the train is carried through from Chicago to Omaha. There are only two sleepers that are dropped off between Chicago and Omaha, one at Cedar Rapids and one at Ames, Iowa, for Des Moines, and they are on two different trains.

Mr. Mason:

Q. Do you set out dining cars enroute between Omaha and Chicago on any of these trains?

A. No, dining cars all operate through between Chicago and Omaha.

Mr. Mason: Any further questions?

Mr. Strouss: No further questions.

Mr. Mason: We offer the exhibit in evidence as No. 76.

Mr. Stronss: The same objection.

The Court: Objection overruled. It may be received in evidence.

(Thereupon the document referred to was received in evidence and marked, "Defendant's Exhibit No. 76.")

Mr. Mason:

Q. Will you refer to No. 76, Mr. Kraemer. I will ask [fol. 993] you if you will identify some of these west bound

trains as trains operated jointly with the Southern Pacific as one of the other carriers. Can you pick out some of those?

A. There is a train known as No. 49, on line No. 1, the "Forty-Niner" that is operated jointly with the Union Pacific and Southern Pacific. Also train No. 21, the Pacific Limited on line No. 2; also train No. 101 on line 8, the City of San Francisco; also train 27 on line 11, the Overland Limited; also train No. 87 shown on line 12, the Challenger. And east bound, train No. 48, line 15, train No. 14 on line 16, the Pacific Limited; train No. 102 on line 22, the City of San Francisco; train No. 28 on line 25, the Overland Limited; and train No. 88 on line 26, the Challenger, are all jointly operated trains between the Northwestern, the Union Pacific and the Southern Pacific Railroads.

Mr. Mason: That is all for the witness at this time. Mr. Strouss, do you desire to cross examine now or defer your cross examination?

Mr. Strouss: No, I just want to ask one question about this exhibit.

Q. I notice some of these trains appear not to be dailies, is that true?

A. That is true, for example the Forty-Niner is not a daily train. The City of —well, on this exhibit, the City of Portland is not daily, and the National Parks Special, line 3, train No. 19, is only operated during the months of July and August. The same way with the National Parks Special running on the eastbound trip, Train No. 20.

Q. The City of San Francisco in line 8, there appears to have been only one train run during that period?

A. That is correct, that operates every six days.

Q. And the City of Los Angeles, there were three during the period?

A. Yes, the City of Los Angeles operates every third day.

Mr. Strouss: I will defer my other cross-examination until—

Mr. Mason: The train sheets have already been tendered, and of course, they are available for use in connection with this exhibit still.

The Court: Mr. Kraemer, referring to Exhibit No. 76 about which you have just been testifying, I notice in referring to the last column, designated "Total" that it appears there in some instances, the number of the cars, are 4, 2, 3 and even as low as 1's there on the City of San Francisco, line 8. It is possible that you are operating a through [fol. 995] train with only one car?

A. No, that total in the column "R" is the total number of trains operated during that period.

Q. Oh, the total number of trains?

A. Yes.

Q. And not the total number of cars?

A. No.

The Court: I see.

Mr. Strouss: That is just what I was asking about.

Mr. Mason:

Q. Then that will show in line 8, for example, Mr. Kraemer, that during this ten-day period you operated 101 once.

A. That is correct.

Q. Of twelve cars.

A. That is correct.

Mr. Strouss: Exclusive of the motor cars.

The Court: I think I understand. Any further questions of this witness?

Mr. Mason: That is all then, for the moment, Mr. Kraemer. I imagine this is an appropriate period for a recess.

The Court: Very well.

[fol. 996] (After recess.)

The Court: Call your next witness.

Mr. Booth: Call Mr. Callin.

A. E. Callin, called as a witness in behalf of the defendant, having first duly sworn, was examined and testified as follows:

Direct Examination.

By Mr. Booth:

Q. Will you state your name, please.

A. A. E. Callin.

Q. Where do you reside?

A. Omaha, Nebraska.

Q. What position, if any, do you occupy with Union Pacific Railroad Co.?

A. Accountant on the general staff of the General Auditor.

Q. How long have occupied that position?

A. Oh, approximately sixteen years.

Q. With the same company?

A. With the same company.

Q. And prior to that time were you employed by the same company?

[fol. 997] A. Yes, in various positions. With the exception of three years I spent with the accounting division of the United States Railroad Administration.

Q. Located at Omaha or Washington?

A. Traveling in charge of checking of accounts of different railroads.

Q. A traveling auditor, in other words?

A. That is right.

Q. Checking the accounts of various railroads that were under federal control under the supervision of the Director General of railroads?

A. That is correct?

Q. There has been handed the clerk——

Mr. Booth: And we ask to have it marked for identification as an exhibit——

The Clerk: Defendant's Exhibit 77 for identification.

Mr. Booth: —77 for identification, what purports to be an outline map of the Union Pacific Railroad Company.

Q. I will show this map, Mr. Callin, and ask you whether generally speaking that shows the lines of the Union Pacific Railroad Company?

A. It does.

[fol. 998] Q. The territory in which those lines are located.?

A. That is correct.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No, no questions.

Mr. Booth: We offer it in evidence.

Mr. Strouss: The same objection.

The Court: Overruled. It may be admitted.

(Thereupon the document referred to was received in evidence and marked, "Defendant's Exhibit 77.")

Mr. Booth: The significance of the heavy line will be explained by a succeeding witness. There has been handed to the Clerk and I ask to have marked Defendant's Exhibit 78 for identification a tabulation with explanatory notes entitled, "Union Pacific Railroad Co., Freight Operating and Freight Transportation Expenses Related to Traffic, Calendar Years 1922-1939, Inclusive."

The Clerk: Defendant's Exhibit 78 for identification.

Mr. Booth: Q. Mr. Callin, from what source or sources were the figures contained in columns B, C, and D of Defendant's Exhibit No. 78 for identification, which appear opposite the years 1922 to *to* 1939 inclusive secured?

A. From the annual reports to the Interstate Commerce Commission, with one exception.

[fol. 999] Q. What is that exception?

A. During the years 1922 to 1933, inclusive, it was the practice of the individual lines at that time comprising the Union Pacific System, to assess freight charges at commercial rates, one line against the other, and likewise to compile revenue ton-miles on such traffic and report it to the Interstate Commerce Commission as revenue ton-miles. Commencing January 1, 1933, that practice was discontinued and the material was hauled free by one company for the other, just the same as it is today by the consolidated company.

Q. When you speak of other companies, you mean subsidiary companies

A. The companies that now comprise the present Union Pacific Railroad Company and its leased lines.

Q. Referring to the note on this exhibit at the foot of the exhibit preceded by a star in brackets, the affiliated or proprietary companies to which you refer are named in that note, are they not

A. Yes, sir.

Q. And they were the Oregon Short Line Railroad Company, the Oregon-Washington Railroad and Navigation

Company, the Los Angeles and Salt Lake Railroad Company, and the St. Joseph and Grand Island Railway Company?

[fol. 1000] A. That is correct.

Q. All these reported directly to the Interstate Commerce Commission on Annual Report, Form A, from the year 1922 to what year, inclusive?

A. 1935, inclusive.

Q. And after the year 1935, was there any change in their method of reporting?

A. Commencing January 1, 1936, all of the lines named were leased by the Union Pacific Railroad Company and operated as one operating company, and thereafter the Union Pacific made the Annual Report of all operations. But for corporate purposes; in the year 1936 the report was made on Form E for the other four companies that are now leased by the Union Pacific.

Q. That is OS-E?

A. No, not OS-E, I. C. C. Form E. It was an annual report blank provided for companies of that character, non-operating companies.

Q. Non-operating companies?

A. Yes, sir.

Q. But the operating statistics in so far as they relate to this exhibit, after January 1, 1936, are contained in the annual reports of the Union Pacific Railroad Company for the years 1936 to 1939, inclusive, are they?

[fol. 1001] A. Yes, sir.

Q. Will you take Defendant's Exhibit No. 77 and point out and describe to the court for the benefit of the record on Defendant's Exhibit 77, first, the lines of the Oregon Short Line Railroad Company, where they begin and end?

A. From Granger, Wyoming, to Huntington, Oregon, and from Ogden, Utah, to Butte, Montana.

[fol. 1002] Q. And the lines of the Oregon-Washington Railroad and Navigation Company?

A. From Huntington, Oregon, to Seattle and Spokane, Washington.

Q. And the lines of the Los Angeles and Salt Lake Railroad Company?

A. From Ogden to Los Angeles.

Q. And the lines of the St. Joseph and Grand Island Railroad Company?

A. From St. Joseph, Missouri, to Hastings and Grand Island, Nebraska.

Q. Where is Huntington by reference to the exhibit?

A. Do you wish me to connect it close to some point?

Q. Connect it close to some point on the map.

A: It is not far from the state line between Idaho and Oregon, a short distance beyond——

Mr. Mason: Practically at the Oregon-Idaho line.

A. —beyond Boise, Idaho, but not shown on this map.

Mr. Booth: Beyond Boise, Idaho, near the state line.

A. West, near the state line.

Q. That is, west of Boise, Idaho.

[fol. 1003] A. Yes, sir.

Q. What annual reports of the Union Pacific Railroad Company and the subsidiary or proprietary companies you have named have you with you here in the court room?

A. All of them.

Q. For the period covered by the exhibit?

A. Yes, sir.

Q. How many in number are there, approximately?

A. About sixty.

Q. Referring to the first paragraph of the Source note, which reads, "Revenue ton-miles—Annual Reports to Interstate Commerce Commission, excluding company material hauled by one Union Pacific line for another as revenue freight prior to January 1, 1934," what was the purpose of making that exclusion in preparing this exhibit?

A. To place the figures for the years 1922 to 1933, inclusive, on a comparable basis with the succeeding years.

Q. And they would not have been on a comparable basis had the company material been included in the first period and excluded in the second?

A. That is correct, because it was considered as revenue ton-miles prior to 1934.

Q. And can you and do you as an accountant say that [fol. 1004] with that computation and that exclusion the revenue ton-miles are now on a comparable basis throughout the years 1922 to 1939, inclusive?

A. Yes, sir.

Q. Now, will you explain, please, the second paragraph of the source note, "Freight operating and transportation

expenses—Annual Reports to the I. C. C. with an addition to total freight expenses of a proportion of some joint facility expenses under Maintenance of Way & Structures and some locomotive repair, depreciation and retirement expenses under Maintenance of Equipment prior to January 1, 1927, that were reported in Annual Reports to the I. C. C. as not apportioned to freight or passenger"?

A. Those were some expenses which according to the rules of the Interstate Commerce Commission we considered we had no basis of making the apportionment between freight and passenger service. Under that technical interpretation no apportionment was made. But commencing in 1927, it became the practice to apportion all of those expenses on an appropriate basis.

Q. So that you went back of 1927 and made this apportionment?

A. So as to bring in the entire amount of the operating [fol. 1005] expenses, to put it on a comparable basis with the method followed thereafter.

Q. Did you resort in any respect in preparing this exhibit to your Form OS-A?

A. No.

Q. Did you make or personally check the computations shown in Columns E and F, and in the three lower blocks of the exhibit?

A. I did not do so personally, I had them checked by a comptometer operator.

Q. Are you satisfied they are true and correct?

A. I am satisfied they are correct. They are first made, then verified.

Mr. Booth: Any questions?

Mr. Strouss: No.

Mr. Booth: We offer this in evidence as Defendant's Exhibit No. 78.

Mr. Strouss: The same objection.

The Court: Objection overruled. It may be admitted.

(Thereupon, the document referred to was received in evidence and marked "Defendant's Exhibit No. 78.")

Mr. Mason: And we tender for counsel's inspection the 60 reports, or thereabouts.

Mr. Booth: There has been handed to the Clerk and we [fol. 1006] ask that there be marked for identification as

Defendant's Exhibit No. 79, a proposed exhibit in one page, headed "Union Pacific Railroad Company (See note), Freight Service Operating Averages, Calendar Years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 and 1939." Have you a copy——

The Clerk: Defendant's Exhibit 79 for Identification.

Mr. Booth: Have you a copy of this proposed exhibit, Mr. Callin?

A. I have.

Q. Are the sources from which the items shown in the first block of the exhibit and numbered from 1 to 10, inclusive, correctly shown in the five notes headed "Source"?

A. They are with the exception of the first note. I would like to add to that a little.

Q. Very well.

A. For the years prior to 1936, some of our lines did not report all of their operative mileage as being operated in freight service, but under our present arrangement since 1936 we report all operative mileage as operated in the freight service, operated, reported to the I. C. C. as operated in freight service at the end of the month. So we take it all as operated in freight service, because it is operated [fol. 1007] in freight service. So, in order to make the figures comparable for the years prior to 1936 with those for 1936 and subsequently, I used the total average mileage operated, the same as we are doing today.

Q. And you took the figure you used from the Annual Report——

A. That is correct.

Q. ——of the Union Pacific Railroad Company to the Commission?

A. I took it from the different roads comprising the present Union Pacific Railroad Company, and excluded therefrom the mileage that was operated jointly by two or more companies, what we call duplicated mileage.

Q. Then in the case of jointly operated mileage you would not credit both roads with it, but only one road?

A. We placed it on a system basis. We credited it just once.

Q. Was there a great amount of that jointly operated mileage?

A. No, there is only about 25 miles.

Q. It wouldn't alter the percentage increase shown in the last column, of 1939 over 1922, to any appreciable extent?

[fol. 1008] A. Very little.

Q. The relation that "25" bore to "9901."?

A. Yes.

Q. You refer in these notes to Forms OS-A and OS-E, respectively. Have you here in the court room the Forms OS-A and OS-E for the Union Pacific Railroad Company and the affiliated companies in the note at the bottom of the exhibit, in so far as those forms were used in the preparation of this exhibit?

A. Yes, sir.

Q. Are those available for the inspection of counsel?

A. They are.

Q. Were the formulas mentioned in Items 5, 6, 9 and 10, of the Source note followed in the construction of this exhibit?

A. Yes, sir.

Q. And is the exhibit true and correct and in accordance with the sources and the source note to the best of your knowledge and belief?

A. Yes, sir.

Mr. Booth: Any questions?

Mr. Strouss: No questions.

Mr. Booth: We offer it in evidence.

Mr. Strouss: The same objection.

[fol. 1009] The Court: Objection overruled. It may be admitted in evidence.

(Thereupon, the document referred to was received in evidence and marked, "Defendant's Exhibit No. 79.")

Mr. Booth: We tender the OS-A's and OS-E's, together with the——

We ask that there be marked for identification as Exhibit No. 80, a typewritten statement just handed the Clerk, containing a list of commodities which I shall describe.

The Clerk: Defendant's Exhibit 80 for Identification.

Mr. Booth: Referring to Defendant's Exhibit 80 for Identification, did you personally prepare this, Mr. Callin?

A. Yes, sir.

Q. When was it prepared?

A. Last night and this morning.

Q. Is it correctly described in the title, which is "Statement showing number of Carloads of Revenue Freight Carried during the Year 1939 for Certain Selected Commodities, Total Products of Agriculture and Total Carload Traffic; also, Total Cars and Tons by General Commodity Groups for Carload Traffic, and Total Tons of l. c. l. and of [fol. 1010] all Traffic carried, as shown in Schedule 541 of the Annual Report to the Interstate Commerce Commission"?

The Court: Mr. Booth, may I ask what l. c. l. means?

Mr. Booth: Less than carload.

Q. Is that correct?

A. That is correct.

Q. That applies, for instance, to a case where a number of shipments for different consignees are contained in the same car, or where a consignor has not loaded his car to the minimum carload weight?

A. That is correct.

Q. And the less than carload freight, according to this exhibit, handled by the Union Pacific Railroad Company during 1939 was but 367 thousand odd tons, as compared with 26-million odd tons handled as carload traffic?

A. That is correct.

Q. Now, will you state whether the Items 110 to 143, inclusive, on this exhibit are entirely and literally taken from the Union Pacific Railroad Company's report to the Interstate Commerce Commission on Form A for the year 1939?

A. They were, from Schedule 541.

Q. Without change or computation?

[fol. 1011] A. Without any change.

Q. The totals under those items were made by you, were they not?

A. Yes, sir.

Q. And are they correct?

A. They are.

Q. The items designated as Total Products of Agriculture and Grand Total Carload Traffic, were those taken by you from the same report?

A. Yes, sir.

Q. And are correctly shown?

A. Yes.

Q. The cars and tons shown opposite the designations of the various groups in Schedule 541, the last subject of the

exhibit, are those abstracted by you correctly from that report and are they correct?

A. They were, and they are correct.

Mr. Booth: I will state that the totals just referred to were read in the record on the testimony of a former witness, and for the sake of accuracy I asked the witness to include them in this exhibit.

That is all.

We offer the exhibit in evidence as Defendant's Exhibit No. 80.

Mr. Strouss: The same objection.

[fol. 1012] The Court: Objection overruled. It may be admitted.

(Thereupon, the document referred to was received in evidence and marked "Defendant's Exhibit No. 80.")

Mr. Booth: Do you desire to defer cross-examination?

Mr. Strouss: No, I think I will ask a general question and then I will look at these—I don't want to look at sixty of them, however—reports this evening. If I have any more questions, I will call him back, and if not, it won't be necessary.

Q. Mr. Callin, referring to this Exhibit 78, "Freight Operating and Freight Transportation Expenses Related to Traffic," the amounts shown in Column C represent the total of items 201 to 462 of the Annual Report?

A. That is correct.

Q. And Column D, accounts 371 to 420 of the Annual Report?

A. Inclusive.

Q. Inclusive?

A. Yes, that is right.

Q. Now, on Defendant's Exhibit 79, you had a deduction in mileage after 1932. What was that deduction? Was that due to abandonment, do you know?

[fol. 1013] A. Yes, abandonment of lines, branch lines.

Q. Unprofitable branch lines?

A. Yes.

Mr. Strouss: That is all.

Mr. Booth: With the permission of the Interstate Commerce Commission, as you understand it?

A. Yes, in all cases.

Mr. Booth: That is all.

Mr. Mason: Your Honor, in connection with Exhibit No. 80, we will prepare a stylographic copy in form similar to the others, and will ask leave to substitute it when it is available.

The Court: The substitution may be made.

(Witness withdrawn.)

R. C. RANDALL was called as a witness on behalf of the defendant and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you state your name and residence to the reporter?

A. R. C. Randall; Cleveland, Ohio.

Q. What position do you occupy with the Erie Railroad?

A. Assistant to the Operating Vice President, of the Erie [fol. 1014] and Chicago and Erie Railroad.

Q. What has been your experience in the railroad business, Mr. Randall?

A. I entered the service of the Erie Railroad on April 1, 1906. I was employed in various clerical capacities in the operating department until October, 1910, and then I was away from the railroad approximately a year and a half until April, 1912, going to a business school; I resumed service on April 1, 1912, as yardmaster on the Kent Division, Marion, Ohio. I held that position until 1917, when I was made assistant general yardmaster at the same point; and on October 1, 1918, I was made general yardmaster at the same point, and I held that position until May, 1922, when I was transferred to Hammond, Indiana, as general yardmaster. On October 1, 1926, I was made trainmaster of the Marion Divison, located at Chicago, Illinois. In March, 1927, I was made assistant superintendent of the Chicago terminals. On September 1, 1928, I was transferred to assistant superintendent of the New York Terminal Division. On September 16, 1929, I was made superintendent of the New York Terminal Division, and I held that position until the first of June, 1934, when I was transferred to Scranton, Pennsylvania, as superintendent of the Wyom-

[fol. 1015] ing and Jefferson divisions and the W. B. and E. Railroad, and on October 1, 1935, I was transferred back as superintendent of the New York Terminal Division. On February 1, 1938, I was made assistant general manager of the Western District, located at Youngstown, Ohio, covering lines west of Hornell, New York, and Buffalo, New York, to Cleveland, Chicago and Dayton, Ohio. On July 1, 1939, I was transferred as assistant general manager to the Eastern District, located at Jersey City, New Jersey, covering the lines from Jersey City to Buffalo and Hornell, New York, including the Rochester division, Rochester, New York, the Wyoming Division to Avoca, Pennsylvania. On November 1, 1939, I was made assistant to the operating vice president at Cleveland, Ohio.

Q. Your experience and jurisdiction has included the entire line of the Erie and the Chicago and Erie from Chicago to Jersey City, has it not, Mr. Randall?

A. Yes, sir.

Q. Have you seen Exhibit No. 55 for Identification, which was marked during the testimony of Mr. Oakley?

A. I have.

Q. Will you say whether or not the exhibit is a fair repre- [fol. 1015] sentation in outline of the lines of the Erie and Chicago and Erie—and I will refer to them both as the "Erie" from now on—and of the territory through which the line runs?

A. It is a fair representation, but there is one correction.

Q. Will you indicate what that should be?

A. The point on the exhibit which is indicated as "Waterloo" should be "Waterboro."

Mr. Mason: We will ask that the record copy and the copies in the hands of counsel be changed accordingly. I think there is also a mistake here in the spelling of Susquehanna. It should be S-u-s-q-u-e-h-a-n-n-a.

A. Yes.

The Court: The two changes may be made upon the original record.

Mr. Mason: With those corrections, your Honor, we offer the exhibit in evidence as number 55.

Mr. Strouss: The same objection.

The Court: Objection overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 55.")

Mr. Mason: Now, as superintendent, and later as assist[fol. 1017] ant general manager, and now as assistant to the operating vice president, do you make frequent trips over the lines of the Erie?

A. I do.

Q. Do you always travel by passenger train?

A. Not always.

Q. Do you ever make such trips by freight train?

A. Yes, sir.

Q. By track motor car?

A. Yes, sir.

Q. Do you sometimes make them in a business car?

A. Yes, sir.

Q. When you travel in a business car, do you ever use freight trains?

A. Yes, sir.

Q. Where is the business car placed in the freight train?

A. Behind the caboose on the extreme rear end of the train.

Q. Does the Erie operate trains of greater lengths than 70 cars over its main line?

A. It does.

Q. When you make your trips with the business car on the freight train, do you select the particular train according to length for that purpose?

A. No, sir.

[fol. 1018] Q. What do you do?

A. I place the business car on any freight train that I wish to travel on, regardless of the length of the train.

Q. Have you ever had the car on the rear end of trains of more than 70 cars?

A. Yes, sir.

Q. Can you recall the longest freight train upon which you have traveled during the past year or two in that manner?

A. One hundred and twenty-five cars, on the Wyoming Division in mountain territory.

Q. Have you in the course of your career as an officer of the Erie become familiar with the fixed property, and by that I mean the roadbed, bridges, rails, and so forth?

A. In a general way, yes, sir.

Q. Have you also become familiar with the rolling equipment?

A. Yes, sir.

Q. Are you familiar with the operating rules of the Erie?

A. Yes, sir.

Q. Do you have a regular code of rules?

A. We do.

Q. Do you know anything about the A. A. R. Standard [fol. 1019] Rules that have been referred to?

A. I am familiar with it. Our code of rules is practically the A. A. R. code, with the exception of a few rules to cover certain local conditions.

Q. Is the Erie equipped with block signals on any part of its main line?

A. The entire main line is equipped with block signals. The entire line over which the passenger trains operate is equipped with block signals. There is a certain portion of our railroad over which freight trains operate that we have the manual block.

Q. Your line is predominantly a freight carrier, is it not?

A. Yes, sir.

Q. And the passenger service is not emphasized to a great extent?

A. What we have is as good as anybody else's, but it is limited.

Q. Do you have any territories on your main lines where more than one locomotive is used to handle trains which are elsewhere handled with a single locomotive?

A. Yes, sir; we have two pusher grades on our main line, one about ten miles in length, out of Susquehanna, Pennsylvania on the Delaware Division; another pusher grade about eight miles in length on the New York Divi- [fol. 1020] sion just east of Port Jarvis, New York.

Q. Do you regularly operate helpers in those districts with the ordinary freight train?

A. Yes, sir.

Q. What are the ruling grades in those particular territories?

A. The ruling grade in the direction of east-bound traffic on the Susquehanna hill is 1.36; on the Port Jarvis hill, so-called, it is 1.1.

Q. Are you familiar with the ruling grades elsewhere on that railroad?

A. Yes, sir.

Q. Generally speaking, the ruling grades elsewhere are less than one percent, are they not?

A. That is right.

Q. Is the principal main line between Chicago and Jersey City double tracked in any part?

A. In order to make it clear, our passenger trains operate over one route, one portion of the railroad, and our freight trains operate over another route, on certain portions of the railroad.

A. Yes, sir.

[fol. 1021] Q. Looking at the map, exhibit No. 6, do you designate there by weight of line the districts over which freight trains operate?

A. Yes, sir.

Q. And your passenger train operations, I take it, are in some districts over another line than the ones designated by the heavy weighted line.

A. That is right.

Q. Is the preponderance of the freight lines double track or single track?

A. It is 980 miles from Hammond, Indiana, to Croxton, New Jersey. All of this line is double tracked with the exception of 101 miles. There is 30 miles between S. N. Junction and Pymatuning that is single track and operated under manual block rules. There is 28 miles between Shenango, Pennsylvania, and Buchanan, Pennsylvania, that is single track, over which both freight and passenger trains operate, and it is automatic block territory. There is 10 miles from Waterboro, New York, to R. H. Tower that is single track and it is operated under traffic route control signals. There is 33 miles from Cuba Junction, New York, to River Junction, New York, which is single track for freight operations only and is operated under manual block rules. The balance of the railroad is double track and [fol. 1022] automatic block territory.

Q. Now, you speak of manual block rules. Will you explain briefly the difference between manual block and automatic block?

A. Manual blocks are blocks designated by the dispatcher to the operator and operated manually by an operator.

Q. And traffic route control, what is that?

A. Traffic route controls are signals operated at the direction of the dispatcher where traffic is moving in both

directions on a single piece of track, the dispatcher can on his own discretion, based on his own judgment, give the eastbound or westbound train the right to operate over that particular piece of track, and it is controlled by signals actuated by operators, or the dispatcher himself in some cases.

Q. Traffic route control is wholly distinct from centralized traffic control where the dispatcher operates the switches and lets the trains in and out of sidings, is it?

A. Well, yes. We also have in this territory between Shenango and Buchanan some remote control sidings, in other words; sidings on single track where the switches are controlled by remote control, by a tower at one end or the other of the siding.

[fol. 1023] Q. Have you been furnished with a copy of defendant's exhibit No. 2?

A. I have.

Q. Now, without undertaking to go into details at any length, would you say whether the freight boxcars owned by the Erie have been developed and improved along lines substantially similar to those indicated for Southern Pacific boxcar equipment?

A. I would say they have, the one difference being that we went to the steel superstructure car in 1911, whereas the Southern Pacific, as the exhibit indicates, went to it in 1913; and we have adopted the all-steel cars in 1928, whereas, according to this exhibit, you adopted them in 1936 and 1937.

Q. Does the Erie now operate any wooden underframe boxcars in revenue service?

A. No, sir.

Q. Will you refer to the passenger car exhibit, No. 4. Has the development of the Erie Railroad's passenger cars proceeded along the lines indicated by this exhibit, generally speaking?

A. Up to the point where you went into the articulated units and that type of equipment, we don't have any of that.

Q. Do you operate any wooden passenger cars?

[fol. 1024] A. No, sir, nothing but all steel cars.

Q. Are they largely air conditioned as well?

A. Well, we are progressively air conditioning them. We have some 40 air conditioned cars on our property at the present time.

Q. I take it that the construction here shown for coaches has extended to your dining cars and other passenger carrying equipment?

A. It has.

Q. Do you operate Pullman cars in your passenger service?

A. Yes, sir.

Q. Do they differ in type from those operated on other railroads?

A. They are the standard type Pullman cars such as operated on other lines.

Q. Will you refer to the locomotive exhibits 5 and 6. Does the Erie have locomotives of types similar to those shown?

A. We have certain of the types as indicated on your exhibit. We have the Consolidation, the 2-8-0 locomotive, we have the Mikado, the 2-8-2, we also have some Decapod locomotives.

Q. That is the 2-10-0 wheel arrangement?

A. 2-10-0. We operate some Pacific type locomotives, 4-6-2, in freight service, and we also have the Berkshire [fol. 1025] type of engine, the 2-8-4, which is not in the exhibit here.

Q. How does your Berkshire type compare in tractive effort with any of those freight locomotives shown here?

A. The Berkshire type that we have, the tractive effort is 72,000. They are all equipped, or most of them, are equipped with boosters, which increases that tractive effort to about 84,000.

Q. Do you have any of this 2-10-2 or the Santa Fe type?

A. We also have some Sante Fe type locomotives. The tractive effort of those locomotives is 83,000, which compares—it is a little higher than this 2-10-2 you have on this exhibit.

Q. Do you operate a Mountain type locomotive or something similar to that?

A. No, sir.

Q. Do you have the 4-6-4 type referred to here?

A. No, sir.

Q. Do your passenger locomotives, any of them, correspond in wheel arrangement with those shown on No. 6?

A. Well, our passenger power is represented by 4-4-2, the Atlantic type of locomotive, 4-6-2, the Pacific type locomo-

[fol. 1026] five, that is the only two types of passenger power.

Q. How do your Pacific type locomotives compare with the Pacific type shown here as to tractive effort?

A. Just about the same.

Q. Are your freight and passenger locomotives equipped with super-heaters?

A. Yes, sir.

Q. Feed water heaters?

A. Yes, sir.

Q. I think you have mentioned boosters. Is that——

A. Some of our K-5 passenger engines, the Pacific type engines, have recently been equipped with boosters.

Q. Does your company operate in suburban service in the neighborhood of New York City?

A. Quite extensively.

Q. Also in the neighborhood of Chicago?

A. No, sir.

Q. Is that suburban service operated over the same lines as the freight service?

A. Well, in part, yes. I would say generally yes.

Mr. Mason: I have to turn to another subject matter, Your Honor.

[fol. 1027] The Court: The court will be at recess until 10 o'clock tomorrow morning.

(Thereupon the court stood at recess until 10 A. M., December 6, 1940.)

[fol. 1028] December 7, 1940. 10:00 A. M.

All parties being represented as heretofore noted, proceedings were resumed as follows:

The witness, R. C. RANDELL, was recalled to the stand and testified further as follows:

Mr. Mason:

Q. Mr. Randall, I call your attention to Defendant's Exhibit No. 2. From your familiarity with the Erie box car equipment, will you say whether or not the development of the Erie's box cars has proceeded on substantially similar lines as indicated by Exhibit No. 2?

A. They have.

Q. Does the Erie now operate in revenue service any cars other than steel or steel underframe construction, that is, of Erie ownership?

A. No, sir.

Q. And of course, you don't operate any interchange cars of wooden construction?

A. No, sir.

Q. Have the improvements in the Erie equipment taken place at about the same times as indicated here, or earlier or later?

A. Well, the Erie went to steel superstructure cars in 1911 and to all-steel cars in 1928. In fact, all of our freight equipment today is built on recommendation of the A. R. A. [fol. 1029] and A. R. A. standards.

Q. You are familiar with those A. R. A. standards, of course?

A. Generally, yes sir.

Q. Referring to passenger car equipment, as indicated on Defendant's Exhibit 4——.

The Witness: If I might interrupt, I think you asked me that yesterday.

The Mason: I will pass that, then.

Q. Does the Erie Railroad Co. maintain or participate in schedules for the transportation of freight eastbound and westbound?

A. Yes, sir.

Q. Do those include schedules entered into jointly with connecting lines?

A. Yes, sir.

Q. Do any of those schedules apply to the movement of perishable traffic eastward from producing points in the Pacific States and related adjacent territory, such as Arizona?

A. They do.

Q. Will you explain briefly the schedule for the movement of perishable traffic originating in Southern California and Arizona and in which the Erie participates?

[fol. 1030] A. We have what is known as a third morning delivery from Chicago to markets in New York and New England. We have published cut-off times at which we will receive traffic from west lines at Chicago. We receive our

traffic, traffic of this type, through gateways at Chicago, the Belt Railroad of Chicago, the interchange point is Clearing yard, and through the Indiana Harbor Belt Railroad. They deliver this traffic into our Hammond yard.

Q. What are those cut-off times?

A. The cut-off time for our train No. 98, which is our night train out of Chicago, a third morning delivery train into New York, the cut-off time at Clearing is 4:15 P. M.; the cut-off time at Hammond through the Indiana Harbor Belt connection is 6:00 P. M.

Q. What time does that train 98 make between Chicago and your Jersey City terminal?

A. Approximately forty-five hours.

Q. That will bring it into——.

A. Approximately at 3:45 P. M.

Q. The second afternoon?

A. The second afternoon.

Q. Now, does the Erie maintain special facilities for the handling of perishable traffic arriving at New York City?

[fol. 1031] A. Yes, sir.

Q. Will you describe those briefly?

A. Well, we have a large fruit holding yard in our Croxton yard. We have icing facilities at that point. In the city of New York we have large piers, Nos. 20 and 21 on the North River, where this fruit is unloaded and displayed for sale. We have to float all of that fruit from the Jersey shore on car floats propelled by tugs.

Q. Then the transportation that you perform from Hammond to New York City includes the rail transportation plus floating the cars across the Hudson River to Manhattan itself?

A. That is right.

Q. What is the rail distance from Hammond to the Jersey City terminal?

A. Over the freight line, 980 miles.

Q. Do you have other schedules besides the schedule for Train 98?

A. Yes sir, we have Train 74, which is scheduled to leave Hammond at 9:30 A. M. and arrive at Croxton at 1:30 A. M. the second morning after, second afternoon placement. The cut-off time for traffic from western connections for that train is 6:00 A. M. Clearing at the Belt Railroad, Chicago, 8:00 A. M. at Hammond through the Indiana Harbor Belt.

[fol. 1032] Q. You spoke of icing facilities at Croxton, that is the Jersey City terminal yard. Do you have these facilities at other points intermediate between Hammond and Croxton?

A. Yes, we have large icing facilities at Marion, Ohio, Hornell, New York, and auxiliary icing facilities at Port Jarvis, New York, for traffic moving to New England through the Maybrooke gateway.

Q. Does the Erie re-ice cars in transit at these points?

A. As the billing designates, as the billing on the cars may designate.

Q. Now, would you describe briefly how the icing in transit is performed at Marion, for example?

Mr. Strouss: I don't see how that would be of any materiality in this case.

Mr. Mason: That is an operation precisely the same as we perform in Tucson; we perform it at El Paso, at Yuma and on the same class of traffic.

The Court: The objection is overruled.

A. The billing on which the cars are traveling, designates the type of icing they should receive. These trains are pulled into a track adjacent to a high platform and the ice is placed from this platform into the ice bunkers of the [fol. 1033] cars.

Mr. Strouss: Of course, my objection heretofore made goes to all this testimony?

The Court: Yes.

Mr. Mason: Does that icing operation involve breaking up the train for the purpose?

A. No, it doesn't involve breaking up the train, but at Marion, Ohio and Hornell, New York, where we have these icing facilities, we do our major classification work on the trains at these points.

Q. From your observation, about ~~how long does the operation~~ of icing at Marion or Hornell take?

A. Well, our freight schedules provide for two hours at each of those points for icing and classification of the train. The icing part of that work ordinarily does not consume over forty-five minutes to an hour.

Q. Does the length of the train or the number of refrigerator cars to be iced have any effect upon the amount of time taken?

A. Yes, the platform at both of these points holds approximately 25 cars; and as we ice the cars we have to progress the train ahead.

[fol. 1034] Q. Do you have any method of keeping track of the perishable cars received by you at Hammond or Clearing yard and of their progress toward their destinations?

A. Yes, sir, we do. We have a teletype installation on our railroad and when those trains leave Hammond there is a report which we call a passing report placed on this teletype system and car number, initial, contents, destination, consignee is advanced to the superintendent of transportation's office in Cleveland, to the general manager's office in Jersey City, and when that information is received at Jersey City there is a passing notice furnished receivers. When those trains pass Meadville, Pennsylvania, that same information is furnished to our general manager's office in Jersey City and also passed on to the receivers of the traffic by mail notice.

Q. Do you have any way of sending information of the passing and progress of the cars to the shippers?

A. The agent at Duane Street, New York, receives a copy of this passing report from Hammond and from Meadville and he in turn sends out via messenger or United States mail a notice of passing to the receiver.

[fol. 1035] Q. I had in mind notices sent to the consignor at the point of origin. Do you have any way of getting information to them?

A. These passing reports that go into our superintendent of transportation's office are made up in train order on a form and those forms are air-mailed to all of our off-line agents including those in San Francisco and Los Angeles and by 10 A. M. the morning following the passing of Meadville that information will be in the offices of those off-line representatives.

Q. Do you know whether the off-line representatives advise the shippers?

A. It is my understanding that they do.

Q. That is part of the regular conduct of the business?

A. Yes, sir, it is part of an improved service that we put in for the benefit of the shippers.

Q. Do you have any additional eastbound schedules besides the two trains that you have mentioned?

A. We have one additional scheduled train from Chicago to Jersey City but it does not handle western connection perishable traffic. It handles particularly late loadings out of the packing houses in Chicago and miscellaneous traffic [fol. 1036] interchanged to us by western lines.

Q. How far do you run the locomotives which handle these scheduled freight trains?

A. We operate Mikado engines from Hammond to Marion, Ohio, a distance of 249 miles and we operate Berkshire engines east of Marion to Croxton and we operate them from Marion to Meadville, Pennsylvania, over two operating divisions, from Meadville, Pennsylvania, to Hornell, New York, over two operating divisions and from Hornell, New York, to Croxton, New Jersey, over three operating divisions.

Q. You make the entire run from Hammond to Croxton——

A. (Interrupting) Four locomotives ordinarily.

Q. With three changes or four locomotives in all?

A. Yes, sir.

Q. Do you have westbound schedules corresponding to the eastbound schedules that you have described?

A. We do.

Q. Do those contemplate deliveries to connections at Chicago as well as deliveries within Chicago itself?

A. Yes, sir.

[fol. 1037] Q. Will you describe your westbound schedules?

A. Our train 77 and train 91 are two third-morning delivery trains into Chicago from Jersey City.

Q. What is the closing hour at Jersey City?

A. The closing hour of our stations at Jersey City is 4:30 P. M.

Q. That is of traffic for those trains?

A. Traffic for those trains, and 77 is due to arrive in Chicago at 10 P. M. the second afternoon for third-morning placement or delivery to connections. Train 91 is due out of Croxton at 11:30 P. M. and is due in Chicago at 3:30 A. M. the third morning and it also makes connections with scheduled western line trains.

Q. Will that permit placement arrival at Chicago at 3:30 A. M., permit placement on consignee's spur track?

A. It is contemplated that the traffic moving into Chicago on train 91, the best placement at consignee's siding would be noon delivery but it does make early morning western connections.

Q. Does that include traffic moving as far as Arizona or California?

A. It does.

Q. Referring first to the eastward movements of the [fol. 1038] scheduled trains, can you say in what percentage of instances as related to the whole the deliveries or arrivals are made in accordance with schedule and in what percentage of instances you fail to make such arrival?

A. I can't give it to you in percentage but I can say that our arrival at our eastern termini in general has been very good. We are not necessarily faced with the same situation that western lines are on Chicago arrival because the predominating factor at the eastern seaboard is whether or not you make the market and we do have to at times perform what we call "fire alarm moves" in our New York terminals in order to get traffic that may have been delayed on a line on account of defects, or for some other reason in arriving later trains, getting them to market before they are shut out.

Q. What is the latest hour that you can put grapes or deciduous fruits into your New York terminal to make the market?

A. We have placed cars for display at Duane Street six hours after they arrive in Croxton yard. That involves the switching out of cars, the movement to the float bridges, the loading on floats, the towing across the river, and the unloading and displaying on the pier but you cannot go [fol. 1039] wrong when you do that.

Q. As to the performance in accordance with the westbound schedules, can you state the percentage of on-time as compared to the total?

A. I can say that our westbound schedules are at least 95 per cent on-time arrivals.

Q. Is there any penalty or possible penalty against your company for failure to comply with the eastbound schedules on perishables?

A. No, there are no penalties except if we miss the market as a result of some disability of our own we are faced with claims. We do not have a guarantee in the sense that the western lines do.

Q. You do have the possibility of claims in the event of your own failure?

A. That is right.

Q. Does the perishable traffic that you handle move to any extent in P. F. E. refrigerator cars?

A. Largely so.

Q. Will you say whether or not the Erie is relatively important in the handling of the eastbound perishable movement from western points of origin to New York City as compared to other carriers from the standpoint of volume?

A. It is considered the most important carrier of west perishable traffic in the New York area.

[fol. 1040] Q. From the standpoint of volume?

A. From the standpoint of volume.

Q. Do you know, and if so will you state what the relative volume of the New York and New Jersey traffic in perishables is handled by the Erie?

A. We handle about 95 per cent of the total.

Q. That is destined to New York and northern New Jersey cities?

A. New York and the metropolitan area.

Q. Mr. Randall, will you refer to a statement of one sheet bearing the designation "Erie Railroad Company, Typical Examples of Freight Trains Handled between Certain Terminals, August 1st to 10th, Inclusive, 1939." Have you that statement before you?

A. Yes, sir.

Mr. Mason: May we have this marked for identification?

The Clerk: Defendant's exhibit No. 81 for identification.

Mr. Mason:

Q. Did you prepare this exhibit or supervise its preparation?

A. The figures represented in this exhibit were prepared under my direction.

Q. From what sources were they taken?

A. They were taken from the wheel reports, conductors' wheel reports.

[fol. 1041] Q. Does that include the column headed, "Ruling Grade"?

A. The column headed "Ruling Grade" was taken from the condensed profiles of the railroads made by the chief engineer.

Q. Do the conductors' wheel reports include all of the information set forth on the exhibit as to each of the trains collectively shown here?

A. Yes, sir.

Q. Has the exhibit been checked against these original sources?

A. It has, and I personally checked certain items of it myself.

Q. As to the computations, have you checked those computations?

A. I have.

Q. Are those conductors' wheel reports and condensed profiles available in the courtroom for the examination of opposing counsel?

A. Yes, sir.

Q. Will you state whether the exhibit is a correct reproduction of the underlying sources of information according to your best knowledge and belief?

A. It is.

Q. Does it include local trains or only through trains?

[fol. 1042] A. It includes only through trains.

Q. Are the conductors' wheel reports from which this was made bound together in bound volumes or something like bound volumes?

A. The ones I have, ordinarily they are maintained in that condition, but the ones I have are separated by weeks I believe or days, I just can't recall.

Q. Do the volumes of wheel reports that you have here include the wheel reports for the local trains which are operated between these points or over these subdivisions for the period?

A. They only involve the trains represented on the exhibit.

Q. Who selected the period covered by this exhibit?

A. I selected the period.

Q. For what reason?

A. Because based on my knowledge of our operations it represents the average period in the year, neither a high nor a low period.

Q. Is this a period when perishable traffic is moving?

A. In ordinary values.

Q. Does the period August 1 to 10 precede or follow a

[fol. 1043] period of heavy perishables?

A. It precedes.

Q. Does this showing include trains carrying other than perishables?

A. Yes, sir.

Q. Does it include trains returning empty refrigerator cars, for example?

A. Yes, sir.

Q. These mileages which are shown in the column headed "Total Distance (Miles)," do those in general indicate the distances between the terminal points of the subdivisions studied?

A. Yes, sir.

Q. Where there are two distances, for example, one of 33 and another of 35, what do those indicate?

A. That 33 miles covers the territory from Port Jervis to Maybrook, that is a part of the New York division but this is included here because it is the route over which we move our New England traffic from our last division point to the connection at Maybrook.

Q. Have you a copy of exhibit No. 55?

A. Yes, sir.

Q. Will you say whether or not the districts which are referred to on exhibit 81 for identification are the same [fol. 1044] districts shown in heavy black line on exhibit No. 55?

A. They are.

Q. Then exhibit No. 81 for identification covers the entire freight main line from Hammond to Croxton, does it?

A. Yes, sir.

Q. And the main line as well from Buffalo to Hornell?

A. Yes, sir.

Q. I believe you spoke of the Maybrook connection?

A. We have indicated the Maybrook connection on this map.

Mr. Mason: Have you any questions.

Mr. Strouss:

Q. This only covers through trains?

A. Through trains.

Q. Does it cover all through trains?

A. It covers all through trains during the period involved.

Q. During the ten-day period?

A. Yes, sir.

Q. Each wheel report simply covers that one train?

A. You will find that our wheel reports move over sometimes as many as three divisions. In other words, where [fol. 1045] there is no particular change in the make-up of the train one conductor will pass that wheel report to the next conductor and going through these records you will find in some instances one wheel report covers the movement of that train over three operating divisions.

Q. But that wheel report does not give any information as to any other train?

A. No, sir.

Q. Or as to what other trains may have been moving during that period?

A. No, sir.

Mr. Strouss: That is all the questions.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 81.

Mr. Strouss: Same objection.

The Court: Same ruling, the objection is overruled and the exhibit admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 81.")

Mr. Strouss: May I ask one more question. Your train sheets would show all train movements during that period?

A. That is right. When we selected this period we checked all the trains from the train sheets that were in-[fol. 1046] volved and then we pulled those wheel reports for those particular trains.

Q. You don't have the train sheets here?

A. I do not have the train sheets here.

Mr. Mason: All of the information shown on this exhibit is entirely taken from the wheel reports except of course as to ruling grade?

A. Yes, sir.

Mr. Mason: It should be understood, I should have stated previously, that the wheel reports referred to by the witness and of course the engineer's profiles are tendered to opposing counsel for their examination.

The Court: The record may so show.

Mr. Mason:

Q. Will you refer to a statement of one sheet bearing the title "Erie Railroad Company, Maximum Number of Cars

Handled in Various Main Line Passenger Trains during Period August 1st to 10th, 1939, Inclusive"?

A. Yes, sir.

Mr. Mason: May we have the statement just referred to marked No. 82 for identification.

The Clerk: Defendant's Exhibit No. 82 for identification.

Mr. Mason:

Q. Was exhibit No. 82 prepared by you or under your direction?

A. It was prepared under my direction.

[fol. 1047] Q. From what sources was it prepared?

A. Conductors' wheel reports.

Q. Do you maintain conductors' wheel reports covering passenger train operation which are similar in form to the reports of the freight train operation?

A. Yes, sir.

Q. Are the wheel reports from which this was taken available in the courtroom?

A. They are.

Q. Who selected the period August 1st to 10th, 1939, indicated on this exhibit?

A. I did.

Q. For what reason?

A. On our through line passenger service there are not many fluctuations in traffic. Most of our fluctuations in the passenger traffic occur in our New York and Delaware division territory which are served only by local trains so inasmuch as we picked August 1st to 10th for the freight exhibit we chose the same period for the passenger exhibit.

Q. These are through long-distance passenger trains?

A. These are trains that operate between Jersey City and Chicago and Jersey City and Cleveland.

Q. What is the "Midlander"?

[fol. 1048] A. The Midlander is represented on here between Chicago and Salamanca. At the time this study was made we split our train No. 5 at Salamanca which is normally a Cleveland train and operated from Salamanca to Chicago.

Q. Will you say whether or not the passenger train showing on this exhibit is fairly representative of your passenger train operation?

A. It is.

Q. That is your passenger train operation between your eastern terminals and your western terminals?

A. It is.

Q. This does not include any reference to your suburban passenger service in northern New Jersey?

A. No, sir.

Q. Has the exhibit been checked against the wheel reports to determine whether it is correct?

A. It has.

Q. Will you say whether in your opinion it is true and correct?

A. To the best of my judgment it is correct.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: This does not purport to show the number of cars that were in a train a continuous distance from Chicago to New York or New York to Chicago but at some [fol. 1049] point during the trip?

A. That is right.

Mr. Mason: Mr. Randall, do you have many setouts or pick-ups of cars at intermediate points on these passenger train runs?

A. We operate trains between Jersey City and Hornell at which point certain equipment is taken out for further operation to Buffalo.

Q. Which train would that be?

A. That would be train No. 1 and No. 3 and train No. 5 and No. 6. Those trains are for combination Chicago and Buffalo connections from Jersey City to Hornell.

The Court: Following Mr. Strouss' question, are the figures shown here the maximum?

A. The maximum at any one time.

Mr. Mason:

Q. That is as the total indicates?

A. Yes, sir.

Mr. Mason: We offer the exhibit in evidence as No. 82.

Mr. Strouss: Same objection.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 82.")

[fol. 1050] The Court: If I understand you, Mr. Randall, all the books and records from which this data was procured are here in the courtroom.

A. Yes, sir.

Mr. Mason: The underlying records are likewise tendered for the examination of opposing counsel.

Mr. Strouss: Of course, you did with this exhibit the same as with the freight, you went to the train sheets first to get the information and to the wheel reports?

A. Well, these are our regular daily scheduled trains as represented on any one of our time tables. Those are the only ones we have. We didn't have to do any checking against train sheets to determine that in this case.

Mr. Mason: I take it there is no objection on the ground that the train sheets are not present in the court room, is there, Mr. Strouss?

Mr. Strouss: On the freight train movement, I certainly think we should have it.

Mr. Mason: Well, the witness testified that there is no information on the exhibit taken from the train sheet.

Mr. Strouss: That will be argued when we get to it, I think.

Mr. Mason: I notice, Mr. Randall, that the exhibit indicates that you did on several occasions operate trains consisting of fifteen, sixteen, seventeen or more cars, and you say that is typical of the operation throughout the year?

A. Yes, sir.

[fol. 1051] Q. Do you know of any difficulty encountered by the Erie in heating the rear cars of any trains of fifteen or more cars during the winter season?

A. We have had no difficulties.

Q. You operate the line which parallels the Great Lakes and then runs along the boundaries between Pennsylvania and New York as the map shows?

A. Yes, sir.

Q. Do you ever encounter severe weather in that locality?

A. Yes, sir.

Q. There has been some there during the last week, hasn't there?

A. That is right.

Q: Temperatures sometimes go well below zero, do they not?

A. Yes, sir.

Mr. Strouss: Is that from your own information during this past week, Mr. Randall?

A. No, sir, from the newspapers and the radio.

Mr. Mason: Will you say, Mr. Randall, whether your [fol. 1052] passenger trains experienced any difficulty in making schedules when they are longer than fourteen cars?

A. No, sir, we haven't met with any difficulty as a result of that condition.

Q. Does your last statement apply equally to all seasons of the year?

A. I might say that during severe weather periods we have to double-head these trains at times in order to make the schedule.

Mr. Mason: I think that is all. Thank you, Mr. Randall.

Cross-examination.

By Mr. Strouss:

Q. Mr. Randall, your line has been doing quite a bit of improvement in the track and road bed by cuts and fills to eliminate dips and rises?

A. Yes, we have done quite a lot of that type of improvement.

Q. As a matter of fact, your system, practically all the way through, you have eliminated dips and hills?

A. Except on the Kent and Mahoning Divisions.

Q. Where is the Mahoning Division?

[fol. 1053] A. From Meadville to Kent.

Q. That is over territory from Western Pennsylvania through Ohio?

A. It is a rolling country and we have quite a lot of so-called hogbacks in that territory.

Q. They are all gradual, not sharp dips?

A. No, with the exception of the one grade on the Kent Division known as Wadsworth Hill, which is about five miles in length and the maximum grade is about 1.2 per cent.

Q. That is on which division?

A. The Kent division.

Q. Through Meadville, is it?

A. Meadville east to Susquehanna our railroad is fairly level.

Q. You have improved operations through that territory by cuts and fills?

A. We have improved the grade.

Q. That is practically a smooth and even operation?

A. Except from Waterboro to Randallville where we have a grade of approximately 0.7 per cent.

Q. Shenango, that is a junction?

A. That is a junction with the B. & L. E. Railroad, and we cross the Pennsylvania also.

Q. And that is where a part of the single track opera-
[fol. 1054] tion is?

A. Yes; prior to 1937 we used to operate our westbound trains from Meadville to Shenango over the B. & L. E. Railroad. Since 1937 we have operated both directions over our own lines between Shenango and Meadville.

Q. Did you testify there was remote control between Shenango and Buchanan?

A. Yes; we have two long passing tracks, one at Atlantic, Pennsylvania, and one at Stony Point. One end of each of these passing tracks is operated by remote control by the operator on the other end.

Q. And that is on this single track part?

A. Yes, sir.

Q. A witness yesterday testified that he had been given these exhibits 2, 3, 4, 5, and 6 when they were prepared. Were you also given those exhibits at that time?

A. Yes, sir.

Q. Then in comparing the comparison of cars and locomotives, did you go to your records to get that information using those exhibits or copies of those exhibits?

A. I went to records that are maintained by the Superintendent of the car department, covering the changes in
[fol. 1055] construction in our type of cars.

Q. Your testimony here as to the similarity is the information you have procured when you examined those records?

A. Yes, sir.

Q. You say you never have any difficulty in making your schedules with long passenger trains. Of course, your

schedules anticipate operation of trains of that length, wouldn't that be a fact, Mr. Randall?

A. Yes, the schedules are devised based on the obligations the train has.

Q. Do you have a train going into Cincinnati from New York?

A. No, sir, no more. We used to, but we have abandoned that service.

Q. Of course, it is quite a congested district both coming into New York and coming into Chicago?

A. Yes, sir.

Q. That your trains operate through?

A. Yes, sir.

Q. You spoke yesterday about your hauling of coal. What is the length of the coal cars that you use on your system.

A. Well, we have various types; we have 50-ton cars, we have 70-ton cars. The 50-ton cars are approximately [fol. 1056] forty feet in length; the 70-ton cars are around forty-six feet in length.

Mr. Strouss: That is all.

Re-direct examination.

By Mr. Mason:

Q. Do the hogbacks and dips that you have spoken of cause you to limit the lengths of trains in the districts where they are encountered?

A. Yes; The Kent and Mahoning Districts are the two low-tonnage divisions on our railroad.

Q. Do you observe any precise limit of train lengths in those divisions?

A. Only controlled, as it would be, by the tonnage the locomotive is specified to handle over those divisions.

Q. Then the size of the tonnage is a tonnage size and not a size determined by number of cars?

A. Yes, sir.

Q. And that in turn is determined by the tonnage rating of the locomotive?

A. Yes, sir.

Q. If a larger locomotive was placed in service there, the tonnage would be greater?

A. Yes, sir.

Q. Is there any rule on those Divisions or on any other [fol. 1057] part of the system as to the maximum number of cars that may be placed in a freight train?

A. No such rule.

Q. In connection with the question as to the design of cars, you were asked whether you referred to the records, I will ask you whether in your experience as yard master, general yard master and as a supervising officer of the higher rank, you have an opportunity to observe and have observed the box cars and locomotives operated by the Erie?

A. For a good many years, yes, sir.

Q. And at rather close range?

A. Yes, sir.

Q. That is necessarily a part of the duties of yard master and Assistant Superintendent and Terminal Superintendent, is it not?

A. That is right.

Q. Can you say whether, independently of any examination of records in the motive power department, the development of cars and locomotives shown on the defendant's exhibits referred to has been along the same lines as the development of the Erie equipment?

A. Generally speaking, yes, sir.

Q. Does your Exhibit 81 show any trains on the Kent [fol. 1058] or Mahoning Divisions?

A. Yes, sir.

Q. On what lines?

A. Line 31, line 32, on the Mahoning Division; line 35, 36, 37 and 38 on the Kent Division.

Q. Now, on the Mahoning Division, if I read the exhibit correctly, line 31 indicates that the maximum train operated during the ten-day period between Kent and Meadville east was 109 cars; is that correct?

A. Yes, sir.

Q. And on the Kent Division, line 35, indicates that the maximum train operated between Marion and Kent, Ohio, eastward during the ten-day period stated was 129 cars; is that correct?

A. That is right. Very likely in both those instances those were double-headered trains.

Q. Is the eastward direction the direction of the heavier traffic?

A. It is the direction of the heavier traffic, but the grades are about the same in both directions on those two divisions.

Mr. Mason: I think that is all. Do you desire Mr. Randall recalled for further cross-examination?

Mr. Strouss: I would like to see the records.

The Court: The court will be at recess.

[fol. 1059] (Thereupon a short recess was taken, after which proceedings were resumed as follows:)

The Court: You had finished with Mr. Randall and you are reserving the right to further cross-examine him?

Mr. Strouss: Yes.

Mr. Mason: We will recall Mr. C. R. Young for further cross-examination. Your honor will recall that yesterday Mr. Young was cross-examined and at that time it was suggested that a check be made of certain information which Mr. Strouss and his assistants had developed from the train sheet, Mr. Young's Exhibit No. 30.

The Court: Yes, I recall.

Mr. Mason: Do you want to proceed with your questioning of Mr. Young?

Mr. Strouss: Yes.

C. R. Young was recalled to the stand and testified further as follows:

Cross-examination (Continued).

By Mr. Strouss:

Q. You checked the train sheets as to broken knuckles and pulled draw bars?

A. Yes, sir, I made a joint check with your representa-
[fol. 1060] tive.

Q. I believe the result, there were seven trains, a total of seven trains?

A. No, there was a total of ten trains, nine trains on which the train sheet record of the movement of the trains showed that a draw bar had been pulled out or a knuckle had been broken, and one train which had become separated between the 20th and 21st car behind the engine. The train sheet didn't show whether that separation was brought about by a draw bar pulled or knuckle breaking, or whether

someone had stepped on the cut-lever. Of those ten, there are five of them that were over seventy cars in length and four were seventy cars or less, and the one train which became separated behind the 20th car behind the engine was over seventy cars in length.

Q. Are these all on the Illinois Division?

A. Those trains which were checked, totalling 721 freight trains, were all on the Illinois Division. That is the first division out of Chicago.

Q. I mean the trains you have just referred to?

A. That is true, all on the Illinois Division.

Q. Will you read into the record the number of each train and the number of cars?

A. Yes. On April 10th, No. 27, Engine 2513, with 94 [fol. 1061] cars and a caboose was delayed thirty minutes, Manteno, Illinois, because of a broken knuckle. On the same date, April 10th, No. 21, Engine 2509, with 38 loads and the caboose was delayed thirty-seven minutes at Kankakee because of the draw head breaking off. On——

Mr. Mason: Just a moment, Mr. Young. You say thirty-eight loads and the caboose. Is that the entire consist of that train?

A. That is true, thirty-eight loads behind the engine, and the caboose. On April 13th, Extra 2503, with 96 cars between the engine and caboose, was delayed 25 minutes at Greendale because of a broken knuckle. On the same date, April 13th, Extra 2505 with 139 cars between the engine and caboose broke in two at Leverette behind the 20th car from the engine. That is the case I have described, the record not showing whether the separation was due to a broken bar, draw bar, or whether someone had stepped on the cut-lever. On April 13th, Extra 2112, with seventy cars between the engine and caboose was delayed at Richton 30 minutes because of the draw bar pulling out from the 50th car from the engine. On April 15th, No. 76, Engine 2518 with seventy-three between the engine and caboose was delayed 30 minutes at Gilman because of a broken [fol. 1062] knuckle. On April 18th, No. 78, Engine 1414 with fifty-two cars between the engine and caboose, was delayed at Gilman 25 minutes because of a broken draw bar. On April 18th, Extra 2507 with forty-two cars between the engine and caboose was delayed at Paxton two hours and

fifty-five minutes because of a broken knuckle and letting other trains pass on account of that delay. On April 19th, Extra 2512 with eighty-three cars between the engine and caboose, was delayed — Kankakee 30 minutes because of a broken knuckle. On April 20th, Extra 2506 with 90 cars between the engine and caboose was delayed 30 minutes at Dorano because of a broken knuckle. That is all of the specific cases that we find on the train sheets.

Mr. Strouss: No further questions.

Redirect examination.

By Mr. Mason:

Q. Mr. Young, is it customary on the Illinois Central to enter on the train sheets any injuries to persons, particularly members of the train crew, which may take place because of a broken knuckle or other incident of the kind?

A. Yes, sir, where any particular member of the train crew is injured in some occurrence such as we have been [fol. 1063] describing, the dispatcher makes a notation giving the name of the employee who may have been injured if the conductor reports the injury resulting from that occurrence.

Q. Do the train sheets which you have checked contain any notations of injuries to employees by reason of the occurrences you have described?

A. There were no notations on the sheets which we checked of that nature.

Q. How many trains on the Illinois Division did you check in developing these various occurrences that you have recited?

A. 721.

Q. From your experience will you describe what is necessary to be done in order to resume operation of the train when a knuckle is broken?

A. Well, when a knuckle is broken, ordinarily there is an emergency, what we call an emergency knuckle carried on the caboose and another one carried on the engine, and that knuckle may — placed in the draw head, replacing the one which has broken, and the train may proceed.

Q. Is the job of replacing the broken knuckle a repair job performed by the brakemen and conductor?

A. Yes.

Q. Readily performed by them normally?

[fol. 1064] A. Yes.

Q. You indicate that the delays there were on the average of 30 minutes, excepting in one case?

A. Yes, there were a few as slight as 25 minutes.

Q. That delay would include the time to get the train in the clear and couple up the knuckle as well, would it?

A. In these instances where the delays were only 25, 30 or 40 minutes, the train was not put in the clear, the knuckle was replaced where the train stood. In some instances the cars were set out. This delay of 2 hours and 55 minutes was an accumulated delay because of this particular train not being able to proceed to the next passing track to clear a first-class passenger train, it did have to get in the clear for the passenger train, and the accumulated delay was 2 hours and 55 minutes.

The Court: Mr. Young, would the breaking of a knuckle, such as you have referred to necessarily result in the parting of the train?

A. Ordinarily yes, your honor.

Q. Would that ordinarily occur when the train is in motion?

A. Sometimes it occurs when the train is in motion and sometimes the knuckle is broken in making the coupling [fol. 1065] where a car has been placed in the train or taken out of the train and the two cars come together, may have broken one of the knuckles.

Mr. Mason: Mr. Young, can you describe the knuckle briefly? What part of the coupler is that?

A. It is rather difficult to explain. A draw head looks something like a man's hand. As the two draw heads come together the knuckle, which is the forward part of the draw head, the two knuckles pass and then grip one with the other and it is the knuckle or the face of the draw head which generally breaks. Sometimes a draw head may break back in what we call the shank. That might correspond with a man's wrist.

Q. The knuckle is the movable part of the end of the coupler which functions in making the coupling between the two cars, is it?

A. That is true.

Q. It is hinged so that it rotates as part of the job of coupling or uncoupling?

A. That is correct, and the lift-lever which I referred to in one of these instances, or cut-lever, is a rod which is connected with the pin which holds the knuckle in the draw head, and that rod extends out to the side of the car so that the coupler may be released by a train employee alongside [fol. 1066] the car without having to go between the cars.

Q. Now, you spoke of possible breaking in two by stepping on the cut-lever. How does that happen?

A. Frequently trespassers riding on trains between the cars or others climbing between the cars, in stepping from the end of the car will step on the lever, on the outside end of the lever, which would depress it and pull the pin which releases the knuckle and lets it straighten out and permits the cars to separate.

The Court: Then is the breaking of a knuckle a common occurrence or uncommon?

A. It is somewhat common, your Honor. They occur in the operation out on the main line and very frequently in the yard when cars are being switched.

Q. Well, Mr. Young, if I don't properly ask this question it is because of my ignorance of railroad operations. Isn't there an air-hose connection, too, between the cars?

A. Yes, sir.

Q. When the knuckle broke, that would necessarily break your air connection there?

A. And that would apply the brakes and stop the train.

Q. Automatically?

[fol. 1067] A. Yes; where the train is moving and the air hose or air connections have been coupled up.

Q. How about that segment of the train that was parted from the engine, would it be automatically stopped?

A. Yes sir, the pressure which is maintained in the air hose, that applies the brakes on either end of the train and that stops it automatically.

Mr. Mason: That is all.

Recross-examination.

By Mr. Strouss:

Q. These 721 trains, Mr. Young, in computing that you counted a train for each division that it operated in?

A. Yes sir, that was the same manner in which Exhibit 30 was made up. These trains which we checked covered the first four blocks in the trains shown in Exhibit 30.

The Court: Any further questions?

Mr. Strouss: That is all.

Mr. Mason: That is all.

The Court: May this witness be excused with his books and records?

Mr. Strouss: Yes.

The Court: Do you desire to call Mr. Fertig for cross [fol. 1068] examination?

Mr. Strouss: Yes.

The Court: Come forward, Mr. Fertig.

H. R. Fertig was recalled to the stand and testified further as follows:

Cross-examination (Continued).

By Mr. Strouss:

Q. Mr. Fertig, your system is double-tracked how far west of Chicago toward El Paso?

A. We have a mileage of 1,137 from Chicago to Tucumcari, New Mexico, which is the farthest point west that we operate. Of that 1,137 miles, about 700 miles is double track and 400 miles is single track. The double track is not continuous out of Chicago, but the total mileage is that amount, approximately.

Q. I take it from your testimony of yesterday that there is a considerably greater volume of traffic between Kansas City and Chicago than there is west of Kansas City?

A. Well, I would say yes, on account of the diverging trains which come into the main line at Silvis Terminal, Illinois.

Q. Is it a fact that even west of Kansas City for a short [fol. 1069] way the traffic would be more dense?

A. Over the 147-mile subdivision between Kansas City and Herington, it carries the traffic of the Texas lines and the Tucumcari line and also that portion of the Denver line coming into the main line at McFarland, Kansas. That territory is double-tracked.

Q. In your testimony yesterday you testified concerning the consolidation of trains at Dalhart and testifying concerning the changing of locomotives you stated that when you have a solid train you have but one engine to service at the terminal, where when you have two sections of the train you have two or three engines to serve, so that by the time the third section has finally left the terminal it tends to lose time instead of making up time, as compared with the heavy train?

A. That is true.

Q. If three trains of seventy cars were to come into Dalhart, you wouldn't consolidate that into one train of 210 cars, would you, Mr. Fertig?

A. No, not at Dalhart. The reference I made to that operation of the long train was after the trains had been consolidated at Dalhart and not the three trains coming in from Tucumcari over that 93 miles of heavy grade line where consolidation is not possible.

[fol. 1070] Q. The point I am trying to make is that you would not consolidate three trains into one but it would be at the most into two?

A. Yes, that is the usual practice at Dalhart.

Q. So that you wouldn't eliminate two locomotives but only one?

A. At Dalhart, but carrying the picture on further to Liberal, Kansas, and Pratt, Kansas, the two terminals through which the consolidated train would be operated, we would at those points eliminate the extra engine or the third engine when it is two or three trains respectively.

Q. Of course it is a fact that an engine can pull a train of 70 cars faster than it can a train of 125 cars?

A. Well, all things being equal we would say he could pull the train faster but whether he would pull the train faster over an extended territory is the question. If you kept him between the terminals that no doubt would be true.

Q. In your testimony you have testified that you have been furnished with copies of defendant's exhibits 2, 3, 4, 5, and 6 at the time they were prepared. Did you then compare those exhibits and the information there shown with the records of your company to procure the information testified to here yesterday by you with respect to similar [fol. 1071] ity of equipment?

A. To the extent of my answer to the direct question that the general improvement in our equipment measured

up to the improvements pictured in the sketches, I did that thing. I conferred with our representatives of the mechanical departments, both covering equipment and power and satisfied myself that my general knowledge of the situation was relatively correct.

Q. You testified as to the number of cars of perishables handled through Tucumcari in 1939, 43,000 cars I believe you testified?

A. Yes, sir.

Q. And that to date there were 42,500 cars, that of course was information that you procured from the records of your company?

A. That was information that is a matter of public record, taken from the interchange of traffic as between the Southern Pacific and Rock Island at Tucumcari, New Mexico, which is a joint terminal and station and the Southern Pacific records are the records of the Rock Island railroad as to the interchange because the interchange is automatic on the arrival of the train.

Q. You were testifying as to information you took from [fol. 1072] those records?

A. Yes, in the form of daily telegraph reports which we receive in our office in Chicago and which are made a part of a daily 7 A. M. situation report to the executive officers of the railroad.

Mr. Strouss: That is all.

Re-direct examination.

By Mr. Mason:

Q. The information of the volume of traffic interchanged between the Southern Pacific and your company at Tucumcari is information that comes to you as assistant superintendent of transportation in the ordinary course of your duties?

A. That is true, we get the reports daily.

Q. Is that necessary information to you for the performance of your duties?

A. Yes, the record is very essential in order that we may properly carry out the distribution of the equipment and keeping the shipping and receiving public advised of the movement of their traffic over our line.

Q. Mr. Strouss asked you whether a locomotive could pull a 70 car train faster than it could pull a train of 125 cars. I assume in answering his question you had in mind that the same locomotive would be used for a 70 car train [fol. 1073] that would be used for the longer and heavier train, did you?

A. Yes, sir, the engine of the two trains would be identical or the comparison would not be fair.

Q. As a matter of fact, in practical operation if you have 125 cars to pull over a particular territory and you also have, let us say, 70 cars of equivalent loading to pull, you will assign a heavier locomotive to the 125 train than you will to the 70 car train if both types are available?

A. We would, if that were necessary, but in actual operation on account of the way the trains come, the engine which handles 75 cars is only performing about 60 per cent of its efficiency, while if we had 125 cars the same engine would handle those cars at the same speed approximately that he would the ordinary train.

Q. Is the problem of the company the problem of moving one 70-car train at a particular speed and over a particular district or moving a 125-car train over a particular district, or is it not instead the movement of all of the traffic over the district in the most convenient and most efficient units possible.

A. That is true. The whole is the important thing and for that reason if we can have a train of 125 cars we can get [fol. 1074] that train across the single track territory more efficiently than we can two trains of a lesser number of cars for the reason that the opposing traffic can be controlled to a better extent against the longer train than it can against the short train and I would like to illustrate that by saying that on our eastbound fruit trains which operate on a fast schedule it is often possible to give them a preference movement over even a westbound passenger train, and that the delay to the westbound passenger train or the expedited freight train meeting 125 cars will not be as great as having to meet two trains of a lesser length, and while the delay to the westbound train may be a result of meeting a long train we cannot carry that process on indefinitely with more eastern bound trains or we will have our westbound schedules so out of balance that we will lose more than we gain. We find that a fact on our single track operation.

Q. Suppose in stead of having one 70-car train to move as against 125 cars as supposed by Mr. Strouss, you have 210 cars altogether to be moved from Terminal A to Terminal B. Will that traffic in your experience be delivered at Terminal B more quickly if it is moved in three 70-car trains [fol. 1075] or two 105-car trains?

A. The preferable movement would be the two long trains because of the reduction in the number of operating interferences the second train would encounter as between the second and third train with the three trains.

Q. Would you be able with your motive power to pull these two 105-car trains along the rails at approximately the same maximum speed as you would the 70-car trains?

A. Approximately the same speed, taking into consideration the territory over which the trains were operating. I will say that our trains out of Dalhart, Texas, and Herington, Kansas, which is entirely a single track operation, the consolidated fruit trains make better arrivals at Herington and Kansas City than do the lesser trains. In other words, during the peak business when we have an extensive volume of perishable freight moving through the Tucumcari gateway and can make the consolidations, the general performance of the perishable freight is better than during the lighter periods of the year when we only have two and sometimes three trains a day across that territory.

Mr. Mason: That is all.

The Court: May this witness be excused?

[fol. 1076] Mr. Strouss: Yes.

The Court: You may be excused, Mr. Fertig.

W. R. Triem was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you please state your name and residence to the reporter?

A. W. R. Triem, residence Philadelphia, Pennsylvania.

Q. In what position are you employed by the Pennsylvania Railroad Company?

A. General superintendent of telegraph, reporting to the chief of freight transportation system.

Q. How long have you been general superintendent of telegraph?

A. About four years.

Q. What has been your railroad experience?

A. I have been employed on the Pennsylvania Railroad continuously for thirty years and prior to that time, during summer vacations, I worked on a coal mine branch of the Pennsylvania in Ohio for five years. My experience has [fol. 1077] been: After graduating from Ohio State University as a civil engineer I was employed in various engineering capacities from 1910 to 1918, at which time I was appointed assistant division engineer at Akron, Ohio, serving on that division and on the Logansport division, Logansport, Indiana, as assistant division engineer; in 1924 I was appointed assistant trainmaster at Toledo, Ohio, and served in that capacity on the Toledo division and on the Pittsburgh division on the western slope of the Allegheny Mountains until 1926, when I was made trainmaster on the Renovo division at Erie, Pennsylvania, and served as trainmaster on that division and on the Panhandle division which extends from Pittsburgh to Columbus, Ohio, until 1927, when I was appointed superintendent of the Buffalo Division at Buffalo, New York. From 1928 to 1933 I was superintendent of freight transportation of the Central Region of the Pennsylvania at Pittsburgh, from 1933 to 1936 superintendent of the Monongahela division at Pittsburgh and from 1936 to date as general superintendent of telegraph.

Q. In your position as trainmaster and superintendent [fol. 1078] you were of course a division officer in charge of operations or assisting in the supervision of operations upon the several divisions you have described?

A. That is correct.

Q. As superintendent of freight transportation what were your duties in general?

A. As superintendent of freight transportation on the Central Region which extends from Altoona and Renovo on the east to Crestline and Columbus, Ohio, on the west, I reported to the general manager and had charge of all matters pertaining to freight train operations such as dis-

tribution of cars, the assignment of locomotives, the fixing of train schedules, and such other similar matters.

Q. Is the office of the superintendent of freight transportation concerned in any respect with the details of freight operation?

A. Yes, it is concerned with the details of freight operation and constant contact is maintained with the division organizations, both the superintendents and the division trainmasters.

Q. Have you previously seen a copy of defendant's exhibit No. 66?

A. Yes, I have a copy before me.

Q. Will you state whether or not that is a reasonably [fol. 1079] accurate outline map of the Pennsylvania Railroad system and of the territory in which it operates?

A. Yes, it is reasonably accurate except there is a typographical mistake made with respect to the stations shown as "Lake Charles" which happens to be "Cape Charles" shown on the lower righthand corner of the map.

Mr. Mason: May we have the record show the name of the station correctly to be "Cape Charles"?

The Court: The record may be corrected.

Mr. Mason: Q. The significance of the heavy black lines will be explained later in connection with an exhibit you propose to offer?

A. Yes, sir.

Mr. Mason: We offer the map in evidence as defendant's exhibit No. 66.

Mr. Strouss: Same objection.

The Court: Same ruling, the court will overrule the objection and admit the exhibit in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 66.")

Mr. Mason: As general superintendent of telegraph you are an officer of the entire Pennsylvania system?

[fol. 1080] A. That is correct.

Q. Did you state the name of the officer to whom you report?

A. I report to the chief of freight transportation, John C. Rill.

Q. Will you state generally what the duties of the general superintendent of telegraph are as performed by you?

A. I have been assigned by the chief of freight transportation a number of what might be considered extraneous duties beyond those prescribed for the general superintendent of telegraph. So far as the duties of the general superintendent of telegraph are concerned, they consist principally of inspecting and insuring that the telephone and telegraph facilities of the Pennsylvania Railroad are maintained according to standards and prescribed methods and it is my responsibility to issue those standards and specifications. In addition, I am the chairman of a so-called system train rules committee which has charge of the operating and signal rules of the Pennsylvania Railroad and through that organization I have considerable to do with the signalling system of the Pennsylvania, working with the signal department as to rules and methods of operation and [fol. 1081] checking all requests for authority and installations of signal systems.

Q. Do you make special studies or investigations as instructed by the chief of transportation?

A. Yes.

Q. Do those investigations and studies carry you over all parts of the system?

A. Yes, those investigations together with other work, have involved visits and inspections at all regional general divisions and divisional headquarters on the system at least once a year for the past four years.

Q. Do you visit the important terminals and yards?

A. Yes, quite frequently.

Q. Do you ever have occasion to visit the dispatchers' offices or examine their records?

A. That is one of my duties. I am in dispatchers' offices looking over dispatching records almost constantly.

Q. What is the total mileage of the Pennsylvania?

A. The total mileage of the Pennsylvania is about 10,000 miles, that is road mileage; the track mileage is about 25,000 miles.

Q. What is the distinction between road mileage and track mileage?

[fol. 1082] A. Road mileage is the right of way mileage or what is commonly thought of as the first main track. That is the entire length of railroad and when I say "all track

mileage" I am including in that some 10,000 miles of side tracks in addition to the main track mileage.

Q. Is the Pennsylvania Railroad system divided into regions, I believe you mentioned you were superintendent of freight transportation at Pittsburgh?

A. Yes, the Pennsylvania is divided into three regions and New York zone. Those regions and zones are under the immediate supervision of a regional vice-president and a general manager.

Q. And your jurisdiction as superintendent of freight transportation at Pittsburgh included which regions?

A. The central region with headquarters at Pittsburgh.

Q. And extending I think you said from Altoona on the east to Crestline on the west?

A. That is right.

Q. Is the region east of Altoona known as the eastern region?

A. The region east of Altoona is known as the eastern [fol. 1083] region and extends east to the junction with the New York division which is just north and east of Philadelphia.

Q. Where are the headquarters of the eastern region?

A. At Philadelphia.

Q. Those are also the system headquarters?

A. Those are also the system headquarters.

Q. The western region has its headquarters where?

A. At Chicago.

Q. And includes what lines?

A. Includes all lines west of Crestline and Columbus.

Q. Is there any mountainous territory in the central region over which you had jurisdiction when stationed at Pittsburgh?

A. Yes, the Allegheny Mountains cross the central region from Lake Erie southeast and all divisions east and west, including the Buffalo, part of the Renovo, the Williamsport, and the Pittsburgh division cross or have lines in those mountains.

Q. When you were superintendent at Pittsburgh, did your jurisdiction include any of the mountainous territory you have just referred to?

A. No, my territory extended along the Monongahela [fol. 1084] River and was entirely in the coal territory and the foothills of the Allegheny Mountains.

[fol. 1085] Q. Were you ever a Division officer in this mountainous territory?

A. Yes, I was superintendent of the Buffalo Division and trainmaster of the Renovo Division.

Q. You spoke of your membership on the System Committee dealing with operating and signaling rules. Are you familiar with the standard code of rules of the Association of American Railroads?

A. Yes, I am.

Q. Does the code of rules of the Pennsylvania bear any resemblance to that standard code?

A. It is based upon the standard code—the Pennsylvania Book of Rules is based upon the standard code and differs from it only to the extent necessary to cover conditions that are peculiar to the Pennsylvania Road.

Q. I take it that your main line is largely, if not entirely, equipped with block signals?

A. Yes, our main lines are entirely equipped with block signals.

Q. Do you have any helper districts in the mountainous territory that you have spoken of?

A. Yes, there are helper districts on a number of divisions in the central region. There are helpers used over the mountains on the Buffalo Division, on the Renovo Divi-[fol. 1086] sion and on the Pittsburgh Division, and then on the Eastern and Panhandle Divisions which extend west from Pittsburgh across the State of Ohio we have helper districts for movements in both directions out in that territory.

Q. Have you become, in the course of your experience as an officer of the Pennsylvania Railroad, familiar with the rolling equipment owned and used by the Pennsylvania?

A. Yes, I think I have.

Q. Is that a necessary part of the knowledge required in your position as superintendent of freight transportation?

A. Yes, it was.

Q. And as a Division Superintendent?

A. As a Division Superintendent.

Q. Have you seen, or been furnished with, copies of Defendant's Exhibits 2, 3, 4, 5, and 6?

The Court: Mr. Mason, before you go into this new matter, it is so near the noon hour that we might defer that. There are two matters that the court would like to take up

at this time with counsel, so we may be ready to leave at four o'clock this afternoon. The first is, I indicated at the beginning of the week, our sessions of this week, that I was of the [fol. 1087] opinion, that certain exhibits had been erroneously admitted in evidence, and the Court indicated that on its own motion it was going to strike these exhibits. At that time counsel indicated that you were going to supply the books and records, and so the Court didn't make the ruling then. In order that there will be no misunderstanding, I at least at this time want to indicate that I have reference particularly to Exhibits 11 and 12, which were admitted in evidence in connection with the testimony of the witness, Mr. Porter, of the New York Central; also, Exhibit No. 13, which was admitted during the time that Mr. Wright, of the New York Central, was testifying and Exhibit No. 26 of the Missouri Pacific, which was introduced in connection with the testimony of Mr. Kirk. Now, unless there is an avowal that these records from which these exhibits were taken will be produced, the Court intends before recessing tonight to strike these exhibits from the file, together with all testimony that was wholly predicated upon these exhibits. I might say in passing, as I recall the record, even the books and records of the Southern Pacific, the defendant here, were not produced when Mr. Russell was on the stand, and there was admitted Exhibits 3 and 7, which appear to be [fol. 1088] statistical information taken from the books and records of the Southern Pacific. I wanted to make the Court's position clear on this matter so there will be no later misunderstanding. Now, unless there is an avowal that these records are going to be produced, the Court might as well enter that order at this time.

Mr. Booth: As to Exhibits 11 and 12 of the New York Central, we will undertake to have either Mr. Porter return with the underlying data which is the same as the underlying data for the other exhibits introduced by statisticians for other railroads, or we will have someone of equal qualifications appear with the same books and records. As to Exhibit 13, we will undertake to have either Mr. Wright return, or someone of equal qualifications, the underlying, either the train sheets or the conductor's wheel reports, and the accompanying collateral data to establish that exhibit. As to the portions of Mr. Wright's testimony referring to that exhibit, your Honor may recall they were somewhat interwoven.

The Court: Yes, that is true, and it will be a little difficult to draw the line of demarcation. You will notice that I said such portions of his testimony as was predicated upon these exhibits would be stricken. I recognize the fact that [fol. 1089] these gentlemen, Mr. Wright and Mr. Porter, as well as the others who testified, have, by reason of their many years of railroad experience, gained certain information which unquestionably they have a right to testify to independent of any records, but you did see fit to introduce here certain specific exhibits which contain a lot of statistical data and the underlying books and records, the original source material from which they were taken were not produced.

Mr. Booth: I may say frankly that we are extremely anxious that this case be submitted to the Court on a record to which no exception can reasonably be taken on the ground of incompetency. It is a case that will take a long time to try. It is a very important case, and if, at the conclusion of the case, and after argument and consideration of the case, we should be so fortunate as to obtain a judgment, we want one that will be reasonably sure to be sustained on a possible appeal, and for that reason we are using every effort to comply with the ruling of the Court, as the Court has indicated from time to time on these evidentiary matters and it has culminated in the Court's statement today. As to Mr. Kirk's exhibit, I have forgotten the number, No. 26, we will undertake to have that exhibit made competent either by [fol. 1090] Mr. Kirk's testimony or by the testimony of someone of equal qualifications, so far as that exhibit is concerned, presenting for the inspection and use of counsel the underlying data for the exhibit.

The Court: Then, in effect, you are asking the Court to defer its ruling at this time on striking from the record these particular exhibits, on the Court's own motion?

Mr. Booth: I am. Mr. Mason will discuss the Southern Pacific exhibits.

Mr. Mason: As to Exhibit No. 3, the witness offered the exhibit as having been taken from the records of the company, I think that is correct. However, when the exhibit was offered, Mr. Strouss said, and I am reading from page 65 of the transcript of the first day's proceedings, that he had no objection. There was no objection made then on the ground of lack of record, and that was an express statement

of his. As to Exhibit No. 7, that was shown as having been taken from the Southern Pacific Company's own records, and when it was offered, no objection was made. There was no express statement but the Court made its ruling admitting it in evidence.

The Court: I merely indicated as yet I didn't recall that [fol. 1091] any of the books and records of the Southern Pacific had been produced.

Mr. Strouss: I might say, in a number of respects when I have indicated records that I have desired they have already been furnished to me before the trial started.

The Court: Then as to these two particular exhibits, there were no objections to them. At least, on the grounds that you based your other objections on?

Mr. Strouss: No, that is true.

The Court: Then you have satisfied me as far as Exhibits 3 and 7 are concerned.

Mr. Strouss: I want the Court to understand that with respect to Southern Pacific records, they have been very kind in giving me anything I have asked for.

Mr. Mason: We don't intend to alter that policy. We intend to furnish Mr. Strouss with everything we can.

The Court: Then the Court will defer its ruling striking those exhibits I have mentioned on your avowal that you intend to produce the original books and records.

Mr. Mason: As to Exhibits 3 and 7, you will make no ruling at all?

[fol. 1092] The Court: No, and the other matter we can take up at the noon recess. I thought before we adjourned today we should have an understanding as to the Christmas and New Year recess, about how long that will be so we can govern ourselves accordingly.

Mr. Booth: We will be glad to have that, your Honor.

(Thereupon, at twelve o'clock noon, December 6, the court recessed until two o'clock, P. M. this day.)

[fol. 1093] December 6, 1940; 2:00 P. M.

All parties being represented as heretofore noted, proceedings were resumed as follows:

Mr. Booth: I meant to ask Mr. Strouss, I understood from you, you have no questions of Mr. Gallin?

Mr. Strouss: No, I have no questions.

The Court: Then may that witness be excused permanently with his records?

Mr. Strouss: Yes, he may be excused.

The Court: Mr. Callin, you may be excused permanently.

F. W. Green was recalled to the stand and testified further as follows:

Cross-examination (Continued).

By Mr. Strouss:

Q. Colonel Green, I asked you to check your train sheets concerning the movement of two trains. You did that?

A. I did.

Q. It is a fact that the train sheets show that Train No. 15 on April 13th parted at Otwell, is that the station?

A. Yes, mile post 131, which is approximately Otwell.

[fol. 1094] Q. That train had 83 cars?

A. Yes, sir.

Q. It again parted at Hunter with the same consist?

A. Yes.

Q. And on the 16th of April, Train No. 19 broke in two at milepost 171 with a consist of 87 cars?

A. That is true, that is what the train sheets show.

Mr. Strouss: That is all.

Re-direct examination.

By Mr. Mason:

Q. Does the train sheet, Colonel, show whether the break in two's were caused by the breaking of knuckles or slip-by's of the couplers?

A. I have searched diligently as to these two trains mentioned and I fail to find any explanation of the cause of it, so I wired the Division at 10:40 this morning and I am expecting a telegram momentarily explaining the cause of the break.

Mr. Mason: Will it be satisfactory to you, Mr. Strouss, if we recall the Colonel and have him give that information if it becomes available?

Mr. Strouss: Yes. Colonel Green had told me that he had [fol. 1095] telegraphed.

The Court: With the exception of this telegram, the witness may be excused with his records.

W. R. Triem was recalled to the stand and testified further as follows:

Direct examination (Continued).

By Mr. Mason:

Q. Mr. Triem, I think that just before the noon recess I had asked you as to your familiarity with the rolling equipment of the Pennsylvania acquired by you in the course of your several positions on the divisions and in the general headquarters. Now, will you look at Defendant's Exhibit No. 2 relating to the construction of freight box cars of the Southern Pacific Co., and will you say whether from your knowledge of the Pennsylvania car equipment, the development of your equipment is along the same general lines as indicated by that exhibit?

A. Yes, I have examined this exhibit, and from knowledge and experience I saw at once that the development of the Southern Pacific in connection with its box cars was along the same lines as had occurred on the Pennsylvania Railroad.

[fol. 1096] Q. What is the standard of construction of the latest type of box cars of the Pennsylvania?

A. The latest type car is an all-steel car.

Q. Do you have any cars of the steel sides and ends with steel underframes in service?

A. Steel sides and ends?

Q. I mean steel superstructure, steel frames.

A. Yes, we do, we have quite a number.

Q. Do you have any cars that do not have either solid steel or steel underframe construction in revenue service?

A. No, we do not. Every car that we now own in any service in the Pennsylvania Railroad is a steel underframe or all-steel car.

Q. Do you operate refrigerator cars?

A. Oh, yes.

Q. Does that include the Pacific Fruit Express Company cars?

A. Yes, it does, in considerable numbers.

Q. Are you familiar with those cars?

A. Yes.

Q. You operate other refrigerator cars similar in type to D. F. E. cars, do you?

A. Oh, yes.

Q. Will you look at the passenger car exhibit, No. 4, and will you state whether from your observation and knowledge [fol. 1097] of the Pennsylvania passenger equipment the developments of that type of equipment has been along lines similar to those shown on Exhibit No. 4?

A. Yes, I looked at this exhibit, and with the exception that the Pennsylvania Railroad does not have any articulated equipment, the development of the Southern Pacific has been parallel with the development on the Pennsylvania Railroad.

Q. Do you operate any passenger-carrying cars on the Pennsylvania which are not of steel construction?

A. No, we do not.

Q. You operate Pullman cars in considerable numbers in your passenger service?

A. Yes, standard Pullman cars furnished by the Pullman Company.

Q. Are they of older types or the latest types available?

A. They are, of course, of all types depending upon the class of service.

Q. Will you look at the locomotive exhibits, Nos. 5 and 6, referring especially to the freight locomotive exhibit, do you have locomotives in service on the Pennsylvania corresponding with those shown on the exhibit of similar tractive effort [fol. 1098] and capacity?

A. Yes, we have locomotives of similar types. We don't have certain types that are in use on the Southern Pacific, but we have locomotives of as great or greater tractive effort.

Q. Do you have anything on your line similar to the Consolidation?

A. Yes, we have a Consolidation type. It, however, has a little greater tractive effort than the one shown here.

Q. Do you use the Mikado type?

A. Yes, we use the Mikado type to a considerable extent.

Q. Larger or smaller than the one shown?

A. We have two types, they are both a little bit larger.

Q. Do you use the 2-10-2 type locomotives?

A. Yes, we use the 2-10-2 of the larger type; in other words, the tractive effort of our 2-10-2's runs about eighty to eighty-five thousand pounds.

Q. Do you have a locomotive with a wheel arrangement similar to but slightly different than the 2-10-2 in regular service?

A. Yes, the Decapod or 2-10-0.

Q. What is the tractive effort of those locomotives?

[fol. 1099] A. The tractive effort of those locomotives is 90,000 pounds.

Q. Do you use a Mountain type locomotive in freight service?

A. Yes, to a considerable extent.

Q. The 4-8-2?

A. Yes.

Q. What is the tractive effort of the Pennsylvania Mountain type locomotive?

A. 64,000 pounds.

Q. Do you use other larger locomotives with various wheel arrangements like these Articulated Consolidations?

A. No, we don't, we don't have any except one particular engine that is used in hump service at Columbus, Ohio.

Q. How about your passenger power, what is the development there?

A. The development of passenger power on our line has been similar to the Southern Pacific. We have the Pacific type and the Mountain type.

Q. Are your Pacific type locomotives larger or smaller than the large Pacific type shown on Defendant's Exhibit 6?

[fol. 1100] A. They are larger.

Q. Greater tractive effort?

A. Greater tractive effort.

Q. Greater fuel and tank capacity?

A. Greater fuel and tank capacity.

Q. And the Mountain type locomotives, likewise?

A. And the Mountain type the same way.

Q. Do you have a passenger locomotive with the 4-6-6-4 arrangement?

A. Well, that is the so-called New York World's Fair engine that was on exhibition down at the World's Fair, and it is expected to be put in service on the western part of the railroad this winter.

Q. That is a new acquisition?
A. That is a new acquisition, yes.
Q. How many of those have you?
A. We just have one.

Mr. Mason: May we withdraw Mr. Triem for a moment and return Mr. Randall to the stand?
The Court: Yes.

[fol. 1101] R. C. RANDALL resumed the witness stand for further examination as follows:

Cross-examination.

By Mr. Strouss:

Q. I want to know what the consist of the Atlantic Express is, the passenger train shown as running from Chicago to Jersey City.

Mr. Mason: That is Exhibit 82.

A. Three Jersey City to Chicago Express cars. One Jersey City to Binghamton, New York. One express Jersey City to Lima, Ohio; one Jersey City to Chicago working car; one mail storage Jersey City to Chicago; one RPO car, one express Jersey City to St. Louis via the Wabash at Huntington; one express from Jersey City for Dallas via Chicago; one A C coach, one A C sleeper, one A C diner, that is the regular train. Those storage and sealed express cars are augmented and entirely dependent on the amount of traffic.

Mr. Mason: That is the westbound No. 7.
A. Westbound No. 7.

Mr. Strouss: I asked about the eastbound and you give me the westbound. That was the Pacific that you gave me.
A. Yes, that is right. The train you asked about is [fol. 1102] Train No. 8 from Chicago to Jersey City has one express car sealed from Chicago to Jersey City; one working express car from Chicago to Jersey City; one air conditioned coach from Chicago to Jersey; one air conditioned lounge diner from Marion to Jersey City; one air condition 10-2-1 Pullman sleeper from Chicago to Hornell, and then east of Hornell Train No. 8 is also a milk train.

It picks up milk, and the difference between this regular consist of the train and what may be found on it on any individual day is the amount of milk it picks up at Elmira and Susquehanna, and that train ofttimes goes into Jersey City with as high as 40 cars.

Q. This type of consist, the milk and that type——

A. (Interrupting:) Part of that milk is handled on the head end and part of it is handled on the rear end behind the passenger-carrying equipment.

Q. But your consist, so far as passenger train coaches are concerned——

A. Is as I gave it to you. That is the standard consist augmented by whatever milk may be available.

Q. Exhibit 81, typical examples of freight trains handled, I wasn't sure, did you say that included only through trains?

A. Yes, in that sense, through trains that start at the [fol. 1103] terminal at one end of the operating division and continue through to the other end of that operating division.

Q. You didn't mean a through train in the sense of a train from New York to Chicago?

A. Not necessarily; as depicted on this exhibit, it is from Division point to Division point.

Q. The locals, as you would use it here, would mean the trains that were doing way freight work?

A. And operate to some intermediate points on the division, turn-around service. There are none of those kind of trains included in this exhibit.

Q. They would be usually quite short trains?

A. Yes.

Mr. Strouss: That is all the questions I have. I will not have any more questions of Mr. Randall.

Redirect examination.

By Mr. Mason:

Q. This Exhibit 81 includes trains which, though operating from one subdivision terminal to the next, may have [fol. 1104] performed local work at intermediate points?

A. They may have set off or picked up intermediate between the two points the initial points and the termini point on the division.

Q. So long as they made the run from one to the other, they are shown here?

A. And the maximum cars shown in this exhibit are the maximum cars in those trains at any one particular time enroute.

Mr. Mason: That is all.

The Court: If there are no further questions and no objection, this witness may be excused with his records.

(Witness excused.)

W. R. THEM was recalled for further direct examination as follows:

Direct examination.

By Mr. Mason:

Q. You heard mention made of schedules for the movement of freight between the eastern seaboard and western points. Does Pennsylvania participate in any such schedule?

A. Yes, the Pennsylvania participates in the schedules between the west and the east by means of service advertised from Chicago and St. Louis and from Indianapolis and other junction points in the west. [fol. 1105]

Q. You also maintain your own schedules for the handling of traffic which you originate and deliver to destination or to connecting lines?

A. Yes, we do.

Q. Do you advertise those?

A. Yes.

Q. What is your schedule for the handling of perishables received at the junction at or near Chicago and moving to eastern termini?

A. We have three schedules out of Chicago, at three A. M., 8 A. M., and 2 P. M., and they run from 39 to 48 hours. One of them is 48, the other is 39, and the other is 43 hours and 45 minutes from Chicago to Jersey City, which is on the west bank of the Hudson River.

Q. That is for New York delivery?

A. For New York delivery, yes.

Q. Do you make corresponding time to Philadelphia?

A. We make corresponding time to Philadelphia and make corresponding time to Baltimore and Washington, and we make the advertised connections with the D and H at Wilkes-Barre, and with the New York, New Haven and [fol. 1106] Hartford at Greenville across the bay from Bay Ridge when New Haven traffic is interchanged. All of these schedules are on a comparable basis with the other eastern lines and fit into the coordinated arranged service train schedules that are advertised for the handling of traffic from the west to the east, and from the east to the west.

Q. Do you have similar times westward from the principal points of origin on the eastern seaboard?

A. Yes, we have; for instance, from New York two trains to the west, to St. Louis and two trains to Chicago, and an overnight train to Pittsburgh, from New York and Philadelphia, which connects with other trains at Pittsburgh and provides a delivery of the L. C. L. freight throughout Ohio, and the eastern part of the state of Indiana.

Q. Do you connect with the Chicago and Northwestern either directly or through a belt line at Chicago?

A. Oh, yes.

Q. And with the St. Louis Southwestern and the Missouri Pacific?

A. At St. Louis.

Q. East St. Louis?

A. East St. Louis; yes, sir.

Q. Do you maintain similar eastward schedules for the delivery of perishables and other freight from the west [fol. 1107] moving to Pittsburgh?

A. Yes, on a comparable basis performed with the overall service to the seaboard.

Q. What is the percentage of performance on these schedules, according to your past experience?

A. From my observation in the past six months, I would say that it is a rare occasion upon which perishable freight is not delivered at the various produce terminals in time for the market. Extraordinary efforts are made, if something occurs due to storm or accidents, to get that freight delivered on time. So far as the general performance is concerned of the trains themselves, I am not in a position to say what the exact percentage is, but I would say it is 95 to 97 per cent on-time performance.

Q. Can you state, generally, the nature of the territory served by the Pennsylvania? Is it predominantly agricultural or mining or industrial?

A. Of course, on the basis of the volume of traffic handled in tonnage, bituminous and anthracite coal is the principal commodity. However, when you consider the territory served extending along the eastern seaboard, and across the state of Pennsylvania and Ohio, Indiana and [fol. 1108] Michigan, it would have to be considered as predominantly serving a manufacturing territory so far as originating traffic is concerned.

Q. I take it, the agricultural side of your business as a carrier is more as a connecting carrier than as an originating carrier?

A. More as a connecting carrier than an originating carrier, except for portions of Indiana and Ohio and Northern New York, where a considerable amount of both grain and farm products, apples and grapes and fruits are collected at different seasons of the year.

Q. Do you know, and if so will you state, whether the Pennsylvania participates in the handling of freight originating on the Southern Pacific lines in California and Arizona?

A. Yes, I know that the Pennsylvania does handle traffic originating on the Southern Pacific.

Q. Does the Pennsylvania originate or as intermediate carrier handle any traffic destined to points reached on or via the Southern Pacific in California and Arizona?

A. Yes, our westbound connections by westbound service that I mentioned a moment ago, is coordinated with the westbound service of the Western Lines and the Southern Pacific.

[fol. 1109] Q. Does that include, for example, the service coordinated with the service of the Cotton Belt to St. Louis and thence by Southern Pacific lines to the west coast?

A. That is correct.

Q. Or equally in connection with the Chicago and Northwestern, Union Pacific, Southern Pacific route through Omaha and Ogden?

A. And other lines to Chicago, yes.

Q. You were present when Mr. Randall testified respecting the passing reports which the Erie undertakes to furnish to receivers and shippers?

A. Yes, I was.

Q. Does the Pennsylvania provide any similar service of information to shippers or receivers of perishables moving via its lines?

A. From what he described, I would say that our service along those lines is very similar. We maintain what is called a telegraphic passing report of perishables at all of our principal yards, and the numbers of the cars, the contents, the name of the shipper, and the name of the consignee, and the train in which it is moving is handled by teletype through the office of the superintendent of freight transportation in charge of that particular area. A copy is [fol. 1110] forwarded at the same time to the destination agent, and the destination superintendent of freight transportation, so that the consignee is at all times fully conversant with the movement of his perishable, that is, the consignee's perishable.

Q. Is any report made to your traffic agent in the originating territory?

A. Oh, yes, we send passing reports by airmail from Chicago, Pittsburgh, Philadelphia, and New York, every day to the off-line agents to cover the traffic which originates in the territory served by them.

Q. We have so far spoken of your east and west schedule. Does the Pennsylvania handle any perishable traffic to Philadelphia and New York originating in producing areas in southeastern United States?

A. Yes, it handles a very large volume of perishable traffic moving from the southeast through Potomac yard which is just outside of Washington, the connection of the R. F. and P. which gathers up all the traffic from connecting lines in the south.

Q. Are those perishable products of the same general character as those produced in California and Arizona?

[fol. 1111] A. Yes, they are.

Q. And reaching the same market?

A. Reaching the same markets.

Q. Do they likewise move on schedule?

A. They likewise move on schedule.

Q. Do you handle the eastbound perishable which you receive at St. Louis or Chicago for New York and Philadelphia delivered in trains of more than seventy cars or less than seventy cars as a rule or a custom?

A. As a rule it will be that they run in trains of more than seventy cars on both the Northwest route from Chicago and the Southwest route out of St. Louis.

Q. What practice do you follow as to the number of cars in the trains carrying the perishable from the southeast received at Potomac yard?

A. We follow the same general practice that we follow in the west.

Q. Have you before you a statement in one sheet entitled "The Pennsylvania Railroad Typical Examples of Freight Trains Handled between Certain Terminals, July 10-19, inclusive, 1939?"

A. Yes, I have.

Mr. Mason: May we have the statement marked as Defendant's exhibit next in order?

[fol. 1112] The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 83 for identification.

Mr. Mason: Did you prepare Exhibit 83 for Identification?

A. I had this exhibit prepared under my direction.

Q. Did you supervise its preparation throughout?

A. I supervised its preparation throughout.

Q. From what sources was the exhibit prepared?

A. The information contained on this exhibit, with the exception of the ruling grade, was all obtained from wheel reports which are filed in the office of the superintendent of car service of the Pennsylvania Railroad Company, Philadelphia.

Q. Did you obtain the wheel reports for these particular districts and days, and have this study compiled from them?

A. I did.

Q. Does this showing include all of the trains operated between the points shown in the "From and To" columns on the days referred to?

A. This shows the movement of all through trains between the terminals shown. It does not include the local or way freight trains.

[fol. 1113] Q. By "way-freight" what do you mean, precisely?

A. I mean by that those trains which handle cars for delivery at intermediate points. Sometimes they handle

L. C. L. freight for delivery at local stations and also pick up freight at local stations.

[fol. 1114] Q. Are these trains generally trains then that move from terminal to terminal without substantial change of consist?

A. That is correct.

Q. Does this in all cases include main line trains or are there certain branch or auxiliary lines referred to here?

A. No, this exhibit was set out to show typical examples and on the Fort Wayne division between Chicago and Crestline, a branch operation to Logansport, and on the Panhandle division between Columbus and Pittsburgh, branch operations were shown, whereas on the Middle division between Altoona and Harrisburg, only the main line operations were shown.

Q. Does this exhibit cover steam operated lines only?

A. This covers steam operated lines only.

Q. No electrified lines?

A. No electrified lines.

Q. From what source did you obtain the information as to ruling grade?

A. I obtained that information from the condensed profiles on file in the office of the chief engineer of the Pennsylvania Railroad.

Q. Are the conductors' wheel reports used in preparing [fol. 1115] this exhibit, and the condensed profiles, for the portions of the line referred to, in the courtroom?

A. Yes, sir, they are.

Q. Has the exhibit been compared and checked against the original sources?

A. It has. I participated in it sufficiently to insure that the check was being made accurately.

Q. Will you say whether or not the exhibit is a true and correct reflection of the information contained in the original sources?

A. It is to the best of my knowledge and belief.

Mr. Mason: Have you any questions, Mr. Strouss.

Mr. Strouss: No questions.

Mr. Mason: We offer the exhibit in evidence as No. 83.

Mr. Strouss: The same objection.

The Court: The objection is overruled. It may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 83.")

Mr. Mason: Mr. Triem, did you select the period shown on the exhibit?

A. Yes, I did.

[fol. 1116] Q. For what reason?

A. The period was selected to provide typical examples of freight trains handled, and from my general knowledge of the operations on the system for 1939, I was assured that the month of July after the 4th of July holiday period represented the average typical normal operation on those three divisions.

Q. Have you shown, or are there shown, rather, on exhibit No. 66 the districts which are covered by exhibit No. 83?

A. Yes, they are shown in heavy black lines.

Q. Well, is this line from Chicago to Crestline and thence to Pittsburgh? Is that one of the principal main lines to Chicago?

A. That is the principal main line known as the "Fort Wayne" route between Chicago and the East.

Q. Is that line employed by you to any extent in the handling of this scheduled perishable traffic received at Chicago?

A. Yes, to a considerable extent.

Q. Is it also used for the movement of westbound scheduled freight?

A. It is.

Q. Now, what is this line from Pittsburgh via Columbus and Indianapolis to St. Louis?

[fol. 1117] A. That is the Panhandle route to the southwest to St. Louis.

Q. Is there any perishables handled over that line?

A. Yes, there is a large volume of perishables handled over that line.

Q. In scheduled trains?

A. In scheduled trains.

Q. What is the nature of the line between Altoona and Harrisburg?

A. Between Altoona and Harrisburg, that is the principal through east and west route of the Pennsylvania Railroad.

Q. Does that handle the traffic moving eastward over the other two lines and coming together at Pittsburgh?

A. That is right.

Q. What is the nature of the line from Circleville via Zanesville to a junction with the Columbus-Pittsburgh line?

A. That is a branch line extending down into the central portion of Ohio and is one of the lines I mentioned a moment ago as being concerned principally with agricultural products.

Q. What is the nature of the line from Mingo Junction to Benwood and back to the main line at Weirton, is that [fol. 1118] correct?

A. That is right. That diagram represents two separate branches, one on one side of the Ohio River and one on the other, with a bridge connecting the two of them at Benwood. Lying on both sides of the Ohio River between Weirton and Steubenville, Mingo Junction and Benwood are steel and manufacturing plants of various kinds and that is a typical example of an industrial branch line.

Q. What is this line leading from the main line down to Washington, Pennsylvania?

A. That is another one of the industrial branch lines, but it is also concerned with the movement of a considerable volume of coal.

Q. Did you make any summation of the amount of perishable traffic handled in the trains shown for the ten-day period, July 10 to 19, 1939, on exhibit 83?

A. Yes, in connection with the discussions that occurred here with respect to the movement of perishables it should be noted that these three examples, namely, the Fort Wayne division between Chicago and Crestline, the Panhandle division between Columbus and Pittsburgh, and the middle division between Altoona and Harrisburg, provide a good cross-section of the amount of traffic on the Pennsylvania [fol. 1119] Railroad between the East and the West, and on line 5 of exhibit No. 83 it will be noted a movement from Chicago to Fort Wayne. My addition of the figures on that line indicate that there was moved from Chicago in this ten-day period a total of 611 cars of perishables. On the line "Columbus to Pitcairn," line 14, it will be noted that there was a total of 3,072 cars of perishables handled in this ten-day period. In other words, there was a total of 3,683 cars of perishables moving east on these two divisions during this ten-day period, which on the rate of

365 days a year would produce a total of approximately 134,000 cars of perishables. At the same time, to indicate how this traffic is gathered together and moved east over the railroad east of Pittsburgh, line 1 showing Altoona-Enola, shows that there was a total of 3,577 cars of perishables moved east from Altoona, or at the rate of approximately 130,000 cars per year.

Q. You refer to certain of these operations, particularly those in lines 23 and below in the exhibit as being branch line operations, and I notice that comparatively few of the trains in such operations exceeded 70 cars in length. Will you say whether or not these branch line operations [fol. 1120] are typical of branch line operations on the Pennsylvania generally?

A. They are typical in this respect, that where the volume of traffic is not great, and only daily, or semi-weekly service is performed, it is likely that trains on the average branch will have about this general size and make-up. However, there are a number of branches, particularly in the coal territory, where the lengths of trains are much greater than this.

Q. What considerations then govern the length of trains to be operated over the main or branch line service on the Pennsylvania?

A. The consideration of economy and efficiency of operation is the basis upon which our trains are operated, and the power furnished is to the limit of the distribution which the superintendent of freight transportation is required to make, is distributed to fit as long trains as the volume of traffic will warrant.

Q. Does the volume of the traffic offered have anything to do with the length of the trains to be operated?

A. It has almost everything to do with it. If you have sufficient volume of traffic to one destination, a long train [fol. 1121] will be operated. If there is not sufficient volume of traffic to one destination, then it is necessary to run smaller trains.

Q. As between the policy of holding cars at terminals in order to build up long trains, and moving cars in order to maintain schedules regardless of the amount of traffic offered, which course do you adopt?

A. It is quite essential that the Pennsylvania follow the practice of so arranging the movement of its traffic that it meets with the advertised schedule, and where insufficient

volume of traffic is available at the initial terminal to make up a reasonable sized train, it is necessary to run what we would consider an unreasonably small train.

The Court: We will take a brief recess at this time.

(Thereupon a short recess was taken, after which the witness was recalled to the stand and proceedings were resumed as follows:)

The Court: You may proceed.

Mr. Mason: Mr. Triem, I call your attention to a statement bearing the title "Pennsylvania Railroad Company, [fol. 1122] Maximum Number of Cars Handled in Various Main Line Passenger Trains, July 10th to 19th, Inclusive, 1939," consisting of two sheets. Have you that statement before you?

A. Yes, I have a copy of that statement before me.

Mr. Mason: May we have that marked defendant's exhibit No. 84 for identification.

The Clerk: Defendant's exhibit No. 84 for identification.

Mr. Mason: Did you prepare exhibit No. 84 for identification?

A. I had this statement prepared under my direction.

Q. From what sources was it prepared?

A. The information was taken from the wheel reports on file in the office of the superintendent of car service of the Pennsylvania Railroad at Philadelphia.

Q. Who selected the period covered by the exhibit?

A. I selected the period myself, and primarily to make it conform with the period used for the freight exhibit, feeling that the period was typical or would represent typical passenger movement for the year 1939.

Q. Were there any circumstances present during the [fol. 1123] ten-day period referred to which would either augment the normal passenger movement or cause it to be less than normal?

A. I didn't think so. I felt it was about normal for the period, neither as great as some periods of the year nor as small as some periods of the year.

Q. Does this exhibit cover all your main-line passenger trains in the districts referred to?

A. It does.

Q. Does this include lines other than those which are outlined in heavy black on exhibit No. 66?

A. Yes, it does.

Q. Has the exhibit been checked against the original sources?

A. It has.

Q. Will you say whether or not it is true and correct?

A. It is correct to the best of my knowledge and belief.

Q. Now, have you the wheel reports covering this exhibit and exhibit No. 83 as well available in the courtroom?

A. Yes, I have.

Q. And the profiles showing the ruling grades that were referred to in No. 83?

[fol. 1124] A. Yes, sir.

Q. And they are available for use of opposing counsel?

A. They are.

Mr. Mason: We offer exhibit No. 84 for identification, and at the same time tender the wheel reports and the profiles. I make the offer at this time, but defer to Mr. Strouss for any questions that he may have.

Mr. Strouss: I have no questions. The same objection.

The Court: Objection is overruled. It may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 84.")

Mr. Strouss: I have one question.

Q. Were these all straight passenger trains, or are there some that carry express?

A. They carry express and mail and passengers.

Q. This Federal Express, is that predominately passenger or express?

A. I think that is predominately passenger.

Q. What about your through trains, the New York-Washington Express?

A. I would have to look on my wheel reports, Mr. Strouss, to determine exactly what those are, but the wheel rports [fol. 1125] show exactly what the consists of those trains are.

The Court: If it is convenient, may the court see one of those wheel reports, just as a matter of becoming familiar with what the report consists of.

Mr. Mason: You have handed me, Mr. Triem, copy of your form CT-1023, which is a passenger conductor's car report of through trains. This is a passenger wheel report.

A. That is known as a wheel report for passenger trains.

Q. You have also handed me copy of your form CT-1034 and CT-1034A. Are both of these forms used for wheel reports for freight trains?

A. Two of them together constitute the report which the conductor makes to the superintendent of car service. The small sheet is removed by the superintendent of car service and is cut into pieces, each piece having a hole in it at the left-hand side and distributed to clerks who are in charge of different railroad cars, and these pieces are slipped over spindles, and at the end of the month constitute the record for the Illinois Central, for instance, the New York Central, or whatever line is represented on the number, and is [fol. 1126] just a method of accounting for the cars. The underlying sheet, the large sheet, is a carbon so far as the left-hand half of the sheet is concerned, and the righthand side is an original in pencil for use of the superintendent of car service in his records.

Mr. Mason: May the record show that the blanks supplied to the court have also been supplied to opposing counsel for their examination.

Q. I am referring to exhibit No. 84, Mr. Triem, again. The trains shown on the first sheet operated over what route and between what points?

A. Train 101 is a train which operated between New York and Washington over the New York-Washington route along the eastern seaboard.

Q. That is the direct line through Philadelphia, Wilmington, Baltimore to Washington, is it?

A. Yes, sir.

Q. Is the same true of each of the other trains on the first sheets insofar as they operated over the Pennsylvania?

A. That is correct. All these are of the same character under the general heading "New York-Washington route."

Q. Refer to the first block on the second sheet. Over what route did those trains operate?

[fol. 1127] A. Those trains operated over the New York division to North Philadelphia and thence over the passenger line of the Philadelphia division and the middle division and Pittsburgh division to Pittsburgh.

Q. Operating via North Philadelphia, Harrisburg, Altoona to Pittsburgh?

A. That is correct.

Q. The trains in the second block marked "New York-Chicago route"?

A. Those trains operated over the same route that we just described and continued west over the Fort Wayne line via Crestline and Fort Wayne into Chicago, and in the reverse direction eastward.

Q. Now, in the third block, over what route did they operate?

A. The third block under the heading "New York-St. Louis route" operated over the same route as the trains between New York and Pittsburgh, and thence over the southwest Panhandle route from Pittsburgh through Columbus and Indianapolis to St. Louis.

Q. Does the exhibit show the maximum number of cars handled in each train referred to at any time between the points shown?

A. Yes, it shows the maximum number of cars that were [fol. 1128] in the train at any one time in its movement between the terminals as shown.

Mr. Mason:

Q. These trains, Mr. Triem, between New York and Washington, do they set out cars enroute generally?

A. Very infrequently, once in a while a car may be added or taken out at Philadelphia.

Q. What about those trains on the New York-Pittsburgh, do they set out any cars between New York and Pittsburgh or add any between Pittsburgh and New York?

A. There may be occasions when cars will be added or taken off at Harrisburg and less frequently at Altoona.

Q. What about the trains between New York and Chicago, do they set out enroute to any extent?

A. To no great extent.

Q. As to the New York-St. Louis, do you have intermediate sleepers set out or picked up at Columbus or Indianapolis?

A. There are some cases in which cars are set off and picked up at Pittsburgh, Columbus and Indianapolis.

Q. Which of these runs on Exhibit 84 include crossing the Alleghany Mountains that you have previously described?

A. All of the trains moving on the Pittsburgh-New York route, New York-Chicago route and the New York-St. Louis [fol. 1130] route.

Q. That would be all the trains in both directions on the second sheet?

A. That is right.

Q. You spoke in your earlier testimony of some factors which determine the number of cars in freight trains. I will ask you whether these factors produce trains of different lengths on different divisions or on different days on the same division?

A. The conditions vary to such an extent that the lengths of trains vary as between trains of the same symbol, as between trains of different symbols on the same division and as between trains on different divisions.

Q. Have you any rule on the Pennsylvania as to the number of cars to be put in a freight train?

A. No, we do not.

Q. Do you know in your experience on the Pennsylvania of any such rule having been in effect?

A. Not to my knowledge, no.

Q. When you were Superintendent of freight transportation at Pittsburgh, was there any practice or custom as to the maximum length of a train over the mountain district Harrisburg and Pittsburgh?

[fol. 1131] A. Yes, it was very infrequent that a train of more than 125 cars was moved between Altoona and Pittsburgh in either direction. One reason for that, the principal reason was that you couldn't handle any more than that number of cars with the power available over the steep grade eastward, and it was inadvisable to handle excessively long empty trains because of the capacity of the sidings and yards and facilities generally to accommodate them. There was no reason for doing it because you had more engines than you needed for your westbound movements.

Q. Do you have an un-balance of car-miles?

A. Generally the movement was a little bit greater westbound, but not very much.

Mr. Mason: I think that is all. Thank you, Mr. Triem. Do you wish to defer cross examination?

Mr. Strouss: Yes, but I want one or two questions about these wheel reports.

Cross-examination.

By Mr. Strouss:

Q. Mr. Triem, the wheel report has application only to the particular train to which it applies, isn't that true?

A. That is true, except that I want to clear it up a little [fol. 1132] bit. We talk about a train rather loosely as being one thing one time and again we talk about it being something else another time. A train in this report here and as we have discussed it up to this time is a unit running between two terminals under the jurisdiction of one crew. A train has a symbol, as a symbol train may be any number of trains which operate from Chicago to New York. It will be the same train, but it will be manned by different crews and therefore it becomes a series of trains, if I make myself clear.

Q. You mean the first 78 and the second 78 and so forth?

A. Not exactly. I mean by that the "CMB" will start out of Chicago and that is one train service that day, but so far as the car record is concerned, there will be a CMB on the Fort Wayne Division, one on the Eastern Division, one on the Pittsburgh Division, a series of them. Now to answer your question, one wheel report will be made for this train from Chicago to Crestline.

Q. That is one division?

A. That is one division. One wheel report will be made for that train from Crestline to Altoona, that is, two divi- [fol. 1133] sions; one report will be made from Altoona to Enola as a third division.

Q. But that wheel report will not give any information as to any other trains on that division?

A. It will not, it only applies to that particular train.

The Court: And does account for all the cars in that train?

A. It accounts, your honor, for all the cars which that train has touched during its trip, whether it picks them up or sets them off or moves them.

Mr. Strouss:

Q. To know whether there was one or a dozen trains operating on that division during that particular day or period, that information could not be gotten from one wheel report?

A. No, it would have to be taken from the collection of all the wheel reports for all the trains operated on that day to construct the operation for that division.

Q. But that information is given on the train sheet itself, that will show all trains operated on a particular division during that day?

The Court: When you say the train sheets, you refer to this sheet here shown as exhibit No. 14?

[fol. 1134] Mr. Strouss: That is a train sheet on the New York Central, I believe it was, yes, that is what I am talking about.

A. Not wishing to be technical, the answer to your answer is that it requires the use of one or more train sheets covering the route of the train over a division to determine the total number of trains that may have operated on a division on a given day.

Q. That is because of sub-divisions on the division?

A. Yes.

Q. There would be a train sheet for each sub-division that the train passed through?

A. That is illustrated by the fact that on this panhandle division route I am talking about, there are three different train sheets would have to be consulted to get the whole movements of those through-trains on the Panhandle Division.

Q. But that does give a record of every train that was operated over the division?

A. Yes, sir.

Q. And that is the only record that you have and that is all thrown in together, isn't it?

A. I believe that is true, I don't know of any other record that I can think of right now.

[fol. 1135] Q. You don't have the train sheets here?

A. No, I do not.

Mr. Booth: We don't undertake by this exhibit to show all the trains that operated between these points on a certain day. The exhibit is headed, "Typical Example of Freight Trains Handled between certain terminals."

The Court: That is true, but counsel is interrogating to determine the modus operandi.

Mr. Booth: I thought he was laying the foundation to try to strike out the exhibit.

The Court: Well, maybe you are right.

Mr. Booth: This exhibit is exactly what it is headed.

Mr. Strouss: That is what I am trying to find out.

The Court: Any further examination of this witness?

Mr. Strouss: Not at this time.

The Court: You are reserving your rights to cross examine him?

Mr. Strouss: Yes, sir.

The Court: It seems to the court if it is possible and in order not to discom-ode the witnesses who have been examined on direct, rather than hold them over until Tuesday, [fol. 1136] we should excuse them if possible.

Mr. Strouss: I believe Mr. Triem and Mr. Kraemer are the only two witnesses that I haven't cleared the decks on.

The Court: That will just leave Mr. Kraemer and Mr. Triem?

Mr. Strouss: Answering Mr. Booth's question I don't want to be misunderstood or interpreted as meaning that I don't want those train sheets. I do want them and ask for them if they can be produced.

Mr. Booth: We feel under the underlying document rule we are not compelled to produce train sheets when we don't produce an exhibit that does not depend on the train sheets. The train sheets can be used to determine all the trains that run out of the division but insofar as typical examples are concerned, we have produced the underlying record, the record made by the conductor.

The Court: I don't think there is anything before the court to pass on. Go ahead.

[fol. 1137] Russell J. Hammond was called as a witness on behalf of the defendant, and being first duly sworn testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you please state your name and residence?

A. Russell J. Hammond, Boston, Massachusetts.

Q. Will you state your position with the Boston and Maine Railroad?

A. I am assistant to the operating vice-president and general manager.

Q. You have been in the service of the Boston and Maine for some time?

A. Since August 1, 1912.

Q. Did you have prior railroad experience?

A. From 1903—starting back in 1900, summers, while I was in high school, I was in the engineering department of private engineers on interurban electric railroad construction. In 1903, I was in the New Haven Engineering Department on electrification; in 1906 I was with the Milwaukee on location on the west coast; in 1907 I returned during the panic of that time to Boston, and was in the employ of the New Haven for about six months, and returned to a contractor I had been previously working for, [fol. 1138] and worked for that contractor till 1912.

Q. What have been your positions with the Boston & Maine since 1912?

A. I started in 1912 as a draftsman, was in the engineering, in various positions, assistant engineer, office engineer and designing engineer, up until February 26, 1926. During Federal control, in addition to being in the engineering department, I also acted as assistant to the Federal manager on such special assignments as he cared to give me. On February 25, 1926, I was appointed assistant to the vice-president and general manager, and on January 1, 1927, I was appointed assistant to the president and after his death, on January 1, 1930, I reverted back to my position as assistant to the vice-president and general manager.

Q. What is the nature of your duties as assistant to the vice-president and general manager?

A. The vice-president and general manager of the Boston and Maine has jurisdiction over the operating, transportation, mechanical and police departments. I am his assistant, with jurisdiction in all those departments.

Q. Does that include the jurisdiction over the mainte- [fol. 1139] nance of way and engineering department?

A. No, the maintenance of way department on our road comes under the chief engineer.

Q. Does your jurisdiction extend to the motive power and rolling equipment?

A. As assistant to the vice-president, yes, sir.

Q. Have you before you a map, outline map, of one sheet, bearing the title "Boston and Maine Railroad Company?"

A. Yes, sir.

Mr. Mason: May we have the sheet marked as Defendant's exhibit next in order?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 85 for Identification.

Mr. Mason: Is this map a reasonably accurate outline of the lines of the Boston and Maine Railroad Company?

A. Yes, sir.

Q. Showing the states in which you operate?

A. Yes, sir.

Q. And some of the principal terminals and junctions on the line?

A. Yes, sir.

Mr. Mason: We offer the statement in evidence as No. [fol. 1140] 85.

Mr. Strouss: Same objection.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence, and marked "Defendant's Exhibit No. 85.")

Mr. Mason: What is the approximate mileage of the Boston and Maine?

A. To be exact, it is 1916 miles.

Q. That includes the main and branch?

A. That is miles of road.

Q. Are you familiar with the statistics and records of the Boston and Maine?

A. Yes, sir.

Q. Did you have anything to do with their preparation, or the supervision of their preparation?

A. Well, our department furnishes a great many details that make up those statistics. When it comes to the analyzation of the statistics, I spend a great deal of time on them and am very familiar with them.

Q. Are you familiar with the annual report rendered by your company to the Interstate Commerce Commission?

A. Yes, sir.

[fol. 1141] Q. Have you before you the statement in one sheet, bearing the title, "Boston and Maine Railroad Freight Operating and Freight Transportation Expenses Related to Traffic, Years 1922 to 1939, Inclusive?"

A. Yes, sir.

Mr. Mason: May we have this statement marked No. 86 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 86 for identification.

Mr. Mason: Did you prepare Exhibit No. 86 for Identification?

A. It was prepared under my supervision.

Q. The source is what?

A. Annual report to the Interstate Commerce Commission.

Q. Did your company render annual reports for the Boston and Maine apart from any other railroad for each of the years 1922 to 1939?

A. Yes, sir.

Q. Have you those annual reports present with you in Tucson?

A. Yes, sir.

Q. Are they in the court room?

A. Yes, sir.

[fol. 1142] Q. Referring to Exhibit No. 86, does that reproduce the original figures shown in the appropriate places in the annual report in columns B, C, and D, for the several years?

A. Yes, sir.

Q. I take it that the matters shown in columns E and F, and as well as in the three blocks at the foot of the exhibit, are computations from the other figures on the face of the exhibit?

A. Yes, sir.

Q. Has the exhibit been checked?

A. Yes, sir.

Q. Will you state whether or not it is a true and correct reproduction as to the matters reproduced, and a true and correct computation as to the other matters?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: Not unless I can ask those general questions, and then be through with this.

Mr. Mason: Perhaps you would rather have the exhibits offered and received.

Mr. Strouss: Yes.

Mr. Mason: I offer the exhibit in evidence as Defendant's Exhibit No. 86.

The Court: I understand that the records which support [fol. 1143] this exhibit are here in the courtroom?

A. Yes, sir.

Mr. Strouss: The same objection.

The Court: Objection overruled. It may be admitted.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 86.")

Mr. Mason: Have you some questions now, Mr. Strouss? I will be glad to defer further examination.

Mr. Strouss:

Q. The amounts shown in Column C, that is the total of Items 201 to 462 of the Annual Report?

A. That is correct, with the credit for Investment Account which follows 462.

Q. The amounts shown in Column D is the total of Items 371 to 420 of the Annual Report?

A. That is correct.

Mr. Strouss: That is all.

Mr. Mason: Mr. Hammond, have you a statement in one sheet bearing the title, "Boston and Maine Freight Service Operating Averages, Calendar Years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938, and 1939?"

A. Yes, sir.

Q. Was this exhibit prepared by you or under your di- [fol. 1144] rection?

A. It was prepared under my direction.

Q. From the annual reports as shown in the source footnotes at the foot of the exhibit, together with the forms OS-A and OS-E?

A. Yes, sir, as shown by Item marked "Source."

Q. All of these are reports filed by your company with the Interstate Commerce Commission?

A. Yes, sir.

Q. Have you the counterparts of the retained copies of those reports available with you here?

A. Yes, sir.

Q. Certain of these items are by computations from the others, isn't that correct?

A. Yes, sir.

Q. All as shown by the various references at the foot of the exhibit?

A. Yes, sir.

Q. These computations shown in Column M, "percent in increase," or in some cases decrease, did you check or make those computations?

A. They were made and checked under my supervision.

Q. Is the exhibit otherwise a correct reproduction of the original material or a correct computation of the material [fol. 1145] from the material thus taken?

A. Yes, sir.

Q. Will you say whether or not it is true and correct to the best of your knowledge and belief?

A. It is.

Mr. Mason: Have you any questions on this exhibit?

Mr. Strouss: No.

Mr. Mason: We offer the exhibit as No. 87.

Mr. Strouss: The same objection.

The Court: Objection overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 87.")

Mr. Mason: It was understood, of course, that the annual report and the forms OS-A and OS-E, concerning which the witness has testified as the source of the material, are tendered for the use of opposing counsel.

Q. Mr. Hammond, will you refer to Exhibit No. 86, please? It appears from Exhibit 86 that the volume of Revenue Ton Miles handled by the Boston and Maine in 1922 was two billion, six hundred and ninety million in round figures, and in 1939, two billion, two hundred and forty-eight million, in round figures?

[fol. 1146] A. Yes, sir.

Q. Can you compute quickly the amount of the percentage of decline in revenue ton miles between those two years?

A. About 16.4 per cent.

Q. I call your attention to the figure of Freight Operating Expenses for the year 1922, that is approximately $40,750,000, is that correct?

A. Yes, sir.

Q. And for 1939 a corresponding figure is $20,479,000?

A. Yes, sir.

Q. Is that approximately 50 per cent reduction in freight operating expenses?

A. Approximately fifty per cent reduction in expenses, yes.

Q. Correspondingly, is there a 50 per cent reduction in freight transportation expenses, Column D, between 1922 and 1939?

A. Yes, sir.

Q. Is it correct from this exhibit that you have handled in 1939, traffic sixteen per cent less expressed in revenue ton miles than in 1922 with approximately half the freight operating expense and approximately half the freight trans-
[fol. 1147] portation expense?

A. Yes, sir.

Q. Can you find any explanation of your ability to reduce expenses so greatly out of proportion to the reduction in volume of traffic on Exhibit No. 87?

A. In 1922 we owned 25 2-10-2 locomotives. Their operation—I am talking from my memory now—was confined to the lines west of East Deerfield, which is shown on Exhibit 85, while we used consolidation type engines everywhere else on the railroad. In 1925 the bridges were strengthened between Ayer and Boston, which allowed us to extend the runs of those big engines through to Boston. You will find the first jump is in that period—when I say, "Jump" an increase in our gross ton miles per freight train-hours, which is the efficiency measuring stick.

Q. Such increase in gross ton-miles per freight train-hours shown on Exhibit 87?

A. Shown on Exhibit 87. In 1928 we bought 25 Berkshire type locomotives. In 1930 we bought five more of those. We were hit by a flood in 1927, and all of our line was out of service at various lengths of time from 24 hours to several weeks. When we recovered from that we could
[fol. 1148] run big power over practically all our main tracks.

Q. Did you say 1927 or 1937?

A. 1927. By 1930 we could run big engines over all our main lines. By "big engines" I refer to the Berkshire and Santa Fe type locomotives. In 1936 we bought five mountain type engines, we bought five more in 1937. Each of

these acquisitions of a larger type engine has increased our tractive effort and resulted in our ability to run bigger trains over a greater part of the railroad.

Q. Did that have any effect upon train speed?

A. Our train speed, as shown on Exhibit 87, increased at the same time. We had a 10.2 in 1922 miles per hour, and 13.8 in 1939. That, of course, and the ability to take advantage of what we were given to do business with accounts for the increase in our efficiency and the decrease in our expenses.

Q. Where do you find the index of efficiency, or, if there is more than one, where do you find the indexes on Exhibit 87?

A. On Exhibit 87 I refer to line 8, "Gross Ton Miles per Freight Train-Hour" which increased from 1922 to 1939, 144.9 per cent.

Q. You speak of the bridges, of larger power and in-
[fol. 1149] crease of strength of bridges. Has there been any betterment of the roadbed and fixed structures otherwise?

A. Yes, sir.

Q. What is the standard weight of rail on your main lines at the present time?

A. Our standard at the present time is 112 pound rail. We have, however, many miles of 130 pound rail.

Q. Does that 130 pound and the 112 replace older rail of lighter weight?

A. Yes, sir, it replaced 85 and 100 pound rail.

Q. Have you been furnished with copies of Defendant's Exhibits 5 and 6 showing the locomotive types on the Southern Pacific?

A. Yes, sir.

Q. You made some reference to your own locomotive types. Has the larger power that you have acquired since 1922, according to your testimony, corresponded to any of the types of locomotives shown on Exhibits 5 and 6?

A. Yes, sir, I refer to the consolidation type engine that we had in service in 1922 and prior to 1926 and that is very similar to the 2-8-0 type shown on the sheet. Our engine [fol. 1150] had a tractive effort of 48,200, which is slightly larger, or ten per cent larger than the engine shown. I referred to the 2-10-2 type engine, which is the first large engine we bought. They are similar to the large 2-10-2

shown on the exhibit. Our engine had a tractive effort of 71,300 pounds without the booster which is slightly smaller than the Southern Pacific engine. We have a booster on those engines which gave us a total tractive effort of 84,500. We also have a Berkshire-type engine that is not shown on here, 2-8-4 type, which has a tractive effort of 66,550, with a booster, adding 12,000 pounds. On the Southern Pacific's exhibits, passenger power, we have a mountain-type engine in freight service with a tractive effort of 67,000 pounds, which is about 15 per cent higher than the Southern Pacific mountain engine in passenger service.

Q. Do you have any articulated type of locomotive?

A. No, sir, we do not.

Q. The Berkshire-type and the large mountain type, are the largest types of freight locomotives you use at the present time?

A. The three types, the Santa Fe, Berkshire and the mountain, all very close as far as the tractive effort is con-
[fol. 1151] cerned.

Q. What locomotives do you use in passenger service?

A. Our principal locomotives are the Pacific type, 4-6-2 type. We have three sizes of those engines. Our smallest size has a tractive effort of 31,600, which is slightly larger than the P-5 of yours. Our next size has a tractive effort of 37,600, and is equipped with a booster which gives it additional tractive effort of 9,375, making almost 47,000, which is larger than the Southern Pacific, larger engine, while our biggest Pacifics have a tractive effort of 40,900 and are equipped with a booster of 14,900 additional tractive effort.

The Court: Gentlemen, it is quite evident you will not be able to finish the examination of this witness tonight. I notice that Colonel Green has returned, and if you can complete his testimony——

Mr. Mason: May we excuse Mr. Hammond until next Tuesday morning?

The Court: Yes, Mr. Hammond, the Court will excuse you until next Tuesday morning, but I suggest that these records be made available to counsel.

[fol. 1152] Mr. Mason: They will be. May the record show that we expect to offer through Mr. Hammond an exhibit predicated upon the use of train-sheets, and that the

train-sheets are being made available today to Mr. Strouss in advance of the offer of the exhibit.

(Witness excused.)

F. W. GREEN resumed the witness stand for further cross-examination as follows:

Cross-examination.

By Mr. Strouss:

Q. I think Colonel Green was going to get some information that he wanted to state to the Court.

The Court: Have you secured the information, Colonel Green?

A. Yes, sir.

The Court: All right. You may state it.

A. (Reading:) April 13, 1939. Train 19, Engineer 811, Engineer Flynn handling 26 loads, 56 empties, moving at a speed of 40 miles per hour at mile-post 131, the train parted at PFE 35920, causing 15 minutes delay. Cause undetermined as inspection of car and track showed no defects. The same train, same date, at Mile Post 179, mov-[fol. 1153] ing at 40 miles per hour, train parted at car P. F. E. 50382, twenty-five cars ahead of caboose, ten minutes delay. Cause undetermined as inspection of car and track showed no defects.

April 16, 1939. No. 19, engineer, 813, Engineer Rabeneck, handling 40 loads, 40 empties, moving 45 miles per hour, at Mile Post 171, train parted at DT&E 27056 located 41 cars from caboose, causing 25 minutes delay. Crew advised unable to determine cause and inspection of track and cars showed no defects.

Mr. Mason: You say "parted at DT&E 27056." That is the initial and number of the car?

A. Immediately preceding the break, yes, sir.

The Court: Will you give counsel a copy of that?

A. Yes, sir.

[fol. 1154] Q. This exhibit No. 74, in order that it may be perfectly clear, it shows a subdivision between perishable loads and other loads in the heading, but down in the

body of the exhibit you show no perishable loads. What is the reason for that?

A. Because my information was to the effect that the information shown on this exhibit would have to conform to the information supported by the train sheets. The train sheets make no separation between perishable loads and nonperishable, and therefore I didn't show the perishable loads there, but showed them under column B.

Q. Do you know of your own knowledge whether it is likely that there were perishable loads in any of these eastbound trains?

A. Yes, the original exhibit that we made up and didn't introduce showed that through this same ten-day period between Pine Bluff and Jonesboro, out of the total loads handled, 559 were perishable, and for the same period between Jonesboro to Illmo, 493 of the total loads were perishable, and between Illmo and East St. Louis, 497 of the loads handled were perishable.

Mr. Mason: That is all.

The Court: Any further examination of this witness?

[fol. 1155] Mr. Strouss: No.

The Court: Then may he too with his records be permanently excused?

Mr. Strouss: Yes.

The Court: It is so ordered. There is just one other question, gentlemen, before we close. I am just making an inquiry of counsel for the defendant for information. I don't know how many Class 1 railroads there are in the United States, but I have been making some statistics of my own off the record here and at the close of nine days' actual trial in which we have had the examination of twenty-six witnesses, we have covered thirteen different roads. I merely wanted to know on how many of these Class 1 roads you intended to bring witnesses here to testify with reference to their operations, because I take it —I am not saying that the Court will—but I take it that this testimony is largely cumulative, and while it might be entirely proper to permit you to offer testimony as to all your connecting carriers, I take it the Court would have some discretion in limiting it due to the fact that it is largely cumulative, if it were to go to any great extreme.

Mr. Booth: The Union Pacific, which is our direct connection——

[fol. 1156] The Court: I am counting the Union Pacific as one.

Mr. Booth: Four others, the Milwaukee——

The Court: Three others then besides the Union Pacific.

Mr. Booth: The Milwaukee, Chesapeake and Ohio, and Sante Fe, and Burlington, four others.

The Court: Mr. Triem, counsel has indicated that he wants to finish with your cross-examination to save you from staying here until Tuesday. The court, even though it is overtime, will hear you. Resume the witness stand.

Mr. Strouss: I don't intend to go into those wheel reports because they would give me no information anyhow.

W. R. Triem was recalled to the stand and testified further as follows:

Cross-examination (Continued.)

By Mr. Strouss:

Q. Mr. Triem, on the divisions which are covered by your exhibit of typical examples of freight operation, how many tracks do you have in those divisions?

[fol. 1157] A. Except for the branches, we have two or more tracks on all the main lines for which information is given on this exhibit.

Q. And the branch down at Benwood, is that operated more in the character of double track?

A. No, that is a single track line operated under manual block system.

Q. It doesn't go down one side and back the other side of the river?

A. No.

Q. Is there quite a bit of iron ore carried down there to the steel mills?

A. Yes, there is a good deal of iron ore distributed on both sides of the river.

Q. Now, with reference to your cars, how many freight cars has the Pennsylvania Railroad?

A. 236,000. May I check it?

Q. Approximately?

A. It is about that.

Q. Of course, they are not all of 1940 vintage?

A. No, they are not, of course.

Q. In referring to the similarity to the Southern Pacific cars, you mentioned that you have cars that are being operated that were constructed back in—how far back?

A. I am not able to answer that question.

[fol. 1158] The Court: A witness for the Southern Pacific testified, I believe, that they had some very few cars in operation that were built in 1909. Would you say yours went that far?

A. No, I have in mind, Your Honor, 1913 as about the oldest car that we would have on our railroad.

Mr. Strouss: Of course, all of the improvements have not been placed on all cars.

A. That is correct.

Mr. Strouss: I think that is all the questions. I do want to now again ask for the train sheets covering this operation, and if they fail to produce them I ask that the exhibit be stricken and the testimony with respect to it.

Mr. Booth: The defendant tenders an exhibit with reference to certain typical trains. We have made no effort to prove all of the trains that were operated in those districts on certain days. These train sheets are not under the defendant's control, so it does not fall within any rule that evidence in the defendant's control must be produced. The witness, it is true, is subject to the jurisdiction of the court, but it is shown that the train sheets are not in the possession of the witness.

[fol. 1159] The Court: As I understand the situation, the exhibits now in evidence were not compiled from the train sheets.

Mr. Booth: They were not compiled from the train sheets.

The Court: The motion will be denied.

Mr. Strouss: I want to say that the period of course has been selected by the witnesses and this permits them to select the trains as well as the periods.

Mr. Booth: The witnesses testified it didn't include many trains that were actually run.

The Court: We don't want to cut short your vacation in sunny southern Arizona, Mr. Trim, but you may be permanently excused now.

(Thereupon the court stood at recess until Tuesday, December 10, 1940, at 10 A. M.)

[fol. 1160] December 10, 1940, 10:00 o'clock A. M.

All parties being represented as heretofore noted, the proceedings were resumed as follows:

The Court: I believe we had finished with the witness who was on the stand. Call your next witness.

Mr. Mason: At the adjournment, your Honor, we had finished with Colonel Green, but we had withdrawn Mr. Hammond temporarily.

The Court: He may resume the witness stand.

Mr. Mason: Before we proceed with Mr. Hammond, I will ask Mr. Strouss to refer to page 1152 of the transcript, in Colonel Green's testimony on last Friday, wherein reference is made to the train parting at P. F. E. 35920. That is lines 23 and 24. Have you the place there, Mr. Strouss?

Mr. Strouss: Yes.

Mr. Mason: Colonel Green received telegraphic information after the conclusion of the trial day as to the location of P. F. E. 35920 in that train, and he asked me to ask your consent to supplement his testimony by that statement. I have the telegram here.

Mr. Strouss: By which statement?

Mr. Mason: The location of that car in the train at the [fol. 1161] time of the parting. You remember as to each of the other train partings, the location of the car in the train is shown. I would simply make the statement from the telegram that Colonel Green received.

Mr. Strouss: That is subject to my running objection.

Mr. Mason: Yes. This simply has to do with those break-in-two's which were checked from his train sheets.

The Court: It is hearsay. If counsel objects on that ground, I will have to sustain it.

Mr. Strouss: No.

Mr. Mason: It is supplementary to the information already given.

Mr. Strouss: No, I have no objection on the ground of hearsay.

Mr. Mason: The location of this particular car, mentioned in lines 23 and 24 on page 1152, according to Colonel Green's advices, was the 23rd car from the caboose.

[fol. 1162] RUSSELL J. HAMMOND was recalled to the stand and testified further as follows:

Direct examination (Continued):

By Mr. Mason:

Q. At the conclusion of your testimony on last Friday, I think that you had completed your comparison of the locomotives presently owned and operated by the Boston and Maine with the locomotives shown on Defendant's Exhibits 5 and 6. Now, will you refer to Defendant's Exhibits 2 and 3. I think copies of those have been supplied to you, have they not?

A. Yes, sir.

Q. Does the Boston and Maine own and operate freight cars of its own ownership?

A. Yes, sir.

Q. Have you familiarized yourself in the course of your duties with the type, design and construction of those freight cars?

A. Yes, sir.

Q. And will you say whether or not the freight cars owned and operated by the Boston and Maine, that is to say, the box-cars, conform generally in design and construction to those indicated by Exhibit No. 2?

[fol. 1163] A. Well, we haven't gone as far in the development of box-cars as the Southern Pacific. We have no all-steel cars. We have the steel underframe with wooden body, both single and double sheath bodies. The capacities are not as great; the 80,000-capacity car is our standard car. Our requirements for our own on-line loading do not require the size car of the Southern Pacific. It should be remembered that the Boston and Maine is a terminating carrier. We receive better than two cars, two loads, for every load off-line, so that we have a large number of foreign cars at all times available for off-line loading. While we only own, at the present time, approximately 6500 freight cars, we have on the line between 11,000 and 13,000 cars daily.

Q. Does the Boston and Maine have any wooden underframe cars in regular service?

A. No, sir.

Q. All of your cars have steel underframes?

A. Yes, sir.

Q. Will you refer to the exhibit showing pasenger-car design on the Southern Pacific, Exhibit No. 4?

A. Yes, sir.

[fol. 1164] Q. And state whether the development of passenger-car design of Boston and Maine owned passenger cars has been along somewhat similar lines?

A. Very similar, except we have only the four-wheel trucks, and we have no articulated units except the streamlined train.

Q. Do you operate a streamlined train in regular service?

A. Yes, sir.

Q. Between what points?

A. Jointly with the Maine Central between Boston and Bangor.

Q. Is that a daily service?

A. A daily service, yes, sir.

Q. The passenger-carrying units in that train, do they resemble anything on Exhibit No. 4?

A. Well, that is an articulated three-car train.

Q. Does your passenger equipment other than for the two-wheel truck design, generally conform in design to that shown on Exhibit No. 4?

A. Yes, sir.

Q. Other than the articulated unit?

A. Yes, sir, other than the articulated unit.

Q. Do you have any all-wooden passenger cars in serv-[fol. 1165] ice today?

A. No, sir, we have steel underframe cars and all-steel cars, no all-wooden cars.

Q. Does the Boston and Maine have any districts or territories where the grades are such as to require additional locomotive power other than a single locomotive, to handle the ordinary train?

A. Yes, sir.

Q. Where are those districts with reference to your map?

A. We have helper service eastbound from East Deerfield to East Gardner, which, on the map, is where the heavy lines going toward Worcester out of Mechanicville as far as Johnsonville, a distance of thirteen miles. On the same route we have helper service from Fitchburg to

East Gardner, a distance of about ten miles, and from East Deerfield west to Shelbourne Falls, a distance of about thirteen miles. We also, on the Worcester to Portland Line, use helpers between Worcester and Ayer.

Q. In general, what ruling grades exist in the helper districts which compel the use of helpers?

A. Well, eastbound, the grade between East Deerfield [fol. 1166] and East Gardner is 1.17; westbound, the grade between Fitchburg and East Gardner is about 1.23; and the grade between East Deerfield and Mechanicville westbound is a one per cent grade.

The Court: What is the maximum grade, Mr. Hammond, on any of the lines?

A. On any of our lines, we will run up in our mountain district to approximately one and a half per cent. On this heavy traffic line it is 1.23.

Mr. Mason: Do you have mountain operations in Vermont or New Hampshire?

A. In New Hampshire, the White Mountains.

Q. What is the maximum elevation reached at any point on the line?

A. I don't think I can answer that, Mr. Mason. These condensed profiles don't show the elevation.

Q. I think you spoke of the principal traffic lines. Now, will you refer to Exhibit 85, the map, and state which are the principal traffic lines?

A. Our heaviest freight line is the line between Mechanicville and Boston. The next to that is the line from Boston to Portland, in part of which the traffic between Worcester and Portland passes.

[fol. 1167] Q. On your runs between Mechanicville and Boston, do you run the same locomotive all the way through or change out at intermediate points?

A. It is a through engine and crew run, Boston to Mechanicville.

The Court: What is the distance?

A. 187 miles.

Mr. Mason: Do you run the same crew and engine between Boston and Portland?

A. Yes, sir.

Q. What is the distance?

A. 115 miles.

Q. Do you have any through trains between Worcester and Portland by Ayer?

A. Yes, sir.

Q. Is that a through run?

A. Yes, that is a through run.

Q. What distance?

A. Approximately 140 miles.

Q. That run crosses Massachusetts, New Hampshire, and into Maine, does it?

A. Yes, sir.

Q. Do you have any runs longer than the 187 miles between Mechanicville and Boston?

A. No, sir, that is the longest run.

[fol. 1168] Q. You spoke of the Boston and Maine being largely or predominately a delivering line or terminating line. Does your company originate a substantial volume of traffic?

A. Yes, sir.

Q. Have you prepared from the annual report to the Interstate Commerce Commission for the year 1939 an analysis of the traffic carried?

A. Yes, sir.

Q. Do I understand that this analysis relates particularly to the perishable traffic carried?

A. Yes, sir.

Q. And contains a grand total of all carload traffic carried?

A. Yes, sir.

Q. This is a statement in one sheet bearing title "Boston and Maine Railroad, Revenue Freight Carried during the Year 1939"?

A. Yes, sir.

Q. And is a correct transcript of the information appearing in certain schedules of the annual report to the Interstate Commerce Commission for that year?

A. Yes, sir.

Q. Will you refer to those schedules by number, that is, the general schedules?

[fol. 1169] A. It is Class 110 to 143.

Q. On what pages?

A. Mr. Strouss has my 1939 report.

Q. Is it a portion of schedule 541 as you recall it?
A. Yes, sir.

Mr. Mason: May we have this statement marked for identification.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 88 for identification.

Mr. Mason:

Q. Has the exhibit been checked against the annual report to determine whether these figures are correct?
A. Yes, sir.

Q. Are these figures taken entirely from the annual report and without any summation or computation of your own?

A. The only computation of my own is the addition of Classes 110 to 143.

Q. That is in the line on the exhibit reading "Total Classes 110 to 143, Inclusive"?
A. Yes, sir.

Q. That is a computation from the preceding figures?
A. Yes, sir.

[fol. 1170] Q. Will you say whether or not the exhibit is true and correct to the best of your knowledge and belief?
A. It is.

Mr. Mason: We offer the statement in evidence as exhibit No. 88 subject to any questions which Mr. Stronss may have before the exhibit is received.

Mr. Strouss: I have no questions but the same objection.

The Court: The objection is overruled, it may be admitted in evidence. I take it that the reports from which this exhibit is compiled are here in court?

Mr. Mason: I understand that they are in the possession of opposing counsel.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 88.")

Mr. Mason:

Q. Mr. Hammond, I call your attention to the figures appearing in the total classes 110 to 143 and especially to columns C and D. What is the total of the two columns C and D in Classes 110 to 143? Have you that figure readily at hand?

A. Yes, sir, 2,194.

Q. That is 2,194 carloads of these particular products, of agricultural perishable products which originate on your [fol. 1171] railroad, is it?

A. Yes, sir.

Q. You have undertaken by these various Classes 110 to 143 to include only so-called "perishable agricultural products"?

A. Only items covered by these classifications.

Q. Have you readily at hand or can you calculate the totals shown for Classes 110 to 143 for columns E and F?

A. 47,003.

Q. What total carloads does that represent?

A. That is the carloads from connections either terminating on line or delivered to other connecting lines.

Q. That represents business as to which you are either a terminating or a bridge carrier participating in a haul of traffic originated by other carriers?

A. Yes, sir.

Q. What is the principal description of the perishable agricultural traffic which the Boston and Maine handles?

A. The largest single commodity is potatoes.

Q. What is the next most important?

A. Oranges and grapefruit.

The Court: I take it those come to you by boat?

[fol. 1172] A. Potatoes?

The Court: No, the citrus and the bananas.

A. The bananas come by boat but the citrus comes by rail.

Mr. Mason: As to the bananas, the exhibit indicates that only ten of some 1,584 carloads were received from connecting carriers.

A. That is right.

Q. How does it come that you originate so many carloads of bananas?

A. The United Fruit Company has sailings into Boston regularly twice a week, in the summer season three times a week. Those bananas are loaded at ship-side for distribution over our lines through New England and into Canada.

Q. Those are reported as originating on lines as far as you are concerned as a railroad?

A. Yes, sir.

The Court: Where is your connection with the citrus?

A. Most of it is through Mechanicville. There is some southern fruit that comes at Worcester, but the bulk of it is western fruit.

Mr. Mason:

Q. You are shown here as receiving some 1,780 carloads of grapes from connections. At what point is that received?

[fol. 1173] A. That would be Mechanicville, western California grapes.

Q. What railroad or railroads deliver this western perishable production to you at Mechanicville?

A. Our direct connections are the New York Central, our interchange point being Rotterdam, but the New York Central train running directly into Mechanicville.

Q. Are the two points closely adjacent?

A. They are 23 miles apart and the D. & H., Delaware and Hudson, at Mechanicville.

Q. Do you have any schedules relating to the transportation of freight originating at Mechanicville and moving to terminal points on your line?

A. Yes, sir.

Q. Do those contemplate regularly scheduled departures of freight trains from Mechanicville?

A. Yes, sir.

Q. What are the hours of those departures?

A. The first train is MB-2, leaving Mechanicville at 7 o'clock; RB-3 at 11 o'clock; RB-4 at 3:45; MB-6 at 6 o'clock, the regular Mechanicville-Boston daily trains.

Q. What was the first departure that you spoke of?

[fol. 1174] A. 7 o'clock.

Q. What time is that train scheduled to arrive at Boston?

A. That train is scheduled to arrive at Boston at 4:30 P. M.

Q. What is the next departure?

A. 11 o'clock.

Q. When is that scheduled to arrive at Boston?

A. 8 o'clock that night.

Q. Then the third was at 3:45 P. M.?

A. Due at Boston at 11:55 that night.

Q. And the final departure?

A. The 6 o'clock train is due at Boston at 3 o'clock in the morning.

Q. Do you have scheduled trains between Boston and Portland?

A. Yes, sir.

Q. And between Worcester and Portland also?

A. Yes, sir.

Q. What are your schedules between Boston and Portland?

A. Our fast train is out of Boston at 7:05 P. M., due at Portland at 10:30 P. M.

Q. What is the distance there?

A. That is 113 miles for a freight train.

Q. And the second train from Boston, do you have [fol. 1175] another train from Boston to Portland?

A. We have another regular scheduled train which does the intermediate work which is due out of Boston at 9:30 at night, which does intermediate work all the way to Portland.

Q. You spoke of schedules between Worcester and Portland?

A. Yes, sir.

Q. What is the scheduled departure time from Worcester?

A. We have a train out of Worcester at 2:20 A. M., due at Rigby, the freight terminal for Portland, at 10 A. M.

Q. What is that distance?

A. 144 miles.

Q. And the elapsed time is how much?

A. 7 hours and 40 minutes. In the opposite direction we have a train out of Rigby at 4:45 P. M. due at Worcester at 10 P. M. for Harlem River delivery at 7 o'clock next morning. That is five hours and fifteen minutes elapsed time.

Q. Does the Boston and Maine ever handle Pacific Fruit Express cars?

A. Yes, sir.

Q. Do you handle refrigerator cars of other ownership? [fol. 1176] A. Yes, sir.

Q. Do you operate any Pullman cars on your passenger trains?

A. Yes, sir.

Q. What type of Pullmans are they?

A. The standard Pullmans of all classes.

Q. Have you before you a statement in one sheet entitled "Boston and Maine Railroad, Typical Examples of Freight Trains Handled"?

A. Yes, sir.

Mr. Mason: May we have this statement marked No. 89 for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 89 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 89 for identification?

A. It was prepared under my supervision.

Q. In your office?

A. In my office.

Q. From what sources was it prepared?

A. The train sheets.

Q. Are those the train dispatchers' train sheets for these districts and for the period covered by the exhibit?

A. Yes, Mr. Strouss has them.

[fol. 1177] Q. Have they been furnished to opposing counsel?

A. Yes, sir.

Q. The exhibit indicates that the period studied was a ten-day period during September 1939?

A. Yes, sir.

Q. Who selected that period?

A. I did.

Q. For what reasons?

A. Because it represented an average normal period.

Q. Does the Boston and Maine have any particular peaks of freight traffic and periods when the freight traffic is at a minimum?

A. Yes, sir, we have two peaks.

Q. What are those?

A. Normally one peak in March with the last week in March being the spring peak, and the other peak in October with the last week in October being the peak.

Q. When are your periods of minimum traffic?

A. The minimum traffic is the New Year period and the July period.

Q. Will you say whether or not the period during the second half of September represents a reasonably typical [fol. 1178] average of the year's business?

A. It is an average of the year's business.

Q. Who selected the districts on the lines to which the study relates?

A. I did.

Q. What was your reason for making that selection?

A. It is representative of our operation.

Q. Are the districts selected shown in the heavy line on exhibit No. 85?

A. Yes, sir.

Q. I notice you include the Mechanicville-Boston, Worcester-Portland, and the Boston-Portland districts?

A. Yes, sir.

Q. And certain others?

A. Also the Springfield-White River.

Q. What is the nature of the traffic on the Springfield-White River line?

A. General commodities. It is the connection or a link of the connection between Pennsylvania and the South and Canada.

Q. Is White River Junction a junction with some other important connection of yours?

A. White River Junction is the junction with the Central Vermont Railroad which is a part of the Canadian Na- [fol. 1179] tional system.

Q. Springfield is a junction of what character?

A. Boston and Albany and the New Haven.

Q. Has the information shown on exhibit No. 89 for identification been compared with the original sources?

A. Yes, sir.

Q. Has it been checked?

A. Yes, sir.

Q. Will you say whether or not it represents that information correctly?

A. It does.

Q. What kind of trains do you show on exhibit No. 89?

A. Through trains.

Q. Do you include any of the so-called "local trains"?

A. No, sir.

Q. Are all of these trains shown trains which operate from the terminal shown in the left-hand column to the terminal shown in the right-hand column, that is, columns B and C?

A. Yes, sir.

Q. Did you say whether or not the exhibit is true and correct?

A. Yes, sir.

[fol. 1180] Q. This information as to ruling grade, from what documents was that obtained?

A. The company profiles.

Q. Are those available here?

A. I offered them to counsel Friday afternoon and he declined so they are in the hotel room now.

Q. They have been made available?

A. Yes, sir.

Mr. Mason: Have you some questions, Mr. Strouss?

Mr. Strouss:

Q. The train sheets which were given to me, Mr. Hammond, covered only the ten-day period which is covered by your exhibit?

A. Yes, sir.

Q. And no other train sheets are here or have been tendered?

A. Only just for this ten-day period.

Q. What do you mean by "through trains" as used in this exhibit?

A. Trains which run from a major terminal to a major terminal. They may pick up at intermediate points but they do not do local station switching.

Q. Just pick up cars but not switching?

A. Not switching.

Q. In your columns B and C you have set forth stations from and to which trains operated?

[fol. 1181] A. Yes, sir.

Q. Is a train which operated between the stations indicated in each instance considered by you a through train if it did not do local switching?

A. If it did not do local switching, it was a through train, yes, sir.

Q. And it would be on this exhibit?

A. Yes, sir.

Mr. Strouss: That is all.

Mr. Mason:

Q. Would local trains be shown on the train sheets in addition to those through trains?

A. All trains are on the train sheets.

Mr. Mason: We now offer the exhibit as defendant's exhibit No. 89.

Mr. Strouss: Same objection.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 89.")

Mr. Mason:

Q. Mr. Hammond, I notice in columns B and C you have shown the name of Rigby, Maine, several times?

A. Yes, sir.

Q. What is Rigby with relation to Portland, Maine?

[fol. 1182] A. It is about 3 miles west of Portland; it is the freight terminal for Portland.

Q. Did you from the train sheets make any check of the trains operated during the ten-day period studied on this exhibit with relation to the schedules under which they were operating and the times made on such schedules?

A. Only in a very general way as I went over the train sheets, in checking over naturally I watch about the time they got into the terminal because it is a matter of habit.

Q. You didn't make any other particular check of the particular trains here between Boston and Mechanicville, for example?

A. No, sir.

Q. Did you make any check of the trains between Boston and Mechanicville otherwise during the past year or two period with respect to the actual time enroute and the cars handled in such trains?

A. Of course I make that comparison constantly every day on account of our connections and deliveries.

Q. You make a check of the number of cars handled as well as the maximum and minimum in the trains?

[fol. 1183] A. We watch the loading of our locomotives.

Q. Do you make a check of the performance as related to the schedule?

A. Daily.

Q. The type of locomotives shown on this exhibit, Mr. Hammond, are those the same type that you were discussing in your references to defendant's exhibit 5 and 6?

A. Yes, sir.

Q. Refer to line 6 of your exhibit, Mechanicville to Boston. You show a total of 18 trains in the block 71 to 100 cars and 5 trains in the block 101 to 125 cars?

A. Yes, sir.

Q. In the same period on line 7 you show 18 other trains handled with a different type of locomotive. Were those segregations merely made according to types of locomotives of trains operating on the same day and between the same points?

A. Yes, sir.

Q. These 23 trains operated with the Mountain type were not a particular schedule during that ten-day period, were they?

A. No.

Q. You have segregated trains between the same points according to locomotive types in the various lines as well as [fol. 1184] according to length in the various columns?

A. That is correct.

Q. Are the trains operated throughout the year generally the same according to length as are indicated by exhibit No. 89?

A. Generally. Of course your length is going to depend upon your commodities and your weather.

Q. You spoke of length depending upon commodities. Do you mean that you operate shorter trains or longer trains according to the loading and the cars to be handled?

A. Our trains are based entirely on the tonnage rating of the engine, tractive power of the engine, and it wouldn't take as many cars of hundred tons to make up a 4,500-ton train as it would cars of fruit and merchandise.

Q. Are fruit and merchandise lighter loading on the average than other commodities?

A. Yes, sir.

Q. Then if you have a yard at Mechanicville full of fruit and merchandise cars to be handled eastward can you make up longer trains than if you had a yard full of coal or steel?

A. You could if that was the condition.

Q. Does that condition ever obtain?

[fol. 1185] A. No, sir.

Q. Are there any other considerations which govern the lengths of the trains that you operate besides the tonnage in the cars?

A. The tonnage in the cars and the weather.

Q. What is the effect of the weather?

A. In stormy weather you cannot handle as great a tonnage with your engine as you can in good weather.

Q. Is that because of the effect of the temperature upon the capacity of the locomotive?

A. It is not so much temperature as it is snow and wet rail.

Q. Do you ever have to limit the length of your trains operating on particular schedules because of the lack of sufficient tonnage to fill out the tonnage rating?

A. We occasionally have light trains.

Q. I call your attention to a statement in one sheet entitled "Boston and Maine Railroad, Maximum Number of Cars Handled in Portland and Fitchburg Division Passenger Trains, September 17th to 26th, Inclusive, 1939."

A. Yes, sir.

Q. You have that statement before you?

A. Yes, sir.

[fol. 1186]. Mr. Mason: May we have the statement just referred to marked No. 90?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 90 for identification.

Mr. Mason:

Q. Did you prepare this statement, Mr. Hammond?

A. It was prepared under my supervision.

Q. From what sources?

A. From the train sheets.

Q. Are those the same train sheets which were used in the preparation of exhibit No. 89?

A. Yes, sir.

Q. They have been furnished to opposing counsel for his examination?

A. Yes, sir.

Q. Has the exhibit been compared against the original sources?

A. Yes, sir.

Q. Do you know whether it is true and correct?

A. It is.

Q. The computations I take it in the recapitulation are your own?

A. They were made in my office.

Q. Made from the face of the exhibit?

A. Yes, sir.

[fol. 1187] Q. The total indicates maximum number of cars handled. Does that mean the maximum consist of the trains studied, of each train studied at any point enroute?

A. Yes, sir.

Q. Do your through passenger trains set out or pick up cars at intermediate points to any great extent?

A. Not to any great extent, although there are trains on this exhibit that did or would ordinarily set out and pick up cars at one or two points.

Q. This I note is the same period as used for the freight train study. Was this your own selection?

A. Yes, sir.

Q. Why did you use this same period for a passenger train study?

A. It is representative of an average period.

Q. Is there any peak of passenger traffic during the month of September?

A. Yes, the Labor Day traffic is a peak.

Q. That is not included here?

A. No, sir.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

[fol. 1188] Mr. Mason: We offer the exhibit in evidence as No. 90.

Mr. Strouss: The same objection.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 90.")

[fol. 1189] Mr. Mason: I would like you to refer again to Exhibit 87. That is the freight service operating averages?

A. Yes, sir.

Q. I notice that in line 3, you show that the average freight cars per freight train has increased from 31.3 in 1922 up to a figure of 51.1 in 1939?

A. Yes, sir.

Q. Although Exhibit 89 indicates that through trains, during the period stated, had consists varying from those shown, average consists varying from those shown in Column D, group of seventy cars and less, to as much as 137 cars, as indicated by Column I-I at the extreme right.

A. Yes, sir.

Q. Does your company operate any substantial local freight-train service?

A. Very heavy local freight service.

Q. Do you have considerable branch-line mileage?

A. Yes, sir.

Q. What is the character of the freight-train service on those branch lines?

A. Local freight trains doing station-to-station work.

Q. Do those local freight trains ordinarily exceed sev-
[fol. 1190]. enty cars in length?

A. Ordinarily, no.

Q. What would be the length of the typical branch-line freight train, according to your best experience?

A. Well, they run anywhere from ten or fifteen cars up to thirty-five or forty?

Q. Why do they not exceed the length you have just stated?

A. Because, they are based—the territory they cover is based on the work they can do in a given eight-hour period, or seven hours and forty minutes.

Q. Is there traffic available to enable you to handle or to operate longer trains on these branch lines?

A. A local freight train has to do the switching at each of the stations, work on the branch lines at stations; while the branch itself might have traffic enough, it would not be feasible to do the local switching with a longer train, neither could they serve the number of stations in the day's work to cover the long train.

Q. Now, do you have local trains on the main line as well as on the branches?

A. Yes, sir.

[fol. 1191] Q. Do you have more or less than seventy cars?

A. They are mostly short trains. They would run—our local trains out of Boston would average somewhere around twenty-five cars.

Q. Do those cars perform a gather or pick-up service as well as delivery service?

A. Yes, they deliver, do the pick-up and station placement.

Q. Do those local trains enter into the computation of the average-train lengths shown on Exhibit 87?.

A. Yes, sir.

Mr. Mason: May we have our morning recess at this time?

The Court: Yes, we will take a recess of ten minutes.

(Thereupon a short recess was taken, after which the witness was recalled to the stand and proceedings were resumed as follows:)

Mr. Mason: Mr. Hammond, in the course of your preparation of Exhibit 89, did you make any check of the trains shown on that Exhibit; moving from Mechanicville to Boston, and between certain other points on the schedules to which you referred earlier in your testimony?

A. Yes, sir.

[fol. 1192] Q. You referred, I think, to schedule which you designate as the R. B. 2 from Mechanicville to Boston.

A. Yes, sir.

Q. Did certain trains from Mechanicville to Boston move on that schedule during the ten-day period covered by Exhibit 89?

A. Yes, sir.

Q. And from the train-sheets, did you check the number of cars in the train in the R. B. 2 schedule?

A. Yes, sir.

Q. What was the minimum number, the maximum number, and the average number of cars handled?

A. They varied from 76 to 90 cars, with an average of 88 cars.

Q. That is on the R. B. 2 schedule?

A. Yes, sir.

Q. What is the running time from Mechanicville to Boston on that schedule?

A. Nine hours.

Q. Now, did you check the R. B. 4 Schedule from Mechanicville to Boston?

A. Yes, sir.

Q. What was the minimum and the maximum and the average number of cars per train on that schedule?

[fol. 1193] A. That varied from 76 to 90 cars with an average of 81.

Q. Is that R. B. 4 Schedule one in which perishable traffic coming from the west is handled?

A. Yes, sir.

Q. Did you check also the N. B. 6 Schedule previously mentioned?

A. Yes, sir.

Q. What did you find as to the minimum, maximum and average number of cars on that schedule?

A. That varied from 80 to 109 cars, with an average of 100 cars.

Q. What is the running time on the R. B. 4 Schedule you just mentioned?

A. Eight hours and ten minutes.

Q. And on the N. B. 6?

A. Nine hours.

Q. You spoke also of schedules from Boston to Rigby, or Boston to Portland?

A. Yes, sir.

Q. Did you check those against the train sheets to determine the variation in length and the average number of cars handled?

A. Yes, sir. That seven o'clock train varied from 91 to 110 cars, with an average of 98 cars.

[fol. 1194] Q. What is the running time on that schedule?

A. Three hours and twenty-five minutes.

Q. Now, did you check the schedule from Worcester to Portland, or Worcester to Rigby for Portland?

A. Yes, sir.

Q. What did you find from the train sheets as to the minimum, maximum and average number of cars in the train?

A. The train from Rigby to Worcester varied from 36 to 89 cars, with an average of 63.

Q. And from Worcester to Rigby?

A. From 63 to 131, and an average of 87.

Q. Did you check the schedule from Rigby to Boston?

A. Yes, sir.

Q. What was the minimum, maximum, and average on that schedule?

A. That train varied from 66 to 113 cars, an average of 84.

Q. What is the running time on that schedule?

A. Three hours and forty-four minutes.

Q. Are your schedules from Mechanicville to Boston in any way coordinated with schedules between Chicago and Mechanicville?

A. Yes, sir.

[fol. 1195] Q. What delivery at Boston is provided by these schedules, taking into account the departure from Chicago?

A. Cars leaving Chicago on the six o'clock departure same day, third morning delivery in Boston.

Q. You mean the 6 P. M. departure from Chicago?

A. Yes, sir.

Q. Do your schedules connect with those mentioned by the witness Randall for the Erie?

A. Yes, sir.

Q. Do you know, and, if so, will you state what percentage of on-time arrival or on-time performance you make with your scheduled trains handling this perishable traffic originating in the west?

A. Of course, our on-time arrival is not necessarily arrival of trains at the terminal; it is the time cars are placed for the consignee. We have five o'clock placement for the beef people.

Q. Five o'clock A. M.

A. Five o'clock in the morning. We have a six o'clock placement for the fruit auction, and the seven o'clock for public delivery, general public delivery. So far as the placement is concerned, except in stormy weather, we are [fol. 1196] around 98 per cent.

Q. Now, in achieving placement, there is both the handling over the road, and the terminal handling at Boston to be considered?

A. Yes, sir.

Q. Combining those two you say your percentage of placements in accordance with the requirements you mentioned is 98 per cent?

A. About 98 per cent.

Mr. Mason: I think that is all. Thank you Mr. Hammond.

Cross-examination.

By Mr. Strouss:

Q. How do you define the term "Ruling Grade?"

A. The maximum grade with allowance for curvature on the length of a train, train length.

Q. In the helper district you referred to, the use of a helper will depend upon the tonnage in the train?

A. Yes, sir.

Q. Your road handles a considerable amount of passenger business, doesn't it?

A. Yes, sir.

Q. You have a great many passenger trains?

A. Yes, sir.

[fol. 1197] Q. Other than the ones that are shown on your exhibit?

A. Yes. I only showed the through trains on that exhibit.

Q. What do you mean by through trains with reference to your passenger exhibit?

A. Trains going the length of the division.

Q. It includes trains which make all local stops as well as——

A. They would make some local stops, yes, sir.

Q. But if a train went the length of a division and made all local stops, would that be included?

A. Yes, sir.

Q. Now, in your Exhibit 89, Mr. Hammond, as I understand it now, all trains that operated during the ten-day period between the points indicated in Columns B and C not doing local switching, are included in the exhibit following the names indicated?

A. Yes, sir.

Q. Now, if there is a train operated between Boston and Mechanicville, that didn't do local switching, it is shown on the exhibit opposite those names?

[fol. 1198] A. Yes, sir.

Q. The same would be true of the other points shown on down through the column?

A. Yes, sir.

Q. If a train operated between East Deerfield and Mechanicville, that is shown opposite those points here on your exhibit?

A. Yes, sir.

Q. Isn't there a duplication there, Mr. Hammond?

A. No, sir.

Q. If the train operates from Boston to Mechanicville, it will operate from Deerfield——

A. Yes, but I haven't shown it that way. The Boston and Mechanicville are trains operating between Boston and Mechanicville. The trains operating between East Deerfield and Mechanicville are trains only operating between East Deerfield and Mechanicville.

Q. A train which operates from Boston to Mechanicville, while it also operates between East Deerfield and Mechanicville, wouldn't be shown on here opposite the points East Deerfield to Mechanicville?

A. No, it is only shown on here once.

Q. It is only shown once?

[fol. 1199] A. Yes, sir.

Q. So there is not a duplication, then, between those two points?

A. No, sir.

Q. On Exhibit 87—I don't remember whether I asked you concerning that exhibit—in Line 1, miles of line operated in freight-train service——

A. Yes, sir.

Q. —you show a reduction of about five hundred miles since 1922?

A. Yes, sir.

Q. Is that due to abandonment of unprofitable branches?

A. With one exception. In 1926 we leased or sub-leased 105 miles of line between Wells River, Vermont, and Sherbrooke, Quebec, to the Canadian Pacific. The rest of it is abandonment of unprofitable branch lines. I said 1926; I want to correct that to 1925.

Q. Now, on Friday you testified concerning Exhibit 86, and in connection with the reduction in freight operating expense, freight transportation expense, Columns C and D, you testified that in part, or a considerable part, was due to increase in size of locomotives, running them greater distances and increase in length of train?

[fol. 1200] A. Yes, sir.

Q. Now, isn't it true, Mr. Hammond, that those two columns reflect the total of items 210 to 462, and Column D, Item or Account 371 to 420 of your Annual Report?

A. Yes, sir.

Q. And the reduction which is shown here is the over-all reduction?

A. That is correct.

Q. Of those accounts?

A. Yes, sir.

Q. For example, in both items there is the item of Station Employees?

A. Yes, sir.

Q. That item was reduced $1,700,000 in that period, isn't that correct?

A. I don't remember what the figure is; a substantial reduction.

Q. Do you know whether it was something up around that figure?

A. I couldn't say offhand.

Q. That item would be a part of this reduction?

A. Yes, sir.

Q. Which is shown here. And the same would be true of reductions in any of the other items or accounts?

[fol. 1201] A. Yes, sir.

Q. A reduction in the items Ties or Rails, that would all be reflected in the reduction?

A. Yes, sir.

Q. Do you have a tunnel operation on that line?

A. Yes, sir.

Q. Is that operated by electric locomotives?

A. Yes, sir.

Q. That is between——

A. The Hoosac, between East Deerfield and Mechanicville.

Mr. Strouss: That is all.

Redirect examination.

By Mr. Mason:

Q. Mr. Hammond, in your definition of ruling grade, I take it that you have in mind a grade which influences the pulling power of the locomotive measured in tons of freight which can be carried over the grade, or tons of weight which can be carried over the grade and excludes short maximum grades which do not influence the tonnage rate?

A. That is right.

Q. You included also the influence of curve?

A. Yes, sir.

Q. Does the curvature of track, combined with the slope [fol. 1202] of the track, have an influence upon the amount of tons that a locomotive may haul over that particular piece of track?

A. Yes, sir.

Q. The two taken together form the components that go to make up the ruling grade?

A. Yes, sir.

Q. Is it proper to say, then, that ruling grade is that grade which combined with curvature, if present at that particu-

lar point, is of sufficient length and steepness to influence and determine the amount of tonnage which may be handled with a single locomotive or combination of locomotives?

A. Yes, sir, that is right.

Q. Your electric operation, just how do you handle trains in the territory where electric locomotives are used? Do you substitute electric locomotievs for steam, or add them to the trains with steam locomotives?

A. They are added to the train. The steam locomotive is hauled through the tunnel with the train by the electric locomotive.

Q. Does the steam locomotive work and add its power to that of the electric locomotive?

A. The steam locomotive starts the train, the electric [fol. 1203] locomotive cutting in at the same time. After the train starts, the steam engine cuts out and idles through the tunnel.

Q. What is the reason for that? Is the tunnel very long?

A. Five miles.

Q. What is the purpose of having the steam locomotive idling?

A. To get away from the smoke nuisance.

Q. Is the grade at the tunnel such as to require helper at either portal or through the tunnel?

Q. No, so far as the ability of the engine is concerned, the engine could take the train through the tunnel, and does if there is any reason to take the electric power off.

Q. This is simply a substituting of electric for steam locomotives through the long tunnel?

A. Yes, to avoid the smoke nuisance.

Mr. Mason: That is all.

Mr. Strouss: That is all.

The Court: May the witness be excused with his records?

Mr. Strouss: Yes.

The Court: Call your next witness.

Mr. Mason: Your Honor, before the witness testifies, we [fol. 1204] have now the reproduced exhibits of certain witnesses, which exhibits were originally offered in typewritten form and without the designation of the court and number, and so forth, at the top. Your Honor will recall there were quite a series of those, and we agreed to substitute copies. I have those and I offer to Court and to counsel numbers 57, the witness Oakley, 61, Witness Millard, 65, Witness Snell,

69, Witness Albert, 70, Witness Gregory, 71, Witness Siddall, 72, Witness Burn. I think there are certain additional exhibits which were offered in the same way, and copies of which will be substituted in due course.

The Court: If there is no objection, the substitution may be made.

Mr. Strouse: I have no objection to the substitution. Of course, retaining my general objection.

The Court: Yes, that is understood.

George H. Warfel was called as a witness on behalf of the defendant and being first duly sworn, testified as follows:

Direct examination.

By Mr. Mason:

Q. Did you state your name and residence to the reporter, [fol. 1205] Mr. Warfel?

A. George H. Warfel, Kansas City, Missouri.

Q. Will you state your employment, Mr. Warfel?

A. I am Division Superintendent of the Kansas Division of the Union Pacific.

Q. With headquarters at Kansas City?

A. Headquarters at Kansas City, Missouri.

Q. Over what particular lines of the Union Pacific does your jurisdiction now extend?

A. From Kansas City to Ellis, Kansas, on the main line between Kansas City and Denver, and over the branch line from Salina, Kansas, around to Oakley, Kansas, a point on the main line on the Colorado Division, and from Menoken just west of Topeka, northwestward to Grand Island, Nebraska, connecting with the Nebraska Division. Those are the outer limits of the division.

Q. What is the approximate mileage of your division?

A. 1152.

Q. And that includes how much main line?

A. About 498.

Q. And the balance, I take it, is branch line?

A. Yes, sir.

Q. How long have you been in railroad service, Mr. Warfel?

[fol. 1206] A. I entered the service of the Union Pacific Railroad in August, 1902, left the service August 31, 1904,

and re-entered January 10, 1906, since which time I have been continuously employed.

Q. Been continuously with the company for practically thirty-five years, plus your two earlier years?

A. Yes, sir.

Q. Will you describe, briefly, what your experience has been in the various positions you have held?

A. I entered service as a laborer in the Signal Department; and progressed as a battery man and as a signal maintainer, assistant signal supervisor, assistant roadmaster, district roadmaster, general roadmaster on the Kansas and Nebraska Divisions, and for a period of three months in 1925 was assistant trainmaster. Then in January, 1927, I was made assistant to the general manager in charge of safety, and later, when my jurisdiction was extended to all units of the system, assistant to the operating vice-president in charge of safety, which position I held until February, 1935, when I was made assistant superintendent of the [fol. 1207] Nebraska Division at North Platte. In February, 1937, I was made superintendent of the Wyoming Division at Cheyenne, at the time when the territory between Omaha and Ogden was divided into three divisions. At the end of that year, the territory between Omaha and Ogden was again restored to only two operating divisions, at which time I was returned to North Platte as assistant superintendent, and remained there in that position until March 15, 1939, when I was made superintendent of the Kansas Division.

Q. When you were assistant to the general manager, and later assistant to the operating vice-president, Mr. Warfel, what was the extent of your jurisdiction?

A. Over all lines of the Union Pacific System.

Q. Did that include the lines as far west as Seattle, Spokane, and Los Angeles?

A. Yes, sir.

Q. Were your headquarters then at Omaha?

A. At Omaha.

Q. You have had experience as an operating officer, then, on the lines in Kansas, Nebraska, Colorado and Wyoming?

A. Yes, sir.

Q. And as system officer, in charge of safety, on all of the railroad?

[fol. 1208] A. That is correct.

Q. Have you been furnished with a copy of the exhibit marked No. 77?

A. Yes, I have.

Q. And the lines on which you have had this experience as a division officer and in other capacities as well as a system officer, are shown on Exhibit 77?

A. Yes, sir. That is correct.

Q. The Kansas Division, over which you are now superintendent, is the portion confined to all of the lines in Kansas, as indicated there?

A. Yes, extends about two-thirds the way—about half the way from Kansas City to Denver, about two-thirds the way through the State of Kansas.

Q. As a Division officer, and later as a System officer, Mr. Warfel, was it ever your duty or privilege to ride upon freight trains as well as passenger trains?

A. Yes, I have ridden many of them.

Q. Do you, in the course of your duties as superintendent now ride upon freight trains in your division?

A. Quite frequently.

Q. Have you ridden on freight trains on other portions [fol. 1209] of the system?

A. Other than that on which I am now employed?

Q. Yes.

A. Yes.

Q. Have you ridden on freight trains in the territory west of Cheyenne as well as east?

A. Yes.

Q. What part of the freight train do you generally ride?

A. Almost always the caboose.

Q. Is that part of the duties of an assistant superintendent, trainmaster, or roadmaster, to ride in a caboose?

A. Yes, sir.

Q. As well as the superintendent, when occasion offers?

A. That is right.

Q. Was it part of your duty as assistant to the operating vice-president to ride on freight trains?

A. It was.

Q. Did you then ride the caboose as well?

A. I did.

Q. Do you make any particular selection of freight trains according to their length on which you are going to ride?

[fol. 1210] A. No, sir.

Q. Have you ever ridden on freight trains of more than seventy cars?

A. Oh, yes, quite often.

Q. As often as upon trains of shorter length?

A. I think, about even.

Q. What is the longest freight train on the Union Pacific on which you ever rode, as you recall?

A. I believe 132 cars.

Q. In what territory was that?

A. The territory between Grand Island and North Platte.

Q. Are trains of that length frequently operated between Grand Island and North Platte?

A. Rather frequently. We don't very often operate trains much longer than that.

Q. Does the Union Pacific have a code of rules governing its operations?

A. It does.

Q. Is that a regular printed and bound book supplied to the employees of the operating department?

A. Yes, sir.

Q. Have you ever seen or heard of the Standard Code of Rules of the American Railroads Association?

A. I have.

[fol. 1211] Q. Are you familiar with it?

A. Fairly so.

Q. Will you say whether or not the Union Pacific rule book bears any relation to the A. R. A. Standard Code?

A. It conforms to it quite closely.

Q. Are you familiar, in general, with the operating conditions encountered on the various parts of the Union Pacific System, including those west of Ogden and Granger, as well as east of those points?

A. I think fairly so.

Q. You have made frequent trips over those parts of the system, have you?

A. Yes, sir.

Q. I mean, particularly the main lines.

A. Yes, sir.

Q. Do you know whether or not the Union Pacific has block signals upon its main lines?

A. Throughout its main lines.

Q. You were for a long time a member of the Signal Department, were you not?

A. For a number of years, yes, sir.

Q. You are familiar with the block system of signals?

A. Reasonably so.

[fol. 1212] Q. You are able to recognize their operation and characteristics?

A. I am.

Q. Do you know what the standard weight of rail in the Union Pacific main lines is at the present time?

A. All rail laid in the past three years is 131 pounds to the yard. We have in the main track, however, a very large amount of 110-pound rail.

Q. Is the 131-pound replacing the 110-pound?

A. It is, yes, sir.

Q. Now, does the 110-pound prevail in the districts west of Granger and Ogden, to any extent?

A. Yes, I think it does.

Q. And on your particular division, the Kansas Division, what is the extent of the heavy rail?

A. We have 100-pound and 110-pound rail for the first seventy-five miles of the main track to Menoken, about five miles west of Topeka. Beyond that our rail is mostly 90 pounds to the yard. From that point to Ellis, Kansas.

Q. The district between Kansas City and Topeka, is that a single or double track?

[fol. 1213] A. Double track.

Q. Used jointly with another railroad?

A. The Chicago, Rock Island and Pacific.

Q. What is the character of the district between Council Bluffs and Ogden; is that single or double tracked?

A. That is double tracked throughout.

Q. Does that cross any mountain ranges?

A. Yes, that crosses the East range of the Rockies and crosses the Continental Divide west of Rawlins, and the Wasatch Range just before reaching Ogden.

Q. Do you remember what elevations that railroad attains between Cheyenne and Ogden?

A. Our highest point in the eastern range of the Rockies is a little over 8000 feet. I believe the figure is 8,012 feet; our next highest elevation is, I believe, 6,800 feet.

Q. Those are both in Wyoming, are they not?

A. Yes, sir.

Q. Your elevation on the Kansas Division does not exceed 4000 feet, does it, at any point?

A. No, not at any point.

Q. Now, referring to the line between Ogden and Salt Lake City and Los Angeles, does that cross any mountain ranges that you know of?

[fol. 1214] A. That railroad is rather mountainous, that is, it runs in the mountains, but as to crossing ranges, with the exception of the crossing of the range at Cajon Pass, which we cross on the tracks of the Santa Fe coming into San Bernardino, California, I don't know that it crosses other ranges of mountains.

Q. Now, between Barstow,—your railroad runs through Barstow, does it not?

A. It does.

Q. Between Barstow and Salt Lake City, what is the general character of the country traversed?

A. That is a rather hilly country, a desert country, but very little of it is level. That railroad is rather crooked, a great many curves.

Q. The country is predominantly desert country, however, isn't it?

A. It is.

Q. Does your line between Granger and Portland cross any districts of desert and mountain?

A. It is a good deal of so-called desert country, the lava district. We, however, run through the Snake River Valley, which are irrigated bottom lands, we cross the Blue [fol. 1215] Mountains between LeGrande and Pendleton.

Q. In Oregon?

A. In Oregon, and then follow the Columbia River down to Portland along the bluffs.

Q. Have you become familiar with the ruling grades upon any portions of the Union Pacific System?

A. To some extent, yes. I know where they are located.

Q. I take it that would relate particularly to the grades in the district between Ogden and Council Bluffs?

A. Yes, I am fairly familiar with that.

Q. By the way, what is the nature of the territory in Wyoming, is that fertile valley, or mountainous or desert?

A. No, that is practically a desert country throughout.

Q. Between Cheyenne and Omaha, what is the character of territory there?

A. We leave the mountains coming east from Cheyenne, coming east to Omaha, and after the first forty miles east of

Cheyenne, which is rather a desert country, some grazing, we come out into the beginnings of cultivated areas, and from there on eastward as we approach Omaha we come [fol. 1216] into better richer farm country. Eastern Nebraska is rather a rich farm country.

Q. From North Platte to Omaha you follow the Platte River?

A. Yes, from Julesburg, Colorado, to Omaha, we follow the Platte River.

Q. Does the Union Pacific connect with the Southern Pacific lines?

A. At Ogden, Utah.

Q. Also at Wells, Nevada?

A. At Wells, Nevada.

Q. Portland, Oregon?

A. It does.

Q. And Los Angeles, California?

A. It does.

Q. And at various other points in southern California?

A. It does.

[fol. 1217] Q. Have you been furnished with copies of defendant's exhibits 2, 3, 5, and 6, Mr. Warfel? No. 2 I think is the exhibit relating to the design of boxcars.

A. Yes, I have.

Q. Does the Union Pacific own and operate freight boxcars which conform in any respect to those indicated by exhibit No. 2?

A. Yes, we do. As a matter of fact the standards of the Union Pacific and the Southern Pacific have been quite similar. At one time they were operated under the same general management.

Q. You mean the standards of boxcar design or general standards of railroad construction and operation?

A. I mean both, the standards of cars and the maintenance of way standards are quite similar.

Q. They use many of the same forms and methods of accounting to this day, do they not?

A. That is correct.

Q. As to those standards of boxcar construction, do the Union Pacific standards and actual construction of boxcars conform to those shown on the exhibit?

A. They do.

Q. Does the Union Pacific now operate any steel or steel [fol. 1218] underframe cars?

A. All the freight cars operated by the Union Pacific are steel or steel underframe cars with the exception of 174 logging cars used out on the logging branches in the state of Washington. There are 174 wooden frame cars used for bringing logs down to the central line that are still in service. They are simply trucks with a center sill.

Q. Do those logging cars ever move off the Union Pacific lines?

A. They do not, they don't get into main line service on the Union Pacific.

Q. You say you have only 174 wooden underframe cars of any description?

A. That is all owned.

Q. You have no wooden underframe boxcars?

A. No.

Q. Are you familiar with the Pacific Fruit Express Company's cars?

A. Yes, sir.

Q. Does the Union Pacific handle any of those cars?

A. A great many. The Union Pacific is a direct connection with the Southern Pacific and the P. F. E. cars, as we call them, are in very general use for perishables.

[fol. 1219] Q. Do you know of your own knowledge whether the Union Pacific bears any direct relation to the Pacific Fruit Express Company?

A. I don't know how strict that term "my own knowledge" applies. It is common knowledge on the Union Pacific that the Union Pacific is a part owner of the Pacific Fruit Express.

Q. A half owner, is it?

A. I believe so.

Q. Do you knows who owns the other half?

A. It is common report that the Southern Pacific owns the other half.

Q. You don't know that of your own knowledge?

A. I haven't seen the stock certificates, no, sir.

Mr. Strouss: Of course the court understands my objection is a running objection to all this testimony.

The Court: If you are objecting to these last questions——

Mr. Strouss: My understanding was that my objection was a running objection. I haven't voiced it again.

The Court: You mean this is not the best evidence?

Mr. Strouss: It is a conclusion and not the best evi-
[fol. 1220] dence and is hearsay.

The Court: I will sustain the objection to these last two questions and answers and they may be stricken.

Mr. Mason: You mean as to the common knowledge?

The Court: Yes, sir. The court will appreciate, Mr. Strouss, even though you have the running objection which I think the court pretty well understands, in an instance such as this if you would voice an objection because it is apparently objectionable. I was just waiting for your objection.

Mr. Strouss: I haven't wanted to interrupt the examination of the witness but it was my understanding that the objection was a running one.

Mr. Mason:

Q. Do you know, Mr. Warfel, from what source the Union Pacific obtains its supply of refrigerator cars?

A. All refrigerator cars operated by the Union Pacific or placed on lines of the Union Pacific, practically all of them are Pacific Fruit Express cars.

Q. Do you know whether the Pacific Fruit Express maintains icing facilities at points on the Union Pacific?

A. They do, they operate icing facilities at all the major icing points.

[fol. 1221] Q. Do you know whether the Pacific Fruit Express maintains any repair facilities at points on the Union Pacific?

A. They do.

Q. At which Pacific Fruit Express Company cars are repaired?

A. That is right.

Q. Can you name one or more of those points?

A. One of those points is near Nampa, Idaho. I don't at the moment recall the name of that station where that repair yard is located. I don't believe that it is Nampa.

Q. You have seen the plant, have you?

A. I have seen the plant, I have been in it.

Q. Are there any repair facilities maintained at North Platte, Nebraska?

A. Not specifically for P. F. E. cars.

Q. Or Laramie, Wyoming?

A. Not for P. F. E. cars.

Q. You have seen many P. F. E. cars of course?

A. I have.

Q. Are you familiar with the medallions, sometimes employed by railroad companies as indications of their identity?

A. I assume you refer to the Union Pacific shield which appears on the sides of a great many P. F. E. cars. I am [fol. 1222] familiar with that.

Q. The Union Pacific has a shield or medallion with——.

A. A distinctive emblem of the railroad.

Q. That appears on P. F. E. cars, does it?

A. It does.

Mr. Strouss: I don't see the materiality of all of this.

Mr. Mason: I am determining from the witness's own knowledge the close relationship between the P. F. E. and the Union Pacific.

Mr. Strouss: Supposing there is, why is that material?

Mr. Mason: I am going to connect it with the Southern Pacific and the materiality will be obvious.

The Court: I will overrule the objection on the avowal of the counsel that he will connect it up.

Mr. Mason:

Q. Do you know whether the Pacific Fruit Express Company maintains repair facilities at points on the Southern Pacific which you have observed?

A. I have been in the repair yard of the Pacific Fruit Express cars which I understood was a part of the Southern Pacific lines at Los Angeles.

[fol. 1223] Mr. Strouss: I move that be stricken.

The Court: It may be stricken.

Mr. Mason:

Q. Have you observed any other medallion or emblem on P. F. E. cars other than the Union Pacific emblem?

A. Yes, the Southern Pacific insignia or emblem appears on a great many P. F. E. cars.

Q. On the same cars which bear the Union Pacific emblem?

A. No.

Q. Will you refer to exhibit No. 4, please, and without undertaking to go into detail will you state whether or not the Union Pacific has developed and constructed its passenger cars along lines similar to those indicated by the exhibit?

A. It has.

Q. Do you now have in service in the Union Pacific any passenger train cars of wooden construction?

A. None.

Q. Does that last answer apply to so-called "head-end cars" as well as the passenger-carrying cars?

A. Yes. There are no wooden passenger cars in revenue service anywhere on the Union Pacific lines. There are a few wooden passenger cars in camp service as camp [fol. 1224] outfit cars. Those are discarded wooden passenger cars that are in camp service as kitchen cars.

Q. Do you have any articulated units or units of similar design as shown for the years 1937 to 1939?

A. Yes, the Union Pacific has articulated cars similar to those.

Q. Do any of those operate in through service with the Southern Pacific?

A. They do.

Q. Through what gateway?

A. Through Ogden.

Q. Do you operate passenger trains in through service jointly with the Southern Pacific?

A. Yes, sir.

Q. Through the Ogden gateway?

A. Through the Ogden gateway.

Q. Do you have any through cars in service through any other gateways such as Portland?

A. Not in through service with the Southern Pacific so far as I recall.

Q. These trains that are operated in through service with the Southern Pacific through the Ogden gateway, do those operate in through service with any other railroad beyond your lines?

[fol. 1225] A. Yes, with the Chicago and Northwestern at the eastern terminus of the Union Pacific through Omaha.

The Court: I see the noon hour has arrived. Before taking our recess, so there will be no misunderstanding, the record may show that all testimony of this witness with reference to the ownership of P. F. E. cars may be stricken.

Mr. Mason: The cars or the company? I think the question was addressed to the ownership of the company and I think that is where the objection was made.

Mr. Strouss: It went further than that, it went to the cars also.

The Court: I think it will cover both. The court will be at recess until 2 P. M.

(Thereupon, at 12 o'clock noon the court stood at recess until 2 P. M. this day, December 10, 1940.)

[fol. 1226] December 10, 1940, 2:00 P. M.

Proceedings were resumed at this time as follows:

The Court: You may proceed with your examination of the witness.

The witness, George H. Warfel, was recalled to the stand and testified further as follows:

Mr. Mason: Mr. Warfel, does the Union Pacific operate pullman cars on your through passenger trains you referred to before the adjournment?

A. Yes, they do.

Q. And in any of its other trains?

A. The Union Pacific operates sleeping cars in some trains that do not go through to other connecting lines.

Q. It operates those through pullmans in connection with the Southern Pacific?

A. Yes, it does.

Q. Are they of peculiar type of ——

A. The regular standard sleeping cars, with the exception, I might say, of the streamliner, where they are specially constructed.

Q. You refer to streamliner trains. Are there some streamliner trains operated by the Union Pacific in connection with other railroads?

A. Yes, the Chicago and Northwestern, Union Pacific [fol. 1227] and Southern Pacific operate through streamliner trains between Chicago and San Francisco.

Q. You have through streamliner trains as well to the Pacific coast?

A. Yes, there are streamliner trains operated from Chicago to Los Angeles, and from Chicago to Portland.

Q. Have you before you a copy of Defendant's Exhibit No. 5, Chronology of Freight Locomotives?

A. Yes, I have.

Q. Will you say whether the development of freight locomotives on the Union Pacific has proceeded along the lines indicated by that exhibit?

A. Very similar.

Q. Do you have on your line types which are the same as or similar to those shown?

A. Yes, we do, all except the articulated consolidations, we don't have engines of that particular type.

Q. You have Mikados, Consolidation 2-10-2 type, do you?

A. Yes, we do.

Q. Do you have a large type locomotive corresponding in tractive effort to the articulated consolidation?

[fol. 1228] A. Yes, we have Mallets of the 2-8-8-0 type. They have a tractive effort of 102,666.

Q. Do you have any other large locomotive corresponding to this 124,000-pound tractive effort size that the Southern Pacific has?

A. No, the Mallets have the highest tractive effort of any engines we use.

Q. Apart from those Mallets, what is the largest locomotive you have in regular freight service?

A. We have an engine known as Union Pacific type, a 4-12-2 engine, that is a three-cylinder locomotive with a tractive effort of 96,650.

Q. That is slightly larger than the Southern Pacific type, but a somewhat similar wheel arrangement?

A. Yes.

Q. Now, will you refer to the passenger class locomotive, Defendant's Exhibit No. 6? Do you have locomotives on the Union Pacific corresponding to those shown there?

A. Very similar to all of these shown. You have ten-wheelers shown in two items here; we have a few ten-wheelers.

Q. Do you use the mountain-type locomotive in passenger service to any extent?

[fol. 1229] A. Yes, we do.

Q. Are they larger or smaller with respect to tractive effort than those shown here?

A. We don't get quite the tractive effort shown in your exhibit, 54,838, and we have no boosters on our engines.

Q. You have a 4-8-4 locomotive in service on the Union Pacific, have you?

A. Yes, that is a Northern type of locomotive.

Q. Which corresponds to what is known here as the Golden State?

A. Very closely.

Q. How does that compare?

A. It is 63,629 pounds; slightly more than that shown in your smaller 4-8-4's here.

Q. Do you have any other types which are different than those shown on this exhibit which are used in passenger service?

A. We use a Mallet, which we call the Challenger type locomotive, a 4-6-6-4, which has a tractive effort of 97,400. We use those in heavy grade territory on passenger equipment.

Q. Are those 4-8-4's and the Challenger type locomotive comparatively recent acquisitions?

A. Yes, they are. The last of the 4-8-4's were received in [fol. 1230] 1938, in October, and the last of the Challenger-type Mallets also in 1938.

Q. Are your locomotives equipped with superheaters?

A. Yes.

Q. With feed water heaters?

A. Yes.

Q. Do you know what type of brake equipment they use?

A. No, I don't believe I can state the exact type.

Q. What sort of air-compressors are applied to them? Do they have single compressors?

A. No, they have double compressors on all the latest engines.

Q. Do they have more than one air reservoir?

A. Yes, they do.

Q. Do they burn coal or oil, or do you use both types of fuel?

A. All of our engines in use between Omaha and Ogden are coal-burning engines. We have some oil-burning engines in the northwestern territory up in the forest country in Oregon and Washington, but the large majority of our engines are coal-burning.

Q. Do you use oil-burning engines on the line from Salt [fol. 1231] Lake City to Los Angeles?

A. Yes, we have oil-burners on that.

Q. These large types, mountain-type, 4-8-4's, the Mallet type, and the Challenger type, when they are coal-burners, are they hand-fired or stoker-fired?

A. Stoker-fired.

Q. Do you know whether any of them are equipped with pressure lubrication?

A. Yes, the more modern engines are equipped with pressure lubrication, force feed lubricated.

Q. In freight service, and particularly through freight service, what are the lengths of the locomotive runs?

A. Well, they vary under the different traffic conditions. We have runs of the 4-8-4's from Omaha to Cheyenne; that is 507 miles; that is regular practice.

Q. That is a regular run?

A. Yes, sir. Several of our runs run through with those engines.

Q. How far from Kansas City do you run with the same passenger engines?

A. To Denver, 640 miles.

Q. Do they change out the passenger locomotive at Cheyenne?

[fol. 1232] A. Yes, engines are changed at Cheyenne.

Q. How far do they run from Cheyenne?

A. We run to Salt Lake from Cheyenne. That is 519 miles. We run to Pocatello, that is 551 miles. We also run Denver to Salt Lake, 625 miles, without changing engines.

Q. Your run from Denver to Salt Lake City would be through Colorado, Wyoming and Utah?

A. Yes.

Q. And from Cheyenne to Pocatello would be across Wyoming and part of Idaho?

A. Yes.

Q. Do you know what the length of the freight run in through freight trains is?

A. Our longest runs, about 335 miles, Las Vegas to Los Angeles, and Pocatello to Huntington, 336 miles. Those are about as long runs as we have. We run Omaha to North Platte, change engines at North Platte, that is 281 miles.

Q. That is, the freight trains.

A. Yes.

The Court: Mr. Warfel, diverting a moment to the passenger runs, if I understood your testimony correctly, on certain of your runs the same locomotive is used for a distance of approximately 600 miles without change?

[fol. 1233] A. That is right.

Q. How many times during that distance, how often is the crew changed?

A. Engine crews customarily change with the freight subdivision, that is where they hold their seniority rights. Engine crews on the run from Omaha to Cheyenne would change, use four different crews on that locomotive.

Q. The total distance is what?

A. 507 miles.

Q. With four changes of crews?

A. Four changes of crews.

[fol. 1234] Mr. Mason: On the run from Denver to Salt Lake City where would the engine crew changes take place?

A. At Laramie, Rawlins, Green River, and Evanston.

Q. You would have five different crews, four changes?

A. To Salt Lake City you would also change at Ogden, there would be five crews in that one.

Q. On your freight run from Omaha to North Platte how many changes would there be and where would they take place?

A. The first subdivision from Omaha to Grand Island we would change crews and the next subdivision from Grand Island to North Platte.

Q. Do you run through from North Platte to Cheyenne with freight engines?

A. Yes.

Q. Where do you change the crew?

A. At Sidney, Nebraska. That is the end of the third subdivision and the beginning of the fourth subdivision.

Q. Do you interchange freight with the Southern Pacific at the Ogden gateway?

A. Yes, we do.

Q. Does that include perishable freight?

[fol. 1235] A. Yes, we get a great deal of perishable freight from the Southern Pacific at Ogden.

Q. Do you interchange westbound freight as well as perishable?

A. Yes, very extensively.

Q. Will you say whether or not Ogden is one of your principal gateways on east and westbound traffic to the Pacific Coast?

A. It is.

Q. Do you know whether the Union Pacific maintains through schedules jointly with the Southern Pacific through the Ogden gateway relating to the east and westbound traffic?

A. They do.

Q. You heard the testimony of the witness Fertig of the Rock Island as to schedules in which his line participates, did you?

A. Yes, I did.

Q. Does the Union Pacific participate in similar schedules for California originated traffic?

A. Very similar.

Q. Do you know what point on the Southern Pacific in California the schedules for eastbound perishables are based?

A. Roseville is the assembly point.

Q. You heard Mr. Fertig's testimony as to run-off time [fol. 1236] on these eastbound perishable schedules?

A. Yes.

Q. Does the Union Pacific participate in the run-off on the later trains moving on these schedules?

A. We do.

Q. At what point does the Union Pacific deliver traffic destined to Chicago and received at the Ogden gateway?

A. At Council Bluffs.

Q. Is that your principal eastern gateway for such traffic.

A. That is the principal gateway for Chicago, yes. A materal amount of our perishable also passes through the Kansas City gateway.

Q. To what territory is perishable passing through the Kansas City gateway generally destined?

A. We get a portion of the Chicago business sent through the Kansas City gateway, routed that way and a considerable amount for southeastern and middle-southwestern territory comes to Kansas City.

Q. Does that routing through Kansas City of Chicago traffic have anything to do with diversion enroute?

A. It does. There is a great deal of diversion of perish- [fol. 1237] able traffic. We get diversions at the major

terminals on a considerable proportion of the through perishable traffic.

Q. Will you explain in order that the court and the parties may understand more fully just what is meant by these diversions of perishable traffic?

A. A diversion is a telegraphic order from the shipper or the party having possession of the bill of lading to divert the car to a different route or a different point from which it was originally way billed. A considerable amount of perishable freight is sold while enroute and they wire the new destination. They may start the car billed to Chicago and divert it to Memphis, Tennessee, or Indianapolis, or to any other point and wire us the diversion which we accomplish. They have a record of the progress of the cars over the railroad and those diversions are placed at the next terminal the car will reach and accomplish that.

The Court:

Q. Is that a rather common practice with perishable products?

A. It is quite a general practice.

Mr. Mason:

Q. Is that part of the normal and ordinary handling of perishable by the Union Pacific to receive and perform these diversions?

A. It is.

[fol. 1238] Q. You heard the testimony of witnesses Randall and Triem as to the furnishing of passing reports to shippers of perishables and to consignees?

A. Yes.

Q. Does the Union Pacific have a similar service?

A. It does, practically the same as they referred to.

Q. Do you know why these passing reports are furnished to shippers or receivers of this perishable freight?

A. That is to enable them to know the location of their cars at any time and to be able to distribute them to the best advantage.

Q. By "distribution" you mean to accomplish or direct these diversions?

A. To accomplish diversions on the cars.

Q. Can you say what effect the use of the diversion privilege has upon the marketing of perishables?

A. It permits marketing to better advantage. The crop can be moved and can be sold while moving or distributed I should say moving according to the demands of the territories and the advantages of the different terminal markets. The result of that is, of course, the obtaining of the [fol. 1239] best price available at the final market.

Q. Does the Union Pacific in its participation in these schedules also participate in the guarantee feature of which Mr. Fertig spoke?

A. Yes, it does.

Q. I ask you to recall Mr. Fertig's testimony as to the over-all times from California origin points to Chicago. Does the Union Pacific have allotted to it a particular portion of that over-all time?

A. Yes, they have an agreed upon portion which they undertake to—a portion of that schedule which they undertake to make, depending upon the time they get their deliveries from the connection, they put the cars over the Union Pacific at a given amount of time.

Q. Does that obligate you to make the turnover to your connection at Council Bluffs or Kansas City within a specified over-all time?

A. Yes, it does.

Q. From your experience and knowledge are you able to say whether the Union Pacific performs according to the schedule obligations?

A. We very rarely are late in our deliveries, almost invariably put the business over our portion of the through route in its allotted time.

[fol. 1240] Q. Can you give us any approximate percentage of performance as compared with failure?

A. I don't think that I can state it in terms of percentage. I recall we delivered for two years straight continuously to Council Bluffs without a failure but that was not within the last two or three years. I am not sure what the percentage of performance is now.

Q. You are stationed at Kansas City and are somewhat familiar with the situation at Kansas City?

A. Yes.

Q. What is the situation there?

A. We very rarely fail to make our connection at Kansas City.

Q. Are you familiar to any extent with the westbound schedules?

A. Yes, we have westbound schedules on high-class merchandise, forwarded cars, business of that type.

Q. Do these schedules obligate you to handle the business within a particular allotted time from Council Bluffs to Ogden, for example?

A. Yes, we handle through schedule business, auto parts and business of that type where the shipper depends upon the steady movement of his business to the factory or his plant and we participate in the westbound schedules with [fol. 1241] the Southern Pacific also,

Q. Do you know what your percentage of performance in proportion to the total number of trains of that kind moved may be?

A. I couldn't state it in terms of percentage, I know, however, that failures to handle the business over the railroad in the allotted time are very, very rare. I should say that the percentage of on-time performance would run better than 95 per cent but I couldn't state it exactly.

Q. Is this handling of perishables eastward according to schedule and of manufactured traffic, merchandise of the kind you have described westward according to schedule, a special and distinct service or part of the regular order of business?

A. It is part of the regular order of business. The perishable business is a very heavy part of the Union Pacific's freight business if I understand your question correctly.

Q. Do you maintain similar schedules to the ones applying to the Ogden gateway or the movement from the north Pacific Coast?

A. Yes, we do, from Reith concentration point at Reith, Oregon, which corresponds in the northwest territory to Roseville in the San Francisco territory, central California, [fol. 1242] and also Colton in the southern California territory.

Q. Do you maintain a schedule from Colton?

A. Schedules from Colton to Chicago, in fact it is identical with the schedules from Roseville.

Q. Is it the same as the schedule from Colton via Southern Pacific to Chicago?

A. I think identical.

Q. I direct your attention to a statement of one sheet entitled "Union Pacific Railroad Company; Typical Examples of Freight Trains Handled between Certain Termi-

nals, August 10-19, Inclusive, 1940." Have you that statement before you?

A. I have.

Mr. Mason: May we have this statement marked for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 91 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 91 for identification?

A. Yes, it was prepared under my direction.

Q. From what sources was it prepared?

A. From the train sheets.

Q. Are these districts shown on this exhibit indicated in [fol. 1243] heavy line upon the map, exhibit No. 77?

A. They are.

Q. Who selected the period August 10 to 19th, 1940?

A. I did.

Q. For what reason?

A. It was the most recent month of normal business at the time I was asked to prepare this exhibit and I chose it because it is about halfway between our lowest volume of business in the early summer and our maximum volume of business which usually comes in the latter part of October.

Q. Who selected the districts or subdivisions?

A. I chose them.

Q. Does the exhibit include local trains or only through trains?

A. It includes only through traffic, it does not include local freights, turn-around freights, or local switchers, or any of the branch runs, it only includes the through line. This is our trunk line, that is the reason I took this territory, from North Platte to Omaha is our main trunk railroad. That is east of the Rocky Mountains where the Denver traffic—that is, the traffic from Denver, the Colorado traffic as well as that from the west coast all runs [fol. 1244] over this line into Council Bluffs and Omaha.

Q. The district between Hastings and North Platte, is that part of the main through line?

A. Yes, Hastings is about 20 miles south of Grand Island, and the run from North Platte to Hastings splits

off at Gibbon, a point about 21 miles from Hastings. That is the traffic that goes via Kansas City gateway. In other words, crews run from North Platte east to Grand Island or to Hastings because at the eastern end of their subdivision there is that split of 20 miles where the Kansas City traffic splits off from traffic running via Omaha and Council Bluffs.

Q. These trains between North Platte and Grand Island and between North Platte and Hastings would run for 106 miles approximately over the same stretch of track?

A. That is correct.

Q. Before they reach the junction at Gibbon?

A. That is right.

Q. Are these types of locomotives the types you have referred to in your discussion of exhibit No. 5?

A. Yes, they are.

Q. What is the wheel arrangement of the Santa Fe type?

[fol. 1245] A. That is a 2-10-2.

Q. And the Northern?

A. The Northern type engine is a 4-8-4, that is the large passenger power.

Q. And in this instance was used on a freight train?

A. Yes, there is a run made during this ten-day period on each of the subdivisions, breaking in a 4-8-4, an engine that was in the shop and broke in on freight service before put into passenger service.

Q. Is the information on ruling grade shown on the dispatchers' train sheets?

A. No, it is not.

Q. From what source was that taken?

A. The ruling grade is taken from the profiles of the railroad.

Q. Have you the train sheets and profiles available in the courtroom for the use of opposing counsel?

A. Yes, I have.

Q. Has the exhibit been compared against the original source?

A. It has, yes, sir.

Q. Have you determined whether or not it is true and correct?

[fol. 1246] A. It is to the best of my knowledge and belief.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: The train sheets which you have here are train sheets covering this ten-day period only?

A. That is correct.

Mr. Strouss: That is all.

Mr. Mason: I take it that all of the trains, including locals, turn-arounds, etc., are shown on the train sheets although not reproduced here?

A. Every train in movement is shown on the train sheets.

Mr. Strouss: For the ten-day period?

A. On each train sheet for the twenty-four hours that it covered.

Mr. Strouss: And the train sheets cover the ten-day period?

A. They do; there are two dispatchers' districts in this territory and the sheets from both districts are here.

Mr. Mason: We offer the exhibit in evidence as No. 91.

Mt. Strouss: The same objection.

[fol. 1247] The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 91.")

Mr. Mason: While exhibit No. 91 refers to the district between North Platte and Council Bluffs, will you say whether or not the operation of trains of similar length and consist is practiced on other parts of the railroad?

A. It is, very similar.

Q. For example, do you on the Kansas division have train operations somewhat similar to that shown on this exhibit?

A. Yes, we do, the trains that run to Hastings, Nebraska, come on my division and pass over my division intact.

Q. Do the operations between North Platte and Cheyenne include operations similar in any respect to that shown here?

A. Yes, they do, almost the same.

Q. What as to the district between Cheyenne and Green River?

Mr. Strouss: If the court please, are we going to have a record of those districts brought in? If he is going to

testify what their operations are there, I think we should have the record brought up.

[fol. 1248] Mr. Mason: I am asking this based on the witness's own knowledge and he is subject to cross-examination. We are not attempting to show it as a matter of record but merely to exhibit this as typical.

The Court: Will you read the last question?

(The last question was read by the reporter.)

Mr. Mason: It will be recalled that I qualified the witness as having been assistant superintendent at North Platte and formerly superintendent at Cheyenne with knowledge gained of course in those capacities as to operations in those territories, which by the way are adjacent, as the map will show, to the territory shown here.

The Court: Objection overruled, you may answer.

A. The operation between Cheyenne and Laramie is not similar to the operation here. We go over what is known as Sherman Hill, that is our highest grade, steepest grade, and trains of the length shown here are not often run, in fact, we don't run trains as long as the longest train shown here over Sherman Hill, but trains are consolidated again, particularly empty trains in the westward movement at Laramie and trains of similar length to this shown here are run westward from Laramie.

[fol. 1249] Q. Do you run heavier power between Cheyenne and Laramie over Sherman Hill?

A. Yes, that is where the Mallets are utilized.

Q. What is the ruling grade over that?

A. 1.55.

Q. Do you use helper service there?

A. At times, yes.

[fol. 1250] Q. Is there any rule as to the maximum length of trains to be operated, maximum length of freight trains to be operated on the Union Pacific?

A. There is not.

Q. You said that you did not operate trains as long as the longest shown on this exhibit over Sherman Hill. What length trains do you operate over Sherman Hill eastward or westward?

A. Eighty-five to one hundred, or one-hundred five cars normally.

Q. In either direction?

A. Yes, in either direction.

Q. I want to ask you, are these matters within your own knowledge and observation as superintendent and division officer?

A. They are.

Q. Do you have branch lines on the Nebraska and Kansas Division?

A. Oh, yes.

Q. Branch-line operated freight trains?

A. Oh, yes.

Q. How long do the trains run on the branch lines?

A. Branch-line runs are usually limited to a hundred miles. The only branch that I recall offhand on my own [fol. 1251] division, of all the branches with which I am familiar, one of the longest is on my own division, I should place it that way, and we have a terminal in the middle of that branch line; that run is 110 miles.

Q. How many cars are handled in those freight trains in the branch lines, normally?

A. I should say, all that are offered. They seldom run over forty cars, and frequently on branch lines, only five, six, or ten cars.

Q. Will you state the reason why no more are handled?

A. That is all the business there is for us to do. Our business has been very seriously affected, of course, as everybody knows, by highway competition; branch lines are very poor lines now.

Q. Have you before you, Mr. Warfel, in one sheet bearing the title, "Union Pacific Railroad Company, Maximum Number of Cars Handled, November, 1939, January, April, and July, 1940, in Through Main Line Passenger Trains"?

A. Yes, I have.

Mr. Mason: May we have the statement marked "Defendant's Exhibit No. 92 for Identification"?

The Court: It may be marked.

[fol. 1252] The Clerk: Defendant's Exhibit No. 92 for identification.

Mr. Mason: Did you prepare Defendant's Exhibit No. 92 for Identification?

A. It was prepared under my direction.

Q. From what sources was this prepared?

A. From the conductor's wheel reports.

Q. Have you the conductor's wheel reports covering the period and the trains shown on this exhibit?

A. Yes, sir.

Q. Are they in the court room?

A. Yes, they are.

Q. Are they available for examination of opposing counsel?

A. They are.

Q. Who selected the period?

A. I did.

Q. For what reason?

A. I was impressed by a similar report that I had recently seen on performance of our trains, and I thought that would be a very typical arrangement for a report of this kind, so I had the report made up in the same way covering a series of months, every three months. I should say, the reason this report started with November is that [fol. 1253] since our latest 800's were received in October, I started the report with the next month. We have been able to get the best use of our passenger power since we got the latest of the 800's.

Q. By the 800's, you mean a new type of locomotive?

A. Yes, Northern 4-8-4's.

Q. The latest passenger power you have purchased?

A. Yes.

Q. Will you say whether the showing for the four months, November, January, April and July, shown on this exhibit, represent a fair cross-section of the twelve months' business?

A. It does.

Q. Has the information shown on the exhibit been checked against the wheel reports?

A. It has been.

Q. Will you say whether or not the exhibit is true and correct?

A. It is true and correct, to the best of my knowledge and belief.

Q. Now, do I understand that the showing here is of the largest, that is, shows the largest number of cars which [fol. 1254] may have been in the train at any one time during its operation over the Union Pacific railroad?

A. It does. The exhibit actually shows the number of cars in these trains. It doesn't show the largest number, because the final column is "17 and Over," but it shows

the number of times that those trains run in the four months under study with trains of the different lengths shown here up to 17.

Q. Let us take an example, the City of San Francisco, in line 6, is shown as having run 15 times with eleven cars, and five times with thirteen cars. Does that mean on those five occasions at some point or another there was thirteen cars in the train?

A. Yes.

Q. And on fifteen occasions it had eleven cars?

A. Yes, sir.

Q. Exclusive of the motive-power units?

A. That is right.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: It doesn't mean on these, necessarily, that a train had that number of cars at all times during the trip?

[fol. 1255] A. No, these trains, these districts shown are the districts over which a train passes with the number of cars shown in these columns. The trains running between Omaha and Ogden, for instance, in that upper left-hand bracket, those trains shown ran that many times with that many cars. For instance, in the Overland Limited, in the third line, it shows that that train ran four times with fourteen cars in those four months. Sixteen times it had fifteen cars, thirty times it had sixteen cars, and seventy-one times it had seventeen or over.

Q. That is, some time during the trip it had those?

A. That is right. As I meant to explain, that is the maximum number of cars in the train, but it ran with that maximum number of cars over practically the entire territory.

Q. Are these trains all just straight passenger trains, or do they carry milk, for example?

A. No, these trains are mail, express and passenger; some of them exclusively passenger trains, but most of them, I should say, carry mail and express.

Mr. Strouss: Well, I want to know more about the consists.

The Witness: The wheel reports will show the consists.

[fol. 1256] Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit No. 92.

Mr. Strouss: The same objection.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 92.")

Mr. Mason: Now, referring first to the block of the exhibit, lines 1 to 18 inclusive, are those trains shown in that block, or any of them, operated jointly with the Southern Pacific?

A. Yes, they are.

Q. Now, the westward trains, shown in lines 1 to 8, will you indicate which ones are operated jointly with the Southern Pacific?

A. The Overland Limited, No. 3, the Forty-Niner, Line 4, the San Francisco Challenger, line 5, the City of San Francisco on line 6.

Q. What about No. 21, the Pacific Limited?

A. Yes, No. 21 is a connection with the Southern Pacific also.

Q. Now, does the——

Mr. Booth: That is line No. 2.

A. Yes.

Mr. Mason: Does the City of Portland change its con-
[fol. 1257] sist at any point between Omaha and Green River?

A. The City of Portland does not change its consist. That is an articulated streamliner train, the consist remains the same.

Q. What about No. 21, does that change its consist and route between Omaha and Ogden?

A. Yes, it changes its consist once at Cheyenne.

Q. Does it pick up or set out?

A. Both. Train 21 there, as it comes from Omaha, cars are taken out of it destined to Los Angeles, and cars are put into it from the Kansas City 21, Kansas City and Denver 21 shown down in the next section as Pacific Limited.

Q. Now, does the Overland Limited change its consist between Omaha and Ogden?

A. It does not.

Q. Does the Forty-Niner?

A. It does not.

Q. Does the San Francisco Challenger?

A. Adds one car at Cheyenne.

Q. Does it ever add a diner at Green River?

A. Yes, it does pick up a diner at Green River.

Q. Does the City of San Francisco change its consist?

[fol. 1258] A. It does not.

Q. Or the City of Los Angeles?

A. No.

Q. Or the Los Angeles Challenger?

A. No, the Los Angeles Challenger doesn't change until it gets to Ogden.

Q. What about the eastward trains in lines 9 to 16, inclusive?

A. The City of Portland goes through without change; No. 14, Pacific Limited, changes at Cheyenne; No. 28, the Overland Limited, goes through as it stands; No. 48, the Forty-Niner, goes through; No. 88, the San Francisco Challenger, loses a car at Cheyenne; No. 102, the City of San Francisco, doesn't change; No. 104, the City of Los Angeles, doesn't change; No. 818, the Los Angeles Challenger, loses a car at—no, it doesn't change between Ogden and Omaha, that car is taken out at Salt Lake.

Q. You show, in the upper righthand block, the Omaha-Denver route. Are there any changes enroute on any of those trains?

A. No, those trains run intact from Denver to Omaha, or Omaha to Denver.

Q. In the next block below, you show the Ogden-Los Angeles group of trains. Do those trains change their [fol. 1259] consists enroute by pick-ups or set-outs?

A. There are some changes made at Salt Lake on those trains. That is forty miles from Ogden, but beyond Salt Lake those trains run intact, Salt Lake to Los Angeles. That is practically Ogden to Los Angeles, practically no change, but there are some changes made at Salt Lake.

Q. Do they carry any set-out sleepers in the summer season for passengers going to the Utah parks?

A. Yes, set out sleepers at Lund.

Q. On the Green River-Portland run, are there changes enroute in those four trains?

A. Yes, there are changes at Pocatello, and that is the only place of changes on those trains.

Q. And on the Kansas City-Denver route, are there changes enroute there?

A. No, those trains go intact, Kansas City to Denver.

Q. The Pony Express, Denver-Salt Lake Route, does that run through intact?

A. It does. I was in error about this Pony Express; it cuts out a chair car and a sleeper at Laramie to go northwest toward Portland.

Q. That is the westward train No. 37?

[fol. 1260] A. Yes.

Q. Are there any trains shown on Exhibit 92 which are not operated by steam?

A. Yes, there are a number of them.

Q. Can you refer to them by name or number?

A. Beginning with the upper lefthand square, the first line, No. 1, City of Portland, is a Diesel-powered train. No. 6, the City of San Francisco, is a Diesel-powered train.

Q. You mean Line 6?

A. Line 6, No. 101. The next train, 103, City of Los Angeles, is a Diesel-powered train. And the sister trains, eastward in line 9, No. 2, the City of Portland, is Diesel-powered, line 14, No. 102, the City of San Francisco, and the next below, the City of Los Angeles, No. 104, they are all Diesel-powered trains.

Q. Those same trains, or some of them, are shown on other districts, I believe.

A. Yes, they are.

The City of Los Angeles trains are shown in the second square on the right hand side, second from the top.

Q. Is the No. 11 and its companion train, No. 112, are those steam trains, the City of Denver?

[fol. 2161] A. In the upper righthand bracket?

Q. Yes.

A. Yes, they are Diesel-powered streamlined trains.

The Court: We will take our mid-afternoon recess at this time.

(Thereupon, a short recess was taken, after which the witness was recalled to the stand, and proceedings were resumed as follows:)

The Court: You may proceed.

Mr. Mason: Mr. Warfel, refer to Exhibit No. 92. Will you say whether or not that includes, that exhibit includes all of the through passenger trains operated by the Union Pacific over the district shown?

A. It does.

Q. Does that include, substantially, all of the through passenger trains operated by your company?

A. Yes, it does.

Q. The exhibit excludes the line between Portland and Seattle and between Portland and Spokane?

A. Yes.

Q. Otherwise, it is complete, is it?

A. It is complete, the exhibit as headed, in through main [fol. 1262] line passenger trains, and this covers our entire through passenger service, everything except local short-line trains.

Q. Now, I notice that you show the Pacific Limited and the Overland, and some of these other trains with 15, 16, and 17, and over, cars, quite a number of times. I will ask you, first, does the Union Pacific run through any territory where severe weather is encountered in the winter?

A. Yes, the winter temperatures are pretty low in Western Nebraska and across Wyoming.

Q. How low do those temperatures go?

A. Well, I shouldn't say—I wouldn't be able to say how low they do go, but it is not infrequent to have temperatures of twenty degrees below zero in the winter months in the territory from Cheyenne to Evanston down to Ogden. We come down out of the mountains into Ogden.

Q. Are temperatures as severe as that encountered between Cheyenne and Grand Island; Cheyenne and Oaha?

A. Yes, occasionally, more frequently what we regard as cold weather in Western Nebraska is ten and twelve and fifteen below zero.

Q. Now, in your experience as superintendent and assistant superintendent, and a system officer in that terri- [fol. 1263] tory, can you say whether or not you have experienced any difficulty in heating the rear cars of passenger trains when they consist of fifteen cars or more during the winter weather?

A. Very rarely, and scarcely at all, since we have the newer power with the higher boiler pressures, we are able to heat our longest trains very satisfactorily.

Q. Has the Union Pacific any rule, or has it ever had any rule in recent years as to the limitation of passenger trains during severe weather?

A. No, it has not.

Mr. Mason: That is all. I understand, Mr. Strouss, that you desire to defer cross-examining Mr. Warfel, for the time being?

Mr. Strouss: Yes.

Mr. Mason: I suggest that we call Mr. Kraemer for cross examination, if you are ready to do so.

Mr. Strouss: All right. Are we to have the train sheets?

Mr. Mason: Oh, yes.

The Court: Mr. Kraemer will come forward for cross-examination.

[fol. 1264] W. A. KRAEMER, was recalled to the stand, and testified further as follows:

Cross-examination.

By Mr. Strouss:

Q. Mr. Kraemer, you testified that your on-time schedule performance on the perishable schedules in which the Chicago and Northwestern participated, was about 98 per cent; that is correct?

A. That is correct.

Q. Now, do you mean that that is the percentage of performance on the part of the schedules to be performed by the Chicago and Northwestern, or that is the performance over the entire schedule of carriers combined?

A. The part that is to be performed by the Chicago and Northwestern Railroad.

Q. You don't know anything about those that deliver the perishables to you?

A. Well, that is included, the performance of the combined schedules of the connecting lines, as well as the Northwestern Railroad, the arrivals into Chicago, and the deliveries to connecting lines and placement of the perishable freight at Chicago for unloading.

[fol. 1265] Q. In other words, the carriers, your connecting carrier must deliver to you on time for you to make your deliveries in Chicago?

A. That is correct, or very nearly so.

Q. Now, in connection with your exhibit 75, typical examples of freight trains operated on Wisconsin-Galena and Iowa Divisions, this exhibit is only on through trains between the points indicated in Columns B and C?

A. That is correct.

Q. It doesn't include locals or wayfreights, I believe you said?

A. It does not.

Q. In using the terms "locals," and "wayfreights," they are used as synonymous, meaning the same type of train?

A. Not exactly. Way freights are trains which, in addition to doing station switching, also load and unload l. c. l. freight, whereas switching runs are run for the exclusive purpose of doing station switching.

Q. That would be the locals?

A. That would be the locals.

Q. Now, any train, then, other than a local or wayfreight operated between the points in these columns, is considered [fol. 1266] a through train, and is shown on the exhibit.

A. That is correct.

Q. Now, you show trains operating between Proviso and Clinton, and Proviso and Nelson, I believe.

A. Yes.

Q. Of course, trains that operate between Proviso and Clinton would operate between Proviso and Nelson?

A. Yes, they would operate through Nelson.

Q. Now, is there a duplication here on your exhibit in those trains in showing the trains between Proviso and Clinton?

A. There is not.

Q. In other words, where the trains just operate between Proviso and Nelson, they are not shown operating between Proviso and Clinton?

A. No, they are not.

Q. And that would be true of other points where the terminals in one instance extend beyond the terminals in the other?

A. That is correct.

Q. Your exhibit 76, many of these trains, that are shown there, are not dailies; that is true, isn't it?

A. Yes, none of the trains with the prefix "City" are [fol. 1267] daily trains.

Q. Number 48 and 49, they are operated ten times a month, from June 19th to September 19th, and thereafter, five times a month, isn't that correct?

A. That is correct.

Q. Trains 1 and 2 are operated only five times a month, that is, the City of Portland?

A. Correct.

Q. 103, City of Los Angeles, those trains are operated ten times a month?

A. Yes, sir.

Q. Trains 101 and 102 are operated five times a month?

A. Correct.

Q. Trains 14 and 21, 27 and 28, 87 and 88, 717 and 818, those trains are local in the sense that they make all local stops between Chicago and Omaha; isn't that true?

A. No, they don't make all local stops, they make the most important stops.

Q. Doesn't your timetable show them as making all stops between those points?

A. No.

Q. What are the consist of these last-named trains?

[fol. 1268] A. Trains 27 and 28 are solid sleeping-car trains.

Q. No head-end cars?

A. No head-end cars, and, in addition to the sleeping cars, contain lounge car and diner. When I say "sleeping cars," I refer to standard sleepers and not tourist cars. Trains 717 and 818 occasionally have head-end cars of express; they consist primarily of coaches and tourist sleeping cars. The same is true of trains 87 and 88. Trains 21 and 14 are the principal so-called head-end trains; they carry mail, baggage, and express cars in addition to coaches, tourist sleepers and standard sleepers.

[fol. 1269] Mr. Strouss:

Q. Mr. Kraemer, I believe you checked some references I gave you to break-in-twos, broken knuckles and drawbars on your divisions?

A. Yes, I did.

Q. Will you check me and see if I give those correctly. On the Iowa division, August 8, 1940, train 223, broken knuckle, 108 cars; on August 8, extra 3025 east, broken coupler, 125 cars?

A. That was 118 cars.

Q. On August 5, extra 3002 west, broken knuckle, 86 cars?

A. Correct.

Q. On August 2, extra 3015, broken knuckle, 86 cars?

A. Correct.

Q. On the Galena division, August 9, Train 229, broken knuckle, 125 cars?

A. That may be 124 or 125, the train sheet didn't disclose. They stopped at Morrison to set out a car of merchandise and the train sheet does not disclose whether the knuckle was broken when stopping or when they started, so it might have been 124 or 125 cars. They had 125 into Morrison, and 124 out.

Q. August 1st, train 253, broken knuckle, 77 cars?

A. Yes.

[fol. 1270] Q. On the Wisconsin division, August 3, train 287, broken knuckle, 147 cars?

A. That is correct.

Q. August 4, broken knuckle, train 287, 97 cars?

A. Correct.

Q. August 4, train 484, broken knuckle, 79 cars?

A. That is rather difficult to determine. In reviewing the train sheets I found that it says the train was delayed in Butler yard setting out and picking up cars and repairing a broken knuckle. The train had 79 cars out of Butler and of course there is nothing on the train sheet to indicate whether that knuckle was broken during the course of switching the train, that is, while the switch engine was setting out or picking up the cars or whether it broke as the train pulled into the yeard or whether it broke when they first started. The information is silent. All it says is that the train was delayed setting out and picking up cars and making repairs to a broken knuckle.

Q. August 5, train 287, defective locking block, 148 cars?

A. Correct.

Q. August 6, extra 3035 west, 144 cars, broken [fol. 1271] knuckle?

A. That is correct.

Q. August 6, extra 2803, 145 cars, broken knuckle?

A. Correct.

Q. Did you also check to determine the number of trains operated between Clinton and Boone considering the locals as well as the through trains?

A. Yes; we did.

Q. Do you have that summary?

A. Yes, total of 131 trains of less than 70 cars and 115 cars of over 70 cars. Now in those 131 trains of less than 70 cars that included several work trains and several trains

run with just the cabooses, just the engine and caboose, no cars.

Q. Do you have that by days so you can give it to us for a ten-day period?

A. Yes, for August 1st we had 16 and 12.

Mr. Mason: Sixteen of less than 70?

A. Sixteen of 70 cars or less and 12 of over 70; August 2, 19 trains of 70 cars or less and 14 of over 70; August 3, 14 of 70 or less and 14 of over 70; August 4, 12 of 70 or less, 9 of over 70; August 5, 7 of 70 less; 10 of over 70; August 6, 12 of 70 or less, and 9 of over 70; August 7, 12 of 70 or less and 12 of over 70; August 8, 17 of 70 [fol. 1272] or less and 11 of over 70; August 9, 14 of 70 or less and 11 of over 70; August 10, 8 of 70 or less and 13 of over 70.

Mr. Strouss: That is all.

Redirect examination.

By Mr. Mason:

Q. Mr. Kraemer, in a question addressed to you on exhibit No. 76 reference was made to trains not operating daily and I think you said that all trains bearing the words "City of" as part of the name were less frequent than daily. Isn't it a fact that the City of Denver operates daily?

A. That is correct, my mistake. The City of Denver, trains No. 111 and 112 are daily trains.

Q. Mr. Strouss called your attention to various broken knuckles occurring on certain of these divisions. I will ask you whether the dispatchers' train sheets show any personal injuries to members of the train crew in connection with those occurrences?

A. They do not.

Q. Is it customary on the Chicago and Northwestern to show personal injuries on the train sheet if such personal injuries occur where the train is delayed or a break-in-two occurs?

[fol. 1273] A. It is.

Q. Did any delays take place in connection with these broken knuckles to which you referred?

A. Yes, delays were encountered, total delays anywhere from thirty minutes to an hour and a half, not all as a result

of the broken knuckle. They are impossible to determine, how much was chargeable to the broken knuckle, because invariably in most cases the knuckles were broken as a result of the brakes being applied from the caboose due to someone discovering some defect on the train, either a brake breaking down or hot-boxes.

Q. This was due to the use of the conductor's valve in the caboose?

A. Correct.

Q. Which broke the knuckle and stopped the train?

A. Yes.

Q. Does your study of the train sheets show at what point in the train the break-in-two or broken knuckle took place?

A. In several instances it does, generally it does not. The one on the Galena division on August 1st, which was a train of 78 cars, the knuckle broke on the 17th car from the engine as a result of the brakes being applied in emergency [fol. 1274] for some unknown reason.

Q. Does the record show from what point the brakes were applied?

A. It does not.

Q. It does not show whether it was the conductor's valve or the engineer?

A. No, it does not.

Q. How many cases of broken knuckles or other breaks were referred to in the course of your cross-examination. Have you got the total number?

A. Eleven.

Q. Eleven in a ten-day period?

A. Correct.

Q. Is that all of the broken knuckles that were revealed by the train sheets during that ten-day period?

A. That is correct, all that were revealed on the train sheets for that ten-day period for the 727 trains shown on exhibit No. 75 in addition to local trains, switch runs, way freights, and work trains that are not shown on the exhibit.

Q. Were there a substantial number of local trains, way freights, work runs, and other operations during this ten-day period in addition to these 727 trains referred to in line 50 of exhibit No. 75?

[fol. 1275] A. Yes, quite a substantial number. They will average about 25 or 26 trains per day, local switch runs and way freights in the territory covered by exhibit No. 75.

Q. That would mean approximately 260 additional trains not here shown which were on the train sheets for those ten days?

A. That is correct.

Q. You referred to a locking block as having been one of the appliances which broke. What is the locking block?

A. A locking block is a locking device in the coupler of the car that holds the knuckle in a closed position.

Q. Does it have anything to do with the pin?

A. It is a part of the pin, the locking block is the bottom end of the pin.

Q. I take it that some of the delays encountered in some of these occurrences may have been due to the necessity of repairing whatever brake rigging or whatever other apparatus was down which caused the brakes to be applied?

A. That is correct. For example, on August 6 extra 3035 with 144 cars, the brakes were applied from the caboose by the conductor on account of having been flagged by the sectionman and after the train came to a stop they [fol. 1276] found two hot-boxes in the train. Therefore in addition to replacing the broken knuckle they also had to make repairs to the two hot journals and the total delay encountered by the train was an hour and forty minutes.

Q. You spoke of being flagged by the sectionman. From your experience will you state just how that occurs, what the sectionman does?

A. Yes, all our maintenance-of-way employees, such as sectionmen, bridge and building men, signal department men, crossing flagmen, are all required to watch passing trains for hot-boxes or brake riggings down or any other defects that might be noticeable and if they see any such irregularity they signal the conductor or rear brakeman on the caboose, giving him a stop signal, indicating to the train crew there is something wrong with their train that the train crew hasn't been able to observe, and in such cases if the conductor or brakeman is not able to signal the engineer within a reasonable distance he applies the brakes from the caboose and brings the train to a stop and makes an inspection.

The Court: Do I understand in railroad operations either on freight or passenger trains, that the conductor can in an emergency even without signalling the engineer [fol. 1277] stop the train?

A. Correct. In a passenger train he can do it from any car. In a freight train he can really only do it from the caboose.

The Court: That is by the application of the air brakes?

A. Correct.

Mr. Mason: That is all.

Recross-examination.

By Mr. Strouss:

Q. There were only three of these in which the air was applied from the caboose, wasn't that true?

A. I didn't check the number.

Q. I think that train 287 on August 3, extra 3035 west on August 6——

A. (Interrupting) Yes, there were only three so recorded. However, the train sheet records do not indicate in all cases when the air is applied from the caboose. Judging from my knowledge of the situation here, the location where the knuckles were broken and the location of the car in the train that the knuckle was broken, either the brakes were applied in emergency through a broken air hose or from the caboose or from some other defective braking appliance on the train. I notice 287 also on August 4 with 97 cars [1278] had a broken knuckle 17 cars from the way-car.

Mr. Mason: You mean by the "way-car" the caboose?

A. Rather the caboose. That would appear that the brakes on that train had been applied from the rear end of the train. However, it is impossible to state definitely whether it was. That information is not always recorded on the train sheets.

Mr. Strouss:

Q. On these train sheets the only instances where it is shown are those three, isn't that true? Three instances where it is shown that the air was applied from the caboose?

A. That is correct, three.

Q. You say these train sheets do not show any instance where there was an injury to an employee?

A. Not as the result of train separation or broken knuckle.

Q. It is a fact, isn't it, that on the Galena division, on the first day of August extra 2801 east with 90 cars the conductor was injured at Malta by a rough stop?

A. What date was that?

Q. August 4th?

A. That is correct, yes, rough stop caused the conductor to be injured. The train sheet does not indicate the ex-
[fol. 1279] tent of the injuries.

Q. It does indicate he was taken to a station called DeKalb and given medical treatment?

A. Yes.

Q. The 260 additional trains which you spoke of; those are all short trains, aren't they?

A. Yes, they are, all trains less than 70 cars.

Mr. Strouss: That is all.

The Court: May this witness be excused with his records.

Mr. Strouss: Yes.

The Court: It is so ordered.

(Witness excused.)

[fol. 1280] J. P. KILEY was called as a witness in behalf of the defendant, and being first duly sworn, testified as follows:

Direct examination.

Mr. Mason:

Q. Will you please state your name and residence to the Reporter?

A. J. P. Kiley, Chicago, Illinois.

Q. Are you in railroad service?

A. Yes, I am special representative of the Chief Operating Officer of the Chicago, Milwaukee, St. Paul and Pacific Railroad.

Q. Are you on the staff of the Chief Operating Officer of the company at Chicago?

A. Yes, sir.

Q. How long have you been in railroad service?

A. Steadily since 1915, except for one year when I was in the army during the World War, and prior thereto during two summer vacations while I was at school. I graduated from Villanova College in 1915 with the degree of Bachelor of Science in civil engineering and since that time I have been continually employed by the Milwaukee Road in the Engineering Department on construction as rodman and instrumentman, and on valuation as instrument [fol. 1281] man, cost engineer, assistant valuation engineer. During the last ten years I have been Assistant Chief Statistician and Engineering Assistant for the Chief Financial and Accounting Officer and special representative of the Chief Operating Officer.

Q. Are you familiar with the Milwaukee system as a whole?

A. Yes, sir.

Q. In your position as special representative of the Chief Operating Officer do you have system-wide jurisdiction?

A. Yes, sir.

Q. Have you before you a map of one sheet bearing title "Chicago, Milwaukee, St. Paul and Pacific Railroad"?

A. Yes, sir.

Mr. Mason: May we have that marked as Defendant's Exhibit next in order?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 93 for identification.

Mr. Mason:

Q. Is Exhibit No. 93 for identification a reasonably accurate outline map of the Milwaukee Railroad and the territory which it serves, Mr. Kiley?

[fol. 1282] A. Yes, sir, it does include some of the lines that are operated under trackage rights.

Q. It shows some of your principal terminals and gateways, does it?

A. Yes, sir.

The Court: This railway will hereafter be referred to as the "Milwaukee"?

Mr. Mason: It is frequently referred to as the Milwaukee, is it not?

A. That is right.

Q. Your literature and advertising calls it the Milwaukee Road?

A. That is right.

Mr. Mason: I must apologize for lapsing into railroad dialect a good deal.

The Court: That is all right.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No, I think not.

Mr. Mason: We offer the exhibit in evidence as Exhibit No. 93.

Mr. Strouss: Same objection.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked Defendant's Exhibit No. 93.)

[fol. 1283] Mr. Mason: Have you before you a statement of one sheet showing the title of the railroad and then the title "Freight Operating and Freight Transportation Expenses Related to Traffic, Calendar Years 1922 to 1939, Inclusive"?

A. Yes sir, I have.

Mr. Mason: May we have this statement marked No. 94 for identification.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 94 for identification.

Mr. Mason: Will you state how No. 94 was prepared?

A. That was prepared from the annual reports to the Interstate Commerce Commission.

Q. Are those the annual reports on Form A?

A. Yes sir.

Q. The figures in Columns B, C and D, are those actually transcribed from the annual reports?

A. Except for the year 1928. On January 14, 1928 the receivership of the predecessor company of the present Milwaukee Road was terminated and during that year two annual reports were filed with the Interstate Commerce Commission, one covering the 14 days and the other cover-

ing the remainder of the year and the figures for 1928 are [fol. 1284] the combined figures of those two reports.

Q. The figures for the years 1922 to 1927 are from the reports of the predecessor company or its receivers?

A. That is right.

Q. And since 1929 inclusive for the present company or its management?

A. Yes, or its trustees.

Q. Are all of the reports from which these figures were taken available in the courtroom?

A. Yes sir, they are.

Q. I take it that the figures in Columns E and F are computed figures from the others?

A. Yes sir, they were computed in the offices in Chicago.

Q. And the figures in the blocks at the bottom where the totals are aggregated for four year periods are also computed from the face of the exhibit?

A. Yes sir.

Q. Have you checked the exhibit against the original sources?

A. Yes sir, I have.

Q. Will you say whether or not the transcribed figures and the computations are true and correct?

A. Yes, they are to the best of my knowledge and belief.

[fol. 1285] Mr. Mason: We offer the exhibit in evidence as Number 94 subject to any questions by opposing counsel.

Mr. Strouss: I have no questions at this time, but the same objection.

The Court: Objection overruled, it may be admitted in evidence.

(The document referred to was received in evidence and marked Defendant's Exhibit No. 94.)

Mr. Mason: With the exhibit we tender the under-lying annual reports to counsel for their use if they desire.

Q. Mr. Kiley, have you a statement in one sheet being the title of the railroad and its trustees and the further title, "Freight Service Operating Averages, Calendar Years 1922" and so on to 1939?

A. Yes sir.

Mr. Mason: May we have this statement marked as Number 95.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 95 for identification.

Mr. Mason: Did you prepare exhibit No. 95 for identification?

[fol. 1286] A. Yes sir.

Q. I take it that the source of the information at the foot of the sheet show the original sources from which it was taken or prepared?

A. Yes sir, it does.

Q. As to certain items there is a computation the character of which is shown by the notes opposite those particular items?

A. Yes sir, that is true.

Q. Are the Forms OS-A referred to on this exhibit for the years in question available and on hand in the courtroom?

A. Yes sir, they are.

Q. Did you use the Form called OS-E in any way in connection with this exhibit?

A. Not in connection with this exhibit.

Q. This is based entirely upon the annual report Form A and the Forms OS-A report?

A. That is right.

Q. And the computations in the column (m), are those your own?

A. They were made in our office; I didn't actually make the computations but they were checked.

Q. Is the exhibit a true and correct transcript or computation from the under-lying sources?

[fol. 1287] A. Yes sir, it is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No, I have no questions at this time.

Mr. Mason: We offer the statement in evidence as Defendant's Exhibit No. 95.

Mr. Strouss: Same objection.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked Defendant's Exhibit No. 95.)

Mr. Mason:

Q. Mr. Kiley, have you before you a statement in one sheet bearing the title of the railroad and the further title "Revenue Freight Carried during the year 1939"?

A. Yes sir.

Q. From what source was this statement prepared?

A. From the Form A, Annual Report to the Interstate Commerce Commission for the year 1939.

Mr. Mason: May we have this statement marked as No. 96 for identification.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 96 for identification.

Mr. Mason: Are there any portions of this exhibit which [fol. 1288] represent your own computation?

A. The additions of the commodity classes 110 to 143; the remainder are taken from or just transcribed from the annual report.

Q. That annual report is one of the series of annual reports which you have already referred to as being available for the use of opposing counsel?

A. Yes sir.

Q. Is this exhibit true and correct as a transcription or computation from the figures appearing upon it?

A. Yes sir.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit No. 96.

Mr. Strouss: Same objection.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked Defendant's Exhibit No. 96.)

Mr. Mason: Your Honor, this exhibit is now in typewriting and I believe a carbon copy of the original typewriting has been furnished to the Clerk. We will undertake to reproduce this in plan-o-graph and supply a copy for the permanent copy of the record.

The Court: The Court will permit the substituted copy.

[fol. 1289] Mr. Mason:

Q. Mr. Kiley, according to Exhibit No. 96 what is the principal description of the perishable fruit and vegetable traffic carried by your line?

A. Potatoes other than sweet; then oranges and grapefruit.

Q. Do the oranges and grapefruit come to you as a connecting line, as an intermediate line?

A. Yes, practically all of it.

Q. Do you know, and if so will you state at which gateway you receive oranges and grapefruit?

A. Principally it comes through the Council Bluffs gateway.

Q. Does it come to you at Kansas City to any extent?

A. To some extent, but not to the extent it does at Council Bluffs.

Q. Do you receive these cars of grapes and peaches at the Council Bluffs gateway likewise?

A. I think we get more peaches at Chicago than we do at the Council Bluffs gateway. That is not a very important part of it.

Q. From what territory do you handle the potatoes which are shown here?

A. Originating on our line we have the largest area of potatoes in Wisconsin and Washington.

[fol. 1290] Q. Those handled as connecting carrier, where do those reach your line?

A. I am not certain as to where they come from.

Q. Does your line handle a substantial volume of livestock?

A. Yes sir.

Q. Where does that originate?

A. Practically all over our entire system, Montana and the Dakotas, Iowa and Wisconsin.

Q. Do you serve any mining regions in which you originate a substantial quantity of products of mines?

A. Yes, we serve the Indiana mines; there are mines in Southern Indiana in the neighborhood of Terre Haute on what we call our Terre Haute Division; it is a line we lease from the Chicago, Terre Haute and Southeastern Railroad.

Q. Is this tonnage of products from mines principally coal?

A. Principally bituminous coal. Now, that is true both of the revenue freight originating on our lines and the revenue freight received from connecting lines. The connecting lines' tonnage of coal is principally from Illinois and eastern areas, eastern Kentucky, West Virginia, [fol. 1291] Pennsylvania.

The Court: We will recess until ten o'clock tomorrow morning.

(Thereupon the Court stood at recess until December 11, 1940, at 10 o'clock A. M.)

[fol. 1292] December 11, 1940, ten o'clock A. M.

All parties being represented as heretofore noted, proceedings were resumed as follows:

The Court: Mr. Kiley, you may resume the witness stand.

J. P. KILEY was recalled to the stand, and testified further as follows:

Direct examination (Continued).

By Mr. Mason:

Q. Mr. Kiley, are you familiar with the code of rules, the operating rules, of the Association of American Railroads, to which reference has been made in the testimony of several witnesses.

A. I am not familiar with the rules themselves. I do know that we publish a code of rules with the Union Pacific, the Northern Pacific, and Great Northern.

Q. Are your rules the same as the rules of the Union Pacific, the Great Northern, and the Northern Pacific?

A. Yes, it is a consolidated book put out by all those.

Q. Do you have occasion, in the course of your duties, to make frequent trips over your system, Mr. Kiley?

[fol. 1293] A. Yes, sir.

Q. Do you make those trips on passenger trains entirely?

A. No, I make them occasionally on freight trains, but most of my trips are made in passenger trains.

Q. Do you ever ride locomotives?

A. Yes, sir.

Q. When you ride on freight trains, do you ride on the locomotive or the caboose?

A. Usually the caboose.

Q. Do those trips carry you to all parts of the Milwaukee System?

A. Yes, sir.

Q. Will you state whether the main lines of the Milwaukee are equipped with automatic block signals?

A. Partially. They are equipped with automatic block signals from Chicago to Council Bluffs, from Chicago to the Twin Cities, and from Minneapolis to Glencoe, Minnesota, and from Ortonville, Minnesota, to Aberdeen, South Dakota, and from Harlowton, Montana, to Seattle and Ta-

coma, exclusive of freight line between Plummer, Idaho, and Marengo, Washington.

The Court: Mr. Kiley, what is the total mileage of the [fol. 1294] Milwaukee, approximately?

A. Ten thousand, nine hundred.

Q. What percentage, roughly, would you say had the block signal system?

A. Between 25 and 30 per cent.

Mr. Mason: What percentage of your main line mileage is block signal equipped?

A. Of our primary main lines, it is, I would say, about sixty per cent, sixty-five per cent. On a part of the block signal territory we have cab signals. It was formerly an automatic train stop installation between Portage, Wisconsin, and Hastings, Minnesota That is between Chicago and the Twin Cities on the main line, but the train stop portion of the installation was taken out under authority of the Interstate Commerce Commission, but the cab signals were retained.

Q. Mr. Kiley, have you before you a copy of Defendant's Exhibit No. 2?

A. Yes, sir.

Q. And from your observation of the box car equipment owned and operated by the Milwaukee, will you say, generally, whether the development of your box cars has been along the same lines as are indicated on the exhibit?

A. Generally, it has been. I think we went to the compo- [fol. 1295] site body a little later than the Southern Pacific, and went to the all-steel about the same time, but, generally, the development has been much the same as the Southern Pacific.

Q. Do you now operate in revenue service any cars of wooden underframe construction?

A. Of all wood cars, we do not.

Q. Will you refer, please, to Exhibit No. 4 and from your observation and knowledge of Milwaukee passenger equipment, state whether the development of passenger-train cars on the Milwaukee has proceeded along the lines indicated by that exhibit?

A. There are a few things that are different. On the Milwaukee we have always used six-wheel trucks, com-

pared with the four-wheel trucks you have shown on this exhibit. We also operate our own sleeping cars, and until 1927 we operated all of the sleeping cars that were operated on the Milwaukee; but we have had very little development from 1915 to 1934. Our Pudget Sound lines were completed in 1909, and between 1909 and 1915 we acquired a very large number of steel cars, including sleeping cars, and between 1915 and 1934, those cars were used on all of our principal trains. We did modernize them somewhat from time to
[fol. 1296] time, but we purchased no new cars between 1915 and 1934, except some head-end cars and a couple of dining cars. Between 1934 and 1939, we acquired a large number of light weight streamlined passenger cars, coaches, dining cars, parlor cars, and so forth, for use on our streamlined trains as well as our primary passenger trains.

Q. Are the sleeping cars which the Milwaukee owns and operates on its line generally similar in construction to the standard Pullman sleeping car?

A. Yes, we do now have on our principal trains Pullman-operated and Pullman-owned sleeping cars, but we still operate all the tourist cars that are operated on our railroad and, in addition, operate some of the less important trains with our own sleeping cars.

Q. Do you have passenger-carrying equipment similar in general appearance and design to the articulated units shown for 1937 and 1939 on exhibit No. 4?

A. No, we don't have any articulated units.

Q. Those recently acquired passenger-carrying cars are used on what particular trains of the Milwaukee?

[fol. 1297] A. On the Hiawathas, which are our streamlined, high-speed trains, our Chippewa, which is also a high-speed train.

Q. Between what points?

A. The Chippewa, between Milwaukee and Chicago, and the Northern Wisconsin and Michigan, along the lake shore of Michigan; the Hiawathas operate between Chicago and the Twin Cities, and also go into the Wisconsin Lakes country about in the middle of Wisconsin, and today we are putting on a new Hiawatha, the same type of equipment, between Chicago and Omaha, Sioux City and Sioux Falls.

[fol. 1298] Mr. Mason: Will you refer to defendant's exhibits Nos. 5 and 6 which present the chronology of locomotive development on the Southern Pacific. Does the Mil-

waukee have any steam locomotives corresponding to the types or any of the types indicated on those exhibits?

A. We have in the freight locomotives only Consolidation and Mikado types that are indicated on this exhibit. We formerly had some Mogul type locomotives, not a very large number but they have been retired for a number of years.

Q. What is the tractive effort of your Mikados?

A. We have two types; one a tractive effort of 54,700 pounds and the other approximately 63,000 pounds. We have a next size, larger than Mikado, a 4-8-4 type of locomotive, I think some of them call it the "Golden State" and the others the "Northern" but that is our primary freight power on our principal main lines.

Q. What is its tractive effort?

A. 71,000 pounds approximately.

Q. That is the type which corresponds in wheel arrangement to the locomotives shown at the foot of exhibit No. 6, is that correct?

A. Yes, sir.

Q. But you use it for freight service?

[fol. 1299] A. Yes, we also use some of those units in passenger service and we have two smaller units of that same type which are used exclusively in passenger service.

Q. Do you have other types of locomotives other than those corresponding to those shown on Exhibit No. 6?

A. Yes, and in addition we have a 4-6-4 Hudson type passenger locomotive that is used on practically all of our principal trains.

Q. What is the tractive effort of the Hudson?

A. 45,000, except for some of the streamlined Hudson type locomotives that are used on our high-speed trains which have a tractive effort of 50,000 pounds and in addition we have some streamlined, that we call the "Hiawatha" type locomotives with a wheel arrangement of 4-4-2.

Q. Do you use the Pacific type locomotives on the Milwaukee?

A. Yes, we have a large number of Pacific types used principally on secondary passenger trains. In addition to the steam locomotives we have a large number of electric locomotives as we operate about 650 miles of our railroad electrically.

Q. Between what points?

[fol. 1300] A. Between Harlowton, Montana, and Avery, Idaho, and between Othello, Washington, and Tacoma, Washington. That crosses the big belt, the Continental Divide, and the Bitter Root Mountains between Harlowton and Avery and the Saddle and Cascade Mountains between Othello and Tacoma.

Q. Do you have a steam locomotive of the Mountain type?

A. No, we have no Mountain type locomotives. We do have some Articulated locomotives that we use between Avery, Idaho, and Othello, Washington, with a wheel arrangement of 2-6-6-2 and a tractive effort of about 80,000 pounds.

Q. About what is the length of the ordinary run of your freight power in ordinary freight service, first on the districts east of the Missouri River or the Twin Cities?

A. Our freight power on through trains operates from Chicago to the Twin Cities, a distance of 420 miles and between Chicago and Council Bluffs, a distance of about 480 miles.

Q. West of the Twin Cities do you operate your freight locomotives for corresponding distances?

A. For longer distances. We operate from the Twin Cities to Harlowton, 907 miles I believe.

Q. Without change?

[fol. 1301] A. Without change. They are serviced at intermediate stations but we operate the locomotives through.

Q. That is, they are not taken out and taken to roundhouses at intermediate points, are they?

A. Only where it is necessary to go to the roundhouse to get coal and water. We do not have coaling stations on all our main lines and where it is necessary for them to get coal they go to the roundhouse to get coal but they do not go to the roundhouse for service.

The Court:

Q. How many changes in train crews would you have in that?

A. Between Twin Cities and Harlowton I believe there are five.

Mr. Mason:

Q. Do you make similar runs for your passenger power?

A. Yes, sir.

Q. Do you change passenger locomotives on your through trains between Chicago and the Twin Cities?

A. No, sir.

Q. Or between Chicago and the Missouri River points?

A. No, sir.

Q. Are these steam locomotives equipped with superheaters?

[fol. 1302] A. Yes, sir.

Q. Feed water heaters?

A. Yes, sir.

Q. What character of air compressors are applied to them?

A. I am not familiar with the air compressors.

Q. Are you familiar with the ruling grades encountered on the various parts of your system generally?

A. Yes, sir.

Q. Do you have any ruling grades on any part of the principal main lines where helper locomotives are required?

A. We use helpers regularly at several points and we have several points where we do not use them regularly. Between Chicago and the Twin Cities we use helpers out of Milwaukee over what we call the "Brookfield Hill," it is just out of Milwaukee and it is a ruling grade for the district west of Milwaukee. That is the only place where we regularly employ helpers westbound between Chicago and the Twin Cities. Eastbound we use helpers regularly on some of the trains between Sparta and Tunnel City and occasionally we have one of the yard engines help the trains out of Milwaukee yard over what we call the "Lake Hill."

[fol. 1303] Q. What is the ruling grade at the point where you use helpers immediately west of Milwaukee?

A. .67 of one per cent.

Q. And the ruling grade at Sparta and eastward from there?

A. The same, .67.

Q. Do you have any helper districts between Chicago and Council Bluffs?

A. Yes, we have two helper districts between Chicago and Savanna but we do not always use helpers on those districts. One is the Elgin Hill and the other is the hill just out of Savanna, they are one per cent ruling grades.

Q. What as to the ruling grades in the territory between Chicago and Harlowton where you employ steam locomotives?

A. One per cent. We use helpers between Milbank, South Dakota, and Summit, a distance of about 15 miles. That is the only point between Minneapolis and Harlowton where we have regularly employed helpers westbound. Eastbound we have helpers between Mobridge and Alamo and occasionally use helpers east of Aberdeen, South Dakota. We also use helpers in the vicinity of Rhame, North Dakota.

Q. In the territory where you employ electric locomotives is it necessary to use helpers or do you accomplish [fol. 1304] the same results by coupling in additional electric units?

A. We use helpers. Our regular electric locomotives are three-unit electric locomotives having a tractive effort of about 170,000 pounds but over the maximum and ruling grades we cut in additional helpers some of which are three-unit electric locomotives and some of which are two-unit electric locomotives.

Q. What are your ruling grades in the electrified territory?

A. They vary from one to 2.2 per cent.

Q. You have a maximum ruling grade in the mountainous territory of 2.2 per cent?

A. Yes, westbound. Eastbound our maximum ruling grade is 1.75 per cent.

Q. Does the Milwaukee participate in schedules relating to the movement of eastward or westward freight?

A. Yes, sir.

Q. You have heard the testimony of previous witnesses regarding schedules for the movement of perishable freight originating in California and related Pacific Coast territory?

A. Yes, sir.

Q. Does your company participate in schedules on traffic [fol. 1305] moving through the Kansas City and Council Bluffs gateways?

A. Yes, sir.

Q. Is that on the same basis as the other Missouri River lines?

A. I am not familiar about the run-off. I know that we make the same connections and the same time as the other railroads.

Q. Do you also have schedules for traffic from the north Pacific Coast?

A. Yes. Of course we operate ourselves to and from the north Pacific Coast and those are our own schedules.

Q. Does the Milwaukee handle any traffic moving in Pacific Fruit Express cars?

A. Yes, sir.

Q. Where do you receive such traffic?

A. At Kansas City and at Council Bluffs.

Q. Do you handle other perishable traffic moving in other types of refrigerator cars?

A. Yes, sir.

Q. What other refrigerator cars generally speaking are operated on the Milwaukee?

A. Principally the U. R. T. cars.

Q. Is that a type of car similar to the Pacific Fruit Express car?

[fol. 1306] A. Yes, sir.

Q. What is the "U. R. T."?

A. It is the Union Refrigerator Transit.

Q. Have you before you, Mr. Kiley, a statement in one sheet bearing the title, "Chicago, Milwaukee, St. Paul and Pacific Railroad Company," etc., "Typical Examples of Freight Trains Handled between Certain Terminals, March 1st-10th, Inclusive, 1939"?

A. Yes, sir.

Q. Was this statement prepared by you or under your direction?

A. Yes, sir.

Mr. Mason: May the statement be marked No. 97 for identification.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 97 for identification.

Mr. Mason: Q. From what sources was it prepared?

A. From the train sheets.

Q. Are the train sheets from which the exhibit was prepared available for the examination of opposing counsel?

A. They now have them in their possession.

Q. From what sources did you obtain the information as to ruling grade shown in column D?

[fol. 1307] A. From the engineer's profiles.

Q. Are those likewise available for the use of opposing counsel?

A. Yes, sir.

Q. With reference to exhibit No. 93, the map of the Milwaukee system, have you indicated thereon by heavy black line the districts to which exhibit No. 97 for identification relates?

A. Yes, sir.

Q. Will you say whether or not the exhibit includes any purely local trains or only the trains which operated from terminal to terminal as indicated by the from and to columns on the exhibit?

A. It only includes trains that operated throughout the subdivision marked "From" and "To." For example, from La Crosse to St. Paul it only includes trains that operated clear from La Crosse to St. Paul.

Q. Does it include trains doing local or way-freight work in that territory if they made the through trip?

A. Yes, sir.

Q. Who selected the period represented on the exhibit?

A. I did.

Q. For what reason?

[fol. 1308] A. I wanted to get a typical period, I didn't want to get the high period or a low period, and March is more nearly an average period than any we have, the month of March.

Q. Is that statement based upon your general knowledge of the Milwaukee operations?

A. Yes, sir.

Q. Has the exhibit been compared with the original sources to determine its correctness?

A. Yes, sir, it has.

Q. Will you say whether or not in your opinion it is true and correct?

A. Yes, it is, to the best of my knowledge and belief.

Q. I take it that the computations shown at the bottom of the sheet showing the total and percentages of various classes of trains are your own computations?

A. Yes, sir, they are.

Q. The statement "Maximum Cars per Train," does that indicate the largest number of cars in any one train which may have operated between the points opposite which the maximum number of cars per train is shown?

A. Yes, sir, that does.

Mr. Mason: Have you any questions, Mr. Strouss?

[fol. 1309] Mr. Strouss: No questions.

Mr. Mason: We offer the statement in evidence as defendant's exhibit No. 97.

Mr. Strouss: Same objection.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 97.")

Mr. Mason: Q. I notice on exhibit No. 97 the line showing operations from La Crosse, Wisconsin, to St. Paul, Minnesota, you show 14 trains of 70 cars or less having an average over-all total consist of 48 cars and one other having an actual over-all total consist of 68 cars. Will you state what those trains were?

A. Of the 15 trains, 9 of those were way-freights that operated from La Crosse to St. Paul. In that territory we operate way-freights in only one direction and 9 of those 15 trains were way-freights, handling the local work.

Q. Between La Crosse and Portage, Wisconsin, there are two blocks shown. Is the same statement true as to the same trains shown in the collective columns headed "70 Cars or Less"?

A. I am not certain of that, I would have to make another [fol. 1310] check of the train sheets.

Q. That could be ascertained by an examination of the train sheets?

A. Yes, sir.

Q. You show on the last line of trains on the exhibit the operation between West Clinton, Indiana, and Terre Haute, Indiana, and indicate that there were 32 trains having an average over-all consist of 52 cars. Have you checked the train sheets to determine what the nature of those trains was?

A. No, I have not.

Q. What is the nature of the traffic carried in the territory extending down to Terre Haute between Bensenville, Illinois, and Terre Haute, Indiana?

A. Northbound it is practically all coal. That is the line that extends down into the Indiana coal fields, and northbound it is all coal and southbound it is miscellaneous traffic.

Q. Do you have any flow of returning empties southbound?

A. A very large amount of empties.

Q. Do you have before you a statement bearing the title of the company and the further title, Maximum Number of Cars Handled in Selected Through Main Line Passenger Trains Operating between Chicago and Minneapolis [fol. 1311] during Months of January, April, July and October, 1939"?

A. Yes, sir.

Q. Did you prepare this statement or supervise its preparation?

A. Yes, sir.

Mr. Mason: May we have the statement marked "Defendant's Exhibit No. 98"?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 98 for identification.

Mr. Mason: Q. From what sources was this exhibit prepared?

A. From the train sheets.

Q. Do you have available, or have you made available, to opposing counsel the train sheets from which the information on the statement was taken?

A. Yes, sir,

Q. I notice in the title you say, "Selected Through Main Line Passenger Trains." What was the occasion for the selection?

A. We eliminated from, or rather we did not include two strictly local accommodation trains that operated between Chicago and Minneapolis. They handle principally local [fol. 1312] mail and express and a few passengers.

Q. Then this includes what might be called your principal through main line passenger trains between these two points?

A. That is right.

Q. And all of them?

A. Yes, sir.

Q. All that were operated during the four-month period shown?

A. Yes, sir.

Q. Did you select the period?

A. Yes, sir.

Q. For what reason?

A. To get a representative period for a year. I did not believe we would get as representative a period by taking just a few days in one month.

Q. Will you say whether or not the showing for these four months is a reasonably accurate cross-section of the year's business?

A. Yes, sir, it is.

Q. Has the exhibit been compared against the original sources?

A. Yes, sir, it was.

Q. Will you state whether or not it is true and correct?

A. Yes, sir, it is.

[fol. 1313] Q. Are any of these trains handled by other than steam locomotives?

A. No, sir, they are all operated with steam locomtives.

Q. Are any of these trains overnight trains with Pullman equipment?

A. Yes, the Pioneer Limited and the Olympian have Pullman equipment and train No. 56, the eastbound Fast Mail, has Pullman equipment. Train No. 57 is a solid mail and express train.

Q. Does the Olympian westward end its run at Minneapolis?

A. No, sir, it operates to Tacoma.

Q. Are there any intermediate points between Chicago and Minneapolis at which these trains either pick up or set out cars so as to vary the number of cars in the train?

A. Yes, the Pioneer Limited, the Olympian, and the Fast Mail all pick up and set out cars. The Hiawatha trains do not pick up or set out at intermediate points.

Q. What is the principal intermediate point at which cars are picked up or set out?

A. Milwaukee. They also pick up, for example, the Olympian westbound picks up cars at Milwaukee, sets out cars at New Lisbon which is a junction point for a line [fol. 1314] operating into the northern Wisconsin territory.

Q. What is the distance from Milwaukee to the Twin Cities, approximately?

A. 336 miles.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 98.

Mr. Strouss: The same objection.

The Court: May I ask, Mr. Kiley, if you have the original records from which both this exhibit No. 98 and No. 97 were taken; are they here in court and available for counsel?

A. Yes, counsel has the records, the train sheets covering the freight exhibit, No. 97, and he advised that he did not desire at this time the train sheets for exhibit No. 98. They were offred to him yesterday, they are in the city.

The Court: All right, objection overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 98.")

Mr. Mason:

Q. Mr. Kiley, your railroad operates in a territory where severe winter weather is sometimes encountered, does it [fol. 1315] not?

A. Yes, sir.

Q. Do you have, and if so will you state whether any difficulties have been enocuntered in the heating of the rear cars of trains of 15 or more passenger cars?

A. I have never heard of any.

Q. Do you have any rule limiting the length of the passenger trains to be operated by you during severe winter weather in, for example, this district between Chicago and Minneapolis?

A. We do not have any rule that I know of.

Q. Do you have any rule limiting the lengths of the freight trains to be operated by you on any of your main line districts?

A. No, sir.

Q. Referring to exhibit No. 97 again, will you say whether operations of freight trains on others of your principal main line districts not represented on the exhibit are in train lengths approximating those shown here?

A. Yes, if we have enough traffic.

Mr. Strouss: My objection is going to this testimony and I particularly want to call the court's attention to this last question.

The Court: Will you read the last question?

[fol. 1316] (The last question was read by the reporter.)

The Court: If that information is being taken from the record, the objection will be sustained.

Mr. Mason: I will ask the witness further to say whether the answer is based upon your general knowledge and observation of system operations or based upon any particular record?

A. It is based upon my knowledge of our regular operation.

The Court: The objection then is overruled.

Mr. Mason: I think that is all, thank you, Mr. Kiley.

Mr. Strouss: I desire to defer my cross-examination of this witness.

The Court: You may step aside.

(Witness temporarily excused.)

[fol. 1317] Mr. Mason: Do you wish to proceed with the cross-examination of Mr. Warfel?

Mr. Strouss: No, I am not ready yet. One of my men has been sick during the last two days, and it has slowed me up in going over these train sheets.

Mr. Mason: Call Mr. Peckenpaugh.

C. D. Peckenpaugh was called as a witness on behalf of the defendant and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you please state your name and employment to the reporter, Mr. Peckenpaugh?

A. C. D. Peckenpaugh, General Manager, Burlington Lines, in Texas.

Q. The Burlington to which you refer, is the Chicago, Burlington & Quincy Railroad Company, is it not, Mr. Peckenpaugh?

A. That is correct.

Q. And it is generally referred to in railroad circles and in its literature as the Burlington?

A. That is right.

Q. How long have you been with the Burlington?

A. Fifty years in September.

[fol. 1318] Q. What was your first employment by the Burlington?

A. I entered service as telegraph operator in September, 1890. I have been continuously in the service of the Burlington since that time.

Q. From telegraph operator, were you promoted to various other positions?

A. Yes; I was promoted to train dispatcher, chief dispatched, trainmaster, superintendent of various divisions of the Burlington, then general superintendent on various parts of the territory, and for the past four and a half years I have been general manager of the Texas line.

Q. Mr. Peckenpaugh, have you before you a map of one sheet and bearing reference to the Chicago, Burlington and Quincy Railroad Company?

The Court: You will hereafter refer to that as the Burlington line?

Mr. Mason: Yes, for convenience.

A. Yes, I have.

Mr. Mason: May we have the map marked for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 99 for identification.

Mr. Mason: Looking at the map, Mr. Peckenpaugh, will [fol. 1319] you say whether or not it is a reasonably accurate outline map of the lines of the Burlington and the territory it serves?

A. It is not drawn to scale, but it indicates the various lines.

Q. And the significance of the heavy black lines, you will explain later in connection with another exhibit?

A. That is right.

Mr. Mason: We offer the map in evidence as Defendant's Exhibit 99.

Mr. Strouss: The same objection.

The Court: Overruled. It may be admitted.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 99.")

The Court: What is the total mileage of the Burlington, Mr. Peckenpaugh?

A. The Burlington proper, 9000 miles; the Burlington System lines, 14,000 miles.

Mr. Mason: This map includes all of the Burlington System lines, does it, Mr. Peckenpaugh?

A. Yes, that is correct.

Q. The entire 14,000 miles of the system?

A. That is correct.

Q. A large portion of that is branch lines, is it not, Mr. Peckenpaugh?

[fol. 1320] A. Yes, a goodly portion of our lines are branch lines in Missouri, Nebraska, Iowa, and Kansas. Probably divided fifty-five per cent branch mileage, forty-five per cent main line mileage.

Q. Will you start at Chicago, will you describe the stations through which your principal main lines to the west and northwest extend?

A. From Chicago through Aurora, Galesburg, Omaha, Lincoln, McCook to Denver, one of our principal main lines; from Chicago through Aurora, Savanna, LaCrosse to St. Paul, Minnesota, is a principal main line; from Lincoln northwest through Alliance, Nebraska, Sheridan, Wyoming, to Billings, Montana, is a principal main line; from Galesburg south through Beardstown to Centralia and on is our principal coal-carrying line to the Southern Illinois territory; from Kansas City to Omaha is a principal main line; from McCook east through St. Joseph, not indicated on the map, and on in to Kansas City, is a principal main line.

Q. With what railroads do you connect at Billings, Montana?

A. With the Northern Pacific and the Great Northern.

[fol. 1321] Q. Do you have an end to end conection with the same railroads at Minneapolis or St. Paul?

A. At St. Paul, yes.

Q. Do you have any important connections at Denver?

A. Yes, sir, the Rio Grande, Union Pacific and Santa Fe.

Q. By the Rio Grande, you refer to the Denver and Rio Grande?

A. Yes, sir.

Q. And the Santa Fe, of course, is Atcheson, Topeka & Santa Fe?

A. Correct.

Q. Are you familiar with the code of operating rules of the Association of American Railroads, Mr. Peckenpaugh?

A. Yes, very much so. I have been a member of the Train Rules Committee of the Burlington System for many years.

Q. Do you have a printed code of operating rules on the Burlington?

A. Yes, sir.

Q. Does it resemble the standard code of the Association of American Railroads?

A. It conforms very closely to the standard code.

[fol. 1322] Q. In your capacity as a division and system officer of the Burlington in the past, have you made, and do you now make frequent trips over the system?

A. Yes, I do.

Q. Do you, in the course of those trips, observe operations on the railroad?

A. Yes, sir.

Q. Is it part of your duties to make such observations and report upon them if necessary?

A. That is correct.

Q. Have you, in the course of your career with the Burlington, been a supervising officer on all parts of the system shown on Exhibit 99?

A. With the exception of the territory in the Omaha-Lincoln, in the immediate territory around Omaha and Lincoln, I have been a supervisory officer or employee on all parts of the Burlington line.

Q. Are you familiar, from observation and association, with the territory around Omaha and Lincoln?

A. I am.

Q. Do you know and, if so, will you state, based upon your own knowledge, what the standard weight of rail is in your principal main lines?

[fol. 1323] A. Yes. We have somewhat different standards for different lines. The Chicago main line west towards Denver, 131-pound rail; the Chicago-St. Paul line, 112-pound rail; other lines, 100 and 110-pound rail. On some of our lesser important main lines, the Kansas City line, for example, 90-pound rail.

Q. Now, on this principal main line from Chicago to Denver, has the 131-pound rail, now standard, replaced lighter weight of rail previously in the tracks?

A. That is right.

Q. What is the standard of maintenance as to ballast, if you know of your own knowledge?

A. Yes. The territory, Chicago to Galesburg, is largely lead chatt ballast; from Galesburg to Omaha, gravel; from Omaha to Denver, more or less, slag.

Q. Are the Burlington main lines equipped with block signals to any extent?

A. The main lines to a considerable extent, almost, with the exception of the line between Lincoln and Billings and between McCook and Kansas City, they are all automatic or other form of signals.

Mr. Strouss: Between Billings, and what point was [fol. 1324] that?

A. Lincoln and Billings. There are some signals, but it isn't throughout.

Mr. Mason: Does the Burlington have any double or other multiple track mileage?

A. Yes.

Q. Will you describe, briefly, where it is?

A. The mileage, Chicago to Aurora, 37 miles, is multiple track mileage; from Aurora to Galesburg and to Omaha, double tracks; some double track between Omaha and Lincoln; all double track between Savanna and St. Paul; double track between Beardstown and Zeigler Junction, a short distance south of Herrin; double track between Kansas City and Napier, which is 35 miles north of St. Joseph, Missouri, and which is 97 miles north of Kansas City. Then there are other short stretches of double tracks in various locations.

The Court: What percentage of your main lines is double-tracked, approximately?

A. Approximately twenty-five per cent.

The Court: We will take our morning recess.

(Thereupon, a short recess was taken, after which the witness C. D. Peckenpaugh was recalled to the stand, and proceedings were resumed as follows:)

[fol. 1325] The Court: You may proceed.

Mr. Mason: Mr. Peckenpaugh, are you familiar with the rolling equipment, particularly locomotives and cars, owned and operated by the Burlington?

A. I am.

Q. I will ask you to refer to defendant's exhibit 2 showing the development of freight boxcars of the Southern Pacific Company?

A. Yes.

Q. Will you say, from your knowledge of the Burlington equipment, whether the development of your boxcars as to design and construction has proceeded along lines similar to those indicated by exhibit No. 2.

A. Yes, very similar to those.

Q. Do you now operate any cars of wooden underframe or other all wooden construction in revenue service on the Burlington?

A. No, not in revenue service. We have old boxcars, wooden boxcars used in company service outfit cars, not in revenue service.

Q. By "outfit cars" you refer to cars used by work parties out on the line?

A. Yes, maintenance of way gangs.

Q. Does the Burlington employ refrigerator cars?

[fol. 1326] A. Yes.

Q. Are you familiar with the Pacific Fruit Express Company car?

A. Yes, sir.

Q. Do you handle any of that type of car on the Burlington?

A. Yes, we handle a considerable number of P. F. E. cars in refrigeration service.

Q. Do you handle other refrigerator cars besides the P. F. E. cars?

A. Yes, sir.

Q. What other type predominates?

A. We handle—I would say the next largest number of cars would be the S. F. R. D., Santa Fe Refrigerator Dispatch cars, the U. R. T., A. R. T.

Q. What is the full name?

A. American Refrigeration Transit, Union Refrigerator Transit; we have the B. R. E. X., the Burlington Refrigeration Express car.

Q. All of those types are refrigerator cars?

A. That is right.

Q. Are they equipped with ice bunkers and insulation?

A. That is correct.

Q. Do they resemble the Pacific Fruit Express Company car?

[fol. 1327] A. A very similar car.

Q. Are those refrigerator cars subject, if you know, to the rules respecting interchange of equipment of the Association of American Railroads?

A. They are.

Q. Will you look at exhibit No. 4, and state whether the passenger equipment of the Burlington has been developed along lines similar to those indicated there?

A. Yes, this represents quite completely our development of passenger equipment.

Q. Does your present-day passenger equipment include the streamlined construction and the articulated units indicated for 1937 and 1939?

A. They do.

Q. It is a fact, is it not, that the Burlington was rather a pioneer in the development of that type of passenger equipment?

A. That is correct. The Burlington type of lighter weight streamlined equipment is more closely allied with the Budd built car rather than the Pullman built car, the Budd car being a shotweld, stainless steel car, while the other represents a different type of construction, and a little different type of steel, that is the Cor-Ten steel rather [fol. 1328] than the stainless steel.

Q. Are the Burlington cars used in your streamlined trains similar in general appearance and equipment to those shown here?

A. That is right.

Q. Do you operate steel passenger cars of the conventional appearance as well?

A. That is correct.

Q. Do you have any passenger cars of wooden underframe construction in service?

A. Not in revenue service. We also have a wooden set-aside, antiquated coach that we use in company service for maintenance gangs, or in camp service, but not in revenue service.

Q. Now, will you refer to the locomotive exhibits, Nos. 5 and 6, and directing your attention first to No. 5, will you

state whether the Burlington has types of freight locomotives corresponding in general design and characteristics to those shown on exhibit No. 5?

A. Yes, we have.

Q. For example, do you employ the Mikado type of locomotive?

A. Yes, we have a large number of light and heavy Mikado locomotives.

Q. What is the tractive effort of your heavier Mikados?

[fol. 1329] A. About 67,000 pounds. Just a second, I will correct that—66,640.

Q. Are those used in general freight service, main and branch line?

A. Largely main. Not so much on branch lines.

Q. Do you have in service any consolidation type locomotives?

A. Yes, on our branch lines.

Q. Do your have the 2-10-2, sometimes called the Santa Fe type locomotive?

A. Yes, we have.

Q. Are they larger or smaller than those shown on the exhibits?

A. Just a little larger. Our Santa Fe type locomotive rates 81,125 tractive pounds.

Q. Are those used in main line service principally?

A. Yes, sir.

Q. Do you have other types of freight power corresponding to, if not identical with, the others shown on the exhibit?

A. Yes, we use a Texas type, that is a 2-10-4 wheel arrangement, with tractive power of 83,300, and we use in fast freight service a type, I have heard designated as a Northern, we designate that as a Mohawk type of 4-8-4, [fol. 1330] with a tractive power of 67,500. Then we also use in our Black Hill territory in the vicinity of Deadwood, South Dakota, the articulated Mallet compound 2-8-8-2 type, with a tractive power of 90,000 pounds.

Q. Will you refer to exhibit No. 6, which shows the types of passenger locomotives. Do you have locomotives corresponding to those shown on the exhibit, and, if so, will you designate?

A. We have the light and heavy Pacific type, the 4-6-2 type; we have the mountain type, 4-8-2; we use the Hudson type, the 4-6-4, and the Mohawk previously described,

which is a flexible engine used in both fast freight and fast heavy passenger service.

Q. Are your Pacific type locomotives of the heavier class more powerful or less so than those shown as the heavier class on exhibit No. 6?

A. Sligltly heavier. Our heavy Pacific type rates 47,000 pounds; our light Pacific type rates 38,382.

Q. As to your mountain type engines, what is the tractive effort?

A. 52,750, just a little less than the Southern Pacific type.

Q. You have also referred to the Hudson or 4-6-4 type [fol. 1331] locomotive; what tractive effort does that have?

A. That rates 47,700, but has a much greater sustained boiler capacity, carrying 250 pounds of steam, and has a large combustion chamber and fire box.

Q. Do you use coal or oil predominantly as fuel for your locomotives?

A. Predominantly, coal.

Q. Are these locomotives of the classes used in through main-line freight and passenger service, when fired by coal, when using coal, rather, fired by hand or fired by stokers?

A. Fired by stokers.

Q. Are any of your locomotives equipped with superheaters?

A. Practically all.

Q. And are they equipped, also, with feed water heaters?

A. Yes, sir, they are modernized engines, siphons, feed water heaters, circulators, outside steam pipes, modernized engines.

Q. What type of air compressor do you use?

A. We use a double cross-compound, eight and a half inch pump.

Q. Do the tender capacities in gallons of water corre- [fol. 1332] spond to those shown for corresponding types on exhibits 5 and 6?

A. Yes, we run from ten, twelve, up to twenty-one thousand gallons of water, 16 to 24 tons of coal.

Q. How far do you run these steam locomotives in main-line freight service?

A. We operate between Chicago and the Twin Cities, 430 miles; between Chicago and Lincoln, Nebraska, 535 miles; Lincoln to Denver, 483 miles; Chicago to Kansas City, slightly less than 500 miles.

Q. Now, do those through runs that you have described extend over more than one freight crew district?

A. Yes, they do.

Q. There are several changes of freight crews between Chicago and the Twin Cities, for example, aren't there?

A. There would be three freight crews, two passenger crews.

Q. In general, what is the approximate length of the run of a freight train crew in through main-line service?

A. A minimum of 100 miles. It runs from 100 to 150 miles.

[fol. 1333] Q. You speak of a minimum of 100 miles.

A. We try to space our terminals not closer than 100 miles, because 100 miles constitutes a minimum day in freight service.

Q. Why does it constitute a minimum day?

A. Under contracts and schedules with the labor organizations, they are paid on the basis of a hundred miles for a minimum day.

Q. Is that a more or less standard provision in the working agreements with which you are familiar?

A. It is.

Q. Are you familiar with the ruling grades in the various parts of the Burlington System, Mr. Peckenpaugh?

A. Yes, I am.

Q. Are there any districts in which the ruling grades are such as to require helper service on your through main-line freight trains?

A. Yes. We have a short helper district between Burlington and West Burlington, Iowa, which is a distance of only about four miles, where the railroad line raises from the Mississippi river bottom up onto the table 1.19 grade. That is the only helper district between Chicago and Denver.

[fol. 1334] Q. Do you have any helper districts between Chicago and the Twin Cities?

A. No, we do not.

Q. Do you have helper districts on the line between Lincoln via Alliance, Nebraska, to Billings?

A. Yes, we have helper districts out of Edgemont, South Dakota, to the first station east, eight miles; from Crawford, Nebraska, to Belmont, Nebraska, a distance of approximately 14 miles. The grade is 78, that is 1.5.

Q. You mean 78 feet to the mile?

A. Yes; that is 1.5. Then we have a helper district between Sheridan, Wyoming, and Ulm, a distance of 26 miles, where we double-head and also use a pusher for three miles out of Sheridan.

Q. Do you have any helper districts on the Colorado and Southern and Fort Worth and Denver portions of the system?

A. We have on the Colorado and Southern, but not on the Fort Worth and Denver.

Q. Do you know, and if so will you state, whether the Burlington maintains schedules for the handling of freight over its lines?

A. Yes, we do.

Q. Do you participate in schedules related to the handling [fol. 1335] of freight by yourselves and connecting carriers?

A. We are a party to the agreements.

Q. Do those include schedules for the handling of freight between Chicago and related terminals on the one hand, and Pacific Coast points on the other.

A. That is correct.

Q. Through what gateways and by what routes do those schedules apply over the Burlington?

A. Through the gateway of Billings, Montana, through St. Paul, Minnesota, through Denver, Colorado, through Council Bluffs, Iowa, through Kansas City, Missouri.

Q. Does your line, as a line extending from Council Bluffs to Chicago, handle freight moving on schedule east and westbound in conjunction with the Union Pacific at that point?

A. To a limited extent, yes.

Q. Do you also handle freight on schedule through the Denver gateway jointly with your connection at that point, the Denver and Rio Grande and Santa Fe?

A. That is correct.

Q. Does your traffic through the Denver gateway include [fol. 1336] any traffic originating in Arizona or California?

A. Yes, through the Dalhart gateway with the Rock Island, thence Denver and east.

Q. Do you receive any Arizona traffic originating on the Santa Fe and moving through the Denver gateway?

A. Santa Fe and Southern Pacific, lettuce, peas, cucumbers, cantaloupes, and some fruit.

Q. Does the Burlington participate in the run-off time on these perishable schedules which have been mentioned by previous witnesses?

A. We do.

Q. Are you familiar with the details of the westbound schedules from Chicago and related points to the Pacific Coast destinations?

A. Probably not to the extent I am with the east as to the over-all time. I am familiar with our schedules from Chicago west to Denver and St. Paul, into that area.

Q. What is your scheduled time on westbound freight moving in schedules to the Pacific Coast from Chicago to the Twin Cities?

A. Merchandise train out of Chicago at ten A. M. due into the Twin Cities at two A. M., sixteen hours. Merchandise train out of Chicago at ten P. M. due into the Twin Cities [fol. 1337] at 6 P. M., twenty hours; 16 hours and 20 hours.

Q. What is your scheduled time from Chicago to Denver on westbound transcontinental traffic?

A. No. 67, out of Chicago at 7:50 A. M. due into Denver, 3:45 A. M., 43 hours; 61, due out of Chicago at 10:00 P. M., due into Denver at five o'clock, 36 hours.

Q. Are you familiar with those schedules from your own knowledge and observation of the operations independent of any necessary refreshment of your recollections by the timetables?

A. I am; I just referred to the timetable to be sure I was correct.

Q. Do the scheduled times eastward from the interchange points correspond generally to the times westward that you have just stated?

A. The running time is a little bit less eastward, because of the favorable grade conditions.

Q. Mr. Peckenpaugh, will you please refer to a statement of c e sheet entitled, "Typical Examples of Through Road Freight Trains Running Between Terminals Shown for Continuous Ten-Day Period in September, 1939, (September 11 to 20th, inclusive)"?

A. Yes.

[fol. 1338] Mr. Mason: May we have this statement marked as Defendant's Exhibit No. 100?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 100 for identification.

Mr. Mason: Did you prepare the statement just referred to, Mr. Peckenpaugh?

A. Yes, sir, it was prepared under my direction.

Q. From what sources was it prepared?

A. From the conductor's wheel reports that operated these trains.

Q. Are the conductor's wheel reports used in the preparation of this exhibit available in the court room?

A. Yes, they are here.

Q. Was the information as to the ruling grade taken from the engineering profiles?

A. Yes, taken from the engineering profiles. Those are here.

Q. And they are available at this time for the examination of opposing counsel, are they?

A. Yes, sir.

Q. Now, I notice that the title of the exhibit states that it refers to through road freight trains. Does this include any local trains operating between the points shown during [fol. 1339] the period referred to?

A. No, it does not, just through trains.

Q. Who selected the period?

A. I did.

Q. What was the reason for that selection?

A. In my judgment, this gives the most representative, that is, September gave us a representative month. There is no particular reason for the choice of days as between any particular period in September, other than Labor Day. We took the middle of the month as being representative of the month, and the month as being representative of one twelfth of a year's business.

Q. In your long experience with the Burlington, does the month of September generally represent a fair average month of the year?

A. It does.

Q. How did you determine that you had obtained all of the wheel reports for the through freight trains operated during the period shown and over these districts?

A. We took all of the wheel reports in the car accountant's records, and checked and took from that all of the wheel reports for the St. Paul-LaCrosse, the Savanna-LaCrosse, the Beardstown-Centralia, and the Centralia-Herrin territory.

[fol. 1340] Q. Did you segregate out any local trains?

A. Yes, we segregated from that the local trains that did the local switching and the local work. The balance represented all of the trains run.

Q. Has the exhibit been compared against the original sources to determine its correctness?

A. It has.

Q. Would you say whether, in your opinion, it is true and correct?

A. I believe it is entirely correct.

Q. Now, are these subdivisions shown on the exhibit subdivisions of particularly heavy traffic, as compared to the other main lines or other portions of the main lines of the system, or otherwise?

A. It is representative. The territory between Savanna and St. Paul gives us a picture of the high speed, double track line; the Beardstown Division area gives us a picture of a double-tracked, heavy tonnage, slow moving line. By slow moving, I mean general freight that does not require the high speed that is attained in operations on other main lines.

Mr. Mason: Have you any questions, Mr. Strouss?

[fol. 1341] Mr. Strouss: These wheel reports, Mr. Peckenpaugh, a wheel report has only the information concerning the particular train, isn't that true?

A. That is correct, yes.

Q. Now, the wheel reports which you have here are the wheel reports which cover the trains that are shown on the exhibit?

A. That is right.

Q. The other trains that were operated during this period, you don't have those similar reports here?

A. For trains not shown on this sheet, no.

Q. There were other trains operated between these points during that period?

A. Only local trains, only the local way freight trains.

Mr. Strouss: That is all the questions.

Mr. Mason: We offer the statement in evidence as defendant's Exhibit 100.

Mr. Strouss: The same objection.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and and marked, "Defendant's Exhibit No. 100.")

[fol. 1342] Mr. Mason: Do these trains between St. Paul and Savanna include trains containing perishable and other expedited or manifest freight?

A. Yes, sir.

Q. And these trains between Beardstown and Centralia, Centralia and Herrin, what is the predominant character of the loaded traffic carried in them?

A. Almost exclusively coal.

Q. Is there any substantial amount of returning empties southward away from Beardstown?

A. Yes, as indicated on the sheet, the larger number of cars southbound are empty cars.

Q. Is the Burlington, in so far as its freight traffic is concerned, devoted to the transportation of any particular or restricted type of traffic, or does it carry all types?

A. It carries all types.

Q. It is not predominantly a wheat or grain carrying road, for example?

A. Not predominantly. The Burlington has always been recognized as a granger railroad, serving an agricultural area and handling, of course, all products of agriculture, livestock, coal in various states, perishable traffic from the west coast, manufactured products from the east; a very [fol. 1343] large variety of commodities.

Q. Does the Burlington serve principally as a bridge or intermediate carrier, or does it originate as well a substantial volume of traffic?

A. It originates a substantial volume of traffic, and also a bridge line for east-west commodities, as well as north-south.

Q. The Burlington is also a substantial carrier of passengers, is it not?

A. Yes, sir.

[fol. 1344] Q. Have you a statement referring to your passenger operation and bearing the title, "Maximum Number of Cars Handled in Various Main Line Passenger Trains, Total for the 10 Day Period of September 11th to 20th, 1939"?

A. I have.

Mr. Mason: May we have the statement just referred to marked "Defendant's Exhibit No. 101" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 101 for identification.

Mr. Mason:

Q. Was exhibit No. 101 for identification prepared by you or under your direction Mr. Peckenpaugh?

A. It was.

Q. From what sources was the exhibit prepared?

A. From the conductors' wheel reports.

Q. Have you the wheel reports covering these trains available in the courtroom?

A. Yes, sir.

Q. And available for the examination of opposing counsel?

A. Yes, sir.

Q. Does this exhibit include all or less than all of your principal through main line passenger trains operated [fol. 1345] during the period shown?

A. It represents not all of our through passenger trains. For example, between Chicago and St. Paul-Minneapolis we operate a daylight Zephyr type train, two roundtrips each way. That is not included in this because it handles no sleeping cars. It is merely a day train. The through trains, transcontinental trains are included.

Q. This does not include any of your trains operating into or out of St. Louis or Kansas City

A. No, sir.

Q. Or any of your connections operating to Billings, Montana?

A. No, sir.

Q. Has the exhibit been compared with the wheel reports?

A. Yes, sir.

Q. Will you say whether or not it is true and correct.

A. It is correct.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss:

Q. The wheel reports which you have here are only the wheel reports covering the trains shown on the exhibit?

A. That is right.

[fol. 1346] Q. And during this period there were, were there not, Mr. Peckenpaugh, other trains operated?

A. Yes, as stated.

Q. For which the wheel reports are not here?

A. That is right.

Q. You don't have the train sheets covering the operations over this period here either, do you?

A. No, I do not.

The Court: Do you mean what you designated as "local train operations"?

A. Yes, sir.

Mr. Mason:

Q. Were the train sheets upon which the operation of these trains or any of them is shown used by you in any respect in the preparation of exhibit No. 101 for identification?

A. No, it was not.

Mr. Strouss: The train sheets would show all operations during that period?

A. That is right, yes, all trains are shown on the train sheets.

The Court: And those sheets are here?

A. No, the train sheets are not here; the wheel reports are here. The wheel reports that make up this exhibit are here.

The Court: In other words, the data for this exhibit was not taken from the train sheets?

[fol. 1347] A. No, sir.

Mr. Strouss: But you did check all of the wheel reports for that period to select these particular trains that are on the exhibit, did you not?

A. No, I wouldn't say that. From this ten-day period, September 11th to 20th, we know that No. 10, the Denver Zephyr, ran ten times. We pulled ten wheel reports for those dates, we couldn't miss any because there were only ten trains run. This would not be on the same basis as freight service.

Q. How would you know that you had all through trains during that period?

A. Because we know what trains covered this territory.

Q. Aren't there sometimes extra sections operated?

A. Sometimes, but not in this particular instance.

Q. Could you tell whether there had been or not if you had examined all wheel reports for that period?

A. Yes.

Q. You could?

A. Yes.

[fol. 1348] Q. How would you do that?

A. From our passenger reports we know there were no additional sections of these trains in that particular period.

Q. You would have to go to some record to determine that, would you not?

A. I wouldn't say that would be necessary. As I said, we know there were ten Zephyr trains No. 10 operated from Denver to Chicago.

Q. How do you know there were no extra sections operated?

A. Being in the territory and watching the operation, we would know there were not.

Q. Do you mean that you yourself watched all of these trains during that ten-day period?

A. No, I didn't say that. I say we know there were no additional sections of these trains run during the ten-day period and this is a correct statement of the trains as indicated.

Q. How do you know that?

A. From the wheel reports.

Q. By eliminating those trains which are not through trains?

A. That is right.

Q. From all of the wheel reports?

A. That is right.

[fol. 1349] Mr. Mason: We offer the statement in evidence as exhibit No. 101.

Mr. Strouss: Same objection.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 101.")

Mr. Mason:

Q. Were all of these trains shown on exhibit No. 101 operated by steam locomotives?

A. No, train No. 10 eastbound and train No. 1 westbound and train No. 3-39 westbound, train No. 40 eastbound operated with Diesel electric units. The balance of the trains were operated with steam power.

Q. Does the Burlington have a number of electric locomotives used in passenger service as well as steam locomotives?

A. We have.

Q. You regularly operate the Denver Zephyrs and the Exposition Flyer with Diesel locomotives, do you?

A. That is right.

Q. Do these trains contain Pullman cars?

A. Yes; sir.

Q. Does the Burlington operate Pullman cars in service between points on its railroad and also in through [fol. 1350] service in conjunction with other railroads?

A. Yes, we do.

Q. What other railroads in particular do you have in mind?

A. We operate through sleeping cars between Chicago and the north Pacific Coast over the Northern Pacific; between Chicago and the north Pacific Coast with the Great Northern; between Chicago and the San Francisco area with the D. & R. G. and Western Pacific; outside of this exhibit between St. Louis and Los Angeles in connection with the Santa Fe.

Q. Where are those Pullmans received from or turned over to the Santa Fe that are operated in connection with that railroad?

A. Kansas City.

Q. Do you ever operate the North Coast Limited and the Empire Builder trains between St. Paul and Chicago as one rather than two separate trains?

A. Yes, we do, very largely through the fall and winter months.

Q. When that operation takes place, how many cars are handled as one unit between Chicago and St. Paul?

A. A maximum of 22 cars northbound and 23 cars [fol. 1351] southbound.

Q. Is that an overnight operation between Chicago and the Twin Cities?

A. Yes, sir.

Q. Will you explain just how that consolidation is handled at Chicago and St. Paul?

A. Trains Nos. 49 and 51, the Empire Builder and the North Coast are due to leave Chicago at 10:55 P.M. and 11 P.M.; they also have a five-minute variation in arrival time at St. Paul. The trains are set in the Chicago Union Station on individual or separate tracks and at 10:55 P.M., at the leaving time, the North Coast Limited is pulled out and doubled over onto the Empire Builder and leaves Chicago station as one train. On arrival at Division Street, St. Paul, the North Coast section being ahead, is cut off and backed into the St. Paul station. Then the Empire section is pulled up around the Y and backed in so

that they have a five-minute difference in arrival time at St. Paul. On the reverse movement the reverse is true. The trains leave St. Paul on a five-minute spread in the evening around 11 o'clock, the same procedure is handled. On arrival at Halsted Street, Chicago, the head-end, first train goes into the station, then the rear section is pulled [fol. 1352] in on another track and they are consolidated during the fall and winter months.

Q. Why is it during the fall and winter months?

A. During the summer season the trains handle a considerable number of extra cars and it is not feasible to consolidate them.

Q. Is the Empire Builder a through train to the north Pacific Coast?

A. Yes, sir, over the Great Northern.

Q. The North Coast Limited is over what railroad?

A. Over the Northern Pacific.

Q. Do they handle a substantial volume of tourists or national park business during the summer months?

A. They do, Glacier Park and Yellowstone.

Q. Mr. Peckenpaugh, do you have any rule on the Burlington as to the number of cars which may be operated in a freight train on your main lines?

A. You mean train limit?

Q. Yes.

A. No, we do not.

Q. What circumstance or consideration governs the number of cars to be placed in a freight train?

A. There are several factors. One would be the sched- [fol. 1353] ule requirements dependent on the leaving of a terminal and the time our train was due to reach final terminal. Another would be the tractive power of the engine and the grade over which it operates.

Q. I take it that the tractive power of the engine and the grade over which it operates refers to the weight of the train rather than the number of cars?

A. That is true, although the number of cars might be a factor. A third consideration would be the capacity of passing tracks on single-track lines.

Q. Have you had any recent experience with the limitation of trains of particular lengths because of the lack of passing tracks to permit longer train operation?

A. That has been a factor in recent years because of the acquisition of heavier power, higher tractive effort,

the possibility of handling an increased number of cars has occasioned studies of capital investment to increase capacity of passing tracks in order to accommodate this particular movement.

Q. Did you as superintendent of one of your divisions have that experience?

[fol. 1354] — A. Yes, particularly in Missouri on the Missouri lines, a territory of rolling grade, rolling territory where it seemed almost impossible to find a level location for a passing track. Because of the steep grades trains were limited to cars and tonnage. With the advent of heavier power, more efficient modern power, the train load has been increased to the extent that it became necessary to increase and we are still increasing the capacity of passing tracks. That becomes a rather important factor in a train limit.

Q. What was the limit in number of cars enforced by the passing tracks in this particular district to which you refer prior to the increase in their limit?

A. About 60 cars.

Q. What increase did you make as a result of increasing passing tracks?

A. 125 cars.

The Court: We will take our noon recess at this time.

(Thereupon at 12 o'clock noon of December 11, 1940, the court stood at recess until 2 o'clock P.M. this day.)

[fol. 1355] December 11, 1940, Two o'clock, P. M.

All parties being represented, as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed.

Mr. Mason: We have no further questions of Mr. Peckenpaugh at this time. Do you wish to cross-examine now, Mr. Strouss?

Mr. Strouss: No, I would rather defer the cross-examination.

The Court: You say step aside, Mr. Peckenpaugh. You will be recalled for cross-examination by counsel later.

Mr. Mason: Do you wish the record to show that Mr. Peckenpaugh is supplying you with the current timetables, working timetables?

Mr. Strouss: That is right.

Mr. Mason: Do you want to cross-examine Mr. Warfel at this time?

Mr. Strouss: Yes.

GEORGE H. WARFEL was recalled to the stand, and testified further as follows:

Cross-examination.

By Mr. Strouss:

Q. Mr. Warfel, can you determine the ruling grade in a [fol. 1356] particular district merely by riding over that district in a train?

A. No, we usually get the ruling grade from the calculations of the engineers and profiles.

Q. That is really the only way you can get that?

A. That, I perhaps should qualify. We get the different degrees or percentages of grade from the profiles. The ruling grade is not necessarily the steepest individual grade in a territory. I would say, as an offhand definition of ruling grade, the hill that is the hardest to get over in the district.

Q. Well, that information you don't get by just riding over the district, you have to go to a record to get that, don't you?

A. No, you do get that by riding over the district and by experience with your heavier trains.

Q. In other words, you would determine, by riding over a district yourself, in each of these districts that the ruling grade is a certain percentage?

A. No, you determine where your most difficult grades are by experience and ascertain what the percentages of [fol. 1357] those grades are or steepness of the grade from the engineer's figures.

Q. So, when you give a percentage of ruling grade, that is based on the engineer's figures?

A. That is correct.

Q. I believe you testified that for the past year since March 15, 1939, you have been superintendent of the Kansas Division?

A. That is right.

Q. And before that, for two years, assistant superintendent at North Platte?

A. Yes.

Q. What are the duties of a superintendent or an assistant superintendent?

A. The superintendent has general jurisdiction over all departments of the railroad; I mean by that, over the transportation, the maintenance of way, and the mechanical departments on his division, on the Union Pacific Railroad.

Q. When you say, "all of the railroad," you don't mean the whole system, you mean of his division?

A. I mean, of his division.

Q. And the assistant superintendent, his duties, what are they?

A. His duties are similar to those of the superintendent under his direction.

[fol. 1358] Q. Do either the superintendent or assistant superintendent have duties with respect to other divisions?

A. No, not directly.

Q. In the past year, how many times have you traveled over the entire system of the Union Pacific?

A. I haven't traveled over the entire system of the Union Pacific in the past year.

Q. What parts have you traveled over?

A. From Kansas City to Los Angeles, via Denver, Cheyenne, Ogden and Salt Lake.

Q. When?

A. In August of 1939.

Q. Any other time?

A. I traveled over the Nebraska Division from Cheyenne to Omaha on the return of that trip in August of 1939.

Q. Any other time?

A. No.

Q. How long were you on that trip?

A. Eight or nine days.

Q. Were you just going through to Los Angeles?

A. Yes.

Q. You just made the trip through to Los Angeles, and back to Kansas City?

[fol. 1359] A. That is correct.

Q. When you were assistant superintendent at North Platte, how many times were you over the entire system?

A. I made a trip to San Francisco and return, a trip to Los Angeles and return, several trips—oh, I should say,

probably twenty or twenty-five trips to Omaha and return, and very frequently as far as Grand Island, between Grand Island and Cheyenne, I traveled daily. These trips that you asked me about are all since I became assistant superintendent at North Platte?

Q. Yes.

A. That was subsequent to my work as a general officer of the railroad.

Q. That was, as I understand, between some time in 1937, and March 15, 1939?

A. Yes, that is right.

Q. How many times in the past year have you traveled between Council Bluffs and North Platte?

A. Only the one time referred to.

Q. Now, you testified concerning improvements in locomotives, I believe, your super-heaters, feed water heaters, the forced feed lubrication, there has been some improvement, also, in the baffle plate, baffle draft, some improvement [fol. 1360] along that line?

A. There has been, particularly in the front end of the smoke box, as we call it, of the locomotives, improvements in the nozzles and jets of the exhaust steam, creating better draft through the boiler tubes of the engine.

Q. Was there some improvement in the firebox arch?

A. I think there has been. I know of some replacements and rearrangements in the last few years; that is, I know they have made them, but I am not qualifying myself as an expert on firebox drafting.

Q. When you testified as to improvements, that your engines had these improvements, the super-heaters, feed water heaters, and forced feed lubrication, do you mean by that that all of the locomotives owned by the Union Pacific have those improvements, the road engines and yard engines as well?

A. I think I said that the more modern engines had those improvements, the later purchase of engines.

Q. Those are more or less recent improvements, I mean recent developments in locomotives, are they not?

[fol. 1361] A. Yes, we have had super-heaters on locomotives for a number of years.

Q. About 1921?

A. I was going to say some twenty years, I would say, on the super-heaters. The other improvements you men-

tion have come since that, but the super-heater is the earlier one of the recent improvements.

Q. Of course, they were not all placed on your locomotives at one time?

A. Oh, no, usually they were developed, bought on new power, that is, came with new power as it was bought, and also bought separately and applied to the best of the older power which justified such expenditures.

Q. Now, I think you testified that your passenger engines run around 600 miles in some instances?

A. The longest runs.

Q. And freight around 335?

A. That is right.

Q. How long have you been making those long runs?

A. Runs as long as 600 miles in the last three or four years. Runs as long as 335 miles for the past six or seven years.

[fol. 1362] Q. Has the increase in capacity of the tender had some tendency to bring about that increase in distance of running an engine?

A. That has helped. I think the higher degree of maintenance of the locomotives and the force feed lubrication; improvements in lubrication and in closer fits of working parts have been a greater factor than the increased size of locomotive tenders.

Q. You testified that your on-time performance of perishable schedules was better than 95 per cent?

A. I expressed that opinion, yes; I said I didn't have the accurate percentage.

Q. By that did you mean over the entire schedule, that is, including the part run by the connecting carrier as well as the part run by your railroad?

A. No, what I had in mind when I said that was the portion run over the Union Pacific that we delivered. I am sure better than 95 per cent of our trains are operated within the portion of the schedule, the number of hours allotted to us, which is about 63 hours. That is our part of that through schedule and I am sure that better than 95 per cent go over our road in 63 hours or less.

[fol. 1363] Q. You didn't by that mean to testify that the deliveries to you by connecting carriers were 95 per cent on time or reasonably on time?

A. No, but I would say that our deliveries to the connecting carriers which includes whatever time may have

been lost by the connections which came to us before we got the train, that our delivery to the connecting carriers on the eastbound schedules are 95 per cent or better on time. In other words, though we may get the train late from Colton on our own road or from Roseville when it comes to us at Salt Lake, we will deliver on time at Council Bluffs and Kansas City.

Q. In other words, you make up time, back time?

A. That is right, yes, sir.

Q. You stated that your freight business had been very much affected by highway competition?

A. That was speaking of the branch line traffic.

Q. Is that because they are carrying the traffic faster?

A. Because as a rule your branches spread out from local distributing centers for comparatively short distances and practically every good branch on any railroad in the country has been paralleled by good highways within the last twenty-five or thirty years, with the result that [fol. 1364] much of the freight which used to be distributed by train is now distributed by the wholesalers and by the jobbers, either in their own trucks or by contract carrier in some cases and in some cases by common carrier trucks, but much of that short-distance distribution other than spreads of 200 to 300 miles from distributing centers has been taken from the railroad by the highway transportation and that has very badly reduced the revenues on branch lines.

Q. There has been some of your main line travel taken by highway competition too, hasn't there?

A. Yes, there has.

Q. Has that been due to speed of movement by the trucks?

A. No, not the speed of movement by the trucks. As a matter of fact I might say in that connection that practically all of the Class I railroads in a consuming territory have put on fast overnight hot-shots in an effort to regain business which had been taken away by the highways because of the flexibility with which they can move trucks at different times and different hours to different places. They get a considerable portion of that business away from the railroads which they will get back by these [fol. 1365] hot-shots.

Q. Which operate at passenger train or faster speed?

A. Approximately that.

Q. On your exhibit No. 91 I believe you testified that only through trains are shown by that exhibit?

A. That is correct.

Q. What do you mean by "through trains" there?

A. Trains which handle traffic through from one terminal to the other. I don't mean the final terminal of the railroad, but Cheyenne or Denver to Omaha or Kansas City or Cheyenne to Salt Lake or Ogden, eliminating short local runs, branch runs, and it would also eliminate trains such as you just now spoke of, the fast merchandise train run out of Kansas City, for example, which terminates at Ellis and only makes a 300-mile run. That train would not be on this list here.

Q. Any other trains that would not be on this list?

A. That is the only one I can think of, aside from the branch and part district locals. I might add, by the way, that train is frequently a good big train because in that territory we don't run through freight service and that [fol. 1366] carries all the service for that territory.

Q. You mean the so-called "hot-shots"?

A. That is right, when it gets over 85 cars I begin to get uneasy about the hot-shot schedule.

Q. I should think you would.

A. It makes it, however, I will say that.

Q. What territory is that?

A. From Kansas City to Ellis, 303 miles.

Q. Your exhibit No. 91 covers a ten-day period August 10-19?

A. Yes, sir.

Q. On exhibit No. 92, which is the passenger train exhibit you took a period of four months, that is, four different months, November, 1939, and January, April, and July, 1940?

A. That is right.

Q. Why did you take a ten-day period in one instance and a four-month period in the other?

A. We were asked for a ten-day picture on the freight traffic and for a typical exhibit showing the operation of through passenger traffic on the Union Pacific Railroad, and as I believe I said yesterday I had seen an exhibit made on quarterly months since we got the 800's showing

the big improvements that have been made in our passenger handling and I thought that would make the type of [fol. 1367] exhibit they wanted here so I made it that way.

Q. It would more probably indicate normal traffic?

A. It indicates all the traffic. In fact, it is a sampling throughout the year and gives the whole picture of passenger traffic on the Union Pacific.

The Court:

Q. A more comprehensive picture?

A. Yes.

Mr. Strouss:

Q. That would be true more with respect to freight traffic?

A. Had we not been asked for a ten-day period on the traffic line operation I think I would have considered doing the same thing with the freight exhibit.

Q. What are the consist of passenger trains which are operated here, which of these?

A. They are shown averaged here.

Q. I mean as to head-end cars?

A. Pardon me, I thought you referred to the freight traffic.

Q. Let me ask you, first, Mr. Warfel, the train set out in the Omaha-Ogden square and the ones over on the right-hand side, the second frame Ogden to Los Angeles, those are the same trains in each division or each section [fol. 1368] except that they run on through to Los Angeles?

A. Some of those trains run to San Francisco also. For instance, in line 3 of that particular right-hand square train No. 27, and the next line, train No. 49, those trains go through on the Southern Pacific to San Francisco.

Q. The trains shown in both squares are the same train except that the terminal points are different?

A. That is right, for instance, on line 8, train No. 717, the Challenger (L. A.), that is the Los Angeles Challenger; that is the same as this train over in the Ogden-Los Angeles on line 42, train No. 717.

Q. What about the head-end cars on the trains shown on this exhibit?

A. Most of these trains shown here do comparatively little head-end work with the exception of train No. 21-5,

line 2 in the upper left-hand square, Pacific Limited. That train carries four to five head-end cars daily, I should say and likewise I should point out that in the upper right-hand bracket that train No. 111, City of Denver, is a streamlined train but has one mail and one baggage car and we do a very heavy mail business, we run that mail car to capacity and do a big mail and express business on [fol. 1369] that streamlined train. The other streamliners do very little mail and express work, practically all passenger work. These Challenger trains which are among the longest shown on this exhibit carry only two or three head-end cars as a rule, the balance are passenger-carrying cars.

Q. Are they Pullmans?

A. They carry about an even number of day cars, coaches and chair cars and so-called "tourist" sleeping cars on the Challengers. They carry no standard sleepers but the tourist sleepers carried on those trains today are the standard sleepers of yesterday which have been converted into tourist sleepers by the simple means of taking up the carpets in the sections and one or two other small luxuries and designating them as "tourist" cars.

Q. There are other trains which are run between the different points shown on this exhibit other than those shown on the exhibit?

A. Not through between these points.

Q. Locals?

A. Yes, there are some local trains, as from Omaha to Grand Island; we have a motor train with one baggage-express car. We have a train that comes in at Columbus off the branch and runs the 90 miles to Omaha; runs of [fol. 1370] that sort are not shown.

Q. That is what you mean by "locals"?

A. Yes.

Q. All other trains are shown?

A. That is right.

Q. I think I asked you to check these trains that I found where there were broken knuckles in the Nebraska division between Council Bluffs and Grand Island, August 13, extra 5047 east at Mile Post 95 east of Gardiner, broken knuckle, 106 cars; August 14, extra 5071 east at Duncan, broken knuckle, 119 cars; August 15, extra 5044 east, coupling pin pulled near the rear end on a 66-car train. Is that correct?

A. Will you give me that last train again?

Q. Extra 5044 east, August 15.

A. Yes, that is correct. I should state that I happen to know very well the territory in which two of these occurred. You spoke of one 1½ miles east of Gardiner and the one at Duncan. We have approximately 41 miles of tangent track eastward from Grand Island toward Columbus until the curve at Gardiner is reached and from Gardiner on into Columbus there is a succession of curves. You approach the Loup River there and it is also grown up with trees on both sides of the track where you have [fol. 1371] been running in open country. Usually on the curves at Gardiner and Duncan if there is any defect whatever observable in a train it is observed there when they come off the straight track onto these curves, but the engine is already out of sight of the conductor before the conductor gets to the curve because they go in behind the trees. I happen to know that in both the case of extra 5047 east on August 13th and extra 5071 east on August 14, defect was detected by the crew at the rear of the train, the first one a hot-box, the second one sparks indicating hot wheels or brakes sticking and in each case the air was applied by the conductor from the rear end and the knuckle broke just as the train came to final stop. In the other case that you mentioned, extra 5044 east at Columbus, that train had stopped at the Columbus coal chute standing over three or four crossings for a period of about five minutes and some impatient individual had climbed through the train, stepping on the cut lever as he did so and when the train started it separated.

Mr. Strouss: That is all.

[fol. 1372] Redirect examination.

By Mr. Mason:

Q. Does the record which you have consulted in this connection show any personal injuries to any members of the train or engine crew in connection with those incidents?

A. There were no personal injuries in connection with those incidents.

Q. You spoke of the 63-hour schedule but didn't mention the points, the origin and terminal points?

A. The 63 hours applies from Ogden, Utah, to Council Bluffs, 63 hours and 13 minutes to be exact.

Q. That is the Union Pacific over-all time?

A. That is the Union Pacific portion of 139 hours and 30 minutes from Colton or Roseville to Chicago.

Q. That 63 hours may be affected by your proportion of the run-off time if run-off time is included or is to be made up?

A. That is true. On run-off trains we have to make that same distance in 56 hours and 17 minutes.

Mr. Mason: That is all.

The Court: May this witness with his records be excused?

[fol. 1373] Mr. Strouss: Yes.

The Court: It is so ordered.

(Witness excused.)

[fol. 1374] E. A. WHITE was called as a witness on behalf of the defendant, and being first duly sworn testified as follows:

Direct examination.

By Mr. Booth:

Q. Will you state your name and residence to the reporter?

A. E. A. White, Chicago, Illinois, car accountant for the Chicago, Burlington and Quincy Railroad Company.

Q. Are you in the accounting department of that company?

A. Yes, sir.

Q. What length of time have you been in the accounting department of the Burlington?

A. Twenty-five years.

Q. Are you familiar with the accounts rendered annually and monthly by the company, called the annual reports, on forms OS-A and OS-E reports to the Interstate Commerce Commission?

Mr. Booth: There has been handed to the clerk a statement headed, "Chicago, Burlington & Quincy Railroad Company, Freight Operating and Freight Transportation Expenses, Related to Traffic, Calendar Years, 1922 to

[fol. 1375] 1939," which we will ask to be marked for identification.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 102 for identification.

Mr. Booth: Have you before you a copy of the exhibit just described?

A. I have.

Q. From what source were the figures in columns B, C, and D, opposite the years 1922 to 1939, inclusive, in column 9 derived?

A. From the annual reports to the Interstate Commerce Commission.

Q. Of the Chicago, Burlington and Quincy Railroad Company?

A. Of the Chicago, Burlington and Quincy Railroad Company.

Q. Have you those reports with you?

A. I have.

Q. On the table by your side?

A. Yes, sir.

Q. And are the figures I have just referred to correctly transcribed from those reports?

A. They are.

Q. The figures in columns E and F, and in the three horizontal boxes at the bottom of the exhibit are calculations, are they not?

[fol. 1376] A. Yes, sir.

Q. From the figures in B, C, and D?

A. Yes, sir.

Q. And have those calculations been correctly made?

A. They have.

Q. This table does not represent any adjustments made by you or anyone else, so far as you know?

A. No, sir, they are exact transcriptions from the reports with those calculations.

Mr. Booth: Any questions, Mr. Stronss?

Mr. Strouss: No questions.

Mr. Booth: We offer this exhibit in evidence as defendant exhibit No. 102.

Mr. Strouss: The same objection.

Mr. Booth: We tender for inspection and for the use of counsel the reports referred to by the witness.

The Court: The objection is overruled. The document may be admitted in evidence.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 102.")

Mr. Booth: There has been handed to the clerk and we ask that there be marked, "Defendant's Exhibit 103 for Identification," one sheet headed, "Chicago, Burlington [fol. 1377] and Quincy Railroad Company, Freight Service Operating Averages, Calendar Years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938, and 1939."

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 103 for identification.

Mr. Booth: Mr. White, are the sources used in preparing this exhibit shown in the five sources notes at the bottom of the exhibit?

A. Yes, those are the sources.

Q. And in addition to the annual reports of the Chicago, Burlington & Quincy Railroad Company for the years shown in columns C to L, inclusive, of the exhibit, you used what other reports to the Inferstate Commerce Commission?

A. Forms OS-A and OS-E.

Q. For those years?

A. For those years as shown.

Q. Have you those forms with you?

A. Yes, sir, I have.

Q. They are on the table beside you?

A. Yes, sir.

Q. In so far as the items shown in this exhibit involve items taken bodily from the reports of the company to the Commission. Have those items been correctly transcribed [fol. 1378] by you?

A. They have.

Q. And in so far as the items shown in the exhibit involve calculations by use of the formula described in the footnotes, have those calculations been correctly made?

A. Yes, they have.

Q. And in accordance with those formula?

A. Yes, sir.

Q. Is this exhibit true and correct, to the best of your belief?

A. It is.

Q. You have checked this exhibit yourself?

A. I have.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Booth: We offer it in evidence as Defendant's Exhibit No. 103.

Mr. Strouss: The same objection.

The Court: The objection is overruled.

Mr. Booth: And we tender therewith, in addition to the annual reports, the forms OS-E.

The Court: It may be introduced in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 103.")

Mr. Booth: There has been handed to the Clerk and we [fol. 1379] ask to have marked as defendant's exhibit 104 for identification, a typewritten statement in one sheet, headed "Chicago, Burlington & Quincy Railroad Company, Number of Cars of Revenue Freight Carried during the Year 1939." Have you that before you, Mr. White?

A. I have.

Q. Aside from the totals in the horizontal line headed "Total, 110 to 143, Inclusive," I ask you if these descriptions of commodities, class numbers and figures are taken without change or alteration from schedule 541 of the Chicago, Burlington & Quincy Railroad Company's annual report to the Interstate Commerce Commission on Form A for the year 1939?

A. They are.

Q. And are the totals shown in the line to which I refer correctly computed, to the best of your knowledge and belief?

A. They are.

Q. This exhibit involved no calculation other than the totals?

A. That is all.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Booth: We offer this in evidence as defendant's ex- [fol. 1380] hibit 104.

Mr. Strouss: Same objection.

The Court: Same ruling. It may be admitted in evidence.

(The document referred to was received in evidence, and marked, "Defendant's Exhibit No. 104.")

Mr. Booth: No further questions.

Cross-examination.

By Mr. Strouss:

Q. Mr. White, your exhibit 102, in column C, the amounts there shown represent the totals of accounts 201 to 462 of the annual report?

A. That is correct.

Q. And the amounts shown in column D represent the total of accounts 371.—

A. 372—no, 371.

Q. —371 to 420?

A. That is correct.

Q. Now, in exhibit 103, I notice that there has been a reduction in miles of line operated. Is that due to abandonment of unprofitable branches?

A. Well, principally. There have been same changes in the operation of freight service over certain lines, but prin- [fol. 1381] cipally due to the abandonment of lines.

Mr. Strouss: I think that is all the questions I have at this time. I want to look at the annual reports, and if I do not have any other questions on which to call Mr. White back I will let you know, Mr. Booth.

Mr. Booth: Very well.

A. E. L. Gareiss was called as a witness on behalf of the defendant and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Booth:

Q. State your name and residence to the reporter.

A. My name is A. E. L. Gareiss. I reside in Chicago. I am statistician of the Illinois Central System, which in-

cludes the Illinois Central Railroad Company and the Yazoo and Mississippi Valley Railroad Company.

Q. I show you Exhibit No. 27 in this case, defendant's exhibit No. 27, which was introduced through the examination of Mr. C. R. Young, and ask you to state what portion of that exhibit covers the line of the Yazoo and Mis-
[fol. 1382] sissippi Valley Railroad Company?

A. Well, the lines of the Yazoo and Mississippi Valley Railroad Company are shown along the Mississippi River here, from Memphis down to New Orleans with various branches. This map does not show all the stations that I would like to describe here, but it runs through Vicksburg, Greenville and Baton Rouge. It also includes the leased lines of the Alabama and Vicksburg Railway Company; and the Vicksburg, Shreeveport and Pacific, extending from Lorraine, Louisiana, to Meridian, Mississippi. It also includes the line from Memphis to Gwin.

The Court: Many of the points, the cities that you have named, are not shown on this exhibit?

A. They are not shown on the exhibit.

Mr. Booth: Generally speaking, it includes the lines south of what points?

A. South of Memphis along the Mississippi River.

Q. It doesn't include the line east of that through Frog-more and McComb?

A. No, that is the Illinois Central.

Q. Now, to what extent and for what length of time has
[fol. 1383] the Illinois Central report to the Interstate Commerce Commission, the annual report, comprised the operations of the Yazoo and Mississippi Railroad Company?

A. The annual reports themselves are made separately for the Illinois Central and the Yazoo and Mississippi Valley Railroad.

Q. Has that been true since 1922, including 1922?

A. Yes, sir.

Q. Do you have here in the courtroom the annual reports for each of the two railroads, the Illinois Central and the Yazoo and Mississippi Valley, for the years 1922 to 1939 inclusive?

A. I have them in court, yes.

Q. What as to Forms OS-A and OS-E, were those reported separately or consolidated?

A. They were consolidated.

Q. So, while there will be two annual reports for each of those years, there would be but one OS-A or OS-E?

A. That is correct.

Q. There was introduced for identification during the testimony of Mr. C. R. Young, and marked "Defendant's Exhibit No. 28," an exhibit entitled, "Illinois Central System, Including the Yazoo and Mississippi Valley Railroad [fol. 1384] Company, Freight Operating and Freight Transportation expenses Related to Traffic, Calendar Years 1922 to 1939, Inclusive." Are you familiar with that exhibit?

A. I am.

Q. Did you prepare it?

A. I did.

Q. Did you prepare it entirely from the annual reports of those two companies to the Interstate Commerce Commission for the 17 years covered by that exhibit?

A. All these figures were taken from the annual reports to the Interstate Commerce Commission.

Q. That is, except the computations?

A. That is, except the computations.

Q. Then the figures, in columns B, C & D, represent the addition to the corresponding items in those two reports for the years mentioned; is that correct?

A. That is correct.

Q. Are the figures there shown in columns B, C, and D, correct additions of the corresponding items in those reports for the years mentioned?

[fol. 1385] A. They are correct.

Q. And that work you prepared yourself?

A. I prepared it myself.

Q. Did you also prepare the computations shown in columns E and F, and in the three horizontal blocks at the foot of the exhibit?

A. I did.

Q. And, including those computations, is the exhibit true and correct to the best of your knowledge and belief?

A. It is true and correct, to the best of my knowledge and belief.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: I have no questions.

Mr. Booth: We offer the exhibit in evidence as defendant's exhibit 28.

Mr. Strouss: The same objection.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence, and marked "Defendant's Exhibit No. 28.")

Mr. Booth: We tender to counsel for examination the reports referred to by the witness, which are here in the courtroom.

Q. Mr. Gareiss, there was introduced in evidence during the examination of the witness C. R. Young, one sheet [fol. 1386] marked "Defendant's Exhibit No. 29 for Identification," and which is headed "Illinois Central System, Including the Yazoo and Mississippi Railroad Company, Freight Service Operating Averages, Calendar years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938, and 1939." Have you that before you?

A. I have.

Q. Did you prepare this yourself?

A. I prepared this myself.

Q. Did you prepare it from the sources by the formula and methods and computation shown in the five source notes at the bottom of the exhibit?

A. I did.

Q. Have you with you the forms OS-A of the two railroads mentioned consolidated as you have described, in so far as they were used in the preparation of this exhibit?

A. I have.

Q. Were any OS-E used?

A. The OS-E were used for 1936, 1938 and 1939.

Q. Have you those with you?

A. I have.

Q. Are the items shown therein as having been transcribed from the sources mentioned, and the computations made therein as appearing on the face of the exhibit, true [fol. 1387] and correct, to the best of your knowledge and belief?

A. They are.

Mr. Booth: We offer the exhibit in evidence, as defendant's exhibit No. 29, and also tender counsel for his use the forms OS-A and OS-E therein referred to.

Mr. Strouss: The same objection.

The Court: The objection is overruled. The document may be admitted in evidence as exhibit 29.

(The document referred to was received in evidence, and marked "Defendant's Exhibit No. 29.")

Mr. Booth: There has been handed the Clerk, and we ask that there be marked "Defendant's Exhibit No. 105 for Identification," a typewritten sheet headed "Illinois Central Railroad Company, Number of Carloads of Revenue Freight Carried of Certain Selected Commodities, Total Products of Agriculture and Total Carload Traffic as shown on Schedule 541 of the Annual Report to the Interstate Commerce Commission, Calendar Year 1939." Mr. Gareiss, have you that sheet before you?

A. I have.

Q. Did you prepare this yourself?

A. I did.

[fol. 1388] Q. Since you came down to Tucson?

A. That is right.

Q. Aside from the totals shown in the third line from the bottom of the exhibit, is this sheet an accurate and correct transcription of the portion of Schedule 541 of the Illinois Central's Annual Report to the Interstate Commerce Commission for the calendar year 1939, as it purports to be on the exhibit?

A. It is.

Q. And the totals were made by yourself?

A. The total of items 110 to 143 was made by myself.

Q. Are they true and correct?

A. They are true and correct?

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Booth: We offer this exhibit in evidence as defendant's exhibit 105.

Mr. Strouss: The same objection.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 105 in Evidence.")

Mr. Booth: There has been handed to the Clerk and we [fol. 1389] ask that there be marked as defendant's exhibit 106 for identification an exhibit headed "The Yazoo and Mississippi Valley Railroad Company," consisting of one sheet, and also headed "Statement Showing Number of Carloads of Revenue Freight Carried of Certain Selected Commodities, Total Products of Agriculture, Total Carload Traffic as Shown on Schedule 541 of the Annual Report to the Interstate Commerce Commission, Calendar Year 1939."

Q. Mr. Gareiss, did you prepare this exhibit?

A. I did.

Q. Since you came to Tucson?

A. Since I came to Tucson.

Q. Is this exhibit, exclusive of the third line, of totals a correct transcription of the corresponding entries in the report referred to in the title?

A. It is.

Mr. Booth: Any questions?

Mr. Strouss: No questions.

Mr. Booth: We offer this in evidence as defendant's exhibit 106.

Mr. Strouss: The same objection.

The Court: Objection overruled. It may be admitted.

[fol. 1390] (The document referred to was received in evidence and marked "Defendant's Exhibit No. 106.")

Mr. Booth: We ask the privilege of substituting for these two exhibits and the similar exhibit introduced in Mr. White's examination, planograph copies.

The Court: There may be such substitution. We will take our afternoon recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows:)

The Court: Mr. Strouss, you didn't want to cross-examine the last witness until later?

Mr. Strouss: No, I think not. I could ask a general question. I want to go over the annual reports before he is released.

The Court: Then you may resume the witness stand.

[fol. 1391] Following the recess, proceedings were resumed as follows:

Cross-examination.

By Mr. Strouss:

Q. Exhibit No. 28, the amounts shown in column C represent the total of accounts 210 to 462 of the annual report?

A. They include all the operating expenses, I think it is account 201.

Q. 201 to 462?

A. That is correct.

Q. And the amounts in column D represent the accounts 371 to 420?

A. Correct.

Q. Of course here you have combined from the two annual reports?

A. That is the combination of the two annual reports.

Mr. Strouss: That is all at this time until I have examined the reports.

The Court: You may step aside subject to later cross-examination. Call the next witness.

[fol. 1392] Peter Parke was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Booth:

Q. Will you state your name and residence to the reporter?

A. Peter Parke.

Q. Where do you reside?

A. 1725 East 53rd Street, Chicago.

Q. What official position do you have with the Pullman Company?

A. I am chief engineer for the Pullman Company.

Q. How long have you occupied the position of chief engineer of that company?

Vol. II

TRANSCRIPT OF RECORD

(Pages 785 to 1568)

Supreme Court of the United States

OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY, APPELLANT,

vs.

STATE OF ARIZONA, EX REL. JOE CONWAY, ATTORNEY GENERAL OF THE STATE OF ARIZONA

APPEAL FROM THE SUPERIOR COURT OF THE STATE OF ARIZONA, COUNTY OF PIMA

FILED APRIL 12, 1944.

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JUDD & DETWEILER (INC.), PRINTERS, WASHINGTON, D. C., JULY 20, 1944.

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Redirect	1989	1100
Recross	1992	1102
Joseph Henry Dyer—		
Direct	1993	1103
W. H. Kirkbride—		
Direct	2027	1120
Cross	2136	1178
	3861	2094
	4034	2184
Redirect	4042	2188

Record from Superior Court of State of Arizona in and for County of Pima—Continued
Statement of evidence—Continued
Defendant's case—Continued.

	Original	Print
G. C. Baker—		
Direct	2332	1281
	2669	1455
Cross	2392	1312
	2727	1485
	2894	
Redirect	2780	1567
	2910	1583
W. P. Herbert—		
Direct	2395	1313
	2830	1540

A. Since February 1, 1914.

Q. Where did you receive your academic training?

A. After receiving technical education in my native country, Sweden——

Q. Then you came to this country?

A. I came to this country and started in with the Pullman Company in the drafting room as a draftsman.

Q. Will you give briefly your experience in your chosen [fol. 1393] profession since you started with the Pullman Company. What year was that?

A. October, 1890, to 1898, draftsman with the Pullman Company; from 1898 to 1900, mechanical engineer with the Illinois Car and Equipment Company. The Illinois Car and Equipment Company operated plants in Chicago; Urbana, Ohio, Anniston, Alabama; I was at the Anniston plant. That plant was later taken over and the company went out of business and it was operated by the Southern Car and Foundry Company. From 1900 to 1905, I was assistant master car builder of Swift Refrigerator Lines.

Q. That was the Swift Packing Company?

A. Yes, Swift and Company. The master car builder was manager down at Anniston and when he left I went with him up there. From 1905 to February, 1914, I was with Western Steel Car and Foundry Company in various positions from mechanical engineer to manager of their works at Chicago.

Q. In what business generally was the Western Car and Foundry Company engaged?

A. Western Steel Car and Foundry Company was an affiliated company with the Pressed Steel Car Company and they were engaged primarily in building steel freight cars, the company being controlled by the Pressed Steel Car [fol. 1394] Company. There were periods when I spent months, several months at a time in their plant at Pittsburgh when the local plant in Chicago was down. The plant was never continuously operated.

Q. Since your incumbency of the office of the official position as chief engineer of the Pullman Company what in general have been your duties as chief engineer?

A. As chief engineer I have complete charge of designing and all mechanical matters pertaining to the construction of Pullman cars, preparing specifications, preparing designs, requisitioning material, and also taking care of

having in charge the mechanical construction for maintenance carried out by our repair shops. From 1914 to 1924 the Pullman industry was operated as one corporation. The company then had a manufacturing department of the company. As chief engineer at that time I had charge of both the specifications and all mechanical features of building and constructing the cars. After the complete separation of the manufacturing company from the operating company the Pullman Company is now a subsidiary to Pullman, Incorporated. Pullman, Incorporated, owns the manufacturing company and the Pullman Company. From the time of this separation I am chief [fol. 1395] engineer for the Pullman Company and have nothing to do directly with the manufacturing company. As chief engineer for the Pullman Company my duties are as before, preparing specifications and supervising the construction of new equipment purchased by the Pullman Company from the manufacturing company or, in other words, my position now relative to the manufacturing company is about the same as a railroad mechanical officer to the manufacturing company.

Q. You prepare the specifications?

A. I prepare the specifications and control the design and all features.

Q. And inspect the cars?

A. To inspect the cars, I have directly under my supervision inspectors who inspect the cars and see that they comply with our specifications.

Q. Has your office a record of the design and specifications of Pullman cars as far back as 1900?

A. No, the records for all Pullman cars are maintained primarily in the organization which maintains or has charge of repairs. They maintain the complete record history of every car, also there is a record which we rely on completely now in the office of our engineer of valuation. The engineer of valuation is an office designated after the [fol. 1396] separation of the company in accordance with the Interstate Commerce Commission's requirements. He has a complete record of every car and to his office goes all the information about changes which take place in the cars and in that way he keeps control of the value of the car, the depreciation, etc.

Q. You have access to those records?

A. We have access to all records of the company, yes, sir. We have, of course, specifications for all lots of cars built. We may give an order for small or large numbers of cars to the manufacturing company and for every lot of cars we have the specifications. Those specifications are kept for many years, they are usually for old lots stored out in the water tower and when we come to search for the old records they are not there, but the engineer of valuation has a complete history.

Q. Mr. Parke, there has been handed to the clerk a sheet headed, "The Pullman Company, Chronology of Advances in Sleeping Car Construction, Years 1900 to 1940." Have you that before you?

A. Yes, I have.

Mr. Booth: We ask that this be marked "Defendant's Exhibit No. 107" for identification.

[fol. 1397] The Court: It may be marked.

The Clerk: Defendant's exhibit No. 707 for identification.

Mr. Booth:

Q. Was this exhibit prepared under your direction?

A. This was prepared in my office under my direction.

Q. Taking the first block on the exhibit to the black line in the center of the exhibit, years 1900, 1901, 1902, and 1903 is the designation, does that correctly show the side elevation of the Pullman cars in general used in those years?

A. Not necessarily. It is a typical view of it. The oval windows, for example, on some lots we have oval windows and on others something else. It is typical. All cars constructed in that year were constructed under specifications and minor modifications made in the building of those cars. In three years someone gets an idea it would be better to have an obscure window for the toilet and that is recommended and it is put there but in general it represents the type of car, I would say aside from those oval windows, represents the type of car that was built during those years and the descriptive matter shown to the right-hand side is typical of those cars.

[fol. 1398] Q. Those are the new features which were added in those years?

A. I would say that those are the features that existed in the cars built during those years, not necessarily added in those years. Some of them may be carried over from

a way back, I know many of them were but they describe the car as of that period. From 1900 to 1903 the cars included the features shown in that statement.

Q. The length over platforms coupled, the average weight of the car and trucks, and the average weight of one truck is shown in the column so headed, is it?

A. That is right. Those weights are fairly representative. There is no two cars that weigh exactly alike, one may weigh 120,000 and the other will weigh 121,000 and the other 119,000, all exactly the same construction. There is enough variation in the material that enter into it to account for the slight difference, but that is typically representative of the weights of the cars for that period.

Q. Taking the Pullman car in the block for 1904, what does that represent?

A. That represents substantially the same cars with the slight difference mentioned in the centering device for the [fol. 1399] coupler to improve the centering and means a slight change in the brake rigging and a slight change in the truck and also a change in the brake beam, really immaterial changes.

Q. And in 1907?

A. In 1906 I think is the next.

Q. Yes.

A. 1906 there is a decided improvement. It is in the draft gear. The Westinghouse friction draft gear was applied to those cars and instead of having the plate transoms or body bolsters, we call them either, that means the cradle which supports the car, was constructed of steel plates. Instead of that a large steel casting was substituted which made a more solid and substantial construction and another very important improvement was in the substituting of the L.N. brake for the P.M. brake. That was substituted on cars built that year.

Q. Has that brake been applied since or has there been a still further improvement?

A. There has been further improvement in the brakes.

Q. We will come to them later, will we?

A. I could mention the difference in the L.N. as against the P. M. It shows as a matter of fact on the bottom of [fol. 1400] the exhibit under the head of "Brake Schedules." It shows the difference, the P.M. brake which we had previously to L.N., the braking pressure was lower than the L.N. and it was lower because of a safety valve

in the brake cylinder which released the pressure after the heavy brake application was made so that the pressure gradually reduced. It was found desirable by the brake company, we as car builders have nothing to do with brakes except we put them on and follow along with all improvements we find desirable, it was desirable to maintain the higher emergency brake pressure to the end of the stop and for that reason the L.N. brake was designed. It gave the higher brake pressure and maintained it. It maintained it by short-circuiting the release valve on the emergency brake application.

Q. That L.N. brake made its appearance in cars that were built in 1906?

A. That made its appearance in cars built in 1906.

Q. What improvements, if any, were made in cars built in 1907?

A. In 1907 there weren't many changes. The reference here is first experimental car built was the first steel car [fol. 1401] constructed at Pullman car works. It was built for the Jamestown Exposition, that is the car described here. There was very little change in the other cars, that is, in the standard cars.

Q. Coming down to the block of 1910, 1911, 1912, 1913, and 1915, will you describe that?

A. That was the most revolutionary development in car construction. It changed entirely the practice of building cars. Previous to 1910, all cars built were of wood construction. In 1910, after the preliminary experience with one car built in 1907, the Pullman Company started to build steel cars and with the steel cars there were introduced several other improvements. There was a new coupler, a vapor heat in place of Safety Company heat. That former heat was hot water heated with steam, a water heater on each car, heated with steam.

Q. What was substituted for that?

A. Vapor Company, that is a system of heating cars which prevents pressure steam from entering the car. It is reduced to atmospheric pressure as it enters the car, as a safety measure to avoid scalding in cases of breakage in any of the steam lines. The car was of entirely new construction all the way through, including steel interior [fol. 1402] which had never up to that date been manufactured. That development was prompted primarily by the Pennsylvania Tunnel into New York, making it obliga-

tory to have fireproof cars to go through the tunnel, and so at that time the Pullman Company had to change their cabinet makers into workers in steel. The wood cabinet workers were the only ones who could make good steel interior finish. After the first steel car built there was another factor entering into the picture and that was the promulgation of the Railway Mail Service specification requirements for railway postal cars.

[fol. 1403] Mr. Booth: May I interrupt there just a moment. Those were mentioned in Mr. Leriche's testimony, and before we conclude our case we will furnish a copy here either as an exhibit or for identification, and either party can use such portions as they desire. I won't ask the witness to attempt to testify to what those specifications were, except in a most general way. We will undertake to furnish a copy of it.

The Witness: Previous to 1912, every car builder used his own notion as to what constituted a safe car. The Railway Mail Service, in preparing specifications for steel cars previously—they had nothing but wood cars—requested railroads and car builders to get together and work out a safe car for the protection of the train crew, and the result was the Railway Mail Service specification. That specification carried with it a minimum requirement of strength of underframe, strength of side frame, strength of roof, strength of ends. The first Pullman steel cars built in 1910 were not quite strong enough in the end to meet that end requirement, so later they were redesigned and reinforced at the end to meet the buffing requirements for end posts. The changes aside from that in that group [fol. 1404] from 1910 to 1915, is that P.C. brake was introduced. The P.C. brake was introduced practically exclusively for the New York Central operation. They were not entirely satisfied with the L.N., and the only deficiency they found in the L.N. was that an emergency brake application couldn't be made immediately after a service application. In other words, with the L.N. brake, when it was applied it depleted the supply of air in the reservoir, and if you should immediately afterwards want to make an emergency application, you couldn't do it. It was also more quick acting and the entire brake mechanism, the entire brake valve mechanism, was completely redesigned, but unfortunately the P.C. brake was rather

rushed through and is probably not as satisfactory as the former L.N. It was never universally used. We used it on all Pullman cars in service on the New York Central, but to the best of my knowledge no other road used the P.C. because it was in the development stages and the air brake company was forced to put something in the market, which later on developed into the U.C. The U.C. was not applied or brought out until 1916. It took a long time to develop that, but the U.C. brake was a perfected brake. The rest of the items in the group 1910 to 1915 says, "steel U-beam construction." That was a [fol. 1405] means of strengthening the end to meet the Mail Service requirements.

Q. Will you describe the improvements on cars in the next block?

A. The next block,—really the 1915 should come in the next block too—built-up structures, steel platforms, and bolsters. In 1915, under my direction, we redesigned the entire steel structure. We were not satisfied with the original development, and we redesigned not only the underframe, but the entire structure, and in place of the interlocking siding, steel siding, we had on the first cars, the cars were built to look as much like wood cars as possible, because they were operated with wood cars, and in order to make them look like wood cars we put in interlocking steel sheathing, which was just a nuisance because it rusted out too rapidly, and we eliminated that and put in instead a more substantial steel plate siding, and that was the radical departure in 1916, when we placed those cars in service. Also, we introduced in 1917, under my direction, clasp brakes and improvements in brakes.

Q. Will you describe the difference between the application and function of a clasp brake as distinguished from the brakes previously in use?

A. There is no difference in function nor in its applica- [fol. 1406] tion, it is just in the mechanical construction. The brake previously used consisted of only one brake shoe per wheel. The objection to that was that it put too great a lateral thrust on the wheel when the brake was applied, which was not entirely satisfactory for the proper alignment of the bearing. On clasp brakes there are two brake-shoes, one on each side, exerting opposite and equal force on the wheel so as to eliminate any dis-

tortion thrust on the bearings. But the primary purpose of applying clasp brakes was to have a larger amount of brake-shoe metal in case of long-continued brake application. There is more metal to absorb the work of braking and, therefore, the brake-shoe will not be heated to such an extent as it would be if half the material, half the amount of metal, had to absorb the heat of the retarding forces, so the two brake-shoes are really a safety measure in a way, and more so than a mechanical measure. You get more life out of the shoe by not heating it too much, because it doesn't last long when it is heated to the degree to which it would be heated with the heavy cars on a triple brake truck. So far as stopping a car is concerned, it has no particular effect because you can stop a car in just as short a distance with a triple brake as [fol. 1407] you can with the clasp brake.

Q. What about the improvements in 1920 and 1921 in this bottom block in the first column? Did you mention those?

A. They are important. In 1920, the coupler companies got together and decided that a larger coupler knuckle should be used, and a stronger coupler, and they put in the market what is known as a "D" coupler, and, as usual, when anything in the line of an improved device is available, we started to apply it immediately. In that connection also, we changed the draft gear. That in itself doesn't mean much, we changed that for economic reasons, although the new gear cost more than the old. The old draft gear which we had in service since 1906 was also a friction draft gear, but it was very difficult to maintain on account of its construction, wedge-shaped friction surfaces which were hard to match. The new draft gear applied in 1920 was of a flat plate type, which could easily be maintained in good condition, so that that was an improvement in 1920 and '21, quite an improvement, in draft attachment.

Q. I notice, by the way, in this first column that the length of the types of cars shown in that column increased [fol. 1408] from 78 feet 10 inches to 81 feet 11¼ inches, and the average weight of the car and trucks increased from about 120,000 pounds to 159,000 pounds. What was responsible for the principal part of the increase in weight?

A. Its constant addition to take care of safety, when you are applying heavier underframes, heavier draft sills,

heavier draft gears, heavier couplers, it all adds to the weight. The reason for increase in length is primarily the increasing service demand, the traffic people always figuring "Can't we get a little more salable space in a car." The increase in weight is entirely due to strengthening and improving the underframe.

Q. Turn to the second column, consider the second column beginning with the new features in the years 1923, 1927 and 1929, and describe those, please.

A. The new features in 1929 have no effect on the safety of operation; it is simply an increased length of the car.

Q. What about the one in 1923 and 1927?

A. In 1927 we changed the truck in order to get more working space for the clasp brake; with the double brake beams on the old trucks we didn't have enough working space. We tried a new draft gear because we wanted to [fol. 1409] avoid the sticking and the shock that is experienced in friction draft gear, so we applied Waugh draft gear, which is more of a friction plate type draft gear.

Q. I notice in 1927 you say "Two inch steam train line metal connections."

A. That is a very important feature. As the train operated and gradually increased in length, it became increasingly difficult to get steam through the train line because of the weakness of the steam hose connection between two cars, so we decided to put in metal steam connectors between the cars, which would permit you to carry the full boiler pressure through the train line, and in that way there is no difficulty in heating cars. That is a very decided improvement.

Q. As to 1933 and 1934, what have you to say as to the improvements in the device built during those years?

A. We entered a new picture, almost as revolutionary as the picture in 1910, when we changed from wood to steel. Now we are changing from ordinary conventional cars, which employed conventional steel, open-hearth steel, to high tensile steel, or alloy aluminum, and we are building no more heavy weight cars, no more old-style cars have been built since those years. Every car we build [fol. 1410] now is of so-called light-weight type and of alloy steel or alloy aluminum.

Q. According to this exhibit, the 1927 car weighed 170,000 pounds, and the 1933 car 149,700 pounds.

A. Yes, sir; that is entirely due to a change in material. While this work of car building was going on, the steel industry and the metal industry as a whole developed material which was not available in earlier years, and it was not until 1933 that all those new materials were available, so that we couldn't build the type of light weight car we build today prior to 1933, because there was no such material available. One reason also for the big increase in the weight of the older cars was the air-conditioning, which we started to apply in 1927. That added tremendously to the weight of the car. As a matter of fact, the 170,000 pounds may be a fair average for the cars, but we have cars which weigh much more than that, due to the heavy air-conditioning. Air-conditioning systems as applied to Pullman cars are of several types. We have one of our own, but certain roads have required different types, and for cars assigned to their service we may apply that. It may be steam air-conditioning system, [fol. 1411] or it may be electro-mechanical, mechanical or ice system, but that accounts for the high weight. The low weight in new cars is entirely due to using material which has superior strength value. All those light weight cars are designed to be more than equal in strength to the old heavy weight car, which is accomplished by the use of these light alloy metals I am speaking of.

Q. As to the cars shown in the bottom four blocks, second column, those are all light weight cars?

A. They are all light weight cars, and are of various types. The first block, articulated cars, represents a type which when we first started to build cars we thought would be desirable. We since abandoned that idea, and I question whether we ever will build any more articulated cars. The other type represents, one in 1937, that is a steel car built entirely of Cor-Ten steel. The second car is built to suit the requirements of certain roads which purchased Budd equipment and want to maintain the corrugated siding, and they are built of Cor-Ten steel with stainless steel corrugated sides.

Q. That is 1938?

A. 1938 car, the last car is typical of the cars we are [fol. 1412] building today, and the cars we are building today are far stronger than anything required by the Mail Service specifications, because the American Railway Association appointed a committee, of which I was a member,

to draft a specification for cars as an American Railway Association specification, to which all new cars should conform. That specification was issued in 1939, and all cars, passenger cars now and hereafter built will be built to that specification. The principal difference in that specification from the Mail Service is that it has much increased strength against telescoping.

[fol. 1413] Q. Since what time have all Pullman cars built by or for your company conformed to the railway mail specifications you mentioned?

A. The minute railway mail specification was issued and became official, we built cars to that specification, using that specification as the minimum requirement until the new specification, the A. A. R., in 1939 was issued.

The Court: Mr. Parke, what was the particular weakness of the articulated units shown here in 1936?

A. There was no weakness. The reason for going away from it is the interchange of cars. It is difficult to interchange; it is not desirable for that reason. With the individual car, you can shorten a train or lengthen it to your heart's content. You cannot do that with articlated units. That was the only reason. Otherwise, there is probably some advantage, but the advantage is not apparent; we came to the conclusion there is no advantage in it.

The Court: The disadvantages outweighed the advantages, in other words.

A. That is correct.

Mr. Booth: Referring to the brake schedules at the bottom of this exhibit, at what time, or approximately what [fol. 1414] time did you cease using P. M. on new cars?

A. When the L. N. brake was marketed in 1906.

Q. I believe you said you use the P. C. brake only on cars that the New York Central operated?

A. That is right.

Q. At what time did you, if you ever did, abandon the use of the L. N. type brake?

A. As soon as the U. C. brake was marketed. That was in 1916.

Q. And has the H. S. C. brake superseded the U. C., or do you still use the U. C. on some of your cars?

A. We are using the H. S. C. brake on all light-weight cars, but we are not using them as an electro-pneumatic

brake. I will explain that this way: The U. C. brake when first marketed was intended to be an electro-pneumatic brake; the difference with electro-pneumatic and straight pneumatic brake, it acts instantaneously on every car in the train, but the U. C. brake proved to be so effective and acts so quickly that the complication of electric control didn't seem to be advisable, and electric control was never applied to the U. C. brakes. It probably takes twelve to thirteen seconds for the brake to apply on the longest train, and [fol. 1415] that seemed to be so effective that the electric brake was not applied.

Q. You say "on the longest train." What number of cars do you refer to?

A. What I consider the longest train, what we know as the longest train, about 21 or 22 cars.

Q. Does this brake apply successively car by car, or instantaneously on all cars?

A. Theoretically, it must be applied successively, but the time lag is so little there is only twelve or thirteen seconds from the front to the rear car, it is close to instantaneously. It is applied by the release of the brake pressure, and each car releases the brake pressure locally. Now, the U. C., that is high-speed control brake we use, doesn't have electro-pneumatic operation. On all the light-weight cars we have built we haven't applied the electric feature, but the brake is arranged so that the electric feature can be applied any time it should be desired for very high-speed braking. We have some few cars on one line equipped with the electro-pneumatic feature, and we are building two more trains now which will have the electro-pneumatic feature. That brake is new and it is more or less in the development stage, but the idea is to use very high braking power percentages [fol. 1416] in these high speed trains. So long as you are operating trains at sixty miles per hour, the braking was not a difficult problem. When you begin operating cars one hundred miles per hour, the braking problem is quite different, and it is contemplated to apply to high speed trains that operate at one hundred miles at least two hundred and fifty per cent braking power. Then, in that connection, there will have to be an unloading of the braking power as the speed decreases, and complicated devices have been tried out to that end. We have cars which are controlled from the head end, but that is not satisfactory for the same

reason that articulation is not satisfactory. In the two trains that we are constructing for service in the City of Los Angeles and City of San Francisco, we will have independent retardation control on each car operated from the car axle so that the two hundred and fifty per cent braking power will be automatically unloaded as the train speed decreased.

Mr. Booth: May we suspend.

Mr. Strouss: I wondered, Mr. Booth, this exhibit is not in evidence.

The Court: No, it is not.

Mr. Booth: In intended to offer it in evidence. I may [fol. 1417] have some further questions on it. I ask that it be admitted.

Mr. Strouss: My only objection to this exhibit is that it is irrelevant and immaterial. I am not objecting on the ground that the records are not here.

The Court: The objection is overruled and the exhibit may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 107.")

The Court: We will take our recess until tomorrow morning at ten o'clock.

(Thereupon, the court stood at recess until December 12, 1940, at ten o'clock, A. M.)

[fol. 1418] December 12, 1940, ten o'clock A. M.

All parties being represented as heretofore noted, proceedings were resumed at this time as follows:

PETER PARKE was recalled to the stand and testified further as follows:

Direct Examination (Continued).

By Mr. Booth:

Q. Mr. Parke, in going over your exhibit 107, I neglected to ask you regarding the improvement in wheels. What was the type of wheel in use on Pullman cars as of January first, 1912?

A. The wheel used at that time was a steel-tired wheel, had a separate hub and two web plates connecting the hub to the tire. The improvement consisted in changing a forged type of solid steel wheel, for the reason that in the operation the steel-tired wheel at times developed fracture through the bolt holes connecting the tire to the web plates, and there was always a liability of a cracked tire. Another reason, frankly, was one of economy, but the primary reason was to get away from the split tire, the solid wheel having proved itself after a considerable test period to be much more reliable and safer to operate at [fol. 1419] the higher speeds.

Mr. Booth: Your Honor, we can dispose of some witnesses who are anxious to get away on the train, if I may be permitted to withdraw Mr. Parke temporarily.

The Court: Yes.

Mr. Strouss: There are two witnesses who may be released without calling them back, Mr. White and Mr. Gareiss.

The Court: The record may show that both Mr. White and Mr. Gareiss are released from further attendance upon the court, and permitted to take with them their records.

(The witness Peter Parke was temporarily withdrawn from the stand).

C. D. Peckenpaugh was recalled to the stand, and testified further as follows:

Cross-examination.

By Mr. Strouss:

Q. Mr. Peckenpaugh, yesterday, in testifying concerning your freight divisions, the points where you change freight crews, you stated those were spaced about every one hundred or one hundred fifty miles apart; is that correct?

[fol. 1420] A. That is approximately correct. I said we tried to space our terminals a minimum of 100 miles, but in some cases the area covered a distance of 150 miles.

Q. This 100-mile minimum day is a minimum and not a maximum?

A. Yes, sir, that is right.

Q. Your passenger-train exhibit, defendant's exhibit No. 101——

The Court: Before you go on with that, Mr. Strouss, let me see if I understand that last statement. Do I understand, if a train crew operates as far as a hundred miles a day, even though it might take them only a very few hours, and there is nothing else for them to do, you would have to pay them for a full day?

A. That is correct.

Mr. Strouss: What I asked was, whether that is a maximum.

The Court: You said a minimum.

Mr. Strouss: A minimum day, they are paid on a hundred mile-basis for a day.

A. Yes, they have a minimum day of one hundred miles, or eight hours. If they run 150 miles and run it in five hours, they are paid for 150 miles. If they run 100 miles [fol. 1421] in twelve hours they are paid for 100 miles and penalty overtime beyond eight hours. If a crew ran 100 miles and worked twelve hours, they would be paid for 100 miles and six hours overtime, which would be four hours at time and one half, which would be the equivalent of six hours overtime.

Q. The point I was trying to make was that the length of running your engines is not restricted by any maximum miles that a train crew will run?

A. Do you mean, Mr. Strouss, engines or crews?

Q. Crews. There isn't any maximum number of miles you might run a train crew except in so far as the hours is concerned under the Federal statutes?

A. Yes, there is.

The Court: You mean by contract with your employees?

A. That is right. There is a limit to the maximum. The train crews are restricted to operating between certain terminals over which they have seniority rights. In other words, you may not run a train crew through and beyond a terminal without the beginning of a new day and a new payment.

Q. Of course, that doesn't prohibit you from combining distance?

[fol. 1422] The Court: You mean by eliminating certain division points?

Mr. Strouss: Yes. That is, you have certain divisions or districts, where the trainmen have priority you might combine those to include in one the two districts; you would have to make a new agreement with the men with regard to seniority, or something of that sort?

A. Yes, that would be the influencing factor, the question of a new agreement. We may not run crews off their seniority district without the beginning of a new day or new payment.

Q. That is a matter of contract?

A. That is right.

Q. Of course, where there has been a consolidation, two divisions might be combined, then it is a matter of the working out of the seniority as between the rights on the two districts or divisions?

A. No, that is not correct. The consolidation of two divisions doesn't involve the rights or the seniority territory of the train service employee. We have consolidated a good many divisions in recent years in attempting to economize in our transportation costs, but in such consolidations each organization retains its seniority district, and the [fol. 1423] operation of trains under a consolidated division under one superintendent is identical with what it may have been under two superintendents.

Q. That is by reason of a new contract?

A. It is by reason of the existing contract. The consolidation of superintendents' divisions doesn't involve any change in labor contracts.

The Court: Mr. Peckenpaugh, is your freight division and your passenger division identical?

A. No, sir, not in all cases. In some cases, but not in all cases. For example, in my territory, on the Texas lines, we operate passenger cars between Dallas and Childers, Texas, a distance of 255 miles. Our freight crews run between Ft. Worth and Wichita Falls, 114 miles, Wichita Falls to Childers, 106 miles. Now, in the territory in the third and fourth districts, on the same Ft. Worth and Denver Railroad, the passenger crews run between Childers and Texline, Texas, a distance of 231 miles, while the freight crews run between Childers and Amarillo, 112

miles, and between Amarillo and Texline, 117 miles, so our freight divisions are regulated, as nearly as it is practicable, on the basis of a minimum of 100 miles. Our passenger [fol. 1424] runs often extend 200 or more miles.

The Court: Well, now, the passenger run of 200 miles, we will say, if operating conditions were normal you wouldn't be paying more than an eight hour day's work on that run?

A. A passenger day is predicated on a minimum of 150 miles instead of the freight day of 100 miles. Necessarily, we attempt to regulate our passenger mileage district 150 or more miles to avoid bonus payment, and also to avoid changing conductors too often and picking up and handling transportation too often.

The Court: Go ahead.

[fol. 1425] Mr. Strouss: Coming to exhibit No. 101, what are the head-end cars on the trains shown?

A. The Denver Zephyr handles three head-end cars. Similarly No. 1 westbound handles identical equipment, that is a streamlined articulated train. No. 40 eastbound, train No. 39 westbound have two to four head-end cars. No. 2 from Denver which consolidates at Omaha with No. 8 and runs east of Omaha as No. 8 has three to five head-end cars eastbound, including dead-head return requipment and No. 8 from Omaha will have as many as seven or eight head-end cars, being the fast mail train eastbound picking up mail from the Union Pacific connection at the U. P. transfer which is the mail interchange point between the east and west lines located between Council Bluffs and Omaha. No. 44 and No. 50 from the northwest coast through St. Paul carry three head-end cars. No. 49 and 51 westbound carry similar equipment. No. 3, the Overland Limited from Omaha to Denver carries three to five head-end cars. No. 7, the Fast Mail, Chicago to Omaha is an exclusive mail express train and carries only a rider car. By that I mean one coach on the rear for the trainmen to use, no other passenger equipment. No. 5, Chicago to Omaha, companion train to No. 12 carries from Chicago five head-end cars [fol. 1426] of which two set out at Galesburg for Kansas City and St. Joseph.

The Court: Any further re-direct?
Mr. Mason: Have you finished?
Mr. Strouss: Yes.

Re-direct examination.

By Mr. Mason:

Q. What is the meaning of a seniority district?

A. That part or subdivision of a railroad on which train and engine service employees have right to work under their contracts.

Q. I suppose there are seniority districts for clerks and maintenance-of-way employees and so forth as well?

A. That is right.

Q. Particularly to train and engine service employees, the seniority district then defines the extent of territory in which they have the prior right to be and remain in the service?

A. That is correct. I would add this: on certain divisions train and engine service employees may have division rights. On other divisions they may have separated rights. In other words, you may have two seniority districts on one division.

[fol. 1427] Q. A division is a creation of the railroad companies for purposes of its operation and is not necessarily the same as the seniority district?

A. That is exactly correct.

Q. Is it possible for a seniority district to lap over from one operating division to another of the railroad company?

A. It is possible under agreement.

Q. If seniority districts are to be changed with the change of the extent of operating divisions, how can that be accomplished?

A. Only by negotiation and agreement.

Q. Is it necessarily the fact that seniority districts for conductors and brakemen, for example, are the same as those for engineers and firemen?

A. That does not follow.

Q. In your experience are they ever different?

A. They are.

Q. Is it possible to run a train service employee beyond the extent of his seniority district other than by agreement?

A. Yes, it may be done in emergency but you accept the penalty for doing so.

Q. What is that penalty?

A. A new day and a runaround for the crew that was entitled to the trip.

[fol. 1428] Q. By "runaround" you mean a payment of some kind?

A. That is right.

Q. What is that payment?

A. It varies. In some cases it is a minimum of 2½ hours, in other cases it is 5 hours, and in other cases it is a complete day.

Q. To whom is the runaround paid in the case of a man running to a point beyond his seniority district?

A. To the man who stood first out or would be entitled to the trip if you had had time to call him and make him available.

Q. Would that be somebody on the seniority district which was invaded, so to speak?

A. That is right.

Q. You spoke of a minimum day in freight service as being 100 miles or 8 hours. Suppose you have a run of 114 miles as you have stated and a through freight train crew makes the run from terminal to terminal in 5 hours, is that possible?

A. Very much so.

Q. What would be the amount of the payment expressed in hours or miles to that train crew?

A. It would be paid 114 miles.

Q. Would that be 9 hours and a fraction?

[fol. 1429] A. Our accounting would not be on that basis. He would be paid straight mileage without overtime, 114 miles.

Q. At the rate of 12½ miles per hour?

A. That is right.

Q. Suppose in making that 114 miles the train crew takes 12 hours, would there be any overtime payment involved?

A. Yes, he would be paid 114 miles. Let me make a mental calculation, 114 miles on the basis of 12½ miles an hour is approximately 9 hours. It is a mile and a half off 9 hours. He would be paid 114 miles and 3 hours overtime at time and one-half or at three-sixteenths of the hourly rate, an equivalent of 4½ hours overtime.

Q. That would be in addition to the straight time payment of 9 hours and a small fraction?

A. It would be in addition to his straight time payment of 114 miles.

Q. The minimum day in passenger service I think you said is 150 miles?

A. Yes.

Q. Or 8 hours?

A. No, on the basis of 20 miles an hour.

Q. 7½ hours?

A. That is right.

[fol. 1430] Q. You are speaking now of the Burlington contract?

A. I think that is standard with most of the Class I railroads.

Mr. Strouss: Now, what he thinks and what he knows is different.

The Witness: We have standard contracts, I will confine it, however, to the Burlington.

Mr. Mason:

Q. You have participated and negotiated in concerted negotiations, haven't you?

A. Many times.

Q. And become familiar with the contracts of other railroads?

A. That is right.

Q. What you have stated as to the Burlington contracts is true as a matter of general principle with the other contracts with which you are familiar?

Mr. Strouss: I will object to that.

The Court: Yes, I will sustain the objection to that.

Mr. Mason: I think the witness by his experience and negotiations is competent to state from his general knowledge.

The Court: No, I will sustain the objection.

Mr. Mason: I take it the objection is only to the last [fol. 1431] question?

Mr. Strouss: I am objecting to any testimony concerning agreements with any other roads than the Burlington.

Mr. Mason: The subject was introduced by counsel himself on cross-examination.

The Court: There is nothing before the court, gentlemen, proceed.

Mr. Mason: That is all.

The Court: May this witness be excused with his records?

Mr. Strouss: Yes, Your Honor.

The Court: It is so ordered.

(Witness excused.)

PETER PARKE resumed the witness stand for further direct examination:

Mr. Booth:

Q. Mr. Parke, are there any other important changes in the construction of Pullman equipment since 1912 that you have not dealt with in your testimony, and if so will you please state them briefly.

A. I cannot for the moment think of any changes of importance.

Q. You stated yesterday that the first major change was [fol. 1432] the change of the standard of construction from wood to steel. That occurred about 1912?

A. 1910, an experimental steel car was built in 1907 but the actual construction of steel cars began in 1910 and 1909 extending through those years. The cars were produced in 1910.

Q. The steel car itself has been, according to this exhibit, strengthened in construction and otherwise improved since that time, is that correct?

A. It has.

Q. What was the object of those strengthenings and improvements?

A. To meet the minimum strength requirements particularly of the end construction as covered by the Railway Mail Service Specifications which were issued in 1912.

Q. You are familiar in a general way at least with the acts of Congress relating to safety appliances and equipment on railroad cars for the protection of employees and travelers which are administered by the Interstate Commerce Commission?

A. I am.

Mr. Booth: For the record I put in the reference, they are obtained in Title 45, United States Code, Chapter 1.

[fol. 1433] Q. Has the Interstate Commerce Commission made regualtions pursuant to the authority and direction of these statutes which are applicable to car construction?

A. In 1913 the Commission gave a time limit for incorporating in existing equipment all safety appliances prescribed by that act and it is obligatory for railroad operating cars in interstate traffic to comply with the requirements of that act.

Q. In the construction and repair and rebuilding of the Pullman cars has that company followed the requirements made either by or under the authority of those safety appliance acts?

A. By necessity or we would not be in position to operate the cars in interstate commerce.

Q. You have so?

A. Yes, sir.

The Court: What was that time limit?

A. It varied for different applications. It was several years—I think I have a copy of the act here.

Mr. Booth: Will you let me have your file?

A. It gives the different time limits for doing certain things.

Mr. Strouss: There were different limits for different [fol. 1434] types of appliances, were there not?

A. Yes, sir, that is what I meant: Obviously they couldn't be done instantaneously.

Mr. Booth: The witness produces an order of the Interstate Commerce Commission with the facsimile signature of Edward A. Moseley, secretary, dated March 13, 1911, in the matter of the extension of the period within which common carriers shall comply with the requirements of the act, approved April 14, 1910, as amended by the act approved March 4, 1911. We will furnish a copy of this order later and it contains the various lengths of extensions of time, the maximum of which is five years from July 1, 1911, with some minor exceptions.

Mr. Strouss: I might say I will have no objection to your putting into the record that information if you want it.

Mr. Mason: The court is entitled by decision to take judicial notice of these matters.

Mr. Strouss: I have no objection to that.

Mr. Booth: We call attention for the purpose of the record to the order of the Interstate Commerce Commission, General Order, dated March 13, 1911, which designates the number, dimensions, location, and manner of applica-
[fol. 1435] tion of certain safety appliances with certain diagrams indicating those safety appliances.

Q. Referring in particular to the order I have just mentioned as containing the diagrams, has your company followed the provisions of that order?

A. We have.

Q. Has the Pullman Company itself made improvements in the specifications and design and strengthening of its cars since 1912 irrespective of the Railway Mail Specifications and the orders of the Interstate Commerce Commission act?

A. We have. We have more than exceeded the minimum strength requirements.

Q. What was the primary purpose and the effect of these improvements since 1912 that you have described?

A. The primary purpose was to permit operation with safety and comfort to passengers of longer trains at higher speed.

Q. Has that purpose been accomplished?

Mr. Strouss: I object to that; that is a conclusion, what has been accomplished.

The Court: Yes, objection sustained.

Mr. Booth:

Q. Since that time have longer trains of higher speed consisting in whole or in part of Pullman equipment been
[fol. 1436] operated generally on the railroads of the United States?

A. A very decidedly longer train and at very much higher speed.

The Court: Before counsel go into the next phase of this matter, there are one or two questions the court would like to ask. What is the relationship between the Pullman Company and the operating railroads?

A. I am not of course properly qualified to give anything but my general impression. I have nothing to do with that transaction.

The Court: You have nothing to do with the operations?

A. None whatever, purely mechanical.

Mr. Booth: The Pullman Company you do know has a contract with each railroad individually?

A. I do know that.

Q. For the furnishing of Pullman cars?

A. I know that definitely that they have these contracts. I have seen them, read them, and handled them after they have been executed however.

The Court: Do I understand that the Pullman Company as such actually owns all of the so-called "Pullman" cars in operation?

A. That is correct.

The Court: Irrespective of what line it is operated [fol. 1437] over?

A. That is correct.

Mr. Booth: You do not operate them in the sense of hauling them over the road?

A. We do not.

Q. You service them by furnishing porters and terminal cleaning and so on?

A. We service them completely and in some instances like running gears or items affecting operation the railroads will perform the work for us and bill us for the expense. All interior work is handled by Pullman Company employees.

The Court: Another thing, Mr. Parke, maybe you are able to answer the question, I notice from the exhibit No. 107 that you show various types of cars going back to the year 1900. How old a car as shown on this exhibit is still in operation?

A. Today not a single wood car is in operation in any railroad in the United States.

The Court: That would mean then that the steel cars were first constructed in 1910, that the oldest car that would be in operation would be a car that had been constructed in the year 1910?

A. That is correct.

Mr. Booth: I have somewhat elaborate statistics on that subject.

[fol. 1438] The Court: I see. I think that is all, go ahead.

Mr. Booth: Neither the Pullman Company nor the Pullman Manufacturing Company nor the parent or holding company operates any railroad, does it?

A. They do not.

Q. Do any of them furnish locomotives or other power for the operation of the Pullman cars?

A. They do not, no power of any kind.

Q. Does your office have anything to do with the design of locomotives or locomotive brakes?

A. We do not.

Q. Does your office have anything to do with the design of freight cars or freight car brakes or any appurtenances of a freight car?

A. Since the separation of the company, no; previous to that as car builders we simply applied what the railroad company required in freight cars.

Q. That is, the railroad furnishes the specifications and you build the car?

A. That is right. The Pullman Company has never had anything to do with the operation of freight cars, I mean to say, directly. We may have owned freight cars and financed them and the railroads have been paying for them.

[fol. 1439] The Court: Well, does your company construct a particular type of car for any given railroad, or is it standard equipment throughout?

A. Our company doesn't construct cars of any kind; we are in the same position as the railroad, not exactly in the same position, but we are buying all our new cars from the Standard Car Manufacturing Company. The Standard Car Manufacturing Company is simply a car-building concern, a contractor for cars. They will build cars for anybody to anybody's specifications.

The Court: You mean cars other than Pullman cars?

A. Yes, other than Pullman cars. They are contractors building cars for any railroad in the country on a competitive basis with other manufacturers.

Mr. Strouss: Do you mind if I ask a question?

The Court: Go ahead.

Mr. Strouss: Along in line with the Court's question, do different companies over lines you operate cars, do you have different types of cars for different systems?

A. We do. As a general proposition we operate Pullman standard cars, but have special cars; if a railroad desires to operate special types of cars over their line, [fol. 1440] they will have to make necessary financial arrangements with the company. It is a matter of contract for those special cars, and we are glad to furnish anything that our customers, the railroads, desire, and we have provided many special cars for the different lines.

Q. I was thinking of your testimony yesterday, with respect to the Pennsylvania requiring the— what was it, the P. E. brake?

A. No, the New York Central required the P. C. brake. We will do that any time. If railroad systems like the Pennsylvania and the New York Central which have a certain number of cars allocated as regular cars, they will call for extra cars; as traffic demands it, we supply them.

The Court: Then, these special cars that you might construct for the New York Central, their operation would be limited to the New York Central lines?

A. That is theoretically true; it doesn't practically work out that way. They might change their minds and say, "Take these cars off our hands, and give us something else," and we have to do it.

Q. But the ownership of those cars, if specially made [fol. 1441] is still in the Pullman Company, it is a Pullman Company car?

A. Yes.

Mr. Booth: Do these cars, so far as the structural strength is concerned, and the type of brakes that are used, their ends and ability to withstand strains, differ in any respect from your standard Pullman equipment?

A. They contain certain requirements for certain roads. They may want to have cars with stainless steel sides, we will provide that car. Certain railroads want the special brake like the electro-pneumatic; we will provide that brake. Other roads may want to have certain specialties in the form of special trucks, and we will provide special trucks, sometimes against our will. We are always in the position that we must bow to our customers.

Q. Some of them want special paint jobs?

A. Special paint job and special interior finish, particularly on the interior finish.

Q. No matter how the car is dolled up, it is still a standard Pullman car?

A. Still a standard Pullman car.

Q. Now, has the Manufacturing Company, at the present time, and has it since its creation as a separate unit, built [fol. 1442] freight and passenger cars, passenger coaches, and lounge cars, dining cars, even street cars, for other railroad companies and street railway companies?

A. I can't say as to street cars, but the other types of cars they have built of all kinds, I know of my own knowledge. As to the street cars, I don't know. The Manufacturing Company controls quite a number of plants, such as the Worcester plant in Massachusetts, and several other plants, and I am not in contact with the Manufacturing Company outside of what I see almost daily at the Pullman plant.

Q. Leaving out the street cars, is the Pullman Manufacturing Company in competition with other car building companies in the United States for supplying railroad companies with coaches, lounge cars, dining cars, club cars; in short, any type of freight or passenger car that they desire?

A. Yes, sir.

The Court: Is there such competition in the Pullman car field?

A. No, sir.

Q. You have the exclusive rights on that?

A. The Pullman cars, by agreement, probably "agree- [fol. 1443] ment" is not the right word to use, but the Pullman Company is under the control of the Interstate Commerce Commission in its methods of accounting, and subject to all the acts and rulings of the Interstate Commerce Commission. I am now speaking on a subject which I haven't handled, and I only know from general knowledge; and in this investigation, the question of its relation to the Manufacturing Company was thoroughly investigated and the Commission tacitly approved an arrangement of cost and a percentage of costs, which the Manufacturing Company showed was less than the average profit derived from contract cars, and on that basis the cost and percentage arrangement between the Pullman Company and the Manufacturing Company was tacitly approved by the Commission.

Mr. Mason: I think what His Honor had in mind, in so far as the business of providing sleeping cars in the United States is concerned, the Pullman Company has a virtual monopoly of the business.

A. Not at all. There isn't any reason in the world why anybody shouldn't build sleeping cars if they could do it more economically.

Q. I mean, the provision of sleeping cars for the railroads, as a practical matter, there are no other companies [fol. 1444] providing sleeping cars?

A. There are no other, but there is no reason why there shouldn't be if they could do it as economically.

Q. As a matter of fact, there is some competition in the field of providing sleeping cars in this issue, that the Canadian companies do provide some of their sleeping cars?

A. Yes, they have their own sleeping cars.

Q. Although you provide Pullman's for them?

A. I wouldn't say we provide Pullman cars for the Canadian roads; we provide Pullman cars in through service cars, running from Canada into the United States. We are usually providing half and half, Pullman cars on one line and Canadian Pullman cars on the other line. We don't operate in Canada.

Q. There is at least one railroad in the United States, and perhaps more, which provides its own sleeping cars, in part at least, in spite of the Pullman Company's willingness to do so?

A. I think you have reference to the Milwaukee, but the Milwaukee recently found it to their advantage to contract with the Pullman Company for new cars. I know of no [fol. 1445] other road that does it.

The Court: Is there a distinction between "sleeping car" and "Pullman car," or are they synonymous?

A. They are synonymous.

Mr. Booth: The Pullman Company, however, has cars such as club cars?

A. Yes, I was going to add that a Pullman car is essentially a sleeping car, but Pullman Company owns other

cars. When we speak about Pullman cars, we usually mean sleeping cars, but we have parlor cars, lounge cars, and club cars.

Mr. Booth: The clerk has been handed a sheet, consisting of one page, which we ask to have marked "Defendant's Exhibit 108" for identification.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 108 for identification.

Mr. Booth: The title is, "The Pullman Company, Number of Pullman Cars on Hand December 31st." Have you a copy of that before you, Mr. Parke?

A. I have.

Q. Is there a correction you desire to make opposite the year 1929?

[fol. 1446] A. There is. In rechecking after preparing that statement we found that in 1929 there was an error in the number of steel cars for that year. Instead of 294 it should be 394. In other respects the figures are correct.

Mr. Booth: May we have the figures 294 in column D, and also in column E, corrected to read 394?

The Court: It may be corrected.

Mr. Booth: With that correction, Mr. Parke, is this statement taken from the records of your company?

A. This statement is taken from the records of the engineer of valuation and we had it rechecked very carefully.

Q. He is the engineer of valuation in charge of the valuations made under the valuation sections of the Interstate Commerce Act?

A. That is correct.

Q. And he maintains a constant and current record of cars owned and on hand?

A. That is correct.

Q. What is meant by the expression "on hand" in the title as quoted?

A. That means the cars that we had at the end of that year.

[fol. 1447] Q. Serviceable?

A. Serviceable cars, yes, sir.

Q. Do you retire cars from time to time?

A. We do.

Q. Those cars would not be classified as serviceable from the time that the company in some formal way marked them for retirement?

A. They would in this respect, that they wouldn't show up on this statement until they had actually been retired on the books. It might be possible that in cars on hand it may include a number of cars which are scheduled for retirement, which have been set aside but haven't as yet been retired on the books.

Q. I notice in this statement, answering his Honor's question a few moments ago, that the first steel car you added to your equipment was in 1907?

A. Yes, sir.

Q. And that the next steel cars were constructed in 1909, and only five of them were added during that year; is that correct?

A. That will be correct. My impression previously was that the first cars were turned out in 1910, but they started to build them in 1909, and this statement is unquestionably [fol. 1448] correct that five of them were turned out before the end of the year.

Q. You added in 1910, 519 steel cars, is that correct?

A. Yes, sir, that is correct.

Q. The same during the following year?

A. That is correct.

Q. And then the succession of additions of steel cars, as shown in column D of the exhibit; is that correct?

A. That is correct.

Q. In 1912, the last wood car was added to the supply of the Pullman Company, is that correct, of which there were only twelve added in that year?

A. That is correct, but I cannot tell from my knowledge at the moment just what they were. There was something special about building those cars.

Q. They weren't built for regular service?

A. No; there was something special about them, and I can't recall just what it was. The 54 cars, wood cars, shown added in 1910, were cars that were under construction, and a lot had to be completed and they were completed in 1910 with the steel cars, but after 1910 we didn't build [fol. 1449] any wood cars, and this record shows there were twelve cars built.

Q. Turning to column F, which shows the number of wooden cars rebuilt during the years—no, we will confine

it from 1912 to 1916, leaving out the years prior to 1912. In what particulars were those cars rebuilt? How were they rebuilt, and what was done with them?

A. They were rebuilt. The principal improvement added was steel underframe, and steel draft gear.

Q. Will you explain to the Court for the benefit of the record what is a draft gear and what is its function?

A. The function of a draft gear is to provide slack connection between cars and also a cushioning means to absorb any shock which may be incident in the operation to the slack existing between two cars, to absorb and dissipate the shock.

Q. What was the type of draft gear in use in 1912?

A. In 1912 it was a Westinghouse D-3 friction draft gear. That was a good draft gear, but there was no continuous steel attachment from one end of the car to the other. The draft gear in cars previous to this, the rein-
[fol. 1450] forcements were simply applied to steel members extending from the end of the car to the bolsters supporting the body. To strengthen the cars in later years, after we started to build steel cars, a continuous steel member, draft sill, known as steel center sills, were provided for the cars.

Q. What is the type of draft gear at present in use?

A. When we speak of the present, we are dealing with light weight cars.

Q. I mean of the standard weight cars.

A. Also a type of friction draft gear. We have very few if any, of the D-3 draft gear in service. There may be a few. Practically all of the draft gears of the latest Westinghouse type are plate type.

The Court: Do you now have in service any wood cars or wood underframe?

A. We haven't a wood car in service. At the end of 1939 we had on our books, eight wood cars that operated in Mexico. Today two of them have been retired, three of them are operating in Mexico, and three of them have been stored in the shops, taken out of service, taken off the books, so we haven't today a single wood car in operation in the United States.

[fol. 1451] Mr. Booth: What is meant by the expression "purchased" in column 1?

A. The purchase of cars that are taken over from railroads when sleeping car lines or tourist car lines have been absorbed. The railroads, like the Great Northern, wanted us to take over their tourist car service, they have some tourist cars they don't want to maintain. An arrangement was made to take over those cars, scrap them or put them in use.

Q. What was this 257 cars purchased in 1912, 1913, I believe it is?

A. I don't know. I couldn't say. I wasn't with the company in 1913.

The Court: I notice you haven't purchased any, according to this exhibit, since 1925.

A. That is correct. 1925, that was the Central of Georgia Lines, that was the last line operating their own Pullmans. They found it wasn't economical to do so, and they wanted Pullman service.

The Court: We will take our morning recess.

(Thereupon, a short recess was taken, after which the witness, Peter Parke, was recalled to the stand and proceedings were resumed as follows:)

The Court: You may proceed.

[fol. 1452] Mr. Booth: If Your Honor please, I offer in evidence the statement to which the witness is testifying as Exhibit 108.

Mr. Strouss: I object to this exhibit only on the ground that it is irrelevant and immaterial, not on the ground that the records are not produced.

The Court: The objection is overruled. The exhibit may be received in evidence.

(The document referred to was received in evidence, and marked "Defendant's Exhibit No. 108.")

Mr. Booth: The next exhibit has been handed to the clerk and we ask that it be marked "Defendant's Exhibit No. 109 for identification."

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 109 for identification.

Mr. Booth: Mr. Parke, has there been prepared at your direction, and from the same valuation records of the

company, a statement similar to defendant's exhibit 108, but showing the cars on hand as of December 31st of each year of the three classifications of wood, steel, and light weight?

A. Such a statement has been prepared at my direction.

[fol. 1453] Q. Is it correct to the best of your knowledge and belief?

A. It is.

Q. Referring to this statement, the first column shows the years, does it not?

A. Yes, sir.

Q. And the second the total number of cars on hand?

A. That is correct.

Q. And the third, the number of wood cars?

A. Correct.

Q. The fourth, the number of steel cars?

A. Correct.

Q. And the fifth and last column, the number of light weight cars?

A. Yes.

The Court: What do you mean by that last?

A. The new type of light cars, built of light steel or alloy aluminum.

Q. The type referred to by you in your testimony yesterday?

A. Yes, sir.

Mr. Booth: The cars in the four bottom blocks shown in exhibit 107?

A. That is right. That is the only type of cars that are [fol. 1454] being constructed today. We have entirely abandoned the old construction, and have gone to the alloy steel construction.

The Court: What you formerly termed your steel cars will ultimately become obsolete?

A. Obsolete on account of the weight.

Q. You have struck off as much as 50,000 pounds on a single car?

A. Yes, sir.

Mr. Booth: There is no structural defect in the steel cars, you simply desire to lighten the weight of the car?

A. Yes.

Q. And permit the running of the so-called streamlined trains?

A. Permitting the running of long trains. Heavy cars are a detriment with not enough motive power to handle as long a train as desired. Adding light weight cars, that would permit the operation of long trains, and that is the only reason. It is a very great increase in expense to build these cars, but railroads demand it.

Q. On the matter of expense, there is no expense figures in No. 107. Roughly, what is the difference in expense of constructing the standard Pullman car of the type shown [fol. 1455] in the 1929 block and the standard Pullman car of the type shown in the 1939 block?

A. A conventional Pullman car today could be built for approximately, I would say, $35,000. We have no up to date figure, of course, because no such cars are being built, but that would be my judgment, $35,000. The light weight cars cost approximately $80,000.

Mr. Strouss: Both on today's costs?

A. On today's costs, yes, sir.

The Court: You anticipate you will ultimately be able to substantially reduce the cost of the 1939 cars?

A. We do. The cost varies, depending on the number of cars you build at one time. If you place an order for a large number of cars, you may cut the cost materially, maybe ten or fifteen thousand dollars a car. If you place an order for one car, or place an order for ten cars, it makes a big difference in the manufacturing costs.

Mr. Booth: It makes a large difference in the designing cost?

A. It is in the designing cost. That is the big engineering item to build one of these new types of car. In addition, there are patterns templates, formers, dies, and of course, [fol. 1456] you have to prorate it over the number of cars in a lot. The big expense, naturally, is the engineering expense.

Q. So the net result of this statement, No. 109 for identification, is that the Pullman Company has on hand as of December 31, 1939, only eight wooden cars, the location and the use of which you stated a while ago.

A. That is correct.

Q. That it has 6756 all steel cars of the conventional Pullman type?

A. Correct.

Q. And 288 light weight cars of one of the types shown in the five blocks on the second column of exhibit 107?

A. Correct.

[fol. 1457] The Court: Mr. Parke, what accounts for the very substantial difference in the number of steel cars on hand in 1938 and 1939, some 600 steel cars?

A. The difference is altogether on account of retirements on account of age, age and obsolescence. Obsolescence is frequently a cause of retiring cars.

Mr. Booth: We offer the statement in evidence as defendant's exhibit No. 109.

Mr. Strouss: That is objected to only on the ground it is irrelevant and immaterial.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 109."),

Mr. Booth: Statement 108 referring to rebuilt cars, is that an engineering term or an accounting term as used in that statement?

A "Rebuilt" is really an accounting term. When in remodeling cars or improving old cars there is spent a considerable amount of money in excess of a certain fixed amount they call it a "rebuilt" car. Rebuilding a car sometimes consists of placing rooms in a car which was originally built as a section car and spending a great deal of money on that car to doll it up and also putting in some improvements if the [fol. 1458] car is not provided with the latest, and, if that cost, we will say 50 per cent of the cost new, the accounting department sets it up as a rebuilt car, or at least they did that in certain periods. What is termed a "rebuilt" car has varied from time to time and I am not sure today but what the Interstate Commerce Commission has in their accounting method changed it from time to time. We cannot set up a car new, when we deal with a rebuilt car, it is set up on our books at an increased value. If we spend a certain amount of money for improvement costs, it is simply a maintenance cost. The Interstate Commerce Commission prescribes exactly what we have to do. We have to convince them that we have made enough changes in the car to set it up at an increased value on our books.

Q. In other words, if it is charged as maintenance expense it would be charged as operation?

A. That is right.

Q. Otherwise it would be charged to capital investment?

A. That is right.

Q. Mention has been made in the testimony regarding passenger train operation of the so-called "Pullman tourist [fol. 1459] car." You are familiar with those, are you not?

A. I am.

Q. From the standpoint of structural strength and all of the other impovements in the structure and body of the car you have mentioned, are the steel cars of the tourist type any different from the steel cars of the conventional or standard type?

A. They are not. From the standpoint of strength there is no difference, they have the same strength requirement.

Mr. Booth: You may cross-examine.

Cross-examination.

By Mr. Strouss:

Q. I had intended to ask you about these tourist cars. You do operate the tourist Pullmans as well as the standard Pullmans?

A. Yes, sir.

Q. Those are your older type Pullman cars?

A. At one time we built tourist cars as tourist cars and the only difference between them and the standard sleepers was in the interior finish, it was simplified, not quite as expensive. Now we take our older Pullmans and instead of spending a great deal of money on them to maintain [fol. 1460] them in standard service, if there is a demand for tourist cars we leave them the way they are without such improvement. By improvement I mean this, the carpet may be of an old pattern, the upholstery may be of an old pattern. If we continue them in standard service we may have to doll them up, change that. If we turn them into tourist service we leave them the way they are, until actual replacement is needed due to wear. Also in older steel cars built we had old light fixtures not nearly as

attractive. If we had to maintain the cars in standard service we would change out the light fixtures but if we are turning them into tourist cars we leave them the way they are. There is really very little difference today between the tourist car and the standard sleeper except they are not dolled up so much.

Q. What about air conditioning, has that been put in all tourist cars?

A. That is a thing that is being done now, tourist cars are being air conditioned. We first didn't intend to do that, we intended to make that one of the great distinctions between the tourist car and the standard sleeper, but the railroad companies insisted that they wanted that and there was nothing to do but apply air conditioning in [fol. 1461] tourist cars.

The Court: Approximately what would that cost per car?

A. About eight or nine thousand dollars a car.

Mr. Strong:

Q. Is that dry air conditioning?

A. What do you mean?

Q. It is over refrigeration?

A. No, we have our standard air conditioning system which is a regular compressor system, regular mechanical refrigeration using Freon gas. We have, however, ice refrigeration in many lines on short runs. Ice refrigeration seems to work all right. We provide whatever refrigeration system is best suited but our standard system is a mechanical refrigeration system.

Q. That classification, "rebuilt" as I take it from your testimony is a classification fixed by the Interstate Commerce Commission?

A. Yes, as I stated a moment ago at one period our own accounting department set up a rule that if we spent over 50 per cent of the original cost of cars in making repairs and revamping the cars the expense would be capitalized and the car set up at a new value. The Commission, however, and I am only stating now from general knowledge, had some objection to that and there are some other rules [fol. 1462] now and whatever we set up now is entirely under the control of the Interstate Commerce Commission

accounting department. I know there were some changes that they didn't approve of our method.

Q. The total cars are shown on exhibit No. 109 in the year 1939?

A. Yes, sir, that was the number of cars on our books in 1939.

Q. How many cars do you have actually in service now, do you know?

A. It is variable, of course, it runs about six thousand cars.

Q. Of course these cars include cars now that were built from 1910 on?

A. No, many of the 1910 cars have been retired. We show on a previous exhibit which cars were built each year and as I pointed out there is a reduction in the number of steel cars.

Q. Perhaps all of those of 1910 have now been retired?

A. Perhaps, I can't tell, it all depends on the service.

Q. But this total would include cars over the different years back to a period before 1920 at least?

A. I am not sure about 1920. That would be nearly [fol. 1463] twenty years and we may have cars retired before twenty years. It all depends on the service they are subjected to. Some of the cars may be used in stand-by service and not much used.

Q. Would you say that cars as old as twenty years would still be included in these in service?

A. Yes, very definitely because the Commission has established the life of the car and as I recall it it is twenty-seven some odd years on which they base the rate of depreciation.

Mr. Strouss: I think that is all.

Re direct examination.

By Mr. Booth:

Mr. Booth: We would like permission on this exhibit No. 109 to substitute the planograph copy for the one filed with the clerk.

The Court: It may be substituted.

Mr. Booth: One other question. Regarding the lighting of these cars, these standard or conventional tourist cars, lounge cars, club cars, and auxiliary cars operated by the

Pullman Company. How are those lighted at the present time?

A. At the present time all our cars are independently lighted by a generator on each car. The generator is driven [fol. 1464] either through mechanical drive or through belts with the pulley on the car axle so that the current will be furnished when the train is in operation. In addition each car is provided with storage batteries which will light the car when the train is standing still.

Mr. Strouss: You don't operate diners, do you, Mr. Parke?

A. We do not.

Mr. Booth:

Q. You operate meal service in some of your club cars?

A. We do, we operate club cars and lounge cars where our commissary department furnishes meal and refreshments.

Q. You say that the electric lighting is uniform now on all of your cars which are on hand and in serviceable condition?

A. That is correct.

Q. Formerly they were lighted by gas, were they not?

A. Yes.

Q. When was that discontinued?

A. It is shown on this exhibit here. They were lighted with Pintsch gas in the early days; that is, within this period of 1900, lighted with Pintsch gas. In 1906 there was applied to certain lines eastern and western main lines a head-[fol. 1465] end system of electric lighting. The railroad provided a generator in the baggage car ahead and lighted the individual cars from the head-end. In that connection, however, we still maintained the Pintsch gas on the cars because in the early days of electricity there was frequent failure of car lighting and we always had to have a standby to help out. Then in 1910 we started to put in the present modern system of a generator on each car driven from the car axle and storage batteries and at that time the electric light had been—in 1907 we had the combination of that also, but in 1910 that was done away with and from that on in, that is when we started to build—[illegible] cars, we eliminated Pintsch gas altogether and had reliable operation of the generator.

Mr. Strouss: What is Pintsch gas?

A. It is simply a trade name, it is an oil gas compressed under very heavy pressure and maintained in tanks.

Mr. Booth: No further questions.

The Court: The witness may then be excused and the court desires to state that this testimony has been very interesting and very enlightening and I compliment the witness on the clear manner in which it has been presented. [fol. 1466] You may be excused.

(Witness excused.)

J. B. Baker, was called as a witness in behalf of the defendant and being first duly sworn, testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you state your name and field headquarters to the reporter?

A. J. B. Baker, San Francisco, California.

Q. By what company are you employed, Mr. Baker?

A. I am valuation officer of the Southern Pacific Company.

Q. How long have you been valuation officer?

A. Since July 1, 1929.

Q. What was your railroad experience prior to that time?

A. I have been with the valuation department of the Southern Pacific Company since about December 1, 1913, and prior to that I began service in August, 1902, in the engineering department and from 1902 to 1915 I was in engineering, construction, and maintenance work, being road [fol. 1467] master in 1910 and 1911; on construction work to 1913 and roadmaster again in 1914 and 1915.

Q. Since 1915 you have been in a particular department of the company devoted to valuation?

A. I have been in the valuation department since 1915 and that was about the time that the original inventory work was started by the Interstate Commerce Commission and from the field inventories it was carried through to the placing of value on the properties of the company.

Q. Does the Southern Pacific maintain a particular bureau or department designated as the department of valuation?

A. It does, yes. In addition to the original valuations which were completed on a tentative valuation or final valuation placed on the properties by the Commission we are now required to report annually to the Commission under certain valuation orders changes in the property, both quantities and units added and retired, and their costs.

Q. Does the company maintain a particular department for the purpose of a continuing valuation of property and of reporting in that connection to the Interstate Commerce Commission?

A. It does, those reports are made annually.

[fol. 1468] Q. You are the head of that department now?

A. I am.

Q. To what officer do you report in the company?

A. I report to the chief engineer.

Q. Do you know and if so will you state when the valuation department was first set up in the company's organization?

A. The valuation department was first organized in 1910 to prepare valuations required by the State Commission, the Railroad Commission of California, but that work was discontinued after the valuation act, Section 19-A, was added to the Interstate Commerce Commission act. That was as of March 1, 1913.

Q. Did the company then organize a valuation department to work with the Interstate Commerce Commission in valuing the properties of the company?

A. On the method and orders prescribed by the Interstate Commerce Commission the parties were sent out by the Commission and the company in some cases had representatives and in other cases it was a joint work and then we were also required to furnish the Commission with numerous records, that is, the cost of various classes [fol. 1469] of material, such as ties, rail, and lumber and record costs of many of the jobs, that is, buildings and bridges and structures of that kind.

Q. That type of information was furnished from the records of the company?

A. That was furnished from the records of the company.

Q. Did you work with the Commission representatives in this process of valuing the company's property?

A. I did, yes.

Q. Was a valuation made by the Interstate Commerce Commission for the properties of the company?

A. Yes, the valuation was made on the final value, but prior to that time the Commission sent out various parties, inventory parties, for example, a road and track party which inventoried the grading and track structure and related items; structure parties which inventoried the steel bridges and trestles, buildings, water and fuel stations, and facilities of that character; parties which inventoried the signal and telegraph lines; equipment parties inventorying mechanical facilities and the equipment, rolling stock, and from these inventories in which the carriers were [fol. 1470] furnished a copy and also the carriers had a representative along with each party assisting in obtaining records and identifying the facilities, the Commission in their office organization collected from these inventories in a quantity form the quantities and facilities or units on a basis that they could be priced out on a money return. The money was based on the period generally from 1910 to 1914 inclusive with some records going back over a ten-year period and the quantities adjusted to the date of June, or as a valuation date which for the Southern Pacific Company property was June 30, 1916, and these quantities were priced on the 1910 to 1914 period.

Q. Were reports prepared by accounts and districts of the line showing the valuations assigned?

A. The property was divided into valuation sections for convenience, convenience in pricing and also for future use, that is, sections of main line always broken at a state line and broken at other convenient points, branch lines, for example, being separate valuation sections. The engineering report prepared by the Commission was a value by accounts by valuation sections with money summaries. The engineering report was a quantity set-up priced on the 1910 to 1914 basis and there were money [fol. 1471] summaries which followed that. The land section was composed of appraisers both for the Commission and the company which acted jointly and they placed a value on the property, a market value as of the valuation

date and those values were by zones and by valuation sections and they issued a land report.

Q. The land report shows what as to the lands covered by the valuations investigation by the Commission?

A. It shows the areas either in square feet or acres and that is valued on a market value as of June 30, 1916, on the Southern Pacific property for the major portion of it. There was some variation in valuation dates, some of them being June 30, 1915, and some June 30, 1917.

Q. Were reports issued as to the fixed properties, by that I mean the tracks, roadbed, and other structures that you have described known as engineering reports?

A. The engineering reports covered all of the improvements except the land.

Q. Did the engineering reports show value on the basis of cost of reproduction?

[fol. 1472] A. That was the reproduction as of June 30, 1916. However, that was based on the pricing period from 1910 to 1914.

Q. Was there any showing of the cost of reproduction less depreciation?

A. Yes, the engineering reports showed the cost of reproduction less depreciation.

Q. Did it also show the cost of reproduction new based on the prices you have mentioned?

A. Yes, it showed the cost of reproduction new and the cost of reproduction less depreciation.

Q. Do the valuation reports that you have mentioned segregate between the properties not used in common carrier service by the company and those which are used in that service?

A. Yes. The principal value placed on the property was those properties used in common carrier service although they reported on the non-carrier properties, they reported a value.

Q. And the non-carrier properties were separately treated and separately reported?

A. They were separately reported.

Q. You spoke of this valuation having been with some exceptions as of June 30, 1916. Has any provision been made to bring such valuations down to later dates?

A. Yes, the act itself provides that after the original [fol. 1473] valuations are completed the Commission will inform itself of the additions or extensions or changes in

the properties included in the original valuations and also the additions and betterments, improvements or retirements that have been added subsequent to the valuation date and that in order to do that they have issued certain valuation orders, order 3 being the primary one with supplements which require that the carriers will report annually to the Commission changes by valuation sections showing the quantities added or retired and their cost.

[fol. 1474] Q. Does the Southern Pacific make such annual reports to the Commission?

A. Yes, we report annually to the Commission the changes in the properties?

Q. Are those reports prepared in your office and under your supervision?

A. They are.

Q. Does the Commission make any check against those reports by means of its own forces?

A. Yes; the Commission has examiners that review not only the return that we are required to make direct to the Commission, but the underlying completion reports. Those are more detailed reports covering each approved project, and in addition to the check of the record, they also spot-check in the field for quantity returns, and items of that character. In other words, if we were to put in a construction, a line change or a piece of construction, they would undoubtedly make a field check of that particular project.

Q. They have done that, in your experience?

A. They have done so.

Q. Are the land values brought down to date in the same way?

A. Yes, the Commission have appraisers assigned by dis-
[fol. 1475] tricts, and we are also required under the regula-
tions to work with them, and most of the work, a great deal of the work is joint appraisal. They are bringing the land values to a current basis continually, that is, they are bringing it up for a certain area to a particular date, and then they will bring another usually terminal areas, to the year following, and that work continues, although at no time have they fixed a value as of any particular date. It is a continuing process on land values particularly.

Q. What is the number and style of the form upon which you make these periodical annual reports to the Interstate Commerce Commission?

A. Our reports are made on Form VB, 588, which is a summary of inventorial quantities and units, and their costs. There is a lag in that report due in part to the time that it requires the railroads or the division offices to report on a particular project, and the Commission do and have asked us to furnish money summaries on VB forms 589, which is a money report only, and does not reflect the quantities.

Q. Do you retain in your records copies of these reports on these forms 588 and 589?

A. Yes, we retain copies of all reports on VB Form [fol. 1476] 588 and 589, and also the original of the completion report and the record of property changes, which underlies those reports.

Q. Do you from time to time make preliminary or interim reports other than the reports you have just mentioned?

A. Well, the 589 is a tentative report, or money report, which would be furnished if we are not able to get out the 588, which is a money and quantity report.

Q. What is the latest report—what I mean by that, down to and including what latest date have you reported to the Commission on Form 588, Form VB 588?

A. We have filed on the 588 for the year 1936 and that is now being checked by the Commission's examiners. We are just completing the report for the year 1937, and we have filed on VB Form 589 for the years 1937 and 1938.

Q. Are the records in process of completion for the year 1939?

A. 1939 is in the process of development, that is, the completion reports for the particular jobs completed during that year are now coming in from the division offices, are being prepared in our offices.

[fol. 1477] Q. Is the material at hand from which you will shortly make the report to the Commission on Form 589 for the year 1939?

A. It is on hand on a preliminary basis. For the year 1939 we would take what reports we have in, plus the record money shown on the auditor's reports for any projects that have been completed during the year in making up the report at the present time. The reason for the delay is that it requires some time after a job is completed, to make the completion report in the detail, and to show the quantities and the money that the orders call for.

Q. Those are all details which must necessarily be available before the report is made to the Commission?

A. The money record is available in the accounting office accumulated by months as expended.

Q. Are you able, from these reports, or from your retained copies of these reports to the Commission, to present a valuation of the lands and fixed properties of the company used in its carrier service as at the end of any particular year since 1916?

A. We are able to take the moneys for both facilities [fol. 1478] and lands as of the original valuation date, and add to that the moneys that have been reported on Form VB 588 or 589 for the years up to and including 1938. For 1939, as I say, it will be necessary to take the record as now available from completion reports and going to the auditor's record for those jobs which have been completed and not yet returned on the regular reports.

The Court: Well, Mr. Baker, when you refer to land, to land values, you refer to rights of ways ground used for station purposes; do you have reference to grant lands, or what do you mean?

A. That takes all lands used for rights of way, station grounds, and for other carrier purposes, also the values are available for the lands classified as non-carriers.

Q. Does the Southern Pacific own land grants?

A. Well, the grant lands are not included in our record. They are owned by a subsidiary company.

Q. They are handled separately?

A. Yes, sir.

The Court: We will be at recess until two o'clock.

(Thereupon, the court stood at recess.)

[fol. 1479] December 12, 1940, two o'clock P. M.

All parties being represented, as heretofore noted, proceedings were resumed as follows:

Mr. Mason: Do you want to call Mr. Kiley now?

Mr. Strouss: Yes.

Mr. Mason: Your Honor, there is a matter of the correction of the record by stipulation between Mr. Strouss and Mr. Polley and ourselves, page 1249, during the testimony of Mr. Warfel, he answered a question as to the ruling

grade on the Union Pacific over Sherman Hill between Cheyenne and Herrin by saying it was 1.26 per cent, and after he had so stated and read the transcript he realized he had misspoken himself, and he advised both of us that the correct percentage was somewhat greater. Mr. Strouss and I have stipulated that the answer may be corrected to read the correct figure.

The Court: What is the correct figure?

Mr. Mason: The correct figure is 1.55 instead of 1.26.

Mr. Strouss: I agree to that stipulation.

The Court: The record may show the change.

Mr. Mason: That is line 5, page 1249, of the transcript, [fol. 1480] being the transcript of Tuesday, December 10, 1929.

Mr. Strouss: I think there was one other thing, when Mr. Baker takes the stand, of course, my running objections are not intended in so far as the testimony of Mr. Baker is concerned. He is the Southern Pacific representative and what objections I have to his testimany will be made as he testifies.

The Court: Very well, that will be better.

J. P. Kiley was recalled to the stand, and testified further as follows:

Cross-examination.

By Mr. Strouss:

Q. Mr. Kiley, you are assistant chief accounting officer?

A. No, I am assistant to the operating vice-president. I formerly worked for the chief accounting officer.

Q. How long have you been in your present position?

A. About a year.

Q. And before that, you were what?

A. I was assistant engineer assistant to the chief accounting officer.

[fol. 1481] Q. About how long?

A. About nine years.

Q. Now, what are your duties in your present position?

A. My duties in my present position are whatever work may be assigned to me by the chief operating officer, and

they consist principally of economic studies in connection with railroad operation and maintenance, and maintenance of equipment, the acquisition of new equipment, studies of motive power, formation of policies with respect to trucking; in fact, every phase of railroad operation.

Q. Now, is that work done from the records of the company?

A. Yes, sir, it is done from the records of the company, from observation, tests, inspection.

Q. Your work as engineering assistant, what was the nature of your duties there?

A. Very similar to the present work. Prior to my association with the chief operating officer, most of the work of that type was done by the chief accounting officer, chief financial accounting officer, and at his death that type of work was taken over by the chief operating officer.

[fol. 1482] Q. Now, how often do you travel over the entire system of the Milwaukee?

A. Well, I travel over portions of the system quite often. There are some lines on the railroad, some branch lines that I have never traveled on, but I have been over all of the main lines at least once in the past year, several of them a good many times.

Q. How many times have you been over the line from Chicago to Seattle?

A. The complete line from Chicago to Seattle, once. I have made several trips to portions of the line, I have been out as far as Roundup, Montana, twice—three times in the last year, I believe.

Q. What was the nature of that trip?

A. It was an inspection of our coal properties at Roundup, Montana.

Q. You just continued right on straight through?

A. No, that was a separate trip. I did make a trip from Chicago to Tacoma and back over a good portion of the line last June on a test freight train.

Q. Was that a continuous trip?

A. Yes, sir.

[fol. 1483] Q. You didn't stop at different terminals and spend time there?

A. Yes, we stopped at different terminals in order to switch the train and to service the equipment.

Q. How long would you be there?

A. Well, some terminals we were there for five or six hours, some terminals just an hour. It varied, depending upon the amount of work that had to be done.

Q. What did you do while you were there?

A. Observed the work that they were doing, switching or transferring of freight, or whatever work they happened to be doing.

Q. That is, on whatever train you were on?

A. Yes, or whatever was to be done at the terminals during the time I was there.

Q. How many times have you been over the line to Omaha in the last year?

A. Probably a half a dozen times.

Q. And to Rapid City?

A. I haven't been to Rapid City for a considerable time. I haven't been west of Canton, west of Canton, that is considered a branch line of our railroad. While it shows as a main line we run one freight train and one passenger train [fol. 1484] daily through there and the passenger train carries freight cars, but that is not an important line on our railroad, and it would have to be some particular special study to require me to go out on that line.

Q. How many times have you been to Canton?

A. Three or four times this past year.

Q. And to Kansas City?

A. I believe twice in the last year.

Q. Terre Haute?

A. I haven't traveled over the line north of Terre Haute for a considerable time. I have been down south of Terre Haute twice or three times in the last year.

Q. Now, you testified you are familiar with all the ruling grades on the system. How did you get the information as to percentage of ruling grade?

A. From the engineer's profile.

Q. And that is what you were referring to when you testified as to ruling grade?

A. That is where you obtain the information as to percentage of ruling grade. The determination of the actual grade may be obtained either from calculation or from observing the operation of a dynamometer car.

[fol. 1485] The Court: What type of car is that?

A. It is a car used to measure the performance of a locomotive. It has instruments that measure the tractive

power, the pulling power of the locomotive, the speed, the application of the air, mile posts. It is really a test car that measures practically everything in connection with the operation of a locomotive.

Mr. Strouss: Now, how often do they run those cars over the road?

A. Well, it depends, as the occasion requires. Whenever we obtain new locomotives we always make very extensive tests of the capacity and the performance of that locomotive over various sections of the line, in some cases in connection with possible future operation of the motive power over sections of the line that the original acquisition of the motive power didn't contemplate their operation.

Q. When was the last time that you rode in one of those?

A. Last June.

Q. Is it from your memory of the degrees of grade registered by that car, that you were testifying here?

A. No; the only thing that that dynamometer car will [fol. 1486] tell you is the grade that requires the greatest power from the locomotive. Now, as far as the degree or the percentage of the grade is concerned, that can be determined only from survey or records of the engineering department.

Q. Now, your exhibit 97, through freight trains, there were other trains that you didn't include in the exhibit?

A. There were other than through trains that I didn't include on the exhibit. I included on the exhibit all trains that operated from one terminal to another, as shown on that exhibit.

Q. What trains did you not include?

A. I didn't include any trains that didn't operate clear through. You take, for example, if a way freight operated over a portion of the line, I didn't take that train at all, I didn't consider that train, or if on the section of the line under consideration there was a junction intermediate to the terminals, and the train operated only part way over that section of the line, that was not included.

Q. Now, on the passenger train exhibit, Exhibit 98, what trains were taken there?

A. All trains operating between Chicago and Twin Cities, all passenger trains operating between Chicago [fol. 1487] and Twin Cities, except two accommodation trains that handle principally head-end traffic and make all

station stops between those two points. I didn't include any trains that did not operate clear through between those two terminals.

Q. The trains shown on that exhibit—did I ask you what trains—it seems I did—were mail trains, and what were not?

A. No, you did not. In that passenger exhibit, the Olympian and the Fast Mail, and the morning Hiawatha carry mail cars, using clerks, mail clerks. Storage mail may also be handled on the Pioneer Limited and the afternoon Hiawatha.

Q. Why did you take a four-months period for the passenger train study, and a ten-day period for the freight train?

A. I think it is a little harder to take—it is on our railroad, a little harder to take any short period of passenger train operation and expect to get any period that is representative of an entire year, and it is not quite as much of a job to take a four-months period for passenger trains as it would be for freight trains.

Q. Was it because you thought that would be more of an [fol. 1488] example of your normal operations?

A. Yes. In passenger service you have different seasons, or holidays that affect your passenger business more than it affects your freight business.

Q. Wouldn't a four-month period be more typical of your normal operations than a ten-day period of freight trains also?

A. It might be difficult to pick out four months; you cannot pick out, in our case, the same months and expect to get exactly the same representative period throughout the year. It might be that four months would be a more representative period, but I don't know that they would. Your seasons in freight service, or your highs and lows in freight service don't change so rapidly as they do in passenger service.

Mr. Strouss: That is all.

[fol. 1489] Redirect examination.

By Mr. Mason:

Q. When you stated you had made one complete trip to Seattle you made one complete trip to Seattle and return in the last year?

A. Yes, sir.

Q. You have made trips to Seattle and Tacoma and return previously, have you?

A. Yes, before this year but that is a long ways from Chicago and we don't get out there unless we have some particular study to work on.

Q. When was that trip made?

A. In June.

Q. Was that the same trip in which you rode in the dynamometer car?

A. Yes, sir.

Q. Was that a special freight train?

A. It was not a special freight train, it was classed as a test train but was our coastline time freight that we operate every day in the year.

Q. How much mileage did you cover with the dynamometer car on that trip in June?

A. I rode in the dynamometer car, I should say around 3,500 miles.

Q. Counsel referred in your cross-examination to the ruling grades and you said they could be determined from [fol. 1490] the engineering department's profiles. Did you bring those profiles with you to Tucson?

A. Yes, sir.

Q. Have they been tendered for the use of opposing counsel?

A. Yes, sir, they have been here all the time.

Mr. Strouss: For the whole system?

A. No, for the sections of the line included in the freight train exhibit.

Mr. Mason:

Q. Are you familiar of your own knowledge and observation with the general contours of the system?

A. Yes, sir.

Mr. Mason: That is all.

The Court: May this witness be excused with his records?

Mr. Strouss: I think there is a calculation that I have asked Mr. Kiley to check with my man who is working for me on these train sheets. They couldn't get it ready in time for him to be cross-examined on that this afternoon

and it is my understanding if they can agree upon it, it is just a matter of taking off what the sheets show and if they agree that counsel will stipulate.

Mr. Mason: I understand what they are to check is the [fol. 1491] number of trains of 70 cars and less and the number of trains of more than 70 cars as shown by the train sheet or train sheets covering the district between Bensenville, Illinois, and Savanna, Illinois, including the trains reflected by exhibit No. 97 and other trains which may appear on the train sheets and that is the entire information which they are to agree upon.

Mr. Strouss: The exhibit covers a ten-day period. This will cover a thirty-one-day period or the complete month.

Mr. Mason: And that is all the information they are to take off?

Mr. Strouss: That is all the information.

The Court: With that understanding you may be excused.

(Witness excused.)

J. B. Baker, resumed the witness stand for further direct examination:

Mr. Mason:

Q. Mr. Baker, will you say whether or not it is possible from the report rendered to the Commission or rather from the retained copies thereof on V. B. forms 588 and 589 and the other retained records in the office of the de- [fol. 1492] partment of valuation to obtain the valuation down to a particular date, say the end of a particular year for any specified section of the line and for any item of the valuation account?

A. That is correct. From the V. B. form 588 or more particularly the underlying records we can fix a value on the basis of the Commission's reports with subsequent additions and betterments a cost record as of any date and to cover any particular section of line that is desired.

Q. Can it be broken down by states at state boundaries?

A. All records are broken at state lines.

Q. Those of course would apply only to fixed properties and lands, not to rolling equipment?

A. Oh, yes, to the fixed property. Our reports to the Commission are split on state lines.

Q. Can you likewise furnish the information or obtain and prepare the information, I should say, by other districts such as by divisions?

A. We can break it at any desired point. It is a little more work to set up the quantities and re-price it but the record is so that it can be broken down for any section of line or any particular account or subdivision of the property.

Q. And the information when so obtained will reflect [fol. 1493] what the Commission found as of June 30, 1916, plus additions and betterments less retirements since that date as shown by the accounts currently kept?

A. That is correct.

Q. I will ask you to refer to a statement of one sheet bearing title, "Southern Pacific Company (Pacific Lines), Statement Showing by Accounts Appraised Market Value of Land and Reproduction Cost New of Other Facilities as Shown in the I. C. C. 19A Valuation Reports as of Valuation Dates Adjusted for Additions, Betterments and Retirements, as Shown in Carrier's Reports to I. C. C. under Valuation Order 3," with the added statement, "Does Not Include Rolling Equipment." Have you that statement before you?

A. Yes, sir.

Mr. Mason: May we have the statement marked as defendant's exhibit next in order for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 110 for identification.

Mr. Mason: Was exhibit No. 110 for identification prepared from the forms *B*. B. 588 and 589 and the supplementary underlying records in the bureau of valuation to [fol. 1494] which you have referred?

A. It is a summary of the V. B. forms 588 and 589 to and including the year 1938. For 1939 we set up the record on the same basis as we will when preparing either the 588 or the 589. For the year 1939 there may be some adjustments before that record is finally turned over to the Commission but they will be minor in character.

Q. Will they have any substantial effect on any of the amounts shown in column E?

A. No, they will be very minor in nature. They might be somewhat greater, as all of the reports, that is, the completion reports covering particular projects are not in and we therefore have to rely for completed jobs on the accounting department's money records.

Q. Is all of this information a true reflection of the underlying records in your testimony or in the possession of the company I should say?

A. Yes, sir.

Q. Has it been compared and checked?

A. Yes, sir.

Mr. Mason: We have previously discussed the subject matter of this and following exhibits with Mr. Strouss and I understand that he does not desire or insist upon at least the production of the underlying documents. I may say that [fol. 1495] we are informed that they would be very, very bulky indeed.

The Court: Is that true, Mr. Strouss?

Mr. Strouss: Yes, that is correct.

The Court: May I ask the purpose of this, Mr. Mason?

Mr. Mason: The exhibit is for the purpose of bearing out that allegation of the complaint which states that we have made substantial investment in road and equipment since 1912 and more especially since 1920, the detail of which will be shown in subsequent exhibits, in improving our property; that we have substantial investments in our properties in states where our system operates and which we will show by subsequent exhibits is particularly addressed to Arizona, New Mexico, and California.

The Court: I assumed that that was true but I wanted to be sure.

Mr. Mason: This is also for the purpose of showing the value of the fixed properties, the use of which we claim is impaired by the restrictions of the law which we challenge. We offer the exhibit in evidence as defendant's exhibit No. 110.

Mr. Strouss: I object to all parts of the exhibit except that relating to properties in Arizona shown on line 5, the objection being based upon the ground that it is irrelevant [fol. 1496] and immaterial.

The Court: I will hear you on that, Mr. Mason.

Mr. Mason: I will have to refer to the answer, Your Honor. In paragraph 3A of subdivision 3 which is the

first affirmative defense, reference is made to improvements on defendant's railroad lines in Arizona and elsewhere since 1912 and more especially since 1920, in both road and equipment and it appears that this relates only to road.

Mr. Polley. Which page is that, Mr. Mason?

Mr. Mason: Page 5. By the expenditure of large sums of money, and while the allegation relates itself more emphatically to the equipment, nevertheless there is a sufficient allegation relative to expenditure of monies to road as well as to equipment. Paragraph 3C on page 7 relates to the expenditures in Arizona and perhaps does not meet the objection so definitely. However, there is also reference there to operations in the adjacent states of California and New Mexico.

The Court: I might state I can see where there might be some relevancy in the expenditures made in the adjacent states, but certainly with Oregon, Louisiana, and Utah, states such as those shown on the exhibit, frankly I cannot [fol. 1497] see where it would have any bearing on this trial here.

Mr. Mason: Your Honor, it shows we have made expenditures in other states for the purpose of improving our property so we may operate in accordance with the best modern standards. Now, expenditures made in Nevada and Utah would have as a purpose and at least a result the operation, the improvement of the property so that we might operate longer and heavier trains than we did in 1912 and 1920. Similarly, as to Oregon and New Mexico and California and certainly similarly as to Texas and Louisiana which after all are merely eastward connections of the line across Arizona and New Mexico.

The Court: You mean you might offer that proof as to the state you have named, not adjacent states, on the somewhat similar theory on which the court has admitted the evidence as to these other railroads?

Mr. Mason: Yes, except that we operate these trains under the same rules as of course in Arizona, with the same engines, the same cars, the same cabooses, because they are interchangeable, in Nevada and Utah and Oregon and California, in New Mexico outside of the territory where the Arizona law operates with extra-territorial effect, [fol. 1498] in Texas and Louisiana and certainly a comparison of our own operations, if there be degrees of appur-

tenancy, is even more pertinent and relevant to the question of whether a similar operation is practicable in Arizona or whether the law operates unreasonably.

Mr. Booth: I think, if Your Honor please, the admissibility of this evidence cuts even more deeply than counsel has indicated. The case which has been referred to here as the Nevada Train-Limit case, the case of Southern Pacific Company vs. Mashburn——

The Court: What is the citation?

Mr. Booth: 48 Fed. Supplement 393, decided February 23, 1937. The opinion was a per curiam opinion by Mathews, Circuit judge, and Louderbach and Norcross, District judges. It is a somewhat brief opinion dealing with only a few features of the many that were involved in that case and I may say that the bill in equity in that case was substantially the same as the answer in this case, but at the conclusion of the opinion the court said: "The court approves and adopts the findings of fact and conclusions of law submitted for consideration by the special master. Defendant's exceptions to certain of the findings of fact so submitted are overruled." Now, following [fol. 1499] the announcement of that opinion a set of findings of fact were signed by the court which were practically identical with the findings of the master except for the necessary change in the preliminary paragraphs and those findings of fact go very fully into the system of the Southern Pacific Company as an operating unit as a system, go very fully into the operations conducted by the Southern Pacific Company on other parts of its system as to the relative safety of operation of trains on other parts of its system compared with operations in the state of Arizona as developed by statistics kept in accordance with the requirements of the Interstate Commerce Commission. While I do not claim for the decision of the court in the Nevada Train-Limit case any compelling effect as res adjudicata on this court or even stare decisis yet we shall argue when it comes to the argument of this case that the case is valuable and should be persuasive as a precedent just as any decision of a court of competent jurisdiction and high respectability on any question involving the same state of facts is received and considered by a trial court in any case, but these findings of fact of the master go to another point and that is the admissibility of testimony of what

[fol. 1500] may be used in this case. This three judge court in adopting the findings of the master and overruling the exceptions of the defendant to a majority of those findings has as we contend placed its stamp of approval upon the reception in evidence of the class of testimony which we offered and which was received in that case and which we propose to offer and we trust will be received in this case. I do not refer to the manner of proof such as the objection we encountered at the outset of this case to certain exhibits on the ground that the records on which they were based were not produced in the courtroom. I refer rather to the character of proof, its relevancy and its admissibility as distinguished from its competency. The findings of the master will show that we proved in that case the very things we are seeking here to prove by this exhibit. They will show that the condition of the property of the Southern Pacific Company throughout its lines is a very important consideration in determining whether long-train operation may be safely conducted in Arizona as we claim it is on other parts of the system. It is a question of comparability. We cannot compare Nevada with Arizona in a set of safety statistics very well unless the court knows what the physical [fol. 1501] property in Nevada consists of, what class of trains operate through there, what class of traffic, and so on and so on. We cannot try this case of course with the testimony of one witness; we have to build it up piece by piece just as was done in all of the cases. I may say also that the master received and the three-judge court approved of his findings in the original Arizona Train-Limit Case by adopting the master's findings in its findings, the same type of testimony concerning the operations of the system as a whole. Now, when we say that this act deprives the defendant of the use of its property and impairs the present usefulness of its facilities we don't refer to Arizona alone. We claim that it impairs the usefulness of our entire system's facilities, that freight may originate at any point on our system and be transported into or through Arizona and to the extent to which this act prevents us from transporting that freight efficiently and economically, to that extent pro tanto are our facilities impaired. We have written for a certified copy of the findings in the Nevada case. We respectfully submit that those findings which are signed by Circuit Judge Mathews, District Judges Loud-

erbach and Frank H. Norcross as of February 23, 1937, are [fol. 1502] as much a part of the opinion printed in the Federal supplement as though they had been reproduced in the decision therein. There should be no question about it. If the court refers to a document, it is necessary to go to the document to ascertain what the court had in mind, something that the court has frequently done. The Supreme Court of the United States is very prolific in its citations of standard authorities and it is not unusual for them to merely refer to the authority by name. I mean by standard authorities various Commissions and bodies, they refer to it by name and it is not unusual for a court considering the decision of the Supreme Court to go to that source of authority to find out to what the court referred. We will substitute a certified copy for this. This pamphlet, a copy of which I have handed the court and counsel, was prepared for distribution to the members of Congress and particularly to the members of the House Committee on Interstate and Foreign Commerce, as will be shown by its preface, but it is a reprint and barring typographical errors, a correct reprint of what will be seen on page 90 to be a certified copy of the findings and at the bottom of page 27 it will be seen that the court found, "In considering the [fol. 1503] Pacific lines of plaintiff, it appears that $14,-331,000 was expended for net additions and betterments from December 31, 1930, to December 31, 1935." This case was tried in 1935 and 1936. "The money so expended was allocated only to roadway and fixed structures." On the next page it is shown that a system showing was made there of the entire system and we submit at least as a precedent the action of the three-judge court in approving these findings is highly significant of the fact that a proper regard for the very important and diverse issues that are made in this case would seem to require that we be permitted to make the same showing here that we made there.

This case has three primary divisions as far as the evidence is concerned. The first division is what we are about to conclude except for a couple of witnesses we may call after the holiday recess and that is the picture of the United States as a whole, of the principal railroads of the United States, what might be called a general economic picture. The second division relates to the economy and efficiency of defendant's operation and the handicaps which are

placed upon it by the Arizona law, the issues of burden on [fol. 1564] interstate commerce, interference with interstate commerce, impairment of defendant's facilities and extraterritorial operation of the law. The third general subdivision of the case is the question of whether the law is reasonable as an exercise of the police power of the state in the interests of the safety or health of persons or the safety of property and while the third subdivision may overlap the second to some extent in some of our testimony it is yet a distinct part of the case, and returning to that I may say that it is almost impossible to understand the safety testimony that we shall submit in this case, comparisons of operations on our lines with operations in Arizona, without a picture of the property on which these other operations have been carried and without the story of the continued development of that property for the purpose of enabling us to handle our traffic in as large units as may be possible, the nature and quality and time of presentation of the traffic and the condition of our power considered, so I respectfully submit that the entire exhibit is admissible on the theory I have endeavored to argue.

The Court: Do you care to be heard, Mr. Strouss?

[fol. 1565] Mr. Strouss: Only to say that as far as the train-limit case in Nevada is concerned, I have no desire or intention to argue the findings in that case. There is nothing in this to show what the status of the evidence was at the time this testimony was introduced there, there is nothing to show what objections were made to the evidence at that time. The mere fact that some other court may have improperly admitted evidence of this sort is no basis for the admission of it in this case. There is nothing to show here that there was even an objection made in Nevada to the introduction of the evidence there and certainly at this stage of the case there is nothing here that would lay the foundation for the reception of this evidence, nothing upon which this evidence would tend either from the standpoint of relevancy or materiality. The property that is invested in some other state, Louisiana, for example, it would be quite a stretch of the imagination to see any connection between the Arizona Train-Limit law and what property they own in Louisiana. So far as their lines in other states are concerned there is nothing here to show there is any similarity between the properties here and there.

Mr. Booth: That objection goes rather to the order of [fol. 1506] proof. As I say, we cannot introduce all our proof by one witness, but counsel overlooks the fact that our theory is that the entire system is a unit and when one part of the unit is impaired necessarily the operations of the entire unit are impaired. We report all of these lines as a unit to the Interstate Commerce Commission and the Interstate Commerce Commission does not recognize state boundaries or territorial boundaries. It orders the railroad to report all operations on this form A and all the operations on the statistical reports OS-A, and so on. May I also suggest that we have proceeded in this case on a definite theory and part of that theory is that we are entitled to make a system showing. We are endeavoring to make this system showing in as compact and brief and understandable a form as possible. If at the conclusion of the case the court decides that evidence as to other states is irrelevant, the court can disregard it and so state in its opinion, but without the evidence in the case we are simply deprived of foundation for the court finally to adopt our theory if it sees fit to adopt it. It is like trying a case on demurrer.

The Court: I don't think it is necessary to argue it further. The Court has admitted and I think properly the [fol. 1507] statistical data with reference to the operation of numerous other roads which was admitted upon the theory of similarity of operations which the court required be shown. Now, it does seem that certainly the defendant here should be permitted to show its operations as a whole. This exhibit merely seeks to break that down into the different states through which they operate, and the record may show the objection is overruled.

Mr. Strouss: May I say this further, your Honor. This is not going to a matter of operation, this is merely the investment in property. What it has to do with the operation of trains is another thing.

The Court: That is true.

Mr. Strouss: There is one thing I wanted to say, because it keeps popping up here continually, that is the Nevada and Arizona Train-Limit Law. I was not in the Nevada case. I was in the former Arizona Train-Limit Law case and I know in that case, while objections were made at the beginning, the master said from the beginning and continually that he was admitting all this leaving it to the court

to determine what should later be heard. I have the tran-
[fol. 1508] script here, in which I can show repeated state-
ments by the master to that effect and so far as the three-
judge court is concerned, that was an ex parte matter.

Mr. Mason: There is only one other comment to be made. You cannot operate trains unless you have a roadbed on which to operate them and you cannot have a roadbed unless you keep it up and spend money as it wears out and improve it, and the purpose of this exhibit is to show what we have done in order to permit our operations to continue. It responds to an allegation in paragraph 3 (A), eliminating the parts which do not relate to ours, may be phrased as follows: "Railroad operating conditions, both on defendant's lines in Arizona, and elsewhere, and on railroads throughout the United States generally, differ substantially from the operating conditions which existed in 1912 when the Arizona Train-Limit Law was passed, in that since 1912 and more especially since 1920 great improvements have been made in both road and equipment. The greater part of these improvements has taken place since 1920 and has been accomplished by the expenditure of large sums of money."

The Court: Well, the court has ruled on the matter. Go ahead.

[fol. 1509] Mr. Mason: Have you before you, Mr. Baker, an exhibit in one sheet entitled, "Statement Showing By Accounts Appraised Market Value of Land and Reproduction Cost New of Other Facilities as Shown in the I. C. C. 19A Valuation Reports as of Valuation Dates Adjusted for Additions, Betterments and Retirements, as Shown in Carriers' Reports to I. C. C. under Valuation Order 3. Yuma, Arizona, to El Paso, Texas, via Gila and Lordsburg; Tucson, Arizona, to El Paso, Texas, via Douglas; Wellton, Arizona, to Picacho, Arizona, via Phoenix"?

A. Yes, sir.

Q. Consisting of one sheet?

A. Yes, sir.

The Court: Before you proceed further with that, I wonder if this last exhibit No. 110, that was offered, the objection was made, the Court overruled the objection. The record may now show that the exhibit is admitted in evidence.

Mr. Mason: Now, as to the statement just referred to by title, may we have that marked No. 111 for identification?"

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 111 for identification.

[fol. 1510] Mr. Mason: Mr. Baker, was Exhibit 111 prepared from the same underlying documents as No. 110?

A. Yes, sir.

Q. But addressed particularly to these sections of line which are shown in the title?

A. Yes, sir, and it is subdivided to the accounts.

Q. And by referring to column C, you can find what the reproduction cost new valuation was as of December 31, 1923, for any particular item?

A. Yes, sir.

Q. And the columns D and E collectively will show the net additions and betterments by subtracting E from F?

A. Yes, sir. Column D is gross additions, and E is retirements. Those are facilities that taken out for replacement or abandonment to make room for new facilities, and under the accounting rules, and also under the rules of the Bureau of Valuation, we have to report the value of property retired as well as property added. That is, the property retired is predicated on a cost or estimated original cost, and those costs are based on the engineering reports [fol. 1511] and the record costs of additions and betterments subsequent to the valuation dates.

Q. When property is retired, does that become a deduction from the total investment shown?

A. That is a deduction from the investment and the records, yes.

Q. Then the figures in column F represent the figure in column C, plus the figures in column D, less the figures in column E?

A. Yes.

Q. Has this exhibit been compared against the underlying records?

A. Yes, sir.

Q. Will you say whether or not it is true and correct?

A. Yes, sir.

Mr. Mason: It is my understanding, Mr. Strouss, that your agreement as to the non-production of these underlying records goes to this and succeeding statements of the same character?

A. That is true, yes.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: The figures in column E, are those the original costs, or original costs depreciated?

[fol. 1512] A. That is original cost, there is no depreciation in any of the figures on this exhibit.

Q. They are charged off at the original cost?

A. The same money as in the record, or estimated cost of what was in the record, as a rule we use the I. C. C. engineering reports as of valuation dates for any facilities that were in place as of that date which have subsequently been retired.

Q. This does include the Phoenix line?

A. Yes, sir.

The Court: But this covers, Mr. Baker, these figures represent, I should say, the matters therein stated covering the line from Yuma, Arizona, to El Paso, Texas?

A. Yes, sir.

Mr. Strouss: That is all the questions I have.

Mr. Mason: We offer the exhibit as defendant's exhibit 111.

Mr. Strouss: The same objection as to exhibit 110.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 111.")

[fol. 1513] Mr. Mason: Now, have you before you, Mr. Baker, a statement in one sheet bearing the same title as Nos. 110 and 111 except for the subtitle "Wellton, Arizona, to Picacho, Arizona, via Phoenix"?

A. Yes, sir.

Q. Was this exhibit prepared in the same manner as the preceding exhibit, particularly 111?

A. Yes, sir, it is prepared from the same underlying record.

Q. And simply addressed to the main line from Wellton via Phoenix to Picacho?

A. It sets up that section separately, yes, sir.

Q. Has it been compared?

A. It has.

Q. Will you say whether or not it is true and correct?

A. Yes, sir, it is.

Q. The same explanation applies as applied to the preceding exhibit?

A. Yes, sir.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: We offer the statement in evidence as defend-
[fol. 1514] ant's exhibit 112.

Mr. Strouss: I have no objection.

The Court: It may be admitted. There is no objection.

(The document referred to was received in evidence, and marked "Defendant's Exhibit No. 112.")

Mr. Mason: Will you refer to an exhibit of four sheets, Mr. Baker, similar in form as appears with respect to 112, and bearing on the first sheet in addition to the long title, the designation, "Yuma, Arizona, to El Paso, Texas, via Gila and Lordsburg, Arizona, New Mexico, Texas. Summary." Have you that before you?

A. Yes, sir.

Q. And the second sheet bears the designation, "Yuma, Arizona to El Paso, Texas via Gila and Lordsburg, Arizona?"

A. Yes, sir.

Q. The third sheet similarly relates to New Mexico?

A. Yes, sir.

Q. And refers to that section of the line between the Arizona-New Mexico line, I take it, and the New Mexico-Texas line?

A. Yes, sir.

[fol. 1515] Q. Via Lordsburg; and the fourth sheet refers to the Texas portion of the same line.

A. Yes, sir.

Mr. Mason: May we have this statement in four sheets marked "Defendant's Exhibit No. 113 for identification"?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 113 for identification.

Mr. Mason: Was exhibit No. 113 for identification prepared in the same manner, and from the same source as exhibits 111 and 112?

A. The same basic record and the same methods of compilation.

Q. You have on the first sheet shown the valuation information for the entire line from Yuma to El Paso via Gila and Lordsburg?

A. Yes, sir.

Q. And then broken it down by states on the succeeding three sheets?

A. Yes, sir.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: We offer the exhibit in evidence as Exhibit 113.

[fol. 1516] Mr. Strouss: The same objection as to Exhibit 110.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 113.")

Mr. Mason: Mr. Baker, will you refer to a statement of one sheet bearing a title similar to the preceding exhibits, and the subtitle, "Tucson, Arizona, to El Paso, Texas, via Douglas, Arizona—New Mexico—Texas. Summary," on the first sheet, and the designation of the several states, Arizona, New Mexico and Texas on the succeeding sheets?

The Court: Is that the road that was formerly known as the El Paso and Southwestern?

A. Yes, sir.

Mr. Mason: May we have this statement marked 114?

The Court: It may be marked.

The Clerk: Defendant's Exhibit 114 for identification.

Mr. Mason: Did you prepare this statement in the same fashion as No. 113?

A. Yes, sir.

Q. And from similar sources?

[fol. 1517] A. Yes, sir.

Q. You have shown the summary of the line from Tucson via Douglas to El Paso for the three states in which it lies on the first sheet?

A. Yes, sir.
Q. And then by states on the other three sheets?
A. Yes, sir.

Mr. Mason: Have you any questions, Mr. Strouss?
Mr. Strouss: No.

Mr. Mason: Has the exhibit been compared and checked?
A. It has.
Q. Will you state whether or not it is true and correct?
A. Yes, sir, I believe it is.

Mr Mason: We offer the statement in evidence as defendant's Exhibit 114.
Mr. Strouss: The same objection as to Exhibit 110.
The Court: It may be admitted

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 114.")

Mr. Mason: I think that is all of the direct examination.
[fol. 1518] The Court: We will be at recess at this time.

(Thereupon a short recess was taken, after which the witness J. B. Baker was recalled to the stand, and proceedings were resumed as follows:)

Mr. Mason: No further questions.

Cross-examination.

By Mr. Strouss:

Q. Mr. Baker, that I might a little better understand these exhibits, Column B of 110 represents the valuation of 1916 by the Interstate Commerce Commission, or under the supervision of the Interstate Commerce Commission, brought down to December 31, 1923; is that correct?
A. That is correct. Our reports to the Commission for additions, betterments and changes.
Q. In other words, what you did was to take the additions for the different years between 1916 and 1931 and the retirements to arrive at this value, just as you have taken additions between December 31, 1923, shown in column C, and the retirements after December 31, 1923, to December 31, 1930, shown in column D, to arrive at the total shown in column E?
[fol. 1519] A. Yes, sir, the same method was pursued.

The Court: Mr. Baker, do I understand that these valuations were made by you or representatives of the Southern Pacific Company, or by the experts of the Interstate Commerce Commission?

A. The valuations as of the valuation dates, which was generally on June 30, 1916, in some cases it was 1915, or June 30, 1917, was prepared by the Commission and the carriers were furnished a copy of it, both the facilities and the land reports.

Q. That is as shown in this first exhibit 110?

A. That is the basis. From that we have added; from those basic reports we have added the additions and betterments and taken out the retirements that we have reported to the Commission under the Commission's valuation order No. 3, which we report annually.

The Court: Go ahead, Mr. Strouss.

Mr. Strouss: Those additions and retirements are checked by the Interstate Commerce Commission also?

A. Yes, sir, they are checked by the examiners for the Bureau of Valuation.

Q. Now, your land values, that includes only land used [fol. 1520] as operative property?

A. Yes, sir, that is the carrier property, classified as carrier.

Q. Now, the values were taken as of June 30, 1916. What has been done with respect to values of land, operative land, since that time?

A. In these reports the land value was taken from the basic—from the original reports, and the lands acquired or the lands disposed of have been added to or retired from that original report. There has been no change in the value of the lands in these reports, that is, they haven't been revised to the current appraisals.

Q. The values remain the same as the original valuations in 1916?

A. Yes, in these reports they were not changed.

Q. Now, in the 1916 valuation, I believe you stated that there was a valuation based on reproduction new and a valuation on reproduction new less depreciation.

A. Yes, that is correct.

Q. Which is used here?

A. This is the reproduction new, based on prices current for the period 1910 to 1914.

Q. Now, these temporary reports, Form 589, are the [fol. 1521] valuations there supervised by the Interstate Commerce Commission?

A. The 589?

Q. Yes.

A. Yes, sir, they call on us to furnish the 588, which is the quantity and cost report for additions and retirements, and if we are unable to complete that report, they would generally call for the 589, which is a money statement and which can be obtained from the record in less time than it requires to set up all of the quantities. We have recently furnished at the request of the Commission the money statements for the years 1937 and 1938 on the 589; that is a money by accounts by valuation sections.

Q. At any rate, it is the original cost?

A. Oh, yes.

Q. Of the additions, and the original cost of the retirements?

A. Yes, it is the cost money and is the same money, possibly subject to some minor adjustments, as will be shown on the 588 when completed, which includes quantities.

Q. Now, the valuations, as of December 31, 1923, do not include the E. P. & S. W. properties?

A. No, sir.

Q. When was the merger, do you know?

[fol. 1522] A. That was taken up in 1924. The year 1924 includes the E. P. & S. W.

Q. What about the Phoenix line?

A. The Phoenix line came in as an addition in 1926, that is, the portions of the Phoenix line that were constructed new.

Q. How does the addition of the E. P. & S. W. property, how is it shown on your exhibits here?

A. Well, that is included in the additions, subsequent to January 1, 1924.

Q. Now, exhibit No. 110—

The Witness (Interrupting): Just a moment. Allow me to correct that, please. That is set up on the same basis as the other lines, the engineering report, which was June 30, 1917, plus the additions and betterments, as recorded to December 31, 1923.

Q. In other words, you took the E. P. & S. W. valuation as fixed by the I. C. C.

A. Yes, sir.

Q. And the additions and retirements to bring it up to the time of acquisition by the Southern Pacific Company, to bring it up to 1923?

A. And it is handled in the pool and not as an addition, as of the date of acquisition. You see we have the original [fol. 1523] records for the El Paso and Southwestern, so far as the Commission reports are concerned.

Q. Would it be shown in column B of exhibit 110?

A. No——

Mr. Mason: Column B of exhibit 110, have you that exhibit before you?

A. Yes, it is in column B of 110.

Mr. Strouss: In other words, the properties for Arizona, New Mexico and Texas would include the parts of the E. P. & S. W. lines valued as of the date December 31, 1923?

A. Yes, sir.

Q. And the additions, then, would be included in C and retirements in D along with the other Southern Pacific property?

A. Yes, sir, it was included with the balance of the property on the same basis.

Q. This exhibit shows all operative properties of the Southern Pacific Company in the states indicated on the exhibit?

A. Yes, sir.

Q. And the next——

Mr. Mason: This was—I think we should make it clear, it includes only fixed equipment.

Mr. Strouss: Yes.

[fol. 1524] Mr. Mason: The title says it doesn't include rolling equipment.

A. No, rolling stock is not included.

Mr. Strouss: On exhibit 111, that is the so-called Gila Bend and the North Line—let's see——

Mr. Mason: I think, Mr. Strouss, it is the main lines, those three main lines, the North Line through Phoenix, the Central Line, if you like, through Gila and Lordsburg, and the South Line, the former E. P. & S. W.; is that correct?

Mr. Strouss: The North Line through Lordsburg?

Mr. Mason: Yes.

Mr. Strouss: In other words, it is all of your lines from Yuma to El Paso?

A. Yes, it is the Yuma to El Paso line, the original Southern Pacific line, the El Paso and Southwestern from Tucson to El Paso via Douglas, and the Wellton to Picacho line, which included the new construction and part of the Arizona Eastern.

Q. This exhibit includes all of the lines between El Paso and Yuma?

A. Yes, sir.

Q. Then the next one takes only the Phoenix line?

[fol. 1525] A. Exhibit 113 is the Yuma to El Paso line via Gila and Lordsburg. Exhibit 112 is the Wellton to Picacho via Phoenix.

Q. In other words, these last exhibits divide them up into separate lines?

A. Yes, sir.

Mr. Strouss: That is all.

Redirect examination.

By Mr. Mason:

Q. I want to have this clear in the record, Mr. Baker. The reproduction cost new as of 1916 or 1917, as the case may be, is a figure fixed or determined or reported by the Interstate Commerce Commission, is it not?

A. Yes, sir, that was put out in the engineering reports by the Commission.

Q. And it is brought down to date by showing the actual cost of facilities added, less the actual cost, as nearly as that can be obtained where an estimate is necessary, of facilities retired?

A. Yes, sir, that is true. It is the actual cost of facilities added and the actual cost or estimated original cost of facilities retired.

[fol. 1526] Q. Now, the showing on exhibit 110 includes branch lines as well as main lines of the properties described?

A. That is the total system properties, yes, sir.

Q. And the showing on exhibit 111, as I understand it, is not inclusive of any branch lines in the territory between Yuma and El Paso, but only the main lines indicated by the sub-head.

A. Just the lines indicated between the termini, as shown in the heading.

Q. The same is true as to each of the other exhibits down to and including the last one received, which is No. 114?

A. Yes, sir.

Q. They are main lines only?

A. Yes, sir.

Q. I think you made it clear, but if not, I should like to have it clear in the record that the valuation in the El Paso and Southwestern properties, which were in 1924 acquired by the Southern Pacific to the extent that they had been valued by the Commission and subsequently been added to, up to December 31, 1923, properties in column B in Arizona, New Mexico, and Texas on exhibit 110. I think that was [fol. 1527] your answer to Mr. Strouss?

A. That is correct. It is shown as an original property and not as an acquisition. It is set up on the engineering report, plus the additions and betterments along with the balance of the system properties between the valuation dates and December 31, 1923.

Q. And is the same true as to Arizona Eastern properties which were acquired by the Southern Pacific and merged about the same time?

A. Yes, the same is true of the Arizona Eastern.

Mr. Mason: I think that is all.

The Court: You may step aside.

Mr. Mason: We will call Mr. Masson.

[fol. 1528] L. J. Masson was called as a witness on behalf of the defendant and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Mason:

Q. State your name to the reporter.

A. My name is L. J. Masson.

Q. Your residence?

A. I reside in Berkeley, California.

Q. What is your official position?

A. I am an assistant general auditor of the Southern Pacific Company, headquarters at San Francisco.

Q. As assistant general auditor you report directly to the general auditor of the company at San Francisco?

A. Yes, sir; I am under his immediate direction, supervision and direction.

Q. Does the jurisdiction of the office of the general auditor and of yourself as assistant general auditor extend to the entire Pacific lines of the Southern Pacific?

A. It does, yes, sir.

Q. How long have you occupied your present position?

A. Since August 1, 1933.

[fol. 1529] Q. What was your first experience—when was your first experience in railroad work?

A. I entered the employ of the Morgan's Louisiana and Texas Railroad and Steamship Company at New Orleans, Louisiana, on October 4, 1903. Since that time I have been employed in the accounting department of the Southern Pacific Company or one of its affiliated companies, except that between August 4, 1912, and February 13, 1913, I was employed as a general bookkeeper for the Missouri, Kansas and Texas Railroad Company in St. Louis, Missouri.

Q. Is the Morgan's Louisiana and Texas Railroad, or was it, rather, in 1903 and since an affiliate of the Southern Pacific?

A. Yes, it was a wholly-owned subsidiary of the Southern Pacific, operated independently at that time, but since merged with the Texas and New Orleans Railroad Company.

Q. And the Texas and New Orleans is what?

A. Is a wholly-owned subsidiary of the Southern Pacific, operated from El Paso east with an eastern terminus at New Orleans.

Q. And you have been engaged all of these 37 years in railroad accounting work?

A. Yes, sir, I have.

[fol. 1530] Q. You have become thoroughly familiar with the records and books kept in the accounting departments and the methods by which they are kept, particularly on the Southern Pacific Lines?

A. By progressive steps through the accounting organization in each of the offices of the accounting department, I have become familiar generally with the details and records of the accounting work of railroads, of the Southern Pacific especially.

Q. You are familiar with the Interstate Commerce Commission's classification of accounts and the orders issued by the Interstate Commerce Commission in connection with the accounts and reports of carriers?

A. Yes, sir.

Q. Have you appeared as a witness in proceedings before various commissions and courts in cases in which the Southern Pacific has been interested?

A. Yes, sir, I have.

Q. Have you prepared or had prepared under your direction certain exhibits for introduction in this case?

A. I have.

Q. I call your attention first to a statement bearing the title, "Southern Pacific Company—Pacific Lines—Oper- [fol. 1531] ated Steam Mileage by Divisions and States as of December 31, 1939." Have you that statement before you?

A. Yes, sir.

Mr. Mason: May we have the statement marked as Defendant's Exhibit 115?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 115 for Identification.

Mr. Mason: From what sources was Exhibit No. 115 for Identification prepared?

A. The source is indicated at the bottom of the exhibit. The mileage that is shown in this exhibit will also be found in the Annual Report of the company to the Interstate Commerce Commission and to the State of Arizona, as indicated in the footnote there. The details, however, are a little bit different; the totals agree with that which appear in the schedules of the Annual Reports referred to.

Q. Does the company make an annual report to the Arizona Corporation Commission along the same lines as the Annual Report, Form A, made to the Interstate Commerce Commission?

A. Yes, sir, except that there is an additional section in [fol. 1532] the report to include revenues, expenses and statistics applicable entirely to the State of Arizona.

Q. Then do I understand that the report is the counterpart of the report to the Interstate Commerce Commission as to system operations?

A. Yes.

Q. And includes a separate section devoted to Arizona operations?

A. It does.

Q. Is that report rendered annually?

A. Annually, yes, sir.

Q. In accordance with instructions of the Arizona Corporation Commission?

A. Yes, sir.

Q. Does the company retain a file copy of each of these annual reports to the Arizona Commission?

A. It does, in this way, the first part being an exact reproduction of our I. C. C. report, is not filled in; however, the state part is filled in for our record purposes.

Q. To fill in the first part would be merely a duplication?

A. A duplication, yes, sir.

Q. Of the report to the I. C. C.

A. Yes, sir.

Q. Does the company render reports to state commis-
[fol. 1533] sions in other states?

A. It does.

Q. Similar to the reports rendered to the Arizona commission?

A. Yes, sir.

Q. But related, of course, to the operations in the several states.

A. True.

Q. Does each contain a duplicate of the Annual Report rendered to the Interstate Commerce Commission?

A. They do.

Q. Does the company retain counterpart copies of those annual reports to the several state commissions similar to the counterpart of the annual reports to the Arizona commission?

A. It does.

Q. Will you state the names of the several states to the commissions of which reports are rendered as just testified to by you?

A. The Corporation Commission of Arizona—I refer to this simply to get the correct names—The Railroad Com-
mission of California, The Public Service Commission of Nevada, The Corporation Commission of New Mexico, Public Utilities Commissioner of Oregon, Railroad Com-
[fol. 1534] mission of Texas, Public Service Commission of Utah.

Q. Now, you state in the note at the foot of the exhibit 115 that the source is records of the company. To what records do you refer particularly?

A. I refer to our record that we maintain in the office of the mileage by divisions, which I hold in my hand now.

The information for this record originates on the divisions in the office of the division engineer, who reports any changes in mileage to the chief engineer, who in turn reports to us the changes in mileage, and those are recorded in this record by divisions and states for our reporting purposes.

Q. Is that a permanent record maintained in the office of the general auditor?

A. Yes, sir.

Q. And is it now available for use of opposing counsel if they desire?

A. If he cares to have it, it is available to him. (Addressing Mr. Strouss) Do you want it?

Mr. Strouss: I will take a look and see.

Mr. Mason: Has the exhibit been compared against the original record to which you referred in your last preceding testimony?

A. Yes, sir.

Q. Will you state whether or not it is true and correct?

[fo]. 535] A. It is true and correct.

Q. Now, there are certain designations on the exhibit which might perhaps be explained. Opposite the words "San Joaquin" in Column 1, where it appears twice, you have the initials "S. G." and "N. G." What is the significance of those words?

A. "S. G." means "Standard gauge." "N. G." means "Narrow gauge." It so happens that that particular division has narrow gauge railroad running from—it is on the east side of California there from Keeler to Benton.

Q. Is the same meaning to be attached to the same initials as they appear opposite the name "State of California" in the lower block?

A. Yes, sir.

Mr. Mason: We offer the statement in evidence as Defendant's Exhibit No. 115.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 115.")

Mr. Mason: Mr. Masson, were you present at the first day of the trial when the map, Exhibit No. 1, reproduced on the easel, was offered in evidence?

[fol. 1536] A. No, I wasn't.

Q. I call your attention to the reference on that map to the paired track mileage in Nevada Between Weso, Nevada, and Alazon, Nevada.

A. That part between the two arrows.

Q. Is that the mileage to which you refer in the footnote designated with the asterisk upon your exhibit No. 115?

A. Yes.

Q. Are there any other features of this exhibit, any particular mileages, to which you care to call attention here?

A. It might be of interest to call attention to the fact that the State of Arizona is the second in importance in the matter of main line first track mileage operated by the Pacific Lines, there being 743.53 miles of main line first track in Arizona out of a total of 5,147.96 miles operated by the system in all states. So far as branch line mileage is concerned, Arizona stands third in importance, there being 464.96 miles of branch lines in the state out of a total of 3,500.16 miles of branch line operated by the Pacific Lines in all states. Taking all tracks into consideration, that is, all main tracks, Column 8, and sidings, Column 9, [fol. 1537] the State of Arizona stands third in point of all tracks out of a total of 13,669.19 miles operated in all states by the Pacific Lines. That is shown in Column 10, the lower section of Column 10.

The Court: Well, Mr. Masson, so that I will get this straight, referring here to this Defendant's Exhibit No. 1, you classify this as a main line here from Wellton by way of Phoenix over to Picacho?

A. Yes, sir.

Q. And also from Picacho directly to Wellton?

A. Yes, sir.

Q. The same thing is true here, is it, of Tucson, the route running through Lordsburg to El Paso, and the route running through Douglas?

A. Yes, sir, that is true.

Q. Both of those are classed as main line?

A. That is true.

[fol. 1538] The Court: Another question, assuming that in certain of the areas mentioned by the Court a moment ago there should be a double tracking, is that counted in this column (2) as main-line tracking or is that a branch?

A. If it is a main-line it would be in Column 5 as an addi-

tional main track. You will notice Column 5 carries all such types of track.

Mr. Mason:

Q. Referring to Column 5, you can find from Column 5 the length of double or multiple track in any particular state or on any particular division by referring to the mileage of additional main line track?

A. That is true.

The Court: Where are the principal branch lines of the Southern Pacific in the State of Arizona? What do they consist of?

Mr. Mason: Do you mind if I lead the witness through these? I know them pretty well.

The Court: No, go ahead.

Mr. Strouss: It is all right with me.

Mr. Mason:

Q. Will you refer first of all, Mr. Masson, to the Nogales branch?

A. Yes, that is one branch, from Dugson to Nogales.

Q. Then there is a branch from Fairbank to Tombstone, [fol. 1539] is there not, a short branch?

A. That is right, from Benson to Fairbank.

Q. There is one from Benson to a point just above Fairbank?

A. And there is the Christmas branch running from McQueen to Winkleman. There is the Erman to Christmas, that is all in the Christmas branch.

The Court: That entire road from Mesa to Magma and Winkelman is a branch line?

A. Yes.

The Court: And this one (indicating map).

A. There is the so called Creamery branch from Tempe to Normal Junction.

Mr. Mason: That is a short line extending southward from Tempe.

The Court: And one running down the Gila Valley to Miami and Globe?

A. Yes, that is the Globe branch, Globe to Inspiration Junction.

Mr. Mason: Returns to the main line at Bowie.

A. Yes.

The Court: And the line running into Clifton?

A. Yes.

Mr. Mason: That is the Lordsburg-Clifton branch.

A. And there is the Litchfield Park and one to West [fol. 1540] Chandler from Tempe Junction.

The Court: Some of those are extremely short lines.

A. Very.

Mr. Mason: There is a branch from Fairbank to Patagonia which is a part of the Rio Grande division and the branch line from Lewis Springs to Fort Huachuca. Your Honor will remember when Mr. Sines introduced the exhibit he designated the branch lines as those indicated by the light solid line and the others as indicated by the heavy solid lines except where there was double track, in which event it was shown as a double line.

The Court: What would be this road down to Ajo?

Mr. Mason: That is a short line called the Tucson, Cornelia and Gila Bend.

The Court: It is owned by the Southern Pacific?

Mr. Mason: No, it is independent of us entirely.

The Court: I think you have answered the Court's question sufficiently and I see the examination of that map properly discloses the information wanted.

Mr. Mason: Your Honor will recall our understanding [fol. 1541] that Mr. Kiley would check with Mr. Strouss' representative and obtain the numbers of the trains by classes over and under 70 on the Bensenville-Savanna, Illinois subdivision of the Milwaukee Railroad for the month of March, 1939, and I have been handed the memorandum check which shows that westward there were 93 trains of 70 cars and less; 97 trains of more than 70 cars. Eastward there were 141 trains of 70 cars and less and 38 trains of more than 70 cars.

The Court: I presume then that Mr. Kiley may be permanently excused?

Mr. Strouss: Yes.

The Court: Do you care to proceed further tonight?

Mr. Mason: We are about to proceed to another exhibit which will take quite a while and if it is agreeable to Your

Honor and opposing counsel it might be just as well to adjourn.

Mr. Strouss: I wonder if you are going to have any more train sheets before the recess?

Mr. Booth: No, we have two witnesses for tomorrow but the only exhibit dealing with the number of trains operated is based on the wheel reports which the witness has here with him. One is an operating witness and the other an [fol. 1542] accounting witness who will testify to standard operating statistical exhibits we have here and some other exhibits as well.

(Discussion off the record.)

The Witness: I understand that Mr. Strouss will not require these mileage records any more?

Mr. Strouss: That is right.

The Court: We will be at recess until tomorrow morning at ten o'clock.

(Thereupon at 4:00 p. m. December 12, 1940 the court stood at recess until 10:00 a. m. Friday, December 13, 1940.)

[fol. 1543] December 13, 1940, ten o'clock A. M.

All parties being represented as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed.

Mr. Mason: Your Honor, we would like at this time to suspend the direct examination of Mr. Masson, and proceed with another witness.

The Court: Any objection?

Mr. Strouss: No objection.

Mr. Mason: We will call Mr. Beale as our next witness.

FRANK D. BEALE was called as a witness on behalf of the defendant and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you state your name to the reporter, Mr. Beale?

A. Frank D. Beale.

Q. And your residence, Mr. Beale?

A. Cleveland, Ohio.

Q. What position, if any, do you hold with the Chesapeake and Ohio Railway?

A. I am assistant vice-president, assistant to the presi- [fol. 1544] dent of the Chesapeake and Ohio Railway Company.

Q. What has been your educational training and your service with the Chesapeake and Ohio?

A. I graduated in civil engineering at the University of Virginia in 1915. I entered the service of the Chesapeake and Ohio Railway in October, 1915, and have continued in the service of the company continuously except for a period of fifteen months, during which time I was in the United States Army in the World War.

Q. What was the first position you occupied with the Chesapeake and Ohio, and at what point?

A. The first position I had with the Chesapeake and Ohio was as section foreman at Newport News, Virginia.

The Court: Where is your residence, Mr. Beale?

A. Cleveland, Ohio.

Mr. Mason: Mr. Beale, as a means of identifying your subsequent service, perhaps it would be well to introduce a map of the Chesapeake and Ohio Railway System. Have you before you a map on one sheet entitled, "The Chesapeake and Ohio Railway Company," and so forth?

A. Yes, sir.

[fol. 1545] Mr. Strouss: May the objections heretofore made run to this witness's testimony?

Mr. Mason: The general objection to the testimony of witnesses, officials, of railroads other than the Southern Pacific?

Mr. Strouss: That is right.

Mr. Mason: Made on the second day of the trial in connection with the officers of the New York Central?

Mr. Strouss: That is right.

Mr. Mason: May we have this map marked for identification with the next number?

The Clerk: Defendant's Exhibit 116 for identification.

Mr. Mason: Mr. Beale, is the map, Exhibit No. 116 for identification, a reasonably accurate outline map of the lines of the Chesapeake and Ohio?

A. It is. It is not a scale drawing, but is a reasonably accurate outline map.

Q. And shows the states in which the railroad operates?

A. It does.

Q. And the significance of the heavy lines to be discussed later in your testimony or in that of the following witness?

[fol. 1546] A. It does.

Mr. Mason: Are there any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: We offer the exhibit in evidence as Exhibit 116.

Mr. Strouss: The same objection.

The Court: The objection is overruled. It may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 116.")

Mr. Mason: Now, with general reference to the map, Mr. Beale, will you state your experience and the positions you have occupied on the Chesapeake and Ohio System since 1915?

A. The first position was as assistant section foreman at Newport News, Virginia. The next position was as assistant supervisor of track on the Rivanna Division, which is between Richmond, Virginia, and Gladstone, Virginia. My next position was as division engineer at Clifton Forge on the Clifton Forge Division, which extends from Charlottesville, Virginia, to Hinton, West Virginia, and from Gladstone, Virginia to Clinton Forge, Virginia, with [fol. 1547] the intersecting branches. My next position was as trainmaster at Strathmore, Virginia. My next position was as trainmaster of the territory between Clifton Forge and Hinton. My next position was as superintendent of the Richmond Division, which takes in all of the territory on the C and O east of Gladstone and east of Charlottesville, including the line into Washington. My next position was as assistant general superintendent at Huntington, West Virginia, on the western general division of the C and O, which takes in all of the line west of Hinton, West Virginia, except that part between Cleviot, Ohio, and

Chicago. I occupied that position until April 1, 1940, when I moved to Cleveland in my present position.

Q. Are the executive general headquarters of the Chesapeake and Ohio Railway Company maintained at Cleveland?

A. The executive offices of the Chesapeake and Ohio are maintained at Cleveland.

Q. Does it also have a general office and operating headquarters at Richmond, Virginia?

A. The general office and the operating headquarters are at Richmond, Virgina.

Q. In your present position, does your jurisdiction ex- [fol. 1548] tend to the entire system?

A. Yes, sir.

Q. What is the operated road mileage of the Chesapeake and Ohio as of the end of last year?

A. Three thousand, one hundred seventeen miles.

Q. Between what points do the main lines extend?

A. The main line extends from Phoebus, Virginia, on the east to Chicago, Illinois, on the west, with diverging lines to Washington, a diverging line to Toledo, a diverging line to Louisville, a diverging line to Elkhorn City—I will say in passing that word "Elkhorn" on this map should be "Elkhorn City"—and with a diverging line to Gilbert, and some other branches. This line is through the states of Virginia, West Virginia, Ohio, Kentucky, Illinois, Indiana, and goes into the District of Columbia.

Q. What is the principal commodity handled by the Chesapeake and Ohio?

A. Coal is the principal commodity handled by the Chesapeake and Ohio.

Q. What is the district in which the coal handled by your line principally originates?

A. The coal originates on the territory between Hinton, West Virginia, and Ashland, Kentucky. Very little of it [fol. 1549] originates on the main line; the major portion originating on the branch lines which are designated on this map.

Q. In what direction does the coal move after it reaches the main line?

A. The coal moves in both directions, but the major portion of the coal that is mined on the western end moves west.

and the coal that is mined on the eastern end, which is east of Deepwater, divides about half and half.

Q. Do you have a through haul on this coal to deepwater terminals at the Virginia Capes?

A. We have a terminal at Newport News, Virginia, and coal moves from all of our coal fields to Newport News and to connections at Richmond, Lynchburg, Charlottesville, and Washington.

Q. Now, as to your westbound movement of coal, is that again to your terminals at Chicago and Toledo and connections?

A. Yes; we have at Toledo a modern coal-dumping plant. We can and do dump coal at the rate of a hundred and some cars an hour very often. The coal plants turn a car over, dump a car every minute; we have three such machines.

Q. Is that coal being transferred to vessels for lake movement?

[fol. 1550] A. That is coal being transferred to vessels for movement toward other lake ports, particularly to the Lake Superior points in northern Michigan.

Q. Does your company handle other classes of traffic besides coal in any substantial volume?

A. Yes, we have ore that is brought down in lake boats to Toledo and transferred to cars; we handle ore that is brought into Newport News and transferred to cars. We handle a general connection business from our connections at Chicago, Cincinnati, Louisville, and those points mentioned on the east end of the railroad. We have connections with other lines at Fostoria and Columbus, and from them receive and deliver coal and freight of various kinds. We have in connection with the southern roads a through service from Elkhorn City through to Toledo for movement to Detroit of perishables.

[fol. 1551] Q. Are these perishables handled in refrigerator cars?

A. Usually.

Q. Do you have any substantial traffic in boxcar equipment in any of the traffic you have mentioned in your previous discussion?

A. Yes, sir.

Q. In what class of equipment is the coal handled?

A. Coal is handled in open top cars classed as hopper bottom gondolas and flat bottom gondolas.

Q. Are they standard cars used in interchange with other railroads?

A. Yes, sir.

Q. Do you have any other lading for these open top cars?

A. Yes, we move ore, gravel, crushed stone, sand, and in some of them move fabricated steel, steel plates, and any commodity that lends itself to being loaded by machinery into an open top car.

Q. Are these open top cars of wooden construction or part wood and steel or all steel construction?

A. All steel cars.

Q. Does the Chesapeake & Ohio have any wooden underframe or wooden freight equipment of any class?

[fol. 1552] A. Not in revenue service.

Q. You are familiar with the exhibit heretofore introduced showing the development of Southern Pacific boxcar equipment, exhibit No. 2?

A. I have it.

Q. Has the development of the boxcar equipment on the Chesapeake & Ohio proceeded along similar lines?

A. I have no direct knowledge of boxcars back of 1915. Since that time the development of boxcars on the Chesapeake & Ohio has paralleled that on this exhibit. We may have gotten some feature a year or so before this or a year or two afterwards in some cases.

Q. What is the standard of boxcar construction on the Chesapeake & Ohio now. I mean is it all steel or any steel underframe?

A. The present standard boxcar on the Chesapeake & Ohio Railroad is all steel boxcars with in many cases wooden floors.

Q. Will you refer also to the exhibit showing construction of passenger train cars for the Southern Pacific, exhibit No. 4. Does the Chesapeake & Ohio operate passenger cars of its own ownership?

A. Yes, sir.

[fol. 1553] Q. Addressing yourself to the period subsequent to 1915, will you say whether or not the development of your passenger car equipment has been along the lines indicated by that exhibit?

A. It has, except that the Chesapeake & Ohio has no cars similar to those shown in the last two blocks which were bought by the Southern Pacific in 1937 and 1939 respectively.

Q. Does the Chesapeake & Ohio now operate any woodlen passenger cars in revenue service?

A. No.

Q. Do you operate Pullman cars?

A. Yes, sir.

Q. You were present when Mr. Parke of the Pullman Company testified yesterday?

A. Yes, sir.

Q. And on the day before?

A. Yes, I heard Mr. Parke's testimony.

Q. Do you operate standard Pullman cars of the type described by him and shown upon his exhibit?

A. Yes.

Q. Will you refer, please, to defendant's exhibit No. 5 showing the chronology of freight locomotives and state whether the Chesapeake & Ohio has freight locomotives similar to those shown on the exhibit or has developed other [fol. 1554] designs for use in its freight service?

A. We have 2-6-0 type locomotives very similar to that shown on this exhibit; also 2-8-0 type very similar to that shown. We have 2-8-2 locomotives very similar to that shown and also have 2-8-2 locomotives of this type equipped with boosters. We have 2-10-2 locomotives very similar to the large 2-10-2 as shown on this exhibit; we have no 4-10-2 but we have a 2-10-4 with a tractive effort of 93,350 pounds without the booster and 108,625 pounds with the booster. We have what we call a "Mallet" type engine, a 2-6-6-2 which is a compound engine with 77,900 pounds tractive effort compound and our type H-7 which is a 2-8-8-2 with a tractive power of 108,550 pounds.

Q. That would correspond fairly to the articulated consolidation 4-8-8-2 shown here as having a tractive effort of 116,900, would it?

A. Yes. We have no engine as large as your engine which has 124,300 pounds tractive power.

Q. Referring to the exhibit of passenger locomotives, exhibit No. 6. Have you that exhibit at hand?

A. Yes, sir.

Q. Do you have locomotives especially designed or devoted to passenger service or used in freight and passenger [fol. 1555] service both corresponding to any of those shown on exhibit No. 6?

A. We have, with a tractive power very close to your 4-6-0s, engines of the 4-4-2 type and of the 2-6-0 type. We have Pacific type engines with 31,050 pounds tractive power and large Pacific type engines with 43,400 pounds tractive power and 46,900 pounds tractive power. We have Mountain type engines with 60,850 pounds tractive power. We have a 4-8-4 with 66,450 pounds tractive power. This engine is equipped with a booster and with the booster has a tractive effort of 80,800 pounds.

Q. Are your locomotives equipped with superheaters?

A. Generally.

Q. Feed water heaters?

A. Generally.

Q. What type of air compressor do they use?

A. I can't answer that question.

Q. Are they generally coal-burning locomotives?

A. All of our locomotives are but we have seven or eight gas electric and gas passenger cars which operate alone in passenger service.

Q. Are your locomotives used in main line freight and passenger service fired by hand or stoker fired?

[fol. 1556] A. Almost all of them are stoker-fired engines. Some of the very smallest Atlantic type are hand fired.

Q. The larger types indicated are all stoker fired?

A. All of the larger types are stoker-fired engines.

Q. Are you familiar with the device known as the "power reverse gear"?

A. In a general way that an operating man is.

Q. Will you say whether or not that device has been applied to your larger main line freight and passenger locomotives?

A. It has.

Q. Will you refer to a statement in one sheet entitled, "The Chesapeake & Ohio Railway Company. Freight Trains Operated between the Regular Freight Engine Terminals on Subdivisions Listed, Separated to Show Number of Trains Handling a Maximum Number of Cars (Including Caboose) as Indicated by the Groupings." Have you that statement before you?

A. I have.

Mr. Mason: May we have the statement marked for identification "Defendant's Exhibit No. 117"?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 117 for identification.

[fol. 1557]

Mr. Mason:

Q. Mr. Beale, have you made frequent trips over the line in addition to the experience gained by you in the several positions you occupy?

A. I have.

Q. Is it part of your duty first as assistant general superintendent and now as assistant to the president and assistant vice president to make such trips?

A. Yes.

Q. Have those trips included trips on the dynamometer car?

A. When I was trainmaster and superintendent and general superintendent I made a great number of trips on the dynamometer car.

Q. Did that include all of the lines other than the line from Cheviot to Chicago?

A. I have ridden the dynamometer car on all of the main line of the railroad except from Cheviot to Chicago and between Richmond and Gordonsville.

Q. With exhibit No. 116 before you and with reference to certain subdivisions shown on exhibit No. 117 for identification, will you describe briefly the line of the Chesapeake

[fol. 1558] & Ohio commencing at Newport News and proceeding thence westward, stating the ruling grade, the signal equipment, the type of locomotive used, and the nature of the traffic, particularly freight traffic handled?

Mr. Strouss: Just a minute, may I ask a question?

The Court: Yes.

Mr. Strouss: With respect to the ruling grade, do you mean to testify you can ride on a dynamometer car and determine the percentage of grade?

A. No.

Q. How do you get that information?

A. From an engineer's profile.

Mr. Mason:

Q. Do you have the engineer's profiles with you?

A. I have.

Q. Are they available for the use of opposing counsel for cross-examination.

A. Yes.

Mr. Booth: Have you the employees' working timetables for the divisions as to which you are about to testify?

A. I have our employees' timetables for the entire Chesapeake & Ohio Railway Company.

Q. Are they available to counsel?

A. Yes.

[fol. 1559] Mr. Booth: I would state, Your Honor, that I would like to take over the examination, Mr. Mason is obliged to meet the general manager and would like to be excused for a few minutes.

The Court: You may be excused, Mr. Mason.

Mr. Booth: I think it will expedite the examination if Mr. Beale, without detailed questions from me, will take up each of the subdivisions shown on defendant's exhibit No. 117 for identification, identify it with the aid of defendant's exhibit No. 116, state the ruling grade, the class of power used, the signals employed, and what he knows of his own knowledge without reference to the exhibit No. 117 as to the general character of traffic handled and the length of the train units in which it is customarily handled. It will greatly expedite the examination if you can do that. Otherwise I will have to cut it up into a series of questions from the memorandum I have before me.

Mr. Strouss: I have no objection to that method of procedure but my running objection goes to this testimony.

The Court: You are not objecting to the multiplicity of the questions?

Mr. Strouss: No.

[fol. 1560] The Court: Go ahead.

A. The first subdivision shown on Exhibit No. 117 for Identification is the Peninsula Subdivision; it extends from Newport News, Virginia, to Fulton, Virginia. This subdivision is a double track line completely equipped with automatic signals. The locomotives generally used are 2-8-8-2, with over 108,000 pounds tractive power. The trains we handle consist of 160 loads or empties. The ruling

grade westbound is .57 per cent. The ruling grade eastbound is .63 per cent and is operated as a helper grade. The trains in this territory consist of coal and a varied assortment of freight moving to Newport News for export and for coastwise movement by boats. The westbound trains consist of empty coal-cars and freight which has been received from boats at Newport News and from connections at Norfolk, which is across the bay from Newport News.

Q. West of Richmond, Virginia?

A. West of Richmond, Virginia, we have two lines extending to Clifton Forge. The old line extends through Gordonsville and Charlottesville. The trains moving on that line are not included on Defendant's Exhibit No. 117 for identification. That line is primarily a passenger line, [fol. 1561] the grades being about one per cent on the line between Richmond and Charlottesville. Between Charlottesville and Clifton Forge the line crosses the Blue Ridge Mountains and the North Mountains with ruling grades of about one and one-half per cent.

Q. Is that the line that George Washington laid out?

A. No, sir, that is not the line that George Washington laid out.

Q. Which is the line that George Washington laid out?

A. The other line which passes through Strathmore, Gladstone, and Lynchburg toward Clifton Forge is laid on the tow path of the James River and the Kanawha Canal, which canal was the successor to an old canal company which was originally incorporated with George Washington as president, to transport freight between the East and the West. That line has a descending grade or level grade continuously from Clifton Forge to Richmond, no adverse grades against the eastbound movement. The line is single track with some short stretches of double track. It is operated as a manual block operation with a few short stretches of automatic signal. Trains of 160 cars are regularly handled in both directions on this territory. [fol. 1562] The eastern half of this line which extends from Gladstone to Fulton is the Havanna subdivision as shown in column 3 on exhibit No. 117 for identification. The line from Gladstone to Clifton Forge is the James River subdivision shown in column 4 of the same exhibit. The engines used in this territory are generally Mikado engines, with a tractive power of 67,700 pounds. Westward from

Clifton Forge towards Cincinnati, Ohio, the line is double track and completely equipped with automatic signal. In the section between Barboursville and Limeville there is some third and fourth main track. The line between Clifton Forge, Virginia, and Hinton, West Virginia, is known as the Allegheny subdivision and is the subdivision shown in column 5 of the exhibit. This subdivision crosses the Allegheny Mountains at a maximum elevation of approximately 2,080 feet. The ruling grade westbound is 1.14 per cent. The ruling grade eastbound is .57 per cent. This territory is operated with the use of helpers and the engines used are 2-8-8-2 type with a tractive power of 198,550 pounds. Trains of 135 to 140 loads are regularly operated eastbound and trains of 160 empties are regularly operated westbound.

[fol. 1563] Q. Let me ask you here, if these trains of loads of 100 cars and upwards that you have been talking about, is merchandise contained in boxcars regularly operated in connection with the loads of coal when and as the traffic demands are justified?

A. They are. We have assigned schedules to meet our service requirements and when the boxcars to be moved in those trains are not sufficient to load the locomotives we handle coal in those trains. That is true all the way to Newport News from Hinton.

[fol. 1564] Q. Now, will you testify regarding the New River Subdivision?

A. The territory from Hinton, West Virginia to Handley, West Virginia, is known as the New River Subdivision. This subdivision is in the valley of New River and the Great Kanawha river and is generally descending from Hinton to Handley. Eastbound the ruling grade is .4 per cent. 2-8-8-2 locomotives with a tractive effort of 108,550 pounds are used in this territory.

Q. On coal trains?

A. On coal trains, and these engines are also sometimes used on other trains, but usually the other trains are handled with a Mikado type engine with a tractive effort of 67,700.

Q. Is that subdivision shown on this exhibit 117 for identification?

A. It is not. The next subdivision which extends from Handley, West Virginia to Russell, Kentucky, is known as the Kanawha Subdivision. The ruling grade on this sub-

division is .3 per cent in both directions. This grade is operated as a helper grade. The engines used generally in this territory are Mallet type engines, with tractive power of 77,900 pounds compound and 98,300 simple, and [fol. 1565] Mikado-type engines with a tractive power of 67,700 pounds. Trains of 140 loads or 160 empties are regularly handled on this territory.

Q. Is that shown on Exhibit 117?

A. That is not shown on 117.

Q. What is the Cincinnati Division?

A. The Cincinnati Division, which is shown on 117, is the line extending from Russell, Kentucky, to Stevens, Kentucky. This line lies in the valley of the Ohio River and is generally descending from Russell to Stevens. The engines used in this territory are Mikado-type engines with a tractive power of 67,700. Trains of 160 empties or 150 loads are regularly handled westbound, and trains of 125 loads and 160 empties are regularly handled eastbound. The ruling grade against eastbound movement is .23 per cent. Diverging from the main line at Limeville, Kentucky, and extending to Parsons, Ohio, is the subdivision known as the Northern Subdivision, which subdivision is shown in column 7 of exhibit 117. This subdivision has a ruling grade of .7 westbound, which is operated as a helper grade. Extending from Parsons to Wallbridge is a division known as the Toledo Division, which is that shown in column 8 of exhibit 117. This subdivision has a ruling grade westbound [fol. 1566] of .5 per cent, which is operated as a helper grade. The entire line between Limeville and Toledo is equipped with automatic signals. Russell is the eastern terminal for Northern Subdivision trains. These trains operate over the Cincinnati Division between Russell and Limeville, and thence over the Northern Division to Parsons, and thence over the Toledo Subdivision to Wallbridge. The engines used on these two territories are 2-10-4 type locomotives, with a tractive power of 108,625 pounds with booster, and 98,350 pounds without booster. Trains of 160 cars are regularly handled in both directions on these two subdivisions.

Q. The Northern Subdivision and the Hocking Division, of which the Toledo Subdivision is the principal part, are among the subdivisions shown on exhibit 117 for identification?

A. The Northern Subdivision is among the divisions shown on Exhibit 117, and the Toledo division is shown on Exhibit 117 for identification. The Exhibit 117 does not include that part of the Hocking Division which is south and east of Parsons, Ohio.

Q. Now, there are some other subdivisions, three or four, that are not included on exhibit 117, but which will be in-
[fol. 1567] cluded in the mass of statistics and will be introduced by a succeeding witness from your line. Will you describe those?

A. The Chicago Subdivision extends from Cheviot, Ohio, to Chicago, Illinois. This is a single track manual block operation. The ruling grades are about 1.3 per cent. Traffic is not heavy on this line. 2-8-2 type locomotives with tractive power of 63,450 pounds without booster.

Q. Are you referring to your motive power records now?

A. Yes, sir. I know with the booster of that engine there is approximately 12,000 pounds added power, but I wanted to see exactly what it is. The tractive power with booster, 74,700 pounds.

Q. Now, on that line is it the practice to handle the trains of substantially over a hundred cars that you have been describing?

A. On that line the passing tracks will not permit the handling of trains of substantially over a hundred cars. We handle trains of eighty cars on that line.

Q. The average train would be less than seventy, would it?

A. Very much.

Q. Is this a district of light traffic?

[fol. 1568] A. Comparatively speaking, compared to these others we have been talking about.

Q. What is the Logan Subdivision?

A. The line diverging from the Kanawha Subdivision at Barboursville, and extending to Gilbert is the Logan Subdivision. This is a double track line, with one short piece of single track, is equipped with automatic signals. 2-6-6-2 type locomotives with a tractive effort of 67,900 pounds, compound, and 98,300 pounds simple are generally used.

Q. Will you check that? You said 67,900.

A. 77,900, if I said sixty seven.

Q. What is the ruling grade?

A. The ruling grade against eastward movement is .55 per cent; the ruling grade against westbound movement is .18 per cent. Trains of 150 loads and 160 empties are regularly handled on this territory.

Q. Is that Logan Subdivision shown on this exhibit?

A. It is not.

Q. What as to the Big Sandy Subdivision?

A. Diverging from the Kanawha Subdivision just east of Ashland, Kentucky, and extending to Elkhorn City is the Big Sandy Subdivision. This is a single-track line with [fol. 1569] a few short stretches of double track. It is operated as a manual block operation. Generally, the line lies in the valley of the Big Sandy river and is descending from Elkhorn City toward the main line, although there are some adverse grades. 2-6-6-2 type locomotives, with tractive power of 77,900 pounds compound, and 98,300 pounds simple, are generally used. Trains of 125 loads and 160 empties are regularly handled.

Q. What about the line from Ashton through Lexington, Kentucky to Louisville, Kentucky?

A. I would like to add a little to this.

Mr. Booth: Very well.

The Witness (Continuing). This is the line—I am speaking now of the line from Elkhorn City to the main line—is the line which connects with the C. C. & O. Railway at Elkhorn City, and is the line over which we have a perishable movement from the south to the cities in Northern Ohio, and in connection with the Pere Marquette to Detroit.

The Court. We will take our morning recess.

(Thereupon, a short recess was taken, after which the witness was recalled to the stand, and proceedings were resumed as follows:)

[fol. 1570] Mr. Booth: Mr. Beale, have you completed the description of the principal subdivisions? I believe, however, that I asked you about the line from Louisville, Kentucky.

A. The line that diverges from the main line at Ashland and extending to Lexington is known as the Lexington Subdivision, and that between Lexington and Louisville is known as the Louisville Subdivision. The traffic on these two subdivisions is comparatively light. There is a grade of 2.67 per cent on the Lexington Subdivision, which is op-

erated as a helper grade. The trains on this territory are usually short, although trains in excess of seventy cars are operated.

Q. Do the divisions and subdivisions you have described constitute the major portion of your lines?

A. They constitute the major portion of our lines.

Q. As to the freight tonnage handled, what would you say as to the percentage of the freight tonnage on these subdivisions you have described with relation to the total freight tonnage of the entire system?

A. More than ninety per cent.

Q. Referring to defendant's exhibit 117 for identifica-
[fol. 1571] tion, irrespective of the exhibit itself, what have you to say, from your general knowledge of the railroad and its traffic, as to the representative character of the showing for the four weeks shown on that exhibit of the average length of freight trains operated between the regular freight engine terminals on the subdivisions shown on that exhibit?

Mr. Strouss: I think he has already testified to that division by division.

The Court: If there is anything additional the witness cares to add, he may do so.

Mr. Booth: Simply laying the foundation for the exhibit as a representative exhibit.

A. The figures on this exhibit conform to the ideas I had as to what they would be.

Q. Did you select the periods as shown on this exhibit?

A. I selected the territories. I didn't select the periods.

Q. What have you to say as to the general character of the volume of traffic during the month of June, 1939, as related to the volume during the rest of the year, light, heavy or medium?

A. June, on the east end of the railroad, is a little lighter
[fol. 1572] than medium. On the line toward Toledo, June is medium.

Q. What is the middle of October, two weeks ending October 24th, what would that represent in volume of traffic?

A. That represents a period eastbound that was heavier than June, and to Toledo also a period a little heavier than June.

Q. When is your lightest coal movement on your system, all parts of the system considered?

A. Our lightest coal movement is during Christmas week.

Q. I mean, for periods. Take a month, for instance.

A. That varies a great deal from year to year. There are some years that December will be our lightest period; other years that May will be the lightest period.

Q. What about 1939, from your observation of the traffic?

A. In 1939 we had comparatively light business through the first seven months. It wasn't until somewhat later in the year that we got into our really heavy business in 1939. We also, in 1939, had an interruption in movement from a strike of coal miners in April and May.

[fol. 1573] Q. Can you say whether or not the four weeks shown on this defendant's exhibit No. 117 is fairly representative of the train-length movement on the subdivisions shown on the exhibit?

A. From my knowledge of these subdivisions, yes.

Q. And are these subdivisions fairly representative of the character and volume of traffic handled on your system as a whole?

Mr. Stronss: Now, if the Court please, I think he has testified to that by divisions; now, to make a blanket statement, when his testimony is that some of these divisions are light-traffic divisions, operating with predominantly short trains——

Mr. Booth: I will withdraw the question.

Q. Where is Lineville, Kentucky, located with reference to your map, defendant's exhibit 116?

A. Lineville, Kentucky is shown on the map and is between Russell and Stevens.

Q. On what subdivision, shown on Exhibit 117?

A. Lineville is on the Cincinnati Division on 117, and is the junction point of the Cincinnati Division of the Northern Subdivision.

Q. Is it on one of your primary main lines?

[fol. 1574] A. It is on one of our primary main lines.

Mr. Booth: I have handed the clerk a photograph, which I ask to have marked "Defendant's Exhibit 118 for Identification."

The Court: It may be marked.

The Clerk: Defendant's Exhibit 118 for identification.

Mr. Booth: Mr. Beale, were you present when this photograph was taken, defendant's exhibit 118?

A. Yes, sir.

Q. Was it taken at your direction?

A. Yes, sir.

Q. And by whom was it taken?

A. It was taken by Mr. Thomas, a photographer at Huntington, West Virginia.

Q. Did you take him into Limeville for the purpose of taking a photograph of a typical coal train of 160 cars?

A. I did.

Q. Are you in this photograph? Are you the gentleman standing with his hands in his hip pockets in the foreground just immediately back of the automobile?

A. I am.

Q. In which direction is the train moving?

[fol. 1575] A. This train was moving in a westerly direction, enroute from Russell, Kentucky, to Parsons, Ohio.

Q. Was it standing still at the time the photograph was taken?

A. It was.

Q. Did you cause it to be halted for the purpose of taking the photograph?

A. I did.

Q. Was that train made up for the purposes of the photograph, or was it a freight train in regular operation in commercial freight?

A. It was a freight train in regular operation in commercial service.

Q. Is that freight train typical of the 160-car coal trains about which you have testified as being regularly operated on a number of subdivisions?

A. It is.

[fol. 1576] Q. Have you the wheel report for this train?

A. I have a car list of this train which I made myself.

Q. Was there more than one locomotive hauling this train in regular commercial service?

A. There was only one locomotive to haul this train.

Q. And that is shown in the photograph?

A. Yes, sir.

Q. What type of locomotive?

A. Engine No. 3018 which we class as our T-1 type of locomotive and has a tractive power of 93,350 pounds without booster and 108,625 pounds with booster, a 2-10-4 type of locomotive.

Q. Are all of the cars in the train of Chesapeake & Ohio ownership?

A. No.

Q. You are looking at your copy that you made at the time?

A. I am looking at the notes I made of the consist of the train myself. It had four Virginian Railway cars in it, four private line cars that were stenciled N. R. B. X.

Q. What does that stand for?

A. It stands for New River Pocohontas Coal Company.

[fol. 1577] Q. Does this train have a caboose on it?

A. Yes, sir.

Q. What type or types of gondola cars appear in this photograph?

A. There are two general types of coal cars in this photograph, hopper bottom cars and flat bottom cars.

Q. Can the hopper bottom cars be unloaded from the bottom?

A. The hopper bottom cars can be unloaded from the bottom.

Q. What about the flat bottom cars?

A. Some of them can be and some of them can't be unloaded from the bottom.

The Court: These cars in this picture appear to be loaded.

A. All of these cars had a lading of coal. That train had a tonnage of something over 12,000 tons, about 12,400 gross tons.

Mr. Booth: Q. That included cars and contents?

A. Yes, sir.

The Court: How many cars were in the train?

A. 160.

Mr. Booth: Are these coal cars loaded mechanically or by manual labor?

A. I can tell you generally how coal is loaded in coal [fol. 1578] cars.

Q. You don't know about these particular cars?

A. I can say generally that coal is produced underground in the mine, loaded into mine cars, and transported to what is known as the coal "tipple" and from the tipple it moves by gravity into the coal cars. These coal tipples usually are arranged so that they grade the coal and you load coal

of one grade on one track and coal of another grade on another and so forth but it is mechanical in the sense you mentioned.

Q. How are they unloaded?

A. That depends entirely on the unloading facilities at the point where they are unloaded. In some cases they are unloaded by hand; in other cases, by machinery. If they are unloaded by the Chesapeake & Ohio Railway Company, at either Toledo or Newport News, they will run up on a coal dumper, a clamp comes down over the top of the car to hold it attached to the track, and track, car, and all are turned over and the coal dumped into a pan with a chute to deliver the coal to the ship so that in that operation it makes no difference whether it is a hopper bottom car or a car with a closed bottom.

Q. Was this photograph made by a single exposure at [fol. 1579] one time or is it a series of separate photographs?

A. This photograph was made with a single exposure of a rotating camera which I suppose is a panoramic camera. It rotated through something over two hundred degrees in taking this picture.

Q. Does this photograph correctly represent the train as you yourself saw it at the time?

A. It does.

Mr. Booth: We offer in evidence the photograph as defendant's exhibit No. 118.

Mr. Strouss: Same objection.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 118.")

Mr. Booth: Q. What does the bridge shown at the extreme right of the photograph cross?

A. That is the bridge across the Ohio River which at that point is the state line between Kentucky and Ohio.

Q. Then the train is standing just south of the river?

A. Yes, sir, in Kentucky.

Q. This train did not differ, did it, in any way from the usual and ordinary solid coal train of 160 cars which you referred to in your testimony?

[fol. 1580] A. It did not.

Q. Thoroughly typical of that type of train?

A. It is.

Q. I am handing to the clerk for identification as defendant's exhibit No. 119 and ask that it be so marked, a single sheet headed, "The Chesapeake and Ohio Railway Company, Maximum Number of Cars Handled in Various Main Line Passenger Train, Total for Months of January, April, July and October, 1939." Have you that before you?

A. Yes, sir.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 119 for identification.

Mr. Booth: I will ask you first what is the principal through movement of passenger trains on your line?

A. The principal through movement is from Washington, D. C., between Washington, D. C., and Cincinnati, Ohio.

Q. With connecting trains?

A. With connecting trains serving the intersecting lines connecting with the main line at Charlottesville and serving Richmond and Newport News and connecting with the main line at Ashland and serving Lexington and Louisville, [fol. 1581] connecting with the main line at Limeville and serving Columbus and Toledo.

Q. How many through passenger trains does the Chesapeake and Ohio regularly operate in each direction between Washington and Cincinnati?

A. Three in each direction, a total of six trains each day.

Q. Do you know from your own observation whether frequently and as traffic and occasion requires more than 14 cars are operated in those trains?

A. I do.

Q. Do you ride those trains frequently?

A. Yes.

Q. And observe them?

A. Yes, sir.

Q. This exhibit which will be further testified to by a succeeding witness represents the totals for the months of January, April, July, and October. What have you to say as to the representative character of those months with respect to the operation of the trains named on the exhibit?

A. It is representative of the operation of those trains. I would say at the time this exhibit covers I was located at

Huntington, West Virginia, and as assistant general super-
[fol. 1582] intendent had under the general superintendent
direction of the movement over those trains from Hinton,
West Virginia, to Cincinnati, Ohio.

Q. How far are the locomotives run on the operation of those trains?

A. The locomotive runs on these trains are from Washington to Charlottesville; Charlottesville to Hinton and Hinton to Cincinnati and in the return direction generally the same runs in the opposite way.

Q. About what length of run?

A. The run from Charlottesville to Hinton is 176 miles; the run from Hinton to Cincinnati is about 308 miles.

Q. Did you hear the testimony of Mr. Parke, the chief engineer of the Pullman Company, given in this case?

A. Yes, sir.

Q. To what extent does your company utilize the standard Pullman car or conventional Pullman car, as Mr. Parke called it, in the operation of the passenger trains?

Mr. Strouss: I think he has already testified to that.

Mr. Booth: Very well.

Q. Does your company promulgate and cause to be ob-
[fol. 1583] served rules for the guidance of its train and engine men?

A. It does.

Q. Is that published in book form convenient for carrying in your pocket?

A. Yes, I have a copy in my hand.

Q. Are you familiar with the code of operating rules called the "Association of American Railways Code"?

A. Yes, sir.

Q. Except for local situations peculiar to your own railroad, does this book of rules which you have there correspond closely to the A. A. R. code?

A. It does; it is issued in accordance with the standard code and conforms very closely thereto.

Mr. Booth: We tender counsel for examination and perusal the book of rules together with the profiles referred to by the witness and the employees' working timetables; also the record showing in detail the construction of locomotives and other information pertaining thereto which the witness used

on the witness stand. Do you want the consist of that 160-car train?

Mr. Strouss: Yes.

Mr. Booth: What are the length of runs of the freight [fol. 1584] locomotives, just give us some typical example?

A. Usually they are short but we have some runs, from Clifton Forge to Richmond, 233 miles; from Russell, Kentucky, to Hinton, West Virginia, about 165 miles; from Russell, Kentucky, to Wallbridge, 235 miles.

Q. Does your equipment conform to the interchange rules of the Association of American Railroads?

A. Yes.

Q. Do you regularly interchange equipment on your road with other roads and equipment of other roads, speaking of freight equipment now, with your road?

A. We do.

Q. Through the junction point which you mentioned earlier in your testimony?

A. We have junction points at Chicago——

Mr. Booth: (Interrupting) I think you gave that list of junction points, Mr. Beale, didn't you?

A. Not completely.

Q. Mention the principal ones.

A. Cincinnati, Chicago, Louisville, Lexington, Toledo, Fostoria, Marion, Columbus, Elkhorn City, Gilbert, Deep [fol. 1585] water, Charleston, Lynchburg, Charlottesville, Washington, Richmond, Norfolk.

Q. On this map, defendant's exhibit No. 116, I see a number of branch lines running to the south from the main line in the main line territory beginning at Huntington, West Virginia, and ending at Hinton. Do these lines penetrate a coal producing territory?

A. They do. The first one of those was the one we described as the Logan subdivision. The others have not been described but they are branches on which coal originates.

Q. What is the general character of the freight movement on those lines expressed in number of cars in a train?

A. It varies a great deal, depending on the amount of business there is available and the facilities for handling it. On some of them we handle 100 or more loads, handle 160 empties. On others the train is much shorter.

Q. Do you handle freight other than coal in trains of over 140 cars?

A. Yes.

Q. What character of freight?

A. All the general kinds of freight that we have to handle, which would be manufactured products, products of agricul- [fol. 1586] ture, perishables, road materials, anything that we have to handle and we handle a diversified freight.

Mr. Booth: I think that is all. Do you desire to defer cross-examination?

Mr. Strouss: Yes, I prefer to defer it.

(Witness temporarily excused.)

Locke S. Wilbur was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Booth:

Q. Will you state your name to the reporter?

A. Locke S. Wilbur.

Q. Where do you reside?

A. Richmond, Virginia.

Q. Are you employed in the general offices of the Chesapeake and Ohio Railway Company?

A. Yes, sir.

Q. At what point?

A. Richmond, Virginia.

Q. In what capacity?

A. I am chief clerk of the statistical division and in that capacity report direct to our vice-president and general [fol. 1587] manager who is in full charge of the operations of the Chesapeake and Ohio Railway at Richmond, Virginia, with headquarters at Richmond.

Q. You are attached to the operating department and not to the accounting department?

A. Yes, sir, the operating department, not the accounting.

Q. Do you have full access to the books and records of the accounting department as well as your own department?

A. I do.

Q. Are you familiar with the accounting methods and practices of your company particularly as they relate to the

movement of trains, recording of statistics relating to train movements, the reporting of accidents, and the making of all classes of reports to the Interstate Commerce Commission?

A. Yes, sir.

Q. Do you have access to all of those records?

A. I do.

Q. When did you enter the service of the Chesapeake and Ohio?

A. In August, 1922.

Q. As what?

A. Chief clerk in the maintenance of way department and [fol. 1588] in June, 1924, became chief clerk of the statistical division. In September, 1933, I was still chief clerk of the statistical division but from that time on reported direct to the then general manager and later this title was changed to vice-president and general manager.

Q. Do you make and direct the making of special statistical studies for the information and guidance of the officials of the company and for presentation before courts and commissions?

A. I do.

Q. You have testified before courts and commissions in support of such studies?

A. I have.

Q. When and where and in what capacity did you first enter the railway service?

A. I entered railway service with the Cleveland, Cincinnati, Chicago and St. Louis Railway as an accountant in the maintenance of way department. In 1913 I became chief clerk of the valuation department and in 1920 chief clerk in the executive offices. I remained in that capacity until I went with the Chesapeake and Ohio Railway in August, 1922.

[fol. 1589] Q. You speak of the valuation department. Was that the department having to do with the valuation of the properties of the C. C. & St. L. Railway required by the valuations sections of the Interstate Commerce Act?

A. Yes, sir, the valuation of that property ordered by the Interstate Commerce Commission.

Q. Have you prepared a number of exhibits for the purpose of testifying to them in the course of your testimony in this case?

A. Yes, sir.

Q. Now, in preparing those exhibits, what regular practice did you follow as to the incorporations, the figures for which you have included in the exhibits with respect—I will be a little more definite—with respect to the Chesapeake & Ohio Railway proper and the Hocking Valley Railway Company?

A. These exhibits, some of which go back to 1922, and others to 1924, all include the Hocking Valley Railway. The Hocking Valley Railway formerly operated 348 miles of railway, and reported separately to the Interstate Commerce Commission until the Hocking Valley Railway was taken over by the Chesapeake & Ohio Railway, effective as of May 1, 1930. Due to this property operating such exten-
[fol. 1590] sive mileage, we have always made a practice in preparing our statistics and exhibits for our own purposes, as well as all others, and for proper comparisons, have included the Hocking Valley in order to make the road, except for and excluding minor changes in mileage, comparable for the entire period.

Q. Look at defendant's exhibit 116, the map testified to by Mr. Beale, and state where the Hocking Valley lines are located?

A. The Hocking Valley lines started at approximately what is shown here as Columbus, it is just outside of Columbus, and extended to Toledo. Then, from Columbus again down to Parsons, and extended to Athens and Pomeroy.

Q. That was a subsidiary company of the Chesapeake & Ohio prior to the time it was merged with the Chesapeake & Ohio?

A. Yes, sir.

Q. But as it was separately operated, it was required to report separately to the Interstate Commerce Commission?

A. Yes, sir.

Q. Did it file separate OS-A and OS-E reports?

A. It did.

[fol. 1591] Q. And was a Class I railroad?

A. Class I railroad, yes.

Mr. Booth: I have handed the clerk, and I ask that there be marked "Defendant's Exhibit 120 for identification," a sheet headed: "The Chesapeake and Ohio Railway Company (Includes Hocking Valley Railway for entire period) Freight Operating and Freight Transportation Expenses Related to Traffic Calendar Years 1922 to 1939, Inclusive."

Q. I ask you, Mr. Wilbur, if you have that sheet before you?

A. I have.

The Court: It may be marked for identification.

The Clerk: Defendant's Exhibit 120 for identification.

Mr. Booth: Was this prepared by you?

A. Yes, sir.

Q. From what source or sources did you take the figures contained in the columns B, C, and D, opposite the years 1939 to 1922, inclusive?

A. The entire information was taken from the annual reports to the Interstate Commerce Commission, for which purpose I used the office files of our general auditor, which [fol. 1592] are the official office copies of the report as rendered to the Interstate Commerce Commission.

Q. Did you use those reports for both the Chesapeake and Ohio and the Hocking Valley?

A. I did.

Q. And have you those here in the courtroom?

A. Yes, sir.

Q. About how many of them are there?

A. Thirty-one, I think, due to the fact that there are two reports for some years, for 1922 to 1929, and one for a four-months' period in 1930 for the Hocking.

Q. Do these aggregates, in columns B, C, and D, correctly reflect the corresponding entries in the reports to which you have just referred?

A. They do.

Q. Are the computations in the columns E and F and in the three horizontal blocks at the foot of the exhibit true and correct?

A. They are, to the best of my knowledge and belief. I checked these, however, so I was very positive.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Booth: We offer this in evidence to be marked "Defendant's Exhibit 120."

[fol. 1593] Mr. Strouss: The same objection.

The Court: The objection is overruled. The exhibit may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 120.")

Mr. Booth: There has been handed to the clerk and I ask that there be marked "Defendant's Exhibit 121 for identification," an exhibit, consisting of one sheet, headed "The Chesapeake and Ohio Railway Company (Includes Hocking Valley Railway for entire period) Freight Service Operating Averages, Calendar Years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 and 1939." I will ask you, Mr. Wilbur, whether you have prepared this exhibit?

A. Yes, sir.

Q. Are the sources from which this exhibit was prepared correctly shown and described, together with the formulae for computing the computed items in the exhibit in the five source notes at the bottom of the exhibit?

A. Yes, sir, with the exception that there is no mention made, of course, as to the method for computing the percent increase, 1939 over 1922, shown in column M. That calculation, however, is obvious.

[fol. 1594] Q. Have you with you the forms OS-A?

A. I have.

Q. Used in making this report?

A. Yes

Mr. Booth: I don't know that I have tendered to counsel the annual reports referred to by the witness, and I will tender them to him at this time, together with the forms OS-A just referred to by the witness.

Q. What was the reason, if you know, for the variation in miles of line operated in freight service shown in this exhibit?

A. I will give you some of the major changes. You will notice, generally it has been an increase throughout the period. In 1925, we leased the Long Fork Railway between Martin and Weeksbury, Kentucky, approximately 35 miles; also, the Sandy Valley and Elkhorn between Shelby Junction and Dunham, Kentucky. I don't think these little towns will show on the map. They are coal branches. That last mentioned is 30 miles. We also, in 1925, purchased the Coal River & Eastern, located between Seth and Prentiss, West Virginia, ten miles. I am giving these miles in round numbers. In 1926 we leased the Pond Fork and Bald Knob, 13 miles. We made a purchase of some further parts of one [fol. 1595] of our lines of about three miles. In 1927, we extended the Pine Creek branch four miles, and the Kincomnick and Freestone. We are in 1927 now. We took over

the operation of the Loop and Lookout and the Sewell Valley, both branches of the coal railroad known as the N. F. & G.; that is a total of fifty miles. In 1928 we took over the Green Brier and Eastern, eleven miles, and an additional part of the Sewell Valley, eight miles. Then there were some very small items in 1928, totaling four miles of these two coal branches. In 1929, we took over the Big Clear Creek, five miles, and in 1930 the Big Sandy and Kentucky River, 25 miles. We made an extension of the Ganley and Rich Creek branch in excess of five miles, and some other miscellaneous in that year of nine miles. In 1931 we added the Blue Jay branch, fifteen miles. And in that year there was a decrease in mileage due to discontinuing the operation of the Kentucky and South Atlantic branch, 19 miles. In 1932 we added additional mileage between Swiss and Nallen, West Virginia, 28 miles, and a little branch of that branch of two miles. In 1933 we retired all or part, I am not sure whether it is all of the branch, the Potts Creek branch, 17 [fol. 1596] miles, and a part of the Buckingham Branch in excess of four miles. In 1934, we retired the Cabin Creek branch, and we added trackage of nine miles on the Cabin Creek, and added three miles of trackage at Charleston, West Virginia; in 1935 we retired the upper end of that Kinniconnick and Freestone, four miles. There didn't much happen then until 1938, when we extended a branch known as the West Fork Subdivision, five miles, and in 1939 we entered into joint operation with the Virginian, in excess of 17 miles, and in that year we retired the Sugar Creek subdivision up in the Hocking Valley six miles. That probably won't balance, but those are the major items.

The Court: We will take our noon recess.

(Thereupon the court stood at recess.)

[fol. 1597] December 13, 1940, two o'clock P. M.

Proceedings were resumed at this time as follows:

The Court: You may proceed.

Mr. Booth: We were discussing Exhibit 121 for identification when the court adjourned for the noon recess. Now, does that exhibit include the consolidated reports to the Interstate Commerce Commission, or does this exhibit represent a consolidation of the reports to the Interstate Commerce Commission of the Chesapeake and Ohio Railway

Company, and the Hocking Valley Railway for the period shown by the exhibit, in so far as those companies rendered separate reports?

A. It is compiled by adding the proper aggregates together for the two companies.

Q. And to the best of your knowledge, is the exhibit true and correct, including the computations made in accordance with the formula shown thereon?

A. It is.

Q. And the percentages shown in column M?

A. They are correct, to the best of my knowledge and belief.

Mr. Booth: Mr. Strouss, have you any questions?

[fol. 1598] Mr. Strouss: No questions.

Mr. Booth: We offer this exhibit in evidence as defendant's exhibit 121.

Mr. Strouss: The same objection.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 121.")

Mr. Booth: Mr. Wilbur, considering together exhibits 120 and 121, will you state from exhibit 120, the number of revenue ton miles, in round figures, carried in 1939?

A. 18,041 million ton-miles.

Q. And in 1922?

A. 11,487 million ton-miles.

Q. Then the railroad hauled approximately six million five hundred fifty three thousand, or slightly more than six billion five hundred fifty three thousand ton miles more of revenue freight in 1939 than it did in 1922, is that correct?

A. No, they hauled approximately six billion five hundred fifty three million net revenue ton miles, an increase of 57.0 per cent.

Q. Now, going to exhibit 121, how many freight train [fol. 1599] miles did the two railroads, considered together, operate in 1922?

A. They handled approximately nine million, four hundred seventeen thousand train miles.

Q. In 1922, that is line No. 2 in exhibit 121, is that correct?

A. Correct.

Q. And in 1939, how many freight train-miles were operated according to that line of the exhibit?

A. Nine million, five hundred sixty-nine thousand. That is an increase in train miles of 1.6 per cent.

Q. Or one hundred fifty-two thousand train-miles?

A. One Hundred fifty-two thousand train-miles or 1.6 per cent.

Q. Then, according to these exhibits, the railroad handled over six and a half billion revenue ton-miles of freight more in 1939 than it did in 1922, with an increase of only 152,000 train-miles?

A. Yes, sir.

Q. Now, will you turn to line 4 of exhibit 121? What does that line represent?

A. That shows the net tons per freight train; that is tons [fol. 1600] in the car and does not include the weight of car.

Q. Those tons would be represented in another form by the revenue ton-miles?

A. Yes, sir, in the revenue freight trains, there are a few cars of non-revenue material, not in all revenue freight trains, but they may be in any revenue freight train.

Q. Such as company material?

A. Such as company material, the rail we receive and ballast and some other materials. You understand we do not include work trains. This is just straggling cars that move over the road when there is not sufficient to get out a work train.

Q. In putting the three comparisons together, the company during that same period increased its revenue tons per freight train by 59.3 per cent?

A. Yes, sir.

Q. And increased its revenue ton-miles by 57 per cent?

A. Yes, sir.

Q. But its freight train miles by only 1.6 per cent?

A. That is correct.

Q. During the same period, what increase was there in [fol. 1601] figures of cars per train from 1922 to 1939?

A. The freight cars per freight train are shown in line three. In 1922 the average number of cars per train of all freight trains is 51.9. In 1939 it was 79.5, an increase of 53.2 per cent.

Q. What method is used by the Interstate Commerce Commission in ascertaining the average number of cars per freight train?

A. It is found by dividing the total freight car-miles by the total freight train-miles.

Q. Is that the method used in arriving at the cars per freight train in the annual reports to the Interstate Commerce Commission, from which this exhibit was constructed?

A. Yes, sir.

Q. And that would include all trains classified as freight trains, no matter how short or how long they were, and no matter how many miles the train operated or whether it operated on the main or branch lines, would it not?

A. That is true.

Q. It would include what has been referred to here as local freights and way freights?

A. Yes, sir.

[fol. 1602] The Court: I don't know that I just get that answer, Mr. Wilbur. Will you elaborate on that, or restate it as to how the Interstate Commerce Commission arrives at the number of freight cars per freight train, I believe was the question.

A. Under their rules, for freight car-miles, a record is made from the wheel reports and obtain the total freight car-miles run in all freight trains, and having obtained that, and also under their regulations obtained the freight train-miles, the miles run by the trains carrying these cars, the car-miles are divided by the train-miles, that gives the average cars per train.

Q. I notice in this exhibit that it shows, for instance, for the year 1939 on your road that the average number of cars per freight train was seventy-nine and a half?

A. Yes, sir.

Q. And that was arrived at in the manner you have indicated?

A. Yes, sir.

The Court: The reason I was asking this question, gentlemen, this road appears to have a much larger number of freight cars per freight train than any road we have had to date. Some of the others were extremely low, down to [fol. 1603] thirty or forty, as I recall.

The Witness: Yes, sir.

Q. But your road, due to the operations that were reported this morning, you do have exceptionally long trains?

A. That is the influence, yes, sir. The influence downward on our road is due to all these branch-line operations that Mr. Beale spoke of, where we have to go down and bring out just a few cars. That is an adverse condition we have, but in spite of that it is 79.5 cars in 1939.

Mr. Booth: Will it be all right to say that the method of computation required by the Interstate Commerce Commission really represents as the average number of cars per train the average number of freight car-miles handled per freight train-miles?

A. Yes, sir.

Q. Suppose you have a freight train, one freight train running one mile with one hundred cars, how many car-miles would it have accumulated?

A. It would accumulate a thousand car-miles—you said one mile?

Q. One mile.

A. It would just accumulate a hundred.

[fol. 1664] Q. If you had the same freight train but only had ten cars in it, it would accumulate only ten car-miles?

A. Yes, sir.

Q. The two freight trains added together would be one hundred ten car-miles?

A. Yes, sir.

Q. You divide that by two freight trains and obtain an average——

A. ——of fifty-five cars.

Q. Which would really be the average number of freight car-miles to a freight train-mile?

A. Yes.

[fol. 1665] Q. Would it be correct from a statistical standpoint to say that it was really the weighted average of distance and number?

A. It is a weighted average, yes, sir, and not a mathematical average, the difference being the weighted average takes into account all features and the mathematical average in your case would have been the sum, but in the case of varying factors the weighted average would be the true average.

The Court: What do you mean by "weighted average"?

A. It might be best illustrated—if you ran ten trains with thirty cars each and twenty trains with sixty cars each, now if you add—you put your two factors together and add them,

20 and 60, you would have an average of 45. The total would be 90, and you would have an average of 45. The weighted average, you multiply 30 cars by the 10 and have 300, and the 20 trains by 60 and you have 1,200, and you divide the 1,500 by the sum of those trains, which is 30, and that gives you the weighted average of 50 cars. The first is merely a mathematical average, you have some trains of 30 and some trains of 60, and you add them together and divide, it is [fol. 1606] merely the mathematical average of that.

(Discussion off the record.)

By Booth:

Q. Mr. Wilbur, before we pass to another exhibit have you before you a copy of the Chesapeake and Ohio annual report to the Interstate Commerce Commission for the year 1939?

A. Yes, sir.

Q. Will you turn to schedule 541, revenue freight carried during the year, beginning at page 512 and read it to the record, first from page 519 the grand total of all carload traffic carried during that year?

A. The grand total carload traffic carried during the year 1939 was 1,359,943 cars.

Q. And the total number of tons of less than carload freight in line 710?

A. 475,676 tons.

Q. Related to the number of tons carried in those cars which is shown in column K on page 519 what percentage of the tonnage does L. C. L. bear to the total tonnage carried, about?

A. Approximately eight-tenths of one per cent.

Q. Taking the commodity groups 1 to 5 inclusive, will you read the number of carloads of freight in each group, giving the name of the group.

[fol. 1607] A. Group No. 1, products of agriculture, carloads, 69,649 cars; Group No. 2, animals and products, carloads, 22,214 cars; group No. 3, products of mines, carloads, 989,823 cars.

Q. Of those products of mines, how many carloads were bituminous coal?

A. 917,873.

Q. How many were coke?

A. 14,562.

Q. How many were iron ore?

A. 6,932.

Q. Group No. 4, products of forests?

A. Group No. 4, products of forests, carloads, 42,481 cars.

Q. And group No. 5, manufactures and miscellaneous?

A. Carloads, 235,776.

Q. There is one agricultural product I believe Mr. Beale did not refer to and that is leaf tobacco. How many carloads of that did you handle?

A. 14,992 cars.

Q. Will you turn to defendant's exhibit No. 117 for identification. Mr. Beale has already stated that he selected the main line and subdivisions for the purpose of this check. [fol. 1608] That is correct, is it?

A. Yes, sir.

Q. Who selected the two two-week periods consisting of 28 days in June and October, 1939, respectively?

A. I selected those.

Q. For what reason did you select them?

A. I endeavored as near as possible to get two periods which would represent combined about the normal flow of traffic on all these divisions, four of which are on the eastern general and three on the western general part of the railroad.

Q. Do you in the course of your employment have occasion as part of your duty to make forecasts for the vice-president in charge of operation?

A. Yes, sir, that is one of my major duties, to forecast not only the volume of business but also to prepare forecasts of the estimated expense under which we will be in handling.

Q. In connection with that duty is it necessary for you and do you become familiar with the character and class of commodities and traffic handled by the railroad and their probable volume and past volume?

A. Yes, sir, I keep in daily touch with that.

Q. Based on that information and your experience will [fol. 1609] you say you consider these four weeks to be fairly typical weeks of the year's business of 1939?

A. On the subdivisions as shown.

Q. Based on the same experience would you consider these subdivisions as representative of the system as a whole?

A. No, this set-up here in each subdivision, the figures here are typical of that subdivision.

Q. What are those subdivisions typical of if they are typical of anything?

A. They are typical of the heavy traffic portion of the railroad.

Q. From what source or sources were the figures in lines 1 to 13 of this exhibit obtained?

A. They were taken from the conductors' wheel reports, our company form BF-2 and AF-374.

Q. Are those reports signed by the individual conductors of the individual trains?

A. Yes, sir.

Q. And from the conductor they go where?

A. From the conductor, one copy goes to the superintendent; two copies of that portion of the wheel report showing the car numbers, commodities, and the weights are sent to the car accountant. From one of his copies he prepares all [fol. 1610] the statistical data required by the Interstate Commerce Commission and from the other copy he strips so that each car is by itself and from that he keeps his book record of where every car is and what cars are delivered to other railroads and where foreign cars on our lines are moving, the last report as per the wheel report, that is, their location.

Q. Does the information contained on these wheel reports find itself into the OS-A eventually?

A. Yes, sir.

Q. Does it also find its way into the records of the company maintained for the purpose of showing volume and mileage of traffic on its respective subdivisions?

A. Yes, sir.

Q. Do you have access to the wheel reports as well as to the reports that follow them?

A. Yes, sir.

Q. But you used only the wheel reports in making up this exhibit?

A. Just the wheel reports.

Q. This exhibit according to its title is confined to freight trains operating between the regular freight engine terminals on the subdivisions listed. Were there other freight [fol. 1611] trains on those subdivisions besides the freight trains operated between those terminals?

A. Yes, sir, on the Peninsula division at the lower end, down near Tidewater we have a little local freight that operates in and around called the "Hampton local." That

is not included, it does not go up on the main line except for a few miles.

Q. Did you bring all of the wheel reports including trains shown and the trains not shown for all divisions numbered 2 to 8, inclusive?

A. No, sir, I brought all the wheel reports which cover trains which, as is stated in the heading, operated the entire distance between the terminals of these subdivisions. In other words, all the wheel reports covering every train shown on the exhibit but not wheel reports covering any trains which ran or turn around and do not make the entire trip over the subdivision listed.

Q. Was this exhibit prepared under your personal direction?

A. Yes, sir.

Q. Did you satisfy yourself that the exhibit showed all trains of the character described in the title of the exhibit? [fol. 1612] A. Yes, sir, I examined those wheel reports for those subdivisions which were not used in preparing this statement and found that all of those covered trains which did not traverse the entire distance of the subdivision.

Q. You prepared this for the purposes of this case?

A. Yes, sir.

Q. Is it true and correct to the best of your knowledge and belief?

A. It is.

Mr. Booth: Are there any questions, Mr. Strouss?

Mr. Strouss: Mr. Wilbur, the wheel reports which you have here of course only cover the trains which are shown in this exhibit?

A. Yes, sir.

Q. They don't show what other trains may or may not have been operated during that period?

A. No, each wheel report is individual unto itself, not each individual sheet because some of them have as many as five and six sheets.

Q. But the information has only to do with that train?

A. Yes.

Q. From those wheel reports it is impossible to determine [fol. 1613] how many trains other than these may have been operated that day or that period between the divisions?

A. That is true.

Mr. Booth: This exhibit is submitted, if the court please, as a typical exhibit only showing the general character of the through trains operated on these subdivisions. We offer the exhibit in evidence.

Mr. Strouss: Same objection.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 117.")

Mr. Booth: We tender for counsel's examination the wheel reports in question. Those are here in the courtroom, are they, Mr. Wilbur?

A. Yes, sir.

Q. Turning to defendant's exhibit No. 119 for identification, the passenger exhibit, from what source did you procure the information shown in columns 3 to 17, inclusive, of this exhibit opposite lines 1 to 6 and lines 9 to 14, inclusive?

A. Those were obtained from the passenger wheel reports, form BP-1½.

Q. What is the method of handling these passenger wheel [fol. 1614] reports?

A. A conductor makes up his wheel report on leaving his terminal and then as he ends his run, which in the case of the train crews out of Washington and Clifton Forge, he hands his wheel report on to the next crew and that is continued on until they get into the final terminal which for these trains is either Washington or Cincinnati as the case may be according to whether they are east or west.

Q. What wheel report goes to whom?

A. To the superintendent and to the car accountant at Richmond, Virginia.

Q. You have access to those reports and did that for the purpose of this statement?

A. Yes, sir.

Q. Did you obtain those reports from the office of the car accountant?

A. Yes, sir.

Q. Do those form a basis eventually for OS-A reports?

A. Yes, sir.

Q. And eventually, in one form or another get into your annual report to the Interstate Commerce Commission?

A. Yes, sir.

[fol. 1615] Mr. Booth: Mr. Mason calls my attention to the fact that OS-A relates only to the freight service?

A. I overlooked that, too, form OS-B that is the passenger statistical form similar in some ways to the freight form OS-A.

Mr. Booth: In preparing this exhibit did you take the greatest number of cars in the trains at any one time between Washington and Cincinnati as the basis for classifying the train into these various lengths?

A. Yes, sir.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: These wheel reports that you have here relate only to the passenger trains?

A. No, I have all the passenger—you will notice they are very compact little files. They are all the wheel reports for all passenger trains for four months. We didn't unbind those, in the other case, they were simply so voluminous.

Q. Why did you take a four-month period here and two week period on the freight trains?

A. It is a matter of necessity that we take a much shorter period on the freight trains in order to have the information ready. It is quite a voluminous task to draw these [fol. 1676] freight trains down. In that period you will notice there are 3,200 freight trains for which some 9,000 wheel report sheets had to be examined.

Q. Your passenger operation, is that affected by Congress being in session at any time?

A. Not particularly, no, sir.

Q. Your traffic between Washington and Chicago——

A. We don't have passenger business between Chicago and Washington, it competes with the Pennsylvania and the New York Central. You have to come down through Cincinnati and then over to Washington, a considerably longer route.

Q. How about Cincinnati and Washington?

A. Between Cincinnati and Washington there would be some variance in the traffic, it is more seasonal and affected by other things, conventions influence it, movements of the National Guard will influence it when they move. This year they influenced it. As to the months of January, April, July, and October I have some knowledge of the car miles which I keep track of in connection with my other duties and they are approximately one-third of the car miles for the year.

Q. Were any of these things that you speak of as influencing that traffic, were any of those during the months that you used here?

[fol. 1617] A. They might or might not. I know the Guard movement would not because that is chiefly in August.

Mr. Strouss: That is all.

Mr. Booth: We offer this in evidence as defendant's exhibit No. 119.

Mr. Strouss: Same objection.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 119.")

Mr. Booth: I have handed the clerk an exhibit in one sheet entitled, "The Chesapeake and Ohio Railway Company, (Includes Hocking Valley Railway for entire period) Casualties to All Classes of Employees on Duty and to Trainmen and Enginemen on Duty Sustained in Train and Train Service Accidents," and ask that it be marked defendant's exhibit next in order.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 122 for identification.

[fol. 1618] Mr. Booth: I now show the witness portions of defendant's exhibit No. 9, certified to by the Secretary of the Interstate Commerce Commission, the portions shown being the rules governing monthly reports of railway accidents, the order of October 24, 1935, supplementing those rules, the order of June 5th, 1936, supplementing those rules, the order of October 30, 1936, supplementing those rules, and the order of January 28, 1939, supplementing those rules. Are you generally familiar with the rules to which I have referred, Mr. Wilbur?

A. Generally, yes, sir.

Q. And do you know whether or not the Chesapeake & Ohio Railway Company, during your official connection with it in the capacity to which you have testified, has regularly rendered reports to the Interstate Commerce Commission under those rules?

A. They have.

Q. And have you seen in the office of the Commission as well as in the office of your company the copies of those reports?

A. Yes, sir.

Q. I now call your attention to a part of the same certified record, which is the monthly report of railway ac-
[fol. 1619] cidents, Form T, of the reports. Were the reports in question rendered, in so far as that form was applicable, on Form T?

A. Yes, sir.

Mr. Booth: I desire to show the Court this Form T.

The Court: In other words, that is a report that the Interstate Commerce Commission requires to be made monthly by each of the railroads?

A. Yes.

Mr. Booth: Now, are you familiar with the accident bulletins of the Interstate Commerce Commission for the years 1924 to 1938, inclusive?

A. Yes, sir.

Q. And have you a set of those reports in the courtroom with you?

A. There is a set here, I have them in hand for 1922 to 1938, both inclusive.

Q. I show you a bulletin headed, "Interstate Commerce Commission, Bureau of Statistics, Accident Bulletin No. 107, Summary and Analysis of Accidents on Steam Railways in the United States, subject to the Interstate Commerce Act, Calendar Year 1938," with a facsimile of the seal of the Commission, and underneath that; "United States Government Printing Office, Washington, 1939. For
[fol. 1620] Sale by the Superintendent of Documents, Washington, D. C. Price 20 cents." I ask you whether that is the latest accident bulletin of that character that has been issued by the Interstate Commerce Commission?

A. Yes, sir, Bulletin 107 is the latest one.

Q. The bulletin for the calendar year 1939 has not yet been off the press, has it?

A. No, sir.

Q. Now, from what source or sources was this exhibit 122 for identification prepared?

A. Column B, which shows car-miles of all transportation service and work was obtained from the annual reports of the Hocking Valley and C. & O. Railway made to the Interstate Commerce Commission.

Q. Which have been produced in court and tendered to counsel?

A. Yes, sir.

Q. Now, just explain the term "all transportation, service and work."

A. The "all transportation service" includes freight train operation, passenger train operation, mixed train operation, and work service trains, in other words, all the trains that you run and all the car-miles that you run, and [fol. 1621] also includes what we call our gas-electric car operation, of which we have a very small amount on some of the smaller subdivisions.

Q. By "very small," what [illegible] does that relationship bear?

A. Well, it would run about 720,000 car-miles of the 722,000,000 car-miles in 1938, or about one per cent.

The Court: Explain what you mean by this gas car; what type of car is that?

A. Well, I am not mechanically able to explain other than it runs by an engine which, from the fuel applied to it, produces power, it consumes gasoline and produces electric power. It is a comparatively small combine car, most of them about half passenger, a compartment for mail and express, and then they sometimes carry a trailer car, which will be all for passengers, and in one case an express car, but they never run over two or three cars in it.

Q. Do I understand such car or train would have no locomotive?

A. No. This gas-electric car is the motive power for it.

Mr. Booth: You say it represents about one per cent of the total car-miles?

[fol. 1622] A. Yes, sir.

Q. And that exclusively in passenger service?

A. Exclusively, yes, sir.

Q. Not classified as a freight train?

A. No; it handles no freight.

The Court: But such car and its operation is included in this column B?

A. Yes, sir.

Mr. Booth: From what sources did you obtain columns C, D and E?

A. They are obtained from the table 99 of the bulletin of accidents issued by the Interstate Commerce Commission.

Q. Will you take your copy that you have before you of Bulletin 107, and state for the benefit of the Court, who has

one of the copies before him, the page and place where these entries are contained. (Addressing Mr. Strouss) I am sorry, Mr. Strouss, I haven't another copy here.

Mr. Strouss: I have been all over that table.

A. You find the Chesapeake & Ohio Railway on page 70, and that shows in table No. 99 on line 10—I beg your pardon—yes, that is right, table 99.

[fol. 1623] Mr. Booth: Just state from that line as it is before you in that bulletin the number of casualties to all employees on duty during the year 1938 in terms of persons killed and persons injured.

Mr. Strouss: I think, if the Court please, that there should be some offer of the exhibit in evidence before they start reading it in.

The Court: That is true.

Mr. Booth: You are correct about that.

Q. Does the table show for 1938 the number of all employees on duty killed and the number of all employes on duty injured on the Chesapeake & Ohio, including the Hocking Valley Railway, for the year 1938?

A. It does.

Q. Now, when you go back to former years when the two companies reported separately to the Interstate Commerce Commission, are these figures in a consolidated form, or separately, in the annual accident bulletins by the Chesapeake and Ohio and the Hocking Valley?

A. The Hocking Valley is shown separately, and the figures for exhibit 122 are obtained by combining the two reports for the years 1924 to 1929, both inclusive, and in [fol. 1624] 1930 the Hocking Valley shows for the four months' period prior to May first. That is included in the totals for 1930.

Q. During those years when the companies reported separately, is the Hocking Valley in the same group in the annual accident bulletin as the Chesapeake and Ohio?

A. The same group? No, sir. The Chesapeake and Ohio, in 1924 appeared in the group called the Southern District; the Hocking Valley appeared in the group called the Eastern District.

Q. Those are regional groups?

A. Regional groups prescribed by the Interstate Commerce Commission.

Q. Now, where will casualties to trainmen or enginemen on duty be found in the bulletin 107 of 1938?

A. They will be found on page 71, line 10, under the heading in Roman numerals "VI," 6(b), transportation train and engine.

Q. Columns I and J of this defendant's exhibit 122 for identification, are computations made by you from the preceding figures, are they?

A. Yes, sir.

Q. And likewise, are the blocks numbered 16 to 20 inclusive, computations made by you?

[fol. 1625] A. Yes, sir.

Q. Are those computations true and correct?

A. Yes, sir, to the best of my knowledge and belief.

Q. When did you come to Tucson, Mr. Wilbur?

A. I arrived Monday morning.

Q. Last Monday morning?

A. Yes, sir, on the Golden State.

Q. Has this exhibit been prepared by you since you have reached Tucson?

A. Yes, sir.

Q. Did you use to any extent or in any manner the forms T, or any other records or documents of the Chesapeake and Ohio in preparing this statement except the annual reports?

A. I used the annual accident bulletins for the number of casualties both to all employees and trainmen and enginemen. These bulletins, as shown here in these three bound books.

Q. And the annual reports?

A. And the annual reports, which I brought with me.

Q. Is this exhibit true and correct, to the best of your knowledge and belief?

A. Yes, sir.

Mr. Booth: Any questions, Mr. Strouss?

[fol. 1626] Mr. Strouss: Yes.

Q. I understand you to say you tendered me something a while ago. I didn't hear what it was.

A. Oh, I didn't——

Q. Was it the accident bulletins?

A. I laid it up there. It can be tendered.

Q. I was just trying to get clear what your answer has been.

A. I guess it was something I misunderstood.

Q. This exhibit, except for the items shown in column B, is taken entirely from table 99 of the accident bulletins of the Interstate Commerce Commission?

A. Yes, sir.

Q. Now that table is made up of information taken from the Form T's filed by the railroad with the Interstate Commerce Commission.

A. Yes, sir.

Q. Those Form T's are not limited to the different employees shown in the column here, are they? In other words, they cover all train accidents and all train service?

A. Those listed on exhibit 122 are all the casualties to employees on duty in train and train-service accidents.

[fol. 1627] Q. I understand that, but the Form T that you filed with the Interstate Commerce Commission is not limited to accidents involving employees on duty?

A. No, sir.

Q. It covers all accidents?

A. Yes, sir.

Q. And the classification set up in table 99 shows different classifications of employees?

A. Yes, sir.

Q. And that is a compilation by the staff of the Interstate Commerce Commission from the different Form T's filed by your railroad?

A. That is correct.

Q. In other words, they have to sort out different Form T's that apply to this particular class.

A. The Form T classifies employees by number, it is prescribed in this bulletin. In their rules, they have a code and it is required that the carrier show, for example, that the injury occurred to employee that comes under the heading Division No. 111, which would be a road passenger conductor.

Q. But the result of this compilation in the accident bulletin is the segregating or sorting of those particular Form

[fol. 1628] T's?

A. That is the result of the use made of the Form T's by the Bureau of Accidents of the Interstate Commerce Commission, yes, sir.

Q. Of course, this exhibit doesn't in any way show whether these accidents occurred on short or long trains, does it?

A. No, this is all casualties.

Mr. Strouss: That is all the questions.

Mr. Booth: We renew the offer, if Your Honor please.

Mr. Strouss: We make the same objection, and the further objection that this is irrelevant and immaterial, because there is no probative value; there is nothing to show whether there is any relation between trainmen, just the total of all accidents that have occurred without any showing as to whether they may have been on short or long trains, no probative value as to effect of train length on accidents.

The Court: The objection will be overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 122.")

Mr. Mason: I think it should be understood, Your Honor —Mr. Strouss, may we understand that your objection to [fol. 1629] Exhibit 122 is not on the ground that the documents upon which it is based are not available to you?

Mr. Strouss: No.

Mr. Mason: Or that they are not, as to the publications of the Interstate Commerce Commission official publications of that body?

Mr. Strouss: My objection is that it is not the best evidence in the first place, therefore incompetent, second, that there is no showing here of similarity, that it is irrelevant and immaterial, third, that it has no probative value, fourth, that it is calling for a conclusion.

The Court: We will take our afternoon recess at this time.

(Thereupon, a short recess was taken, after which the witness was recalled to the stand and proceedings were resumed as follows:)

Mr. Booth: Mr. Wilbur, you prepared a tentative exhibit entitled "The Chesapeake and Ohio Railway Company (Includes Hocking Valley Railway For Entire Period). Derailments, all Classes of Service Reportable to the Interstate Commerce Commission for the Years 1924 to 1938, Inclusive," then the word "System."

A. Yes, sir.

[fol. 1630] Mr. Booth: That has been handed to the Clerk, and I ask that it be marked "Defendant's Exhibit 123 for identification."

The Court: It may be marked.

The Clerk: Defendant's exhibit 123 for identification.

The Court: Mr. Booth, before you go on with that, you questioned Mr. Wilbur with reference to 122. This does not purport to cover any casualties to passengers, does it?

A. No, sir, this is employees of the railroad on duty.

Q. Is there any report made to the Interstate Commerce Commission covering casualties to passengers?

A. Yes; that is included on the Form T. When there are injuries they are reported on Form T to the Interstate Commerce Commission.

Q. Would that report cover only such individuals as might be passengers on your lines, or would it cover, for instance, grade crossing accidents?

A. They are also reported on Form T. They wouldn't be passengers, of course, but it comes under the general heading "Highway Crossing Accidents."

[fol. 1631] Mr. Booth: Non-trespassers?

A. Non-trespassers, if they are grade crossings. Occasionally there are some that are trespassers.

Mr. Mason: Isn't it a fact you also report accidents to trespassers, hoboes on your trains, if they are killed or injured?

A. Yes; in fact, any accident that is the result of the operation of the trains is reportable on form T.

The Court: But this particular schedule, 122, is limited entirely to the employees of the railroad?

A. Yes, sir.

Mr. Booth: This exhibit, the one I have just identified, really belongs logically in what I refer to as the third grand subdivision of our case, but because I did not want to ask Mr. Wilbur to stay here or to come back, I have put it in in connection with the economic part of the case. The classification of accidents, the form of report, and a great deal of information regarding that will be very fully gone into after the recess.

The Court: All right.

Mr. Booth: Mr. Mason calls my attention to the fact that [fol. 1632] the casualties to passengers is shown on Table 100 of the accident bulletins by railroads.

Q. Mr. Wilbur, referring to defendant's exhibit 123 for identification, from what source did you take columns B, C, and D of this exhibit?

A. I took those from the annual reports to the Interstate Commerce Commission of the Hocking Valley and C. & O. Railways for the period 1924 to 1938.

Q. Reports which you have already produced here?

A. Yes, sir.

[fol. 1633] Mr. Booth: Column B is headed "Locomotive Miles (Thousands)." Does that include freight and passenger locomotives?

A. Yes, sir, and switching locomotives.

Q. It includes locomotives operated in yards?

A. Yes, sir.

Q. Does that include the mileage made by these gas cars you spoke of a while ago?

A. No, sir; I will change that expression of it. This includes the locomotive miles and the train miles of these gas-electric cars. In other words, there is only one of the cars with power and that is the motive power unit and the miles of that unit are found by taking the train miles from the report of mileage made by the gas-electric cars.

Q. That is in accordance with the instructions from the Commission?

A. Yes, sir.

Q. Column C, "Train Miles (Thousands)," does that likewise include all classes of freight trains, passenger, work, and mixed, if you have any?

A. Yes, sir.

Q. And these gasoline units?

A. Yes, sir.

Q. The car miles in thousands, does that include freight [fol. 1634] cars, passenger cars, and cars with company material moving in maintenance-of-way trains?

A. Yes, sir.

Q. And these gasoline cars also?

A. Yes, sir.

Q. From what source did you take columns E, F, G, H, and I?

A. They are taken from the table No. 101 of the accident bulletins issued by the Interstate Commerce Commission.

Q. Did you find the same necessity for combining the Hocking and the Chesapeake figures from the same years that you found with respect to exhibit No. 122?

A. Yes, sir.

Q. You combined them in the same manner?

A. Yes, sir.

Q. Did you find those figures consolidated in the Chesapeake portion of the accident bulletins in this exhibit as you did in the other exhibit, No. 122?

A. Yes, sir.

Q. The derailments shown here are not confined to derailments resulting in personal injury to employees or others, are they?

[fol. 1635] A. No, sir.

Q. They include all classes of derailments from what point, or what is reportable to the railroad?

A. In accordance with the rule here a train accident would include, if it were a derailment, which is what we are discussing in this exhibit, a derailment which cost for repairs to equipment and including the cost of clearing the wreck in excess of $150.

Q. In any derailment that resulted in damage to equipment or other railway property, including the cost of clearing the wreck, of $150 or less is not reportable to the Interstate Commerce Commission and would not be included on this exhibit, is that correct?

A. That is correct.

Q. So that these derailments shown on this exhibit may or may not have resulted in personal injuries, is that correct?

A. That is correct.

Q. If they resulted in personal injuries the character of the injury and the person to whom it happened would be shown on the form T in addition to the cost of clearing the wreck and so forth?

A. Yes, sir.

[fol. 1636] Q. And if it did not result in personal injury only the character of damage and the cost thereof would be shown?

A. That is right.

Q. You have computed in columns J, K, and L total derailments on three bases, have you not?

A. Yes, sir.

Q. What are the bases?

A. The total derailments per 100,000 locomotive miles are shown in column J; for 100,000 train miles in column K, and per 1,000,000 car miles in column L.

Q. You have shown in block 16 the corresponding figures to those shown for the respective years from lines 1 to 15, inclusive, but for the four years, 1924 to 1927, inclusive?

A. Yes, sir.

Q. And the same is true of line 17 except it relates to the years 1928 to 1931, inclusive?

A. Yes, sir.

Q. And line 18 except that it relates to 1932 to 1935, inclusive?

A. Yes, sir.

Q. And line 19 except that it relates to 1936 to 1938, inclusive?

A. Yes, sir.

[fol. 1637] Q. In line 20 you have compared the period 1936 to 1938 with the three-year period 1924 to 1927?

A. No, Mr. Booth, with the four-year period 1924 to 1927.

Q. The four-year period, 1924 to 1927?

A. Yes, sir.

Q. And line 21 you have made a comparison of the year 1924 with the year 1938?

A. Yes, sir.

Q. I take it that the word "improvement" as used in line 20 simply means there were 81 per cent less derailments in the three-year period 1936 to 1938 than there were in the period 1924 to 1927 measured on the basis of car miles?

A. Yes, sir, in column L.

Q. And the word "improvement" as used in line 21 merely refers to the decrease in percentage of 1938 compared with 1924 in the three columns J, K, and L?

A. Yes, sir.

Q. Are the figures and computations shown on the face of this exhibit true and correct to the best of your knowledge and belief?

A. Yes, sir.

Q. This exhibit, like exhibit No. 122, was prepared after [fol. 1638] you came to Tucson?

A. Yes, sir.

Q. And solely from the sources shown in the two source notes at the bottom of the exhibit?

A. Yes, sir.

Q. You used no other records or information?

A. No other records or information

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Booth: We offer this in evidence.

Mr. Strouss: The same objection as to exhibit No. 122.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 123.")

Mr. Booth: Do you desire to defer the cross-examination?

Mr. Strouss: Yes, I prefer to, I don't feel so very good today.

Mr. Booth: I just have a very few questions of Mr. Beale, an extension of the direct examination. Will you resume the stand, please, Mr. Beale?

[fol. 1639] Frank D. Beale resumed the witness stand for further direct examination:

Mr. Booth:

Q. Mr. Beale, my attention has been called to the fact that some of my questions and some of your answers which were made because of the form of the question might leave the inference that these 160-car trains which I called coal trains carried nothing but coal. Is that universally so?

A. No.

Q. Is it a common practice for the Chesapeake and Ohio to handle merchandise or other commodities in boxcars in connection with and as a part of those 160-car trains?

A. It is.

Q. Will you explain briefly the circumstances under which such an operation takes place?

A. We have arranged scheduled trains to handle merchandise or freight that is handled in boxcars and when there is not a sufficient number of cars of that character to load the engine as we wish it loaded we will add a sufficient number of coal cars of either loads or empties, as the case may be, to build a train up to 160 cars and in the cases on the Logan division and on the Big Sandy division [fol. 1640] where we have a small amount of boxcar freight to move we regularly move that on the trains that consist mostly of coal cars. The only reason for running the trains of boxcars separately from coal cars is a matter of efficiency and convenience but wherever it is desirable to run the two in the same train we regularly do it. There is a train that leaves Clifton Forge each day with freight for Washington. That train never has enough boxcars to fill the train out so we put the coal in that train.

The Court: What would be the comparable weight of a car of coal as compared with a boxcar loaded?

A. The average on our railroad is 45 tons perhaps for the average boxcar and 78 to 80 tons for the average coal car, loaded in both cases.

Mr. Booth: Referring to this photograph which was introduced during your testimony, what would you say the average net weight of the coal per car was in those cars basing your answer on your experience with the loading and unloading of coal cars?

A. About 55 tons.

Mr. Booth: Mr. Mason wanted to ask you about some mathematical calculation which is a little too deep for me. [fol. 1641] The Court: If there is no objection, you may proceed, Mr. Mason.

Mr. Mason: Having in mind the court's question as to the meaning of the average cars per train in exhibit No. 121 and your experience with operations on your own railroad, have you prepared a short example which will indicate how that average is computed and what its meaning is?

A. I have.

Q. Will you state that for the record?

A. If a train of 160 cars runs 25 miles and sets off 80 cars at a junction, then runs 50 miles and sets off 70 cars at a junction, then proceeds 25 miles with the remaining 10 cars to its destination, this train has accumulated 25 multiplied by 160 which equals 4,000; 50 multiplied by 80 equals 4,000; 10 multiplied by 25 equals 250, a total of 8,250 car miles and a total of 100 train miles. The statistical length of this train is 82½ cars although it for 25 miles had 160 cars.

Q. Is that reasonably typical of an operation which may occur?

A. It is reasonably typical of an operation that occurs on our Toledo division. Marion is a large interchange point with the Erie and Fostoria is an interchange point with the Nickel Plate and quite often we start a train out [fol. 1642] of Parsons that will set off perhaps half the train at Marion, all but a few cars at Fostoria and proceed to Wallbridge with those few cars. The mileages I have given here were merely for simplicity of calculation but the principle is the same.

Mr. Strouss: May I ask, that train then would be shown on your exhibit as a train of——

A. 160 cars because that exhibit is made up on a maximum car basis.

Mr. Mason: No further questions.

Mr. Strouss: I would prefer to cross-examine later.

The Court: Have you finished with the witnesses who are available?

Mr. Booth: Yes, Your Honor, except for their cross-examination.

(Discussion off the record.)

The Court: The court will be at recess until 2 P. M. tomorrow afternoon, December 14, 1940.

(Thereupon at 4 P. M., December 13, 1940, the court stood at recess until 2 P. M., December 14, 1940.)

[fol. 1643] December 14, 1940, two o'clock P. M.

All parties being represented as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed with Mr. Beale's cross-examination, I believe.

FRANK D. BEALE was recalled to the stand, and testified further as follows:

Cross-examination.

By Mr. Strouss:

Q. Mr. Beale, what is the length of these coal cars you operate?

A. They vary in length, they average about forty feet.

Mr. Strouss: You gave me a copy of your rules before we adjourned yesterday. I would like you to take this and read into the record the duties of freight conductors and freight brakemen. (Addressing Mr. Booth.) If you prefer, Mr. Booth, to save time, we have copies of it——

Mr. Booth: We will stipulate that the reporter may copy that into the record without being read, if you will indicate by pages.

The Court: The record may show the stipulation.

Mr. Strouss: Beginning with the words in dark letters [fol. 1644] "Freight Conductors" on page 161, and ending with the words "the conductor when the train needs protection" on page 166, just before the word "Enginemen" in dark heavy letters. That is all the questions I have.

(The following matter is copies into the record in accordance with the following stipulation:)

"Freight Conductors

Freight Conductors report to and receive instructions from the Train Master, and, at stations and yards, will also obey the instructions of the Station Agent or Yard Master.

They will report for duty at the required time, and assist in making up the train when necessary.

Where required, they will compare time with engineman and brakeman who will act as flagman, each trip before departure of the train. They will never entrust the duties of a flagman to any person not entirely familiar with them, except in emergency, and then they will give the fullest instructions in such duties, which circumstances will permit.

They must know that the men employed on the train are familiar with their duties.

[fol. 1645] Except where otherwise directed, they will look over the train carefully before starting, and know that the

couplings, brakes and running gear are in good order, and that the prescribed signals are correctly displayed.

Flat cars will be placed near the rear of the train, and camp cars will be placed next to the caboose.

They must have the proper authority for the movement of each car in the train.

They will not take cars that are improperly loaded or overloaded, or cars not in condition to run safely, and will report all such cases by wire to the Superintendent.

Unless otherwise directed, they will not start the train from an inspection station until the inspectors have given notice that their work is finished.

They will inspect the train as often as opportunity offers during the trip.

They will collect all brasses, drawheads, car doors, and other material broken from cars, when practicable, and when not practicable, report to the Train Master where they are left.

They will when crippled cars are cut out of the train report the fact by wire to the Chief Train Dispatcher, [fol. 1646] and in case they are left where there is no station agent, take the slips or waybills to the next regular station, making endorsement as to action taken.

They will see that doors of all empty cars in the train are properly closed and fastened while in transit.

They will be responsible for the movement, safety, and proper care of the train, and for the vigilance and conduct of the men employed thereon.

They will station themselves upon the train in the best position possible to enable them to see that the train is intact, and that there trainmen properly perform their duties, so as to insure the best possible management of the train; and must know that their flagmen go out promptly when necessary to flag, and with proper signals.

In approaching yard limits, ends of double track, railroad crossings at grade, drawbridges, junctions, water stations and meeting points, where the train may be required to stop, also in ascending and descending heavy grades, trainmen must all be in proper position on the train, and when practicable, should consult the air pressure guage in caboose to know that brakes are properly charged.

[fol. 1647] They will see that hand brakes, when used,

are applied so as to avoid sliding or overheating the wheels. Braking should be changed in descending long grades.

They will see that brakes are set on cars left on side tracks, and where on grades or during high winds that the wheels are blocked. So far as possible, all cars on side tracks will be left coupled.

In switching, where it is necessary to move cars that are being loaded or unloaded, notice will first be given to all persons in or about such cars. When cars are so moved, they will be returned to the same position as found.

They will comply with local ordinances relating to the obstruction of public crossings.

They will, in leaving cars on side tracks, see that they are entirely clear of any street, highway or private crossing. When placing cars on sidings adjacent to running tracks where there is a public road crossing, trainmen will place the cars as far from the road crossing as conditions will permit, in order that persons using the crossing will have unobstructed view of approaching trains for as great a distance as possible.

[fol. 1648] They will carefully check with the waybills (in conjunction with the station agents if possible) all freight loaded and unloaded, and make a record of freight over, short, or in bad order. When necessary to transfer freight from one car to another, they will record the transfer on face of waybill, together with the number of the car to which it is transferred.

Passengers will not be carried on freight trains without proper authority. Tramps or other trespassers must not be allowed to ride; and every precaution will be taken to prevent cars from being robbed while in transit.

They will make memorandum of any occurrence connected with the trip that is important to record, with the date and a brief statement of the circumstances.

They will at the end of each trip make out all reports required, observing all instructions, and deposit such reports in the prescribed places.

"Freight Brakemen

Freight Brakemen report to and receive instructions from the Train Master, and while on trains are subject to the instructions of the conductor, and at terminal stations are

also subject to the instructions of the Station Agent or [fol. 1649] Yard Master.

They will report for duty at the required time, and assist in making up the train when necessary.

They will look over the train carefully before starting, unless otherwise directed, and know that the couplings, brakes and running gear are in good order; and inspect the train as often as possible during the trip.

They will keep a constant lookout, while running, for defects on cars in their own trains, also watch passing trains for defects.

They will in approaching yard limits, ends of double track, one mile before reaching and while passing railroad crossings at grade, drawbridges, junctions, water stations, and other points, where the train may be required to stop, also in ascending and descending heavy grade, be in proper position on the train.

They will see that hand brakes, when used, are applied so as to avoid sliding or overheating the wheels. Braking should be changed in descending long grades.

They will see that chains on rear end of cabooses are kept securely fastened.

Rear brakemen or flagmen will compare watches with [fol. 1650] the conductor. Front brakemen will compare watches with conductor or engineman.

Rear brakemen or flagmen must consider it their especial duty to protect the rear of the train in accordance with the rules, and they will allow nothing to interfere with the prompt and efficient discharge of this duty. They will obey the signal from the engineman prescribed by the rules but will never wait for the signal or instructions from the conductor when the train needs protection."

Redirect examination.

By Mr. Booth:

Q. As a matter more of curiosity than anything else, what was the length of the freight train shown on the photograph that you exhibited?

A. I didn't measure that train, but from the mile posts and rail lengths, I know it was approximately six thousand six hundred feet in length.

The Court: And the grade at that point, Mr. Beale?

A. I would have to look at the profile.

Q. Let me change the question. Not necessarily at that point, on that particular run.

A. The grades on that particular run are .2 of one per [fol. 1651] cent, except for one point where we have helper service, and at that point the grade is .7 of one per cent, but over that entire district .2 of one per cent is the maximum in the direction this train was moving.

Mr. Booth: No further questions.

The Court: May this witness with his records be now excused?

Mr. Strouss: Yes.

The Court: It is so ordered.

(Witness excused.)

Locke S. Wilbur was recalled to the stand.

Mr. Booth: If the Court please, Exhibits 122 and 123, introduced during the testimony of Mr. Wilbur, which dealt in part with casualties, ended with the year 1938, as explained by the witness, for the reason that the 1939 annual accident bulletin published by the Interstate Commerce Commission is not yet off the press. We may, and probably will, want to supplement that exhibit by showing of casualties, which will be merely an extension of that exhibit, to cover the year 1939, and in order to do so, we will have to have the same mileages for the year 1939 that are shown [fol. 1652] in that exhibit, namely, locomotive-miles, train-miles, and car-miles.

Direct Examination (Continued).

By Mr. Booth:

Q. I will ask the witness to take his file copy of the Form A, annual report to the Interstate Commerce Commission of the Chesapeake and Ohio, for the calendar year 1939, and read into the record the locomotive-miles, train-miles and car-miles corresponding to the same entries on those two exhibits.

A. The figures in question are found in Schedule 531, page 508. The locomotive-miles, which include motor car train-miles, 21,120,076; train-miles, 14,375,611; the car-miles expressed in thousands of car-miles, 793,886.

Mr. Booth: No further questions.

Cross-examination.

By Mr. Strouss:

Q. Mr. Wilbur, defendant's exhibit No. 120——

A. Yes, sir.

Q. The items which occur in Column C, those are the totals of Items 201 to 462 of your annual reports each year?

A. I think you have the right account numbers. Yes, [fol. 1653] sir.

Q. And the amounts which are shown in column D of the exhibit are the totals of accounts 371 to 420 of your annual report each year?

A. 371 to 420, yes, sir.

Mr. Strouss: That is all.

Mr. Booth: No questions.

The Court: Then, may this witness with his records also be excused?

Mr. Strouss: Yes.

The Court: It is so ordered.

(Witness excused.)

Mr. Booth: I want to take this occasion to wish Your Honor and the officials of the court, and counsel on the other side a very Merry Christmas.

The Court: Thank you. The court will then be at recess until Monday, January 6, 1941, at ten A. M.

[fol. 1654] January 6, 1941, ten o'clock A. M.

The parties were represented as heretofore noted, except that Mr. B. G. Thompson, of the law firm of Knapp, Boyle & Thompson, appeared in the stead of Mr. James P. Boyle, who was absent.

Thereupon, the following proceedings were had:

The Court: You may proceed, Gentlemen.

Mr. Mason: We will call Mr. Blanchard.

M. C. Blanchard was called as a witness on behalf of the defendant, and being first duly sworn, testified as follows:

Direct Examination.

By Mr. Mason:

Q. Mr. Blanchard, will you please state your name and residence?

A. M. C. Blanchard, Los Angeles, California.

Q. Are you employed by the Atcheson, Topeka & Santa Fe Railway Company, Mr. Blanchard?

A. Yes.

Q. In what capacity?

A. Chief Engineer of the Coast Line.

Q. As Chief Engineer of the Coast Lines, between what points does your jurisdiction extend?

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[fol. 1655] A. Albuquerque and Belen to Los Angeles, San Francisco, San Diego, Phoenix.

Q. Your jurisdiction as chief engineer includes all of the lines of the Santa Fe west of Albuquerque and Belen then, but not the lines between El Paso and Deming?

A. That is right.

Q. And all of the Santa Fe lines in Arizona and California?

A. Yes.

Q. How long have your been with the Santa Fe, Mr. Blanchard?

A. Thirty-eight years.

Q. What positions have you occupied in its service?

A. Well, from 1892 to 1905 I was rodman, transitman, assistant engineer, on what is known as the Middle, Panhandle & Western divisions; 1905 to the middle of 1907, I was assistant engineer on the Kansas City Belt Railway and in charge of second track construction in northeastern Missouri; 1907 to 1909 I was division engineer on the Kan-

sas City division and the Middle division; 1909 to the middle of 1910, I was roadmaster on the Middle division; from the middle of 1910 to the first of 1911, I was assistant engineer [fol. 1656] in the Chief Engineer's office in Topeka; from 1911 to about the middle of 1913 I was division engineer of the Eastern and Kansas City Divisions; from the middle of 1913 to the middle of 1915, I was office engineer for the Chief Engineer of the Eastern lines at Topeka; from the middle of 1915 to February, 1918, I was district engineer of the territory from Chicago to Emporia, Kansas; from 1918 to 1920, Division Superintendent on the Missouri division; 1920 to November, 1922, superintendent of the Illinois division; November 1922 to September 1929, Chief Engineer of the Western Lines. That comprises the territory from Newton to Albuquerque south to El Paso, and some of the lines in Texas; September, 1929, to date, Chief Engineer of the Coast Lines.

The Court: Your headquarters are where?

A. Los Angeles.

Mr. Mason: Your service, then, has extended over every part of the main lines of the Santa Fe from Chicago as far west as San Franisco, Los Angeles, and San Diego?

A. Yes, sir.

Q. Your 38 years of service has been largely in the engineering department, except, I think, for two terms of two years each, four years, as a division superin- [fol. 1657] tendent?

A. About five years as division superintendent and a year and a half as roadmaster.

Q. I show you a map of a single sheet, bearing the title "The Atcheson, Topeka & Santa Fe Railway System," with a legend referring to a heavy line. Have you seen that map, Mr. Blanchard?

A. Yes, I have.

Mr. Mason: The map has been distributed, your Honor. We will ask that it be marked for identification as Defendant's Exhibit 124.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 124 for identification.

Mr. Mason: Will you say, Mr. Blanchard, whether Defendant's Exhibit No. 124 for identification is a reasonably

correct outline map of the lines of the Santa Fe and of the territory and states where it is operated?

A. It is.

Q. And the significance of the heavy black line will be explained by another witness, I understand; is that correct, Mr. Blanchard?

A. I think it is, yes.

Q. Now, looking at the State of California, I notice you [fol. 1658] show a line extending from Lathrop northward. What is the terminus of that line?

A. Sacramento.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit No. 124.

Mr. Strouss: It is objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted in evidence.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 124.")

Mr. Mason: I take it, there are no questions on this Exhibit, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Mr. Blanchard, have you before you a statement in one sheet entitled, "Main Track Operated Mileage of the A. T. & S. F. Railway System," and so forth?

A. I have.

Mr. Mason: We ask that this statement, which has now been distributed, be marked "Defendant's Exhibit No. 125 for identification."

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 125 for identification.

Mr. Mason: Was defendant's exhibit No. 125 prepared [fol. 1659] at your direction, Mr. Blanchard?

A. Yes, sir, it was prepared at my request by the chief engineer of the System in Chicago.

Q. Are you familiar with the underlying records from which it was prepared?

A. Yes, sir. I can state from what is prepared.

Q. Will you state from what records it was prepared?

A. It was taken from the employees' time-table, except for the second track, which didn't cover an entire operating district, in which case the chief engineer's monthly mileage reports were used. By that, the chief engineers of the grand divisions, the same as myself, render each month a mileage report.

Q. And those accumulated monthly mileage reports represent the source of the information as to the second track where it was necessary to use them; is that correct?

A. Yes, that is correct

Q. Do you have with you in the court-room, or otherwise available in the city, the operating timetables which were used for the purposes of this exhibit?

A. I have them here.

[fol. 1660] Do you also have the monthly mileage reports to the extent that they were used?

A. No, not with me.

Q. Do you know of your own knowledge as to the correctness of the figures on this exhibit?

A. I do to the extent of the Coast Lines; otherwise, I will have to rely on the information as prepared by the chief engineer of the System, who received all of the mileage reports.

Mr. Strouss: My objection will be limited to its materiality and relevancy.

Mr. Mason: Will you require the underlying records as to the second track?

Mr. Strouss: No.

Mr. Mason: Will you say whether, in your opinion and to the best of your knowledge and belief, the exhibit is a correct reflection of the underlying sources?

A. I think it is.

Mr. Mason: Your Honor, I understand that Mr. Strouss will not require the production of the underlying records, nor object to the exhibit on the ground of its competency in so far as the production of those records might be required. Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

[fol. 1661] Mr. Mason: We offer the statement in evidence as Defendant's Exhibit No. 125.

Mr. Strouss: It is objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence, and marked, "Defendant's Exhibit No. 125.")

[fol. 1662] Mr. Strouss: I just want to ask a question. That "East Bd" means eastbound track and "West Bd" means westbound track?

A. That is right.

Mr. Strouss: That is the double track territory?

A. Double track territory.

Mr. Mason: Mr. Blanchard, have you made up a total of the operated mileage of the system and have you that figure available?

A. No, I do not.

Q. This exhibit merely shows the total trackage without attempting to show the main line mileage?

A. This is the maintrack operated mileage between Chicago and Los Angeles.

Q. Without reference to the San Diego lines or the line to El Paso or the line to San Francisco or the Texas lines?

A. That is correct.

Q. Can you by reference to exhibit No. 124 pick out the lines which are represented on exhibit No. 125. Does it include all of the lines shown in heavy black between Chicago and Gallup, New Mexico?

A. Yes, it includes all of that shown in heavy black from Chicago to Gallup. Also the line from a point marked [fol. 1663] "Ellinor" via La Junta to Albuquerque and to the junction with Albuquerque and Dalies.

Q. Does it include the line from Gallup via Ash Fork to Needles, being the main line across northern Arizona?

A. It does.

Q. But not the rest of the Arizona lines, is that correct?

A. Nothing but the main line.

Q. Going into California, does exhibit No. 125 include the line from Barstow via Mohave to Bakersfield and thence northwesterly to Richmond and San Francisco?

A. According to this statement it is simply from Needles to Barstow to San Bernardino to Los Angeles.

Mr. Mason: Have you any other questions on the exhibit before we leave it, Mr. Strouss?

Mr. Strouss: Dalies is not shown on the map, is it?

A. Dalies is the point of intersection of the two lines west of Belen where you can see the little line here (indicating).

Mr. Mason: There is perhaps another explanation on exhibit No. 125, Mr. Blanchard. Take the first item, Los [fol. 1664] Angeles Division, Third District. You show first single track 57.4 miles and then in separate columns "Eastbound Track" and "Westbound Track" each of them 14.1 miles. Will you explain the significance of the three columns headed "Single Track," "Eastbound Track" and "Westbound Track" in connection with that first item?

A. It is 14.1 miles of double track on the Third District out of San Bernardino towards Fullerton and Los Angeles.

Q. And the 57.4 miles are single track?

A. That is right.

Q. The total of 85.6 is made up by adding the first three items; the single, the eastbound, and the westbound?

A. Yes, sir.

Q. I notice in the Arizona Division, Second District, the eastbound track is 165.7 and the westbound, 167.6, so the two do not agree. Does that come about because the two tracks are not on the same alignment or in the same location in certain districts?

A. That is correct. They are divergent in certain localities and one line is longer than the other.

Q. Will you refer now please to a statement in three [fol. 1665] sheets, the first of which bears the title "Main Line of the A. T. & S. Ry. Co. between Los Angeles, California, and Cloyis, New Mexico." Have you that statement before you?

A. I have.

Mr. Mason: May we have the statement marked "No. 126" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 126 for identification.

Mr. Mason:

Q. Mr. Blanchard, was exhibit No. 126 for identification prepared by you or at your direction?

A. It was.

Q. From what sources was it prepared?

A. From the record profiles of the various portions of the line as covered by this particular exhibit.

Q. Are those profiles maintained as permanent records in the engineering department?

A. They are.

Q. Do you have access to them?

A. I have access to all of those from Albuquerque west. Of course to secure copies of those from the rest of the system——

Q. Those from Albuquerque west are in your office?

[fol. 1666] A. They are maintained in my office.

Q. You are familiar with those profiles both as to the coast lines and as to the other portions of the system?

A. Having been chief engineer on all of this territory, I am.

Q. Was this exhibit especially prepared for purposes of this case from those profiles?

A. That is my understanding.

Q. Are those profiles or counterpart copies of them available here in Tucson?

A. You mean the originals?

Q. Yes, the original record profiles.

A. No, they are not.

Q. Have you counterpart copies of them, are they kept in blueprint form?

A. They are kept in blueprint form but in order to get them you would have to call on the chief engineer at Chicago to get them. I can get them in my office, that is what I have there. This is compiled from all those record profiles.

Q. Do you have profiles for the territory west of Albuquerque available here?

A. I do not.

Q. Will you say whether or not exhibit No. 126 for identi-
[fol. 1667] fication is a correct reproduction of the underlying records from which it was prepared?

A. From my knowledge of the railroad, having been on all of this territory, as chief engineer from Newton west I can say that this is a correct profile of the line insofar as a condensed profile can reflect all of the grade.

Q. The exhibit purports to show in certain localities the controlling or ruling grades eastward and westward. Are you familiar with those of your own personal knowledge?

A. Yes, sir, of my own personal knowledge.

Q. Can you say whether or not the showing on the exhibit of such ruling or controlling grades is correct according to your knowledge?

A. It is.

Q. I will ask you to refer to the first sheet of exhibit No. 126 for identification and to this figure of 2.2 per cent which is shown with an arrow immediately underneath the line indicating the profile at a point near Cajon, California, and ask you what that figure undertakes to show or indicate.

A. That shows the ruling grade on the eastbound track from San Bernardino to Summit.

Q. What does the figure 1.6 per cent immediately adjacent to the other figure 2.2 per cent just mentioned [fol. 1668] indicate?

A. That indicates the ruling grade on the westbound track from Victorville to Summit.

Q. Going over to the second district of the Arizona Division to a figure of 2.30 per cent shown near the location of Ash Hill or Siberia, California, with an arrow above the profile line pointing to the right. What does that indicate?

A. That is the gradient on the eastbound track descending.

Q. That is not a ruling grade?

A. No, that is in the opposite direction.

Q. Are ruling grades always shown on this exhibit below the profile line?

A. Yes, sir, that is explained by this legend.

Q. The legend to the left explains in the note?

A. Yes.

Q. The figures above the line are the down grades in the direction of the movement?

A. They indicate the gradient down grade in the direction of movement of trains. That is the maximum grade.

Q. What do the figures below the profile itself, for example, you start at the left with Los Angeles 0.0 and then go to 3.7 and 7.2 and so forth. What do those indicate? [fol. 1669] A. The distance in miles from Los Angeles.

Q. And the figures which are opposite the vertical lines but in the center of the profile chart, what do those indicate?

A. Elevations.

Q. Elevations at those stations which are indicated by the lines?

A. Yes, sir.

Q. Does the profile portion of the chart correspond to the outline map of the railroad which appears in the upper portion of the chart as to location?

A. It does.

Q. Do the explanations you have made as to the first sheet and the figures on the first sheet apply equally to the second and third sheets?

A. They do.

Q. I notice on the map portion of the sheet, referring again to the first sheet, that the outline map of the railroad—take the district between Los Angeles and Needles for example, shows a double line from Los Angeles to Hobart and then a single line from Hobart via Fullerton to Riverside and then a double line to Cajon and two separated lines from Cajon to Summit. Will you explain what those mean? [fol. 1670] A. They mean there is double track from Los Angeles to Hobart, from Riverside to Cajon and divergent lines from Cajon to Summit.

The Court: Mr. Blanchard, from Hobart to Riverside it is single track?

A. Yes, sir, single track.

Mr. Mason: Between San Bernardino and Cajon I notice that the "E. B." appears above the map line and "W. B." appears below which is the reverse location of those indications between San Bernardino and Riverside. What does that indicate?

A. The eastbound track is on the left side as you come west until you reach a point near Victorville when the lines cross each other and then the eastbound is righthand and the westbound is lefthand.

The Court: Then there is no uniformity necessarily on the east and westbound lines?

A. You will note from the map that they cross back again.

The Court: Where the lines are parallel, what is the rule as to operation.

A. They can either be righthand running or lefthand running but those extend from certain locations to certain locations just as it is shown right here.

[fol. 1671] The Court: What I am getting at is this, if the tracks are parallel, running side by side, how does your

road customarily operate trains as to the east and westbound traffic?

A. I don't think there is any customary manner. That depends upon topographical conditions just as I say are shown on this map, from Victorville almost to Ash Fork, west of Ash Fork the eastbound track would be the righthand track.

Mr. Mason: All the operations on the righthand track?

A. That is east and west or running what you would call "righthand," that is, you are running righthanded.

Q. To express it this way, isn't it correct, from Victorville to a point just west of Ash Fork the eastbound track is the south track and the westbound is the north track?

A. Yes, sir.

Mr. Strouss: Your tracks are not necessarily always on the same grade, are they?

A. No.

Mr. Mason:

Q. From a point west of Ash Fork to where the double track ends at Dalies apparently you have lefthand operations, is that correct?

A. That is correct.

[fol. 1672] Q. Lefthand operations also prevail at the Cajon pass for a short distance between San Bernardino and Victorville?

A. From San Bernardino to Victorville is lefthand running.

Q. Reference has just been made to the separation of the eastward and westward track. Do you have an example of that between Seligman and Riordan in Arizona?

A. Yes, sir.

Q. And again in the neighborhood of Gonzales, New Mexico?

A. There are numerous places where the lines are separated and divergent on account of the grades in the line. In order to secure a flat grade, that is, ascending in the direction of traffic, the lines are divergent for the purpose of securing that flatter gradient.

Mr. Mason: We discussed some of the material appearing on the face of the exhibit without having it formally

offered, but subject to any questions Mr. Strouss may have before the offer I am prepared to offer it.

Mr. Strouss: I have no questions, I think it has been pretty well gone over but I object to the exhibit on the [fol. 1673] grounds it is irrelevant and immaterial.

The Court: No objection on the ground that the basic records are not produced?

Mr. Strouss: No.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 126.")

Mr. Mason:

Q. Mr. Blanchard, you spoke about the lines being separated in order to secure a more favorable grade in the direction of movement of traffic I think?

A. That is correct.

Q. Were these lines where double track exists, for example, in northern Arizona, were both eastern and western tracks constructed at the same time or located at the same time?

A. No, it was all single track until 1910.

Q. The double track was constructed subsequent to 1910?

A. Yes, sir.

The Court: As a matter of fact, you finished the last of it last year, didn't you?

A. That is right.

Mr. Mason: Mr. Blanchard, have you prepared an exhibit to show the dates of the completion and placement in [fol. 1674] service by years of the various sections of the second track in the state of Arizona?

A. I have.

Q. Have you that statement before you?

A. Yes, sir.

Q. Consisting of a single sheet?

A. Yes, sir, a single sheet listing by mileposts and years the date of construction of the second track.

Mr. Mason: Your Honor, we present this now in typewriting with the understanding that it will be replaced by a printed copy later.

Q. Was this prepared by you from your own records?

A. It was.

Q. Has it been compared to determine whether it is true and correct?

A. It has. It was made from our second track construction records.

Q. Did you make it since your arrival in the city?

A. I have.

Q. Are the records from which it was prepared available here in the city or in the courtroom?

A. They are available here.

Q. I take it since you prepared it you have also com- [fol. 1675] pared it to determine whether it is true and correct?

A. It is, except for the length in miles as shown in decimal, that is, 387.4 does not check the exact mileage from state line to state line. Naturally you cannot carry all the decimals so as to make an exact check.

Q. The figure 387.4 is a correct addition of the miles above, is it?

A. Yes, that is a correct addition of the miles as shown in decimal.

Q. But it includes either slightly more or slightly less than the total length of the line within the state boundaries themselves?

A. Correct.

Q. The job of double tracking does not necessarily commence at the state boundary or end exactly at the state boundary, does it?

A. It begins at the state boundary of New Mexico and Arizona but it doesn't go to the Arizona-Colorado inasmuch as it is right in the middle of the bridge across the Colorado River.

Q. You mean the Arizona-California?

A. Arizona-California, over which we have a gauntlet track.

[fol. 1676] Q. Will you describe just what you mean by "gauntlet track"?

A. Gauntlet track is where the rails of the two tracks are continuous across a span or a bridge, but they are only a few inches from each other. In other words, you run through that bridge on a separate track for each main line, but you don't have a double track in that the two are separated.

The Court: Two trains can not pass on the bridge at the same time?

A. That is correct.

Mr. Mason: It is not a single track in the sense that there are any switches or connections between the two tracks?

A. That is correct; they both operate on their own line over the bridge, but they cannot operate over it at the same time.

Mr. Mason: We will ask that the statement to which the witness has referred be marked for identification as Defendant's No. 127.

The Court: It may be marked.

The Clerk: Defendant's exhibit 127 for identification.

Mr. Mason: Have you any questions, Mr. Strouss?

[fol. 1677] Mr. Strouss: No questions.

Mr. Mason: We will offer the statement in evidence as No. 127.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 127.")

Mr. Mason: Mr. Blanchard, have you before you a statement in one sheet entitled "Weight of Rail in Main Track Operated Mileage of A. T. & S. F. Railway System"?

A. I do.

Mr. Mason: May we have this statement marked "Defendant's No. 128 for identification"?

The Court: It may be marked.

The Clerk: Defendant's exhibit 128 for identification.

Mr. Mason: Was this statement prepared by you or at your direction, Mr. Blanchard?

A. It was prepared under my direction.

Q. From what source was it prepared?

A. It was prepared from the rail record made by each chief engineer of grand divisions, submitted to the Chief Engineer of the System.

[fol. 1678] Q. Is that rail record made by the several chief engineers of the grand divisions? A permanent record maintained in their offices?

A. It is.

Q. Do you have that permanent record so far as the Coast Lines is concerned?

A. I do.

Q. In your office at Los Angeles?

A. Yes, sir.

Q. Has the exhibit been compared against the underlying sources to determine its correctness?

A. In so far as the Coast Lines is concerned, it has been. I cannot say for the rest of the line, but I presume it has.

Q. Will you say whether or not the exhibit is a correct reflection of the underlying records to the best of your knowledge and belief?

A. It is.

Mr. Mason: Do you desire the underlying records produced in connection with this, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss, before it is offered?

Mr. Strouss: These districts and parts of districts are [fol. 1679] the same as shown on defendant's exhibit No. 125; is that correct, Mr. Blanchard?

A. Yes, they are just exactly the same.

Q. The divisions and districts are as shown on Defendant's Exhibit No. 125?

A. Yes. I have forgotten what number this is, but if this is No. 126——

Mr. Mason: That is right, that is 126.

Mr. Strouss: That is all the questions.

Mr. Mason: So that this exhibit No. 128 for identification corresponds as to territory with both 125 and 126; is that correct, Mr. Blanchard?

A. Yes, sir.

Mr. Mason: We offer the exhibit in evidence as defendant's Exhibit 128.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 128.")

Mr. Mason: Mr. Blanchard, addressing yourself particularly to the portions of your lines in Arizona and New Mexico, and California, in other words, the Coast Lines, I notice that Exhibit 128 indicates that both the eastbound

[fol. 1680] and westbound tracks in single track, where single track is found, are laid largely with 110-112 pound rail, with some 130-131 pound rail, and a comparatively small amount of 90 pound rail. Does this 110-112 pound rail, where it is in the track of the Coast Lines, indicate anything is that a heavier weight of rail than was previously in those lines?

A. To answer that question, it depends on the date that you might have in mind.

Q. The lines certainly were not originally constructed with 112-pound rail?

A. Oh, no.

Q. Do you know, and if so, will you state, whether in 1912 they were predominantly 110-112-pound, or 130 pound, as they are shown today?

A. I don't have the 1912 records with me, but from my knowledge of weights of rail on the Santa Fe System at that time, 90 pound was the heaviest of record, and ranged from that down to 75.

Q. Now, do you know, and if so, will you state whether in 1922 the Coast Lines had the weights of rail which are shown in there as of the present time?

Mr. Strouss: I will make an objection to the relevancy on this. I cannot see where the history of the weight of [fol. 1681] rail can possibly affect the question of the constitutionality of the train limit law so far as this defendant is concerned.

The Court: Well, I take it, it is to show changed conditions since the enactment of the law.

Mr. Mason: Yes, we refer to that part of the affirmative defense, I think it is paragraph 3 of part of the Answer, in which we allege that since 1912, and more particularly since 1920, great improvements have taken place, both in Arizona and elsewhere.

The Court: The objection is overruled.

Mr. Strouss: I just want to say that the Santa Fe is not a party to this action. The fact that they have alleged that, still, doesn't make it a matter which is relevant to the legal question before the Court.

Mr. Mason: That is ground we have gone over before.

The Court: I will overrule the objection.

A. As to 1922, I cannot say. I came to the Coast Lines in 1929.

Mr. Mason: Addressing yourself to 1929, what was the situation as to the weights of rail in the Coast Lines in the [fol. 1682] territory shown on Exhibit No. 128?

A. Practically all 90-pound or less.

Mr. Strouss: My objection, of course, goes to this without repetition.

Mr. Mason: Oh, yes, it is understood.

The Court: We will take a brief recess, and during the interlude the Court will be here for another matter.

(Thereupon, a short recess was taken, after which proceedings were resumed as follows:)

The witness M. C. Blanchard was recalled to the stand and testified further as follows:

Mr. Mason: You recall the dates when the 90-pound rail was replaced by the 110-130-pound shown on Exhibit 128?

A. No, I can't with the record that I have here tell you the date the replacement occurred.

Q. Has the Santa Fe had any program of rail replacement on the main lines since the year 1929?

A. We have had the same program of replacement that all railroads do. When——

Mr. Strouss: I move that that part be stricken, if the Court please.

The Court: Yes, it may be stricken. We are just con[fol. 1683] cerned with the Santa Fe, Mr. Blanchard, at this time.

Mr. Mason: Read the question.

(The question was read by the reporter.)

A. We replace rails of certain weight after they have had a life of a certain time, dependent on the tonnage that goes over the particular stretch of track or rail during that time.

The Court: Well, when you replace these rails, that have seen their service, do you replace them with heavier rails?

A. Yes, sir. 90-pound rail is replaced or has been replaced with 110 and 112-pound, and on the heavy grades with 130 and 131-pound.

Q. What do you mean by "heavy grade," Mr. Blanchard?

A. Well, like from Williams to Supai.

Q. In other words, the heavier the grade the heavier the rail; is that true?

A. That is correct.

Mr. Mason: On the first district of the Arizona Division, you show two-and-a-half miles of 130-131-pound now in the track. Is that on curve or grade territory?

A. The first district of Arizona?

Q. Yes.

A. Yes, that is on what we call "mountain heavy grade" [fol. 1684] territory.

Q. And you show here, the Albuquerque division, the third district, 6.3 miles of 130-131 pound. Would that be in the district between Ashfork and Seligman, or some other comparable mountain territory?

A. Albuquerque— what territory is that?

Q. The third district.

A. Yes.

Q. You show 6.3 miles of 130-pound.

A. The second district also has considerable. I might say that our present standard for all main line track in the replacing of existing rail is 131-pound.

The Court: That is irrespective of grade?

A. Irrespective of grade. That is all the rail we are now laying and have laid in the past year, the renewal if rail is 131-pound.

Q. Mr. Blanchard, that last stretch of double track you just completed near Holbrook, is that 131-pound rail?

A. Yes, sir.

Mr. Mason: Does the 110-pound rail in the track in the Coast Lines represent any improvement over the 90-pound rail which, according to your statement, generally prevailed in 1929?

[fol. 1685] A. The heavier rail section, of course, provides a better and more substantial track.

Q. Is it more expensive to lay 110-pound rail than it is to lay 90-pound rail, both being new?

A. The labor of laying is about the same, but the cost of material is more in that the 110-pound rail weighs 20 pounds per yard more than the 90-pound rail.

Q. You buy rail by the ton rather than by the yard?

A. By the ton rather by the yard.

Q. Does the 130-pound rail now being used in replacement represent any improvement over the 110-pound?

A. By the same process of reasoning, yes; it gives you a much more stable track, and a track that can be maintained with less expense than the lighter section of rail.

Q. As between the 90-pound rail on the one hand and the 110-pound on the other, and the 130-pound rail in the same district, which permits the higher speed of train operation?

A. We have no restrictions with respect to the track as regards the weight of rail as between the 90 and the 110 or the 130.

[fol. 1686] Q. Do you have any restriction as to the weight of equipment, locomotives, or cars which may move over your system as between 90-pound rail on the one hand and the heavier weights on the other?

A. We do not.

Q. Will you say, from your experience as an engineer, whether the use of heavy rail in the track generally permits the use of heavier types of equipment?

A. It does.

Q. Will you say whether or not the use of heavy rail permits the operation of trains at higher speeds?

Mr. Strouss: I want to add to my objections here that it is calling for a conclusion as well as being irrelevant and immaterial.

The Court: Yes, I will sustain the objection.

Mr. Mason: Your Honor, I thought I had qualified the witness as being an engineer of long experience and high attainments, well qualified to express such an opinion, and certainly such an opinion is relevant, because in our affirmative Answer we have alleged that these improvements were for the purpose of permitting higher speeds of heavier equipment, and that they have achieved that [fol. 1687] purpose.

Mr. Strouss: He has already testified there are no speed restrictions or weight restrictions based on the weight of rail.

The Court: That is true. I will adhere to the ruling.

Mr. Mason: Do I understand that you have testified that you have no restrictions as to weight of equipment on any part of the Coast Lines, that is, on main lines?

A. We do not.

Mr. Strouss: I don't think that is what he testified to.

Mr. Mason: Will you state generally whether or not that is the fact?

Mr. Strouss: Do you mean based on weight of rail?

Mr. Mason: I will address myself first to weight of rail, yes. Do you have any restrictions as to weight of equipment which may be operated over any part of the main lines on the Coast Lines based on weight of rail?

A. We do not.

Q. Do you have any restrictions as to the weight of equipment which may be operated on those lines, based on any other considerations?

[fol. 1688] A. Well, from time to time the roadbed may become soft by reason of extensive rains or storms, and you may have a local slow order that limits speed at some particular point, but that is a temporary condition.

Q. Does that local slow order because of track conditions, limit weight at the same time?

A. It doesn't limit weight, just the speed at which trains may be operated.

Q. Do you have at the present time any general restriction of weight of equipment or of speed as opposed to a temporary local condition?

A. We do not. I take it, from that, you are talking about physical conditions of track?

Q. Yes, from your standpoint as engineer in charge of the Coast Lines.

A. We do not.

Q. Have you before you a statement in one sheet, Mr. Blanchard, entitled "Class of Ballast in Main Track Operated Mileage of the A.T. & S.F. Railway System?"

A. I do.

Mr. Mason: May we have the statement marked as defendant's Exhibit 129?

The Court: It may be marked.

[fol. 1689] The Clerk: Defendant's Exhibit No. 129 for identification.

Mr. Mason: Was this exhibit prepared at your direction, Mr. Blanchard?

A. It was.

Q. From what sources?

A. From records maintained by each chief engineer of the grand divisions between Chicago and the Coast.

Q. Are those record permanently maintained in the offices of the several chief engineers of the grand divisions?

A. They are.

Q. Do you have a record, for example, relating to the Coast Lines in your office in Los Angeles?

A. Yes.

Q. Will you state whether the exhibit is a correct reflection of the underlying records from which it was prepared?

A. To the best of my knowledge, yes. I can speak affirmatively so far as the territory Albuquerque west is concerned.

Q. You are very familiar with the territory Albuquerque west in your position?

A. Yes.

Q. But this was prepared entirely from records, was it?

[fol. 1690] A. Entirely from records.

Mr. Mason: Mr. Strouss, will you want those records produced for the purpose of this exhibit?

Mr. Strouss: No, I will not require it.

Mr. Mason: Do the showings of districts and divisions on exhibit 129 for identification correspond to those shown on exhibit 126?

A. Yes.

Q. And this covers the same territory, does it?

A. Yes.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: I notice in the footnotes, indicated by plus and double-plus signs in two instances, the mileage shown is ballasted with native material. Where is that, and what is the nature of that material?

A. I am looking for that.

Mr. Mason: That is both districts of the Arizona Division.

A. That is gravel which is taken from the gravel pits along the line of the railroad.

Mr. Strouss: It is not in the nature of volcanic cinders that you find in the northern part of this state?

[fol. 1691] A. No, it is the native gravel beds that we find along the railway, for illustration, at Hackberry.

Mr. Strouss: That is all.

Mr. Mason: We offer the statement in evidence, as Defendant's Exhibit 129.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 129.")

Mr. Mason: Mr. Blanchard, has there been any change in the character, nature, or depth of the ballasting on the Santa Fe Coast Lines since 1929?

A. A very good portion of the mileage has been resurfaced and reballasted, and in some cases the depth has been increased.

Q. Have you changed the kind of material used in ballasting the Coast Lines?

Mr. Strouss: My objection to the relevancy and materiality goes to this testimony as well as to exhibit.

The Court: Yes. The objection is overruled.

Mr. Mason: Have you changed the kind of material [fol. 1692] used in ballasting any part of the Coast Lines?

A. Not generally. The territory from Belen and Albuquerque to Gallup is ballasted with crushed rock and volcanic cinders, and from Gallup to Yampai almost entirely with volcanic cinders, Yampai to Topock, or the Arizona-California line, with the natural gravel from these gravel pits.

Q. Now, this natural gravel from the gravel pits which you refer to, I think, as native material—

A. That is right.

Q. Will you say whether or not that is a better or a poorer grade of ballast than the crushed rock or volcanic cinders?

Mr. Strouss: That is objected to as immaterial and calling for a conclusion.

The Court: The objection is overruled. He may answer.

A. For the territory in which the gravel is installed, I think it is on a par with the rock or volcanic cinders in those territories where we have that kind of ballast. Our ballast usually is selected to meet the conditions that prevail in certain locations.

Mr. Mason: Do you have any standard of depth of bal- [fol. 1693] last that you employ on the main line?

A. Ten inches, that is from the bottom of the tie to the sub-grade.

Mr. Strouss: My objection, of course, to the relevancy and materiality goes to this without my repeating it.

The Court: Yes. The objection runs to all this.

Mr. Mason: Is the main line of the Coast Lines ballasted to that standard of ten inches depth?

A. Practically the entire distance. There may be a few short stretches that have eight inches.

Q. Do you have any bridges on the lines west of Albuquerque?

A. Many of them.

Q. Do you have any restrictions as to weight of locomotives because of those bridges?

A. We have no restrictions as to weight. We have two bridges on which the speed of the locomotive operating over the bridge is restricted.

Q. Where are those bridges?

A. On the Canyon Diablo and the other is the Colorado River bridge at Topock.

Q. The gauntlet track bridge at Topock over the Colo- [fol. 1694] rado river?

A. Yes, sir.

Q. Do you know, and if so, will you state, whether there has been any work toward strengthening or increasing the capacity of the bridges on the Coast Lines?

A. As our bridges are renewed, the new type of structure is superior to that which it replaces, particularly pile trestles, in that they are now nearly all what we call a ballasted deck type of structure, and they are stronger in their designing of deck and in number of piles. Steel bridges have been either redesigned or reinforced to handle the heaviest type of power that we have.

Q. Do you know, and if so will you state what the actual loading is of the heaviest type locomotive operated by the Santa Fe in the district west of Albuquerque?

A. I can give you that from an engine diagram.

Q. Is that an original permanent record?

A. Yes, sir.

Q. Will you please give it from the engine diagram?

The Court: Mr. Mason, while he is looking up that information, of course, over Mr. Strouss' objection, the Court has admitted a lot of this detail testimony with ref- [fol. 1695] erence to the Santa Fe which I believe you did not go into with reference to any of the other sixteen railroads. May I ask if your purpose in offering this testimony from this road is by reason of the fact it is the only

other Class One railroad operating across the State of Arizona, showing comparable conditions?

Mr. Mason: We think the situation of the Santa Fe, of course, addresses itself a great deal more closely to the issues in the case than the situation of some other railroad, and consequently we are developing the Santa Fe more in detail. It is because of the fact that the law operates to restrict the Santa Fe's operations much the same as it does ours and the Santa Fe situation is necessarily much more worth while to develop from that standpoint.

Mr. Booth: Also, we want to lay a foundation for some safety statistics on the Santa Fe; that is part of the purpose.

The Court: Well, I assumed that that was the reason you were doing that. I am giving you a little more latitude on this road. I think if we were going into all this detailed information on some Class One road operating in the East, [fol. 1696] it couldn't be of very much probative value to this Court. In those instances, you have merely touched on general conditions; here you are going into considerable detail. You may proceed.

[fol. 1697] Mr. Strouss: Of course as I pointed out to the court, the Santa Fe is not a party to this action and so far as the question of the law affecting their operations is concerned this court cannot in this action determine that. We can't try that here.

Mr. Mason: Perhaps the court cannot in this action determine whether the law is unconstitutional as applied to the Santa Fe but it can use the results of Santa Fe operation in Arizona and in adjacent states as some measure of the reasonableness or unreasonableness or other restrictive character of the law as a restriction upon interstate commerce and by comparison of what the law does to the Santa Fe and what the law does to the Southern Pacific and what the absence of the law in some of the other states permits as to those railroads it can determine whether the law as applied to the Southern Pacific is unreasonable and therefore in violation or not in violation of the due process clause of the state and Federal constitutions.

Mr. Strouss: I don't think there is any logic to that argument. The law might be a hindrance to interstate commerce on the Santa Fe and not on the Southern Pacific. The fact that it is on the Santa Fe wouldn't be any proof

[fol. 1698] that it is on the Southern Pacific. The operation on the Southern Pacific must stand or fall on its own feet. The same might be true so far as the safety of operations are concerned. Unless conditions are shown to be similar or sufficiently similar that a legal conclusion could be drawn that the matter of operation so far as safety is concerned has some probative value there wouldn't be any materiality to that evidence even so far as safety is concerned. Certainly the question of whether it is a burden on interstate commerce cannot be shown by proving that it is a burden upon interstate commerce so far as the Santa Fe is concerned.

The Court: I am inclined to agree with you on that. If the witness is prepared to answer the question you may proceed.

A. 5,000 class engine has axle load in round figures of 75,000 pounds.

Mr. Mason: Is that the heaviest type of locomotive that the Santa Fe presently operates in this territory?

A. Yes.

Mr. Strouss: May I ask when you say "in this territory" what do you mean?

Mr. Mason: On the coast lines.

[fol. 1699] Mr. Strouss: The entire coast lines?

Mr. Mason: Yes, including the Arizona lines.

Q. Do those locomotives pass over the main lines in Arizona?

A. They are not regularly used on the coast lines but they have been assigned from time to time and have operated over the coast lines.

Q. Will you say whether or not the physical plant, by which I mean the rail, the roadbed, the bridges, and the other fixed properties are adequate to bear the weight and to withstand the operation of locomotives having a load heavier than the axle load of 5000 class that you have just described?

Mr. Strouss: I am going to particularly call the Court's attention to my objection there as to relevancy and materiality. What it might be able to do and what it is doing are getting pretty far afield.

The Court: Overrule the objection; you may answer.

A. I can't conceive of a locomotive having a much heavier axle load than 75,000 pounds. If you are going to

build a locomotive with greater tractive effort it would probably spread the weight over a greater number of drivers.

[fol. 1700] Mr. Mason: Your exhibit No. 126 indicates in the territory west of Albuquerque and particularly in Arizona there are several districts where grades in excess of one per cent are encountered and in ruling grades in one instance as high as 1.8 per cent. Are those grades encountered in mountainous territory?

A. Yes, they are in mountainous territory.

Q. Are there any curves on main lines in those territories?

A. Yes, sir.

Q. Is the line today in the same condition as respects existence of grades and curves as it was in 1929 or in earlier years or have there been any elimination of grades and curves?

A. Grade reductions have been made. Starting from Albuquerque now the grade reduction eastbound between Gallup and North Guam, the old grade was reduced from one per cent to six-tenths, you will notice on this profile, descending from one per cent grade which was on the original single track line, but in double tracking we built a divergent line and reduced that grade to six-tenths.

The Court: Did I understand you to say that was west of Gallup?

A. East of Gallup.

[fol. 1701] The Court: Toward the Continental Divide?

A. That is right, between Gallup and Gonzales. The grades between Williams and Ash Fork eastbound were reduced at the time of the construction of the second track which I think was in 1911; the eastbound grade being 1.8 per cent as against a westbound or descending grade of 2.6 per cent, the old original line or single track line or 2.6.

The Court: Is that the heaviest grade you have on your railroad in the state of Arizona?

A. Yes, that is the heaviest we have in Arizona.

The Court: Between Ash Fork and Williams?

A. That is right. The same was done in constructing the second track between Crookton and Seligman; westbound or ascending track is now 1.42 per cent grade as against the original 2.8 per cent. Another reduction was made between Yampai and Peach Springs, the old or original

line being 1.8 per cent grade and the second track or eastward track was constructed on a 1.42 per cent grade. West of Kingman, between Kingman and Griffith the second track was built as a divergent line and the eastward track reduced from 1.8 per cent maximum grade to 1.42 per cent.

Mr. Mason: Have you had any construction or recon-[fol. 1702] struction which has had the result of eliminating curves?

A. Many curves have been reduced and eliminated in the course of second track construction and independently thereof particularly in the last five years.

Mr. Mason: I think that is all that we have of the witness, if we may take a recess at this time.

The Court: The court will be at recess until 2 P.M.

(Thereupon the court stood at recess until 2 o'clock P.M. this day, January 6, 1941.)

[fol. 1703] January 6, 1941, Two o'clock P.M.

Proceedings were resumed at this time as follows:

The Court: You may come forward, Mr. Blanchard, and take the witness stand. Have you finished with your direct examination, Mr. Mason?

Mr. Mason: There were just one or two questions that I had; they are more or less in the way of explanation.

The witness M. C. Blanchard, was recalled to the stand and testified further as follows:

Mr. Mason: First of all, Mr. Blanchard, I think in qualifying you at the outset we didn't develop your academic training prior to your first taking employment with the Santa Fe. Will you tell us of that?

A. I am a graduate civil engineer.

Q. With the degree of C.E.

A. No, with the degree of bachelor of science and engineering; also, a member of the American Engineering Association, and a member of the American Society of Civil Engineers.

Q. Now, Mr. Blanchard, in answering a question from the Court, I think you have stated that the heaviest grade in Arizona opposed to traffic was the 1.8 per cent grade on [fol. 1704] the eastward line between Ashfork and Supai, is that correct?

A. That is the heaviest grade ascending in the direction of traffic on the main line.

Q. There are heavier grades in Arizona on other lines than the main line between Needles and Gallup, are there not?

The Court: My question, Mr. Mason, really had reference to the main line.

Mr. Mason: We recall, of course, the grade between Skull Valley and Iron Springs on the Phoenix-Prescott line.

The Court: The Court is more or less familiar with the main lines, having ridden them frequently.

The Witness: Of course, we have descending grades greater than 1.8, as shown by this profile.

Mr. Mason: One other thing, Mr. Blanchard, the outline map of the system, exhibit 124, and also the profile exhibit, No. 126, both show an alternate line between Dalies, that is the junction point immediately west of Belen, and Ellinor, Kansas, one line via Clovis, Amarillo and Wellington, and the other line via La Junta and Dodge City. Is it the fact that there are two alternate main lines between those points?

A. Yes. From Dalies to Belen via Amarillo, Wellington to Emporia is one route.

[fol. 1705] The Court: That is what you call the Belen cut-off?

A. That is the so-called Belen cut-off; and the other is via Albuquerque, La Junta, Dodge City, Newton to Emporia.

Mr. Mason: Now, is one of those lines used predominantly for a particular kind of traffic?

A. The line via Belen to Amarillo and Wellington is predominantly a freight traffic line.

Q. And what of the line via La Junta and Dodge City?

A. It is used almost exclusively for passenger traffic, with the exception of such local freight as originates in that territory.

Q. And I take it that your Exhibit No. 126 will show a comparison of the ruling grades on the passenger line via La Junta and the freight line via Amarillo?

A. Sheet One of that exhibit shows the maximum ruling grade on the line from Belen via Amarillo being one and one-quarter per cent between Belen and Mountainair; Sheet Three shows the maximum grade on the line via La Junta

being three and one-half per cent between Trinidad and Wooten, and 3.3 per cent between Belen and Raton. We [fol. 1706] also have three per cent grade between Glorietta and Lamy.

Mr. Mason: I think that is all, Mr. Blanchard, for the time being. Do you wish to cross-examine now, Mr. Strouss?

[fol. 1707] Cross-examination.

By Mr. Strouss:

Q. Mr. Blanchard, this morning you testified concerning the weight of rails used on the Santa Fe system and replacement of light rails by heavier rails. I believe you testified there were no restrictions on the Santa Fe either as to weight of equipment or speed by reason of the weight of the rails?

A. Correct.

Q. Of course it is true that a heavier rail will last longer in proportion to its weight than a lighter rail?

A. That is right.

Q. The life of the rail is longer?

A. The life of the rail should be longer for the same tonnage that goes over the rail for the life of it.

Q. In proportion to the weight of the rail?

A. I couldn't say whether it is directly proportional or not but some of it.

The Court: What is the average life of the rail, how long can they be safely used?

A. That depends very much on the amount of traffic that goes over the rail. If there is a very heavy tonnage over [fol. 1708] the rail it may have to come out in ten or twelve years. If it is a light tonnage it might run twice that long.

By Mr. Strouss:

Q. There might be other conditions affecting the life of it too?

A. Roadbed conditions affect to some degree the length of time a rail will be satisfactory. There are also defects in the rolling of rail which limit the length of its life.

Q. Develop transverse fissures possibly?

A. Yes, sir.

Q. You were asked this morning concerning the highest rating of your locomotives as I understood the question.

Mr. Mason: No, it was the axle loading of the locomotives.

Mr. Strouss: When you answered this morning as to the 5,000 class locomotives, 75,000 pounds, you were speaking of the tractive effort of the locomotive, not of the tonnage rating?

A. No, I was talking of the average load on each axle of the locomotive.

Q. You were not speaking of the tractive effort?

A. No.

Q. That is the weight of the locomotive itself?

[fol. 1709] A. That is right. It was the weight per driver, driving axle.

Q. That has nothing at all to do with its tonnage rating?

A. Nothing whatever.

Mr. Strouss: I think that is all the questions I have.

Redirect examination.

By Mr. Mason:

Q. When you say that the weight of the locomotive on the drivers has nothing to do with its tonnage rating I take it you mean that the two are not necessarily interrelated?

A. That is correct.

Q. The fact is the larger the locomotive the greater its tractive effort?

A. That is correct.

Q. And also the greater the weight on the driver but not necessarily?

A. Not necessarily, but it usually follows.

Recross-examination.

By Mr. Strouss:

Q. There would be a great many other factors that would enter into the question of its tonnage rating?

[fol. 1710] A. That is correct. You can have an engine with fairly light axle loading, depending on the type of engine with a much greater tractive effort than you could one with extreme weight on drivers. It depends on the number of drivers and how the weight is distributed.

Q. Track conditions also at different localities would be factors in determining the tonnage rating of a locomotive in that particular locality or territory?

A. With a certain tractive effort, of course it exercises that over level grades or ascending or descending grades.

Mr. Strouss: That is all.

(Witness excused.)

G. K. Thomas was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you please state your name and your residence to the reporter?

A. G. K. Thomas, Topeka, Kansas.

[fol. 1711] Q. Do you hold an official position with the Santa Fe?

A. Yes, sir, signal engineer system.

Q. As signal engineer for the system over what territory of the Santa Fe does your jurisdiction or duties extend?

A. The entire Santa Fe system from Chicago to the Pacific Coast and south to the Gulf.

Q. Did you have a technical training before you were employed by the Santa Fe?

A. Yes, sir, in electrical engineering.

Q. Are you a graduate in electrical engineering?

A. It did not carry a degree with it but it was a technical college in London, England, three-year course in electrical engineering.

Q. When were you first employed by the Santa Fe?

A. In January, 1909.

Q. Have you been continuously employed since?

A. Yes, sir.

Q. What was your first position with the Santa Fe?

A. I was employed as a laborer I might say in the signal gang, construction gang, installing automatic block signals in Kansas and Illinois. Later I became signal maintainer [fol. 1712] in charge of a section of signalling, maintenance of signalling on three different sections successively in Kansas and Illinois. In 1911 I became division signal fore-

man or signal supervisor of the eastern and Kansas City divisions having charge of maintenance of signal equipment between Emporia, Kansas, and Kansas City. In 1913 I was promoted to the position of chief draftsman, performing design of signal installations and estimating and so forth for the eastern lines of the Santa Fe at the general office in Topeka. In 1914 I became assistant signal engineer in the system signal engineer's office at Topeka and in 1934 I became signal engineer system.

Q. Your present system?

A. That is my present position.

Q. In your present position what are your particular duties?

A. General supervision over the design, installation, and maintenance of signal equipment on the Santa Fe system.

Q. Are you acquainted with the activities of the Association of American Railroads with respect to signalling?

A. Yes, sir.

[fol. 1713] Q. Do you participate in any of those activities?

A. I have been active in the various committees handling signal problems in the signal section of the Association of American Railroads and its predecessor organizations during the last twenty years, and I am now chairman of the signal section of the Association of American Railroads.

Q. Addressing yourself to 1909 when you first came to the Santa Fe, Mr. Thomas, were there automatic block signals installed on the Santa Fe at that time and if so to what extent?

A. There were very few installations of automatic block signals on the Santa Fe in 1909 chiefly in the vicinity of yards and other special places and most of them were in Illinois, Kansas, and some in Colorado but at that time there were none in the state of Arizona.

Q. When was the installation of block signals generally on the system commenced?

A. About 1911 we began to install automatic block signals on a larger scale and this was continued until by 1932 the entire transcontinental main line was equipped with automatic block signals from Chicago through to San Francisco, Los Angeles, and San Diego.

Q. Did that cover all the main line in Arizona, New Mex-

[fol. 1714] ico, and California adjacent?

A. Yes, that covered the entire main line in those states.

Q. Will you describe briefly the signal system predominately in use on the Santa Fe main lines?

A. The signals consist of a steel structure or post mounted beside or over the track and carrying thereon a semaphore arm and a colored light. Except in the later type of signals which have been installed for a good many years now the semaphore arm is not used and the signal consists only of a powerful light hooded and lensed so that it can transmit its indication a long distance in daytime as well as night.

Q. How are the signals arranged as to the indications which they display?

A. They display three different aspects. When the arm is horizontal and a red light is displayed the signal means "Stop"; when the arm is at forty-five degrees or the yellow light displayed, the signal means "Caution" and when the arm is vertical or a green light displayed it means "Proceed."

Q. Are these signals — by reason or because of the movement of a train through the territory to which the signal relates?

A. Yes, as the train advances along the track it sets up [fol. 1715] its own protection automatically and continuously by affecting electric currents in the rail resulting in the signal to the rear of the train assuming the "Stop" aspect while the next signal further to the rear indicates "Caution" and the other signal "Proceed."

The Court: What are the lengths of those blocks?

A. The blocks vary in length, depending upon local conditions, speed, and other factors but in general they run about two miles. In some places they might be as short as one mile and in other places as long as three miles.

Mr. Mason: Do the automatic signals in single track territory operate so as to protect the train from the front as it advances?

Mr. Strouss: For the purpose of the record I want to show my objection to the materiality and relevancy of the signal system of the Santa Fe.

The Court: I am going to let Mr. Mason state, if he will, the defendant's position with reference to this testimony. What is its materiality? What is the purpose of —.

Mr. Mason: It addresses itself, Your Honor, to the precise allegation in the answer which states that improvements [fol. 1716] have been made in the signal system. Of course we described them and show they have been improved and it is necessary as a part of the showing of the improvement to show what they are at the present time as well as what they have been in the past.

The Court: I take it that Mr. Strouss' objection primarily is to this effect, that while that might be very well for the Southern Pacific to show all this it is not material for you to show what the conditions on the Santa Fe are.

Mr. Strouss: That is true, Your Honor, that is my position here upon this, and even as to the Southern Pacific I would say that the mere fact that the allegation is to that effect is not controlling. It would still have to be material in order to be admissible but here certainly the showing on another railroad, I can't see where there is any relevancy or materiality.

Mr. Mason: We certainly intend to compare our operation on the Southern Pacific with the Santa Fe, in Arizona as well as without Arizona, and we shall show that our signal system is somewhat similar to theirs and operates in much the same fashion. That is one of the conditions of comparability of course and it is necessary to show what the conditions are on the Santa Fe. We cannot show what the [fol. 1717] Southern Pacific is at the same time and by the same witness because he probably is not competent to describe except in general terms what the composition of the system may be. It would probably be preferable to call a witness from the Southern Pacific for that purpose. If this is not material then the allegation in Paragraph 3-A is not material and does not constitute a defense. Opportunity was open to the opposition to have stricken that out. They moved to strike certain parts of this defense and certain parts were stricken and others were not. They didn't pay any attention apparently to Paragraph 3-A, they let it stand as being material to the defense as far as a motion to strike might have taken it out. Paragraph 3-A refers not only to the operating conditions on the defendant's line alone but, "Railroad operating conditions, both on defendant's lines in Arizona, and elsewhere, and on railroads throughout the United States generally, differ substantially from the operating conditions which existed in 1912," and then refers particularly to signals. "Block signals and other safety

devices have been installed." That is not on defendant's lines alone. We are referring to operating conditions throughout the United States generally. "The greater part [fol. 1718] of these improvements has taken place since 1920, and has been accomplished by the expenditure of large sums of money and have been made largely for the purpose of increasing the lengths and the loading of trains and promoting the safety of handling thereof." All of this goes to a comparison between ourselves and the other railroads and the allegation that in Arizona we would be able, if it were not for the artificial restriction of the law, to operate much more than 70 freight cars per train and much more than 14 passenger cars per train with the same character of safety and expedition which obtains on other railroads in other parts of the United States. We wish also to make a direct comparison between our railroad and the Santa Fe from the standpoint of safety——

Mr. Strouss: With the exception of one point I think I have heretofore stated my position. I want to say again that it is not incumbent upon a pleader to move to strike in order to be in a position to object to evidence. I know of no rule of law to that effect and no case has ever so held.

The Court: I agree with you on that.

Mr. Strouss: The mere fact that this has been pleaded [fol. 1719] has nothing to do with whether it is relevant or material except if it were a matter that might be material otherwise and were not pleaded there probably couldn't be evidence introduced but the mere fact that irrelevant matter is pleaded does not make the evidence admissible when offered.

The Court: The objection is overruled. You may answer the question.

Mr. Mason: I think the question was answered and this was simply a running objection. Will you read the question, please?

(The last question was read by the reporter.)

Mr. Strouss: I just want to add that the objection which was originally made as to the materiality and relevancy of this type of evidence, at that time I stated my position and if the court wants me to go over that again I can do it.

The Court: No, I don't think it is necessary.

Mr. Strouss: The statement was made that they couldn't put on both types of evidence at the same time. The de-

fendant here has elected to put on this other evidence before putting on its own testimony and as we see it we think it was up to them to lay the foundation and make their evidence competent and if they haven't, by putting in evidence of their own operations so there might be a com- [fol. 1720] parison of operations to know whether there is a similarity, that is not our fault.

The Court: On that phase of it I am inclined to agree with you. I have been a little nonplussed on the order of proof because heretofore with the locomotives and boxcars and passenger cars the Southern Pacific put on their proof as to what their type of equipment consisted of and each of the witnesses who subsequently testified from the roads were interrogated whether they had comparable equipment. Here we are starting out with a block signal system with the Santa Fe rather than with the defendant in this action.

Mr. Strouss: And there is no evidence in here as a basis of comparison to show any similarity.

The Court: That is true.

Mr. Strouss: Certainly it is incumbent upon them to lay the foundation for it before they can bring that type of evidence in.

The Court: I presume the court has some latitude as to the order of the proof but it does seem to the court it would be better if this order were reversed and the proof with reference to operating conditions as to the signal system and other phases were first put in as to the Southern Pacific. [fol. 1721] Mr. Mason: Your Honor, it is just this: Sometimes we cannot get the men here when we would like to get them, and sometimes we can. Now, all of the witnesses from the Santa Fe happen to be able to come here today, and the first part of this week. We were not able to get them earlier. On the other hand, our chief engineer, who would cover this situation for us, is not able to be here today.

Mr. Strouss: While we made our objection to that point, we realize the Court has a discretion as to the order of proof, but there are rights of the State which should be considered. We are going into our sixth week in taking evidence, and we make our objection on the question of relevancy and materiality of evidence, but it goes in over our objection, the Court reserving its ruling upon this question, but all of that evidence is in here. If the Court should hereafter determine we are right in our objection, it is a little bit unfair to us that just in order to reverse

the order of proof all this evidence is allowed to go in, which may or may not be material.

The Court: Well, the Court did lay down the rule in the early stages of this trial that where proof was offered [fol. 1722] from other roads we would require a showing of comparability of operation, and to a certain extent, of course, such showing has been made along from time to time as to various phases. As to the ultimate sufficiency, the Court, of course, hasn't had occasion to pass on that. In view of the fact that these witnesses are here from great distances and that the Court has some discretion, I will overrule the objection and permit it, but I will state to counsel that I think it would be much better if you presented proof of the defendant's road first and then followed with proof as to the operation of other roads. You may proceed.

Mr. Mason: I think you have the question in mind, Mr. Thomas?

A. Yes. Automatic block signals on single track are controlled so that the signals in advance of the train governing movements in the opposite direction are controlled similarly to that which was described in connection with the signals to the rear of the train, so that the train is automatically setting up its own protection both to the rear and against opposing movements in advance.

Mr. Strouss: The record will show my objec-
[fol. 1723] tion.

The Court: Yes, and the objection is overruled.

Mr. Mason: Mr. Thomas, is there a type of signal whereby the indications are shown in the cab of the locomotive?

A. Yes.

Q. Do you have any of that type of signal on the Santa Fe?

A. Yes, we do.

Q. What is it called?

A. Cab signalling.

Q. And does the cab signal indicator in the cab carry the same indications of stop, proceed, or caution, as are shown by the wayside signals elsewhere?

A. It carries three lights, which, on the Santa Fe, show, respectively, high speed, medium speed and low speed.

However, they serve a similar purpose to the proceed, caution and stop indications of the wayside signals in other territories.

Q. Now, without referring to the System generally, in detail rather, will you say whether you use the semaphore or the color light type of signal predominantly in the territory east of the Arizona-New Mexico bound-[fol. 1724]-ary?

A. Predominantly we use the semaphore.

Q. You do have some color light type?

A. Yes, we have a considerable number of color light signals.

Q. Now, from Albuquerque or Belen west, what type of signals do you use?

A. Predominantly, the color light type.

Q. Do you have any semaphore signals in Arizona?

A. Yes, there are some semaphore signals in Arizona, but about two-thirds of the signals in Arizona are of the color light type.

Q. Where you have left-hand operation in Arizona, as described by Mr. Blanchard, do you use the post type of semaphore or color light mounting, or signal bridges?

A. We use signal bridges or half bridges, depending upon the location, so that the signal is mounted directly over or somewhat to the right of the track which it governs.

Q. Are such signal bridges necessary in righthand operation?

A. Where there are more than two tracks, it is generally necessary to use a signal bridge in order to get sufficient clearance, or, rather, I should say, because of lack of [fol. 1725] clearance between the tracks, generally preventing use of the post type of signals.

Q. Does this prevalent use of the color light type of signal as compared with the semaphore type west of Albuquerque extend all the way to the Pacific Coast terminals?

A. It extends to San Bernardino, and from that point west to Los Angeles we have semaphore signals chiefly on the line which passes through Pasadena, and to a considerable extent on the other line which passes through Fullerton, but there are some stretches of color light signals on that line also.

Q. Can you state when the signals were first installed on the main lines of the Santa Fe in Arizona?

A. Yes. In September, 1913, signals were placed in service between Seligman and Yampai, a distance of—do you want distances on this?

Q. Yes.

A. A distance of about 23.3 miles. In October, 1913, signals were installed between Flagstaff and Ashfork, about 55.8 miles. In April, 1914, they were installed between Winslow and Flagstaff, abou 59.5 miles, and in July, 1914, [fol. 1726] between Ashfork and Seligman, about 27.6 miles. In August, 1923, signals were installed between Yampai and Griffith, about 74.9 miles; and between Griffith and Topock, about 39.2 miles. In Ocober, 1927, they were installed between State Line and Chambers, a distance of about 26.4 miles.

The Court: Is that when the double-tracking was done in that area?

A. I think it was installed before that time.

Mr. Mason: You mean the signals preceded the double tracks?

A. No, the signals followed the double tracks. I can't state for certain the dates of installing the double tracks; I am talking of signals. In August, 1928, they were installed between Chambers and Double Track Junction, about 34 miles. And in October, 1930, between Winslow and Joseph City, about 22.4 miles. In November, 1932, signals were installed on the single track between Double Track Junction and Joseph City, about 23.6 miles; and in May, 1940, after the second track had been installed in that territory, the signals were changed to operate on double track.

Q. Now, have you the total System mileage and the total [fol. 1727] Arizona mileage of signal-equipped main track in various years taken from your records?

A. Yes.

Q. What was the total System and Arizona mileage of signal equipped main line in 1909?

A. In 1909 the total road miles of automatic block signals on the System was 110.4 road miles. There were no signals in Arizona at that time.

Q. Have you the 1922 figures to correspond?

A. Yes, sir. In 1922 the total road miles of automatic block signals on the System was 1,236.1 and 164 miles of that was in the state of Arizona.

Q. Have you the figures for 1939 and 1940 as well?

A. Yes. In 1939 we had 4,681.2 miles on the System, of which 386.7 road miles of signalling was in the state of Arizona.

The Court: Did I understand you to say that the entire main line across the State of Arizona now has the block signal?

A. Yes, that is true.

The Court: I was under the impression that it was more than 386 miles across the state, the way the Santa Fe runs. Am I wrong in that?

[fol. 1728] A. I believe so. From the state line near Manuelito to Topock, at the Colorado river, is approximately 386.7 miles.

Mr. Mason: A check can be made of that figure, perhaps not down to the tenth of a mile, from Exhibit 126, which gives the approximate boundary-line mileages.

Q. Now, these figures which you have just recited into the record, Mr. Thomas, from what source are they taken?

A. They are taken from my office record.

Q. Is that a record regularly maintained in your office?

A. Yes, sir.

Q. Under your personal supervision?

A. Yes, sir.

Q. Were they personally taken by you from that record?

A. Yes.

Mr. Mason: Mr. Strouss, will you desire that record?

Mr. Strouss: No, I am not objecting to it on that ground.

Mr. Mason: I think that is all. Thank you, Mr. Thomas.

[fol. 1729] Cross-examination.

By Mr. Strouss:

Q. I think there is only one matter that I want to ask you about, Mr. Thomas. Did I understand your title is Chief Engineer Assistant?

A. Signal Engineer, System.

Q. This cab signalling, will you explain that a little more, just how that operates?

A. The cab signal is in the form of a small rectangular metal case mounted in the cab of the locomotive directly in front of the enginemen and carrying, as we use it, three lights. Only one of these lights is illuminated at any one time. When there are no trains for a considerable distance in advance, the cab signal indicates "H"; that is, the top light is lighted with the illuminated letter "H", which means "High Speed."

Q. By "High Speed," it would mean, of course, within the speed restrictions in that territory?

A. Yes, it means that there are no restrictions so far as the signal system is concerned, and it permits a train to be operated at whatever is the permissible speed for that particular part of the railroad or track. When the train approaches within a distance of from 8000 to 12,000 feet of another train, obstruction, open switch, or broken rail, [fol. 1730] the signal will change its indication; the letter "H" will no longer be illuminated but the letter "M" will be illuminated, meaning medium speed. When the train approaches within a shorter distance, perhaps 4000 feet, 4000 to 8000 feet of the obstruction, the letter "M" will no longer be illuminated, but the letter "L" will be illuminated, which means "Proceed at Low speed," and on this low speed indication also the train must be operated at restricted speed, prepared to stop short of train or obstruction in the block.

Mr. Strouss: That is all.

Redirect examination.

By Mr. Mason:

Q. Mr. Thomas, the cab signals are actuated so as to indicate obstructions in much the same way as roadside signals are actuated; are they not?

A. Yes, they are actuated by track circuits.

Q. Anything that disturbs the electric current in the track circuits registers on the cab signals just as it would register on the roadside signals?

A. Yes, sir.

The Court: Would a broken rail be shown on this block signal?

[fol. 1731] A. Yes, under normal circumstances, it will.

Mr. Strouss: What do you mean by that, "under normal circumstances?"

A. Well, you cannot guarantee it quite 100 per cent, because of leakage of electric current around the break in the track.

The Court: Mr. Thomas, if some catastrophe occurred to put out your block signal system, that is, the operation of it in a given block, how far would that be shown down the line either way? Would that be recorded?

A. This is with the cab signal, you mean?

The Court: Or with your roadside signal. What I am getting at is, if one block went out, would those on both sides be functioning at that time?

A. If one block goes out, the signal at the entrance to that block will give the most restrictive indication, that is "Stop" in case of a wayside signal or "Low Speed" in the case of a cab signal. At the entrance to the previous block, at the approach to this block that we are talking about, a distant indication will be given in the form of a caution signal, or a medium speed cab signal.

The Court: Another question. Where is the electricity [fol. 1732] generated, at what point, to supply the electricity for the operation of this signal system?

A. On different parts of the railroad there are different power systems used. In Arizona, all of our signals are operated by commercial power which is transmitted over a high voltage transmission pole line along the track and then transformed down at the signal locations to a lower voltage for operating the various signal circuits. On other parts of the system, in some cases we use primary batteries, chiefly of the caustic soda type, and on other types storage batteries trickle charged from the small power circuit by the use of commercial current.

The Court: Then in the sparsely settled area such as you have principally across Northern Arizona, you rely on high voltage lines that run parallel to the tracks, carried on poles there?

A. Yes; we obtain power from our own power houses at locations where we have shops, and at other locations we purchase this power from a commercial concern. For instance, at Winslow, power is obtained from our own shops, while at Williams we purchase power from a saw-milling company there.

[fol. 1733] Mr. Booth: One question, please, out of curiosity. Are these cab signals a substitute for wayside signals, or are they operated as a supplement to them?

A. On the Santa Fe, they are a substitute for the wayside signals, but that is not true on all railroads. Some use both wayside and cab signals. Where we have them, we also have automatic train control.

Mr. Stronss: What happens if your source of electricity, something should happen to it, a thunderstorm, or something of that sort?

A. The fundamental basis of the entire signal system is safety; it is designed to set up a safe condition in case of practically any kind of trouble developing. The power which operates the signals to the stop position is the force of gravity, so that if electric power which holds the signal in the clear position fails for any reason, the force of gravity will cause the signal to come down to its most restrictive indication, and the same thing is true with the cab signals through the medium of the apparatus which is used to control them.

Q. Of course, in the daytime, the position of the arm would be observed by the engine crew. At night, if they [fol. 1734] were to discover the lights out, I suppose it would be up to them to stop under the rules of the road?

A. Yes, a signal, if imperfectly displayed, must be treated as a stop signal, so if a light is out, it is a stop signal.

Mr. Mason: Where you use commercial power in Arizona, Mr. Thomas, do you have any standby scheme of supplying power for your signals?

A. On the later installations we do, a standby storage battery at every signal location, but in the earlier installations before that system was invented we have to rely on the alternating current power without a storage battery, but we have connections at each power station so that we can get around a power station which has failed and feed the entire double section from one end, from either end. In fact, if the occasion arose, it would be possible to connect all of our transmission lines together from Belen, New Mexico, to Arcadia, which is close to Pasadena, California.

Q. In your experience, as a practical matter do these power failures occur in such manner as to cause interruptions of your signal apparatus in the line across Arizona? [fol. 1735] A. Very, very seldom. Occasionally, a fuse will be blown at individual signal locations which would

cause that particular signal to indicate "Stop" and its approach signal to indicate "Caution," but we seldom have complete failure of the power system itself which would affect all the signals.

Mr. Mason: I think that is all for Mr. Thomas. Thank you, Mr. Thomas.

The Court: We will take our mid-afternoon recess.

(Thereupon, a short recess was taken, after which proceedings were resumed as follows:)

J. P. McDONALD was called as a witness on behalf of the defendant and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Booth:

Q. Please state your name and residence.

A. J. P. McDonald, Chicago, Illinois.

Q. What is your official position with the Atcheson, Topeka & Santa Fe Railway Company?

A. General statistician for the System.

Q. How long have you occupied that position?

A. I have been in this present position since April, 1938. [fol. 1736] Q. Prior to that time were you in a similar position?

A. I had a rather varied experience. Shall I start at the beginning?

Q. Yes; start at the beginning and give us your experience briefly.

A. I started with the Denver and Rio Grande Railroad in July, 1907, as a clerk in the mechanical department until September, 1907, and then I left to return to school. I came back to the D. & R. G. in July, 1908, as a clerk and timekeeper until December, 1909. In January, 1910, I started with the Alton Railroad as clerk and accountant, and remained with them until March, 1912. In April, 1912, I started with the Santa Fe as a timekeeper in the car department, and remained until June, 1912. In August, 1912, I went to work for the Denver & Rio Grande Railroad again as chief clerk to the master mechanic, and remained there until March, 1913. In August, 1913, I started with

the Santa Fe again as traveling accountant in the accounting department, and held that position until April, 1914. In August, 1914, I went back to the mechanical department until October, 1914. In October, 1914, I began as an in-
[fol. 1737] spector in the mechanical department, in the roundhouse, inspecting locomotives, and remained in that position until August, 1916. Then I left the railroad for a time to go with the steel mills, and the Standard Oil Company, and came back to the Santa Fe in June, 1918, as an accountant in the transportation department and remained in that position until October, 1919, when I was transferred to the engineering department in connection with matters arising out of Federal control operation, and remained on that assignment until June, 1921, when I was transferred to the accounting department to handle the matters in connection with the guaranty period, which was from March to August, 1920, a six-months period, the guaranteed period of operation.

Q. You know that the United States guaranteed a certain return to the carriers?

A. Yes, that was called the guaranty period. It involved settlements with the government, and I was engaged on those settlements and doing research work in connection with the contract provisions. In June, 1921, when I was transferred to the accounting department in connection with those matters, the guaranty period matters, I functioned in the capacity of chief clerk to the Assistant Gen-
[fol. 1738] eral Auditor at Chicago, and remained in that position until February, 1924, when I was promoted and transferred to Topeka, Kansas, as statistician in charge of the statistics for the System, and remained in that position until May, 1933, when I was promoted to auditor of disbursements in charge of the disbursement accounts of the lines east of Albuquerque; and in July, 1937, I was promoted from that position and transferred to Los Angeles as auditor of the Coast Lines, and remained in that position until April, 1938, when I was promoted and sent to Chicago in my present position.

Q. In your present position, have you access to, and are you familiar with the reports to the Interstate Commerce Commission made annually on Form A of the Atcheson, Topeka & Santa Fe Railway System, and the lines formerly

separately reporting which are now part of that system, for the years 1922 to 1939, inclusive?

A. I am.

Mr. Booth: We hand the Clerk two copies of proposed exhibit in one sheet entitled "The Atcheson, Topeka & Santa Fe Railway System. Freight Operating and Freight Transportation Expenses related to Traffic, Calendar [fol. 1739] Years, 1922 to 1939, inclusive," and ask that it be marked "Defendant's Exhibit 130 for identification."

The Clerk: Defendant's Exhibit No. 130 for identification.

Mr. Booth: Mr. McDonald, did you prepare Defendant's Exhibit No. 130 for identification?

A. This exhibit was prepared in my office under my direction.

Q. Have you checked it?

A. Yes, sir, I have.

Q. Are you satisfied that it is true and correct?

A. It is.

Q. Now, from what source or sources was that exhibit exclusively prepared?

A. This data was procured from the annual reports of the operating lines comprising the Atcheson System subsequent to 1923, as reported to the Interstate Commerce Commission.

Q. You say "of the lines constituting the Atcheson System." What lines, during the period of years covered by exhibit, constituted the System and, during what years?

A. During the year 1922 the Atcheson System was comprised of the Atcheson, Topeka & Santa Fe Railway, Gulf, Colorado & Santa Fe Railway, Panhandle & Santa Fe Rail- [fol. 1740] way, Grand Canyon Railway, and the Rio Grande, El Paso & Santa Fe Railway. In 1923, the System was composed of the Atcheson, Topeka & Santa Fe, the Gulf, Colorado & Santa Fe, the Panhandle & Santa Fe Railway, and the Grand Canyon Railway, the R. G., E. P. & S. F. Railway having been absorbed by the Atcheson, Topeka & Santa Fe Railway. In the year 1924, and up to and including the year 1939, as shown on this exhibit, this System was comprised of the Atcheson, Topeka & Santa Fe Railway, the Gulf, Colorado & Santa Fe Railway, and the Panhandle & Santa Fe Railway.

Q. Did those three companies you last mentioned report separately to the Interstate Commerce Commission?

A. Yes, they reported separately to the Interstate Commerce Commission up until 1934, when we began filing our System reports, including all those separately-operated properties.

So, from 1934 to 1935, inclusive, there is but one annual report to the Interstate Commerce Commission from which the figures in columns B, C, and D in this exhibit are taken; is that correct?

A. From 1934 to 1939, inclusive?

[fol. 1741] Q. Yes. And prior to 1934 there were separate reports made by the companies you mentioned?

A. That is true.

Q. Except as to the Grand Canyon?

A. Yes, except as to the Grand Canyon. That was a Class Two railroad and the Rio Grande, El Paso & Santa Fe.

Q. Have you with your here in Tucson the annual reports for all of these years mentioned for the companies you have mentioned?

A. Yes; they are in the courtroom now in these trunks here.

Q. From what source or sources did you obtain the 1922 and 1923 figures in addition to these reports?

A. That came from our official files known as Form 504. Our office copies of that are also here.

The Court: Mr. McDonald, what you refer to as the Atchison is what we know locally as the Santa Fe? Do you use the two terms synonymously?

A. Yes, that is true.

Mr. Booth: Are the figures shown in columns B, C and D, of this Exhibit 130 for identification true and correct?

A. They are.

[fol. 1742] Q. And are the computations shown in columns E and F true and correct?

A. They are correct.

Q. And is the percentage of improvemen[illegible] the bottom horizontal box calculated correctly?

A. Yes, sir.

Mr. Booth: Mr. Strouss, any questions?

Mr. Strouss: This covers branch lines, of course, as well as main-line operation?

A. Yes, sir.

Mr. Strouss: That is all.

Mr. Booth: We offer the exhibit in evidence and tender the reports and documents referred to by the witness which underlie, for examination by counsel.

Mr. Strouss: We make the same objection to this exhibit as we made to the exhibits of the previous witness.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received and marked "Defendant's Exhibit No. 130.")

Mr. Mason: No objection to competency; your mean the same objections as to the Santa Fe witnesses?

The Court: No, as to the same exhibits from the other [fol. 1743] roads, I take it.

Mr. Strouss: Yes, I am making that same objection. The objection as to competency, since the records are here, is probably not well taken. I do want to check those reports.

Mr. Mason: Do you want all of them?

Mr. Strouss: I think I will almost have to take them all in order to get the information. I shivered when he told me the different companies that were reporting but I don't know how I can avoid it.

Mr. Booth: There are two small trunks of them. We have handed the clerk a document entitled, "The Atchison, Topeka & Santa Fe Railway System. Freight Service Operating Averages, Calendar Years, 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938, and 1939," and ask that it be marked "Defendant's Exhibit 131 for identification."

The Clerk: Defendant's Exhibit No. 131 for identification.

Mr. Booth: Mr. McDonald, referring to Defendant's Exhibit 131 for identification, was that prepared by you?

A. Yes, that was prepared in my office under my direction.

[fol. 1744] Q. Did you check it sufficiently to be satisfied that it is true and correct?

A. I did.

Q. Were the same reports used in preparing Exhibit No. 130 used in preparing this exhibit, in part?

A. Yes, they were to the extent that the information was shown in those same reports.

Q. And are the other reports that were used in preparing this exhibit shown in the footnotes and described therein? I refer to the OS-A's and OS-E's.

A. Yes, those are also reports which we rendered to the Interstate Commerce Commission, on which this particular information was available.

[fol. 1745] Mr. Booth: Have you with you and here in the courtroom the OS-A's and OS-E's used in preparing this report:

A. I do.

Q. Were the computations made correctly which were necessary to produce the items described in the footnote as having been produced by computation?

A. They were.

Q. Are the per cents of increase shown in the last column of the exhibit correctly calculated?

A. They are.

Q. Or a decrease in one case, the case of freight train miles.

Mr. Strouss: I take it, Mr. McDonald, in referring to the system here that the system covers the same operating territory as the previous exhibit?

A. That is true.

Mr. Strouss: This also includes branch line as well as main line operation?

A. Yes, sir.

Mr. Booth: We tender the operating statistic reports for examination by counsel and offer the exhibit in evidence.

Mr. Strouss: We make the same objections as we did to [fol. 1746] the other.

The Court: Objections overruled, it may be received.

Mr. Strouss: This is the objection that we made prior to recess to similar exhibits.

The Court: I so understood it.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 131.")

Mr. Booth: I notice in line 1 of this exhibit No. 131 it has a variation in the number of miles operated in freight service. Can you tell us generally how that came about?

A. That is due to the construction of new lines and acquisition of new lines that enter into the system from time

to time, as well as the abandonment of lines and decreases in lines, decreases in mileage due to abandonment of branch lines.

The Court: How do you class double track for the purpose of that? Do you count it as one mile or two?

A. That is counted as a single unit, as one unit of road.

Mr. Booth: So the Atcheson system is practically speaking a 13,000 mile railroad, that is the way it is usually referred to?

A. That is true.

[fol. 1747] Mr. Booth: I am handing the clerk and ask that there be marked for identification four sheets which purport to be a photograph of Schedule 541, Annual Report to the Interstate Commerce Commission for the Year Ending December 31, 1939, covering revenue freight carried during the year and I will ask you, Mr. McDonald, whether this is a photograph of the corresponding sheets in the annual reports of the Atchison, Topeka, and Santa Fe Railway System to the Interstate Commerce Commission for the year 1939 with the exception of the typewriting shown on the margin of the sheets?

A. That is true.

The Clerk: Defendant's exhibit No. 132 for identification.

Mr. Booth: We haven't a sufficient number of these to furnish the usual number of copies but we will have them next week.

Q. The report from which this was photographed was one of the annual reports which I have handed to counsel?

A. Yes, sir.

Mr. Booth: We offer the four sheets in evidence and ask that they be marked "Defendant's Exhibit No. 132."

Mr. Strouss: The same objections as to the previous [fol. 1748] exhibits.

The Court: Objections overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 132.")

Mr. Booth: Does the Atchison, Topeka and Santa Fe Railway make annual reports to the Arizona Corporation Commission similar to those made to the Interstate Commerce Commission?

A. They do.

Q. Did it make such a report in the year 1939?

A. Yes, sir.

Q. As a matter of fact the report to the Arizona Corporation Commission contains a copy of the report to the Interstate Commerce Commission and with certain additional information required by the state commission, is that correct?

A. That is true.

Q. Have you that report with you for the year 1939 to the Arizona Corporation Commission?

A. I have.

Q. Is it here in the courtroom?

A. Yes, sir.

Q. Have you caused a photograph to be made of pages 908, 909, 910, and 911 of that report to the state commission for the year 1939 headed, "941. Revenue Freight [fol. 1749] Carried during the Year — within the State"?

A. I have.

Q. Is that photograph with the exception of the typewriting on the upper margin of the photograph a correct photograph of those pages of that report?

A. It is.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Booth: We offer this in evidence as defendant's exhibit No. 133.

Mr. Strouss: The same objections as to previous exhibits.

The Court: Objections overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 133.")

The Court: Mr. McDonald, the report which you submit to the Arizona Corporation Commission is both a duplicate of the report made to the Interstate Commerce Commission and then those figures broken down to show the actual operations within the state of Arizona, is that right?

A. That is true.

Mr. Booth: And the Arizona commission prescribes the respects and manner in which you shall break them down, [fol. 1750] does it not?

A. Yes, sir.

Q. In other words you have no option in the matter, you are furnished the form and are supposed to fill it in and you do fill it in?

A. They provide the schedules and define the character of data which we are required to supply for the state and both the state schedules and the entire interstate schedules as reported to the Interstate Commerce Commission are incorporated in the same volume and filed with the state commission.

Q. Under oath?

A. Under oath.

Q. Has that been your practice since the state of Arizona began the requiring of those reports?

A. There have been some changes in the state requirements. They modify them from time to time. I think the last change of consequence occurred about 1920 in the state schedules.

Q. You comply with whatever they require?

A. Yes, sir.

Q. Did the Atchison, Topeka and Santa Fe Railway Company for the calendar year 1939 and for calendar years preceding 1939 make to the state corporation commission of [fol. 1751] the state of New Mexico a report similar to that filed with the Arizona commission?

A. Yes, sir.

Q. Was schedule 941 in that report to the New Mexico commission for the year 1939 the same in form as schedule 941 required by the Arizona commission?

A. Yes, sir, that is true.

Q. Did the two states use the same form on which they required carriers to make reports to their respective commissions in that year?

A. They did.

Q. Was that report to the New Mexico commission made under oath also?

A. It was.

Q. Did that report also contain the copy of your system report to the Interstate Commerce Commission.

A. Yes, sir.

Q. Have you caused a photograph to be made of pages 908, 909, 910, and 911 of that report for 1939 to the New Mexico commission headed, "941: Revenue Freight Carried during the Year—— within the State"?

A. I did.

Q. Do you have a copy of that, Mr. Strouss?

[fol. 1752] Mr. Strouss: I have, yes, sir.

Mr. Booth: Any questions regarding this?

Mr. Strouss: No questions.

Mr. Booth: I have handed that to the clerk and ask that it be received in evidence and marked "Defendant's Exhibit No. 134."

Mr. Strouss: The same objections as to previous exhibits.

The Court: Objections overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 134.")

Mr. Booth: From exhibit No. 132, schedule 541 of the system reports for 1939 will you state separately the number of cars handled by the system, the number of cars of products of agriculture, and the number of cars of perishables as shown by that exhibit, and by perishables I mean those included in lines 110 to 143, inclusive.

A. The total number of carload traffic handled as shown in column J on exhibit No. 132, line 850, is 1,012,778.

The Court: That is all for the year 1939?

A. Yes, sir, and the total number of cars of products of agriculture handled as shown in item 800, column J, is [fol. 1753] 288,028. I have summarized the number of carloads of perishables, commodities 110 to 143, inclusive, from column J of this exhibit and find it amounts to 117,527 cars.

Mr. Booth: Expressed in terms of percentage, what percentage did the total number of cars of products of agriculture bear to the total number of cars handled?

A. 28.4 per cent.

Q. What percentage did the total number of cars of perishables which you have just stated bear to the total number of cars handled on the system?

A. 11.6 per cent.

Q. Will you turn to exhibit No. 133 and give the figures for the state of Arizona for the year 1939 corresponding to the system figures which you have just put in evidence and also the percentages.

A. On exhibit No. 133, column E, item 850, the grand total number of cars of carload freight handled within the state of Arizona during the year 1939 was 141,799. The total products of agriculture as shown in the same column, item 800, 61,436 and the total number of carloads for commodities 110 to 143, inclusive, handled within the state, which I have

summarized from this exhibit was 54,921. The products of agriculture was 43.4 per cent of the total cars handled within [fol. 1754] Arizona and the perishables, commodities 110 to 143, was 38.6 per cent of the total cars of carload freight handled within Arizona during that year.

Q. Does this figure of 141,799 as the total number of cars handled in Arizona, cars of carload freight handled in Arizona in the year 1939, include freight originating outside of Arizona and passing through Arizona as over a bridge to a point beyond?

A. Yes, it does.

Q. Does it include freight originating outside of Arizona and delivered to a point in Arizona?

A. Yes.

Q. And freight originating in Arizona and delivered to a point outside of Arizona?

A. Yes.

Q. And freight originating at a point in Arizona and delivered to another point in Arizona?

A. Yes.

Q. In other words all carloads of revenue freight handled on your lines, on the system lines within Arizona during the year?

A. The carload freight, yes, sir.

Q. It does not include less than carload freight?

A. That is true.

[fol. 1755] Q. That is shown in tons on the exhibit, is it not?

A. Yes.

Q. Will you take exhibit No. 134 and give us the same figures as to New Mexico for the year 1939 that you have given as to Arizona?

A. The total number of cars of carload freight handled within the state of New Mexico during the year 1939 as shown in exhibit No. 134, column F, item 850, is 219,084. The total number of cars of products of agriculture as shown in item 800 of the same column of this exhibit is 70,131 carloads; in summarizing the number of cars of perishables as shown in the same column, commodities 110 to 143, inclusive, I arrived at a total of 57,200 cars; the number of cars of products of agriculture represents 32 per cent of the total number of cars of carload freight handled within the state of New Mexico during the year 1939 and the number of cars of perishables, commodities 110 to 143, inclusive,

represents 26.6 per cent of the total cars of carload freight handled within the state of New Mexico during that year.

Q. How do you account for the fact that the perishables you have mentioned amount to 38.6 per cent of the total [fol. 1756] number of cars handled in Arizona and only 26.6 per cent of the total number of cars handled in New Mexico for the same year?

A. The number of cars of other traffic, that is, other than perishable, represents a much larger part of the aggregate in New Mexico than it does in Arizona, principally because of the heavy movement of ore in the state of New Mexico.

Q. On what lines do those heavy movements of ore occur principally?

A. The ore originates for the most part on branch lines in New Mexico in the vicinity of Silver City, Fierro, and Hanover, New Mexico, and also there is a quite heavy movement of coal in New Mexico.

The Court: Do those Silver City shipments reach the Santa Fe or the Southern Pacific?

A. We have quite a large volume of those shipments that move on our line from Santa Rita to Hurley and then we have another large volume that moves out to the smelters in Colorado on our line.

Mr. Booth: Does the same explanation apply as to the different classes of freight embraced in the New Mexico exhibit as are embraced in the Arizona exhibit, that is, it embraces all classes of carload freight, trans-state, and interstate, coming in and going out and purely intra-state [fol. 1757]. A. That is true. I might explain that this classification of this traffic is in accordance with the rules prescribed by the Interstate Commerce Commission. They define the commodities that we are to report the information on and they define the manner of reporting the carload and less than carload traffic and that same standard of classification and reporting carries through into the state report.

Q. From the exhibits that have been introduced containing portions of the reports to the Arizona and New Mexico commissions respectively, can you develop what proportion of the freight handled was purely intra-state, that is, picked up at one point in Arizona and laid down in another point in Arizona or picked up at one point in New Mexico and laid down at another point in New Mexico?

A. No, that cannot be determined from these reports.

Q. Can you do so on a ton-mile basis from any records which you have here?

A. Yes, from our own records we determine the number of ton-miles of intra-state traffic handled in the state as well as the number of ton-miles of interstate traffic that was handled within the state.

[fol. 1758] Q. The unit is one ton one mile of revenue freight?

A. Yes, sir.

Q. Have you those records with you?

A. Yes, I have the records here from which that computation can be made.

Q. What is the name of the record you are consulting?

A. It is the office record of the movement, form 579, that shows the ton-miles by states.

Q. The record kept currently in the ordinary course of business of your company?

A. Yes, sir.

Q. Basing your answer on that record for the year 1939 what proportion did the purely intrastate revenue ton-miles in Arizona bear to the total number of revenue ton-miles of freight handled?

A. I made a computation from these records and the intra-state in Arizona, the intrastate tons one mile in Arizona represented 2.15 per cent of the total revenue tons one mile handled in the state of Arizona for the year 1939.

Q. Did you make a similar computation for the same year as to the intra-state passengers handled one mile, and if so, will you give it, please?

[fol. 1759] A. I made the same computation with respect to the passengers one mile for the state of Arizona and found that the intra-state passengers one mile represented 2.82 per cent of the total passengers one mile carried within the state of Arizona during the year 1939.

Q. Both of those percentages include all of your lines in Arizona?

A. Yes.

Q. Did you make any similar computation as to New Mexico?

A. No, I haven't made a similar computation for New Mexico but I can do so.

Q. You will be here tomorrow as Mr. Strouss wants to examine you?

A. Yes, sir.

Mr. Booth: I think that is all for the present, Your Honor, I think I only have one more question and that relates to the item I asked about.

The Court: You wish to defer the cross-examination until tomorrow morning?

Mr. Strouss: Yes, sir.

The Court: The court will be at recess as far as this case is concerned until 10 o'clock tomorrow morning.

[fol. 1760] January 7, 1941, Ten o'clock A. M.

All parties being represented as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed.

J. P. McDonald was recalled to the stand, and testified further as follows:

Direct examination (continued).

By Mr. Booth:

Q. Mr. McDonald, do you desire to make any corrections on some percentages you gave yesterday?

A. Yes, I do wish to make some corrections. On page 1753 of the transcript, the number of cars of perishables for the Santa Fe System was given as 117,527 cars. That represents commodities 110 to 164 inclusive, inadvertently. It should be corrected to read 99,161 cars for commodities 110 to 143 inclusive, and this change affects the percentage relationship of the perishables to the total number of cars handled on the System, changing it from 11.6 to 9.8 per cent. Now, on page 1754 of the transcript, the percentage relationship of perishables to the total number of cars handled in Arizona should be changed from 38.6 per cent to 38.7 per [fol. 1761] cent; and on page 1755 of the transcript the percentage relationship of the perishables to the total number of cars handled in New Mexico should be changed from 26.6 per cent to 26.1 per cent, and that percentage is also referred to at the top of page 1756 of the transcript, and should be similarly changed.

Q. You have no further corrections to make?

A. No, sir.

Q. You have examined the transcript of your testimony?

A. Yes.

Q. And you were testifying from the transcript of your testimony just now?

A. Yes, I was referring to the transcript of my testimony yesterday.

Mr. Booth: No further questions, your Honor.

Cross-examination.

By Mr. Strouss:

Q. Mr. McDonald, the defendant's exhibit 130, Freight Operating, Freight Transportation expense, column C, Freight Operating expense represents the total of accounts 201 to 462 of your annual report each year; is that true?

A. That is correct.

Q. And column D, Freight Transportation expense, [fol. 1762] represents accounts 370 to 412, inclusive?

A. 371 to 420 inclusive.

Q. Now, on your exhibit 131, in response to the Court's question yesterday concerning double-tracking, I take it from your answer that you meant that if you had a mile of single track and double-tracked that same mile, it wouldn't add to the miles of line operated under Item I of that exhibit.

A. That is true.

Q. On your comparison of operations in New Mexico and Arizona, there is quite a difference in miles of line operated in the two states by the Santa Fe Railroad, isn't there, Mr. McDonald?

A. Yes, there is some difference in the aggregate mileage.

Q. Your annual report for the year 1939 given the New Mexico Commission shows the miles of road operated in New Mexico as 1,468.72; is that correct? That is, freight mileage operated.

The Court: That would include, Mr. Strouss, all branch lines?

Mr. Strouss: Well, his testimony has covered branch as well as main lines.

A. I don't have those figures before me, but I would say that is approximately correct.

[fol. 1763] Q. Here is the report.

A. 1,460.78.

Q. 1,460.78?

A. Yes.

Q. And for passenger?

A. Well, that is the total miles operated.

Q. What is the total mileage operated in freight service?

A. It isn't shown separately here.

Q. What is the average miles operated in freight service in New Mexico as shown by your annual report to the New Mexico Commission? What is that figure for freight service?

A. The average miles of road operated, as shown in Schedule 931 of our annual report to the New Mexico Corporation Commission is 1,468.72.

Q. And in passenger service?

A. 1,093.26 miles; that is the average miles operated during the year.

Mr. Booth: 1939?

A. 1939.

Mr. Strouss: And in Arizona?

A. What is it you want for Arizona?

Q. The same thing, total mileage operated in freight service first?

A. The average miles of road operated in freight service [fol. 1764] in the State of Arizona for the year 1939 was 819.47 miles.

Q. And in passenger service?

A. Passenger service 750.11 miles.

Q. Now, that same account shows averages for the year, does it not, page 905?

A. Yes, it shows certain averages.

Q. Will you read those averages into the record, miles per revenue ton?

A. Are you referring to Arizona?

Q. Arizona first.

A. The miles per revenue ton as shown in Schedule 931 of the Annual Report to the Arizona Commission for the year 1939 was 321.01.

Q. And the miles per revenue passenger?

A. 360.12.

Q. Revenue per ton miles?
A. .01108 dollars.
Q. And revenue per passenger mile?
A. .01759 dollars.
Q. Revenue per ton?
A. $3.56.
Q. Revenue per passenger?
A. $6.34.
Q. Ton miles of revenue freight per mile of road?
[fol. 1765] A. 1,271,257.
Q. Now, will you turn to that same schedule for New Mexico?

The Court: Do you want him to read the same information for New Mexico?

Mr. Strouss: Yes. First, miles per revenue ton.

A. Miles per revenue ton for the year 1939 in the State of New Mexico, as shown in Schedule 931 of the Annual Report to the Corporation Commission for the Santa Fe is 226.91.
Q. Miles per revenue passenger.
A. 336.75.
Q. Revenue per ton miles.
A. .01098 dollars.
Q. And revenue per passenger mile.
A. .01913 dollars.
Q. Revenue per ton.
A. $2.49.
Q. Revenue per passenger.
A. $6.44.
Q. Ton miles of revenue freight per mile of road.
A. 1,043,451.
Q. Now, that same schedule shows, does it not, Mr. McDonald, that in Arizona, locomotive miles for helper service
[fol. 1766] ice was 732,088 miles?
A. In freight service.
Q. In freight service, and in New Mexico 171,326, is that correct?
A. That is correct for freight service.

Mr. Strouss: I think that is all.
Mr. Mason: No questions.

Mr. Booth: May Mr. McDonald with his records be excused?

Mr. Strouss: Yes, so far as I am concerned.

(Witness excused.)

[fol. 1767] LOYD E. CARTMILL, was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you state your name and official headquarters to the reporter, please?

A. Loyd E. Cartmill, San Francisco.

Q. What position do you occupy with the Pacific Fruit Express Company?

A. General superintendent, car department.

Q. Will you describe in general your duties as general superintendent of the car department of the Pacific Fruit Express Company?

A. My duties are to maintain the equipment, keep it in service.

Q. Do you have supervision of the car shops of the Pacific Fruit Express Company?

A. Yes, sir, everything pertaining to the cars.

Q. Does the building and reconstruction of P. F. E. cars come within your jurisdiction?

A. Yes, sir.

Q. The necessary inspections for the purpose of determining defects in such cars?

A. Yes, sir.

[fol. 1768] Q. The designing of cars or changes in cars?

A. That comes under my supervision, yes, sir.

Q. How long have you been employed by the Pacific Fruit Express Company?

A. Since 1908.

Q. In what capacities, will you say briefly?

A. I have been inspector, foreman, and shop superintendent, assistant general superintendent.

Q. Have you had prior experience, prior to joining the Pacific Fruit Express Company, with other companies operating or handling refrigerator cars?

A. Yes, sir, I had former experience with the Armour car lines which preceded the P. F. E. in service on the coast.

Q. How many years was that?

A. I began with them in 1900.

Q. For what railroads particularly does the Pacific Fruit Express furnish refrigerator cars?

A. Southern Pacific Company, Union Pacific, and the Western Pacific Railroad and their subsidiaries.

Q. Does it furnish refrigerator cars to other carriers other than those three whenever necessary?

A. I believe they are operated over all railroads in the country, yes.

[fol. 1769] Q. Do they operate over the Santa Fe?

A. Yes, sir.

Q. Does the Pacific Fruit Express Company operate the cars itself in the sense that it hauls them over the lines?

A. No, sir.

Q. Does it perform other services in connection with the furnishing of cars such as icing or protection against cold?

A. Yes, we furnish refrigeration and heater service.

Q. Does the Pacific Fruit Express Company service its own cars?

A. Yes, sir.

Q. Perform repairs upon them?

A. Yes, sir.

Q. Do those repairs include repairs to the running gear as well as to the body of the car?

A. Yes, sir.

Q. Does the Pacific Fruit Express operate cars on the Southern Pacific lines in Arizona?

A. Yes, sir.

Q. In Nevada?

A. Yes, sir.

Q. On all parts of the Southern Pacific system?

A. I think so, yes.

[fol. 1770] Q. At what points does the P. F. E. company maintain shops of its own?

A. It maintains shops at Los Angeles; Colton, California; Roseville, California; Nampa, Idaho; Pocatello, Idaho; and Tucson, Arizona.

Q. Do you characterize these shops as general shops?

A. There are four general shops and two light and heavy repair shops.

Q. What are the four general shops and how are those distinguished from the other two?

A. The four general shops are at Los Angeles, Colton, and Roseville, California, and Nampa, Idaho. At those shops we build and rebuild cars in addition to taking care of any other repairs. At Tucson and Pocatello we take care of light and heavy repair cars but do not do any rebuilding at those two places.

Q. Are cars reconditioned at Tucson?

A. Yes, sir.

Q. Do you maintain forces of inspectors as well as repair forces at those points?

A. Yes, sir, complete shop organization.

Q. Taking the Tucson force, for example, about how large a force do you maintain here?

A. We have all the way from, in the season, up to 150 [fol. 1771] to 200 men.

Q. The force fluctuates with service demand?

A. Yes, sir.

Q. About how large a force do you maintain at the shop at Roseville?

A. About 600 men.

The Court: Did I understand you to say you maintain a force in Tucson of about 150 to 200 men?

A. Yes, sir.

Mr. Mason: About how many men do you employ at the peak season at Los Angeles?

A. About 600.

Q. And about the same number at Colton?

A. About 450 or 500 at Colton.

Q. Do these forces also fluctuate with season demands?

A. Yes, sir.

Q. Do you have any points on the line or elsewhere where you maintain inspectors, designated as so-called "outside points"?

A. Yes, sir.

Q. Will you indicate some of those points and state what forces you maintain?

A. We have inspectors and forces at Fresno, Idaho Falls, San Jose, Bay Shore, which is near San Francisco,

[fol. 1772] Oakland, and many others in season. I don't recall all of them. Stockton is one of them.

Q. El Centro and Brawley?

A. We have men at El Centro and Brawley during the season.

Q. And Yuma?

A. Yuma as well.

Q. Do you maintain any forces at El Paso in season?

A. No, sir—pardon me, we have had repair men at El Paso in the past but it is not a regular force.

Q. What is the reason for maintaining these forces at these so-called "outside points"?

A. They are put there to see that the cars in that loading territory are in first-class condition, that they are clean and suitable for the lading. Usually they are located adjacent to a heavy loading territory and they make an inspection of the cars to determine that they are all right.

Q. Do they make light repairs of the cars if necessary?

A. Yes, sir.

[fol. 1773] Q. Are they equipped so as to recondition those cars?

A. No, sir, they can make light repairs and if they find one they cannot make light repairs on and make it satisfactory they would tag it to a closer shop.

Q. You have mentioned the terms "light" and "heavy" repairs as well as "reconditioning." How do you distinguish between light and heavy repairs?

A. A car costing one hundred dollars would be considered a light repair car.

Q. Any repairs up to one hundred dollars?

A. Yes, sir.

Q. And over one hundred dollars and up to what amount are heavy repairs?

A. From one hundred to two hundred fifty dollars.

Q. Do those figures include both labor and material?

A. Yes, sir.

Q. Are these repair forces and inspector forces at these outside points entirely separate and distinct from any railroad repair forces?

A. That is right, they are all P. F. E. forces on our payroll.

Q. Subject to your own supervision and jurisdiction?

[fol. 1774] A. That is right.

Q. Are your shops separate and distinct from the railroad car repair shops?

A. Yes, sir.

Q. When a car is returned empty to Pacific Coast or Southern Pacific territory after having been loaded to eastern territory, what happens to that car so far as the car forces or inspecting forces of the Pacific Fruit Express Company are concerned?

A. They are put into one of our shops or into the tracks assigned us for making inspection of the cars.

Q. This car, for example, is returned through the Tucumcari gateway. Where does the Pacific Fruit Express Company first see it or take charge of it?

A. If it was a car that was needed in this territory it would be stopped at the Tucson shops.

Q. What would be done to it there?

A. It would be given a general inspection, cleaning, and servicing.

Q. Would that be done before it was loaded again?

A. Oh, yes.

Q. Is that done to every car returning?

[fol. 1775] A. Yes, sir, before it is loaded, somewhere.

Q. If the car returns to the Southern Pacific through the Ogden gateway, where is the car first taken care of?

A. We would probably take care of it at Roseville, which is the first shop west of Ogden.

Q. A car returning through the Tucumcari-El Paso route is required in California, would it pass by Tucson and be inspected at some other point?

A. Yes, it would be directed through Colton or Los Angeles.

Q. If a car is required for loading in the Salt River Valley or the Yuma or Imperial Valley territory, where is it taken care of?

A. It is taken care of here, Nogales branch, Salt River Valley and Imperial Valley, anywhere within this vicinity.

The Court: Do I understand that these cars are loaded going east but that they return ordinarily empty?

A. Ordinarily they are, Judge, yes, sir.

Mr. Mason: Are Pacific Fruit Express cars susceptible of lading by other than perishable commodities requiring protection against heat or cold?

[fol. 1776] A. Yes, sir.

Q. They are sometimes used for such lading?

A. Yes, sir.

Q. What types of lading in particular?

A. Dairy products and packing house products; also they are loaded sometimes with dead freight.

Q. Are they ever loaded with such freight as flour or sugar?

A. Oh, yes, I think we have about everything in them.

Q. They are loaded with anything except commodities the nature of which would injure the interior of the cars?

A. That is right. We have some commodities that are not permitted to be loaded in our cars.

Q. That includes steel articles?

A. Yes, I think so, heavy steel, machinery, and things of that kind that would be apt to injure the car are prohibited.

Q. Can you say approximately what percentage of Pacific Fruit Express cars return empty westward as compared with the total returned?

A. I don't know that, Mr. Mason.

Q. Have you seen a copy of defendant's exhibit No. 2 relating to the chronology of car construction of freight boxcars on the Southern Pacific?

[fol. 1777] A. Yes, sir.

Q. Have you prepared or caused to be prepared an exhibit similar in form relating to the chronology of car construction of Pacific Fruit Express Company cars?

A. I have.

Q. Have you that statement before you?

A. Yes, sir.

Mr. Mason: We will ask that the chart which has been handed to the clerk and which consists of one sheet bearing the title, "Chronology of Pacific Fruit Express Freight Refrigerator Cars," be identified as defendant's exhibit No. 135 for identification.

The Court: It may be so marked.

The Clerk: Defendant's exhibit No. 135 for identification.

Mr. Mason: Was this prepared in your office, Mr. Cartmill?

A. Yes, sir.

Q. Under your direct supervision?

A. Yes, sir.

Q. Are you familiar with the details of the exhibit?

A. Yes, sir.

[fol. 1778] Q. Will you state from what records it was prepared?

A. These were prepared from records that are maintained in my office at San Francisco.

Q. Are those the records of details of car construction on the Pacific Fruit Express Company?

A. Yes, sir.

Q. Are they permanent records?

A. Yes, sir.

Q. Do you have those records in the city of Tucson at the present time?

A. I believe they are here, yes, sir.

Q. Are they available for the examination of opposing counsel if they so desire?

A. Yes, sir.

Mr. Mason: Mr. Strouss, we are prepared to produce the underlying records if you wish them. I am not sure that they are in the courtroom, maybe they were a little too bulky to bring in this morning.

Q. Has the exhibit been compared, Mr. Cartmill, against the underlying records to determine its correctness?

A. Yes, sir.

Q. Will you say whether or not in your opinion it is true and correct?

A. It has been checked and double-checked and I believe [fol. 1779] it is correct.

Mr. Mason: Have you any questions, Mr. Strouss, before the exhibit is offered?

Mr. Strouss: This is a question, I am not sure that it is a proper question here but I would like to save making an objection. Under column C you show "New Features" and in 1936 you show "New Features" there for that year. You don't mean by that that this exhibit means that all of the cars which you now own have all of the new features which are shown as those developed in 1936?

A. No, it is simply to show a comparison as between the cars as built in 1906 and as built in 1936.

Mr. Strouss: That is all.

Mr. Mason: Of course I have some more questions on the exhibit but they would necessarily relate to some of the

material and I wouldn't want to ask them preliminary to an offer. I will offer the exhibit in evidence as defendant's exhibit No. 135.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 135.")

[fol. 1780] Mr. Mason: Now, Mr. Cartmill, the 1906 car shown on exhibit 135 was practically the first car developed and built by or for the Pacific Fruit Express Company?

A. It was the first car built for the Pacific Fruit Express Company.

Q. And the features shown in column C, under the heading "New Features," are some of the outstanding characteristics of the car as placed in service in that year?

A. Yes, sir.

Q. Now, there were developments between 1906 and 1930, I presume?

A. Yes, sir.

Q. Then, what is the purpose of showing the 1930 car on the exhibit as the next development?

A. Well, it represents the type of car that was put into service and maintained from 1930 on.

Q. Now, were cars of earlier construction brought down to date by having incorporated in them the features shown for the 1930 car?

A. Well, the first 1906 car, there are none in service at all today, they are all out of service.

Q. But other cars that were built in subsequent years, were they given the improvements?

[fol. 1781] A. Yes, sir.

Q. For example, the 1906 car shows a tandem spring draft rigging, and shows that arch bar trucks were applied?

A. Yes, sir.

Q. Were those eliminated subsequently?

A. Those are all out of service. We have no cars with arch bar trucks, and no cars with tandem spring draft gears.

Q. Then, when cars were rebuilt or reconditioned after 1906 or at some subsequent date, the arch bar trucks were changed out for the type shown here?

A. Yes, sir, a great number of them were changed.

Q. For cast steel truck side frames?

A. Yes, sir, a great number of them were before they were scrapped.

Q. And the friction draft gears, instead of the tandem spring draft gear?

A. Yes, sir.

The Court: Would you classify the 1906 car as a wooden car?

A. No, sir, a steel underframe car.

Mr. Mason: And the other appliances shown here, for example, handholds and brake wheels, were the locations [fol. 1782] of those changed or additional handholds applied as the cars came into the shop?

A. Yes, the cars built in 1930 complied with all A. A. R. safety requirements, while the cars of 1906 did not.

Q. Now, turning to another feature, the cast iron wheels, single plate, is that a feature of the present day, generally speaking, of all P. F. E. cars?

A. Yes, that is an improvement, we considered that a better wheel than the old double plate wheel.

Q. Now, turning to the 1936 car, I notice you show the steel underframe with Corten steel center sills, and at the same time you show that the cross-sectional area of the center sills of the 1936 car is some ten square inches less than the 1930 car. Will you explain that?

A. Well, the Corten steel, is, of course, much stronger than the Grade B steel that is used commonly in center sills, plus the increased strength in the design of the car itself.

Q. How does that increased strength in the design of the car come about?

A. Well, it is a car that is riveted or welded, making a solid steel car body.

[fol. 1783] Q. Is it a solid steel body?

A. Yes, sir, the outside of it is all steel.

Q. Have you in the court room a model which corresponds to any of the cars shown on exhibit 135?

A. I have a model of the exhibit as shown in 1930.

Q. Is that the model car which is shown near the Judge's bench?

A. Yes, sir. It differs somewhat from 1930, as that model was built in 1928, I believe. It is very representative of a number of cars that we have.

The Court: What are the oldest cars that you now have in use, Mr. Cartmill, what year were they reconstructed?

A. Well, we are rebuilding cars in our shop now, Judge, that were built in 1925 and '26. That is the type that we are now giving a new body, turning out as a rebuilt car.

Q. Cars built prior to that time have been retired from service?

A. A great many of them have, but a great many of our cars are in service that have been rebuilt. They are practically a new car after we give them a rebuilding. We mod- [fol. 1784] ernize them and bring them up to date. While they would be built new in 1925, they would probably be rebuilt; we are building large numbers of them over and turning them out in 1940, and 1941 now.

Mr. Mason: When a car is rebuilt as you describe, are the new features shown in the 1936 car added to it so far as practicable?

A. Yes, sir.

Q. You show that the 1936 car has as one of its features AB Brakes. Do you have any program of applying the AB brake to cars built prior to 1936?

A. Yes, we have. Commencing this year, all cars rebuilt in our shops will have AB brakes applied and with the program which we have we will comply with the rule of having them all equipped.

The Court: What do you mean by "AB Brake?" What features does it have?

A. It has a feature that it gives the control of the car from the engine cab, better control than the K-2 Valves.

Mr. Mason: The AB brake refers to the brake valve attached to the car itself and which controls the airbrake mechanism on the car?

A. It refers to the air brakes only.

[fol. 1785] Q. It doesn't refer to the shoes applied to the wheel?

A. No; that is the foundation brake, it doesn't refer to them. Foundation brakes are applied alike to all of our cars; with the exception of the AB features in the airbrakes.

Q. Do I understand, Mr. Cartmill, that the AB feature is the value which replaces the K-2 type triple value?

A. That is right.

Q. Which is the present standard on many cars?

A. That is right.

Q. What is the date when the application of AB brakes will be complete?

A. The present date is January first, 1945.

Mr. Strouss: Now, are you speaking about Pacific Fruit Express cars?

Mr. Mason: Yes.

Q. What is the distinction that classifies the P. F. E. or the refrigerator car apart from other freight boxcars, Mr. Cartmill?

A. Well, a refrigerator car is a car that is built to transport perishables and protect them from heat or cold.

Q. Does it bear any resemblance apart from the wheels and the underbody to the household refrigerator?

[fol. 1786] A. It has the same features in the body of the car as the ice-box that we used to use in our homes.

Q. Are the sides, for example, built up with insulation to prevent the escape of heat or the intrusion of heat, as the case may be?

A. Yes, sir.

Q. And the doors in the same way?

A. The doors are built to close tightly and packed to see that no air can enter or escape.

Q. Does the car include a provision for the carrying of ice as the cooling medium?

A. Yes, sir.

Q. Where is the ice carried?

A. Carried in the ends of the car, two ice bunkers.

Q. Can you indicate the location of those ice bunkers by reference to the sketch of the 1936 car on exhibit 135?

A. Yes, it is outlined there on the diagram showing the ice bunkers at each end, and the hatchways at the top where the ice is supplied.

The Court: They are filled from the top, then?

A. Yes, sir.

[fol. 1787] Mr. Mason: Are those hatchways shown on the model which is adjacent to the Judge's bench?

A. Yes, sir.

Q. How about much ice is carried in the bunkers of the standard refrigerator car, PFE car?

A. Some of them 10,000, some of them 11,500 pounds per car. We also have some that are considerably more than that, but I am talking about the average car.

Q. You have a few very much larger cars?

A. Yes, sir.

The Court: How often do you have to re-ice them with that quantity in the bunkers?

A. We have icing stations all across the country. They are located at points that have been determined to be advantageous for the icing; that has been predetermined before the ice plants were installed; or we have provided for ice supply at those points.

Q. You go a distance of several hundred miles without re-icing?

A. Yes; in fact, we take a car across the country now without re-icing, from one coast to the other.

Mr. Mason: Mr. Cartmill, does the question of whether icing or re-icing may be required at particular points en- [fol. 1788] route depend very largely upon the commodity?

A. Yes, sir, and the instructions of the shipper.

Q. The state of the commodity when it is loaded, whether it is ripe or green?

A. Yes, that would have a bearing.

Q. Whether body ice is used or not?

A. Yes.

The Court: Do you have an automatic feature so that you can keep that temperature in there at a given point?

A. There are no automatic features in the car, except the one of refrigeration that you are all familiar with where ice is used as a refrigerant.

Q. What would be the normal temperature of such a car, iced?

A. It would depend on whether you used any salt or not. If you used ice without any salt, it would be probably around the late thirties or probably forty degrees. If you put in salt, you can freeze the commodity in the car if you put in enough.

Q. You just obey your shipper's instructions as to temperature?

[fol. 1789] A. That is right.

Mr. Mason: Are you able to maintain lower temperatures, for example, where you are carrying fresh meats in the car, than when you are carrying cantaloupes?

A. We have to maintain lower temperatures where we are handling, for instance, frozen products.

Q. Is it possible to vary the temperature also by the use of the vents?

A. Well, it is possible to control it to some degree by the vents. That is not resorted to generally, but where we have bulbs or something that has to have certain temperatures, we can usually give most any temperature they want.

The Court: Is this what you term the vent at the upper end of the bunker?

A. Yes, sir, except, if you will notice, that ventilator is controlled by a graduated lever, with graduations on it that can be set at many angles. You might take the top off and show the judge how that ventilation is accomplished.

(Thereupon, the Court and counsel examined the model referred to and discussed the same off the record.)

The Court: We will take a ten minute recess at this time.

[fol. 1790] Mr. Mason: Mr. Cartmill, I think you stated it was possible to control temperatures in the refrigerator cars according to the desires and needs of the commodity being shipped and so forth. Do you have P; F. E. employees at various places along the principal routes for the purpose of making adjustments of the ventilators of the cars.

A. Yes, sir.

Q. Just how do the employees accomplish this adjustment of the ventilators? Is it possible to adjust the ventilators to any desired degree of opening?

A. Yes, sir, they can vent them to any degree that is required or that they are instructed to do.

Q. That has the effect, I suppose, of lowering or raising the temperature in the body of the car and thus of the lading?

A. Yes, sir.

Q. Are you familiar with the operation called "Pre-cooling"?

A. I am not familiar with that. I know about it.

Q. You know that there is such an operation as pre-cooling of perishable freight?

A. Yes, sir.

[fol. 1791] Q. Is it done with the Pacific Fruit Express Company cars?

A. We perform that service in many places.

Q. That does not come under your jurisdiction?

A. That does not come under my jurisdiction.

Q. Do you have to make any adjustments of the cars or of the appliances on the cars to permit pre-cooling?

A. No, sir.

Q. Are you familiar with the refrigerator cars known as the "S. F. R. D."?

A. Yes, sir.

Q. What company operates those?

A. Santa Fe.

Q. Do they bear any resemblance to P. F. E. Company cars?

A. Some, yes, very much like them.

Q. Are they very similar?

A. Yes, sir.

Q. In the building of P. F. E. cars or in the rebuilding do you take into account the lading which they are to carry?

A. We of course anticipate the needs of patrons before redesigning a car and we get advice from our agents and traffic men concerning such cars and consider them in de-[fol. 1792] signing and redesigning all equipment to fit any particular need.

Q. Is it possible to adjust or design the inside measurements so as to permit various types of perishables to be loaded without the necessity of bracing?

A. We attempt to do that and it can be done. A great many shippers prefer having braces in the center of the load anyway and some of them prefer having solid load. That feature I am not entirely familiar with either.

Q. Are the lugs and boxes in which fruits and various other perishables are loaded of standard dimensions?

A. I believe they have a standardization committee on packages which tries to get the shippers together and so far as possible standardize their packages.

Q. Do you adjust the inside measurements of your cars to fit those standard packages or boxes?

A. We attempt to do that so far as possible.

Q. On your exhibit No. 135 you refer under the heading "New Features" first to the tandem spring draft rigging for the 1906 car, then to friction draft gears for the 1930 car. Do you use friction draft gears now exclusively on all of your cars?

A. All of our cars are equipped with friction draft gears.

[fol. 1793] Q. Are there various types of friction draft gears?

A. Yes, sir.

Q. Generally speaking, do they all employ much the same principle?

A. The same principles are employed in all friction draft gears.

Q. That includes a combination of springs and friction members?

A. Yes, sir.

Q. What is the function of the draft gear as a part of the appliance on the car body?

A. It is placed there to cushion the effect of operating shocks and switching shocks, cars being handled.

Q. Where is the draft gear found on the car?

A. At the end of the car, between the center sills or at the end of the center sill, one one either end.

Q. There are two draft gears on each car?

A. Yes, sir.

Q. Does the draft gear serve as a means of attaching the coupler and coupler shank to the car?

A. Yes, sir.

Q. That is its purpose, is it not?

[fol. 1794] A. That is its purpose.

Q. Are you familiar with the type of draft gear known as the "National M-17"?

A. Yes, sir.

Q. Is that a standard type of draft gear?

A. That is one of the friction standard gears that we use.

Q. Similar in general operation to other types of draft gear that you use?

A. Yes, sir.

Q. I want to call your attention to the model in aluminum which is on the table before you. Is that a model of the National M-17?

A. Yes, sir.

Mr. Mason: I will say to the court and for the advice of counsel that we expect to introduce in evidence not a model of the gear itself but a drawing of the National M-17 gear by another witness who will explain precisely how the gear operates with the drawing so the entire matter can be in the record but I wanted to identify the National M-17 as being a standard type of draft gear in use and similar in operation to other draft gears.

Q. Mr. Cartmill, have you before you a statement in three sheets bearing title, "Pacific Fruit Express Com-
[fol. 1795] pany, Sheet 1 of Sheets," on the first sheet and then details of construction of P. F. E. cars and so forth?

A. Yes, sir.

Mr. Mason: May this exhibit be marked for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 136 for identification.

Mr. Mason: Did you prepare exhibit No. 136 or have it prepared in your office?

A. I did.

Q. From what sources?

A. From the records that are maintained in my office.

Q. Are those the detailed records of car construction and car repair and inspection which you maintain regularly in your office?

A. Yes, sir.

Q. Have you brought those records to Tucson with you?

A. Yes, sir, I believe they are here.

Q. I will ask you to observe a package of records on one of the chairs near the bar in the courtroom. Is that one of the series?

A. I believe so.

[fol. 1796] Q. There are fifteen others?

A. I didn't know just how many there are but I know there is quite a number of them.

Q. Has the exhibit been compared against the underlying sources to determine its correctness?

A. Yes, sir, it has been checked.

Q. Will you say whether or not it is a true and correct reflection of the original records?

A. To the best of my knowledge it is.

Mr. Mason: Mr. Strouss, one of the sixteen packages of these original records is in the courtroom and, if you require of course we will produce the other fifteen.

Mr. Strouss: At the present time I don't know.

Mr. Mason: In round figures what is the cost new as of the present time of a P. F. E. refrigerator car standard size.

A. Between forty-five and forty-six hundred dollars.

Q. Does that include all of the various appliances?

A. That is the car complete and ready for service.

Q. With the AB brake and the friction draft gears you have described?

A. That is right.

[fol. 1797] Q. Referring to sheet No. 2 of the exhibit, I notice that you use the expression, referring to the cars rebuilt, "which cars were modernized at the time of rebuilding." What do you mean by the term "modernized"?

A. In our rebuilding, just as that would indicate, we tried to modernize it and bring it up to the requirements of shippers of that date based on the best knowledge we could obtain as to their requirements.

Q. Does that include the application of the newer and more modern fixtures and appliances?

A. Yes, sir.

Q. Would it include, for example, the replacement of the underframe by a stronger underframe if that was necessary?

A. If it was necessary it would include a new underframe.

The Court: I notice there are several years between 1925 and 1940 where no new cars whatever were built but numerous cars were rebuilt. That is correct, is it?

A. Yes, sir, we had several years in 1933, 1934, and 1935, I believe, that we didn't buy any cars and we didn't rebuild many at that time either.

[fol. 1798] The Court: That was during the depression years?

A. Yes; we didn't find the need for the cars.

The Court: The same is true of the year 1938?

A. Yes.

Mr. Strouss: Has this been admitted in evidence as yet?

Mr. Mason: No.

The Court: I beg your pardon.

Mr. Strouss: I have no objection to the exhibit being received in evidence but I think it should be in evidence before we discuss it.

The Court: Yes, that is true.

Mr. Mason: As to Part 3, Mr. Cartmill, I think you have referred to outside light repair points in your previous discussion without particular reference to this exhibit. What do you mean by "culling stations"?

A. That is an outside repair point.

Q. Is that a point at which you have forces to look these cars over and if necessary remove them from service until repairs can be made?

A. That is right. At each of these outside points we have a man in charge who is competent to judge and if he finds a car that is unsuitable for the service required it is called [fol. 1799] out and billed to the home shop for proper handling.

Q. About how many of these light repair points or culling stations do you maintain, that is, how many different ones are there?

A. I think there are about 85 all told where we have some repair man at some time in the year.

Q. Some of these points are maintained only seasonally, I take it?

A. Yes, sir.

Mr. Mason: We now offer the exhibit as defendant's exhibit No. 136.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 136."

The Court: I notice at the close of the year 1939, referring to page 3, that you had 5,000 fewer P. F. E. cars in active service than you had in the year 1930.

A. Yes, sir, we did.

The Court: And each of these cars on the average gets into the shop five or six times a year?

A. The column shows in 1939 they were at our shops 6.66 times per car in service.

Mr. Mason: Is there an inspection made each time of [fol. 1800] the car before it is handled at the shop?

A. Yes, sir, that is the first thing it gets, is inspection.

Q. Then this column means that there have been 6.66 inspections on the car on the average during 1939?

A. That is right.

Q. Before shopping?

A. It was in one of our shops for inspection and received inspection and conditioning and repairing if necessary 6.66 times.

The Court: Does that necessarily mean that each time work was done on that car or if it successfully passed the test might it be rolled out without having anything done on it?

A. We never turn them out without having something done. They have to be cleaned. One thing about a refrigerator car, it carries foodstuffs and it has to be cleaned and they have to be swept and scrubbed if necessary and deodorized or whatever is needed and then minor repairs made and air brakes tested and doors tested, plugs tested to see that they are tight.

Mr. Strouss: Do you mind if I ask a question, Mr. Mason?

Mr. Mason: No.

. . . . . .

[fol. 1801] Mr. Strouss: I was wondering on column 6, "Average Number Times per Year Each PFE Car Handled at Outside Points," for 1939 is 2.98?

A. That is additional to the 6.66 through the general shops.

Mr. Strouss: Suppose a car is inspected at one of the outside points and some repair is found necessary there which would require it to be taken into one of the shops, would that be counted first in paragraph 6 and when it is taken into the shop and repaired again counted as in paragraph 4?

A. Yes, it would, because we take our records from each movement.

Mr. Mason: I take it that ordinarily the car is first stopped at a shop and those stoppages appear in the fourth column of the Part 3?

A. Yes, sir.

Q. And it is stopped at an outside point only when it is destined for lading to a shop that would require an out-of-line or back haul?

A. Yes, take for instance in our San Francisco territory cars coming in under load made empty in San Francisco. We repair them at Bay Shore or Oakland and make the necessary inspection there rather than send them back to Roseville. However if they found cars there that were [fol. 1802] not suitable and required work they couldn't do or were not equipped to do at those points they would be billed back to Roseville.

Q. You show also in Part 3 reference to cars repaired or set aside for retirement or rebuilding on account of being unsuited for further use. How do you determine whether a car is to be retired or not?

A. It is inspected by the P. F. E. organization and if in their judgment it would not warrant further repairs for service without rebuilding, then the representatives of the Southern Pacific and Union Pacific railroads are notified and they send inspectors and a joint inspection would be made of each car to determine what should be done with it, whether it should be rebuilt or dismantled.

Q. Why do you call in the Southern Pacific and Union Pacific individuals jointly?

A. We are owned jointly by the Union Pacific and Southern Pacific railroads and they require that to justify the rebuilding or destruction of the car.

Q. Are cars sometimes rebuilt after being set aside as unfit for further use?

A. Oh, yes.

[fol. 1803] Q. And in some instances they are retired and destroyed, are they?

A. Yes, sir, the committee of inspectors pass on that and usually their recommendations are followed.

Q. I call your attention to an exhibit in one sheet entitled, "General Instructions for Inspecting Cars," identified further as Sketch No. 359.

Mr. Mason: Your Honor, we ask that this exhibit be marked No. 137 for identification.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 137 for identification.

Mr. Mason: Is exhibit No. 137 for identification a reproduction of instructions issued by you, Mr. Cartmill?

A. Yes, sir.

Q. Is that your facsimile signature which appears in the lower lefthand corner?

A. Yes, sir.

Q. Are these instructions which appear on the face of this exhibit general instructions issued by you and currently in effect?

A. They are, yes, sir.

Q. Were these instructions especially prepared for purposes of this case?

[fol. 1804] A. No, sir.

Q. I take it this is simply the equivalent of a photostatic reproduction of a current publication issued by you to your forces?

A. That is what it is, yes, sir.

Q. Are these instructions applicable at all of your shops?

A. Yes, sir.

Q. Are they applicable to your forces at outside points?

A. Yes, sir, with the exception of the underframe inspection. We do not engage couplers or inspect wheels at outside points.

Q. What forces perform those inspections?

A. Railroad forces.

Q. Your regular shop inspection includes inspection of the running gear as well as the refrigeration part of the car itself, does it?

A. Yes, sir, at the shops they take care of the air brakes and all work and at outside points they take care of the body work.

Q. Are these rules currently in force at all of these points?

A. Yes, sir.

Q. Are they complied with by your forces?

A. Yes, sir, I think they are.

[fol. 1805] Q. Do you make periodical checks through your supervising forces to determine whether they are being complied with and carried out?

A. I do.

Q. Do you have records of the inspections made by your inspectors purportedly pursuant to those instructions?

A. Yes, sir.

Q. Are those currently maintained in your office?

A. Yes, sir.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: We offer the exhibit in evidence as No. 137.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 137.")

Mr. Mason: Mr. Cartmill, are the inspections made pursuant to your instructions in addition to any inspections which may be made by the railroad forces?

A. They are made independently of any railroad inspection.

[fol. 1806] Q. Do they in any way supersede railroad inspections?

A. No, sir.

The Court: Is there a necessity for a dual inspection both by the railroad forces and your forces?

A. I am not entirely familiar with the railroad inspection but I think they require inspection of all trains when they are made up before departure and that would be regardless of the fact that we had done the same thing an hour or two before. They do that anyway in routine handling.

Mr. Mason: I think that is all we have of Mr. Cartmill.

Cross-examination.

By Mr. Strouss:

Q. You don't mean to testify, Mr. Cartmill, that the railroad's inspection is the same as this shown on your diagram?

A. No, sir.

Q. They wouldn't do this sort of an inspection?

A. No.

Q. What is the length of one of these cars, I notice that your exhibit doesn't show that. By the way, is exhibit No. 135 drawn to scale?

[fol. 1807] A. No, I don't think that is to scale. You want what particular dimension?

Q. I wanted the length of a P. F. E. car?

A. Of course we have a good many cars and there are some fractions of inches difference in the lengths. Length over coupler's is about 44 feet, 9 inches.

Q. Is the Pacific Fruit Express a member of the American Association of Railroads?

A. We are associate members, yes, sir.

Q. Do you comply with the rules of interchange, I notice you mentioned those in your testimony?

A. Yes, we do.

Q. One of the rules of interchange is identical with your policy adopted to complete installation of AB brakes by January 1, 1945?

A. Yes, sir.

Q. That is one of the requirements?

A. That is the present requirement.

Mr. Strouss: I understand that counsel for the defendant will have those rules of interchange and introduce them.

Mr. Mason: Yes, we probably will have the rules themselves as an exhibit or excerpt from them.

Mr. Strouss: The subject of air brakes was introduced [fol. 1808] more by the court than by counsel. I wanted to ask if you intend to have a witness with respect to air brakes?

Mr. Mason: We didn't intend to go into the details of the differences between the AB brake and the K type triple with Mr. Cartmill.

Mr. Strouss: Will you have a witness later on that?

Mr. Mason: To develop that difference?

Mr. Strouss: Yes. It has been brought up here now and I don't like to leave it without a more detailed discussion of it.

Mr. Mason: I cannot say that we definitely planned to have such a witness, at least not in our case in chief. It might become necessary at some stage of the case to do that but we hadn't made any definite plan to that end at all at the present time.

Mr. Strouss: Mr. Cartmill, in response to the court's question you had stated generally the difference between

the AB brake and the K triple valve. Can you give that difference in more detail?

A. I am not an air brake expert but I do know a little about it. As far as the difference between a K valve and an AB valve, it is very intricate and requires someone [fol. 1809] with definite knowledge of the very delicate workings of those valves to explain the differences, but in general I believe a car equipped with an AB valve will respond more quickly to the engineer's valve and a surer setting of the brakes instantaneously with the movement of the valve in the engineer's cab more so than the K valve.

Q. One of the features which are recommended by the AB is the quick action feature?

A. And a uniform application of brakes.

Q. By that you mean a more rapid transmission of the air wave through the brake by and through the train?

A. Yes, sir, the A and B valve arrangement on a car will respond more quickly to the engineer's movement of his valve in the cab than the K valve. That is my understanding for the need for it, that they can be assured of that.

Q. There are two separate auxiliary reservoirs in connection with the AB valve, that is true?

A. Yes.

Q. The emergency reservoir being separated from the service?

A. That is right.

Q. Which is not true of the K valve?

A. No, sir.

[fol. 1810] The Court: Well, Mr. Cartmill, is the air brake on the P. F. E. cars different than it is on ordinary modern boxcars?

A. No, sir, it is the same brake that is used on the freight cars generally.

Mr. Strouss: Of course, there is no one type of brake that is on all cars at the present time, either P. F. E. or all other cars; there are two types of brake that are generally used?

A. I think the two we are talking about are most generally used. There are other valves used, but these are most generally in use, but they all function on the same air-reductions in the one as the other, they all function practically the same.

Q. Well, of course, the AB was developed to overcome difficulties encountered in the K triple valve, isn't that true?

A. I will tell you from experience, and I have seen a

great many valves developed and come to know them in the forty years that I have been repairing cars, and there has always been a question at the time of introducing a new type as to whether it does do and has the improvements that are recommended for it. I think that is so today with the AB valve. There are some people that know more about it than [fol. 1811] I do that do not give the credit to the AB valve that is claimed for it.

Q. The AB valve?

A. The AB valve. We are in a transition. We go from one quick action to the K valves that have the retarding release feature, now we go to the AB, and since its introduction there have been changes made in them trying to improve it.

Q. Is it your opinion the AB valve is an improvement over the K triple valve?

A. Well, so far it is doing a very good job.

The Court: Do I understand that by January of 1945 that that will be standard equipment on all cars?

A. On all P. F. E. cars, that is our present plan.

Mr. Strouss: That, of course, isn't a certainty. That is the rule or policy now adopted?

A. That is right. That is recommended by the A. A. R. Association.

Q. The K triple valve is still the valve which is on a great many of the cars?

A. In most general use, yes, sir.

Q. Are you familiar with the tests that were made by the [fol. 1812] American Association of Railways, airbrake tests?

A. I was present at Purdue University when the tests were made.

Q. The rack tests?

A. Yes, sir.

Q. How about the road tests?

A. I wasn't on that.

Q. Are you familiar with the report that was made in connection with those tests?

A. No, I am not familiar with that. I have read it, but I am not very familiar with it.

Q. Those tests were made by the American Association of Railways?

A. I understand they were, in association with the railroad employees and the airbrake company employees.

Q. Following an order of the Interstate Commerce Commission?

A. I don't know what prompted it.

Q. And for the purpose of attempting to develop a more efficient brake?

A. I understand so, yes.

Q. That is what they were attempting to do at Purdue with the rack tests?

A. Yes, demonstrating what could be done.

Q. Do you know what the results of the rack tests [fol. 1813] were?

A. Well, the AB valve was the result.

Q. It is the ultimate result?

A. It is the ultimate result.

Q. There were three brakes which were recommended for road tests, at that time; isn't that true?

A. Yes, that is right.

Q. That was the K triple, and the Westinghouse F-5 and the Westinghouse F-3?

A. I am not familiar with just what was recommended at that time.

Q. Now, these cars that are rebuilt, I believe you testified on direct examination, that when a car is rebuilt the new appliances shown as added in 1936 are added when a car is rebuilt?

A. Generally they are.

Q. You don't mean that each of these new appliances is added in every instance?

A. No, sir.

Mr. Strouss: I think that is all.

The Court: Well, Mr. Cartmill, do I understand that in a given train that there might be cars, P. F. E. cars or other cars, some of which are equipped with your AB valves, and others with the K triple valve?

[fol. 1814] A. Yes, sir.

Q. Yet they would work all right?

A. Yes, sir.

Q. For the engineer up in the cab, he could apply the brakes and the car equipped with the AB brakes, that would function properly, and the next car to it might be equipped

with a K triple valve, and it also would function with the same application?

A. Would be just exactly as good as the AB, Judge; wouldn't be any difference at all, and might not, but generally they do, they operate just the same, but he is sure of it with the AB valve; he has more assurance than he does with the other type, but they will operate together and in unison, and are doing that every day.

Mr. Mason: In practically every train?

A. Yes, sir.

Mr. Strouss: The greater percentage of valves now are still the K type triple valve?

A. I think on the older equipment, yes. All the new cars coming out have the AB valves, of course.

Q. There are probably seventy per cent of the cars in service that are equipped with K triple valves?

[fol. 1815] A. I don't know what that percentage might be.

Q. Of course, in your statement just made that one will function just as well as the other, do you mean that the K triple valve is just as efficient a brake as the AB valve? Is that your testimony?

A. Well, I didn't want to be placed in the position to be the judge, but I was just giving my opinion based on a long time of service and seeing a good many different types of valves, and in those years I have been out on the road and conducted tests for weeks at a time on airbrakes, and I have seen these recommendations made and improvements, or so-called improvements made, and eventually they were not so hot either.

Q. One of the complaints or difficulties that was claimed with respect to the K valve was undesired emergencies occurring after a service application in many instances, and the AB valve is supposed to have overcome that?

A. Well, it does, I believe, have a better reputation now than the K valve.

Q. But whether it does after it has been in operation some time or not, you are doubtful?

A. I imagine that in the evolution of air brakes they will probably develop one that is even better than the one we [fol. 1816] have today; I hope so.

Q. Of course, there was that undesired feature in connection with the K valve?

A. We had some trouble with undesired quick action and that has been corrected in the K valve in most cases, it has with us.

The Court: But the trainmen in making up any given train wouldn't pay any particular attention to the kind of valve on a particular car in placing all of one type together?

A. No, sir; he knows they will all work the same. They are all the same to switchmen.

Mr. Strouss: What do you mean, they all work the same? Of course, in the functioning of the AB and K triple valve, there is quite a bit of difference in a number of respects, isn't there?

A. Yes; they have claims that the AB valve will do certain things that the K valve will not, but when you get up in the cab of an engine and make the brake application, all the brakes will go on, and when you pump them off, all will be released.

Q. On the release, the AB valve, one of the features claimed for the AB valve is, is it not, that in the separation of the auxiliary reservoir separating the emergency and the [fol. 1817] service, that in the rebuilding of the air in the brake pipe and in the service reservoir, the auxiliary reservoir will aid, and in that way speed up the action of the brake?

A. That is right, that is claimed for it.

Q. That feature isn't in the K valve?

A. No, that isn't there. No, I have no brief for the K valve, but I do know there are a lot of claims made for these improved devices that often in service we don't find.

Mr. Strouss: That is all.

Redirect examination.

By Mr. Mason:

Q. Mr. Cartmill, you said, in your answer to the Court, that the trainmen know that these brakes will all apply the same. You mean that he knows that the brakes will be applied to the wheels to stop the car?

A. That is right.

Q. You spoke of the undesired emergency action after a service application with the K type triple valve. Has there

been any change in the graduating spring of the K triple valve for that purpose?

A. Yes, in some tests I was on, we developed that it was desirable to have the graduating spring tension increased, [fol. 1818] and by doing that we found that eliminated a great deal of the undesired quick action.

Q. Is the heavier graduating spring now a standard requirement in K type triple valves?

A. It is on all P. F. E. cars where the K valve is employed.

Q. Is if one of the A. A. R. requirements?

A. Yes, it is a standard.

Q. That you meet?

A. Yes, we meet that.

Q. How long has that been a standard requirement?

A. Oh, that has been a number of years. The tests were conducted along about 1915 that I referred to. We have been using it every since.

Q. Do you now operate any P. F. E. cars which do not have the graduating spring changed?

A. No, they all have the heavier springs.

Mr. Mason: That is all.

Recross-examination.

By Mr. Strouss:

Q. Of course, that doesn't overcome the undesired emergency resulting from failure to build up the air in the auxiliary reservoirs following the service application of the [fol. 1819] brakes in long-train operations?

A. Well, I predict that there will be undesired quick action for a long time yet.

Mr. Strouss: That is all.

Redirect examination.

By Mr. Mason:

Q. Mr. Strouss referred to long-train operation. Does the length of train have any effect on the undesired quick action?

A. Well, I don't think so. I think a faulty brake might have, but if they were all in perfect order, I don't believe

there would be any difference in how many cars you had, if they were all all right at the start.

Recross-examination.

By Mr. Strouss:

Q. Mr. Cartmill, of course, the operation of the brake is controlled from the engine, isn't it?

A. Yes, sir.

Q. And the air wave begins from the engine?

A. Yes, sir, that is right.

Q. Now, I just want to show you defendant's exhibit No. 118, and ask you if you believe that an air wave starting at the engine up here is going to get back to that caboose back [fol. 1820] there as quickly as it will up here at the middle of this train.

Mr. Mason: Just a moment. My question, and I suppose that this recross-examination should refer to my question, had reference to the undesired quick action; now, this question has to do with the application of the air from the engine. I have no objection to the question, if it has to do with undesired emergency action.

Mr. Strouss: Of course, undesired emergencies result from the failure to build up the air in the rear of the train in a great many instances?

A. Not necessarily.

Q. But in many instances, isn't that true?

A. No, I don't think so.

Q. Never does?

A. Not to my knowledge. I have never tested a train of the length that this seems to be, I don't know how many cars are in there.

The Court: One hundred sixty cars, I believe is the testimony.

The Witness: I have never conducted any tests on a train that long.

Mr. Strouss: Will you read my previous question. [fol. 1821] (The following question was read by the reporter: "Now, I just want to show you defendant's exhibit No. 118, and ask you if you believe that an air wave starting at the engine up here is going to get back to that caboose back there as quickly as it will up here at the middle of train?")

A. Well, it stands to reason that it takes time for anything to move. Of course, if the air starts from the engine, it would have to travel the length of 160 cars to get there, if you were charging your train.

Mr. Strouss: That is all.

The Court: May this witness with his records be excused?

Mr. Strouss: Yes.

The Court: The court will be at recess until two o'clock.

(Thereupon, the court stood at recess until January 7, 1941, at two o'clock P. M.)

[fol. 1822] January 7, 1941, Two o'clock, P. M.

Proceedings were resumed at this time as follows:

Mr. Mason: We will call Mr. Weeks.

R. H. Weeks was called as a witness on behalf of the defendant and being first duly sworn, testified as follows:

Direct examination.

By Mr. Mason:

Q. Please state your name to the reporter, Mr. Weeks.

A. R. H. Weeks.

Q. Are you employed by the Atcheson, Topeka & Santa Fe Railway Company, Mr. Weeks?

A. I am.

Q. In what capacity?

A. Car accountant.

Q. Where are your headquarters?

A. Topeka, Kansas.

Q. As car accountant, who is your immediate superior?

A. W. P. Dolan, Superintendent of car service.

Q. Do you report through Mr. Dolan to the general superintendent of transportation?

[fol. 1823] A. Yes, sir.

Q. And receive your instructions to some extent from the general superintendent of transportation?

A. Yes, sir.

Q. As car accountant, will you describe your duties briefly?

A. The car accounting office keeps a record of the movement of all the cars that move on the Santa Fe System, the movement of the engines, all the accounting in connection with the cars themselves, the earnings, and also work up the statistics which are the basis for all the System reports.

Q. Do those statistics include the statistics relative to car and train movements?

A. They do, yes, sir.

Q. The statistics are sometimes referred to as the car-mile and train-mile figures?

A. Yes, sir.

Q. Are those made up by you or in your office under your supervision?

A. In my office under my supervision, yes, sir.

Q. How long have you occupied your present position?

[fol. 1824] A. Five years.

Q. Did you have previous service in the office of the car accountant at Topeka?

A. I have had thirty years in the office in Topeka.

Q. In making up your statistics of train-mile and car-mile movement for the System, what type of underlying report, naming it by name, do you principally use?

A. Conductor's wheel report, which is the official record, and the only basis for all statistics and all the accounting.

Q. Do the conductors' wheel reports reach your office regularly and periodically?

A. When a conductor has finished his run, he immediately mails in the wheel report.

Q. To you at Topeka?

A. Yes, sir.

Q. Then you assemble all the wheel reports from the System and make your records accordingly in your office?

A. That is correct.

Q. Are the wheel reports bound up into books?

A. They are.

Q. By districts?

A. By divisions and by dates.

[fol. 1825] Q. Are you able to make studies showing the movement of trains and cars by divisions or districts or by state lines from the wheel reports?

A. Yes, sir.

Q. Did you bring with you to Tucson certain wheel reports of the Santa Fe from your office?

A. I did.

Q. About what quantity?

A. About 18,000 pounds, a baggage car full.

Q. Mr. Weeks, I should like to have you refer, if you will, to a statement of three sheets entitled, "The Atchison, Topeka & Santa Fe Railway Company. Typical Examples of Freight Trains Handled on Main Line between Chicago, Illinois, and Gallup, New Mexico, February 1st to 10, 1940, Inclusive," the third sheet bearing a similar title but referring to main line between Needles and Bakersfield, and Barstow and San Bernardino, California. Have you the statement before you?

A. Yes, sir.

Mr. Mason: We ask that this statement be marked defendant's exhibit for identification next in order, Your Honor.

The Court: It may be marked.

[fol. 1826] The Clerk: Defendant's Exhibit No. 138 for identification.

Mr. Mason: Did you prepare the details of the showing set forth on Exhibit 138 for identification, Mr. Weeks?

A. It was prepared in my office under my supervision, yes, sir.

Q. That is, of course, except as to the ruling grade?

A. Yes, sir.

Q. And from what sources was the exhibit prepared?

A. From the conductors' wheel reports.

Q. Now, I notice that, as the title shows, there are certain districts and also certain dates selected. Did you make the selection of the period covered by the exhibit?

A. I did not. They were selected by the general superintendent of transportation.

Q. Is that your superior, the general superintendent of transportation?

A. Yes, sir.

Q. That is Mr. J. J. Mahoney?

A. Yes, sir.

Q. He directed you then to make a study for the first

[fol. 1827] ten days of February, 1940, is that correct?

A. Yes, sir.

Q. Did he select also the districts that were to be studied for this purpose?

A. Yes, sir.

Q. Now, is all of the information appearing on this exhibit, with the exception of the ruling grade, set forth in detail as to each of the trains on the underlying wheel reports?

A. Yes, sir.

Q. Does the exhibit show all of the trains operated between the points shown and for the period mentioned?

A. Yes, sir.

Q. It doesn't relate merely to through trains, then?

A. No, trains operated on the main line.

The Court: That would include any local trains?

A. Yes, sir.

Mr. Mason: Now, the exhibit is obviously, Mr. Weeks, a summary or a computation as to the averages and, of course, the number of trains. Were those computations made in your office under your supervision?

A. Yes, sir.

[fol. 1828] Q. Have they been checked?

A. Yes, sir.

Q. Has the exhibit throughout been checked against the underlying sources?

A. It has.

Q. Will you say, in your opinion, whether or not it is true and correct to the best of your knowledge and belief?

A. I can. It is correct, to the best of my knowledge and belief.

Mr. Mason: Have you any questions, Mr. Strouss? I may say, we expect to call Mr. Mahoney, who is present in the court room, as to the reason for the selection of this period and, of course, the ruling grade can be checked against the exhibit already introduced by Mr. Blanchard, and the distances also introduced by Mr. Blanchard, and the distances also may be checked in that way.

Mr. Strouss: I have no questions.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit 138.

Mr. Strouss: The same objections as made to the exhibits offered before the recess.

The Court: The objection is overruled. It may be admitted.

Mr. Mason: I take it there is no objection on the basis that the underlying documents are not here.

[fol. 1829] Mr. Strouss: I want to ask what the wheel reports cover.

A. You mean that I have in the car?

Q. Yes.

A. They cover February first to tenth.

Mr. Strouss: My objection will go to that too.

Mr. Mason: Do you wish those wheel reports made available?

Mr. Strouss: I stated before that when this type of exhibit was offered with the wheel reports for a ten-day period with the testimony that it is a typical operation, without submitting the records for a full year's period and there was a chance to examine as to that period, certainly it is calling for a conclusion.

Mr. Mason: Now: Now, as to the question whether the exhibit represents a typical period, we intend to ask Mr. Mahoney as to that, because he made the selection of the period, but the witness prepared it from the underlying documents.

Mr. Strouss: I understand, but I don't want to waive any objections.

The Court: If I understand the situation, Gentlemen, the wheel reports from which this data was taken are here [fol. 1830] in Tucson?

The Witness: Yes, sir.

Q. Available for the use of counsel and any examination he wants to make?

A. That is correct, Your Honor.

Mr. Strouss: That is for the ten-day period only.

The Court: Yes, for the ten-day period. The objection is overruled.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 138.")

Mr. Mason: Now, Mr. Weeks, I call to your attention Sheet 3 of the exhibit, where there appears the statement at the foot of the sheet, "No local trains." Does that mean

that you didn't include any local trains or that no such trains were operated?

A. There were no local trains operated in this territory.

Q. During this period?

A. That is right.

Mr. Strouss: Your wheel reports, the same as any other railroad, just show the matters in connection with the particular train that the wheel report covers?

[fol. 1831] A. That is correct, yes.

Mr. Mason: Mr. Weeks, I call your attention now to a statement consisting of six pages, bearing on the first sheet the title, after the name of the railroad company, "Maximum Number of Cars Handled in Various Main Line Passenger Trains between Chicago, Illinois, and Los Angeles, California, February 2nd to 8th, 1940, Inclusive," and bearing on succeeding sheets a similar title, although on page four a different period is referred to, likewise, on pages 5 and 6, the period there beginning November 17th to 23rd, 1940, inclusive; have you that statement before you?

A. I have.

Mr. Mason: Your Honor, we ask that this be marked "Defendant's Exhibit 139 for identification."

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 139 for identification.

Mr. Mason: Did you prepare Defendant's Exhibit No. 139 for identification, Mr. Weeks, or supervise its preparation?

A. It was prepared in my office under my supervision.

[fol. 1832] Q. From what sources was it prepared?

A. Passenger conductors' wheel reports.

Q. Are the passenger conductors' wheel reports similar in general consist to the freight train wheel reports?

A. Yes, sir.

Q. And are there any computations other than the addition of the number of trains referred to appearing on this sheet—yes, I see that there are percentages.

A. Yes, sir.

Q. Did you make those computations?

A. Yes, sir.

Q. Has the exhibit been checked against the underlying wheel reports?

A. It has been.

Q. Do the mileages appear on the wheel report as well as the other information?

A. They do not.

Q. From what source do you take the mileages?

A. The clerks in the statistical mile reports give the distances that the cars actually run.

Q. The wheel reports show the mileage, the station by mileage at the origin point and the station by mileage where the car is switched off?

[fol. 1833] A. That is correct.

Q. You obtained the mileage in that way?

A. Yes, sir.

Q. I don't know whether I asked you did you check these computations to determine whether they were correct?

A. Yes, sir.

Q. Will you say whether or not the exhibit is a true and correct reflection of the underlying sources?

A. It is, to the best of my knowledge.

Q. Now, does this include all of the main line through passenger trains operated over these particular districts during the periods shown?

A. Yes, sir, indicated by number and also by name.

Q. Did you select the periods themselves?

A. No, sir, they were also selected by Mr. J. J. Mahoney.

Q. Does this include all of the main line passenger trains operated between Chicago and Los Angeles over either of the alternate routes described by Mr. Blanchard?

A. Yes, sir.

Mr. Mason: Have you any questions on the exhibits, Mr. Strouss?

[fol. 1834] Mr. Strouss: No questions.

Mr. Mason: We offer the exhibit as No. 139 with the explanation that Mr. Mahoney will be called to testify in connection with this exhibit as to the typical character of the period studied and the reasons why these particular periods were selected.

Mr. Strouss: The same objection as previously.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 139.")

[fol. 1835] Mr. Mason: Mr. Weeks, have you before you a statement in one sheet, typewritten, that is, the one that has been distributed is typewritten, bearing title, "Atchison, Topeka and Santa Fe Railway, Freight Train-Miles and Freight Car-Miles, Main Line Territory between Clovis, New Mexico, and Gallup, New Mexico, and between Gallup, New Mexico, and Needles, California, Years 1923-1939, Inclusive"?

A. I have.

Q. Did you prepare that statement?

A. Yes, sir.

Q. Was that likewise prepared from the conductors' wheel reports relating to those districts?

A. It was.

Q. And relates only to freight train service in those two districts?

A. Yes, sir.

Q. Does it include all freight trains operated in those two districts?

A. In those two districts, yes, sir.

Q. Would that include any local trains which may have been operated as well as through trains?

A. Yes, sir.

Q. There are certain computations which appear in lines [fol. 1836] 7, 14, 20, and 21. Are those simple additions?

A. Yes, sir.

Q. Of the figures which appear immediately above for the several years?

A. That is correct.

Q. Has the exhibit been checked as to those computations and additions as well as the figures themselves against the wheel reports?

A. It has.

Q. Will you say whether or not it is true and correct?

A. To my best knowledge it is correct.

Mr. Mason: I would say, Your Honor, that this exhibit is for the purpose of laying a foundation for a later comparison between certain results of operation in the territory between Clovis and Gallup on one hand, which is entirely in New Mexico; and the territory between Gallup

and Needles on the other hand, which is largely in Arizona. Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 140.

Mr. Strouss: The same objection, except that I am not making the objection that the underlying records are not [fol. 1837] here. I take it you don't have all these wheel reports and I am not objecting on that ground but with that exception my objection still remains.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 140.")

Mr. Mason: I think that is all, Mr. Weeks. Do you wish to cross-examine?

Mr. Strouss: No questions.

The Court: You are reserving your right to cross-examine him later or are you through with him now?

Mr. Strouss: No, I understand Mr. Mahoney will testify now.

The Court: Very well.

(Witness excused.)

J. J. Mahoney was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you state your name, please, and your headquarters to the reporter?

[fol. 1838] A. J. J. Mahoney, Chicago, Illinois.

Q. What is your official position with the Santa Fe?

A. General superintendent of transportation of the Atchison, Topeka and Santa Fe system lines.

Q. Does that include the entire system shown in outline on exhibit No. 124, including the lines in Texas?

A. Yes, sir.

Q. How long have you been in the service of the Santa Fe?

A. I entered the servide of the Santa Fe in May, 1912, at Pueblo, Colorado, as a switchman.

Q. Have you had railroad experience prior to entering the service of the Santa Fe?

A. Yes, I had five years and eight months in train service with the Denver & Rio Grande Western.

Q. In what capacity?

A. As a trainman and worked between Salida, Colorado, and Pueblo, and Pueblo and Trinidad and La Veta, Colorado.

Q. You mean as a brakeman and conductor?

A. Yes, sir.

Q. Did you have other train service experience with another railroad?

A. I had several years of experience before working for [fol. 1839] the Denver & Rio Grande as switchman and brakeman for the Rock Island Railroad at Herington, Kansas, and also at Goodland, Kansas.

Q. Since you have been with the Santa Fe what positions have you occupied? You started in as a switchman, you say?

A. Yes, I was first employed as a switchman in 1912; served in the capacity of yard foreman or yard conductor, assistant yard master and general yard master for eight years. I was promoted to general switching inspector of the western lines comprising the territory from Newton, Kansas, to Denver, Colorado, to El Paso, Texas. In 1921 I was appointed general transportation inspector for the same territory. In 1924 I was promoted to train master on the Rio Grande division and served in that capacity for approximately a year, and was promoted to assistant to the general superintendent of transportation in June, 1925. I served in that capacity until July, 1936, when I was promoted to my present position.

Q. Does your jurisdiction now extend to the entire system?

A. The entire Santa Fe system.

Q. As general superintendent of transportation what are your duties, briefly described?

[fol. 1840] A. The duties of my office include the distribution of passenger and freight equipment on the entire system, the supervision of all car service matters, including the interchange of traffic with connecting lines as well as the coordinating of freight train schedules with connecting lines and the supervision of all freight train schedules on the entire system where the freight train operates over

more than one division. I might say that local freight trains that are confined to operations on one division, I don't make those schedules.

Q. Do you in your position have anything to do with the assignment of power?

A. No, I do not, only to the extent that I confer with the vice-president in charge of operations and the assistant to the vice-president in charge of mechanical matters in the assignment of power over the various grand divisions and divisions.

Q. Is it necessary for you in your position to become familiar with the locomotive equipment of the Santa Fe?

A. Yes, sir.

Q. Are you familiar with it?

A. Yes, sir, I am.

[fol. 1841] Q. Are you a member of any carriers' committee having to do with schedules or other transportation matters?

A. Yes, I am chairman of a subcommittee on freight train schedules of the Western Association of Railway Executives. That association comprises all lines west of Chicago, and as chairman of the subcommittee I am charged with the responsibility of making studies of all transcontinental schedules over all routes for the purpose of bringabout uniform schedules both east and west bound from California to the Missouri River gateways as well as Chicago and St. Louis.

The Court: Does that include passenger as well as freight trains?

A. No, Your Honor, that is just freight trains. I might say for the benefit of the court that the duties of this committee that I am chairman of, we cooperate with the perishable industry in California and Arizona, confer with them and it is very essential that that industry have uniform service to all of the principal eastern markets and through the cooperation with the industry and the carriers we are able to bring about a uniform service that gives the shippers of perishable products the knowledge of when they [fol. 1842] ship a car on a given date they know it will be available at the principal eastern markets on a given date, thereby affording them an opportunity to regulate the flow of that traffic into these principal markets.

Mr. Mason: Q. Do your studies of these schedules, especially for the benefit and use of the perishable territory in the origin territory out West here, include any studies of the problem of making the empty equipment available to them and of returning it to western territories?

A. Yes, that is quite a problem during the peak seasons covering the movement of deciduous fruits, vegetables, and potatoes. We in our committee cooperate with lines east of the western lines for the purpose of prompt movement and return of our western ownership refrigerator cars in order that we can take care of the traffic offered.

Q. Do you ever undertake to move empty equipment westbound in expedited service in order to meet loading requirements?

A. Yes, that is common with the Santa Fe. During the months of May and June and September and October of each year we give empty refrigerator cars preferred movement. In fact we give those empty refrigerator cars faster [fol. 1843] movement to California than loaded traffic.

Q. Do you cooperate with your connections in affording that movement?

A. Yes.

Q. Your connections in western territory?

A. Yes, we offer them that same kind of service. We give them—a P. F. E. car, for illustration, expedited movement between Chicago and Kansas City, Kansas City and the Colorado gateways, Pueblo and Denver, and likewise we give those cars preferred movement to Deming and El Paso at certain seasons of the year when we were called upon in order to augment the car supply on the lines which the P. F. E. Company has contracts to furnish refrigerator cars.

Q. In your capacity as chairman of the subcommittee you have mentioned, are you familiar with the practices of your competitors and connections in the western origin territory.

Mr. Strouss: May I have the record show that my running objections go to this testimony.

The Court: Yes.

A. Yes, I am quite familiar with their operations. In fact we worked out joint through schedule service with our

western connections as well as with the lines that join us [fol. 1844] on our eastern terminal.

Mr. Mason: Does this working out of schedules include the lines that compete with you, such as the Southern Pacific?

A. Yes, sir, we have through schedules worked out with the Southern Pacific, accepting traffic from that connection at Deming and El Paso, Texas.

Q. And at California junctions as well?

A. As well as California junctions. We likewise have through connections through the Ogden and Salt Lake gateways, at Pueblo and Denver, and likewise we accept traffic from our connections at Kansas City and move through to Chicago or deliver th[e] traffic at Chicago to eastern connections on a through schedule.

Q. From your knowledge will you say whether or not lines paralleling or competing with the Sante Fe give expedited movement to empty refrigerators during the busy season in the same fashion that you have described for the Santa Fe?

A. Yes, sir, I understand, in fact when we are called upon to assist them in expediting the return of their cars we do that on our lines and turn those cars over at the various gateways to other western connections that perform the same service.

[fol. 1845] Q. Do you travel over the lines of the Santa Fe frequently?

A. Quite often.

Q. About how much of your time on the average is now spent away from the office and out on the lines?

A. That will vary from I would say year to year, but I would say forty per cent of my time is away from the office. Sometimes it will be more, sometimes less.

Q. In prior years has it reached any higher percentage?

A. Yes, when I was assistant to the general superintendent of transportation and served in that capacity for approximately twelve years, my time out on the railroad would be 90 per cent of my total time.

Q. What means of transportation do you use in traveling over the Santa Fe?

A. In my present capacity I use a business car.

Q. Do you always use passenger trains?

A. No, sir.

Q. You sometimes have the business car attached to freight trains?

A. Yes, sir, I do.

Q. Where do you put it in the freight train?

[fol. 1846]. A. It is the rear car following the caboose.

Q. You don't spot it next to the locomotive?

A. No. I have made one or two trips where I have told the conductor to pick me up next to the engine and set me out because I was going to make a short jump, rather than have to cut the engine off and run around the train and take a little more time setting the car off the train under that method and I would tell him to handle me next to the engine.

Q. Is it correct that generally your business car is at the rear end of the train?

A. Yes, in the majority of the cases.

Q. Do you make any selection of freight trains according to length upon which you will travel with your business car?

A. No.

Q. Do you ever travel with your business car on trains of more than 70 cars?

A. Yes, quite often.

Q. Are you familiar with the box and refrigerator car equipment owned or operated by the Sante Fe on its lines?

A. Yes, sir.

Q. Is that a necessary part of your duties?

A. Yes, it is.

[fol. 1847] Q. Your experience with the Santa Fe as I recall runs back to 1912?

A. Yes, sir.

Q. You are familiar I take it with the Santa Fe equipment from and since 1912?

A. I am.

Q. I will ask you to look at defendant's exhibit No. 2 showing the chronology of freight boxcars of Southern Pacific ownership up to 1940, since 1900. Have you seen that exhibit?

A. Yes, I have seen this exhibit and I have compared our car construction with this exhibit.

Q. Addressing particularly to the period since 1912 down to date, will you say whether or not the development of Santa Fe boxcar equipment has proceeded generally along

substantially the same lines as indicated by exhibit No. 2?

A. It has.

Q. Does the Santa Fe now operate any cars not of steel or steel underframe construction in main line revenue service?

A. No, sir.

Q. That is of its own ownership?

A. That is right.

Q. Does the Santa Fe operate a particular type of car in [fol. 1848] refrigerator car service of its own ownership?

A. Yes, we have our own ownership of refrigerator cars.

Q. How are they designated by initial?

A. S. F. R. D.

Q. Were you present in the courtroom when Mr. Cartmill of the Pacific Fruit Express Company testified?

A. I was.

Q. Have you seen a copy of his exhibit No. 135?

A. Yes, I have a copy of it.

Q. Showing the development of P. F. E. car construction. Do your S. F. R. D. cars resemble the Pacific Fruit Express cars to any degree?

A. They are almost identical and there is a reason for that due to the fact that both the P. F. E. Company and the Santa Fe in the construction of their refrigerator cars endeavored to build the cars according to the request or desires of our perishable industry in California and Arizona in order that they may, if they wish, load the containers in the cars with the least amount of bulk-heading or dunnage, so to speak, that is, gates in the center of the car to brace the loads. The citrus industry can load a load of citrus in either a P. F. E. car or an S. F. R. D. car with [fol. 1849] not some particle of bracing other than the slats between the loads. I think that also applies to the grape industry. The lugs of grapes will fit into the inside dimensions of either car without practically any dunnage what not other than the strips between the layers.

Q. Are the inside measurements of your cars adjusted for this purpose or designed for that purpose?

A. Yes, the inside dimensions of the S. F. R. D. car is 33 feet, 1½ inches, in length. Some are 33 feet, 2⅝ inches. The width is 8 feet, 2 inches wide, and the height varies from about 7 feet, 1 inch from the floor rack to the roof to 7 feet, 7 inches, from the floor to the roof. That might

not be just exactly the inches, the fractions of inches, but that is approximately the inside dimensions of our car.

Q. Do the P. F. E. cars move over Santa Fe lines from time to time?

A. Yes, sir.

Q. With the same type of freight as carried in the S. F. R. D.'s?

A. Yes, sir.

Q. Do the S. F. R. D. cars move over the Southern Pacific from time to time?

[fol. 1850] A. Yes, sir.

Q. Have you seen a copy of defendant's exhibit No. 4 showing the chronology of passenger coach and chair car design of Southern Pacific Company passenger carrying cars?

A. Yes, sir, I have reviewed that.

Q. Are you familiar with passenger cars of the Sante Fe?

A. Yes, sir.

Q. Referring to exhibit No. 4 will you say whether or not the development of Santa Fe passenger cars has proceeded along substantially the same lines as are indicated by exhibit No. 4?

A. They have.

Q. Does your company operate these lightweight streamline units, not necessarily the articulated but the other single unit types?

A. Yes.

Q. In regular revenue passenger service?

A. Yes.

Q. Do you have in main line passenger service any passenger-carrying cars not of steel construction?

A. No, we do not, that is, the steel underframe. We have some cars with the steel underframe with wood bodies that [fol. 1851] we still operate on some of our branch line trains but in our main line passenger trains, we do not.

Q. I will ask you to refer to defendant's exhibits Nos. 5 and 6 which relate to the development of locomotives. Referring first to the chronology of freight locomotives shown on exhibit No. 5, will you say whether or not the Santa Fe has had in the past or now has freight locomotives similar in design and tractive effort to those indicated by that exhibit?

A. We do, with one exception. We do not have the AC type. Our heaviest locomotive is the Mountain type, the 2-10-2.

Q. Sometimes called the "Santa Fe" type?

A. Referred to as the Santa Fe type.

Q. Do you have a locomotive of the 2-10-4 wheel arrangement?

A. Yes, we do.

Q. What is the tractive effort of the 2-10-4's?

A. The 2-10-4 Santa Fe type, 93,000 is the tractive effort and the weight on drivers, 371,000; the 2-10-2's which operate in mountain territory, the tractive effort is 85,360, weight on drivers, 320,000 pounds. Those are the heaviest locomotives that we have.

[fol. 1852] Q. And those are presently in service, are they, in various parts of your line?

A. Yes, sir.

Q. Are those in service, or have they been in service in territory west of Albuquerque, including main lines in Arizona?

A. Yes, sir.

Q. Now, referring to the passenger locomotive showing for the Southern Pacific, which is on defendant's exhibit No. 6, have you examined a copy of that exhibit?

A. Yes, I have.

Q. Does the Santa Fe have passenger locomotives, or locomotives used for both freight and passenger service, which correspond to or resemble those shown on Exhibit No. 6?

A. Yes, they do, with the exception that we do not have the A. C.

Q. There are no A. C.'s shown?

A. I notice some passenger trains are handled with your A. C.'s, but with that exception, our passenger power is quite similar to yours.

Q. You have a passenger locomotive with the 4-8-4 wheel arrangement?

A. Yes, and the 4-8-2.

Q. What is the tractive effort of your 4-8-4 locomotive? [fol. 1853] A. 66,000; weight on drivers, 269,400.

Q. And of your 4-8-2 locomotive?

A. 56,800; weight on drivers, 243,100.

Q. Do you have a Pacific type locomotive in passenger service? A 4-6-2 arrangement?

A. Yes, we do.

Q. I say, do you have one; I mean, do you have that type, a considerable number?

A. Yes, we have that type, a 4-6-2. The tractive force is 39,650; weight on drivers 167,500.

Q. Are those various types of passenger locomotives to which you have just referred in service in the territory west of Albuquerque, including the main lines in Arizona?

A. Yes, they are.

Q. You also use locomotives not propelled by steam, do you not?

A. Yes, by Diesel power.

Q. Do you use those in freight service as well as passenger service?

A. We have two freight Diesel locomotives. The first trip was made in freight service; started from Kansas City, Missouri, Saturday, January fourth.

[fol. 1854] Q. Have they been used east of Kansas City from time to time?

A. We had one on our railroad along in February of last year that we tested and made some runs with.

Q. Is that the M 103, referred to on the first sheet of Exhibit 138?

A. Yes, sir.

Q. It is referred to also on the second sheet at least once?

A. Yes.

Mr. Strauss: When you say "sheet," what are you referring to there?

Mr. Mason: No. 138, the freight train exhibit.

The Witness: If I may, I want to include another type of locomotive that was not on any other sheet that we use in passenger service, what we call the 3765 class.

Q. What is the wheel arrangement?

A. 4-8-4. That is the latest type passenger locomotive purchased by our company. The tractive force is 66,000 pounds; weight on drivers, 286,800.

Q. Does the Santa Fe use oil or coal as a fuel for its locomotives, or both?

A. We use both. On our transcontinental main line from [fol. 1855] Chicago to Los Angeles, or San Diego, San Francisco, through Amarillo, the Clovis territory, we use oil from Kansas City to California, except for the district between Winslow and Clovis, where we still burn coal. Over the Northern route, all freight service burns coal, and all passenger service burns oil.

Q. That is the La Junta route, is it?

A. That is correct; over the La Junta route.

Q. And you use oil entirely west of Winslow, Arizona?

A. Yes, sir. I might conclude by saying that we use coal on all freight trains between Chicago and Kansas City, but at the present time approximately fifty per cent of our passenger locomotives are equipped to burn oil.

Q. In that territory?

A. In that territory.

Q. Where you use coal-burning locomotives on main lines, are those hand-fired or stoker-fired?

A. Stoker-fired, with the exception of the smaller engines, they are hand-fired. The Mikado types are hand-fired, the Mountain types are stoker-fired.

Q. What type of reverse gear is used on these locomo- [fol. 1856] tives? Does the engineer have to use his own power, or does he have some assistance?

A. What I would call an air reverse. I can't tell you the name of it.

Q. Sometimes called a power reverse gear?

A. Yes.

Q. Are you familiar in a general way with the character of the commodities handled by the Santa Fe eastward and westward on its main line, particularly across Arizona?

A. I am.

Q. What are some of the principal commodities handled in eastbound movement within or across Arizona upon the main line?

A. Predominantly perishables, fruits and vegetables, other edible commodities such as canned goods, dried fruit, sugar, products of forests, lumber, and there are some ores moving from Arizona out of the state on our line as well as bullion, and then, at certain seasons of the year, there is a considerable livestock movement east.

Q. Now, what is the general description of the commodities moving westbound on the main lines which cross the state of Arizona?

A. General manufactured articles, or steel and building [fol. 1857] materials, general run of merchandise. In the last few years we have had quite a movement of automobile parts to the assembling plants in California.

Q. Do you have any considerable livestock movement either steadily or seasonal westward?

A. We have almost a constant movement of livestock, both hogs and cattle, for slaughter; then there are certain seasons of the year that we do have more livestock, particularly hogs, that will move in volume, and there is some feeder stock to the feed lots in California that originates in the Panhandle of Texas, Oklahoma, that we move to California.

Q. Is there a substantial movement of empty cars westbound?

A. Yes. Particularly our movement of empty refrigerator cars. There are times that we have moved some empty boxcars to California, but ordinarily, the boxcars going west under load will take care of the traffic originating in California and Arizona both.

Q. Does the Santa Fe have a substantial branch line mileage on its system?

A. Yes.

Q. Do you recall approximately the percentage of branch [fol. 1858] line mileage to the total mileage between Chicago and California?

A. I can tell you about what it is for the System. I would have to calculate it on the main line.

Q. I mean for the entire System.

A. Our total mileage operated is 13,414.33. Of that total mileage 6,619.40 is main line mileage, and 6,794.43 is branch line mileage.

Q. Now, you have spoken of the predominant eastward movement consisting largely of perishable fruits and vegetables and other edible commodities. Do you maintain schedules relating to this eastward movement?

A. Yes.

Q. Those are the schedules to which you previously referred as being the result of the efforts of the committee of which you are chairman?

A. That is correct.

Q. Are you familiar with the development of the eastward schedules as they operate over the Santa Fe and in connection with the carriers with which it connects?

A. Yes, I am.

Q. How are these schedules made up; that is, upon what [fol. 1859] departure points and departure hours, are they based?

A. From California, traffic loaded on a given day is concentrated or assembled on the various lines at Roseville, Sacramento, Bakersfield, San Bernardino, and Colton, California.

Q. Which of those points are Santa Fe concentration points?

A. San Bernardino and Bakersfield. The basic schedule for the movement of traffic originating in California is that traffic will depart from those concentration points three A. M. of the day following the date of loading, and due to arrive at Chicago 12:30 A. M. of the sixth day, or a total of 139 hours and thirty minutes overall running time, predicated upon a three A. M. departure.

Q. Now, suppose that you have four or five trains due to depart from the concentration point at Bakersfield at three A. M. of a particular day. Can they all depart at three A. M.?

A. No.

Q. Do any of them actually depart at three A. M. in actual practice?

A. I don't believe we, or our neighboring lines, have had a train out of concentration point at three A. M. fol- [fol. 1860] lowing the date of loading in several years, for the reason that by conference with our fruit industry in California, under what we call the pre-cooling plan, we permit shippers of deciduous fruits, grapes, cantaloupes, to pre-cool their fruit until five A. M. following the date of loading. When those commodities are moving, pick-up service is not started by any of the originating lines in California until around five A. M. Using the Santa Fe as an example, we operate nine hundred miles of main line and branch line in Northern California, and we operate pick-up trains over that much mileage, assemble the fruit, and all fruit arriving at Bakersfield by seven P. M. of the day following the date of loading is due for movement out of that point on that date.

Q. And what schedule does that freight take if it arrives at Bakersfield at or prior to seven P. M. following the date of loading?

A. That takes the schedule of three A. M. that same morning. Consequently——

Q. Three A. M. of the morning preceding, is that correct, of the same day?

A. Of the same day. Consequently, trains bunch up; groups arrive bunched at Bakersfield, and our last section [fol. 1861] out of that concentration point will depart around midnight.

Q. What do you call the time interval between three A. M. when the schedule theoretically commences, and the time of the departure of the individual train that is running on the schedule?

A. We call that the run-off.

Q. From what is the significance of the term "run-off" derived?

A. Well, the basic schedule predicated upon a three A. M. departure of the first day arriving at Chicago 12:30 A. M. of the sixth day, or a total of 139 hours and thirty minutes, that is the maximum schedule, less the basic sixteen-hour run-off; but instead of the sixteen hours under our present plan of operations, or since we agreed with the shippers to permit them to cool their traffic until five A. M., we actually have in our operations a twenty to a twenty-one and even a twenty-two and twenty-three-hour run-off, so we are actually operating on a schedule of about 118 to 121 hours.

Q. When you speak of run-off, does that mean that you so operate these trains as to run off this late departure and make the 12:30 A. M. arrival in Chicago as if they had de- [fol. 1862] parted at three A. M.?

A. That is correct.

The Court: We will take our mid-afternoon recess.

(Thereupon, a short recess was taken, after which the witness J. J. Mahoney was recalled to the stand, and proceedings were resumed as follows:)

The Court: You may proceed.

The Witness: Where I stated that the basic schedule provided arrival at Chicago 12:30 A. M. of the sixth day, I would like to have the record corrected to show that seventh day.

The Court: It may be corrected.

Mr. Mason: That is the seventh morning by thirty minutes.

A. The seventh morning by thirty minutes.

Q. From departure from Bakersfield? Now, is there a similar schedule on traffic originating in the Salt River Valley and handled by the Santa Fe?

A. Yes; there is.

Q. What is the elapsed time, and the departure point on Salt River Valley traffic?

A. The Salt River Valley present schedule provides de- [fol. 1863] parture, the basic schedule is depart 11:30 P. M. the day of loading, but through agreement with our shippers in the Valley we depart on two to four o'clock in the morning, arrive at Chicago 11:59 P. M. of the fourth evening, the basic schedule containing 95 hours and 29 minutes, traffic available for fifth morning delivery at Chicago.

The Court: Mr. Mahoney, before I forget it, will you explain this pre-cooling arrangement, and just how that matter works out?

A. Yes. Shippers of deciduous fruits, melons, grapes, they load their cars during the day up until midnight in some instances and if they give the carrier the bill of lading by midnight, then they are permitted to pre-cool the traffic until five A. M. the following morning. That pre-cooling is generally done by the shipper or his agent, the carrier does very little pre-cooling at the loading stations. This pre-cooling is generally done at the loading station.

The Court: And of what does it consist?

A. It consists of an apparatus that they put in those bunkers that you were questioning about this morning, and with fans they blow the air through the ice and pre-cool the fruits, and then before the car departs from the station they [fol. 1864] fully ice the bunkers to full capacity, and by that arrangement it brings the temperature of the fruit down quickly and the shippers tell us, the carriers, that under that plan of pre-cooling the fruit it arrives at markets and destinations in a much better shape. In fact, they can leave the fruit remain on the trees or the melons on the vine and get riper under that plan of shipping than without the pre-cooling.

Mr. Mason: The pre-cooling is all done before the traffic receives a line haul?

A. I would say that that is the case 97 or 98 per cent of the times, but there are cases where we do move the car from

the loading station where their agency pre-cools the car, for that short distance.

Q. It is all done at either the loading point or in the origin territory?

A. That is correct.

The Court: And this pre-cooling is at the expense of the shipper?

A. Yes, sir.

Q. He pays extra for that?

A. He pays the agency that does the pre-cooling for him.

Mr. Mason: Does he pay an additional charge to the car-
[fol. 1865] rier for the additional ice consumed, if you know?

A. Well, if the carrier does the pre-cooling, he does, but in most instances, practically all of the pre-cooling of the deciduous, the melons and the grapes is done by the shipper, or some agency other than the carrier. Now, with the citrus, that is a different story. We do considerable pre-cooling at San Bernardino for the shippers with a pre-cooling plant that we have there.

The Court: Thank you.

[fol. 1866] Mr. Mason: Now, you were speaking of the schedules today as including sixteen and up to twenty-one hours of run-off time. Do you actually operate your trains so as to arrive at Chicago yards all at the same time?

A. No. Our operation provides that when we are running the trains in several sections, which is a common practice, the earlier sections are advanced into our outer yard at Chicago sufficiently in advance of the last section so those trains arriving early can be switched and classified, re-iced and delivered to eastern connections, or delivered to the Chicago Produce Terminal if the cars are so billed, and the last train, we figure on it arriving on schedule.

Q. Does the schedule, the basic schedule of 139 hours and 30 minutes from Bakersfield apply to traffic originating over a described extent of territory in Northern California?

A. At the present time the entire state of California gets that service of 139 hours and 30 minutes from concentration points to Chicago.

Q. You mean all points served by the Santa Fe or its short line connections?

A. Yes, sir.

Q. Suppose the traffic originates on the Southern Pacific
[fol. 1867] north of Sacramento, let us say at a point like

Oroville or Colusa, and is destined for line haul by the Santa Fe through California junctions with the Southern Pacific; does that receive that service?

A. It will receive that service provided the car is delivered to us at the junction in time to permit us to handle at Bakersfield by seven P. M. of the day following the date of loading; if not, it takes the one day longer schedule.

Q. As to the traffic originating on the Santa Fe itself, or its short line connections in California, you give it the schedule the next day following the day of loading?

A. Yes, sir.

Q. And has the territory as to which the schedule applies always included all of the Northern California points served by the Santa Fe?

A. No; we had California at one time zoned, Zone 1, Zone 2, and Zone 3, and traffic in Zone 1 got the shorter schedule, Zone 2 one day longer, and Zone 3 two days longer than the shorter schedule.

Q. Was Zone 1 then extended to include all of the territory?

A. Yes; in conferences with our industry and in order to [fol. 1868] to stabilize the market, we agreed to a schedule in June, 1929, of 154 hours for the entire state of California. Several changes have been made since that time.

Q. Was there at one time a basic schedule of 146 hours?

A. Yes. I have that record here; I will give you the correct dates.

Q. Are these all matters within your own personal knowledge?

A. Yes, sir.

Q. In the course of your duties?

A. February 13, 1924, the schedule from Bakersfield to Chicago, agreed schedule with the shipper, was 154 hours. That was the date we established that schedule.

Q. I want to ask you——

A. (Interrupting.) Prior to that the schedule was 180 hours.

Q. Now, I want to ask you, when you say the schedule from Bakersfield, do you know and, if so, will you state whether the schedule offered by your lines from points such as Roseville, Sacramento, San Bernardino and Colton were the same as from Bakersfield?

A. Yes, sir.

[fol. 1869] Q. Was there any provision in 1921 or previously for run-off time?

A. No, sir. In June, 1929, the schedule was reduced from 154 hours to 146 hours with the 16-hour run-off; and on May 24, 1940, the schedule was reduced from 146 hours to the present schedule of 139 hours and 30 minutes with a 16-hour run-off.

Q. When were the Zone 1 extensions made? First of all, before that question is answered, was there any provisions for Zones 1, 2 and 3 in 1921?

A. No. Prior to 1921 is when we had the zones, when we went to the 154 hour schedule, and I think I stated in my opening remarks the one hundred forty-six; it was the 154-hour basic schedule that eliminated the zones in California.

Q. When the 146-hour schedule went into effect—in 1929, was it?

A. 1929.

Q. 1929. Was there any provision then for run off or for zoning of the origin territory?

A. We made the provision then for the 16 hour run-off, and that did away with the zones.

Q. Now, I ask you if these schedules apply over competing lines at various concentration points; and I will ask you [fol. 1870] particularly if you know and, if so, will you state whether they apply over Southern Pacific concentration points?

A. The schedules since 1921, the basic 154 hour schedule that was uniform from all concentration points. We eliminated on the Santa Fe the zone system before the Southern Pacific Company did, and I don't have the date that the Southern Pacific Company eliminated their zones.

Q. So far as the basic schedules from concentration points are concerned, did the changes you have mentioned as taking place on the Santa Fe take place with reference to the Southern Pacific schedules on the same date?

A. Yes, sir, on the same date.

Q. The same schedules were applied by the Southern Pacific as were applied by the Santa Fe?

A. Yes, sir.

Q. Does the same schedule apply by the Southern Pacific via Salt River Valley, if you know?

A. Yes, sir.

Q. Does the Santa Fe participate jointly with the Southern Pacific applying to traffic originating on the Southern Pacific lines in the Imperial Valley or in the Yuma Valley?

A. Yes, sir.

[fol. 1871] Q. What relation do those schedules bear to the schedules from Salt River Valley points?

A. Traffic originating in the Imperial Valley to Chicago is given sixth day delivery there. I might describe it in this way: Service from the Salt River Valley is fifth day delivery at Chicago; from the Imperial Valley sixth day; and from Colton, San Bernardino, California, concentration points, seventh day; one day difference between each territory.

Q. There is approximately twenty-four hours difference in the schedules?

A. That is true.

Q. Were you present this morning when Mr. Cartmill described the service of inspection and repair performed on Pacific Fruit Express Company cars?

A. I was.

Q. Does the Santa Fe follow a similar or comparable system for the inspection and repair of its refrigerator cars?

A. It does, in this way: Cars that are to be furnished for loading in the Salt River Valley are cut out and inspected and prepared at Winslow, Arizona. Such cars when they arrive at Winslow are given the ordinary inspec-

[fol. 1872] tion, that is, for running gears, safety appliances and exterior inspection. When those cars are placed on the cleaning and repair tracks, they are given both an exterior and interior inspection and, following the same process as described by Mr. Cartmill, these cars are swept or scrubbed, whichever is required to condition the cars for loading. Cars that go on to San Bernardino and Bakersfield to be distributed in California are, on arrival, given the ordinary in-bound inspection by our train yard inspectors, covering the inspection of the running gear, the couplers, the wheels, the exterior, and then the cars are placed on cleaning tracks and are again inspected both as to the exterior and interior. From there the cars are, well, I am getting ahead of my story. We card the cars then that have been cleaned and made ready for perishable loadings, and then they are taken and distributed to some load-

ing territories, and when the loading is heavy, in Northern California, we do some of that work at Fresno, but it is the same process of inspection.

Q. Do you have shops at any points you have mentioned, or in the territory you have mentioned where the cars may be shopped if they require it?

A. Yes, we have shops at Winslow, San Bernardino, [fol. 1873] Bakersfield, Fresno, and Richmond up in the Bay District that repair our cars. Our situation is not similar as to the repairs, because we do our repairs at all of our repair points or shop points, whereas the heavier repairs are done at a few points, as I understood Mr. Cartmill's testimony, on the Southern Pacific.

Q. Your situation is different again in that your refrigerator cars are of system ownership rather than of car line ownership?

A. That is correct.

Q. When you receive or use cars, refrigerator cars, of other than Santa Fe ownership for your perishable loadings, do they follow the same process?

A. Yes, those cars, when we ask for assistance from some of the other car owners in times of car stress, those cars are inspected at interchange points where we receive them, and if they meet the requirements, we take them out on our line to points sometimes as far as California to load, but the inspection at the interchange junction determines whether or not the car can be made suitable for our loading.

Q. You say that you inspect these cars of other ownership at interchange points. Do you make inspections of [fol. 1874] cars received from connections at interchange points generally whether they be refrigerator cars or not?

A. Oh, yes, that is part of the interchange rules, but what I mean to convey is that we make the exterior and interior inspection of these empty refrigerator cars that we call for.

Q. By referring to the map, Exhibit No. 134, it appears that your line from Northern California running through Bakersfield and your line from Southern California running through San Bernardino meet and join at Barstow, California.

A. That is correct.

Q. Is Barstow a point at which trains are made up for eastward movement over the main line?

A. Yes.

Q. Is that a point at which you make up trains, for example, containing the perishable traffic you have described?

A. That is correct.

Q. That which has been concentrated at Bakersfield or San Bernardino?

A. Yes.

Q. In making up your trains at Barstow, do you observe any limitations as to number of cars?

A. No, we do this: We make up our trains at Barstow, [fol. 1875] we regulate the tonnage in our trains to 2,900 tons, that is, our perishable trains. Other trains handling dead freight, foreign, eastern foreign cars, company fuel oil, dead freight, why, we don't limit those and we handle more than seventy cars and also more than 2,900 tons per train.

[fol. 1876] Mr. Mason: Mr. Mahoney, when those trains reach Needles, California, do you make any adjustment of their lengths?

A. Yes, we adjust the trains at Needles, California, to meet the requirements of the Arizona law.

Q. You operate them eastward from Needles, California, in what lengths?

A. Lengths varying, I would say, from 62 to 65, up to 70 cars.

Q. Not exceeding 70 cars?

A. Not exceeding 70 cars.

Q. Do you observe that maximum length across Arizona and, if so, how far?

A. With our perishable trains we observe that length to Belen, New Mexico. With our trains that do not handle perishable traffic we observe it to Gallup, New Mexico, where in some instances we fill them out with coal or other traffic that may be available there to fill the trains out in excess of 70 cars.

Q. Why do you observe the consist made up at Needles as far as Belen instead of stopping at Gallup to fill out in the case of perishable trains?

A. In the operation of our perishable trains from Cali- [fol. 1877] fornia through trains departing Barstow, the consist of those trains is telegraphed to our red-ball depart-

ment of our car accountant's office at Topeka, Kansas, in train order. Each car is shown, the origin, the contents, the consignee, the consignor, and destination, and each car is given a symbol number. We move those trains through intact for the reason that that information from that Barstow 23 manifest telegraph report reaching the car accountant's office is disseminated and transmitted to all of our division freight agents and off-line agents and they in turn notify the shipper of the movement of the cars in those trains and they also, after the train leaves Barstow, are given a passing at intervals across to Chicago and with that information the receivers or shippers of those cars can divert those cars to the various destinations that they want to try to dispose of their car.

Q. Is Belen a point at which diversion is undertaken or accomplished?

A. Belen, New Mexico, is one of our main diversion points.

Q. Is that a point at which perishable trains are re-iced and made up?

A. Yes, that is one of our regular icing stations and [fol. 1878] trains arriving Belen are fruit trains. Three trains into Belen generally make two trains out, and trains departing Belen, telegraphic reports again are sent to our car accounting office and all of our general agents, off-line agents, and division freight agents are notified of the trains. the traffic is moving in so diversion can be accomplished between there and the Missouri River.

Q. Why wouldn't it be possible or practicable, if that is a more applicable term, to stop these trains at Gallup and do this re-constituting instead of at Belen?

A. We have no icing facilities at Gallup, New Mexico, and we prefer to handle the cars through to Belen where we have the icing plant and too, with the movement of our trains through to Belen we get many diversions that takes the traffic out of the route through the Amarillo gateway, it goes through the Denver gateway or the La Junta gateway and sometimes to El Paso. We also receive diversions at that point that divert the traffic on our rail at Clovis, New Mexico, into the southeastern territory through Houston and Beaumont.

Q. On the Pecos Valley line?

A. Down on that line, yes, sir.

[fol. 1879] The Court: On your westbound traffic where do you make up those trains to correspond with the Arizona law, at Belen or Gallup?

A. At Gallup, because the nature of our westbound traffic is not perishable. We do handle some perishable packing house products.

The Court: You don't have the icing problem on your westbound?

A. No, sir.

Mr. Mason: Is Gallup the point at which trains are cut down to fit the Arizona law requirements?

A. Westbound?

Q. Yes.

A. Yes, sir.

Q. Is there any point, and if so what is the point at which they are reconstituted after leaving Arizona?

A. We do reconstitute a few trains at Needles, but not many. The principal point is Barstow, California, where the trains are reswitched. That is where the northern and southern lines converge and that is where the trains automatically go through a reswitching or reorganization.

The Court: You are speaking now of the westbound traffic?

A. Yes, sir.

[fol. 1880] The Court: In other words the train as it leaves Gallup would run intact, we will say, to Barstow rather than to Needles?

A. Yes, sir. I would say that would be the case 97 to 98 per cent of the time. I might say this for the benefit of the court, that on my way out here I stopped at Gallup and I stopped at Winslow and I made a check during the month of June. We had 54 trains during the month of June that were reduced from six to twenty cars at Gallup. I have the station record with me, just out of curiosity more than anything else that I stopped there for that purpose but I have a list of the trains, the conductor handling the trains in and the conductor out. The smallest number of cars reduced was six and the largest number, twenty, in the 54 trains that were reduced during the month of June.

Mr. Mason: Did you make any study as to the number of trains which were stopped at Gallup and built up to lengths greater than 70 cars eastbound?

A. No, I did not. In our operations eastbound we do handle quite often 3,100 tons from Winslow to Belen and with our trains arriving at Winslow, Arizona, containing 2,900 tons, when they get to Gallup we generally add [fol. 1881] enough cars on those eastbound trains to make a tonnage around 3,100 tons.

Q. You say when they get to Gallup or when they get to Winslow?

A. Gallup. That is the coal and lumber that comes to us from the Apache. We add on those and fill them out to 3,100 tons.

The Court: When you do that do you have to add a helper engine to get over the Continental Divide?

A. No, we don't. That is the capacity of the type of locomotive that they operate there. They can handle that much tonnage. I might say for the benefit of the court that we have in a good many instances double-headed our trains from Winslow to the top of the Divide in order to overcome some delay built up at concentration points waiting for the pre-cooled fruit. We don't do that very often, but if operating interferences are such that we are not able to overcome much of that delay by double-heading up to the top of the Divide we can make up two to three hours in some instances.

Mr. Mason: You spoke of making up your trains into tonnage not exceeding 2,900 at Barstow where perishable was involved?

A. What I meant to convey was that we do not do that [fol. 1882] very often with a train of perishables. We have taken 2,900 tons of perishables, filled it out to 4,000 tons with company fuel oil, say for Needles, and gave them a helper to Goffs and handled the 4,000 tons to Needles and then cut off the fuel oil or dead freight so the train will be 2,900 tons of freight leaving Needles.

Q. Why do you observe a 2,900-ton limitation, if you do observe it, leaving Needles eastward?

A. That is a contractual agreement we have with the conductors and trainmen that 2,900 tons is the maximum tonnage that we will handle between Seligman and Winslow, Arizona, with double-header trains.

Q. Does that 2,900-ton limitation apply to trains handled with a single engine?

A. No, if we had a locomotive of sufficient tractive effort to handle 4,000 tons we could handle it, providing the 4,000 tons could be placed in 70 cars. There is no limitation other than the 70 cars for one locomotive.

Q. But you do have an agreement with the two brotherhoods, the Train Service Brotherhoods that you have mentioned, that you will not handle more than 2,900 tons between Seligman and Winslow with two or more locomotives?

[fol. 1883] A. That is correct.

The Court: What is the reason for that?

A. That, Your Honor, is the outgrowth of an agreement with our conductors——

Mr. Strouss: (Interrupting) If the court please, we are not getting into an opinion of the witness as to his point of view.

The Court: Maybe I shouldn't have asked the question. I will withdraw it if you object. Go ahead, Mr. Mason.

Mr. Strouss: I don't want to prevent the court from having any proper information. There may be two sides to the agreement.

The Witness: I think there are two sides to it, Mr. Strouss, but I think we have the record of the agreements since 1903 when the first double-header agreement was made with our two organizations?

Mr. Strouss: I have no objection to the agreement itself.

The Court: That double-header agreement is by reason of the mountainous territory betwen Seligman and Winslow?

A. That is correct.

Mr. Mason: This agreement that you refer to, the current 2,900-ton agreement, dates from what year?

[fol. 1884] A. 1924.

Q. And is carried in your working agreements with these two brotherhoods?

A. Yes, sir.

Q. Relating to the trainmen's craft and the conductors' craft?

A. That is correct.

Q. And is not in any state or Federal statute of which you have knowledge?

A. No, sir.

Q. You were asked by the court whether the agreement was effective in mountainous territory. As I understand it, the agreement applies only to trains which are being handled with two or more locomotives?

A. That is correct.

Q. If a single engine were to handle the train in the same territory, the agreement would not apply?

Mr. Strouss: I think they have a copy of that agreement and if they are going into all the details of it I ask that it be produced.

The Court: Yes, I think it should be produced, but frankly I don't think that is going to be particularly helpful to the court. Maybe it was just curiosity on my part.

[fol. 1885] Mr. Mason: The purpose of bringing this into the record was to show how the agreement may operate either in conjunction or alternatively to the 70-car limitation.

The Court: Well, in this matter we are concerned with the law and not with an agreement.

Mr. Strouss: I am not objecting to the materiality of the agreement. I think it is material, except going into the details of it.

Mr. Mason: I didn't intend to go any further into the details of it on direct examination. Of course the witness in his position, and necessarily because of his position and duties, must be familiar with the effect at least of the agreement upon his operations.

The Court: Yes, but that would not obviate the necessity of producing it if you are going into it.

The Witness: I might say this, Judge——

Mr. Strouss: (Interrupting) I object to the witness volunteering so much, we are getting pretty far afield here. I have a hard enough time keeping track of counsel's questions without watching for voluntary statements by the witness.

Mr. Mason: I call your attention to exhibit No. 138 [fol. 1886] which was introduced when Mr. Weeks was on the stand. Did you select the period of the first ten days of February, 1940, to which this exhibit relates?

A. I did.

Q. Did you instruct Mr. Weeks to prepare or have prepared this exhibit?

A. I did.

Q. Will you state, basing your statement upon your experience and knowledge as the general superintendent of transportation and in your previous employment, whether the month of February and the period from the first to the tenth of February is a peak period or an off-peak period from the standpoint of traffic on the main line of the Santa Fe?

A. It is the lightest period we have. The reason I selected that period is that I did not want to show an abnormal situation. I preferred to show a subnormal rather than an abnormal.

The Court: Then this is not an average period?

A. No, it is the lightest period on our railroad.

Mr. Mason: Is it correct to say that in any other month which might have been selected, whether of 1940 or 1939, the volume of the traffic would have been heavier?

[fol. 1887] A. Yes, the volume handled would be heavier.

Q. Would that result in any longer trains or in the average length of the trains being longer if another period had been selected?

A. In my opinion it would have and that is the reason I selected the period.

Mr. Strouss: My objection is going to all of this.

Mr. Mason: Will you state from your own knowledge whether there is any 2,900-ton agreement similar to the one applying between Seligman and Winslow effective on any part of your lines in the state of New Mexico?

A. No, there is none.

Q. Or on any part of your lines in the state of California.

A. No, sir.

Q. Or elsewhere on your system?

A. There is none other than that one between Winslow and Needles.

Q. Is there any agreement expressing a tonnage limitation upon the trains which you may operate upon any other part of your system than the particular district that you have referred to?

A. None other than the double-header rule that is applicable to the entire contract which provides that double-[fol. 1888] header trains will not be run in excess of 40 cars, followed with an exception that trains may be operated

with double-headers providing the tonnage of the heaviest locomotive is not exceeded.

Q. Is that the clause which also provides exception for certain recognized helper districts?

A. Yes, sir.

[fol. 1889] Q. I notice that Exhibit 138, Mr. Mahoney, shows various types of locomotives employed on these trains. What is the wheel arrangement of the Prairie type?

A. That is a 2-6-2.

Q. And the Mikado?

A. 2-8-2. We have some Mikado types with the 2-8-4 and those are equipped with a booster.

Q. You show here Pacific type of 2-8-4. Does that mean that two different locomotives were used on one train?

A. Which item is that?

Q. It is midway on the first sheet between Argentine and Marceline.

A. The 2-8-4 Pacific type?

Q. If I understood you correctly the 2-8-4 is the Mikado type.

A. Those that have the booster on. The Mikado type without the booster is the 2-8-2. This 2-8-4 Pacific type is a passenger locomotive that we used on that train.

Q. You show on sheet 2 a consolidation locomotive. What is the wheel arrangement of the consolidation?

A. 2-8-0.

Q. You show also a Decapod. What is the wheel arrange-
[fol. 1890] ment of that?

A. 2-10-0.

Q. You show also on sheet No. 2 between Canadian and Waynoka three trains showing Mikados and Santa Fe. Does that mean that those trains were operated, one or more of them, with the Mikado and the other with the Santa Fe?

A. Yes, with the Santa Fe.

Q. Farther down the sheet you show Mikado and Pacific. Would that indicate that different locomotives were used, each of them on part of the district?

A. Yes, sir.

Q. Will you refer to exhibit 139, which was also received when Mr. Weeks was on the stand, and particularly to the first of the three, which indicates operations of passenger

trains between February 2nd and February 8th. Did you select that period for the purpose of this study?

A. Yes, I did.

Q. Did you direct Mr. Weeks to make the study for that period?

A. I did.

Q. Will you state your reasons for selecting February 2nd to 8th inclusive, of the present year?

[fol. 1891] A. My reasons for that are the same as I explained for the freight train showing, that I selected the light period rather than a period of heavy movement of passenger trains. I didn't want to show an abnormal situation.

Q. Would you say that the volume of traffic and consequent volume of cars moved in the first week of February as here indicated is less than the average.

A. Yes, it is.

Q. Would that result in more trains of fourteen cars or less and fewer trains of fifteen cars or more than otherwise?

A. Yes, it would.

The Court: Mr. Mahoney, I notice in the case of the freight trains, that that was given for a ten-day period whereas the passenger you only take a week, the second to the eighth inclusive.

A. That is correct. I selected the freight-train period for a ten-day period and I didn't understand—I didn't intend to put in anything in regard to the passenger train showing, and after I studied the situation over I thought I would make a showing also for the passenger trains, but I selected two periods for the passenger trains.

[fol. 1892] The Court: Which two.

A. February 2nd to 8th and November 17th to 23rd, two seven-day periods during 1940.

Mr. Mason: You are referring now to pages 4, 5, and 6, as relating to the period November 17th to 23rd?

A. That is correct.

The Court: Is that also a subnormal period?

A. Yes, sir, it is.

Mr. Mason: Referring to Exhibit No. 139, Mr. Mahoney, are there any trains on here of the so-called streamliner type Diesel operated?

A. Yes, sir.

Q. Will you indicate them by name?

A. On sheet one, trains identified as No. 17, the Super-Chief, No. 21, the El Capitan, are streamlined trains handled by Diesel power. Train 19, the equipment in that train is light weight with the exception of the baggage and mail car and is drawn by steam power and also Diesel power.

Q. Do the same comments apply to the opposite number eastward, 18, 20 and 22?

A. Yes, sir, they do.

The Court: Those trains do not run daily.

A. The Super-Chief and the El Capitan run twice a week. The Chief runs daily.

[fol. 1893] Mr. Mason: Mr. Mahoney, does the Arizona limitation of fourteen cars per passenger train have any effect upon the consisting or scheduling of your passenger trains or your passenger service?

A. Yes, it has a serious effect.

Q. Will you describe it?

A. In our timetable conferences when there is a change of timetable, the consist and schedules of our trains are predicated upon not exceeding fourteen cars, that is, our transcontinental passenger trains, in order to conform with the Arizona law.

The Court: You mean you make them up that way from Chicago?

A. Yes, sir, we consist the trains so they will not exceed fourteen cars. Now, we do have some trains that the normal consist is fourteen cars, and when we get an extra car in those trains we split the trains either at Albuquerque or Gallup. I have a consist with me here that we split up at Gallup with fifteen cars on the fourth of this month. I happened to be there and we had to split No. 3 on account of having fifteen cars, one extra car in the train. Likewise, our eastbound movement from Los Angeles the consist of our [fol. 1894] trains in setting up our timetables and the consists of the trains, the number of cars is predicated upon staying within the car limit of the Arizona law and it is a serious handicap to us in meeting competitive situations through the Omaha-Council Bluffs-Ogden Gateway where there is no limit to the number of passenger cars that can be handled in a train.

Mr. Mason: Do you compete for the Southern California business with the Union Pacific Northwestern route through Omaha, Salt Lake City and Southern Nevada to Los Angeles?

A. Yes, sir.

Q. Do they operate to your knowledge a train service comparable or competitive with your Super-Chief?

A. They do.

Q. Do you know what its name is?

A. City of Los Angeles. They also operate a Challenger that is in direct competition with our Scout service, which trains handle chair car and tourist sleepers and those trains handle an excess of fourteen cars from Chicago through to Los Angeles.

Mr. Strouss: My objection is going to this testimony, Your Honor.

[fol. 1895] The Court: Yes, the record may show your objection and it is overruled.

Mr. Strouss: This is a matter which is capable of proof by evidence rather than a conclusion or argument of the witness.

Mr. Mason: I call the Court's attention to the fact that the movement of trains over the competing route is already in evidence by Exhibit 92.

Q. Have you seen Exhibit No. 92, Mr. Mahoney?

A. No, I have not.

The Court: That is the data put in by the witness for the Union Pacific?

Mr. Mason: That was Mr. Warfel, the witness for the Union Pacific, showing the operation of the trains over his lines handling the traffic between Chicago and Los Angeles.

The Court: The court will be at recess until ten o'clock tomorrow morning.

(Thereupon, the court stood at recess until ten A. M. Wednesday, January 8, 1941.)

[fol. 1896] January 8, 1941, Ten o'clock A. M.

Proceedings were resumed at this time as follows:

The Court: You may proceed.

J. J. MAHONEY was recalled to the stand, and testified further as follows:

Direct examination (Continued).

By Mr. Mason:

Q. Mr. Mahoney, at the conclusion of the proceedings yesterday the testimony had reference to trains operated by the Union Pacific over the route between Chicago and Los Angeles, as compared to those operated by the Santa Fe over its competing route between Chicago and Los Angeles in passenger service. I will ask you if the trains of the Union Pacific over the route in question operate for a part of the distance over the rails of the Santa Fe?

A. Yes, they use Santa Fe rails from Daggett to Riverside, California.

Q. Do you in your position as general superintendent of transportation of the Santa Fe receive any periodical reports of the consists of these Union Pacific passenger trains [fol. 1897] passing over your rails?

A. Yes, our 87 telegraphic report, which report shows all passenger trains and manifest freight trains operated on that railroad, and their status as to the performance, are received daily in my office, which shows the locomotive and the number; number of cars there are in each train handled.

Q. And includes these Union Pacific passenger trains?

A. Yes, includes these Union Pacific passenger trains.

Q. Do you in the course of your duties ever have occasion to visit the Los Angeles Union passenger terminal?

A. Yes, I do.

Q. Do the Santa Fe trains between Chicago and Los Angeles operate into and out of that terminal?

A. Yes, the same union terminal.

Q. Do the Union Pacific trains also operate in and out of that terminal?

A. Yes.

Q. Do you ever observe the Union Pacific trains in that terminal?

A. Yes, quite often.

[fol. 1898] Q. Those that operate on the competing route with the Santa Fe?

A. Yes, sir.

Q. Yesterday you were asked and you explained to some extent the effect of the fourteen-car limitation of the Arizona

law upon your passenger traffic and your passenger train consist between Chicago and Los Angeles. I will ask you whether, in planning your passenger train service between Chicago and Los Angeles, you have to take into account, or do take into account, the fourteen-car limitation?

A. Yes, we do. In setting up the consists of our transcontinental passenger trains, both east- and westbound, we take into consideration the limitations in Arizona, fourteen-car limit.

Q. Is the space available on a passenger train definitely limited as to the number of passengers that may be carried?

A. Yes.

Q. Or, rather, the space on a passenger car, I should say.

A. Yes, there are limitations to the coaches, there is limitation to the chair cars, and the Pullman cars according to the type of Pullman car operated in the train.

[fol. 1899] Q. Do your transcontinental passenger trains, some of them, consist entirely or large of Pullmans?

A. Yes, we have what we call solid Pullman car trains. Then we have the mixed car trains, with the standard Pullmans, the chair cars, and with the tourist Pullmans and chair car.

Q. Your transcontinental trains usually carry dining cars and lounge cars, or either of them?

A. Yes, some carry dining car, lounge car and observation car. Others carry a dining car and a lounge car and no observation car.

Q. Suppose that a passenger train is operated out of Chicago and as far as Gallup or Albuquerque, consisting of more than fourteen cars and containing a dining car, or a lounge car, or an observation car, or all of those cars, what happens when that train reaches Gallup or Albuquerque on its westbound course?

A. We divide the train or split it into two sections. One section carries the dining car and the lounge car, and if the train carries observation, that stays with the Pullman section. We generally split the train on the basis of carrying the chair cars in one section and the Pullman section in the [fol. 1900] other. The chair car passengers from Gallup west to destination in most instances are taken care of at our Harvey eating houses, they are deprived of the dining car privileges from Gallup west.

Q. Why isn't it practicable to provide them with dining car service from Gallup west?

A. That would entail keeping extra dining cars located at Gallup or at Needles, whichever the case may be, to cut into these trains when it was necessary to split the trains in two sections, and that, we feel, is too expensive an operation.

Q. Well, as a practical matter, in planning your transcontinental trains, what course do you take?

A. Well, as I endeavored to make clear, we set the consists up not to exceed fourteen cars in our transcontinental trains both east and west. We do on many occasions handle in excess of fourteen cars, consisting of cars that are destined from Chicago to Denver, Chicago to Kansas City, Chicago to any point that might be short of Gallup, and then when we have cars destined to California, it is necessary to split the train to conform with the law at Gallup, and in some instances we split at Albuquerque.

[fol. 1901] Q. Is your passenger business largely a local business, or a short haul business between Chicago and Kansas City, Denver and intermediate points, or more largely a transcontinental business?

A. Our larger volume of passenger business is on the transcontinental line from Chicago to Los Angeles. The greatest number of passengers handled on our line is between Chicago and Kansas City; the second largest number is from Kansas City to Los Angeles.

Q. Do you ever have special parties operating in special trains, or extra sections of revenue trains?

A. Yes, quite often in the summer months we have special parties, and we operate extra sections of our transcontinental trains.

Q. Do you ever have special parties of such number of persons that they occupy with their baggage and necessary accessories, more than fourteen cars?

A. Yes, we do.

Q. What do you do with those when you reach the Arizona line?

Mr. Strouss: It is understood my objection is going to this.

[fol. 1902] The Court: Yes, the record may show.

A. We split those trains to conform with the law.

Mr. Mason: Does that entail having extra dining cars? What is the result of that?

A. We have on many occasions provided the additional dining car for these special parties, and special trains in order to take care of the split at Gallup, which necessitated handling the second diner all the way through. Other times, dependent on the schedule, whether the train passes through that territory at night, we do split the train and can get by with the one dining car.

Q. Yesterday, in the course of your testimony, Mr. Mahoney, I think you referred to a ten P. M. departure from day of loading of traffic loaded in the Salt River valley. Do you wish to correct that statement?

A. Yes; the latest change on that schedule, the basic schedule is 11:30 P. M. departure, with a privilege permitting the shippers in the Salt River valley to pre-cool their traffic until two A. M. and arrive at Chicago 11:59 of the fourth evening.

Mr. Mason: Then, we will say, for the information of [fol. 1903] Court and counsel that the statement now being corrected appears on page 1863 of yesterday's transcript.

Q. Mr. Mahoney, does the Santa Fe have certain districts on its railroad where two locomotives are used to operate trains, which elsewhere are operated with a single locomotive?

A. Yes.

Q. So-called freight helper districts?

A. Yes, we do have freight helper districts in practically all parts of our railroad.

Q. Where are those freight helper districts?

The Court: You mean in Arizona, Mr. Mason?

Mr. Mason: Not alone in Arizona, but outside of Arizona as well.

A. I checked up last night, and I find that in California we have helper districts between Hector and Ash Hill, eastbound 26 miles; the grade is one per cent; Bagdad to Goffs, eastbound 60 miles, one per cent; Needles to Goffs, westbound, 31 miles, 1.4 per cent grade; Bagdad to Lavic, westbound, 31 miles, 1.4 per cent grade. In Arizona ——

Q. Those are the helper grades east of Barstow?

A. Yes, sir.

[fol. 1904] Q. Is there a helper district in the Cajon Pass?

A. Yes, sir.

Q. And also over Tehachapi Pass between Bakersfield and Mojave?

A. Yes.

Q. Now, in Arizona.

A. In Arizona, Ashfork to Supai, eastbound, 23 miles, 1.8 grade; no westbound helper district. In New Mexico, Belen to Mountainair, eastbound, 41 miles, 1.25 grade; Belen to Dalies, westbound, 10 miles, 1.25 grade. Between New Mexico and Chicago, eastbound, Canadian to Coburn, Texas, 18 miles of .6 per cent grade; and on the Kansas City Belt Line, one mile of .9 per cent grade; westbound, Chillicothe to Edelstein, Illinois, 8 miles, 1.1 per cent grade; on the Kansas City Belt Line, 1 mile .9 per cent grade; Waynoka to Curtis, Oklahoma, 22 miles, one per cent grade.

Q. Those are on your principal freight lines, are they?

A. This is on the line, our transcontinental freight line; I selected these helper districts.

Q. The so-called Belen cut-off, to which the Court referred?

A. Yes, that is over the Belen Cut-off. Now, in addition to [fol. 1905] that we do have other helper grades on other parts of the System, but I just picked those out on this particular line. Now, these helper districts are separate and distinct from this 2,900-ton agreement, as we call it, with our transportation organizations.

Q. Do you have on the Santa Fe a code or book of rules for the guidance of employees in your transportation department?

A. Yes, we do.

Q. Are you familiar with the standard code of operating rules of the Association of American Railroads?

A. Yes, I have read that several times.

Q. Does the Santa Fe rule book resemble the standard code of rules of the A. A. R.?

A. It follows the standard code very closely. There are a few exceptions to conform to local conditions on our line that differ from the standard code.

[fol. 1906] Mr. Mason: Mr. Mahoney, you spoke of operating some of your trains with Pullman cars. Are those the standard conventional type of Pullman cars that one sees in ordinary passenger trains?

A. Yes, we operate trains with what we call the conventional Pullman type and also the streamline type.

Q. Do you have some lightweight Pullman equipment as well?

A. Yes, sir.

Q. Of recent construction?

A. Yes.

Q. Does the Santa Fe run through any territory between Chicago and Los Angeles where relatively severe winter temperatures are encountered?

A. Yes, we do. We encounter severe cold weather in the winter months from Chicago, you might say, to Needles. At times the weather is quite severe. We encounter the most severe weather I think in Colorado and parts of New Mexico and some in Arizona.

Q. Do you on parts of that line other than in Arizona operate passenger trains of more than 14 cars during the winter months?

A. Yes, we do.

Q. Will you say whether or not you have imposed any [fol. 1907] limitation upon the lengths of your passenger trains during the winter months because of failure to heat or difficulty in heating the rear cars of such passenger trains?

A. Yes, we have. Our maximum consist in severe cold weather would be about 16 to 17 cars. Beyond that we would split the train.

Q. What do you mean by "severe cold weather"?

A. Five to ten below zero.

Q. Have you ever found it necessary to reduce to 14 cars or less because of five or ten degrees below zero?

A. No, we feel we can heat that number of cars satisfactorily.

Q. Do you run your locomotives in freight service over more than one freight district?

A. Yes, we do.

Q. Will you state the length of some of your typical locomotive runs in freight service on your main line through trains?

A. We operate our freight locomotives from Marceline, Missouri, to Kansas City, and we have in some instances freight locomotives from Chicago to Kansas City. The reason that we do not do that more than we do is on account of the locomotives on the Illinois division being [fol. 1908] equipped with automatic train control and we keep those locomotives pretty well allocated on the Illinois

division. From Kansas City west we operate freight locomotives to Arkansas City and Wellington, Kansas, and Newton, Kansas. We operate locomotives from Wellington, Kansas, to Clovis, New Mexico; from Clovis, New Mexico, to Belen and from Belen to Winslow. We have operated freight locomotives through from Winslow to Barstow and in some instances they are changed at Seligman. If they are changed at Seligman, they generally run through to Barstow. The running through of freight locomotives depends generally on the conditions of the locomotives. If the locomotive is functioning properly, we take advantage and operate through several terminals. If not, they are alternated with engines that are held at those terminals.

Q. Mr. Mahoney, generally speaking and apart from any restriction such as the 70-car limit, what considerations in your experience on the Santa Fe govern the lengths of the freight trains that you operate?

A. The traffic that is available at the terminal at the time the train is run and the capacity of the locomotive that is going to handle the train govern the tonnage and [fol. 1909] cars to be handled. There are times that we do give consideration to whether or not the train is on schedule, how much late the train is, and in some instances we have to adjust the tonnage to conform with the schedule we are going to make.

Mr. Mason: I think that is all, Mr. Mahoney, thank you. Cross-examine.

Mr. Strouss: I would like to reserve my cross-examination until after lunch, if I may?

The Court: All right. Call the next witness.

L. J. Masson was recalled as a witness in behalf of the defendant and having been previously sworn testified further as follows:

Direct examination (Continued).

By Mr. Mason:

Mr. Mason: Your Honor will recall that prior to the recess on December 14 Mr. Masson had been qualified and I think had introduced one exhibit, No. 115.

The Court: Yes, he is the assistant general auditor of the Southern Pacific Company with headquarters at San Francisco.

Mr. Mason: That is correct.

[fol. 1910] Q. Mr. Masson, I will ask you if you will refer, please, to a statement in one sheet bearing title, "Southern Pacific Company-Pacific Lines, Freight Revenues within the State of Arizona, Years 1912 to 1939, Inclusive." Have you that statement before you?

A. Yes, sir.

Mr. Mason: May we have the statement just referred to marked "Defendant's Exhibit No. 141" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 141 for identification.

Mr. Mason: Did you prepare or cause to be prepared exhibit No. 141?

A. I caused this to be prepared, it was prepared under my supervision and direction.

Q. Is the source as shown at the foot of the exhibit itself?

A. Yes.

Q. Is the exhibit entirely taken from the figures appearing in the annual reports to the Corporation Commission of the state of Arizona?

A. Yes.

Q. Are the reports to the Corporation Commission from [fol. 1911] which this is taken available in the city?

A. The reports to the Corporation Commission for the years 1922 to 1939 are in the courtroom. If counsel desires the reports from 1912 to 1921, they will be made available to him.

Mr. Strouss: I don't desire them. You have your reports from 1922 to 1939?

A. 1922 to 1939 here.

Mr. Strouss: The earlier ones I will not ask for.

Mr. Mason: Is the computation appearing in column 5 your own computation?

A. Yes, sir, that shows the percentage that column 3 is of column 4, indicating the predominance of revenues from interstate freight within the state of Arizona.

Q. Is column 2 the figure reported to the state commission for revenue upon wholly intrastate freight?

A. Yes, that is the revenue that accrues from freight picked up and laid down at points within the state without passing out of the state at any point.

Q. I will ask you to refer to column 3 and to note (B). Is the state proportion of revenue on interstate traffic as-
[fol. 1912] signed to the State in accordance with your own formula?

A. No, according to formula prescribed by the Corporation Commission of Arizona.

Q. Is the formula substantially as indicated by your note (B) based on the mileage pro rate of the total distance the freight may be carried?

A. Yes, sir.

Q. Have the computations of the other figures on the exhibit been checked against the original sources?

A. The figures on the exhibit have been checked against the original sources.

Q. Will you say whether or not the showing is a true and correct representation of the figures appearing in the original sources?

A. Yes, sir.

Q. And are the computations and percentages correct?

A. Yes, sir.

Mr. Mason: We offer the statement in evidence as defendant's exhibit No. 141 subject to any questions of opposing counsel.

Mr. Strouss: Column 3, interstate, you mean by that that is the portion of the interstate allocated to Arizona?

A. Yes, sir.

[fol. 1913] Mr. Strouss: Under the formula of the Arizona Corporation Commission?

A. Under the formula prescribed by the Arizona commission, dated September 23, 1914.

Mr. Strouss: That is the formula which was adopted by the Association of Commissions, wasn't it?

A. No, it is a little different to the formula prescribed by the Association of Railway Commissioners. That prescribes a different formula for allocations to states. This prescribes a special formula.

Mr. Strouss: We object to this as immaterial and irrelevant.

The Court: Objection overruled. It may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 141.")

The Court: Do I understand with reference to this exhibit, Mr. Masson, column 3, that in accordance with the rules of the Arizona Corporation Commission any freight of any class originating within the state of Arizona that was hauled by your lines across the state line either way would be classed as "interstate"?

A. Yes, sir, interstate freight represents freight that [fol. 1914] originates outside the state and moves to a point in the state or that may originate at a point in the state and moves outside the state.

The Court: In other words, column 2 represents that percentage of your business which is wholly within the state of Arizona?

A. That is true.

The Court: The shipment originates in and stops in the state?

A. Terminates in the state, yes, sir.

Mr. Stronss: What is that formula of the Corporation Commission? I think the court should understand that.

Mr. Mason: I intend to develop it further by a concrete example.

Mr. Stronss: There is one question I should have asked there. The percentage of interstate total—just so I understand this exhibit—is that the ratio of the two columns 2 and 3?

A. No, that is the ratio of column 3 to column 4.

Mr. Mason: To state a concrete example of allocation of revenue, if a shipment moves from Phoenix to Tucson, originating on the Southern Pacific at Phoenix and de- [fol. 1915] livered by the Southern Pacific at Tucson, in what column of exhibit No. 141 will the revenue be placed?

A. In column 2.

Q. Suppose that a shipment originates at Colton, California, and moves to Tucson and is there delivered, in what column will the revenue received by the Southern Pacific Company for carrying that shipment be placed and how much of the revenue will be placed in that column?

A. The mileage proportion or the relative percentage that the mileage in Arizona bears to the total mileage

from Colton to Tucson. It would be put in column 3. To make it simple, let's assume that a shipment moves 100 miles, 50 miles of it moves in Arizona and 50 miles outside of Arizona. Fifty per cent of the revenue would be allocated to Arizona.

Q. Suppose a shipment which originates at Los Angeles and moves to El Paso, Texas, all of the haul being Southern Pacific, will any of the revenue received from the transportation of that shipment appear in column 3, and, if so, how much?

A. The mileage proportion through the state.

Q. From border to border?

A. From border to border.

Q. Of the total?

[fol. 1916] A. Of the total revenue.

Q. Will the same process be followed if the shipment originates at a point in Mexico, moving through the Nogales gateway and is delivered at a point outside of Arizona?

A. Yes, sir.

Q. Or delivered at a point inside of Arizona?

A. Yes.

Q. So in the interstate column appears the revenue apportioned to the mileage in Arizona on the pro rate basis from traffic moving across the state or from outside the state to a point within or from within the state to a point outside?

A. Correct. Let me go a little further. You confined your example to shipments originating on the Southern Pacific.

Q. I did, for simplicity, but what happens as to interline shipments?

A. The same process. In other words, if the shipment originates on the Santa Fe in Arizona, comes to us and is delivered at a point in Arizona, Tucson we will say, that is an intra-state shipment. It is an interline intrastate shipment. If it originates, we will say, in the East, on a foreign line, moves through Arizona, Arizona would get its mileage proportion of the revenue allocated or [fol. 1917] apportioned to the Southern Pacific of that shipment.

The Court: Would that be shown in column 2?

A. That would be shown in column 3, that is an interstate shipment.

Mr. Mason: Referring to your shipment originating on the Santa Fe and moving to a Southern Pacific point. Let's suppose the shipment originated at Flagstaff and moving via Phoenix to Tucson. The revenue from that shipment divides at Phoenix, part to the Santa Fe and part to the Southern Pacific?

A. Yes.

Q. How much of that revenue will appear in this statement and in what column?

A. The total Southern Pacific revenue will appear in column 2.

Q. But only the Southern Pacific proportion?

A. We are only dealing here with Southern Pacific revenue.

Q. Suppose a shipment originates on the Rock Island at Kansas City and moves via Tucumcari and El Paso and is delivered at Tucson, how much of that revenue in proportion will appear in exhibit No. 141 and in what column?

A. The revenue accruing to the Southern Pacific from [for 1918] Tucumcari to Tucson would be split and a mileage pro rate of that revenue would be allocated to Arizona and put in column 3.

Mr. Mason: Does that make it clear, Your Honor?

The Court: I think so.

Mr. Mason: Have you any other questions before we pass on to something else?

The Witness: For instance, a rate on a shipment that applies, we will say, from Chicago moving over the Rock Island, Tucumcari, Southern Pacific, divides on an established agreed percentage basis between the Rock Island and the Southern Pacific first.

The Court: I understand that but all of the revenue so far as the Southern Pacific is concerned and so far as this exhibit is concerned on such a shipment would be shown in column 3?

A. No, sir, only the Arizona mileage proportion would be allocated. That shipment moves through Arizona, New Mexico, and Texas and those states will get their cut out of it. It will be prorated between the respective states on a mileage basis in proportion to the mileage hauled in the respective states and Arizona would get its cut out

[fol. 1919] of that revenue and it would be put and is put in column 3.

Mr. Mason: Perhaps a concrete example would help. Suppose a shipment originates on the Texas and Pacific in Texas and moves a total haul of a thousand miles to a destination in Arizona of which one hundred miles are in Arizona and the total Southern Pacific haul is five hundred miles and the division between the Texas and Pacific and Southern Pacific is on a straight 50 per cent basis. How much of that revenue would be apportioned to the Southern Pacific in the first place?

A. 50 per cent of it.

Q. How much of that revenue accruing to the Southern Pacific would be apportioned to the one-hundred-mile haul in Arizona?

A. One-fifth of it.

Q. Or one-tenth of the total revenue for the interline haul?

A. That is right.

Q. That one-tenth would appear where?

A. In column 3.

Mr. Strouss: That has been the formula in use since 1914?

A. Yes, sir.

Mr. Strouss: Of course that applies to freight movement [fol. 1920] out of the state as well as to those into it and going through it?

A. Yes, sir.

Mr. Strouss: In other words, shipments of ore out of Bisbee or Douglas, for example, the revenue from them would be interstate if it were going to El Paso or beyond?

A. That is true.

Mr. Strouss: And the amount of that revenue allocated to Arizona would be the ratio of the mileage in Arizona to the total mileage?

A. That is true.

Mr. Mason: Mr. Masson, while the formula became effective in 1915, have the accounts for the years preceding been stated in the same way?

A. Yes.

Mr. Strouss: You mean in the exhibit?

A. Yes.

Mr. Strouss: I wasn't asking that question for that purpose.

Mr. Mason: I don't think it makes any particular difference because after all whether the percentage is 95 or 94, it is still very substantial.

Mr. Strouss: I wasn't questioning him on that basis.

Mr. Mason: Mr. Masson, have you before you a statement in one sheet bearing title, "Southern Pacific Company-Pa-
[fol. 1921] cific Lines, Freight Revenues as Allocated to the State of Arizona in Accordance with Formulae Prescribed by Arizona Corporation Commission, September 23, 1914, Segregated between Specified Classes of Traffic, Calendar Years 1930 to 1939, Inclusive"?

A. Yes, sir.

Mr. Mason: May we have the statement marked as "Defendant's Exhibit No. 142" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 142 for identification.

Mr. Mason: Did you prepare or cause to be prepared this exhibit, Mr. Masson?

A. This exhibit was prepared under my supervision and at my direction.

Q. From what particular sources was it prepared?

A. It was prepared from the accounting records of the company. I want to point out that column 2 are the same figures as appear in column 2 of exhibit No. 141, which in turn appear in the annual report to the Corporation Commission of Arizona.

[fol. 1922] Q. And the figures in column 10, where do they appear?

A. They appear in column 4 of exhibit No. 141. I have taken the basic records in our office and broken down the interstate revenue to show the amount of revenue that is derived from and allocated to the state of Arizona, first from traffic originating without and ending within the state as shown in column 4. Next, the revenue from freight traffic originating within and ending without the state as shown in column 6. Next, the revenue from freight passing

through the state is shown in column 8. As I said, this segregation was the result from the basic records which are quite voluminous in our office and the columns 3, 5, 7, and 9 are computations that we made.

Q. From the figures on the face of the exhibit?

A. From the figures on the face of the exhibit.

Q. The percentage computations in column 3, I take it, correspond to and are the differences respectively between one hundred and the other figures appearing in column 5 of exhibit No. 141 for the corresponding years?

A. Yes, taking 6.90 per cent shown in column 3 for the year 1939 on exhibit No. 142 and adding it to the percentage of 93.10 shown in column 5 for the year 1939 on exhibit [fol. 1923] No. 141 comes to one hundred per cent.

Q. The same is true as to each of the other years down to 1930?

A. That is true. In other words, the 93.10 per cent has been broken down to show what is in and out and through the state.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No, I have no questions.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 142.

Mr. Strouss: We object to it as irrelevant and immaterial.

The Court: Objection overruled, it may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 142.")

Mr. Mason: I don't know that we developed from the witness that it was true and correct.

A. It is to the best of my knowledge and belief.

Q. And the computations have been checked, have they?

A. They have.

Q. As I understand exhibit No. 142, Mr. Masson, it simply carries further the breakdown into interstate and intra- [fol. 1924] state traffic and for the ten-year period only the showing made by exhibit No. 141?

A. That is true.

Q. Is this showing in column 8 and percentage reference in column 9, is that character of traffic sometimes referred to as "bridge" or "overhead" traffic?

A. Yes, in that instance Arizona would be known as a bridge state.

Q. Take an example of traffic originating at Los Angeles and moving to El Paso. Where would the Arizona proportion of the revenue received for the character of that shipment appear upon exhibit No. 142?

A. That would be in column 8.

Q. If the shipment originated in Tucson and moved to El Paso, where would the Arizona proportion of the revenue appear?

A. That would be in column 6, originating in and ending without.

Q. These shipments which originate at Los Angeles and move on the Overnight to Phoenix and Tucson and are delivered there, where does the revenue from them appear?

A. That would be in column 4.

[fol. 1925] Mr. Mason: Have you any questions before we leave the exhibit, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Mr. Masson, have you before you a statement in one sheet bearing the title, "Southern Pacific Company-Pacific Lines, Revenue Ton-Miles of Freight Carried in the State of Arizona, Calendar Years 1925 to 1939"?

A. Yes.

Mr. Mason: May we have the statement marked as "Defendant's Exhibit No. 143" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 143 for identification.

Mr. Mason: Did you prepare exhibit No. 143 or cause it to be prepared?

A. I caused this exhibit to be prepared and it was prepared under my direction.

Q. From what sources was the exhibit prepared?

A. That was prepared from the basic records in our office.

Q. You say in the source note on the exhibit that it agrees with certain other statistics. Will you explain how it agrees or corresponds to such statistics?

[fol. 1926] A. The total shown in column 6 agrees with the corresponding figure that is shown in Schedule 931 of the annual report made by the company to the Corporation Commission of Arizona, 1939, for instance——

Q. Do you have the report to the Arizona Corporation Commission before you now?

A. Yes.

Q. And are referring to the 1939 figures in Schedule 931?

A. Yes, 1939 figures in Schedule 931. Line 73 shows the same figure as is shown in column 6 of Exhibit No. 143.

[fol. 1927] Q. For the year 1939?

A. For the year 1939. That figure was broken down from our basic records between intrastate and interstate.

Q. Now, the definition of intrastate is, as to the units shown here, the same as stated by you previously?

A. Yes, sir.

Q. And likewise the definition of "interstate"?

A. Yes.

Q. I notice that here you make the segregation of revenue ton-miles using as the unit the revenue ton-mile. Will you explain the use of that unit?

A. Well, a ton-mile is the transportation performed. In other words, the tonnage moved, and the distance that it moves is known by the technical term "ton-mile," one ton of two thousand pounds moved one mile is a ton-mile.

Q. Is that the measure of the freight transportation performed upon revenue freight?

A. Yes.

Q. And that is the measuring unit used by the commission, state commissions as well as by the Interstate Commerce Commission?

A. Yes.

Q. And by the carriers, of course, in rendering their re-

[fol. 1928] ports, by the Southern Pacific in rendering its report, at least?

A. That is a unit of measure that is generally used by all transportation agencies, rail transportation agencies, I should say, all railroads as well as by all regulatory bodies.

Q. Has the exhibit been compared with the original sources to determine its correctness?

A. Yes, sir.

Q. And the computations, the results of which appear in columns 3 and 5, just how were they made?

A. They were made and they were checked and are correct.

Q. Now, your note says "Interstate ton-miles assigned to state on basis of distance carried within or through the state." Does that involve the use of any formula?

A. What did you say?

Q. The Note A at the foot of the sheet says, "Interstate ton-miles assigned to state on basis of distance carried within or through the state."

A. Well, that is the same formula that I referred to, the revenue-mile.

Q. This is the case of actual performance, actual carriage?

[fol. 1929] A. Yes.

Q. There is no formula involved, is there?

A. None other than that which applies to revenue. In other words, the ton-miles assigned to the state are in ratio of the total miles in the state, moved in the state times the tonnage, to the total tonnage and total mileage.

Q. It is necessarily so, from the definition of the term "ton-miles?"

A. That is so.

Q. Is the segregation of the revenue ton-miles of freight as between interstate and intrastate a record currently maintained, or is it the result of a special study of the underlying records for the purposes of this case?

A. We don't maintain a segregation of ton-miles by states; it was made for—except as to Nevada; Nevada is the only state that requires it. We do that currently. The segregation here made was the result of the special study.

Q. Of the primary records?

A. Yes.

The Court: In other words, the Arizona Corporation Commission doesn't require such a report?

A. It doesn't require that report.

[fol. 1930] Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No. I think inadvertently Mr. Masson's definition of revenue ton-miles, he stated a ton—freight moving one mile. I think he meant revenue freight.

The Witness: Yes, we were speaking of revenue freight; otherwise, it would be revenue and non-revenue. But a ton-mile is 2,000 pounds of freight moved a mile.

Q. It wouldn't include company freight?

A. No, this doesn't include company freight.

Mr. Mason: We offer the exhibit in evidence as defendant's Exhibit No. 143.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted in evidence.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 143.")

The Court: We will take our morning recess at this time.

(Thereupon a short recess was taken, after which Mr. Masson was recalled to the stand and proceedings were resumed as follows:)

[fol. 1931] Mr. Mason: Mr. Masson, have you before you a statement in one sheet bearing the title, "Analysis of Interstate and Intrastate Revenue Freight Tons carried One Mile in State of Arizona, Calendar Years 1925, 1929, 1938 and 1939?"

A. Yes, sir.

Mr. Mason: May we have the statement marked "Defendant's 144 for identification?"

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 144 for identification.

Mr. Mason: Did you prepare this exhibit, Mr. Masson, or have it prepared?

A. That statement was prepared under my supervision and direction.

Q. Was this statement especially prepared from the underlying records for the purposes of this case?

A. This was a special study from the underlying records in our office for the purposes of this exhibit.

Q. Do any of the figures appearing on the exhibit correspond with figures appearing in reports to the Arizona Corporation Commission?

A. Yes; as stated in the footnote there, the grand total shown in column 8 agrees with the totals shown in Column [fol. 1932] 6 of exhibit No. 143. This exhibit breaks down the ton-miles, or, in other words, the transportation service to correspond with the breakdown that is shown in exhibit 142. 142 covers the breakdown of the revenue and this shows the breakdown of the ton-miles between various sources as indicated in Column 1. You will note that Item D, freight originating and terminating within the state, intrastate freight, intrastate ton-miles I should say, agrees

with the corresponding figures for the respective years shown in Column 2 of exhibit 143.

The Court: I notice, Mr. Masson, in all of these other exhibits that have been introduced here this morning while you have been on the stand, that they either cover a ten-year period or a period from 1912 to 1939, whereas Exhibit 144 merely takes four years, 1925, 1929, 1938 and 1939. Why was that done?

A. Simply—this exhibit is intended and was constructed simply as an illustration of the transportation service in and out and through the state.

Q. Any particular reasons for taking those four years? [fol. 1933] A. No, there wasn't any particular reason. I assumed that it would serve the purpose of an illustration, and I had no reason to believe that any of the other years would produce any different figures.

Mr. Masson: That is, anything differing very widely from what appears here?

A. From what appears in here.

Q. Referring to exhibit 143, the segregation of the total interstate and intrastate, do you find any such substantial variations in the proportions during the years 1925 to 1939 which would indicate any substantial variations as between classes A, B and C on exhibit 144 for identification?

A. No; that is what caused me to simply use this as an illustration.

Q. Was this a special study requiring special references to the basic records?

A. Yes.

Q. Is it a considerable labor to segregate these figures for each year?

A. Yes, it is.

Q. Is that another reason for having confined it to the four years shown?

A. It is, yes.

[fol. 1934] Q. These figures in percentage of totals in the line bearing the designation "total interstate" for these years are the same as those which appear in Exhibit 143 in columns 4 and 5?

A. Yes.

Q. This is simply a further breakdown for these four years of the figures which appear in Exhibit 143, are they not?

A. That is true, that is the fact.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has the exhibit been checked against the underlying records, Mr. Masson?

A. Yes.

Q. And have the computations been checked?

A. They have.

Q. Will you say whether or not the exhibit is true and correct?

A. It is true and correct, to the best of my knowledge and belief.

Mr. Mason: We offer the statement in evidence as Defendant's Exhibit in evidence No. 144.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: Mr. Strouss, I understood you to say earlier [fol. 1935] in the trial that the defendant company has been cooperative and made available all of their records for you, so you are not objecting on the ground that the original source records are not here?

Mr. Strouss: No, I am objecting only on the ground that it is immaterial and irrelevant.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence, and marked "Defendant's Exhibit No. 144.")

Mr. Mason: Have you before you, Mr. Masson, a statement in one sheet relating to Southern Pacific Company, Pacific Lines, and bearing the title, "Tons of Revenue Freight Carried One Mile Through, And Or, To and From Points Within, State of Arizona, Segregated Between Traffic To and From Mexico and Traffic To and From All Other Points Beyond the State?"

A. Yes, sir.

Mr. Mason: May we have the statement marked as defendant's Exhibit 145 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 145 for identification.

[fol. 1936] Mr. Mason: Did you prepare this exhibit or cause it to be prepared, Mr. Masson?

A. I caused this exhibit to be prepared; it was prepared under my supervision and direction.

Q. Is this likewise based upon original records of the company?

A. Yes, our basic records were used in preparing this, and here, again, we used only one year.

Q. Was this a special study for the purposes of this case?

A. It was.

Q. Requiring considerable labor?

A. Yes.

Q. As I understand it, the exhibit is for the purpose of showing the percentage of the international traffic from and to Mexico handled through Arizona for the year?

A. That is the primary purpose of the exhibit.

Q. Then this is a further breakdown of the 1939 figures appearing in the preceding exhibits?

A. Yes.

Q. Did you make these computations or percentage figures in column 3?

A. The computations were made at my direction.

[fol. 1937] Q. Have they been checked?

A. Yes, and I am satisfied they are correct.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: As I understand it, this exhibit now, the items under "A" represent the traffic which passes through Arizona going either from Mexico to some points beyond Arizona or coming from points beyond Arizona into Mexico, but neither originating nor terminating in Arizona.

A. That is true, that is Item 1.

Mr. Mason: I think that that is not quite clear.

The Witness: Item 1 represents freight that originated or terminated in Mexico, passing through the state of Arizona to and from a point beyond Arizona. Item 2 represents all other traffic passing through Arizona.

Mr. Mason: Now, do I understand

The Witness (Interrupting): Do you understand that now?

Mr. Strouss: Yes.

The Witness: Item B. is the traffic to and from points in Arizona to Mexico, and vice versa.

Mr. Mason: Now, the first two entries, then, numbers 1 [fol. 1938] and 2, is traffic, either Mexican traffic or domestic United States traffic, as to which Arizona is a bridge?

A. Yes.

Q. And Items 3 and 4, and B is domestic traffic, or traffic from or to Mexico, moving to or from points in Arizona?

A. Yes.

Q. But all interstate?

A. It is all interstate traffic.

Q. This contains no showing of any intrastate Arizona traffic?

A. No.

Mr. Mason: Any other questions, Mr. Strouss?

Mr. Strouss: No other questions.

Mr. Mason: We offer the exhibit in evidence as defendant's Exhibit 145.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 145.")

Mr. Mason: Will you now refer, Mr. Masson, to a statement in one sheet entitled, "Southern Pacific Company, [fol. 1939] Pacific Lines. Passenger Revenues Within the State of Arizona, Years 1912 to 1939 Inclusive."

A. Yes, I have it before me.

Mr. Mason: May this be marked, if the Court please, No. 146 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 146 for identification.

Mr. Mason: Did you prepare No. 146, or cause it to be prepared, Mr. Masson?

A. I caused that exhibit to be prepared, and it was prepared under my supervision and direction.

Q. And prepared from the counterpart copies of the annual reports to the Corporation Commission of Arizona?

A. Yes.

Q. The Schedule 710 as shown?

A. Yes, or corresponding schedule.

Q. Does this exhibit bear any resemblance to Exhibit 141?

A. Yes, that is a breakdown of the passenger revenues as between intrastate and interstate in a manner and according to formula similar to that which applies to freight revenues as shown in Exhibit 141.

[fol. 1940] Q. Is the exhibit prepared exactly the same way?

A. Yes.

Q. And the allocation or prorating of interstate passenger revenue to the State of Arizona is accomplished according to formula along the same lines for the assignment or allegation of freight revenue?

A. Yes.

Q. The computations in column 5, I take it, are your computations?

A. Yes, computed for the purpose of this exhibit.

Q. And express the relationship of what other figures on the exhibit?

A. Express the relationship of column 3 and column 4, indicating the predominances of revenue from interstate business within Arizona.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No, I just have one.

Q. These exhibits include branch line operations as well as main line?

A. Yes, the total revenues.

Mr. Mason: Has the exhibit been compared and checked?

[fol. 1941] A. Yes, sir.

Q. Will you say whether it is true and correct?

A. To the best of my knowledge and belief, it is.

Mr. Mason: We offer the exhibit in evidence as defendant's Exhibit No. 146.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence, and marked "Defendant's Exhibit No. 146.")

Mr. Mason: Will you refer, please, Mr. Masson, to a statement in one sheet entitled, "Southern Pacific Company, Pacific Lines, Revenue Passengers carried One Mile in the State of Arizona, Years 1925 to 1939, Inclusive?"

A. Yes, sir.

Mr. Mason: May we have the statement marked "Defendant's No. 147 for identification," Your Honor?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 147 for identification.

[fol. 1942] Mr. Mason: Did you cause this exhibit to be prepared, Mr. Masson?

A. Yes, sir.

Q. Was this prepared as a special study from basic records of the company?

A. Yes, sir.

Q. Here you have a showing of revenue passengers carried one mile. Is that usually so-called "revenue passenger-miles?"

A. That is what it is.

Q. What is the revenue passenger-mile; is that a unit of measurement?

A. A passenger-mile is the measuring unit applied with respect to passenger statistics and represents—it is made up, or, I should say, it is one passenger traveling one mile, which is known by the technical term of the "passenger-mile."

Q. These figures in columns 2, 4 and 6 are passenger-miles?

A. Are passenger-miles. Column 6 ties into the annual report to the Commission, the Corporation Commission of Arizona.

Q. Does this exhibit resemble Exhibit 143 relating to the showing of revenue freight ton-miles?

[fol. 1943] A. Yes, to the extent that it segregates——

The Court: Comparing the two exhibits, Mr. Masson, I notice that on percentage bases, that the intrastate passenger business is considerably smaller than the intrastate freight business?

A. That is true, Sir. You will notice the falling off in the more recent years, which is due to the loss of passenger business.

Mr. Mason: I will ask you if the exhibit has been compared and the computations checked?

A. Yes.

Q. Is it a true and correct reflection of the underlying sources, the records to which you have referred?

A. To the best of my knowledge and belief, it is.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: We offer the exhibit as defendant's No. 147.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence, and [fol. 1944] marked "Defendant's Exhibit No. 147.")

Mr. Mason: Attention has been called, Mr. Masson, to the decline in the intrastate proportion of the revenue passenger business expressed in revenue passenger-miles, as indicated on the face of the exhibit. Is that due to the disappearance or partial disappearance of local passenger traffic, short haul passenger traffic?

A. Yes. Now, when I say that these figures, revenue figures especially, tie into the annual reports, I want to point out that for the purposes of this exhibit the revenue is rounded out in dollars. Of recent years reports have been rendered to the Commission in round dollars; in other words, cents were omitted. In prior years, why, we reported dollars and cents, so to that extent there will be that small difference.

Q. That comment would not apply to Exhibit 147, would it?

A. No, no; there is no money; wherever money is shown, it was rounded out.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: This is 147?

[fol. 1945] Mr. Mason: 147, yes. It has been received.

Mr. Strouss: No, I have no questions on it.

Mr. Mason: Have you before you, Mr. Masson, a statement in one sheet bearing the title, "Analysis of Interstate and Intrastate Revenue Passengers Carried One Mile In State of Arizona, Calendar Years 1925, 1929, 1938, and 1939"?

A. Yes.

Q. Did you cause this exhibit to be prepared?

A. I did.

Q. From basic records in the accounting department of the company?

A. Yes.

Q. Was this a special study for the purposes of this case, similar to Exhibit No. 144, in which you analyzed the revenue freight ton-miles?

A. Yes; and again we used only four years.

The Court: And the same four?

A: And the same four, which is simply for the purpose of illustrating the source of the business.

Mr. Mason: Here you have broken down, I take it, the figures appearing on No. 147, so as to show the interstate movement into the state, out of the state, and across the state.

A. Yes; 147 is revenue.

[fol. 1946] Q. Is 147 revenue?

A. No, no. That is right. Yes, you will notice that the grand total here, column 8, for the year 1939, ties into the figure shown in column 6 for 1939.

Q. On Exhibit 147?

A. On 147.

Q. Is the same true as to the figures for 1925, 1929, and 1938?

A. Yes.

Q. Have the computations been checked and the exhibits otherwise compared to determine its correctness?

A. Yes, it has been checked, and it is correct to the best of my knowledge and belief.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No, I have no questions.

Mr. Mason: We offer the statement as defendant's Exhibit No. 148.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 148.")

[fol. 1947] Mr. Mason: Attention has been called, Mr. Masson, to the fact that this exhibit shows only four years. Is the preparation of the segregation appearing on this exhibit a somewhat detailed and laborious process?

A. It is quite a detailed and exhaustive process to go through and pick out this stuff from our records.

Q. Is that the reason why no more than four years are shown?

A. Primarily, yes. And also, it was my thought that four years would be sufficient, would answer the purpose of illustrating just the source of the business. I had no reason to believe but that the same showing would result if other years were analyzed in the same way.

Q. Will you take up, next, the statement in one sheet entitled "Statistics of Rail-Line Operations Within the State of Arizona. Main Line and Branches, Excluding Mixed Service, Years 1910 to 1939, Inclusive. Freight Trains." Have you that before you?

A. Yes.

Mr. Mason: May we have this statement marked as Defendant's Exhibit No. 149 for identification?

The Court: It may be marked.

[fol. 1948] The Clerk: Defendant's Exhibit No. 149 for identification.

Mr. Mason: Did you prepare No. 149, or cause it to be prepared?

A. I caused this exhibit to be prepared. It was prepared under my supervision and direction, and it is taken from the annual reports to the Corporation Commission of Arizona. The books for 1922 to 1939 are in the courtroom and 1910 to 1921, inclusive, will be furnished if the attorney requires them.

Mr. Strouss: No, we have them in the Corporation Commission.

Mr. Mason: Are all of these figures those which appear on the several reports to the Corporation Commission?

A. Excepting column 4.

Q. Is that a computed figure?

A. That is a computed figure.

Q. What does column 4 represent?

A. Column 4 represents average cars per train.

Q. What computation do you make in obtaining it?

A. You divide column 3 by column 2.

Q. So that the figures in column 4 are in fact the average car-miles per train-mile.

[fol. 1949] A. Average car-miles per train-mile, and they include everything but mixed trains.

Q. This also covers branch-line as well as main line operations.

A. Branch line and main line, short trains and long trains.

Q. The showing for the years, subsequent to 1924, as in preceding exhibits, includes the separately operated companies which were acquired in 1924?

A. Yes. Those companies, of course, were operated as part of the Pacific Lines.

Q. Subsequent to November first or approximately that date in 1924?

A. Yes.

Q. Has the exhibit been compared as to the original figures, and checked as to the computations?

A. Yes.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: The average cars per train is the calculation?

A. Yes.

Q. Considering columns 2 and 3?

A. Yes, as I explained, it is simply a division of column [fol. 1950] 3 by column 2, or in other words, this is the car-miles per train-mile.

Mr. Strouss: No other questions.

Mr. Mason: Is the exhibit true and correct, Mr. Masson?

A. Yes, to the best of my knowledge and belief.

Mr. Mason: We offer the statement as Defendant's Exhibit No. 149.

Mr. Strouss: I object to it as irrelevant and immaterial.

The Court: The objection is overruled; it may be admitted.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 149.")

Mr. Mason: Have you before you, Mr. Masson, a statement in one sheet bearing the title, "Statistics of Rail-Line Operations Within the State of Nevada, Main Line and Branches, Excluding Mixed Service, Years 1910 to 1939, Inclusive"?

A. Yes.

Mr. Strouss: Pardon me just a minute. May I ask one question concerning that previous one?

Mr. Mason: Yes.

Mr. Strouss: Does that include mixed trains or just straight freight trains?

A. No, freight trains, as indicated at the top of this [fol. 1951] sheet. In the heading it says "Excluding Mixed Service," and, as you probably know, the classification "mixed service" is no longer in effect.

Mr. Strouss: When I said I didn't want those reports, I do want to examine these reports from 1922 on.

The Witness: Yes, that is understood.

Mr. Mason: That is understood.

Q. I notice here on exhibit 149, Mr. Masson, a matter which may merit explanation. You show statistics for 1910 and 1911, which, of course, are prior to the existence of the Corporation Commission in the State of Arizona. Were those figures, for Arizona as a territorial unit, kept in the company's records prior to that time?

A. The figures are, of course, and have been back as far as I can remember, kept as part of the company records. These figures were taken from reports to the Corporation Commission to the State of Arizona or a report made to some other commission, of which I haven't the information right now.

Q. Its predecessor in territorial days?

A. Yes.

Mr. Mason: I take it, Mr. Strouss, that there is no ques- [fol. 1952] tion as to the authenticity, if it be material, of the figures for 1910 and 1911?

Mr. Strouss: No.

Mr. Mason: Now, referring to the statement which has been circulated and relates to the State of Nevada, the title of which I believe I recited, may we have that marked, if it has not already been marked, as defendant's exhibit 150.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 150 for identification.

Mr. Mason: Did you prepare exhibit No. 150 for identification, Mr. Masson?

A. I had this prepared.

Q. From what sources?

A. That was prepared from the reports to the Public Service Commission of Nevada back to 1911, inclusive, and 1910 was taken from our company records. We have the reports from 1922 to 1939 in court, the reports to the Nevada Commission in court. If the counsel wants reports from 1910 to 1921, inclusive, they will be made available to him.

Mr. Strouss: No, I will be satisfied with 1922 to 1929.

[fol. 1953] Mr. Mason: Mr. Masson, this exhibit is similar in form apparently to exhibit No. 149, the only difference being that it relates to Nevada rather than to Arizona operations?

A. That is true.

Q. The figures in column 4 represent the quotient of the division of the figures in column 3 by those in column 2?

A. Yes, those are computations.

Q. Includes all branch line operations as well as main line operations?

A. Yes, sir.

Q. And excludes mixed service as that is reported separately?

A. Yes, sir.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has the exhibit been compared and checked, Mr. Masson?

A. Yes.

Q. Will you say whether or not it is true and correct to the best of your knowledge and belief?

A. It is true and correct to the best of my knowledge and belief.

Mr. Mason: We offer the statement in evidence as de-
[fol. 1954] fendant's exhibit No. 150 with the explanation of course that as part of our case in chief we desire and propose to make comparisons between Arizona and Nevada operations and this is one of the features of that comparison.

Mr. Strouss: It is objected to as irrelevant and immaterial and particularly pointing out to the court that it relates to operations without the state of Arizona and there has been no proper foundation laid and no showing of similarity.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 150.")

Mr. Strouss: Of course I assume the court will adhere to the ruling which was mentioned the other day of requiring a similarity be shown before the defendant's case is completed.

Mr. Mason: I take it that the question whether a comparison when offered is to be made the foundation of any findings or decision depends of course upon a showing of similarity of conditions. If conditions are not shown to be reasonably similar, then the comparison loses its force and I think that is the extent of the objection. It is an objection [fol. 1955] more to weight than to sufficiency.

Mr. Strouss: It goes further than that, it goes to the admissibility of the evidence. As we have pointed out to the court heretofore, in the reverse order of proof which we have taken in this case the opportunity of the State to argue its objection based upon the record is not here because of the fact that they have chosen and elected to come in the back door instead of the front door, and all we can do is make our objection and of course the court permitting that order of proof we will have to wait to see what the final record is as made.

Mr. Mason: I will say this, from the face of these two exhibits, 149 and 150, it is possible and I think desirable at this point to indicate a similarity. Now, of course, car-miles or revenue freight ton-miles are a measure of the volume of revenue freight in the respective territories, and from an examination of column 3 it will be seen that the volume of revenue freight handled measured in car-miles in the several years in the states of Arizona and Nevada are reasonably close together and in some years very close together. In some years the volume in one state is heavier than the other, but the two are not so far apart in any year. [fol. 1956] So that the company's operations in the two states from the standpoint of volume of revenue freight handled may properly be held to be comparable. I realize

this is arguing the case at this point but I point out that column 3 does indicate a similarity from that standpoint.

Mr. Strouss: Whether they are comparable or not remains to be seen when all the evidence is in. There are a number of elements which will enter into that question when the matter comes to a final issue.

Mr. Mason: I think Mr. Strouss will agree with me that the volume of traffic to be handled is one of the elements to be considered.

The Court: You may proceed, gentlemen.

Mr. Mason: Have you anything further on No. 150, Mr. Masson?

A. No, I don't think so.

Mr. Mason: Before we pass to another exhibit, Mr. Strouss, have you any questions you would like to ask now on that exhibit?

Mr. Strouss: No, I have not.

Mr. Mason: Have you before you, Mr. Masson, a statement in one sheet entitled, "Southern Pacific Company, Pacific Lines, Freight Operating and Freight Transporta-
[fol. 1957] tion Expenses Related to Traffic, Calendar Years 1922 to 1939, Inclusive"?

A. Yes.

Mr. Mason: May we have the statement marked "Defendant's Exhibit No. 151" for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 151 for identification.

Mr. Mason: Did you prepare Exhibit No. 151 for identification or cause it to be prepared, Mr. Masson?

A. I caused this exhibit to be prepared and it was prepared under my supervision and direction. As shown in the footnote, the figures were taken from annual reports to the Interstate Commerce Commission; from the records of the company to and including 1935, and thereafter all of them came from the annual reports to the Interstate Commerce Commission. In other words, column 2 comes from the reports to the Interstate Commerce Commission in all years. Columns 3 and 4, from 1922 to and including 1935, were taken from the records of the company. We have those records in the court room. We have the reports to the Interstate Commerce Commission in the court room. Columns 5 and 6 are computations. All of the data shown

on this exhibit have been spot-checked by me, and I believe [fol. 1958] all of the figures to be true and correct.

Q. The totals and comptuations shown in the last three blocks of the exhibit are computed figures, are they?

A. Those are computed figures.

Q. Made by the summation of the figures for the years to which they relate?

A. That is true.

Q. And computations are as appear at the foot of the exhibit?

A. That is true.

Q. You speak of percentage of improvement and so forth. Does that mean a percentage decline as between the figures compared?

A. Yes, that means a reduction in the average cost expressed percentage-wise.

Q. And the percentage of improvement is arrived at, I take it, by subtracting the smaller figure from the larger and dividing the difference by the larger figure?

A. That is true.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: When you say "expenses related to traffic," you mean by showing the cost per thousand revenue ton-miles?

[fol. 1959] A. That is true.

The Court: Mr. Masson, will you distinguish for the court what you mean by the freight operating expenses as distinguished from the freight transportation expenses?

A. Operating expenses are incurred for maintenance of way, maintenance of equipment, traffic, transportation, and general expenses. Those general classes of expenses are caused by freight and passenger operations. The total expenses incurred in one class of freight service, for instance, or in passenger service where directly incurred in connection with those particular services are allocated directly to that class of service. Where the expenses cannot be allocated direct of assigned direct to either one or the other service, they are broken down according to a formula between the two services, a formula that has been provided and prescribed by the Interstate Commerce Commission. Column 3 represents, therefore, the expenses that have been incurred in conducting freight service and were

assigned directly to that service, plus a proportion of what we know as common expenses that cannot be assigned to either one or the other service.

Mr. Strouss: That is, you mean, either pasenger or [fol. 1960] freight?

A. Either passenger or freight service.

Mr. Mason: You mean assigned solely to either service?

A. That is true.

The Court: Such as maintenance of right of way?

A. Maintenance of way, although there are some facilities that are classified exclusively as freight facilities in the maintenance of which the expenses are assigned directly to freight service. Therefore, this column 3 represents the freight proportion assigned and allocated to maintenance of way, maintenance of equipment, traffic, expenses, transportation, miscellaneous services, if any, and general expenses. Column 4, on the other hand, is just a part of the expense. It is the expense that is incurred directly in connection with the transportation service, such as train service, the superintendence of train service, the dispatching, the station service, the wages of enginemen and trainmen, and things of that kind.

The Court: Are the items shown in column 4, for instance, for the year 1939, forty-five million, is that included [fol. 1961] within and a part of the total shown in column 3?

A. Yes, sir, it was the intent and is the intent of this exhibit to show first what total expenses cost us per thousand revenue ton-miles. Next, as a side issue, but on the same exhibit, how much of that represents transportation expenses per thousand ton-miles.

Mr. Mason:

Q. When you say "total expense," you mean the total of freight operating expense?

A. Yes, I was speaking of only the freight proportion of operating expenses.

Q. Do you recall exhibit No. 20 introduced by the witness Parmelee relating to railroads of Class I of the United States?

A. Yes.

Q. And exhibits introduced through witnesses for other railroads similar in form to exhibit No. 20?

A. Yes.

Q. Will you say whether or not exhibit No. 151 for identification resembles and is intended to present statistics for the Southern Pacific lines in the same fashion as exhibit No. 20 for railroads of the United States as a whole?

A. Exhibit No. 151 is of the same substance as the exhibit presented by Mr. Parmelee and representatives of [fol. 1962] other lines except that it deals exclusively with the ton-miles and expenses of the Southern Pacific lines only.

Q. It is in the same form and presents statistics which correspond to those shown on the other exhibits?

A. That is true.

Q. Of which exhibit No. 20 is typical?

A. That is right.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: Those freight operating expenses and freight transportation expenses are allocated according to the requirements of the Interstate Commerce Commission, are they not?

A. Yes.

Mr. Strouss: And the amounts shown in column 3 freight operating expense includes all items or accounts beginning with account 201 and ending with account 464 of the annual reports to the Interstate Commerce Commission?

A. 462. It represents the freight proportion of expenses that have been charged to the primary accounts within that range of numbers that you spoke of, 201 to 462. Of course, you understand there are several accounts within that [fol. 1693] range that we have no charges in.

Mr. Strouss: Wherever there is an expense in an account within that range, it is included within this total?

A. Yes.

Q. This total would be the over-all total of all those accounts where you have charges to any account?

A. Yes, as you will notice, take the year 1939 and refer to Schedule 320 of the annual report to the Interstate Commerce Commission for the year 1939, line 247, column E is the exact figure that is reproduced in this exhibit, column 3.

Q. In defendant's exhibit No. 9, there is a typical annual report?

The Court: That is true.

Mr. Mason: Exhibit No. 9 was a blank annual report?

A. Yes, form A.

Mr. Strouss: Freight transportation expenses as shown in column 4 here is the total of accounts 371 to 420 for each year wherever there are charges to that account?

A. That is true, and you will notice, taking 1939 for instance, the figure as shown in Schedule 320 of the Interstate Commerce Commission report, line 215 on page 311 shows [fol. 1964] in column E the exact figure that is shown as reproduced in exhibit No. 151.

Q. Of course that form has been changed somewhat in recent years?

A. Over the period of years there have been several changes.

Q. So far as this allocation of charges to freight and passenger, it is set up differently now than it was eight or ten years ago?

A. There have been modifications. The separation between freight and passenger was originally prescribed by the Interstate Commerce Commission entitled, "Rules Governing the Separation of Operating Expenses between Freight Service and Passenger Service on Large Steam Railways Effective January 1st, 1920."

Mr. Strouss: The point I was trying to show was that you referred to column E which gives you a total of the charges to freight when in the older annual reports it was necessary to add two different columns to get that.

A. That is very true and when I gave the reference I referred particularly to 1939.

Mr. Mason: These figures in column 4, are those the expenses that are particularly associated with the actual [fol. 1965] operation of the trains as distinguished from maintenance or traffic expenses?

A. Yes, it includes the operation of trains, main line and branches, road and yard.

Q. It includes, I think you said, the cost of the wages of the men who are actually manning the trains?

A. Yes.

Q. And the fuel for the train locomotives?

A. Yes.

Q. And other expenses which are particularly associated with the movement of the trains, is that correct?

A. Yes, along with other direct transportation expenses.

The Court: Are you offering this exhibit in evidence?

Mr. Mason: Yes, Your Honor, we offer the exhibit in evidence as exhibit No. 151.

Mr. Strouss: I object to it as irrelevant and immaterial.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 151.")

The Court: We will recess at this time until 2 P. M.

[fol. 1966] January 8, 1941, Two o'clock P. M.

Proceedings were resumed at this time as follows:

The Court: You may proceed. Will the witness who was on the stand resume the stand?

Mr. Strouss: I think they wanted me to take Mr. Mahoney.

Mr. Mason: If it is convenient to Mr. Strouss, he is ready to proceed with the cross-examination of Mr. Mahoney.

J. J. Mahoney, was recalled to the stand, and testified further as follows:

Cross-examination.

By Mr. Strouss:

Q. Mr. Mahoney, you were testifying concerning the consists of your passenger trains. Your published schedules for use of the public show the consists, do they not?

A. Yes, they are included in the passenger train folder and, in addition thereto, we have our consist, which is prepared in my office that shows the consists of trains, and they vary from time to time as certain lines are added to the [fol. 1967] passenger trains, or discontinued. There are time that do not conform with the folder. However, the circu that I issue from my office is up to date and corrected at all times.

Q. Do you have that with you?

A. I don't happen to have one of those with me.

Q. This is one of your folders for the use of the public, is it not?

(Mr. Strouss hands a folder to the witness.)

A. That is for the Coast Lines.

Q. For the Coast Lines, yes.

A. Yes, sir.

Q. That would show the trains eastbound as they leave the coast, the consists of the trains?

A. Yes, that would be about correct, now. That would be December 22, 1940.

Q. Will you take that and give the consists of the trains that are shown in your exhibit?

A. Number 2, the Scout, in the last block under "East," lounge car, Los Angeles to Chicago, three tourist sleepers, Los Angeles to Chicago, an additional tourist sleeper, Los Angeles to Chicago, on Sundays, Tuesdays, Thursdays and Saturdays; additional tourist sleeper, Los Angeles to Chicago, via the Carlsbad Cavern. That car cuts out at Clovis, [fol. 1968] New Mexico. An additional tourist sleeper, Oakland to Chicago, which is picked up by Train No. 2 at Barstow, California, on Mondays, Wednesdays and Fridays; an additional tourist sleeper, Los Angeles, to Kansas City, dining car, Los Angeles to Chicago, chair car Oakland to Kansas City, two cars, two chair cars; Los Angeles to Chicago, chair car for women and children only. I might add that that is the normal consist, and that if it requires additional chair cars or additional tourist sleepers, why, they are added.

Q. That is true of each of the trains?

A. Yes.

Q. The consists as shown here with respect to each of those trains?

A. The normal consists. I might say this, Mr. Strouss: In the summer time, or summer months, the normal consist of that train is four light weight chair cars in addition to the light weight chair car for women and children only.

Q. That is eastbound?

A. Yes. And that is also out of Chicago. I might say this, to make it clear to you, that the consists of the trains from Chicago and from Los Angeles correspond in practi- [fol. 1969] cally all trains, and we use six sets of equipment

in each assignment, that is, the train and its companion train.

Q. So that when these consists are given on the eastbound train, then the westbound train consists would correspond?

A. That is correct.

Q. Would that be true——

A. (Interrupting:) With this exception, that we may occasionally have one car more to take care of the traffic as it comes east, or have an extra car going west that may not come back in the companion train.

Q. Or it is possible that on westbound trains you would have some additional cars, Chicago to Denver, or to Colorado points?

A. Yes, and we may have additional cars clear through to California.

Q. I mean, you are more apt to have as a regular thing, and you do have, don't you, on the Californian, for example, sleepers from Chicago to Denver that are dropped off at La Junta?

A. That is correct.

Q. All-right. Now, if you will give the consists for the rest of them.

A. No. 4, California Limited: standard Pullman from Los Angeles to Denver, tourist sleeper, Los Angeles to [fol. 1970] Denver, chair car, Los Angeles to Denver,——

Mr. Mason: What page of the folder are you reading from, Mr. Mahoney?

A. Page 15.

Mr. Strouss: Page 9, isn't it?

The Witness: But that doesn't look to me like a complete consist of that train.

Q. Look at page 9.

A. Yes, I think this is it. May we strike that and start over.

The Court: It may be stricken.

A. Lounge car, Los Angeles to Denver, or lounge car to Chicago, Los Angeles to Chicago, sleeping car, Los Angeles to Chicago, sleeping car, Los Angeles to Chicago, sleeping car, Los Angeles to Denver, sleeping car; Oakland to Chicago, sleeping car, Los Angeles to Phoenix.

Mr. Strouss: Where does that cut out, at Cadiz?

A. Cadiz. Tourist sleeper, Los Angeles to Denver, Chair car, Los Angeles to Chicago, Chair car, Los Angeles to Denver, dining car, Los Angeles to Chicago. That is the consist of No. 4. No. 8 is the companion train to No. 7, our mail and express train. That train, the consist of that [fol. 1971] train, is governed exclusively by the number of cars of express and mail, as we handle only that rider, as we call it, which is a baggage compartment car, with seating capacity for sixteen people.

Q. The rest of the train is made up of baggage and mail?

A. Yes; so the consist of that train varies from day to day.

The Court: Is that your fast mail train?

A. Yes, Your Honor, that is the mail train east, companion train to No. 7, the mail train westbound. No. 20: Club lounge, Los Angeles to Chicago, Club baggage, Los Angeles to Chicago, four sleeping cars, Los Angeles to Chicago, sleeping car, Los Angeles to Kansas City, sleeping car, Phoenix to Chicago, which is picked up at Ashfork, and a dining car, Los Angeles to Chicago.

Mr. Strouss: I believe you passed 18, which is on the same page there.

A. Yes, No. 18, that is the Super-Chief: Club lounge, Los Angeles to Chicago, club baggage, Los Angeles to Chicago, four sleeping cars, Los Angeles to Chicago, and a dining car, Los Angeles to Chicago. The El Capitan is also a [fol. 1972] streamline, Diesel powered train

Q. I notice, Mr. Mahoney, that on what you just read was Tuesday equipment. I notice on Friday equipment you have one additional sleeper on the Super-Chief. Is that correct?

A. Yes, that is correct; yes, that is shown here on the same page. Is 22 in this thing?

Mr. Mason: Yes, 22 is on page 8.

Mr. Strouss: It is right across the page, the first one.

The Witness: (Continuing) Baggage dormitory, dormitory chair car, Los Angeles to Chicago, two chair cars, Los Angeles to Chicago, lounge counter dining car, Los Angeles to Chicago, chair car, Los Angeles to Chicago, chair observation car, Los Angeles to Chicago. I might say this, Mr. Strouss, that that is the normal consist, but Friday, Decem-

ber third, we ran that train with fourteen cars. They vary from day to day, and especially during seasons like the holiday season we run it as high as fourteen cars, and likewise out of Chicago, Sunday, the fifth of this month we had a fourteen-car train.

Q. Of course, that was true of all of your trains, that you add cars when traffic demands it?

[fol. 1973] A. That is true. Now, we need the Grand Canyon Limited.

Q. That is on page 10.

A. Lounge car, Los Angeles to Chicago, sleeping car, Los Angeles to Chicago, sleeping car, Los Angeles to Chicago, via the Grand Canyon, sleeping car, Oakland to New Orleans, which car is picked up at Barstow, another sleeping car.

Q. Where is that cut out?

A. Clovis, New Mexico.

Q. Another sleeping car, Los Angeles to Chicago. We have another sleeper that we pick up at Ash Fork that goes to Winslow, a tourist sleeper, Los Angeles to Kansas City, another tourist sleeper, Los Angeles to Chicago, via the Grand Canyon, a dining car, Los Angeles to Chicago, chair car, Los Angeles to Chicago. I might add, that this consist doesn't show it, but we do have a smoker chair car in that train, which we convert into a Jim Crow car by inserting partitions in Oklahoma and Texas, as we pass through; and in addition to these consists, with the exceptions of the Super Chief and the El Capitan, is your head-end baggage cars that we do not show in these consists, we may have one [fol. 1974] mail car or one baggage car that are not shown in the passenger folder.

Q. Will you state what is the usual consist so far as baggage or head-end cars is concerned?

A. Generally one car used as a buffer between the locomotive and the passenger-carrying cars. I would say that is generally. Sometimes we have maybe a working mail car and a storage car on some trains.

[fol. 1975] Mr. Strouss:

Q. Mr. Mahoney, yesterday you were asked concerning the type of traffic or principal commodities which are moved on the Santa Fe. Did you hear Mr. McDonald's testimony?

A. Yes.

Q. You heard him testify as to the annual reports and the different commodities that are moved as shown by the annual reports?

A. Yes.

Q. He read into the record the tons of different commodities like products of agriculture and the like?

A. It was the number of cars, wasn't it?

Q. It may have been the number of cars but anyhow that was put in by an exhibit or by reading into the record from Mr. McDonald's testimony?

A. Yes, sir.

Q. That does show the different types of traffic or the commodities that are moved on your road, does it not?

Mr. Mason: Just a moment, I call the court's attention to the fact that my question of this witness related to the predominant traffic carried on the main line and I think I addressed myself particularly to the main line across Arizona. If there is any attempt here to try to impeach Mr. McDonald [fol. 1976] by this witness or impeach this witness by referring to Mr. McDonald's showing, I respectfully submit that the cross examination is not proper, there isn't any consistency.

Mr. Stronss: I am merely trying to find out whether there is or is not.

The Court: Objection overruled, you may proceed.

Mr. Stroiss: Were you testifying to the same matter that Mr. McDonald testified to?

A. As I understood Mr. McDonald's answer to the question, he gave the total cars handled and then he broke that down as between perishable products and agricultural products.

Q. As I remember his testimony, he gave the total of the different types like products of mines and products of agriculture and then broke down the products of agriculture in an exhibit, that is correct, isn't it?

Mr. Booth: The exhibits were in the form of photographic copies of the reports of Schedule 544, reports to the Interstate Commerce Commission and the corresponding schedules and the reports to the New Mexico and Arizona commissions for the year 1939, but in the first case that was a system showing and in the other two cases those were all

[fol. 1977] cars moving within those states on the main line branch within those periods.

Mr. Mason: Pages 4856 and 1857 of yesterday's transcript show that Mr. Mahoney didn't undertake to give any figures but merely mentioned in answer to my question some of the principal commodities handled in eastbound movement within or across Arizona upon main lines and a general description of the commodities moving westbound on the main lines which cross the state of Arizona.

Mr. Strouss: I will ask you now if the matter testified to by Mr. McDonald showed the commodities which are moved both east and west over your lines?

A. Yes, that is correct, the commodities he mentioned move in both directions.

Mr. Strouss: I am a little bit foggy on this perishable schedule. I understood you to testify, take the California schedule, that begins from the point of concentration?

A. Yes. I want to say this, Mr. Strouss, that the basic schedule that is undertaken by all lines operating in the West is based upon departing from one of the five California concentration points, namely, Colton, San Bernardino in southern California, Bakersfield, Roseville, and Sacramento in northern California.

[fol. 1978] Q. What I am trying to reconcile is your testimony as I understood it, that the schedule begins at the point of concentration, say, Bakersfield?

A. All schedules are predicated upon a three A. M. departure from those five points.

Q. Let me finish my question and you will see what I am getting to. Then I understood you to testify that the 139-hour schedule applied to the whole of the state of California?

A. That is correct insofar as the Santa Fe railroad is concerned. That is correct with traffic originating on our own rails and I further stated that traffic originating on connecting line rails that reached our junction that would permit such traffic arriving at our concentration points prior to 7 P. M.

Q. That is before the the run-off time had expired?

A. Yes.

Q. We will take it a step at a time. I am probably a little dense on this and would like to be straightened out. You say this is applied for the whole state of California. Suppose, using Bakersfield as a concentration point and taking a

particular car which is out of some point, say, 25 or 30 miles from there, must that car be in Bakersfield before the run-[fol. 1979] off time has expired in order to come on that day's schedule?

A. That is correct.

Q. From an outlying point the car must be brought into Bakersfield in order to be brought into that day's schedule?

A. That is correct.

Q. You say cars loaded the previous day, the basic schedule would begin at 3 A. M. That would mean that the car would have to be loaded, loading completed at 12 o'clock midnight?

A. That is correct.

Q. Forgetting for a minute the pre-cooling and the run-off time, a car would have to be loaded and then brought into the concentration point before 3 A. M., loaded before 12 midnight, and brought into the concentration point before 3 A. M. in order to get into that day's schedule. I am disregarding any additional time of run-off time or because of pre-cooling.

A. No, Mr. Strouss. I think I can explain it this way. The basic schedule from California concentration points is predicated upon a 3 A. M. departure with a 12:30 A. M. arrival the seventh morning at Chicago with a total over-all of 139 hours and 30 minutes, also includes a 16-hour run-off.

[fol. 1980] Q. I understand that but I was trying to disregard that for the time being.

A. That is the basis on which we handle the traffic. There is no traffic originating in California that must be in a concentration point by 3 A. M. to move on that day's schedule.

Q. With the run-off period it would have to be in by 7 P. M.?

A. Following the date of loading, yes, sir.

Q. You said that pre-cooling under the agreement in California, I believe it allows them to 5 A. M.?

A. That is correct.

Q. And that they sometimes add to your run-off time, making it 20 to 21 hours. Why is that when your run-off time extends to 7 P. M.?

A. When we entered the agreement with the shippers in California at a meeting in Fresno, California, permitting them to pre-cool their shipments until 5 A. M. of the morning of the following day of loading, the California lines themselves agreed that if the traffic arrived at a concentra-

tion point by 7 P. M. that we would permit that traffic to be handled out on that day's schedule. Now with our traffic starting to be assembled at 5 A. M. at the most distant point [fol. 1981] from the concentration point it is a very tight schedule in the pickup service to get that all to the concentration points by 7 P. M. and then the traffic must be iced, made up into trains, and very, very often the trains do not depart the concentration point until midnight or after and that delay is all run-off before we get to Chicago.

Q. The delay is not due to an extension of the time, it is due to a congestion in the cars coming in at the end of the run-off period, making it impossible to get them out rapidly?

A. That is correct. I would say there is considerable bunching of trains into our concentration points which makes for delay in the getting of cars in, made up, re-iced, and out.

Q. This morning you were asked about the operation of your trains during a typical period and other times and you testified that they were operated under a books of rules issued by the company?

A. That is correct.

Q. There are really several books, aren't there, there is a book of signals, a book of duties of the crew, and a book on brakes?

A. Yes, but what I referred to, Mr. Strouss, was the [fol. 1982] operating book of rules which governs the transportation employees in the operation of the train. We do have, as you say, other books of instruction and rules regarding air brakes and signals.

Q. They govern the transportation employees in the operation of the trains do they not?

A. As well.

Q. And the rules that are contained in your trainmen's timetables, special instructions?

A. Special instructions and rules contained in the working timetables.

Q. During the operation of this typical period were those rules in effect?

A. Covered by my exhibit?

Q. Yes.

A. Yes.

Q. Were there any unusual rules, any peculiar rules that were used during that period that were not used in the ordinary operation of your trains?

A. No, sir.

Q. Are you familiar with these different rules?

A. Well, I might say that I am a little hazy on the book of rules, I haven't been in contact with it since I was train master.

Q. Your air brake instructions are in what is known as [fol. 1983] the "Green Book"?

A. That is correct.

Q. Is this a copy of it (handing book to witness)?

A. Yes, that is a copy of it.

Q. Will you read into the record the part between the pencil marks there, please?

Mr. Mason: Let me see it, please. I object to the question as not proper cross examination, the witness hasn't testified to anything in connection with the air brake book. I asked him only as to the transportation book of rules.

Mr. Strouss: They have a showing as I understand it of similar operations to the Southern Pacific and we have a right to show what the nature of the operations are.

Mr. Mason: Make the witness your own witness when your own case is on, Mr. Strouss. It is not proper cross-examination.

Mr. Strouss: He has testified as to operations here, typical operations and we have a right to go into what those operations are. He says they are governed by rules and these are some of the rules.

The Court: My recollection is, Mr. Mason, that you asked this witness with reference to certain operating instruc- [fol. 1984] tion books which were given to their employees for their guidance under which they operate. You are speaking, Mr. Strouss——

Mr. Strouss (Interrupting): To put in evidence what those regulations are.

Mr. Mason: I asked him about the transportation book of rules, which as Mr. Strouss in his examination disclosed is quite distinct from the air brakes book.

Mr. Strouss: The question was whether they didn't operate under rules of operation.

Mr. Mason: It was in this morning's record.

Mr. Strouss: The question this morning didn't designate any book.

The Court: I will overrule the objection. You may answer. Will you make it clear what book you are reading from and the page.

Mr. Mason: May we have him specify the date of publication?

The Court: Yes.

The Witness: I am reading from form 2501, Standard Santa Fe Instructions for Operating and Maintaining Air Brake Apparatus.

Mr. Mason: I think the date of publication is shown on the title page.

The Witness: Revised 1926 by the A. T. & S. F. Ry. On page 12 under item "Brakes sticking."

[fol. 1985] Mr. Mason: Just a minute, would it be all right to copy it in?

Mr. Strouss: Yes, but I want the court to hear it, I would rather have it read.

The Court: Go ahead and read it.

A. (Reading:) "As a general rule the cause for brakes sticking is due to the failure to raise the brake pipe pressure quickly above the auxiliary reservoir pressure which must be done in order to move the triple valve parts to release position. It is more difficult to release the brakes on a long than on a short train and there is a difference between triple valves that stick and fail to release and those that release with the others and reapply, or those that creep on when the brakes are not being used. The first mentioned may be due to failure to raise the brake pipe pressure promptly or an individual triple valve having a bad packing ring. The second mentioned (which is most likely to occur on the head end) can be due to a slight overcharge while the third mentioned (the creeper) can only be caused by an erratic working feed valve, a closed angle cock or the engineman moving the brake valves to release and back to running position after train is charged and with a little study of the operation of the equipment [fol. 1986] if the experience of everyday practice is made use of much of the trouble can be anticipated and prevented."

Mr. Booth: We ask that the whole book be in evidence and we will undertake to furnish a copy of it and identify the copy to counsel.

Mr. Strouss: That is agreeable to me.

Mr. Booth: We will offer the whole book.

The Court: It may be admitted in evidence if there is no objection.

Mr. Strouss: You will provide me with a copy of the book?

The Witness: I will undertake that. How many copies?

Mr. Booth: Three copies.

Mr. Strouss: I would prefer to have one of these copies that are being brought in put in evidence. This is borrowed.

Mr. Booth: Yes, I understood that.

Mr. Strouss: This is one of the employee's books for which he is answerable.

Mr. Booth: That is why I suggested getting the copies.

The Court: You will furnish those, Mr. Mahoney?

A. I will mail those to Judge Booth.

[fol. 1987] (The document referred to was received in evidence and marked "Defendant's Exhibit No. 152.")

Mr. Strouss: I am not offering this in evidence, I just want to first offer the parts I am interested in. They may offer the whole book when it comes their turn on rebuttal.

Mr. Booth: I think it is a general rule of evidence when a publication is shown to a witness and he is asked to read an excerpt from it where, as it is claimed here, there are other rules that explain and may be construed as modifying these rules, that we are entitled to have the whole publication go into evidence.

Mr. Strouss: They are, if they want to offer the rest of it.

Mr. Booth: We do want to offer the rest of it.

Mr. Mason: I understand the record now shows it has been offered and no objection made and received and is now exhibit No. 152.

Mr. Strouss: It is not their turn to fish in the pond, I am doing it now.

(Discussion off the record.)

[fol. 1988] The Court: You may proceed.

Mr. Strouss: May these be marked for identification as one exhibit?

The Court: They may be marked.

The Clerk: Plaintiff's Exhibit No. 153, for identification.

Mr. Mason: May we have identified in the record what 153 consists of?

The Court: Yes, you may state, Mr. Strouss.

Mr. Strouss: I will. I think I will let Mr. Mahoney state. He can probably state better than I can. Will you state what these are, Mr. Mahoney?

A. These are the employees' working timetables for the New Mexico Division of the Western Lines, Northern District, Albuquerque Division, Arizona Division, Los Angeles Division of the Coast Lines.

Mr. Mason: What are the effective dates of the several timetables?

A. All effective October 27, 1940, 12:01 A. M.

Mr. Strouss: And they are the timetables now in effect?

A. In effect at the present time.

Mr. Strouss: We offer those in evidence.

Mr. Mason: No objection.

[fol. 1989] The Court: They may be admitted.

The Witness: Do you need additional copies to those?

Mr. Strouss: You better have several additional copies of those.

The Court: This probably is the plaintiff's first exhibit.

Mr. Strouss: Yes.

The Court: Mr. Clerk, you may mark this particular exhibit "Plaintiff's Exhibit 153, in evidence."

Mr. Strouss: It is for identification first, and then in evidence. No further questions.

Redirect examination.

By Mr. Mason:

Q. Mr. Mahoney, you were asked to read in from the Coast Lines timetable issued for the information of the public, the consists of certain trains which are shown or referred to on Exhibit No. 139. Now, I will ask you if the timetable from which you read isn't the one effective on and after December 22, 1940?

A. Yes.

Q. And that is subsequent to both of the periods referred to on Exhibit 139?

[fol. 1990] A. Yes. I might say that this is our winter season folder, and we issue folders as summer folders and winter folders.

Q. Now, I will ask you this, also, whether the consists, as advertised to the public in the folders, do or do not indicate the minimum number of passenger-carrying cars of various classes which those trains will normally carry?

A. Yes, that is the minimum schedule, or the normal consist.

Q. And in addition to whatever passenger-carrying or passenger accommodating cars may be shown in the schedules, or the consists, rather, as advertised to the public, there may be head end cars such as baggage and mail cars, I think you mentioned.

A. Yes, there is. We use a buffer in all of our trains.

Q. Is there sometimes more than one such car?

A. Yes, generally there is a mail and storage mail, or mail and a baggage.

Q. Now, in reference to the movement of pre-cooled traffic, do you have traffic originating in California in the neighborhood of points such as Modesto and Lodi?

A. Yes.

[fol. 1991] Q. That concentrates at Bakersfield, does it?

A. Yes.

Q. Does any pre-cooled traffic originate in that neighborhood?

A. Yes, there is.

Q. If I understand your explanation correctly, it is that this pre-cooled traffic may be held at the point of pre-cooling until five A. M. following the day of loading; is that correct?

A. That is correct.

Q. And if it is pre-cooled, for example, at Lodi, it may then move after five A. M. to Bakersfield?

A. That is correct.

Q. And will still be given the schedule from Bakersfield timed theoretically to start at three A. M. of that same day?

A. That is correct.

Q. Now, about how far is Lodi from Bakersfield for traffic moving over the Santa Fe from Stockton?

A. I would say approximately three hundred miles.

Q. Mr. Mahoney, is any of the extension, or increase of the run-off time, by reason of the latitude allowed to [fol. 1992] these pre-cooled shipments due to the fact that

the shipments need not be released until five A. M. of the day following the date of loading?

Q. I don't think I understood.

Q. You said that the run-off time in case of pre-cooled shipments, or because of the pre-cooled shipments, sometimes was increased from sixteen to twenty or twenty-one hours?

A. That is correct.

Q. I will ask you if any of that increase is due to the latitude allowed to shippers of pre-cooled traffic in being permitted to hold their shipments until five A. M. of the day following the date of loading?

A. Yes, and I might add further that all of the delay beyond the 16-hour run-off is absorbed by the California Lines themselves in running off the delay.

Mr. Mason: That is all, Mr. Mahoney.

Recross-examination.

By Mr. Strouss:

Q. Could you furnish the consists of your trains during the summer months, for the past summer months, of these trains?

A. Yes, I can, both ways, if you desire.

[fol. 1993] Q. Will you do that?

A. Yes, I will be glad to.

Mr Mason: We can introduce that as an exhibit with the appropriate number at the time.

The Witness: Of these same trains that are shown in this exhibit?

Mr. Strouss: Yes.

The Witness: I will do that.

The Court: Is there any further examination of this witness?

Mr. Strouss: No further examination.

The Court: Then, may Mr. Mahoney with his records be excused?

Mr. Strouss: Yes.

The Court: It is so ordered.

(Witness excused.)

Mr. Mason: Mr. Dyer, will you take the stand, please?

JOSEPH HENRY DYER was called as a witness on behalf of the defendant and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Mason:

Q. Mr. Dyer, will you state your name to the reporter, [fol. 1994] please?

A. Joseph Henry Dyer.

Q. Where do you reside, Mr. Dyer?

A. San Francisco.

Q. What is your present position with the Southern Pacific Company?

A. Vice-President, in charge of maintenance and operations.

Q. When did you first join forces with the Southern Pacific, Mr. Dyer?

A. In March, 1888.

Q. Have you served the Southern Pacific continuously since that time?

A. Continuously since 1888.

Q. Will you just state the positions you have occupied, not necessarily the times, but the positions themselves, to show your experience in service.

A. I was track laborer and a track foreman from March, 1888, to the fall of 1889; I was freight brakeman from 1889 to 1895; freight conductor from 1895 to 1902; general yardmaster, Sacramento, Roseville and other points on the Sacramento division, from 1902 to 1904; from 1904 to 1908 I was trainmaster on the Sacramento division; 1908 to [fol. 1995] 1911 I was superintendent of the Shasta division extending from Red Bluff, California to Ashland, Oregon; from 1911 to 1914 I was superintendent of the Tucson division, located here in Tucson, Arizona. The division at that time extended from Yuma, Arizona, to El Paso, Texas. From 1914 to 1916 I was superintendent on the Sacramento division, which division extends over the Sierra Nevada Mountains, from Sacramento to Sparks, Nevada, and Sacramento to Dunsmuir, California; from 1916 to 1918, I was assistant manager of what is known as the Northern District. Those lines extended from San Francisco, California, to Ogden, Utah, and Portland, Oregon.

From 1918 to 1929 I was general manager of the entire system, Pacific System, extending from El Paso, Texas, to Portland, Oregon, and Ogden, Utah. 1929 to date, I have been vice-president in charge of operations.

Q. Now, as vice-president in charge of operations, what is the scope of your duties, and your responsibility, Mr. Dyer?

A. Responsible for all operations and maintenance.

Q. And do the general officers, respectively charged in [fol. 1996] dividually with the maintenance, engineering and operations report to you as the head of the department?

A. They do. The chief engineer for maintenance of the property, and the general superintendent of motive power for the maintenance of equipment, and the general manager for the transportation.

Q. You have testified, Mr. Dyer, that you were superintendent of the Tucson division at Tucson in 1911 and until 1914?

A. That is correct.

Q. Did the Tucson division at that time include all of the Southern Pacific lines in the State of Arizona?

A. As they exist now?

Q. No, as they existed at that time?

A. Yes, all the lines between Yuma, Arizona, and El Paso, Texas, including the Nogales branch.

Q. There was no Rio Grande division at that time as at present, including part of the line in Arizona?

A. No.

Q. And your jurisdiction then covered all of the Southern Pacific lines in Arizona?

A. That is correct.

Q. Now, without undertaking to go into detail precisely, [fol. 1997] will you say from your experience of that time what was the general weight of the rail in the main line as of that day?

Mr. Strouss: Objected to as immaterial.

The Court. Objection overruled.

A. The weight of the rails was 75, 80 and some 90-pound rail, but very little.

Mr. Mason: That is on your division in 1912?

A. That was on the Tucson division in 1912.

Q. Now, in 1912, Mr. Dyer, and referring yourself to the map which is on the easel and which has previously

been introduced and received in evidence as Exhibit No. 1, will you state whether the line from Wellton via Phoenix to Picacho, existed at that time as part of the Tucson division?

A. It did not.

Q. Did the line from Tucson, formerly a part of the El Paso and Southwestern, to Mescal and thence via Douglas to El Paso, exist in 1912 as a part of the Tucson division?

A. Not as part of the Tucson division; that was owned by the El Paso and Southwestern. In 1912 they started the construction of the line from Douglas to Tucson.

Q. Now, did the branch which now extends from Tucson [fol. 1998] direct to Nogales, did that exist, or was that under construction at that time?

A. That was under construction in 1912.

Q. Now, returning again to the situation on your division in 1912, generally speaking, what was the prevalent length of the sidings, the passing sidings?

A. Well, they varied, they would hold from about 45 to 65 or 70 cars, they varied in length.

Q. What types of freight and passenger locomotives did you use in the Tucson division in 1912; and I will ask you in this connection to refer to the diagrams which are in evidence as Defendant's exhibit Numbers 5 and 6, No. 6 is the passenger power, and No. 5 the freight power of the Southern Pacific.

A. The freight power was a consolidation engine.

Q. Did you use the Mogul type?

A. Some Moguls were used in freight service, the consolidation engine was the largest engine we had on the division.

Q. In passenger service, did you use the ten and twelve-wheeler, or the Mogul?

A. We used what was known as the Atlantic type between Yuma and Tucson, and the Mogul type engine between [fol. 1999] Tucson and Lordsburg, and the Atlantic type between Lordsburg and El Paso.

Q. Do you recall the wheel arrangement of the Atlantic type? I see it is not shown on either of those exhibits.

A. Yes, it was two large drivers and the engine truck.

Q. On each side?

A. Yes.

Q. Does that correspond to the 4-4-2 under the Whyte arrangement?

A. Yes.

Q. I will ask you to refer to the Southern Pacific Company's classification and assignment of locomotives——

(Addressing Mr. Strouss:) Are you familiar with the book, Mr. Strouss, as showing some of the Atlantic type locomotives now in service?

Q. (Continuing) My question, Mr. Dyer, had to do with the Atlantic type shown on page 42. I will ask you by referring to the locomotive book, what the tractive effort of a typical A-3 Atlantic type locomotive type is, as shown by that book?

A. They varied from about 23,000 tractive power to 27,000.

[fol. 2000] The Court: Was that passenger or freight?

A. Passenger, known as the Atlantic type locomotive.

Mr. Mason: Were those A-3 locomotives the type that you had in passenger service on the Tucson division in 1912?

A. Yes, between Yuma and Tucson, and Lordsburg and El Paso.

Q. Now in 1912, Mr. Dyer, were the freight cars all steel or steel underframe cars, or were you still operating some proportion of all wood cars?

A. I would say probably forty per cent of the equipment in 1912 was of wood construction.

Q. What about the passenger cars as of that date?

A. They were wood construction with steel underframe.

Q. Did you operate standard Pullmans at that time?

A. Yes.

Q. Were they steel or wooden cars?

A. Wooden superstructure and steel underframe.

Q. Generally speaking, what was about the average length of the main line freight trains that you operated on the Tucson division in 1912?

[fol. 2001] Mr. Strouss: Object to that as immaterial.

The Court: Objection overruled.

A. In cars?

Mr. Mason: In cars.

A. The average length was about 45 to 47 cars.

Q. And what was the average length of the passenger trains operated in main line service as of that time?

A. About nine to ten cars.

Q. You recall, of course, the enactment of the Arizona Train-Limit Law in 1912, do you, Mr. Dy[illegible]?

A. Yes, sir, very well.

Q. Will you say whether or not the limitations of the law, the 70 and 14 car limitations, respectively, had any effect, or substantial effect, upon your operations in 1912 on the Tucson division?

Mr. Strouss: I object to that as immaterial and as calling for the conclusion of the witness, on a matter that is capable of proof.

The Court: I think it is material, but is is calling for a conclusion.

Mr. Mason: Well, Your Honor, I think that the witness is eminently qualified to say whether a statutory limita- [fol. 2002] tion of seventy cars had any substantial effect upon the length of the trains which he was then operating as superintendent of the division, and which division included all of the Southern Pacific Lines in Arizona.

Mr. Strouss: I think the Court is eminently qualified to arrive at whatever conclusion is necessary from the facts as they are shown.

The Court: No, I will overrule the objection. He may answer.

Mr. Mason: I will rephrase the question if that will perhaps meet the objection.

Q. Did the enactment of the Arizona law, and particularly of the 70-car limitation, cause or compel you to reduce any substantial number of the freight trains you were then operating?

A. It had very little or no effect on our operations when the law was passed.

Mr. Strouss: That doesn't answer the question. I move that the answer be stricken.

The Court: That is true. It may be stricken.

Mr. Mason: Well, then, I will ask that my previous question be read, the one prior to the question just answered.

(Thereupon, the following question was read by the reporter: "Will you say whether or not the limitations of

[fol. 2003] the law, the 70 and 14 car limitations, respectively, had any effect, or substantial effect, upon your operations in 1912 on the Tucson division?")

Mr. Mason: I would like to re-submit that question and ask it of you again, Mr. Dyer. Mr. Strouss: We renew our objection.

The Court: Objection overruled. You may answer.

A. It did not. I might qualify that by stating that if it did, it was in a very small measure. Occasionally we would operate a train of probably 71 or 72, as high as 74 empty cars westbound, but that was very, very seldom.

[fol. 2004] Mr. Mason: Mr. Dyer, from your standpoint as general manager or as vice-president in charge of operations, about what year did you begin to experience any effect of the Arizona law upon Southern Pacific operations in Arizona?

Mr. Strouss: That is objected to as calling for a conclusion of the witness.

The Court: Objection overruled, you may answer.

A. In 1925 we began to feel the effect of this train limit in Arizona.

Mr. Mason: What was the circumstance that led to that?

A. Due to the purchase of a large number of heavy locomotives in the years of 1918, 1919, and 1920 and up to and including 1925.

Q. Were those locomotives of larger hauling capacity than you had previously operated?

A. Very much larger, and due to the volume of business being handled, seasonal operations; it was necessary in order to get the use of that power to transfer it from one district to another. I might explain, if I am permitted, that in the spring of the year, due to the cantaloupe and lettuce movements, the business is heavier through Arizona to the East and in the same period there is light business on the [fol. 2005] Ogden route and as the result of that our business is transferred from the Ogden route to the southern route and when this rush is over, in the fall, during the heavy deciduous fruit movements the engines are transferred to the northern divisions.

Q. When you speak of these heavy locomotives, what particular types of power acquired in the years 1918 to 1920 do you have in mind?

A. What are known as 2-10-2's.

Q. Did you acquire any 4-8-2 locomotives in that period?

A. Mikados?

Q. No, the Mountain type.

A. Yes, that is a passenger engine.

Q. Is it used at times on freight?

A. Yes, used at times on freight. Three classes of the 2-10-2, 3,600 up to 3,785 all heavy 2-10-2's. In 1925 we purchased 50 what are known as a three-cylinder engine, five thousand series, which is still a heavier engine, and in 1928 we made purchase of what is known as the Mallet Consolidation, still a larger engine, heavier locomotive.

Q. Mr. Dyer, as assistant general manager in 1916 did your jurisdiction extend to and include the lines in Nevada [fol. 2006] and Utah?

A. It did.

Q. Your jurisdiction as general manager and vice-president included those lines?

A. Yes.

Q. Is there any difference between the code of operating rules of the Southern Pacific applicable in Arizona and in Nevada and Utah, respectively?

A. No, the same rules apply.

Q. Is there any difference in the standards of maintenance of the properties in the two states?

A. No difference whatever.

Q. Is there any difference in the character of the rolling equipment used in the two states?

A. No; the rolling equipment is used all over the system.

Q. Do you use the same engines sometimes in Nevada and at other times in Arizona or on the southern route?

A. That is correct.

Q. Do you transfer officials of the company, operating officials of the company such as train masters, superintendents, and assistant superintendents, or promote them from the Nevada division to the Arizona division and vice versa.

A. All over the system we rotate those men, both our [fol. 2007] superintendents and train masters are promoted. For instance, a man may be assistant superintendent or train master today on the Salt Lake division and may be

transferred here and the next promotion to assistant superintendent in the Tucson division or vice versa. We aim to give our men in making promotions experience on all the properties under my jurisdiction.

Q. In your own experience, you came from the Shasta division to the Tucson division?

A. As superintendent.

Q. And returned to the Salt Lake division?

A. Yes.

Q. Have there been instances of men who were division officers on the Tucson division being made division officers on the Salt Lake division?

A. No, but there are assistant superintendents who were on the Tucson division who were made superintendents of the Salt Lake division.

Q. Is there a transfer of the engineering personnel of the division?

A. It follows the same course, division engineers and master mechanics, not so much in the mechanical department as it is in the roadway department.

Q. Are you familiar in a general way with the character [fol. 2008] of the traffic handled on the main lines across Nevada and Arizona?

A. Yes, sir, in a general way.

Q. Is there any substantial movement of perishable traffic over either or both of these lines?

A. Very substantial movement of perishable traffic on both lines.

Q. Is that traffic handled on the refrigerator cars?

A. Yes, sir.

Q. What direction does that traffic move in a predominant volume?

A. Eastbound, and the empties are returned light or empty westbound.

Q. Is the empty movement of refrigerators of the same character on both lines?

A. Yes.

Q. Is the return of the empty refrigerator cars a matter of any importance during the producing or heavy shipping seasons?

A. Just as important as moving a carload of perishable freight. We have to get those refrigerators back to the originating point for the load.

Q. What is the predominant character of the westbound movement over these two lines and does it differ substan-
[fol. 2009] tially in Arizona as compared to Nevada?

A. The westbound movement is about the same on both lines. It is what they call "manifest" freight movement to the coast, mostly Los Angeles, moves by the southern gateway to southern California and to northern California it moves by the Ogden gateway.

Q. From the operating standpoint, are you familiar with the operating obstacles and problems to be overcome on both routes?

A. I don't quite get your question, Mr. Mason.

Q. The grades and curvatures?

A. Oh, yes.

Q. And such problems as may be afforded by weather and similar conditions?

A. Yes.

Q. Is there any substantial climatic difference which has an effect upon railroad operations as between Arizona and Nevada?

A. Very much so.

Q. What is that difference?

A. The heavy snows over the Pequop Mountains in Nevada in extreme cold weather in the winter months ranging as low as twenty and thirty and I have seen it as low as forty-five degrees below zero at Wells, Nevada.

[fol. 2010] Q. Is any such weather as that encountered in Arizona?

A. No.

Q. Apart from the severe winter weather is there any substantial climatic difference which would affect railroad operations as between the two states?

A. No, outside of the climatic conditions.

Q. Outside of the cold weather?

A. Outside of the cold weather they compare very favorably towards each other.

Q. What as to the grades and curvatures?

Mr. Strouss: I object to that as calling for a conclusion and a matter which is a matter of record of the company.

Mr. Booth: This is merely preliminary, Your Honor, we will produce those in great detail.

Mr. Strouss: Even if it is preliminary, a conclusion is not permissible.

The Court: I will sustain the objection to this question.

Mr. Mason: From your standpoint as an operating man of long experience, is there any difference between the possibilities of long train operation in Nevada and in Arizona except as to the restriction contained in the Arizona Train Limit Law?

Mr. Strouss: I object to that as calling for a conclusion. [fol. 2011] The proof of what the conditions are will be determined from facts. Certainly the court is not going to have the witness decide whether the trains can be run as easily in one place as in another. There are conditions and facts which should be shown that haven't been shown yet.

Mr. Mason: Do I understand that the objection is on the ground it calls for a an opinion of the witness?

Mr. Strouss: It calls for a conclusion as to matters which are capable of proof by fact.

Mr. Mason: The witness is very well qualified to state the answer to the question from his standpoint as an operating man of long experience. I don't know where we could find a more highly qualified man, a man who can view this matter from the standpoint of the Southern Pacific and as one who has undertaken and solved those very problems which I am asking him.

Mr. Strouss: That is not the only criterion as to whether opinion evidence is admissible. A man may be one of the outstanding men in his profession or calling and yet if the situation is one which is capable of proof by facts there is no necessity for opinion evidence. There isn't any showing [fol. 2012] here that this is something which cannot be shown by the facts themselves. As a matter of fact is is quite apparent that the facts with respect to the conditions of operations can be shown.

Mr. Mason: I think the objection is addressing itself to a previous question or to a question that Mr. Strouss hopes and fears that I will ask and not to the question which I did ask. I would like to have the question I did ask read to the court so he may understand what I am asking for.

The Court: Read the question.

(The last question was read by the reporter.)

(Discussion off the record.)

[fol. 2013] Mr. Strouss: The matter of whether the testimony is admissible or not is not dependent solely on whether the witness is qualified. There is the question of the necessity of opinion evidence. There hasn't been any showing that there is any necessity for opinion evidence. They are jumping clear over the stream by asking a question without showing any facts or without any opportunity to go into the facts. They are asking whether there are any conditions other than the Train Limit Law which would affect the operation of trains in Arizona the same as in Nevada.

Mr. Mason: That is not the question I asked.

The Court: Read the question again.

(The question was read by the Reporter as follows: "From your standpoint as an operating man of long experience is there any difference between the possibilities of long train operation in Nevada and in Arizona except as to the restriction contained in the Arizona Train Limit Law").

Mr. Strouss: That is just one way of saying "are the operating conditions any different in one state than in the other". This is a matter which is capable of proof and then from the facts which are proved that opinion which is here [fol. 2014] asked is to be determined. Without the Court even having heard what the evidence may be, without anything to indicate it, we don't think that is proper, certainly without a further showing that the problem is one which a layman couldn't determine for himself. The rule is laid down in Corpus Juris at 22 Corpus Juris, 498, (reading) "The danger involved in receiving the opinion of a witness is that the jury may substitute such opinion for their own, and the courts will not require parties to encounter this danger unless some necessity therefor appears. Accordingly, where all the relevant facts can be introduced in evidence, and the jury are competent to draw a reasonable inference therefrom, opinion evidence will not be received". It is no different in a case which is tried to the court than to a jury.

The Court: Your point is there is no evidence yet as to operating conditions in Nevada, that they are jumping over the operating conditions and asking for a comparison between the operations in the two states without having shown as preliminary the conditions in Nevada.

Mr. Strouss: Showing the similarity of conditions and drawing a conclusion as to any facts without stating what

[fol. 2015] the conditions are. (Reading) "When the facts are such as can be detailed and described and the jury is able to understand them and draw a conclusion without opinion evidence, the *the* necessity for opinion evidence does not exist." That is 35 Pacific 663. That is the rule universally followed by the courts and it is on that rule that I am making my objection.

Mr. Mason: Your Honor, this is not a jury case and the rule certainly has a greater latitude in a case which is tried to the Court. The rule as stated by your Honor is the rule which is applicable here, and again, this does not ask primarily for the opinion of the witness upon what your Honor stated was one of the vital elements in the case but rather it asks him if there is any difference from his standpoint as an operating man. When the question is clearly understood it seems to me that all of this reference to opinions before juries falls entirely wide of the point and what your Honor has stated in the rule from Jones is the applicable rule here.

Mr. Strouss: There hasn't been anything here to show that the Court cannot arrive at these facts if they are shown to the Court. This is just an attempt to avoid showing the [fol. 2016] facts.

Mr. Mason: I don't think there is going to be any attempt at avoidance of showing the facts. Your Honor, we expect you will be an expert on railroad operations before this case is closed, but at this stage of the case I think nine of us have arrived at that point except perhaps Mr. Dyer.

The Court: Well, in this instance you are asking for a comparison where in one instance you have no factual basis on which to predicate it. There has been considerable testimony from other witnesses as to conditions in the State of Arizona of the ruling grade and general operating conditions and up to date you might say there hasn't been a word of testimony as to conditions in the State of Nevada, yet you are in effect seeking by this question to draw a comparison between the two operations. I have no question in my mind but what this witness is qualified to give such an opinion but whether he is entitled under the rules of evidence to give that opinion without the factual situation being developed is a question in the Court's mind and on second thought I am going to sustain the objection.

Mr. Mason:

Q. Mr. Dyer, do you operate trains in excess of 70 cars in Nevada?

[fol. 2017] Mr. Strouss: Objection to that as immaterial.

The Court: Objection overruled; he may answer.

A. We operate trains in excess of 70 cars, not only in Nevada, but California as well and Oregon.

Mr. Strouss: I move to strike the last part.

The Court: I didn't catch the last part of the answer. You were asked as to a certain state and you volunteered as to other states. The last part may be stricken.

The Witness: I will try to confine myself to the question.

Mr. Mason: Have you followed the practice of operating trains in excess of 70 cars in Nevada for several years?

A. A great, great many years.

Q. If you were relieved of the restriction of the Arizona law in one way or another would you undertake the operation of trains in excess of 70 cars or 14 cars as the case may be in Arizona?

Mr. Strouss: That is objected to as irrelevant and immaterial and calling for a conclusion.

Mr. Booth: I would like to be heard on that a moment.

The Court: Read the question please, Mr. Reporter.

(Question read by the Reporter).

[fol. 2018] Mr. Booth: The answer in this case contains a number of averments of our belief that the law is unconstitutional. We say that it impairs the free use of our facilities; we say that it is a burden on interstate commerce; we say it is an interference with interstate commerce and rely on the due process clause as taking our property without compensation. Now it matters not if all those allegations be true if the party making those charges is neither in a position nor has the desire to operate his property free from the restrictions of the law or to utilize his property in the manner forbidden by the law. In other words, if the defendant in this case were to come into court at the conclusion of the case and state to your Honor, even if this law should be repealed or if Congress should enact a national train limit law which would have the effect of superseding it, or if this law should be declared to be unconstitutional by the

final decree of a court of competent jurisdiction, we nevertheless would not operate trains in excess of 70 cars in Arizona, why the case would fail at once.

The Court: To shorten this up I think we better hear from Mr. Strouss on this.

Mr. Strouss: My position is simply this, what the answer [fol. 2019] alleges, as I have argued before, doesn't make the evidence admissible, but aside from that, if this law is in violation of the commerce clause that is a matter of proof by evidence and whether or not it is constitutional cannot depend in any way on what their operations would be if the law were not in effect. That is immaterial so far as the case before this Court is concerned. There is another phase of this of course. Mr. Dyer doesn't know what conditions will be, but regardless of the question of the law itself I think he will admit that the availability of traffic for one thing would affect the movement of trains and the train lengths, and whether they are going to operate trains if this law is in effect or not in effect depends to some extent upon the traffic and other factors.

The Court: The Court doesn't care to hear from you further, Mr. Booth. I will overrule the objection, he may answer. Read the question to the witness.

(Last question of Mr. Mason read by the Reporter).

A. We would, and at once.

[fol. 2020] The Court: In order that the Court's position may be clear, may I say, Mr. Strouss, that I quite agree with you that his answer to that question does not in any way affect the constitutionality of the law, but it does show what the defendant's attitude and intentions would be if they were successful in this litigation, and it is for that reason that I am admitting it.

Mr. Mason: Your Honor, if we have no intention of operating trains in excess of the limits of the law and would not do so, of course, we could hardly complain that the law is a burden on interstate commerce. It seems extraordinary that the State should come in here and prosecute us for a violation, an asserted violation of the law, and endeavor to maintain the law in effect, and yet not be interested at all in determining whether we intend to operate such trains in the future.

The Court: You may proceed.

Mr. Mason: To what extent would you undertake the operation of freight trains longer than seventy cars?

Mr. Strouss: Objected to as a conclusion as to what extent.

[fol. 2021] The Court: Yes, there are so many factors entering into that, Mr. Mason. Sustain the objection to the question as framed.

Mr. Mason: Would there be any reason because of present siding capacities which would limit the extent of the operation of freight trains of longer than seventy cars, Mr. Dyer?

A. There would not. That is, I say there would not; that would be in one direction.

Q. Would you undertake the operation of long trains; by that I mean trains longer than seventy cars in one or the other directions, but not in both?

A. Absolutely.

Mr. Strouss: May I have the record show my objection goes to this without repeating it?

The Court: Yes, the record may so show, and the objection is overruled.

Mr. Mason: Would you operate passenger trains of more than 14 passenger cars, as traffic might indicate?

A. We certainly would.

Q. Would you make any change in power assignments to the lines in Arizona?

A. We would; as we purchase heavier power it would naturally be transferred to the Arizona district.

[fol. 2022] Q. Would you undertake any program of siding or passing track extension?

A. We would in order that longer trains could be handled both directions.

Q. Would there be any changes in shops or roundhouse facilities in this territory?

A. Very little change, with the exception of the 126-foot turntable in Tucson and one in Yuma, and probably some slight alterations in our roundhouses to take care of the heavier power.

Q. You would make whatever changes were necessary to take care of the heavier power?

A. Absolutely.

Q. Mr. Dyer, are there in effect, to your knowledge, on the Southern Pacific any restrictions on the tonnage which

may be handled in trains by reason of contracts with the train-service brotherhoods?

A. There are no restrictions with the exception of Arizona as to the number of cars we handle in a train. There are no restrictions if the second engine is used in helper districts. I want to make this clear: We have what is known as helper districts, we can put one, two, three or half a dozen engines in a train, and help it up those heavy grades such as we have in the Sierra Nevada Mountains, the Cascade Moun- [fol. 2023] tains, and so forth. There is no penalty.

Mr. Strouss: Are you speaking of Arizona now?

A. Arizona is included. We have helper districts in Arizona.

Mr. Strouss: I understood the question to be "agreements as affecting Arizona."

Mr. Mason: I said the System.

Mr. Strouss: I didn't so understand it.

The Witness: I understood him to say on the System.

Mr. Mason: I did say System.

The Witness: Will you read my answer?

(The answer so far given by the witness was read by the reporter.)

The Court: Now, go ahead, Mr. Dyer, and finish your answer.

A. There is no penalty. However, if a second engine is used in a district where a helper engine is not permitted to be used on account of the number of cars in the train, then it would be necessary to pay double miles to the train crew. In other words, if the rating——

Mr. Strouss: Pardon me a minute. Is this a matter of agreement?

Mr. Mason: I referred to contractual agreements with the [fol. 2024] train service brotherhoods.

Mr. Strouss: I think we should have the agreements produced.

Mr. Mason: I have the agreements here.

The Witness (Continuing) In other words, if the rating of the heaviest engine operating in a non-helper district is exceeded and you use a second engine you must pay the crew double miles.

Mr. Mason: The brakeman and the conductor.

A. The brakeman and the conductor, but not the engineer or fireman. That is the reason the railroad as a whole is looking forward to the purchase of heavier power.

Q. Mr. Dyer, is there any main line territory on the System other than in Arizona where a restriction of freight train length to seventy cars is observed? I refer only to main lines.

A. There is none.

Q. Is there any statute in any of the states in which the Pacific Lines operate other than the State of Arizona, which limits the number of cars in a freight or passenger train, that is, that is now in effect?

A. None whatever.

Mr. Mason: That is all.

[fol. 2025] The Court: The court will be at recess until ten o'clock tomorrow morning.

(Thereupon, the court stood at recess until Thursday, January 9, 1941, at ten o'clock A. M.)

[fol. 2026] January 9, 1941, Ten o'clock A. M.

Proceedings were resumed at this time as follows:

The Court: You may proceed. Are you ready with the cross-examination of Mr. Dyer, Mr. Strouss?

Mr. Strouss: Have you finished?

Mr. Mason: I have a question or two I should like to ask.

JOSEPH HENRY DYER, was recalled to the stand, and testified further as follows:

Direct examination (Continued).

By Mr. Mason:

Q. Mr. Dyer, yesterday you stated that the company operates trains in excess of seventy cars in Nevada. I will ask you whether it operates freight trains in excess of seventy cars in other states in which the Pacific Lines are located other than the state of Arizona?

A. Yes, we operate trains in excess of seventy cars and up as high as 100 and 125 cars in New Mexico, California and Oregon.

Q. And Utah?

[fol. 2027] A. And Utah.

Q. Do such trains operate in that part of Texas where the Pacific Lines run?

A. Yes, but that is a very short mileage through Texas.

Q. Now, I will ask you the same as to operation of passenger trains in excess of fourteen cars; does that take place in Nevada and these other states other than Arizona?

A. That is true.

Mr. Mason: You may cross-examine, Mr. Strouss.

Mr. Strouss: I have no questions.

The Court: This witness then may be excused?

Mr. Strouss: Yes.

(Witness excused.)

W. H. Kirkbride was called as a witness on behalf of the defendant and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you state your name to the reporter, please, Mr. Kirkbride?

A. W. H. Kirkbride.

Q. Where are your headquarters, Mr. Kirkbride?

[fol. 2028] A. San Francisco, California.

Q. Are you employed by the Southern Pacific Company?

A. I am.

Q. In what position?

A. Chief engineer of the Pacific Lines, also chief engineer of the Northwestern Pacific, the San Diego, Arizona Eastern, of the Southern Pacific, and chairman of the standardization committee of all the lines affecting engineering and maintenance standards.

The Court: Where are your headquarters, Mr. Kirkbride?

A. San Francisco.

Mr. Mason: The Northwestern Pacific and the San Diego Arizona Eastern are affiliated properties of the Southern Pacific, are they, Mr. Kirkbride?

A. They are.

Q. When you speak of the committee, standardizing committee for all Southern Pacific Lines, does that include the Texas and Louisiana Lines?

A. It does.

Q. When you group the Southern Pacific Lines, do you include also the Southern Pacific Railroad Company of Mexico?

[fol. 2029] A. I do.

Q. What has been your academic training and railroad experience, Mr. Kirkbride?

A. I am a civil engineer, graduate of Stanford University. My railroad experience covers a period of about forty-two years in location, construction, maintenance and operation. My time with the Southern Pacific Company dates from 1902, during which period I have occupied the positions of assistant engineer, roadmaster, assistant division engineer, division engineer, assistant superintendent, engineer of maintenance of way and structures, chief engineer, and during World War No. 1 when the United States took over the operation of railroads in the United States I was chief engineer for the United States Railroad Administration of the Pacific Lines of the Southern Pacific Company.

Q. As engineer of maintenance of way and structure, and chief engineer, have you had and do you have system-wide jurisdiction?

A. I do.

Q. And what are the duties and responsibilities of the chief engineer of the System?

A. To look after all construction work and maintenance of the property as the head of certain departments grouped [fol. 2030] under such organizations. For instance, as chief engineer there is consolidated under my jurisdiction not only the location and construction of new lines, but the maintenance of way and structures, and signal departments, electrical department, valuation department. It is our duty at the close of any year to prepare and submit to our executives two budgets, one representing the money that we think should be spent, or that we desire to spend during the coming year in the maintenance of the properties, involving such principal items as bridge and trestle

and culvert construction, laying of new rail, application of ballast, ties, repair and construction of depots and buildings, and the maintenance of the roadbed and track. Following the authoriaztion of the budget, it is our duty to distribute the money to the various divisions of the System, to see that it is economically and properly spent and that authorities are issued from time to time covering the particular items.

Q. Is it correct to say, generally speaking, Mr. Kirkbridge, that the construction, reconstruction, maintenance and repair of the fixed properties, fixed physical properties of the Pacific Lines, comes under your jurisdiction?

[fol. 2031] A. That is correct.

Q. That includes the signals, does it?

A. Yes, sir.

Q. Bridges?

A. Yes, sir.

Q. Rail?

A. Yes, sir.

Q. Ties and roadbed?

A. Yes, sir.

Q. Buildings?

A. Yes, sir.

Q. And other miscellaneous fixed properties of the company?

A. Yes, sir.

Q. Does the engineer of maintenance of way and structures report to you?

A. He is one of my assistants; of course, he also reports to the general manager.

Q. He is one of the principal officers in your department, is he?

A. Yes, sir, he is.

Q. And each of the division engineers is under your jurisdiction?

A. In this way: The System is divided into divisional organizations, each division in charge of a superintendent. One of the officers of the superintendent, responsible to him [fol. 2032] for the maintenance of the property, bridges, buildings, track, etcetera, is the division engineer. We dictate and give instructions pertaining to all that kind of work through the superintendent. The division engineer is

looked upon as our engineering representative on the division.

Q. Now, as the System officer in charge of the engineering, maintenance and so forth, as you have described, have you become familiar with the entire physical plant of the Pacific Lines?

A. I have.

Q. Do you make trips over the lines from time to time?

A. I do; I am out on the road approximately one-half of my time.

Q. What duties do you undertake when you make these trips over the road?

A. To ride on the rear of trains and spend the entire daylight hours, as well as twilight hours, in the inspection of the track and that includes the right-of-way. We frequently stop at stations or terminals and make track motor-car trips in order to view some particular job under way, some bridge or some track condition, or to determine upon [fol. 2033] some method of correcting a runoff that might endanger the roadbed.

Q. How long since you became engineer of maintenace of way and structures, Mr. Kirkbride?

A. I was made engineer of maintenance of way and structures in 1920. That is at the time the government surrendered the railroads to the owners.

Q. And prior to that time you were the chief engineer under the Railroad Administration?

A. I was.

Q. For the same properties?

A. I was.

Q. And when did you become chief engineer?

A. 1932.

Q. Then you have been a System officer since the time of the United States Railroad Administration?

A. I have.

Q. 1918, approximately?

A. Yes, sir.

Q. Have you prepared or had prepared under your jurisdiction a map of a single sheet entitled "Southern Pacific Company, Pacific Lines, Operating Divisions?"

A. I have.

[fol. 2034] Mr. Mason: May this exhibit be marked with the next number in order?

The Clerk: Defendant's Exhibit No. 154 for identification.

Mr. Mason: You maintain, do you, in the engineering department, Mr. Kirkbride, maps of the System as a whole and by divisions?

A. We do.

Q. Was this map prepared from the original records and maps in your department?

A. It was.

Q. And will you say whether or not it is true and correct?

A. It is.

Mr. Mason: Now, I may say, Your Honor, that there has been made available to Mr. Strouss prior to the start of the trial the operating timetables for each of the divisions comprising the Pacific Lines; is that correct, Mr. Strouss?

Mr. Strouss: I have them right here.

Mr. Mason: And they are before him on the table, and each of those operating timetables, sometimes called employees' timetables, contains a map of the division to which it relates, and the accuracy of the exhibit identified as No. 154 can be checked from the timetables in Mr. Strouss' [fol. 2035] possession. Have you any questions, Mr. Strouss?

Mr. Strouss: This map is drawn to scale, is it?

A. Yes, sir, but it is a reproduction, and the scale is shown graphically so that the scale will be reduced in the same manner in which the rest of the map is reduced.

Q. What would that scale be; do you know?

A. Well, it shows approximately forty miles to a half inch.

Q. Did you mean that in photographing this there has been a reduction?

A. Yes.

Q. What would that reduction be on the scale?

A. I can't tell you. This is made from a master tracing.

Mr. Strouss: I think that is all.

Mr. Mason: The scale and the map are photographed?

A. Yes.

Q. So any reduction in the map is a corresponding reduction in the scale?

A. Yes, sir. For instance, if we had marked this "One inch equals 100 feet," it wouldn't give you the proper scale after photographing, but a person with a scale, after pho-
[fol. 2036] tographing, could relate any distance up here marked "Scale in miles" to any portion of the map.

Mr. Mason: Will you say whether the map represents in substantially proper proportion, the lines of the Southern Pacific, and particularly represents correctly the boundaries of the several divisions?

A. It does.

Q. I call your attention to the map, Defendant's Exhibit No. 1, the enlarged copy of which appears on the easel. The map, Exhibit No. 154, is of the same lines but with the division boundaries included, is it not?

A. What was this exhibit?

Q. 154.

A. What was your question?

Q. Whether the map, Exhibit 154, is not a reproduction of the same lines of the Southern Pacific which appear on the easel map, Exhibit No. 1?

A. Yes, sir.

Mr. Mason: We offer the map in evidence as Defendant's Exhibit 154.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 154.")

[fol. 2037] Mr. Mason: Mr. Kirkbride, have you before you a statement in one sheet bearing title, "Southern Pacific Company, Condensed Profiles, El Paso Route"?

A. I have.

Mr. Mason: May we have this exhibit marked "Defendant's Exhibit No. 155" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 155 for identification.

Mr. Mason: Do you have in the engineering department profiles of the rail lines of the entire system of the Southern Pacific Company?

A. We do.

Q. Are those maintained there as permanent records?

A. They are.

Q. Referring to defendant's exhibit No. 155 for identification, was that exhibit prepared in the engineering department?

A. It was.

Q. Under your direction?

A. Yes, sir.

Q. From what sources?

A. From the records that are kept in our office dating back to original profiles with changes added and made from [fol. 2038] time to time as additional lines were constructed.

Q. Do your original records show the ruling grades, the elevation in feet, the points at which the grades change, and so forth, as are indicated by the showing on exhibit No. 155 for identification?

A. They do.

Q. Will you say whether or not this exhibit correctly reproduces the information shown on the original records?

A. It does.

Q. I notice there are shown hereon, Los Angeles division, Tucson division, Rio Grande division, and so forth, and also California operation, Arizona operation, New Mexico operation. What is the significance of those particular designations?

A. We have previously referred to an exhibit that showed the various divisions of the Pacific system and these refer to the same subdivisions.

Q. Will you refer to exhibit No. 1, the map on the easel and point out which lines on that easel map are represented on exhibit No. 155 for identification?

A. The line extending from Los Angeles to El Paso and [fol. 2039] extending up from El Paso to Tucumcari and the line from Wellton, which is about 37 mile from Yuma, to Phoenix and around to the old line at Pic ..cho and also extending from Tucson to El Paso via Douglas, as shown on exhibit No. 155.

Q. Does the showing on exhibit No. 155 for identification include any of the branch lines in the territory between Los Angeles and Tucumcari?

A. It does not.

Q. Does it include the alternate line in the Imperial Valley from Niland via El Centro?

A. It does not.

Q. And thence to the junction west of Yuma?

A. It does not.

Q. Does the showing on exhibit No. 155 include all of the main lines within the state of Arizona?

A. It does.

Q. And those are indicated by the appropriate legend and boundary marks on the face of the exhibit, are they?

A. Yes, sir.

Q. I note that at the lower lefthand side of the exhibit under the heading "Los Angeles Division, California Operation," between the stations of Indio and a point a short distance beyond Niland the profile line descends below what [fol. 2040] is apparently the base line of the exhibit. Otherwise the profile line is well above what is apparently the base line. What is the significance of that?

A. The railroad in the stretch that you referred to passes down into and out of the Colorado desert opposite Salton Sea. In other words, the track is about 202 feet below sea level.

Q. At what point?

A. At a place called Salton, it is indicated on this profile.

Q. The descent of profile line below the base line indicates the portion of the line which is below sea level?

A. It does.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 155.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendent's Exhibit No. 155.")

Mr. Mason: Mr. Kirkbride, I will ask you to refer now to an exhibit in one sheet bearing title, "Southern Pacific Company, Condensed Profile—Ogden Route." Have you [fol. 2041] that exhibit before you?

A. I have.

Mr. Mason: May we have the exhibit marked "No. 156" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 156 for identification.

Mr. Mason: Was exhibit No. 156 prepared by you or under your direction in your department, Mr. Kirkbride?

A. It was.

Q. From what sources?

A. From the original records, profiles kept in the office and kept up to date as changes or new lines were made from time to time.

Q. Was this exhibit prepared in the same manner as No. 155?

A. It was.

Q. And from the same type of records?

A. It was.

Q. Will you refer to the map, exhibit No. 1, on the easel and describe briefly the lines which are shown thereon and which are indicated on exhibit No. 156?

A. At the lower portion of the profile the profile conforms to the line that commences at San Francisco and [fol. 2042] passes to Redwood City and across San Francisco Bay and over the Altamont Summit, thence into the San Joaquin Valley at Tracy and through Stockton to Brighton, Elvas and over the Sierra Nevada, the summit of which is marked "Norden" and descending along the Truckee River to Sparks and then across the sinks of the Carson and up the Humboldt River across the state of Nevada to Wells and then over the Pequop Range and down into Montello and terminating at Ogden.

Q. I notice that the principal profile at the foot of the sheet shows a reference to the Western Pacific. Is that in the paired track territory in Nevada?

A. It is.

Q. Is this a profile of the Western Pacific line between the points shown?

A. The lower profile shown is the Western Pacific because that is used for eastward movement of trains.

Q. Southern Pacific trains?

A. Southern Pacific as well as Western Pacific trains.

Q. Just above the profile line of the Sacramento division you show a profile designated with the word "westward" [fol. 2043] between Roseville and Sparks. What does that indicate?

A. That is the second line construction that was carried out partially in 1907, 1913, and 1925, and it is used for westward movement of Southern Pacific trains.

Q. Is that in some parts of the district on a different alignment than the eastward track between the same points?

A. It is on a different alignment.

Q. Betwen the stations in Nevada shown in the lower portion of the exhibit to which the designation "Western Pacific" applies, you show also an alternate profile above. What does that indicate?

A. That represents the profile of the Southern Pacific extending from Alazon to Weso within the limits of the paired track.

Q. For what trains is that used?

A. That is used for the westward movements of trains.

Q. Are the Southern Pacific and Western Pacific rails on different alignments on part of the paired track territory?

A. They are on different alignments.

Q. You show also an alternate profile between Montello and Lucin at the foot of the sheet?

A. That likewise is second track construction extending [fol. 2044] from Lucin to Montello on an alignment different from the original line and used for westward movement of trains.

Q. What is the significance of the profile at the top of the sheet and to what part of the railroad shown on exhibit No. 1 does that refer?

A. Extending in a northwesterly direction from the main line at Fernley is a line that connects at Alturas. From Alturas it extends to Klamath Falls but this profile covers only the territory from Fernley to Alturas.

Q. Is that a part of the main line of the Salt Lake division?

A. It is.

Q. Does this exhibit show in the same fashion as No. 155 the boundaries of the states as well as the divisions to which the exhibit relates?

A. It does, yes, sir.

Q. Does this exhibit include all of the main lines in the states of Nevada and Utah over which the Southern Pacific trains operate?

A. It does.

Q. This exhibit and the preceding exhibit, No. 155, are both designated as "Condensed Profiles," Mr. Kirkbride. Does the fact that a profile is condensed tend to exaggerate [fol. 2045] the slope or inclination of the grade or line?

A. It greatly exaggerates the inclination because of the relationship between the horizontal and vertical scales. A condensed profile does not show the detail of profile or grade construction.

Q. Would it be possible upon a single sheet or any reasonable series of single sheets to show an exact profile of the line? How long would that sheet have to be?

A. It would take many sheets comprising large folios of profiles.

Q. Then I take it that where you have a condensed profile you use a different scale for elevation than you do for the horizontal difference?

A. Yes, sir.

Mr. Mason: Have you any questions Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Will you say whether or not exhibit No. 156 correctly reproduces the information appearing upon the original records?

A. It does.

Mr. Strouss: Just one question, you asked if there was a different scale. I notice the scale shown here, is that the horizontal or the vertical?

A. It is the horizontal.

[fol. 2046] Mr. Mason: The elevations are shown in feet, Mr. Kirkbride, are they not?

A. You will notice horizontal lines marked "1,000, 2,000, 3,000, 4,000, 5,000," as the case may be.

Q. Those indicate the vertical scale, do they?

A. Yes, sir.

Q. And the same would be true of exhibit No. 155?

A. Yes, sir.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 156.

Mr. Strouss: It is objected to as irrelevant and immaterial.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 156.")

Mr. Mason: From your knowledge of the Arizona lines and with such reference to the profiles as you desire, will you describe briefly the main lines of the Southern Pacific in Arizona?

A. Referring to exhibit No. 155 there are, with the exception of a 37-mile stretch from Yuma to Wellton and a 46-mile stretch from Picacho to Tucson, two separate and distinct railroad lines extending in a generally easterly and [fol. 2047] westerly direction across Arizona. Describing the line first built, known as the old original Southern Pacific, the general profile characteristics are, leaving Yuma at an elevation of 136 above sea level, the gradient is variable directly out of Yuma six-tenths per cent, flattening to lower grade lines. The route follows the mesa on the southerly side of the Gila River, the Gila River flowing westward and in a general way the road follows the Gila River eastward but departs from it as if gets further from Yuma. A ruling grade of one per cent obtains in this territory by reason of a small range of hills known as the Mohawk Mountains which are surmounted by means of a one per cent grade.

Q. Is that a comparatively short grade?

A. That is a very short grade, the elevation being 540 feet. A short descent is then made on a one per cent grade and then varying grades with finally a maximum of 1.02 to obtain the height of a higher mesa.

Q. At what point does that 1.02 grade apply?

A. This applies to the immediate ascent to Sentinel.

Q. Is that likewise a comparatively short distance?

[fol. 2048] A. It is, for instance, Mohawk is 60 miles from Yuma and Sentinel is about 30 miles further. The profile then is a relatively flat grade not exceeding six-tenths per cent to Gila, which is 123 miles from Yuma and at an elevation of 736 feet. A climb is then made over the Maricopa Mountains, the summit being marked "Estrella," the elevation of which is 1,520 feet and the distance from Kuma, 142 miles. For 23 miles a descent is made on a .83 per cent to the general vicinity of Maricopa, which is in the lower basin of the Santa Cruz River, the elevation being 1,172, and Maricopa being 165 miles from Yuma. The line then follows upward along the Santa Cruz River for a distance

of 86 miles to Tucson, which is at an elevation of 2,386 feet, the distance from Tucson to Yuma being 251 miles. The line then ascends to Whetstone Mountains in a distance of 40 miles, the summit being at Mescal with an elevation of 4,062 feet. A descent is then made in 8 miles to Benson with a crossing of the San Pedro River on a 1.4 per cent. I should add that the maximum gradient eastward between Tucson and Mescal is 1.06 per cent.

Q. That is the ruling grade in that territory?

A. Ruling grade, yes, sir.

[fol. 2049] Q. That is not a continuous grade, is it?

A. It is not a continuous grade.

Q. You spoke of the 1.4 grade descending Mescal to Benson and the crossing of the San Pedro River at Benson. What is the nature of the line from Benson eastward?

A. A climb is then made on a ruling grade of 1.4 flattening to one percent to surmount the Dragoon Mountains, the crossing being made at Dragoon with an elevation of 4,613 feet, and Dragoon is 70 miles from Tucson. The descent eastward is then made on a 1.1 per cent grade into the Sulphur Springs Valley, which is crossed and designated on the profile, the easterly end of which is Willcox. The general level of this plateau, Sulphur Springs Valley, is 4,150 feet. It is then necessary to climb the Dos Cabezos range, using a ruling grade of .91 and a crossing is made at Raso, elevation 4,380, 99 miles from Tucson. From Raso a descent is made into the San Simon Valley, which is at a general elevation of 3,600 feet by a ruling grade of one per cent, this valley being shown between the point Bowie and San Simon. Leaving San Simon, the Peloncilla range is surmounted by the use of ruling grade of 1.4 per cent, the summit being at Steins, elevation 4,345 and 143 miles from [fol. 2050] Tucson. The descent is then made into another valley by similar ruling grade of 1.4 per cent and on to Lordsburg, but 3.8 miles westward from Steins the state line of Arizona and New Mexico is crossed.

Q. I am going to ask you to refer to the line from Wellton via Phoenix to Picacho. When was that line constructed?

A. 1924, 1925, and 1926.

Q. Did part of it exist prior to that time?

A. Some of the line existed out of Phoenix known as the "Arizona Eastern."

Q. Was it all reconstructed?

A. It was reconstructed.

Q. Brought up to the same standard as the new construction?

A. It was.

Q. Will you describe now that line briefly?

A. Commencing at a point Wellton, 37 miles east of Yuma, the line drops down to a crossing of the Gila River, a steel bridge being used. A varying grade system then exists, the ruling grade becoming one per cent to overcome the Gila Bend Mountains, the crossing being made at Harque. A varying grade system is then used to Phoenix, the ruling grade being six-tenths. The summit of the hill at [fol. 2051] Harque is elevation 1,078 and it is 117 miles from Yuma and the elevation of Phoenix is 1,079, 173 miles from Yuma. The same grade system prevails leaving Phoenix and crossing the Salt River at Tempe and continues on to a connection with the line previously described at Picacho, the ruling grade being six-tenths per cent, there being stretches of much flatter grade in between.

[fol. 2052] Q. You have spoken of ruling grades, of course, but are there on all parts of this line you have described, generally speaking, stretches of flatter grade?

A. There are stretches of level grade in each grade system ranging from no per cent up to the six tenths or five tenths, or one per cent, as stated.

Q. Now you also show on the profile, and I would like to have you now describe the line from Tucson via Douglas to the state line.

A. The line out of Tucson via Douglas, as previously stated, is a separate line from the old line; that is, it is not exactly parallel. The profile of the system develops up the westerly slope of the Whetstone Mountains on an almost continuously supported grade of one per cent; at Mescal Summit the line crosses over the Southern Pacific Line previously described and a descent is then made on a .3 per cent grade to Fairbank, a crossing of the San Pedro river.

Q. Just a moment, Mr. Kirkbride. I want to ask you if the line from Tucson to Mescal which you have just described, the former El Paso and Southwestern, is that part of the line shown on the profile, Exhibit 155, designated as [fol. 2053] "Track No. 1 westward"?

A. It is.

Q. Is that the line that is used for all westward trains between Mescal and Tucson?

A. It is used for westward movement of trains: it can be used by reason of the signal system for eastward movement.

Q. Normally it is the westward movement?

A. Normally, it is the westward track.

Mr. Strouss: May I ask, is that the reason for the note at the bottom, "Providing trains are operated eastward?"

A. Yes, sir.

Mr. Mason: That is to say that one per cent becomes the ruling grade if trains are operated eastward in that territory; is that the understanding?

Mr. Strouss: Yes.

Mr. Mason: Proceeding eastward then from Fairbanks, Mr. Kirkbride?

A. Well, the crossing of the San Pedro river at Fairbank is at an elevation of 3,851 feet, and 62 miles from Tucson; the line then follows along the San Pedro river for a number of miles at a relatively flat grade, and then an ascent of the Barro mountain is obtained by the use of a one per [fol. 2054] cent ruling grade; the summit being at Bisbee Junction; the elevation being 4,679, and the distance from Tucson 99 miles; a line then descends to Douglas on a grade system of less than one per cent, although there is a ruling grade of one per cent in there, Douglas being at elevation of 3,968, and 123 miles from Tucson; a climb is then made out of Douglas over certain ranges of hills, the grade varying, but the ruling grade being one per cent. At Rodeo the state line is crossed.

Q. Does the line continue on into El Paso with ruling grades of not to exceed one per cent?

A. That is true: the line then continues over various low hill summits with alternately descending and ascending grades ranging from .79 per cent to one per cent, and into El Paso, where we have an elevation of 3,719 feet, which is 339 miles from Tucson.

The Court: We will take our mid-morning recess at this time.

(Thereupon, a short recess was taken, after which the witness was recalled and proceedings were resumed as follows:)

The Court: You may proceed.

Mr. Mason: Mr. Kirkbride, in your description which [fol. 2055] you have just completed of the main lines in Arizona, you have referred a number of times to the ruling grades. Now, I will ask you whether those ruling grades are, generally speaking, continuous grades, or whether they prevail for comparatively short distances, with substantial distances of grades much less severe.

A. They are short grades and not continuous, long stretches of level or lesser grade prevailing between points.

Q. Are the lines in Arizona lines of continuous curvature or with considerable tangent tracks?

A. Long tangents and very flat curves are characteristic of the alignment.

Q. The term "tangent" is an engineering term meaning straight track, is it?

A. Tangent is a straight track.

Q. Now, have you an example of a long stretch of tangent track in Arizona?

A. From a point six or seven miles west of Maricope and extending to within a few miles of Picacho the track is tangent except for two ten-minute curves, one of the tangents being of the order of forty-eight miles in length.

Q. You say a ten-minute curve. Is that a very slight [fol. 2056] curve?

A. That is a very slight curve, and from all practical points of view is considered tangent track.

Q. Do you have long tangents on the line between Wellton and Picacho via Phoenix as well?

A. Similar long tangents exist, and between Tempe and Picacho.

Q. Now, will you refer to Exhibit No. 156, and from that exhibit and from your own knowledge of the line in Nevada and Utah, will you supply for the record a description of those lines similar to the description which you have just given of the lines in Arizona?

A. Generally speaking, the Sierra Nevada range of mountains forms the westerly boundary of the state of Nevada,

and as affecting the railroad, the descent is made off of the summit of the Sierras by 1.8 per cent.

Mr. Strouss: My objection, if the Court please, to the exhibit goes to this testimony.

The Court: Yes, and the objection is overruled.

The Witness (Continuing): Changing to a one per cent in the general vicinity of Truckee. The line follows down [fol. 2057] the Truckee river to Floriston, the state line between California and Nevada being about midway between Truckee and Floriston.

Mr. Mason: Isn't the line a little east of Floriston?

A. I should say east of Floriston, but the gradient is a one per cent. There are two lines in there and we are now describing the eastern line. The one per cent prevails until we come to Sparks, which is 246 miles from San Francisco; the Truckee river is followed on flat grades, ranging from level grade to .4 per cent to the sink formed by the Carson and Humboldt rivers, this being in the general vicinity of the point marked "Huxley," 316 miles from San Francisco, the general elevation being 3,897; the gradient then ascends on .5 and .4 per cent to Imlay, and continues on to Winnemucca. About three-and-a-half miles east of Winnemucca the connection with the Western Pacific is made at a place marked "Weso."

The Court: That is where you use the common track?

A. That is the commencement of the paired track territory, and the ruling grade is .4 to Carlin, which is 534 from [fol. 2058] San Francisco, and the grade of the line then begins to increase until a point is reached at Alazon, where the paired track ends, that is, it is the easterly end of the paired track, and the profile from there represents the Southern Pacific line to Wells, where the Pequop Mountains are surmounted by a ruling grade of 1.5 per cent.

Q. Is that practically a continuous grade from Wells to Moor?

A. Practically so. 1.5 per cent for about nine miles. The Pequops form a high plateau of a general elevation of 6,200 feet, and the line passes over this plateau on a ruling grade of .4 per cent to Valley Pass, elevation 6,072 feet. A descent is then made on a descending grade of 1.4 per cent ruling and a distance of 21 miles to Mostello, which is

662 miles from San Francisco, and a .2 per cent grade exists for some distance.

Q. You are describing the eastward track now?

A. I am describing the profile at the bottom of the sheet, which is the eastward track; a descent being made into the general territory known as the Salt Lake Desert and passing through Lemay, Strong Knob and Midlake to Ogden, which is an elevation of 4,300 feet. The line leaves the state of Nevada and enters Utah about 3.8 miles west [fol. 2059] of Alazon.

Q. Does the line cross the Great Salt Lake in the territory west of Ogden, as shown on the profile?

A. The mid-point of the crossing of the Great Salt Lake is designated on this profile as Midlake.

The Court: Well, is that across what is known as the Lucin Cut-off?

A. The Lucin Cut-off extends from Lucin to Ogden, a distance of about a hundred and two miles, and in that territory thirty miles represents the crossing of the Great Salt Lake, and contained in that thirty miles is a long trestle eleven miles in length, Midlake being a station at about the mid-point of that trestle.

Mr. Mason: Now, what are the westward ruling grades in the territory you have just described?

A. By referring to the profile marked "westward" and immediately above the words "Western Pacific" the profile commences at a point marked "Alazon," the descending grade being in the nature of .4 per cent, .5 per cent, leveling off to .4 per cent, and then changing to ruling grade of .64 per cent.

[fol. 2060] Q. This line between Wells and Lovelock on both railroads in the paired track territory lies generally along the Humboldt River?

A. That is true, the Humboldt River extending—the origin, the head waters of the Humboldt River being at Wells and the water disappearing in a common sink with the Carson River in the general vicinity marked "Huxley."

Q. Now, you show here in alternate profile Lucin to Montello with 1.4 per cent. Does that indicate a maximum western ruling grade of 1.4 from Lucin to Montello?

A. That is true.

Q. And the western ruling grade between Sparks and the state line near Floriston, is that the 1.1 or 1.6 that is shown in the upper profile near the center of the sheet?

A. There is a 1.6 per cent grade out of Sparks, then the Truckee River is followed to Truckee on a 1.1 per cent.

Q. Now, is there continuous curvature on these lines in Nevada and Utah, or are there substantial distances of tangent track?

A. There are long stretches of tangent track and flat curves ranging from no degrees and thirty minutes to four [fol. 2061] degrees, with a few six degree curves.

The Court: Well, Mr. Kirkbride, the route that you have described here from San Francisco to Ogden, generally speaking, is a much more mountainous route than anything you encounter across the State of Arizona?

A. It is mountainous in this respect that there are two high mountain ranges, the Sierra and then the Pequops, and the entire territory is at a higher elevation, namely ranging from 4000 to over 6000 feet.

Mr. Mason: Isn't it also a fact, Mr. Kirkbride, that the mountains, the severest mountains on this route, are those in California; that there are no severe mountain ranges in Nevada or Utah?

A. Not within the state of Nevada or Utah. The Wasatoh high range exists east of our property at Ogden.

Q. No, in respect to tangent track and curvature from the Nevada state line eastward, is the situation in Nevada and Utah substantially the same as you have described in Arizona?

Mr. Strouss: Now, I object to that as calling for the conclusion of the witness. The exhibits are before the Court, [fol. 2062] and if there is any evidence as to what the curves are, the degrees of curve, that may be put in, but the question of comparison is a matter for the Court to determine from the evidence.

The Court: Well, Mr. Strouss, it occurs to the Court that in a matter of this magnitude, a matter involving the operation of railroads, with which this Court is not familiar, that this opinion evidence put in within proper limits, might be helpful to the Court. I will overrule the objection to the question. He has now a factual basis on which to offer an opinion; we didn't have that yesterday.

Mr. Strouss: Well, only to the extent that he himself, an interested witness by reason of his employment by the defendant, has in a general way described the territory so far as curves and tangents are concerned. He has referred to the exhibit which is already in evidence, so far as grades are concerned. Now, the exhibit speaks for itself, so far as grades as concerned; I submit, anyone can look at that and see what the comparison is as to grades.

Mr. Mason: I wish that the question might be read.

(Thereupon, Mr. Mason's last question was read by the [fol. 2063] reporter.)

A. They are.

Mr. Strouss: My objection is, of course, renewed to that.

The Court: Yes.

Mr. Strouss: It calls for a conclusion and a comparison.

The Court: It does call for a conclusion, and an expert witness such as this, where it will be helpful is entitled to give that conclusion. The objection is overruled; the answer may stand.

Mr. Mason: Now, referring to the line between Sparks and Ogden, all of which is in Nevada and Utah, as shown by your exhibit, Mr. Kirkbride, and the line between Yuma and El Paso, all of which is in Arizona and New Mexico, as shown by your other exhibit, will you state, first of all, what is the total road mileage between Sparks and Ogden eastward?

A. 531.2 miles.

Q. And what is the total mileage between Sparks and Ogden westward?

A. 536.8 miles.

Q. And what is the total miles of curved track westward between Sparks and Ogden?

A. There is 102.5 miles.

[fol. 2064] Q. Is that eastward or westward?

A. That is eastward.

Q. Now, between Sparks and Ogden westward, what is the total mileage of curved track?

A. 116.8 miles.

Q. Now, taking the route between Yuma and El Paso via Gila, Tucson, and Lordsburg, what is the eastward mileage?

A. 563.7 miles.

Q. And what is the westward mileage between those two points over that same route?

A. 562.8 miles.

Q. And what is the total mileage of curved track eastward between Yuma and El Paso via Gila, Tucson and Lordsburg?

A. The curved track, ranging from no degrees of curvature to six degrees, amounts eastward to 79.4 miles, but the curvature over six degrees is 5.5 miles.

Q. Now, without particularizing as between curvature up to six and over six, what is the total of the curved track westward between Yuma and El Paso?

A. 84.3 miles.

Q. Now, what is the mileage of the Phoenix line, Wellton to Picacho?

[fol. 2067] A. 209 miles.

Q. And what is the total amount of curved track in the Phoenix line?

A. 18.5 miles.

Q. And the mileage over the south line between Mescal, Arizona, and Anapra, New Mexico?

A. 51.7 miles.

Q. That is the line from Mescal via Douglas up to the Junction point?

A. It is.

Q. What was the figure you gave?

A. 51.7 miles.

Q. Of curved track?

A. Yes, sir.

Q. What is the total mileage?

A. 295.3 miles.

Q. Mr. Kirkbride, does the company prescribe a maximum authorized speed for freight trains moving over its lines with regular freight equipment?

A. It does.

Q. What is that maximum authorized speed?

A. 35 miles.

The Court: Pardon me just a minute. You are speaking now of its general lines——

Mr. Mason: Yes.

[fol. 2066] The Court: Not limiting it to any particular state.

Mr. Mason: I will bring that out later.

The Witness: 35 miles an hour, and in some cases 40 miles an hour.

Mr. Mason: Does that maximum limitation apply in Nevada?

A. It does.

Q. Utah?

A. Yes.

Q. Does it likewise apply in Arizona?

A. It does.

Q. And New Mexico?

A. Yes.

Q. Is there any different maximum speed authorized on the lines, whether in Arizona, New Mexico, Nevada or Utah, because of 85 or 90-pound rail in the track in one locality as compared with 110-pound in another locality, referring only to freight trains?

A. There is no speed restriction, 35 and 40 miles being authorized over such weights of rail.

Q. The same maximum speed is authorized whether the rail be 85-pound or 110-pound?

A. That is true.

Q. Does the same apply if the rail is 130-pound?

[fol. 2067] A. That is true.

The Court: Then do I understand, from your testimony, that you have a rule on your railroad in all of the states named, including Arizona, that prohibits the engineer running a freight train at a maximum speed in excess of forty miles an hour?

A. The authorized speed. That is true, except that there is a certain tolerance permitted of five miles in case an engineer was found to be slightly exceeding forty miles.

Mr. Mason: Is that tolerance permitted for the purpose of making schedule or merely for the purpose of discipline?

A. I understand it is for discipline.

Q. Does any such tolerance appear in the time-tables?

A. No, sir.

The Court: Might the word "latitude" be another term for this which you call tolerance?

A. Yes, sir.

The Court: Given that much latitude, the authorized speed is not to be over forty miles an hour in the territory specified, other territories it would be 35 miles an hour.

(No answer.)

[fol. 2068] Mr. Mason: Now, Mr. Kirkbride, is the same latitude or tolerance permitted whether the track on which the speed is made is 130-pound rail or 85-pound rail, or anything between?

A. The same tolerance is permitted. In other words, the track hasn't anything to do with it.

The Court: When you say that the track has nothing to do with it, you mean by that that you consider all of your tracks sufficiently stable that you are able to operate at the maximum speeds that you have indicated?

A. All of our main line tracks.

Mr. Mason: Mr. Kirkbride, are you familiar with the term "axle weight," or weight per axle, as used in connection with rolling equipment, particular locomotives?

A. I am.

[fol. 2069] Mr. Mason:

Q. Mr. Kirkbride, can you determine the axle weight of the locomotive given the weight on drivers and the number of driving axles?

A. I can.

Q. That is to say, you can at least determine the average weight per axle?

A. Yes, sir.

Q. From the standpoint of the weight of the rolling equipment as it passes over the rails or the roadbed or the bridges and may affect them, is the axle weight of the locomotive or the cars in the train of any significance, and, if so, what is the significance?

A. The weight and axle loading of the locomotive is controlling. If a track or structure will take a locomotive, it will take any of the cars behind the locomotive.

Q. Is the track so designed to bear the weight of the axle loading of the locomotives?

A. It is.

Q. Are the bridges and other structures similarly so designed?

A. They are so designed.

Q. Will you please refer to exhibit No. 5 introduced by Mr. Russell and by reference to the tabulation on the right [fol. 2070] hand side of the exhibit will you compute the

average axle load, so-called, of the Southern Pacific type locomotive referred to on that exhibit?

A. The axle loading is 63,400 pounds.

Q. How do you arrive at that figure?

A. The total weight of the locomotive on the drivers is 317,000 pounds. There are five drivers, hence if we divide by five, the result is 63,400.

Q. You say that there are five drivers, you mean five driving axles?

A. Yes.

Q. Ten drivers as indicated by the nominal classification of 4-10-2?

A. Yes, sir, wheels.

Q. Will you from the same exhibit calculate the average axle loading of the Articulated Consolidation locomotive AC-8, which is shown next to the last in the tabulation?

A. 66,462.

Q. 66,400 pounds approximately?

A. Yes, sir.

Q. Was that obtained in the same way, by dividing the indicated figure of weight on drivers by the number of axles?

A. It was. 531,700 total weight on driving axles and [fol. 2071] there are eight axles, so dividing by eight we get 66,450.

Q. Are the Southern Pacific type locomotives shown on exhibit No. 5 regularly operated in freight service on the Tucson division?

A. They are.

Q. Between what points?

A. Lordsburg and El Paso.

Q. On the Tucson division?

A. Tucson to Lordsburg.

Q. Are they operated over the double track between Tucson and Mescal in both directions?

A. They are.

Q. Have Articulated Consolidation locomotives of the AC-8 class ever been operated in freight service on the Tucson division?

A. I can't answer that question. They were operated at the beginning of the year in an experimental way. I can't state as to the continuous operation of them.

Mr. Strouss: Beginning of what year?

A. 1940.

Mr. Mason: Does the company operate the AC-8 class locomotive with the cab in front and the AC-4 with the cab in front referred to on exhibit No. 5 in regular freight serv-
[fol. 2072] ice on the Los Angeles division?

A. That is correct, between Los Angeles, Burbank and Mohave Bakersfield.

Q. That includes a portion of the San Joaquin division, does it?

A. It does.

Q. Are they operated between Roseville and points in Oregon?

A. They operate from Roseville to Gerber up to the Sacramento Valley and from Gerber to Klamath Falls and on over the Cascade Mountains down to Klamath Falls, Oregon.

Q. On this road between Los Angeles and Bakersfield, what is the approximate distance in miles?

A. It is over 200 miles.

Mr. Mason: Do you mind, Mr. Strouss, if the witness refers to a timetable?

The Witness: I believe it is 167 miles.

Mr. Mason: In that extent of 167 miles, Mr. Kirkbride, is there any 90-pound rail in the track over which these locomotives operate?

A. There are very considerable stretches of 90-pound rail.

Q. About how much mileage altogether?

A. I would say about 60 miles.

Q. On the district between Roseville and Gerber, Califor-
[fol. 2073] nia, over which these AC locomotives operate, is there any 90-pound rail in the track?

A. There is.

Q. Can you state the approximate mileage between Roseville and Gerber and the approximate proportion of that which is 90-pound rail?

A. I think it is about 110 miles and I would judge that three-quarters of that mileage is 90-pound rail.

Q. On the west side of the Sacramento River between Davis and Gerber do these locomotives operate in that territory as well?

A. I don't know.

Q. In the territory between Lordsburg and El Paso over which you stated the five thousand class locomotive operates, is there any 85 or 90-pound rail in that territory?

A. There is quite a considerable amount of 85 and 90-pound rail.

Q. Where is the 85?

A. The 85 on the former E. P. & S. W. line out of Tucson extends to Mescal and then on to Douglas in stretches.

Q. Between Lordsburg and Tucson it is on the westward track from Mescal to Tucson, is it?

A. Yes, sir.

[fol. 2074] Q. There is 85-pound as well as other weight of rail in that section?

A. What is the question?

Q. Is there 85-pound as well as other weight of rail in that section?

A. Yes, sir.

Q. Between Mescal and Lordsburg via Bowie is there 90-pound rail in part of that track?

A. There is 90-pound rail.

Q. Have you made any study of the effect upon the rail in the track of the operation of these Southern Pacific type and AC type locomotives in the territories to which you have referred?

A. I have.

Q. Will you state what effects or results have been observed?

A. We test the sufficiency of any rail section as to strength by calculating the fiber stress in the base of the rail set up by any particular locomotive operating at certain designated speeds, and we then permit the operating department to operate their locomotives conforming to the allowed limits of stress in the rail. Our calculations show that the 90-pound as well as the 85-pound rail to be of sufficient strength for the locomotives that are being operated over the railroad.

[fol. 2075] Q. Do you by inspection or other means confirm the results of your calculations as to these particular stretches of rail?

A. We are constantly inspecting track in connection with the maintenance and studying the effect of wheel loads thereon.

Q. Do you employ any particular type of apparatus for that purpose?

A. For testing the rail?

Q. Yes, and inspecting for any defects which may be the result of the locomotive operation.

A. Our system basically gets back to the section foreman who is in responsible charge of a designated section, say ten miles, and he is in daily contact with the section, observing the condition of the track with particular reference to the rail, thus noting any characteristics of failures or defects that may be indicating themselves. From time to time the road master would instruct the section foreman to put on a special patrolman for that purpose and some of the special patrolmen that we have are designated as "Sands mirror inspectors." In other words, it is very difficult for a man to look under the ball of the rail, but by having a small device whereby a mirror of strong magnifying power is supported on wheels, the operator [fol. 2076] shoves the device along the top of the rail and by glancing in the mirror he sees the true condition of the underside of the ball. Obviously he himself can see the condition of other parts of the rail. Further, he has the benefit of signals because any break in the rail structure immediately sets the signal at "Stop" so that the track man as well as the signal maintainer is able to have immediate indication of a defect such as a broken rail because of the signal being at "Stop" with no other apparent cause for it. An inspection being made of the distance between the signals will show up the broken rail if it exists. We further amplify that inspection by the operation of a Sperry detector which is in constant operation over our system, where by reason of a drop in the potential—basically speaking, the application of magnetism and electricity—we are able to record on moving sheets of paper any internal defect that exists in the rail, and if a rail is developing an internal defect such defect is caught by the detector car apparatus and if an examination of that rail at that particular point proves the defect there, even though the rail is not broken, the rail is immediately removed from track, a section gang following along behind the detector car so [fol. 2077] that they may be available for the purpose of removing the defective rail.

Q. Using all of these methods of inspection and detection of rail defects, will you say whether or not in 90-pound and 85-pound sections over which these heavy locomotives referred to in your testimony have been and are now being operated, the result is to develop any higher or greater fre-

quency of defects in the rail than in other territory where greater weights of rail are in tracks.

A. It is hard to distinguish between 85 and 90-pound and greater weights of rail with reference to defect and failure because such failures originate by reason of defects in manufacture, and the weight of the rail has little relationship to it.

Q. Broadly speaking, do you have any more rail trouble in the 85 and 90-pound sections over which these heavy locomotives operate by reason of the operation of those locomotives than you do in other sections?

A. We have little trouble from the 85-pound rail.

Q. I am addressing my question now to defects in the [fol. 2078] rail which arise by reason of the operation of these locomotives over that rail. Do you have any more in the 85 and 90-pound sections than you do in the other sections?

A. I would say there is little difference.

The Court: Mr. Kirkbride, how frequently do you operate these detector cars over your line?

A. We have one detector car that operates continuously and we also hire or rent the services of another car from the Sperry Company, the result being that we cover our property so that any particular mile is inspected at intervals of six months or eight months. In some cases, the inspection will be only a few months apart but the average will be six or eight months.

The Court: The court will be at recess until two o'clock P. M.

(Thereupon the court stood at recess until two o'clock P. M., January 9, 1941.)

[fol. 2079] 2 P. M., January 9, 1941.

All parties being present as heretofore noted, proceedings were resumed as follows:

W. H. Kirkbride resumed the witness stand.

Mr. Mason: At the noon recess, Mr. Kirkbride, you were referring to the operation of the detector car. Do you use the defector car in Nevada, as well as in Arizona?

A. We do.

Q. Do you use those other methods of rail and track inspection that you have described in Nevada as well as in Arizona?

A. We do.

Q. And on all other parts of the system?

A. It is common practice on all other parts of the system.

Q. What factor determines the length of the time that rails are to remain in main line track?

A. Tonnage life is one of the controlling factors so far as tangent track and light curved track is concerned. On curves of our mountain grades the controlling factor is the amount of metal that we permit to be worn off the ball of the rail. In the latter case we have certain curve worn tem- [fol. 2080] plate standards set up and before the curve is changed out a scribing machine is used to determine the amount of metal worn away from the ball, and if the rail is approaching the limit of wear then the rail is programmed for renewal. On tangent track the basic factor is the tonnage life, that is, the number of gross tons that the rail will handle during a period of, say, twenty or thirty years.

Q. The tonnage life of the rail is the amount of gross tonnage that passes over it from the time it is placed in the track until it is withdrawn is that correct?

A. That is correct.

Q. Do you have certain tonnage limits to which you work in determining when rail is to be replaced in main track?

A. We have certain tonnage limits that are used as a guide upon which to make critical examinations of the rail. When a rail begins to approach its tonnage life, there are certain physical characteristics which begin to show up like a worn condition on the top of the rail, so called "black spots," fillet cracks in the ball and that condition is determined by physical examination.

The Court: I presume every new rail that is placed on [fol. 2081] the roadbed is stamped with the year it is installed?

A. It is stamped with the year that it was rolled, not the year of installation. The manufacturer's brand is on the rail, the weight and section of the rail is stamped and the heat number. That is to say, there are a certain number of rails that will come out of a heat from the furnaces, open hearth furnaces, and a record is made of that by the

inspectors as the rail goes through the mill. We keep a perfect record of the number of rails in a heat and then we keep a record of the performance of the individual heats.

Mr. Mason: Do you also keep a permanent record of the year and day when the rail is placed in the track?

A. We keep a permanent record of the time of laying the rail.

Q. Do you also keep a record of the gross tonnage passing over that rail from and after the date of its laying?

A. We do, we keep a cumulative record of the tonnage so that at any time within a year the tonnage life of that rail may be known.

The Court: I take it from your testimony that that tonnage isn't down to an exact science, that is, it wouldn't be [fol. 2082] true in every instance that after so many tons had passed over that rail that the rail would be ready to be cast aside?

A. It is only a guide.

The Court: It is only a guide, not an exact science?

A. Not an exact science or rule.

The Court: Is there a deterioration in these rails between the time that they come from the mill and the time that they may be installed on the road, say after a year or so elapses?

A. No deterioration.

Mr. Mason: Mr. Kirkbride, does the mere age of the rail, apart from the tonnage passing over it, have any particular effect upon its usefulness?

A. The age has no effect. To illustrate the point, you might lay a certain section of rail in a branch line where climatic conditions were dry and the tonnage over that branch line was very light and the rail at the end of fifty years would be practically as good as when it was laid, whereas on a main line where the gross tons moving over the rail was large as compared to the branch, the rail would last only, say, twenty years, or less or more.

Q. Do climatic conditions have any effect upon the life [fol. 2083] of rail?

A. They do. We find that the rail laid along the Pacific Ocean on our coast line between San Francisco and Ventura is subject to corrosive attack by reason of the sea breezes. A similar condition existed in the tunnels, there

being some 37½ miles of tunnels on the Pacific lines, and we find that the gases ejected from the locomotive stacks combine with the moisture in the air within the tunnel, which in turn creates a vapor or moisture that settles on the rail, and a very corrosive condition develops whereby we get only possibly one-third of the life of rail in those tunnels as compared to the rail immediately outside in the open air.

Q. Are there any tunnel conditions or salt air conditions in Arizona which have any substantial effect on the life of rail?

A. There are no such conditions in Arizona and none in Nevada.

Q. Are there in Utah?

A. In Utah by reason of the Great Salt Lake.

The Court: What would be the average life of your rails, say, on your main line in Arizona?

A. There again a question of tonnage enters into it, but twenty——

[fol. 2084] Mr. Strouss: (Interrupting) You are speaking about what weight of rail now?

A. We would get a life of twenty to twenty-five years from the 90-pound rail.

Mr. Mason: That is on the main freight line?

A. Yes. For instance, we now have rail that is twenty years old in the 85-pound rail on the E. P. & S. W. which was laid in 1912.

The Court: Would the 110 and 130-pound rails last correspondingly longer?

A. If you assume the tonnage to level off and be similar and not to increase, then we would get a proportionately greater life.

The Court: That is merely an expectation by reason of the fact that as yet any such rails have not been in use over that length of time?

A. We haven't had the 110 and 130 and 131-pound rail in use long enough to definitely say what life we are going to obtain from such weights of rail.

The Court: One other question, when you speak of the ball of the rail, you mean, I take it, the top of the rail where the wheels from the passing cars go on?

A. That is correct.

[fol. 2085] Mr. Mason: Now, Mr. Kirkbride, let us assume a train of 125 freight cars being handled by an AC Class locomotive such as is shown on Exhibit No. 5, and restricted to the speed of 35 to 40 miles an hour, which you mentioned, and a passenger train, let us say, of ten cars being handled by a mountain type locomotive of the type shown on Exhibit No. 6, and moving at allowed passenger train speed. By the way, what are the allowed passenger train speeds for Mountain type locomotives on main lines?

A. Sixty-five miles an hour, except that on the Coast lines between Los Angeles and San Francisco, we operate at seventy-five miles an hour.

Q. Now, assume this ten-car passenger train with Mountain type locomotives, Mt-1 Class, moving at the maximum speed of 65 miles per hour, which of those two trains would require the heavier rail?

A. Well, the passenger locomotive.

Q. Would the requirement be influenced at all by the number of cars behind the locomotive?

A. The cars behind the locomotive is not a factor.

Q. Why would there be a requirement of heavier rail for [fol. 2086] the passenger locomotive at the higher speed than for the freight locomotive at the lower speed?

A. Because the passenger locomotive operates at a greater speed than the freight locomotive.

Q. Now, as between the AC locomotive and the Mountain type locomotive, Exhibit No. 5 indicates that the AC locomotive, if of the AC-8 Class, would have a weight on drivers of approximately 532,000 pounds, where as the Mountain type locomotive would have a weight on drivers of 246,000 pounds, or approximately one half. Do I understand, then, that the lighter locomotive handling the passenger train would, nevertheless, require the heavier rail because of the higher speed?

A. That is correct, by reason of the following basic factors: The stress in the rail is the function of speed, the axle load conveyed to the rail by the individual drivers and the reciprocating parts, and the question of whether or not the locomotive is properly counterbalanced. The dynamic augment that develops by reason of the reciprocating parts revolving at high speed, the engine moving at high speed, added to the static wheel load creates certain stresses in the rail.

The Court: What do you mean by the locomotive being [fol. 2087] properly counterbalanced?

A. Well, a steam locomotive has certain reciprocating parts on the outside of the drivers by which the power of steam is conveyed through these rods and the piston to cause the driver wheels to revolve. Now, there is an unbalanced load on the outside of that wheel, a very heavy load, represented by the large pin that comes out and holds certain rods, and as that wheel revolves there would be a blow struck that would immediately break the rail if it were not for the fact that the locomotive builder counterbalances his driver by putting in certain counterbalancing weights that bear closely the same weight as the reciprocating part. Now, it is impossible to perform that balancing of weights in a theoretical manner perfectly counterbalanced, therefore, the locomotive designer goes to the design of the spokes of his driver and by other scientific methods of adjusting the weights and keeping the rod weights down low, he is able to reduce the dynamic augment very materially as compared to a locomotive that was not properly counterbalanced.

The Court: Then that counterbalancing takes place entirely within the locomotive itself and has nothing to do [fol. 2088] with the number of cars that the locomotive may be hauling?

A. It has nothing to do with the number of cars behind the locomotive.

Mr. Masoir: Does it have any effect on the number of cars a locomotive may handle?

A. It has no effect.

Q. Now, you have spoken of the dynamic augment and, I believe, contrasted that with the static load. Do I understand the static load is the weight of the locomotive as it stands still?

A. As it stands still.

Q. And when a locomotive is in motion, the very fact of its motion, plus its weight, adds a certain amount to the blow that is struck on the rail as it proceeds along?

A. That is correct.

Q. And the greater the speed, the greater the additional blow that it strikes in proportion to the square of the speed?

A. Approximately so, yes, sir.

The Court: That is the reason why, then, there is a greater stress with your passenger trains on the rail than there would be with the heavier freight train?

A. That is correct.

[fol. 2089] Mr. Mason: Is that increase because of the motion and because of the square of the speed, or approximately the square of the speed, what you call the dynamic augment to the static load?

A. Yes, sir.

The Court: There was just one other question: With these Super-Chiefs and these extremely high-speed trains that are run, the stress on those rails must be something terrific with the trains running 100 miles an hour.

A. To the contrary, Your Honor, a train pulled by a Diesel locomotive doesn't have this problem of dynamic augment, for the reason that there are no reciprocating parts on a Diesel locomotive, which power unit is a gasoline engine that operates and generates electricity, which in turn is conveyed to motors attached to the axles and, furthermore, the center of gravity of a Diesel locomotive is not as high above the top of the rail as a steam locomotive, and the result is that you can run a Diesel locomotive at higher speeds over a given weight of rail and the stress in the rail will be less than with a steam locomotive.

The Court: Well, then, with all of these high-speed trains, [fol. 2090] the motive power is really from the Diesel engines?

A. Not necessarily, because the manufacturer of the steam locomotive, in order to compete with the Diesel locomotive, began to improve the design of his steam locomotive. One of the great improvements, just what I mentioned, in properly counterbalancing the locomotive. In former years when steam locomotives were held down to speeds of fifty or sixty miles an hour, they weren't propery counterbalanced as we now know, and the steam locomotive builder had to overcome that deficiency, and that is one of the reasons why the maintenance of way men said, "No, you can't run these locomotives any faster than the speed we specify, because you will set up stresses in the rail that will be too much." The result is that the steam locomotive man is now able to make locomotives that will run 100 miles an hour.

We operate a steam locomotive on the Coast Lines at 75 miles an hour.

Mr. Mason: Is that a regularly scheduled operation?

A. The daylights run at 75 miles an hour, regular scheduled operation, two daylights each direction daily, and I believe—well, I know that the Hiawatha, for instance, [fol. 2091] runs at 100 miles an hour, Chicago to Milwaukee. It is not desirable to run these locomotives at the higher speeds because the cost of maintenance goes up. If you can afford the increased cost of maintenance and traffic conditions demands, you run the train at higher speeds.

Q. Did you make any changes in the weight of rail on the Coast Lines before the 75-mile schedules were placed in effect on the Daylight?

A. I did.

Q. What were those changes?

A. Well, we started a program——

Mr. Strouss: If the Court please, I haven't objected, but it seems to me we are an awfully long ways from the question before the Court now. It is interesting, but we have a long ways to go in this case yet.

Mr. Mason: Did you place heavier rail in the track of the Coast Lines division where these 75-mile an hour trains were operated?

A. We did.

Mr. Strouss: I object to that.

The Court: Overrule the objection.

Mr. Mason: Suppose that you have in the track 90-pound or 85-pound rail, the tonnage life of which is not exhausted, [fol. 2092] if heavier rail than 90 or 85-pound is placed in the track in place of that 90-pound rail, what purpose is accomplished?

A. To permit passenger trains to operate at higher speeds.

Q. What other effect, if any, is accomplished?

A. To reduce maintenance expense.

Q. Is it necessary to place rail heavier than 85 or 90 pound in the track in order to permit long freight trains to be operated?

A. It is not.

Q. Do you have a regular program of changing out rail on the Pacific Lines, including the lines in Arizona and Nevada?

A. We do.

Q. What factors are considered in determining your rail change-out program?

A. We consider the factor of the tonnage life and the worn condition of the rail, the worn condition of the rail on curves, and operating necessities.

Q. Does that include the demand for higher speed passenger trains?

A. That is correct.

Q. And has that demand or prospect of higher speed passenger operation governed to some extent in your changing [fol. 2093] out of rail in Nevada in recent years?

A. It has.

Q. Now, if passenger trains are not increased in speed, Mr. Kirkbride, is it necessary to change out ninety or eighty-five pound rail which still has a useful tonnage life in order to permit more cars to be operated in passenger trains?

A. It is not necessary.

Q. Have you before you a statement in one sheet, Mr. Kirkbride, entitled, "Southern Pacific Company, Development of Rail Sections?"

A. I have.

Mr. Mason: May this be marked No. 157, if the Court please?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 157 for identification.

Mr. Mason: Did you cause this exhibit to be prepared, Mr. Kirkbride?

A. I did.

Q. It was prepared in your office?

A. It was prepared in my office.

Q. From what sources?

A. From the basic drawings showing in detail the design [fol. 2094] of the rail sections upon which we have the manufacturers roll the rail.

Q. On which the manufacturers roll the rail?

A. On which the manufacturers roll the rail.

Q. Does this exhibit represent rail sections which have been or presently are in the tracks of the Southern Pacific Company?

A. It represents the various sections of rail from 75 pounds per yard up to the rail which we are about to lay in the year 1941, shown as 132-pound, head-free.

Q. Is the exhibit a true and correct representation of the underlying sources?

A. It is.

Q. Does this showing relate particularly to rail sections which have been or are, as to the last item, to be placed in the tracks in Arizona and Nevada, or either state?

A. It does.

Mr. Mason: I will say, Your Honor, that we propose further to show in mileage figures the replacements of rail and the extent of rail of various weights in the tracks of Arizona and Nevada, and this exhibit will, if admitted, illustrate that testimony. Have you any questions, Mr. Strouss?

[fol. 2095] Mr. Strouss: No.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit No. 157.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 157.")

The Court: Do I understand, Mr. Kirkbridge, that the lightest rail that you have on any of your main lines is now 75 pound rail?

A. That is correct. The important main lines, principal main lines, involve 85, 90, 130, 110, 112 and 131-pound rail.

The Court: I wasn't just clear as to another point. Do I understand that these particular rails shown on this exhibit were made specially by the steel mills for the Southern Pacific and that they would differ necessarily from the rails used on other roads?

A. No; the railroads in the United States have an organization known as the American Railway Association, or from an engineering point of view the American Railway Engineering Association. This association consists of committees of engineers of the various railroads. They study [fol. 2096] these problems of rail, ballast, roadbeds, and

all other matters pertaining to track and bridge construction, and it is largely on the recommendation of these committees that the railroads adopt a certain section of rail. They don't necessarily have to, but they follow very closely or entirely the judgment of the recommendations. For instance, the 90-pound rail is a standard section common at one time in the United States, and the 110-pound, 112-pound, 130-pound, 131-pound, are exclusively A. R. A. standards of rail sections. Now, I may explain, Your Honor, that individual railroads, or people that deal in the sale of rails sometimes promote some special feature and claim great advantage therefrom. That explains what we mean by the term "head-free." You will notice that by looking at the section illustrating the 113-pound and the 132-pound, that the lower corners of the ball of the rail are cut off. Certain people called attention to the fact that that lower corner is never subject to wheel wear and that a greater life would be obtained from the rail if that metal was put on top of the ball. Now, we have been experimenting over a period of years, as well as other railroads in the United States, with that special section of [fol. 2097] rail. In all other respects it conforms to the standards and the chemistry prescribed by the rail committees of the American Railway Engineering Association. The result of our experiments, as well as the results obtained on other railroads, led us to adopt those two sections of rail for this coming year, with the expectation that we are going to very materially increase the life of the rail, as will be illustrated by the fact that in the case of the 132-pound head-free rail, the height is seven and five-sixteenths inches compared to the standard 131-pound rail with a height of seven and one-eighth inches. There is a difference in height, an increased difference in height there of those two rails. Now, all other features of those rails are similar to the 131-pound.

[fol. 2098] Mr. Mason: Except for the two cross-sections which are shown for the year 1940, are all of these others standard sections of the type ordinarily found or previously found in railroads generally?

A. They are.

Q. I think you said that the minimum weight of rail in any of our principal main lines is 85 or 90 pound?

A. That is true.

Q. Have you before you an exhibit in one sheet entitled "Southern Pacific Company, Development of Roadbed"?

A. I have.

Mr. Mason: May we have this exhibit marked as No. 158?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 158 for identification.

Mr. Mason: Was this prepared in your office and at your direction?

A. It was.

Q. From what sources was it prepared?

A. From our standard drawings that have been officially adopted from time to time to be used for the direction of [fol. 2099] our trackmen in maintaining their track.

Q. Is this a correct reproduction of these standard drawings?

A. It is.

Q. Are these the standards of cross-section of roadbed which have prevailed or now prevail on the Southern Pacific for the various types of ballast shown?

A. It is correct. It should be known, however, that the three top sections are obsolete standards and that we conform to the sections shown at the bottom of the sheet under present-day practice.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No, I think not.

Mr. Mason: Probably some further explanation of the exhibit is desirable but it would entail a discussion of the face of the exhibit so I will offer the exhibit now as defendant's exhibit No. 158 in evidence.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 158.")

Mr. Mason: Mr. Kirkbride, looking at exhibit No. 158, the [fol. 2100] solid black cross-sections of course are the cross-sections of the rails as they appear on the roadbed, are they?

A. That is correct.

Q. What is the rectangle in each illustration that appears immediately below the rails?

A. That is a cross-tie.

Q. Below and surrounding the tie, particularly in the lower illustration, what is the material shown there?

A. That is the ballast that is under and around about the tie.

Q. And below the ballast what does the line undertake to indicate?

A. That is foundation grade, representing the embankment or railroad cut upon which the track structure is supported.

Q. In the various illustrations, particularly the lower two, the space immediately below the center tie in each case is left blank. Is that for convenience in making the drawing?

A. These drawings were made just to be illustrative in a graphical sense. If I may say by referring to the lower drawing that our present standard ballast section provides for 8 inches and in some cases 12 inches depth of ballast [fol. 2101] below the tie, the tie being 7 inches deep, 9 inches wide, and 8 feet long.

Q. What I meant to ask you was, this, is the material which is shown opposite and under the ends of the ties also filled in under the middle of the ties?

A. That is completely filled in between the ties up to the top of the ties.

Mr. Strouss: I will agree that they don't bridge them.

Mr. Mason: Is this solid line below the material shown as ballast, is that sometimes referred to as the subgrade?

A. That is correct.

Q. In the illustrations for 1895, 1905, and 1930, you show an additional appliance or device in cross-section immediately under the base of the rail. What is that?

A. That is a tie plate.

Q. Just what is a tie plate?

A. A tie plate is a rectangular piece of metal especially rolled to be placed between the tie and the rail for the purpose of adding greater support to the rail to prevent its cutting into the tie and to permit the spiking of the rail to true line and gauge. There are four spike holes through [fol. 2102] a tie plate, permitting spikes being driven on the inside of the flange and on the outside of the flange.

The Court: Does that tie plate more evenly distribute the load over the tie itself?

A. Yes, sir, it acts as a very useful purpose in distributing the load uniformly to the entire tie surface.

Mr. Mason: Have you an exhibit which illustrates the development of tie plates?

A. I have.

Q. Being in one sheet and entitled, "Southern Pacific Company, Development of Tie Plates"?

A. I have.

Mr. Mason: We ask that that exhibit be marked No. 159.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 159 for identification.

Mr. Mason: Was this exhibit prepared from original drawings of record in the engineering department?

A. It was.

Q. Under your supervision?

A. That is correct.

[fol. 2103] Q. Is it a correct representation of those original records?

A. It is.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: I understand from the face of this exhibit, Mr. Kirkbride, it represents in cross-section the tie plates for various weights and types of rail which you referred to in your discussion of the preceding exhibits No. 157 and No. 158?

A. That is correct, old standards and present new standards.

Mr. Mason: We offer the exhibit in evidence as No. 159.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 159.")

The Court: Before we leave the rails, there is one further question, Mr. Kirkbride; referring to exhibit No. 157.

I notice that you use the term "moment of inertia." What is the meaning of that term as applied to those rails?

A. In the scientific design of a rail a balanced condition and a distribution of metal exists as between the top called [fol. 2104] the "ball" and the base represented by the two flanges, the vertical member being the web. Now the strength of any metal of this shape is developed by the depth, the relative depth, between the top area and the bottom area and the areas of these top and bottom areas. To find out whether this rail is strong enough to support a weight between two fulcrums or points of support, the structural engineer goes into the mechanical features of that, known as "moments of inertia." Small minute areas are assumed at the top and bottom in relation to the neutral axis which is about midway between the top and bottom and a moment is set up, a mathematical moment is set up that unit times its distance, and then a summation of all those various units is made and the final answer is what is called the "moment of inertia." That is a rather rough description of the mathematics of the thing but it does enable the bridge designer, for instance, to determine the strength of a beam or girder, all of the factors being that you have a top flange and a bottom flange and a vertical flange and the greater the depth and the more the area the stronger the beam will be. Now a rail must be designed on the same principle as a bridge girder because it does serve [fol. 2105] such a purpose, spanning a gap from tie to tie, which is approximately 21 or in some cases 22 and 24 inches centers. I may further say that a rail is subject to other stresses, that is, to wear and tear on the ball and the outward thrust of the drivers of the locomotive. That is particularly true when you come to curves, the drivers bear on the outside of the curve, the outside rail, by reason of the operation of centrifugal force, and we try to overcome that by making the rails stiff and stable, hence the determination of a width of 5 or 6 inches.

The Court: Thank you.

Mr. Mason: Referring to exhibit No. 157, 158, and 159, do the standards which these exhibits portray apply to the tracks equally in Nevada and in Arizona?

A. They do.

Q. Do they conform generally to standards observed or set forth by the engineering committee of the Association of American Railroads?

A. They do.

Q. The maintenance of bridges comes under your jurisdiction as you stated?

A. That is correct.

Q. Have you any restrictions in the state of Arizona as [fol. 2106] to the weight of locomotives which may operate over any bridges in Arizona?

A. There are no restrictions due to bridges and trestles.

Q. Does that statement include the Colorado River bridge at Yuma?

A. That is a very modern bridge, that statement is correct.

Q. Is there any restriction from the standard of weight of locomotives which may be operated applicable to any main line bridges in the states of New Mexico or Texas on the Pacific lines?

A. No restrictions exist.

Q. Does that include the Rio Grande River bridges immediately west of El Paso?

A. It includes both bridges. I may say when we took over the E. P. & S. W. we had to rebuild or reinforce the bridge across the Rio Grande at El Paso in order to make it of sufficient strength to accommodate our locomotives.

Q. Suppose you wanted to run a train of AC class locomotives, four or five of them coupled in tandem, that is, immediately following each other with no cars between them, would you be able to run such a group of locomotives over the Colorado River bridge at Yuma?

[fol. 2107] A. We could so run the locomotives.

Q. Over the Rio Grande River bridges at El Paso?

A. That is correct.

Q. Would there be any bridges in the state of Arizona or New Mexico otherwise which would be restricted as to such a movement?

A. No such bridges.

Q. Does the same apply to trestles and culverts?

A. That is correct.

Q. Will you refer to the bridges in the states of Nevada and Utah and say whether your statements as to the adequacy of the bridges in Arizona and New Mexico apply alike there?

A. All bridges, trestles, and culverts are adequate to handle the power being operated or that is available for operation.

Q. Would you have any restriction against the operation of a succession of locomotives coupled together in Nevada or Utah?

A. No restriction.

Q. Have you with you a memorandum of the distribution of rail by weights in the state of Arizona?

A. I have.

[fol. 2108] Q. First I will ask you what is the total miles of main track in the state of Arizona as of the end of the year 1940 to which your memorandum relates?

A. There is 808.29 miles.

Q. In the state of Nevada have you a memorandum relating to the miles of track and weight of rail?

A. 819.82 miles including the Western Pacific Railroad paired track.

Q. The 819.82 figure which you have just recited is the main track mileage over which the Southern Pacific trains operate?

A. Yes, sir.

Q. Referring to the year 1912, what was the main track mileage of the Southern Pacific in Arizona as of June 30th?

A. 392.54 miles.

Q. Was there any of that laid with rail of greater weight than 90 pound?

A. No such weight of rail existed in the track.

Q. How much of it was laid with rail of 90 pound?

A. 100.55 miles.

Q. How much of it with rail of 85-pound weight?

A. 124.89 miles.

[fol. 2109] Q. Was that 85 or 80 pound?

A. That is 80. There was no 85-pound rail.

Q. 124.89 is 80 pound?

A. Yes.

Q. How much of it was there of 75 or 76 pound?

A. 167.45 miles.

Q. Was there any of it less than 75 pound?

A. .65 of a mile that was under 75-pound rail.

Q. Going to the year 1920, how many miles of main track were operated by the Southern Pacific in Arizona on December 31, 1920?

A. 399.95 miles.

Q. Was any of that laid with 110 or heavier weight of rail?

A. None of it was laid with such weight of rail.

Q. What was the heaviest weight of rail?

A. 90 pound.

Q. How much of the 90 pound?

A. 288.7 miles.

Q. Was there any 85 pound?

A. No. 85.

Q. How much 80 pound was there?

A. 105.8 miles.

Q. Was there any 75 or 76 pound?

A. 5.45 miles.

Q. Was there any of less weight than 75 pound?

[fol. 2110] A. None.

Q. In 1930 what was the total mileage of track operated by the company in Arizona?

A. 808.29 miles.

Q. How much of that was 130 or 131 pound?

A. 12 miles.

Q. How much was 110 or 112 pound?

A. 104.41 miles.

Q. How much was 90 pound?

A. 593.12 miles.

Q. How much was 85 pound?

A. 98.76 miles.

Q. Was there any of less weight than 85 pound?

A. No weight less than 85.

Q. In 1935 was the operated mileage the same as in 1930?

A. It was the same as 1930.

Q. How much 130-pound rail was in the track as of the end of 1935?

A. 36 miles.

Q. Of 110 and 112 pound?

A. 184.68 miles.

Q. Of 90 pound?

A. 507.32 miles.

Q. Of 85 pound?

A. 80.29 miles.

[fol. 2111] Q. Was there any lighter rail than 85 pound?

A. None.

Q. At the end of 1939 was the mileage the same?

A. The same.

Q. What was the mileage of 130 and 131-pound rail?

A. 57.17 miles.

Q. Of 110 and 112?

A. 273.55 miles.

Q. Of 90 pound?

A. 406.65 miles.

Q. Of 85 pound?

A. 70.92 miles.

Q. Was there any of lighter weight?

A. None.

Q. On December 31, 1940, have your the figures of rail by weights?

A. I have.

Q. What was the mileage of 130 and 131 pound?

A. 59 miles.

Q. And 110 and 112?

A. 305.43 miles.

Q. Of 90 pound?

A. 376.54 miles.

Q. Of 85 pound?

A. 67.31 miles.

[fol. 2112] Q. Was there any lighter weight rail?

A. None.

Q. You spoke previously I believe of the construction of the alternate main line through Phoenix as having taken place in 1924, 1925, and 1926. What weight of rail was used in constructing that line?

A. 90-pound section.

Q. Is that a relatively light traffic line from the stand point of gross tonnage?

A. It is.

Q. There is today as you have just stated 376.54 miles of 90-pound rail in the track in the state of Arizona. Where is the largest proportion of that 90-pound rail found?

A. 90-pound rail exrsts on the Phoenix line to which you have just referred continuously from Wellton through to Picacho except for a few curves. There is some 90-pound rail between Wellton and Dome and then there is 90-pound rail in stretches on the old line between Wellton, Gila, Phoenix, and Tucson. There is 90-pound rail in the track eastward from Tucson and in stretches continuing on to the state line, and dealing with the other line out of Tucson there is some 90-pound rail mixed up with the 85.

[fol. 2113] Q. You have referred to 85-pound rail previously, I think, as being on the line acquired from the E. P. & S. W. in 1924?

A. That is correct.

Q. Your figures show there was as of the end of 1940, 67.34 miles of 85-pound rail still in main line track in the state of Arizona?

A. That is correct.

Q. Where is that 85-pound rail found?

A. Taking the line out of Tucson and continuing on up to Mescal down to Fairbank and to Douglas and in certain stretches between Douglas eastward to the state line, 85-pound rail will be found.

The Court: Most of it is on the old E. P. & S. W. line?

A. I have just described that, it is all on the E. P. & S. W.

Mr. Mason: Is the E. P. & S. W. now called the south line through Douglas, a relatively light traffic line?

A. It is a relatively light traffic line.

Q. You spoke of some of this 85-pound rail on the line between Tucson and Mescal on the westward line, I believe?

A. It is due to the fact that the two lines within a few miles of Tucson are combined in there, practically speak-[fol. 2114] ing there is no 85-pound rail on the eastward track. It is all on the westward track.

Q. That is the downhill track?

A. The downhill track from Mescal to Tucson.

Q. You spoke of 90-pound rail, I think, in the track between Dome and Wellton. Is that double track?

A. Yes, sir.

Q. Does one of the two tracks of a double track receive less tonnage than a single track immediately adjacent to it?

A. I think the tonnage is about evenly divided between those two tracks.

Q. You mean eastward and westward tracks between Dome and Wellton?

A. Yes, sir.

The Court: We will take a short recess at this time.

(Thereupon a short recess was taken after which proceedings were resumed as follows.)

Mr. Mason: Mr. Kirkbride, earlier in your testimony you spoke of your duties as including the programming of vari-

ous maintenance projects to be conducted each calendar year including the programming of rail changes and rail renewal. Have you made up a program of rail renewal for [fol. 2115] Arizona for the year 1941?

A. We have.

Q. Will you state briefly what your program for this state contemplates?

A. Our program which is approved to commence the year with, looking forward to what we think we can do this year, is two hundred miles of new rail which is being purchased and that is distributed to the divisions in such a manner that we are going to lay 44 miles on the Tucson division, of which I think about 6 miles is just east of the state line, on the north line.

Q. The balance will all be in Arizona?

A. The balance will all be in Arizona.

Q. Have you any program of new rail for the Rio Grande division in Arizona?

A. There is some changing out of rail on the south line out of Tucson and extending to Douglas, the total being some 11 miles.

Q. What is to be the weight of the new rail placed in the track in Arizona according to your program?

A. The rail is to be of those sections shown as 113 pound and 132 pound head-free rails. Separating as between the weights of rail, there would be about 39 miles—now, re- [fol. 2116] ferring to the Tucson division—there would be about 39 miles of the 113 and 5 miles of the 132-pound section, all of the 132-pound section being laid on curves within the state of Arizona.

Q. If I got your figures correctly, of the 44 miles programmed for the Tucson division, 38 are within the state of Arizona, is that correct?

A. That is correct.

Q. And in addition, there are 11 miles on the Rio Grande division?

A. Yes, sir.

Q. Or a total of 49 miles programmed for 1941 for Arizona?

A. Yes, sir.

Q. Have you a memorandum as to the distribution of rails by weights and by years for the state of Nevada?

A. I have.

Q. Your figures for the state of Arizona are taken, are they not, from reports to the Arizona Corporation Commission supplemented by original records of your own office?

A. That is correct.

Q. And your figures for Nevada are taken from annual reports to the Public Service Commission of that state sup-
[fol. 2117] plemented by your own records?

A. That is correct.

Q. In the state of Nevada, take the end of the year 1920, what was the total miles of track operated in that state in that year?

A. 522.15.

Q. Was there any of that rail of greater weight than 90 pound?

A. None of it of greater weight than 90 pound.

Q. How much of it was of 90-pound weight?

A. 423.66 miles.

Q. How much of 85?

A. There was no 85-pound rail.

Q. How much of 80 pound?

A. 96.98 miles.

Q. Was there any 75 or 76-pound rail?

A. 1.51 miles.

Q. Any of lighter weight?

A. None.

Q. What was the total operated mileage in 1925?

A. 731.45 miles.

Q. Was any 130 or 131-pound in the track in 1925?

A. None.

Q. What was the mileage of 110 and 112 pound?

[fol. 2118] A. 16.05.

Q. Of 90 pound?

A. 507.75 miles.

Q. Of 85 pound?

A. 177.62 miles.

Q. Where was that 177.62 miles found?

A. On the Western Pacific paired track.

Q. How much 80 pound was there on December 31, 1925?

A. 28.81 miles.

Q. And the 75 pound?

A. 1.22 miles.

Q. In 1930 what was the total mileage of track?

A. 816.48.
Q. How much of that was 130 or 131 pound?
A. 25.45.
Q. How much was 110 and 112 pound?
A. 161.99 miles.
Q. And 90 pound?
A. 393.94 miles.
Q. And 85 pound?
A. 177.62 miles.
Q. And 80 pound?
A. .35 of a mile.
Q. And 75 and 76 pound?
A. 57.13 miles.
[fol. 2119] Q. Where was that 57.13 miles?
A. From Fernley extending to Alturas.
Q. Is that a line which formerly was a branch and was converted to main line in 1929?
A. It was.
Q. In 1935 what was the total of track mileage?
A. 816.38 miles.
Q. What was the mileage of 130 and 131 pound rail?
A. 55.94 miles.
Q. 110 and 112 pound?
A. 479.91 miles.
Q. 90 pound?
A. 190.96 miles.
Q. 85 pound?
A. 47.62 miles.
Q. 80 pound?
A. .35 of a mile.
Q. 75 and 76 pound?
A. 41.60 miles.
Q. What was the total mileage operated at the end of 1939?
A. 819.82 miles.
Q. And what was the mileage of 130 and 131-pound rail?
A. 77.38 miles.
[fol. 2120] Q. 110 and 112?
A. 642.19 miles.
Q. 90 pound?
A. 65.83 miles.
Q. Any 85 pound?

A. No.
Q. Any 80 pound?
A. .15 of a mile.
Q. 75 and 76 pound?
A. 34.27 miles.
Q. And the mileage as of the end of 1940?
A. 819.82 miles.
Q. 130 and 131-pound rail?
A. 78.47 miles.
Q. 110 and 112 pound?
A. 666.02 miles.
Q. 90 pound?
A. 41.90 miles.
Q. 85 pound?
A. None.
Q. 80 pound?
A. .15 of a mile.
Q. And 75 and 76 pound?
A. 33.28 miles.

[fol. 2121] Mr. Mason: Do I understand that all of the 75 and 76 is still on the Fernley-Modoc line?

A. That is correct.
Q. Is that a line of relatively light traffic?
A. Relatively light as compared to the main line.
Q. Any passenger operation over that line?
A. No passenger operation.
Q. You have stated, I believe, Mr. Kirkbride, that the standard of ballast on the Pacific Lines is eight inches, is that correct?
A. And twelve inches measured in depth under the ties to the sub-grade.
Q. Now, as of the present days, is there any track in the state of Arizona which is not fully ballasted?
A. None, dealing with the main line.
Q. That is what I am referring to, the main line. Is there any of the main operated track in the state of Nevada that is not fully ballasted?
A. None.
Q. What is the character of the ballast in use as of the end of 1940 in Arizona, giving that by districts, with particular reference to the Yuma-Gila-Lordsburg line?
A. There is in use in our lines in Arizona two types of [fol. 2122] ballast, namely, slag ballast from Douglas, some

of it coming from El Paso smelters, and the crushed granite rock from Dome.

Q. Now, the same line between Yuma and Lordsburg via Gila and Tucson was Southern Pacific property in 1912, as has been testified. Will you refer to the several sections of the line and state what the character of that ballast was in 1912, and what the character of the ballast is today?

A. All ballast was either gravel or none. When we say "none" we mean native material was substituted. For instance, Yuma to Wellton, there was gravel ballast.

Q. What is it today, Yuma to Wellton?

A. It is rock ballast.

Q. And the next section?

A. Wellton to Trigo, in 1912, none; now it is rock. Trigo to Enid, in 1912 was none, and now it is slag; Enid to Heaton was none in 1912, and now it is rock; Heaton to Jaynes in 1912 was gravel, now it is slag; Jaynes to Tucson in 1912 was none, now it is slag. Tucson to Vail, gravel in 1912, now slag. Vail to Chamiso, rock in 1912, slag now. Chamiso to State Line was rock, and it is now rock and slag.

[fol. 2123] Q. Have you increased the depth of the placement of ballast on the Arizona lines since 1912, or more particularly, since 1920?

A. We have very materially increased the amount of ballast by reason of the fact that our policy in connection with laying new rail is to surface the track up on new ballast approximately four inches in depth or more under the bottom of the tie, the existing ballast being used as a supporting ballast under the new ballast, and we commonly refer to it as sub-ballast; the combined depth of the accumulated ballast under the track in many cases approximating the depth of twelve inches below the bottom of the tie.

Q. Have you increased the standard of ballast in the state of Nevada since 1920?

A. We have.

Q. In the same manner as you have described in Arizona?

A. That is correct.

Q. Now, going to the matter of signals, have you a memorandum of the amount of track protected by automatic block signals in Arizona for several years past?

A. I have.

Q. Referring first to June 30, 1912, how much of the main [fol. 2124] track in Arizona was protected by automatic box signals in miles?

A. 291.27.

Q. How much was not protected?

A. 102.27.

Q. Now, in 1920, how much track was protected by automatic block signals?

A. 296.30.

Q. And how much wasn't protected?

A. 103.65.

Q. In 1925 what was protected?

A. 455.40.

Q. And not protected?

A. 121.04.

Q. What was the situation in 1930?

A. 799.30 miles protected, 8.99 miles not protected.

Q. Is the situation in 1940 and in the intervening years, the same as in 1930?

A. Identical.

Q. Where is this 8.99 miles of main track not protected?

A. Well, it is in the Tucson yard, 7.69 miles of it, being the old south line of the E. P. & S. W.

Q. That is still regarded for the purposes of this compu- [fol. 2125] tation as main line?

A. That is correct.

Q. Is it frequently used for the movement of trains?

A. It is not?

Q. And the balance is within the Tucson yard limits?

A. That is correct.

Q. Now, in the state of Nevada, in 1920, what was the mileage of main track protected by automatic block signals?

A. 521.85 miles.

Q. And how much not protected?

A. .30 of a mile.

Q. In 1930, what was the total mileage of the track protected by automatic block signals?

A. 748.81 miles.

Q. How much was not protected by signals?

A. 67.56 miles.

Q. Where is that mileage not protected by block signals found?

A. That is the line from Fernley on to Alturas.

Q. That is the portion of it in the state of Nevada, is it?

[fol. 2126] A. That is the portion of it in the state of Nevada.

Q. Now, in 1939, what was the total mileage of track in Nevada protected by block signals?

A. 752.5.

Q. Is the situation the same today?

A. It is the same.

Q. And not protected by block signals how much?

A. The same, 67.56.

Q. Is there a short mileage in Nevada protected by a so-called manual interlocker system?

A. .11 of a mile.

Q. How long has that prevailed?

A. That has prevailed since 1925.

Q. Are these block signals, automatic block signals in Arizona and Nevada wayside signals?

A. They are wayside signals.

Q. Generally the semaphore type?

A. Semaphore type.

Q. Is the color-light type of signal in use to any extent?

A. It is not.

Q. What type of ties are used in the main lines in Arizona?

A. We use creosoted fir, creosoted Texas pine, creosoted gum from Louisiana, creosoted spruce and fir from New [fol. 2127] Mexico, and a very small proportion of creosoted oak ties that come from Louisiana.

Q. Are there any portions of the main track in Arizona which are not predominantly laid with creosoted ties?

A. Very small part not laid with creosoted ties.

Q. Are there any stretches of track where creosoted ties are not found at all, or will the non-creosoted ties be found individually at intervals?

A. Our policy of tie renewals calls for the replacement of the tie, the individual tie as it requires replacement. Prior to the adoption of creosoting, we used zinc chloride treated ties, and there are probably a few of those in the tracks.

Q. Do you use the same class of creosoted ties in the state of Nevada?

A. The same class of treatment prevails over the System, there being this exception, that we use Oregon fir exclusively and Port Orford cedar ties for Oregon, the gum tie and the Texas pine not being available for that territory.

Q. Are all of the ties you use in Nevada as replacements at the present time creosoted ties?

A. They are all creosoted ties or Port Orford cedar ties. [fol. 2128] I may say, by way of explanation, that the Port Orford timber gives great resistance to decay, so that we classify it as similar in life to a creosoted tie.

Q. Do you use the same size of ties in the main lines in both states?

A. The same size.

Q. Is that general over the System?

A. It is general over the System, the same standard applies throughout the System.

Q. Is that in accordance with any standards or recommendations of the A.A.R. or its engineering committees?

A. Not specifically, although a seven by nine by eight foot tie is a common standard throughout the United States.

Q. How many ties per mile do you use in the main lines in Arizona?

A. We use 3,250 ties per mile.

The Court: How many was that?

A. 3,250 ties per mile.

Mr. Mason: Do you use any different standard of ties per mile in Nevada?

A. The same standard applies.

Q. Has there been any change in the standard of ties in [fol. 2129] Arizona as between 1912 or 1920 and the present day?

A. There has been a very material change in that the creosote tie has been adopted, and the size of tie previously ranged down to six by seven, and there were not so many ties used in the railroad, namely, we formerly used 2,880 per main-line track mile.

Q. Are the lines in Arizona laid with tie-plates under the rails?

A. They are all laid with tie-plates under the rail.

Q. Has that been true since 1912?

A. The railroad in 1912 was continuously tie-plated in Arizona.

Q. There has been, however, a change in the design of the tie-plate, as indicated on your exhibit No. 159, is that correct?

A. There is a very material change in the size and design of the tie-plate.

Q. Does that result in strengthening the tie-plate?

A. The tie-plate is much stronger and covers a greater area of space on the tie. For instance, the tie-plate formerly used along in 1912 was [illegible] square inches between and eight and three-quarters inches applied lengthwise with [fol. 2130] the tie, and our present plate is, for 110-112-pound rail, ten and seven-eighths inches long and occupying an area of 92.44 square inches, and the plate that goes under the 131 or 132-pound rail is eleven and three-eighths inches long, and is of such a width as to give 96.69 square inches of bearing area on the top. There has been a very material change in the design, which is due to the recommendations of the American Railway Engineering Association, and that is represented by the two flanges that are shown on the two bottom sections of Exhibit 159. This results in the rail resting within a pocket with a ridge of metal projecting against the flange on both sides of the rail. This offers additional strength against spreading of the rail under the impact or pressure of the flanges of the wheels; in other words, these projecting ridges of metal supplement the holding power of the spikes. The outer width is increased to three inches from the outer flange of the rail in order to prevent a tendency for the tie-plates to settle down into the tie and thus tip the rail over.

Q. Now, are the lines in Nevada continuously tie-plated?

A. They are.

[fol. 2131] Q. Have they been continuously tie-plated for several years past?

A. They have.

Q. Have they experienced the same changes in design of tie-plate which have taken place in Arizona?

A. The same change; the standards apply to all divisions.

Q. Will you say whether or not the climatic conditions in Arizona are relatively favorable or unfavorable to track maintenance?

A. They are favorable.

Q. Just what climatic conditions do you refer to in that regard?

A. The absence of heavy rainfall, creating a semi-arid condition, results in a dry, permeable soil, with which the roadbed is constructed. This results in a sub-grade strong, firm and solid, easily maintained and without undue or sudden settlement, which in turn would affect the surface of the track.

Q. Are the conditions of topography in Arizona relatively favorable or unfavorable?

A. They are favorable by reason of the long distances visibility being long and great, and only hills of moderate [fol. 2132] length or height, and without obstructing view due to forests or other obstructions incident to civilization, that is represented by a dense population, there being few grade crossings due to the scarcity of roads.

Q. Are the grade conditions in Arizona and New Mexico generally less severe or more severe than on other parts of the System?

Mr. Strouss: I object to that as calling for a conclusion.

Mr. Mason: This is merely a statement of mathematical facts within the witness's knowledge.

The Court: The objection is overruled.

A. They are less severe because the grades of the lines are not very steep, much flat level grade exists, whereas, elsewhere, on other parts of the System——

Mr. Strouss: Now, I would like to have this also, to know what parts of the System he is talking about.

The Court: Yes, be specific on that.

Mr. Mason: Where you speak of other parts of the System, where heavier grades exist, what parts do you speak of?

A. Elsewhere in California and Oregon, the height of the mountain grades, the river crossings that we traverse, [fol. 2133] makes it necessary to use steeper grades.

Q. Now, what is the ruling grade, for example, on the mountain crossing between Roseville and Sparks, eastward?

A. The compensated grade ascending eastward would be 2.47.

Q. 2.47?

A. Yes, sir.

Q. And what is the ruling grade for the crossing of the Tehachapi Mountain from Bakersfield southward?

A. That is a compensated grade of 2.5 per cent.

Q. What is the ruling grade crossing the Pass between Colton and Indio, the so-called Beaumont Hill?

A. Two per cent.

Q. Is that eastward as well as westward?

A. It is a 1.9 per cent eastward and two per cent westward.

Q. What is the ruling grade crossing the Santa Margarita Mountains between San Luis Obispo and Paso Robles?

A. 2.2 per cent.

Q. In both directions?

A. Yes, sir.

[fol. 2134] Q. What is the ruling grade across the Siskiyou Mountains in northern California and southern Oregon?

A. 3.3 per cent.

Q. Is that on the line between Black Butte and Ashland?

A. That is correct, the old line.

Q. What is it on the line via Klamath Falls and Crescent Lake?

A. We develop up the western slope of the Cascades on a .4 per cent, but on the easterly slope the ruling grade is 1.8 per cent.

Q. Is that 1.8 per cent opposed to traffic moving from San Francisco to Portland?

A. It is opposed to traffic moving southward from the Willamette Valley or from Portland.

Q. To Klamath Falls and San Francisco?

A. To Klamath Falls and San Francisco.

Q. Do you encounter any such grades as those you have mentioned on any main line in the State of Arizona?

A. We do not.

Q. Do you encounter any grades such as those in any part of the State of Nevada or Utah?

A. We do not.

Q. Will you say whether or not climatic conditions as [fol. 2135] they affect railroad maintenance and operation which prevail in Nevada and Utah resemble or differ from the conditions which prevail in Arizona?

A. They resemble.

Q. Is there any difference in the winter weather along our lines in Nevada as compared to the winter weather along our lines in Arizona?

A. The winter conditions are similar, except for the territory between Caslin and Montello, a distance of about 120 miles, where, particularly in the territory west of Wells, very low temperatures exist during the winter months, our thermometers having recorded temperatures below zero, ranging from 40 to 60 degrees.

Q. Do those periods of extremely cold weather prevail throughout the winter or only at intervals?

A. At intervals during the winter months only.

Q. Is Nevada generally a region of sparse rainfall, and having the other conditions of soil which you refer to as obtaining in Arizona?

A. It is.

Q. In referring to the grades on other portions of the System, I overlooked calling your attention to one other. [fol. 2136] Are you familiar with the grade at the upper end of the Sacramento Canyon from Dunsmuir up to Mount Shasta?

A. Yes, we use a 2.2 grade climbing out of Dunsmuir to the territory of Mott, then we flatten off into a 1.4 per cent.

Q. One other grade I want to ask you about, the grade on the western division between Niles, California and Tracy, California?

A. Altamont Hill is developed on a ruling grade of 1.3 per cent.

Q. Do the climatic and operating conditions which you have described in Arizona prevail likewise to a large extent on the company's lines in New Mexico?

A. That is correct.

Mr. Mason: I think that is all. Thank you. You may cross examine.

Mr. Strouss: I won't be able to release Mr. Kirkbride completely tonight, but I have some questions I want to ask.

Cross-examination.

By Mr. Strouss:

Q. When you were discussing earlier in the day defects in the rails, what did you mean by the term "defects," [fol. 2137] Mr. Kirkbride?

A. Well, rails in service develop weaknesses that result in actual breakage or removal from track because they are not considered suitable for further use. Now, there are various different kinds of defects.

Q. What I particularly want to know, were you using the term "defect" there with the meaning that flaws were in the rail which were caused in the making?

A. The source can be traced back to some imperfection in the manufacture in the rail.

Q. In other words, you are using the term "defect" as something that was wrong with the rail itself, not something that is, well, as contrasted to the wear of the rail?

A. Well, defects develop through wear. By way of illustration, you might have in the rolling of a rail, the hot metal having been taken off of the furnace, the open hearth furnace, and poured into an ingot, and then the ingot put in the soaking pit, and then finally put through the rolls, there might be certain imperfect practices, for instance, inclusions of slag might be in the rail, and that inclusion of slag would be in the rail when it is delivered to the [fol. 2138] company that purchased the rail. Now, there might be gas bubbles of hydrogen in the hot metal and in the soaking pits the rail wasn't given the opportunity to let the hot gases get out, and you would roll that rail and there would be a bubble that would be stretched out on the interior section of the rail, and it would take many years of service before that pipe, as we call it, due to this bubble of gas that is spread out in lamination, before it breaks. Of course, as I say, the original source of that defect was in the manufacture of the rail. Now, there might be various other defects in the rail.

Q. You are speaking, then, about defects in the manufacture of the rail, not the normal wear of a perfect rail?

A. I am not referring to the normal wear of a perfect rail.

Q. By the way, is the American Railway Engineering Association, is that a branch of the A.R.A.?

A. It is a branch.

Q. And when you refer to the A.R.A., that now is known as the A.A.R., is that correct?

A. That is correct. We still have the American Railway Engineering Association?

[fol. 2139] Q. But it is a branch now of the A.A.R.?

A. That is correct.

Q. Now, I believe you testified that as to Exhibits 155 and 156, that the condensing of the profile exaggerates, was it the vertical lines?

A. Well, it exaggerates the contour of the ground.

[fol. 2140] Mr. Strouss: If one map is drawn on a different scale than the other, the map with the smaller scale would be exaggerated more, would it not?

A. It depends on the relationship between your horizontal scale and the vertical scale.

Q. I believe you stated these were vertical scales that were shown on these exhibits?

A. I stated the vertical scale was illustrated by the horizontal lines marked 1000, 2000, 3000 or 4000.

Q. The scale on exhibits 155 and 156 seem to be different. That is, the scale on 155 seems to be a larger scale than on 156. I wondered why you used a different scale.

A. The original map is a master tracing and these are photostats. Obviously the scale will not be the same depending on the exact size the map was made.

Mr. Mason: I will say this for your information, Mr. Strouss, that Mr. Kirkbride may not have been familiar with the fact that we were trying to make these sheets all 11-1-2 inches wide and that is why one has been reduced a little more in the photograph than the others.

The Court: Because the originals were not the same [fol. 2141] size.

Mr. Mason: There is more information up and down on 156 than there is on 155. There had to be three drawings placed one above the other in order to show the profiles on 156 and only two on 155 and consequently there has been a little more squeezing on 156 in photography.

Mr. Strouss: That is what I was trying to develop, that 156 has been condensed more than 155.

Mr. Mason: The condensation naturally is simply that due to increase or decrease in size of photograph and squeezes the exhibit both ways, horizontally as well as vertically.

Mr. Strouss: That is true in both exhibits.

Mr. Mason: Yes.

Mr. Strouss: The Southern Pacific Company has the profile maps showing these,—I don't mean here in Tucson?

A. Yes, we have the profiles in San Francisco from which these condensed profiles are made.

Q. The Southern Pacific Company also maintains records with respect to curves on its line, does it not?

A. We do.

Q. Is that called a contour map?

[fol. 2142] A. No, the alignment of the track is shown in plan, including the right-of-way and land ownership and so forth by a right-of-way map upon which the alignment of the track is platted as well as the right-of-way that is known upon which the railroad is built.

Q. Does that show the curves and their location and degree of curve?

A. Yes, sir.

Q. Are there other records giving that same information?

A. Yes, there are various records.

Mr. Strouss: I would say to counsel I would like the profile records showing the ruling grades in both these territories and I want the record showing the curves and the location and the degrees of curvature in both territories.

Mr. Mason: Let me discuss with you off the record whether we will be able to satisfy your request and we will be able to say on the record whether we can.

Mr. Strouss: All right.

Q. You testified concerning the speed limits, both passenger and freight. Each division has special rules and special instructions governing speed in their territory, isn't that true?

[fol. 2143] A. That is correct.

Q. That is shown on the employes' timetables for the particular division?

A. Yes, sir.

Mr. Strouss: I understood from counsel that those timetables will be put in.

Mr. Booth: Yes, we will put in a complete set of timetables and either side may use them.

Mr. Mason: I think it is desirable to have the employes' timetables for the entire system part of the record and we will undertake to produce a sufficient number so they may be made an exhibit in the record. They have already been furnished to Mr. Strouss but I am not sure that those furnished are the latest editions as of this date. There have been some trains put on and perhaps some taken off since those were furnished.

The Court: Did I understand you to testify, Mr. Kirkbride, that with the exception of the mileage in the Tucson

yards the entire main line of the Southern Pacific was protected by block signals?

A. That is correct.

Mr. Mason: I take it your Honor has reference to the line in Arizona.

The Court: Yes.

[fol. 2144] Mr. Strouss: In your testimony a few minutes ago regarding the density of population did I understand you to testify that there is the same density of population along your main line in Nevada as in Arizona?

A. I didn't mean to say the same, but the situation as to population is very similar, the towns being far apart and rather few, so that there are long distances between stations without obstructions.

Q. As to grade crossings?

A. There are few grade crossings and both states are similar in that respect.

Q. What about the cities in Arizona? Are there comparable cities in Nevada?

A. The cities of Arizona are larger than in Nevada.

Q. And that results in more grade crossings?

A. Well, I wouldn't say that. For instance, the town of Reno while of less population than Phoenix or Tucson have a fearful lot of grade crossings; there is one grade crossing right after another.

Q. There are quite a few in Phoenix, aren't there?

A. Yes, that is true.

[fol. 2145] Q. And Tucson?

A. No, Tucson isn't so bad, and they have some subways in Tucson.

Q. They don't have any in Reno?

A. We have no subways in Reno—pardon me, I want to correct that. There are two subways in Reno, the outermost parts of Reno.

Q. Your maintenance crews have been reduced quite a bit over the last 15 or 20 years, haven't they?

A. No, I wouldn't say that.

Q. I am speaking about the number of crews now.

A. There has been some reduction in sections. Are you referring to section forces as pertaining to a section?

Q. That is right.

A. There has been some increase in the length of sections due to providing the section men with gasoline motor cars.

Q. So that your sections have been lengthened out and the number of section crews have been reduced?

A. Yes sir, but when we talk of track forces or section forces we include the extra gangs which now do the major part of the track work.

[fol. 2146] Q. Do you have your record of grade crossings for the two states?

Mr. Mason: We intend to put in an exhibit of the grade crossings of Arizona and Nevada.

Mr. Strouss: I think that is all the questions I have at the present time.

The Court: What is the mileage covered by one section crew now?

A. The average length of a section is ten miles; they will run up to 14 miles or they may be eight miles where curve conditions exist.

Mr. Mason: By that you mean track miles rather than road miles.

A. I mean track miles but not including sidings.

Mr. Mason: Do you have shorter sections in double track territory where there are two tracks to be maintained expressed in road miles?

A. Expressed in road miles it would be a shorter distance.

Mr. Strouss: The tonnage ratings of your locomotives are also shown in your employes' timetables for the particular divisions?

A. Yes, sir.

Mr. Strouss: After I have examined these records which I have referred to I may have some further questions. If [fol. 2147] Mr. Kirkbride is leaving I can look those records up and tell you after I have gone over them whether it will be necessary to bring him back.

Mr. Mason: We appreciate that very much, Mr. Strouss. Then you will not require him to return Tuesday morning, the 14th, for further cross-examination?

Mr. Strouss: No, I will want to examine the records which I will discuss with you after we have recessed before I will be prepared to cross-examine him further.

Mr. Mason: Will it be convenient for you to return at some other time, Mr. Kirkbride, if Mr. Strouss wants you to do so?

A. Yes.

(Discussion off the record.)

The Court: Then we will recess until Tuesday morning at ten o'clock.

(Thereupon at 4:00 p. m. January 9, 1941, the court stood at recess until 10:00 a. m. Tuesday, January 14, 1941.)

[fol. 2148] January 14, 1941, Ten o'clock A. M.

Proceedings were resumed at this time as follows:

The Court: You may proceed.

Mr. Mason: Before we proceed with any further testimony, Your Honor, I wanted to discuss with Mr. Strouss the matter of some stipulation with him which would cover the exhibits Nos. 11 and 12, which were offered when Mr. Porter of the New York Central was on the stand. In connection with other exhibits of this same kind, Mr. Strouss, there were certain questions you asked of the witness who presented them, and I am wondering if we couldn't have from you a statement of the questions that you would ask Mr. Porter if he were recalled, then we will obtain by correspondence with him the answers, and we can stipulate those answers in the record?

Mr. Strouss: Yes, I will be glad to do that.

Mr. Mason: Will you give the matter your consideration and tell me, perhaps today, what those questions will be, and I will air-mail Mr. Porter the questions and get the answers to them.

Mr. Strouss: I will do that this noon.

The Court: That is as to exhibits 11 and 12?

[fol. 2149] Mr. Mason: Yes, Exhibits 11 and 12. I will call Mr. Masson for further testimony.

L. J. Masson was recalled to the stand, and testified further as follows:

Direct Examination (Continued).

By Mr. Mason:

Q. Mr. Masson, I think that the last exhibit introduced by you was No. 151, Freight Operating and Freight Transportation Expenses Related to Traffic, Southern Pacific Company, Calendar years 1922 to 1939, Inclusive?

A. That is true.

Q. Have you that exhibit before you now?

A. Yes.

Q. Now, I wish you would refer, please to columns 4 and 6, particularly, of that exhibit, and state, if you will, explain your answer, whether the expenses which are included in freight transportation expenses, column 4, and which becomes the cost per thousand revenue ton-miles when carried into column 6, are affected by increases or reductions in train lengths.

[fol. 2150] Mr. Strouss: If the Court please, I object to that. The exhibits can speak for themselves, and it is plain here that this is made up of a number of items that the witness has testified to. If there is going to be testimony as to what the effect would be, I think the evidence should be as to what those items are and the changes in them.

The Court: Your objection is that it calls for a conclusion of the witness?

Mr. Strouss: Yes, calling for a conclusion.

The Court: I am inclined to sustain the objection, Mr. Mason. The objection is sustained.

Mr. Mason: Referring to freight transportation expenses, Mr. Masson, will you state whether or not wages of trainmen and enginemen are included in the items which go to make up those totals?

A. Yes.

Q. Now, will you state whether or not the item of the expenses of wages for trainmen and enginemen increases in proportion, or tends to increase in proportion to the number of trains operated?

Mr. Strouss: I object to that as calling for a conclusion. [fol. 2151] The facts might be testified to, but the conclusion to be drawn from those facts, is a matter for the Court. It is not a matter of expert testimony.

The Court: Yes, I will sustain the objection.

Mr. Mason: You are familiar, are you, Mr. Masson, with the fact that when a train is operated there must be trainmen and enginemen employed in connection with that operation?

A. Yes, sir.

Q. And do you know how many men are employed to operate a train of seventy freight cars in Arizona as members of the train and engine crews?

A. Two men on the engine, engineer and fireman, conductor and three brakemen.

Q. Now, if the train consists of sixty or seventy cars, are the same number of men employed?

A. Yes.

Q. If the train were to consist of a hundred cars, would the same number of men be employed?

A. Yes.

Q. If two trains are operated, do you employ twice as many men, or any additional men?

A. Naturally, we would have to have a crew for each train.

Q. Would you pay additional wages to the additional train crew for the second train?

[fol. 2152] Mr. Strouss: What is meant by "additional wages"; other than their regular wages?

Mr. Mason: Would the men employed on the second train be paid for their services?

A. Well, the boys don't work for nothing.

Q. Thus, by a series of what might be called second or first grade questions, we have established that the expense varies upward or downward in proportion to the number of trains operated; is that correct?

Mr. Strouss: I object to that as calling for a conclusion.

The Court: The objection is overruled.

A. The facts are these: as I said, the boys don't work for nothing. If we operate one train, we pay one crew's wages, the wages of one crew; if we operate two trains,

naturally we have to pay two crews. It naturally follows that the expense is greater for two trains, in wages than it is for one train.

[fol. 2153] Mr. Mason: Q. Now, Mr. Masson, suppose that we have at Yuma 490 cars to be moved over the Tucson division eastward. Under present restrictions what is the minimum number of trains in which those cars could be moved?

A. That would take seven trains of 70 cars each, 490 cars.

Q. Suppose that the Train Limit Law being absent, it were practicable to move in units of, let's say, 100 cars, how many trains would be required?

A. I should say four trains of 100 cars each and one train of 90 cars.

Q. So in one instance there would be seven trains and in the other not more than five, is that correct?

A. That is true. Now, of course, dispatchers might work those cars into fewer trains, four trains possibly.

Q. Will you say whether or not a train limitation such as a 70-car law has the effect of increasing or reducing the number of trains required to handle a given amount of traffic?

Mr. Strouss: I object to that question as calling for a conclusion.

The Court: Objection overruled, it is very evident what [fol. 2154] the answer will be.

Mr. Strouss: It is not a matter of expert testimony.

Mr. Mason: Isn't a matter of mathematics well within the comprehension of the assistant general auditor? Even an ordinary attorney may figure that one.

The Court: He may answer.

A. Possibly I could answer that with some figures. Let's take 1939, for instance.

Mr. Mason: First of all I would like to have the question answered specifically. Will you read the question, please.

(The question was read by the reporter as follows: "Will you say whether or not a train limitation such as a 70-car law has the effect of increasing or reducing the number of trains required to handle a given amount of traffic?")

A. Where a given amount of traffic expressed in ton-miles or car-miles is to be moved, the number of trains re-

quired to handle it will increase if the trains are shortened. In other words, as longer trains are operated; fewer of them will be required to handle the same quantity of traffic.

Q. I think you have stated when additional trains are operated additional wages are paid. If fewer and longer [fol. 2155] trains are operated, will the wage expense for train and engine service employees tend to increase or reduce, assuming that the volume of traffic remains constant?

A. Over all the fewer, the number of trains the less wages we will have to pay.

Q. Then if for a constant volume of traffic you pay less wages, can you make a similar computation as to the wage cost per unit of traffic handled, contrasting long-train and short-train operations?

A. The longer the train, the lesser will be the unit cost.

Q. Speaking of wages?

A. Yes.

Q. Where longer trains are operated and fewer of them, will you require more or fewer locomotives for the operation?

A. Longer trains would require of course fewer locomotives, assuming that heavier power will be used.

Q. Do costs of locomotive operations such as fuel and supplies enter into the accounts which form the group making up freight transportation expenses?

A. Yes.

Q. In the operation of fewer locomotives in the manner that you have indicated, would the costs of locomotive fuel [fol. 2156] and supplies tend to increase or to decline?

A. It would decline.

Mr. Strouss: May I have my objection go to the competency of this?

The Court: Yes.

Mr. Mason: What effect, if any, would that tendency to decline have upon the unit cost of freight transportation expense applied to a unit of traffic?

A. The more units of traffic that you can handle in a train the lesser will be your unit cost.

Q. Have you before you a statement in one sheet bearing title, "Southern Pacific Company, Freight Operating and Freight Transportation Expenses Related to Traffic, State of Arizona, Calendar Years 1922 to 1939, Inclusive"?

A. Yes.

Mr. Mason: We ask that this statement be marked No. 160 for identification.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 160 for identification.

Mr. Mason: This statement appears to be similar in form to exhibit No. 151, Mr. Masson, is that correct?

[fol. 2157] A. Yes.

Q. And relates entirely to the state of Arizona?

A. Yes.

Q. Did you have this statement prepared under your direction?

A. Yes.

Q. From what sources?

A. As shown at the bottom of the exhibit, it is taken from schedules 931 and 720 or corresponding schedules of annual reports to the Corporation Commission of the state of Arizona.

Q. Are the computations in columns 5 and 6 and those in the blocks at the foot of the sheet made from the other figures appearing in columns 2, 3, and 4?

A. Yes.

Q. Will you state whether or not the explanation previously made in connection with exhibit No. 151 applies also to exhibit No. 160 for identification?

A. Yes.

Q. Has the exhibit been compared and checked against the original sources?

A. The exhibit has been prepared under my supervision [fol. 2158] and direction, and I spot-checked it and it is correct to the best of my knowledge and belief.

Q. I think you stated previously that any reports to the Corporation Commission of the state of Arizona were available?

A. Yes, they are available.

Mr. Mason: I believe, Mr. Strouss, that you have them from another source anyway?

Mr. Strouss: I don't have them here, they are on file with the Corporation Commission.

The Witness: We have them here.

Mr. Strouss: Mr. Masson has told me that.

Mr. Mason: Have you any questions on No. 160, Mr. Strouss?

Mr. Strouss: Yes. This includes both interstate and intrastate expense, doesn't it?

A. It includes the expense of handling all traffic within the state of Arizona.

Mr. Strouss: Interstate and intrastate?

A. Yes.

Mr. Strouss: Is there any formula used in connection with the apportionment of the expense on interstate?

A. To the state of Arizona?

Mr. Strouss: Yes.

[fol. 2159] A. Yes, as prescribed by the Corporation Commission of the State of Arizona.

Mr. Strouss: And the amounts shown here are in accordance with that formula?

A. Yes, the amounts shown there represent freight expense directly assignable to the state or the freight proportion of interstate expense allocated to the state in accordance with this formula.

Mr. Strouss: I have no objection to the exhibit.

Mr. Mason: We offer it in evidence as No. 160.

Mr. Strouss: This covers all expense, branch lines as well as main lines, doesn't it?

A. Yes.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 160").

[fol. 2160] Mr. Mason: In connection with Exhibit 160, Mr. Mason, will you please refer to Exhibit 149?

A. Yes, sir, 149. Do you refer to Exhibit 160?

Q. I want you to look at 160 and 149 together. As I understand it, Exhibit 149 shows the results of freight train operation in the State of Arizona and, as you have explained, shows the average cars per train in column 4?

A. Yes.

Q. Now, will you look at the years 1922 to 1925, inclusive, in column 4 of 149? Can you compute, readily, the average cars per train during that four-year period? Well, if the computation has not been made, I will pass the subject matter for the moment.

A. No, the computation has not been made.

Q. And ask you to make the computation at the first recess, then we will return to it. Are there any figures on 160 which can be compared with figures on Exhibit 151 for the System?

A. The material comparisons are found in the lower part of the exhibits, where the exhibit 160 shows that in Arizona, there was a reduction in the cost per thousand revenue [fol. 2161] ton-miles of total of freight operating expenses of nineteen and a half per cent.

Q. That is the last figure in Column 5 of Exhibit 160?

A. Yes. Now, the corresponding figure in Column 5 of Exhibit 151 shows that there was a decrease in freight operating expenses on the System of 28.1 per cent.

Q. That is the comparison of the first full four-year period shown on each exhibit with the last full four-year period shown on each exhibit, isn't it?

A. Yes.

Q. Will you also refer to the figures in column 6, and especially of percentage of improvements?

A. In Arizona, exhibit 160 shows, in column 6, a reduction in freight transportation expenses of 6.8 per cent as against a reduction on the System of 21.5 per cent, which is shown in column 6 of Exhibit 151.

Mr. Mason: Have you any questions, Mr. Strouss, before we pass to another exhibit?

Mr. Strouss: No; I think I prefer to wait until you have completed your examination. I will have to go back and [fol. 2162] piece this together when he is finished.

Mr. Mason: Have you before you, Mr. Masson, a statement in one sheet entitled "Southern Pacific Company——"?

The Court: (Interrupting) Oh, Mr. Mason, before you go on with that, the Court does have one question.

Q. Now, I notice by reference to Exhibit 160, as you have just pointed out in your testimony, that the percent of improvements over the entire system, or at least the Pacific Lines, was far greater, that is in the last line; the fifth and sixth columns, than it was in the State of Arizona, and yet,

I find difficulty in reconciling that with the fact that, taking your totals for the years 1936 to 1939, the freight operating expense for the entire system, averaged per one thousand revenue ton-miles apparently $7.15, whereas, within the state of Arizona, it was only $5.97. Isn't that a lesser cost of operation?

A. It is a lesser cost, but the degree of reduction is more on the System than it is in Arizona. The unit cost, it is true, is less. But when we compare the unit cost in the first block, 1922 to 1925, with 1936-1939, we find that rela- [fol. 2163] tively the costs have reduced to a greater extent on the System.

Q. And yet, Mr. Masson, in the first four years of this period, 1922 to 1925, the operating cost or expense for the entire system was $9.94 as against $7.42 for the State of Arizona?

A. That is true.

Q. I find a little difficulty in my own mind in reconciling these figures with the figures in the two columns above?

A. Possibly we look at it in a different way. You are looking at it as to the unit cost. We concede that the unit costs in Arizona, according to these figures, are lower than the System's. However, comparing the two periods, while the cost in Arizona is lower, the progress downward was at a less rapid pace than on the System as a whole.

Q. In other words, you are making more substantial reductions in your cost of operations on the System as a whole?

A. Yes.

Q. On a percentage basis than you were in the State of Arizona?

A. Yes; that is the intent of this exhibit, that is what this exhibit intends to show, the pace or the rapidity of the [fol. 2164] decline was greater on the System, expressed percentage-wise, than it was in Arizona.

Q. Well, even conceding that to be true, as shown by your exhibits, how do you account for the fact, in light of your previous testimony here this morning, that it costs more to operate the short trains, proportionately, than it does if you were to operate long trains, I say, how do you account for the fact that the operating cost in the state of Arizona is less than over the entire system?

A. That is because the entire system takes up all of its operations, long trains, short trains, main line and branches.

Now, the System as a whole, has many branches, which, of course are not affected by the long or the short train operations.

Q. By the way, Mr. Masson, let me interrupt there. I notice your exhibit 151 refers to Pacific Lines?

A. Yes.

Q. Does that include the entire System?

A. Yes.

Q. So, when you say, "Pacific Lines," you really mean the Southern Pacific Railroad Company, in its [fol. 2165] entirety?

A. In its entirety? I don't mean that, no, sir. The Southern Pacific Company owns and operates the lines from——

The Court: Well, shown here on Exhibit 151.

The Witness: Yes. Besides that, it operates the Atlantic Steamship Lines, that is the Southern Pacific Company. When we speak of the Pacific Lines of the Southern Pacific Company, we mean the lines that are on the map there.

The Court: The railroad?

A. Yes.

Mr. Mason: It doesn't include the lines east of El Paso, Texas?

A. No, it doesn't. The lines east of El Paso, Texas, are operated by the Texas and New Orleans Railroad. That railroad is wholly owned by the Southern Pacific Company, but it is separately operated.

The Court: But the statistics of operation are included in your Exhibit 151?

A. No, sir; later on in my testimony. I will have an exhibit that will show the net income of the transportation system. We know, or we term the lines, that are the map, the Pacific Lines of the Southern Pacific Company. The [fol. 2166] lines that are on the map plus the lines east of El Paso, and the Atlantic Steamship Lines are known by us as the transportation system of the Southern Pacific Company.

The Court: I see.

The Witness: (Continuing) So the exhibits that we are submitting here headed, "Pacific Lines," deal only with the lines that are on the map.

The Court: But that does not include the line from El Paso to Tucumcari?

A. Oh, yes, I overlooked that when I said east of El Paso. It includes the lines from El Paso to Tucumcari as part of the Pacific Lines.

The Court: All right.

Mr. Strouss: I didn't mean to say that I wouldn't eventually have some questions of this witness.

The Court: I understand that, Mr. Strouss.

Mr. Mason: I understand. I said, at this time.

Mr. Strouss: I have a number of questions on the exhibit, but I want to see what further exhibits are put in. There may be an exhibit as to operating ratios.

The Court: You may proceed.

[fol. 2167] Mr. Mason: Mr. Masson, were you present in the courtroom when Mr. Kirkbride testified as to the operating conditions in Arizona and Nevada, and to some extent as to those in California and Oregon?

A. Yes, sir.

Q. These absolute unit cost figures, getting away for a moment from the improvement percentages, for Arizona as compared to the System as a whole to some extent would be affected by the operating conditions in Arizona if they are more favorable than those which prevail in other parts of the System, would they not?

A. Naturally.

The Court: Will you read that question and answer?

(The last question and answer were read by the reporter.)

Mr. Mason: Now, in order to complete the picture, Mr. Masson, will you turn to your next exhibit, "freight operating and freight transportation expenses related to traffic, State of Nevada," have you that before you?

A. Yes.

Mr. Mason: May we have that statement in one sheet marked "Defendant's Exhibit 161?"

[fol. 2168] The Court: It may be marked.

The Clerk: Defendant's Exhibit 161 for identification.

Mr. Mason: Will you state, Mr. Masson, whether Exhibit 161 for identification resembles No. 160 and also 151?

A. Yes.

Q. But relates entirely to the State of Nevada?

A. Yes.

Q. What is the source of the figures?

A. Taken from the annual report to the Public Service Commission of the State of Nevada, that is, columns 2, 3 and 4, are taken from that source.

Q. And the computations are otherwise your own computations?

A. Yes.

Q. And you have undertaken to show percentages of improvement by four-year periods, comparing the first four years with the last four years?

A. Yes.

Q. Are the figures for freight operating and freight transportation expenses for traffic handled in Nevada allocated to that state in accordance with a formula prescribed [fol. 2169] by the Public Service Commission?

A. They are allocated to the state in accordance with a formula adopted by the National Association of Railway Commissioners.

Q. National Association of Railway Commissioners?

A. Yes.

Q. Is the same formula followed in both Arizona and Nevada?

A. No.

[fol. 2170] Mr. Mason:—What is the difference, if any, between the formula used in allocating the expenses to the state of Arizona and that used in allocating expenses to the state of Nevada?

A. Read that question back, please.

(The question was read by the reporter.)

A. The difference is this, that expenses allocated to Nevada are on a straight relative train-mile basis, whereas the expenses allocated to Arizona are on the basis of the formulae prescribed by the Arizona commission.

Q. Does the formula prescribed by the Arizona commission take into account other matters besides the train-mile basis?

A. It does, various accounts are split on different bases.

Q. Are any of them allocated on the train-mile basis?

A. I don't find that any of them are.

Q. Are any of these expenses directly allocated to the states in which they are incurred instead of being apportioned?

A. In Arizona, yes; Nevada, no.

The Court: Mr. Masson, these two exhibits which are identical as to form, I refer to No. 160 and No. 161, which purport to show the status of matters in the states of [fol. 2171] Arizona and Nevada, are the figures shown in columns 5 and 6 for those two states comparable?

A. As to the manner of composition, no.

The Court: That is by reason of the fact that a different formula or basis is used for the preparation of these reports in accordance with the laws of the state of Nevada and the laws of the state of Arizona?

A. Yes.

Mr. Mason: Has the same method of allocating the expenses to the state of Arizona been in effect throughout the period 1922 to 1939 shown on exhibit No. 160?

A. Yes.

Q. Has the same method of allocating the expenses to the state of Nevada been in effect throughout the period shown on exhibit No. 161 for identification?

A. Yes.

Q. Will you say whether or not the exhibits correctly indicate the trends of expenses over the period indicated, disregarding for the moment any attempt to compare absolute costs?

A. In my opinion they do.

Q. Do they indicate the trends of expenses, actual and [fol. 2172] average expenses, in the same manner as No. 151?

A. Yes.

The Court: In exhibit No. 151, which covers your entire system, are the figures shown there more comparable with the Arizona setup or with the Nevada setup?

A. They are more comparable with the Nevada setup.

Mr. Mason: Are these figures on exhibit No. 151 the actual figures without allocation of the entire system?

A. Those are the actual figures for the entire system.

Q. Those are not allocated or apportioned?
A. As between services only.
Q. But not as between territories?
A. No.
Q. These figures on exhibit No. 161 are apportioned as between Nevada and the balance of the system, are they?
A. Yes.
Q. These represent the Nevada apportionment?
A. Yes.
Q. As reported and as required to be reported to the Public Service Commission of that state?
[fol. 2173] A. Yes.
Q. Is this a correct transcription of the figures appearing in the reports to the Public Service Commission?
A. Those figures were taken from the reports to the commission, were spot-checked by me, and I believe them to be correct.
Q. And the computations were made under your direction, were they?
A. Yes.
Q. Have you the reports to the Nevada commission for the period of years covered by exhibit No. 161?
A. We have them here. They are in use now, but we will have them available for Mr. Strouss at the close of my testimony?

The Court: Just one more question. I notice by reference to exhibit No. 151 those figures are taken from the reports made to the Interstate Commerce Commission. I take it that Arizona is the one that is out of step in its accounting system rather than Nevada?
A. I wouldn't say that Arizona is out of step, Your Honor, that is the method they require. We have besides Arizona a different basis yet for Oregon, so that each state according to its disposition and outlook has required the [fol. 2174] allocation of expenses to their respective states according as they saw fit. Arizona prescribed this formula; Oregon has another formula; Utah, New Mexico, California, Nevada, all use the formula prescribed by the National Association of Railway Commissioners.

Mr. Mason: Irrespective of the differences in formulae, will you say whether or not the figures as reported to the several commissions of Arizona or Nevada or to the Inter-

state Commerce Commission will reflect increases or reductions in expenses of operation as they occur?

A. Yes.

Q. Will they accurately reflect the trends of operating expenses either upward or downward as those trends are revealed in actual money spent?

A. Yes.

Mr. Mason: Have you any questions on exhibit No. 161, Mr. Strouss?

Mr. Strouss: Yes, I have. Mr. Masson, the same basis of wage scales is not in effect in Nevada and Arizona as far as train crews are concerned. In other words, your enginemen are paid on the basis of so-called "mountain territory" and "plain territory"?

[fol. 2175] Mr. Mason: Paid on the basis of weight on drivers in both states.

Mr. Strouss: One uses the mountain territory as a basis and the other is on the basis of plain territory, isn't that true?

A. The basic rate is the same but our enginemen are paid according to the weight on drivers. Naturally where we have heavy power the engineman will get a higher rate of pay than the man who is running a smaller engine.

Mr. Strouss: You have a differential in wages according to whether it is so-called "mountain territory" or "plain territory"?

A. Yes.

Mr. Mason: I didn't qualify the witness in respect to that and I don't know that this is proper cross-examination in any event. The agreements with the train and engine service employees contain rates for the districts and divisions as shown on Mr. Kirkbride's exhibit, showing the divisions by boundaries and would unquestionably be the best evidence, if you have a copy, that is, brought down to date. As a matter of fact I am sure there is no mountain differential on enginemen, that is based entirely on weight on drivers. You may be correct as to trainmen.

[fol. 2176] Mr. Strouss: I am asking this to lay the basis for an objection that this is not proper. Cost of helper service is an item that enters into transportation and operating expense, isn't that true?

A. Yes.

Mr. Strouss: It is a fact on the Salt Lake division your helper service there is something over one hundred thousand locomotive-miles in excess of that in Arizona, or was for the year 1939?

A. In what territory?

Mr. Strouss: Salt Lake division, in excess of that in Arizona.

Mr. Mason: Is that a matter that is now in evidence?

Mr. Strouss: I don't think it is in evidence, I am seeking the information.

Mr. Mason: It is based upon an assumption of fact not in evidence.

Mr. Strouss: I am taking the information from the records given to me. I am asking if it is a fact as shown by the record of the company as a basis for determining whether there is a comparison between the two divisions.

Mr. Mason: I think that is improper cross-examination. I think that if that is a fact it should be brought out in the State's affirmative case. I don't think there is any such [fol. 2177] fact in evidence now.

The Court: I believe that is true.

Mr. Strouss: This is offered as a comparison between the two divisions, whether they are comparable or not.

Mr. Mason: Isn't that a method of affirmative attack on the part of the State to show that the comparison, such as it is, has certain deficiencies?

The Court: No, I will overrule the objection. However, we are not going into great detail on this or into contracts which are not in evidence. We will take our morning recess at this time.

(Thereupon a short recess was taken after which proceedings were resumed as follows.)

Mr. Mason: I think there was an unanswered question pending.

The Court: Yes. You may proceed, Mr. Strouss.

The Witness: That question was what?

(The question was read by the reporter as follows: "It is a fact on the Salt Lake division your helper service there is something over one hundred thousand locomotive-miles in excess of that in Arizona, or was for the year 1939?")

A. Are you speaking of state of Arizona or Salt Lake division against Tucson division?

[fol. 2178] Mr. Strouss: Against the Tucson division.

Mr. Mason: I suggest without undertaking to renew the objection to the question if the question relates to the Salt Lake and Tucson divisions it doesn't exactly address itself to exhibit No. 161 for identification, which relates to the state of Nevada, and its companion exhibit, No. 160, relates to the state of Arizona. The Salt Lake division includes mileage outside the state of Nevada and does not include all the mileage within that state, although nearly all of it, but it includes mileage in Utah and California as well. The Tucson division does not include all the mileage in Arizona, as Your Honor will recall from Mr. Kirkbride's exhibit No. 154.

The Court: As to the question relating to a comparison between the divisions, the objection will be sustained.

[fol. 2179] Mr. Strouss: Well, can you limit that to the two states? As to the two states, Nevada and Arizona, the helper cost for the year 1939 was substantially in excess of that in Nevada, wasn't it?

A. Will you pardon me just a moment until I get my books. Arizona, for the year 1939, had 201,311 helper locomotive-miles; Nevada had 70,678 helper locomotive-miles in freight service. That would indicate that the helper miles were greater in Arizona than they were in Nevada.

Q. Now, referring to yard switching freight service, the locomotive-miles in yard switching freight service was substantially greater in Arizona than in Nevada for the year 1939?

A. Did you say substantially greater in Nevada?

Q. In Arizona, freight service.

A. Arizona had 419,662 yard switching locomotive-miles in freight service, and Nevada had 146,196.

Q. That is an item that enters into both transportation and operation expense?

A. Yes.

Mr. Strouss: Those are the only questions I have.

[fol. 2180] Mr. Mason: What were the total locomotive miles in Arizona and Nevada in the year 1939?

A. Total locomotive miles in freight service in Arizona was 3,644,355; in Nevada it was 2,214,295.

Q. Where more trains are run, Mr. Masson, it is necessary to run more locomotive-miles, isn't it?

A. Why, yes.

Mr. Strouss: Are all these figures main-line or main-line and branch?

A. This is main line and branch.

Q. The last or all of them?

A. What is that?

Q. The last figures, the total locomotive miles, that is main-line and branch.

A. Yes, sir.

Q. Now, the figures given as to helper locomotive miles, main line only, wasn't it?

A. That is main line and branch, if we have any helper on the branch. In other words, those figures I quoted, come from Schedule 931 of the Annual Reports, which comprehends locomotives in all services on main line and branches.

Mr. Mason: And what about yard switching, is that main line only, or main line and branch?

[fol. 2181] A. That is wherever it happens to be. In other words, these figures I gave you are the totals within the state on any lines that are operated.

Q. These figures on 161, are likewise figures for the State, whether main or branch lines?

A. Yes.

Q. Is the same true of 160?

A. Yes.

Q. And 151?

A. Yes.

Q. I don't know whether I asked you, Mr. Masson, but, in any event, I will ask you again, is the Exhibit 161 for identification true and correct in so far as it reproduces the underlying source?

A. It is.

Q. And true and correct in so far as the computations are made?

A. It is to the best of my knowledge and belief.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit 161.

Mr. Strouss: Objected to as irrelevant and immaterial, and incompetent.

The Court: The objection is overruled. It may be ad-
[fol. 2182] mitted.

(The document referred to was received in evidence and marked "Defendant Exhibit No. 161.")

Mr. Mason: Now, are there any figures on Exhibit 161, Mr. Masson, to which you wish to direct attention, having in mind the preceding exhibits numbers 151 and 160?

A. Yes; the figures which represents the progress made in reducing expenses contained in the last line on Exhibit 161 entitled "Percent of Improvement, four years, 1936 to 1939, Compared with four years 1922 to 1925," shows that in the State of Nevada there was 30.7 per cent reduction in the average freight operating expenses per thousand revenue ton-miles. That is shown in column 5 of Exhibit 161. In column 6, the last figure therein, of Exhibit 161, shows that there was a reduction in the average freight transportation expenses per thousand revenue ton-miles of 24.4 per cent. That, by the way, is a much better showing than for the System.

Q. Has the basis of reporting and allocating the expense to Nevada been the same throughout the period shown in this exhibit?

A. Yes.

[fol. 2183] Q. Are the figures for the four-year period 1922 to 1925, inclusive, in the line which is shown for those figures, comparable from that standpoint to those for the last four years?

A. Yes.

Q. You were asked to refer to exhibit 149, and to compute the average cars per train for the four-year period 1922 to 1925, inclusive, for Arizona. Have you made that computation?

A. Yes. I developed a figure of 54.4 cars per train.

Q. Now, have you made the computation of the average cars per train for the years 1936 to 1939 for Arizona from the same exhibit?

A. I have not.

Mr. Mason: Well, we will defer that computation until two o'clock, and when you make it, I wish you would also make a computation of the average cars per train for Nevada for the four years 1922 to 1925, inclusive, and the four years 1936 to 1939, inclusive, from Exhibit 150.

(Addresssing Mr. Strouss:) Before we pass to the next exhibit, Mr. Strouss, I have in the courtroom here for the purpose of furnishing to you, in compliance with your request made at the conclusion of Mr. Kirkbride's testimony, [fol. 2184] the profiles of our main line in Arizona from the California-Arizona state line to the Arizona-New Mexico state line, including the line via Phoenix, and the south line via Douglas, main lines only, and likewise from the California-Nevada state line to the Nevada-Utah state line, both the so-called principal main line via Sparks, Imlay, Carlin and so forth, and the auxiliary main line from Fernley to the Nevada-California state line in the direction of Wendel and Alturas. Now, I understand these profiles include the information as to grades, as well as curvatures, which you wish to have. They are in the boxes in the rear of the inclosure here and will be available to you.

Q. Mr. Masson, have you before you a statement in one sheet entitled, "Southern Pacific Company, Freight Service, Operating Averages, Calendar Years 1922," and then alternate years to 1938, and including 1939?

A. Yes.

Q. Being in one sheet?

A. Yes.

Mr. Mason: We ask that this exhibit be marked No. 162 for identification.

The Court: It may be marked.

[fol. 2185] The Clerk: Defendant's Exhibit No. 162 for identification.

Mr. Mason: Did you cause Exhibit 162 for identification to be prepared, Mr. Masson?

A. Yes.

Q. Are the sources of the exhibit as shown in the footnotes thereon?

A. Yes.

Q. And do you recall Dr. Parmalee's exhibit No. 22?

A. Yes.

Q. I will ask you whether exhibit 162 for identification is similar to Dr. Parmalee's exhibit No. 22, the difference being that this exhibit relates to the Pacific lines of the Southern Pacific Company, whereas, the exhibit of Dr. Parmalee relates to Class 1 railroads of the United States?

A. It is the same as Dr. Parmalee's exhibit, except that

this exhibit 162 applies or deals with data pertaining exclusively to the Southern Pacific Company Pacific Lines.

Q. Now, Line No. 1, or Item No. 1 of exhibit 162 relates to miles of road operated in freight service. Will you state whether that includes only main lines or all main and branch lines?

[fol. 2186] A. Main and branch lines.

Q. What do the figures in Item 2, freight train-miles relate to, from the same standpoint?

A. All freight train-miles made on main and branch lines over the entire system.

Q. Are those figures contained in the OS-A reports in exactly the same form as they appear here?

A. Yes.

Q. What as to Item 3?

A. Item 3 appears in the OS-A report.

Q. Likewise Item 4?

A. Item 4, yes.

Q. Does Item 3 include only loaded cars or all cars both loaded and empty?

A. Loaded and empty.

Q. When you speak of net tons per freight train, as shown in Item 4, does that include any of the weight of equipment?

A. No, it only includes the contents of the traffic, the contents of the cars I should say.

Q. Does it include non-revenue as well as revenue freight?

A. Yes.

Q. Now, Item No. 5, is that a calculated figure?

[fol. 2187] A. Yes, that is based on data that is shown in the Annual Report to the Interstate Commerce Commission.

Q. It is a quotient as indicated in the note bearing the reference to Item 5?

A. Yes.

Q. And obtained from what figures appearing in the underlying source?

A. It is the total tractive effort that appears in Schedule 417, Column X, page 405, using 1939 as an illustration, divided by the total number of locomotives available for service at the close of the year.

Q. And is Item 6 a similar quotient calculated by division of items appearing in the annual report?

A. Item 6 is a figure that is reported in the annual report to the Interstate Commerce Commission in Schedule 417,

being on line 26 of the Annual Report for 1939, using that year as an illustration, page 406, except that we have in preparing this exhibit dropped one place in the decimal, raising the figure "five" to "six"; in other words, the figure in the annual report reads 47.55 whereas the figure in 1939 of the exhibit reads 47.6.

Q. In general, in this item number 6 you have reduced [fol. 2188] the decimal places to one and taken the nearest whole tenth, is that correct?

A. Yes.

Q. Now, these other figures, Items 7 and 8, are figures reported to the Commission, are they?

A. On Form OS-A, yes.

Q. And Item 9, is that a calculated figure?

A. Item 9 is a calculated figure, yes.

Q. The net ton-miles and the train-hours being reported on the form?

A. The net ton-miles, the basic figures are shown on Form OS-A.

Q. What about Item 10?

A. The basic figures are shown on Form OS-A, from 1922 to 1934, then the gross ton-miles, cars, contents and cabooses are shown on Form OS-A, and the equated net tons of fuel consumed is shown on Form OS-E, both of those forms are required monthly by the Interstate Commerce Commission.

Q. Do you have these forms, OS-A and OS-E to the extent that they have been used in the preparation of Exhibit 162 for identification available here in the courtroom?

A. Yes.

Q. And I think you have stated already that you have [fol. 2189] the annual reports on Form A to the Commission?

A. Yes.

Q. Likewise available. Has the exhibit been compared and checked as to the original figures and checked as to the compilations?

A. Yes, and the exhibit is correct to the best of my knowledge and belief.

Q. There are certain computations which appear in the two columns furthest to the right on the exhibit. Are those computations explained by the headings?

A. Yes.

Q. Have those computations likewise been checked?

A. They have been spot-checked by me, and they are correct to the best of my knowledge and belief.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: Mr. Masson, on Item 1, you have an increase of mileage of road operated?

A. No.

Q. That item, assume a mile of single track and a mile of double track road, would the double track be considered as one mile of road operated, or two [fol. 2190] miles?

A. That would be one mile. This is miles of road point to point. If we were speaking of tracks, we would say track-miles, that would include first, second and third track, and so on.

Q. You say point to point. Now, your line by way of Lordsburg, and your line by way of Douglas are considered as separate lines in this miles of road operated, are they not?

A. Yes.

Q. Although they both go from Tucson to El Paso?

A. No, we don't consider that as a second track.

The Court: Is that by reason of the fact they serve different territory?

A. Yes.

Q. They are not parallel in any sense of the word except for a short distance?

A. That is true.

Mr. Strouss: Your increases shown in miles of road operated are due to the acquisition of additional roads like the E. P. & S. W.?

A. Yes.

Q. And possibly the construction of some

[fol. 2191] A. Over the period of years, Mr. Strouss, from 1922 to 1939, that mileage figure is affected by the acquisition of lines, such as the Arizona Eastern and the El Paso and Southwestern, by the construction of new lines and by the abandonment of other lines.

Q. And usually your abandonment is due to the fact that a line has become unprofitable?

A. That is the only reason we would abandon the line.

Mr. Strouss: That is all.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit 162.

Mr. Strouss: No objection.
The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 162.")

[fol. 2192] Mr. Mason: Refefring to certain details in this exhibit, Mr. Masson, I wish first you would refer to item 4. Does the character of the commodities handled have any effect upon the figures shown in line 4.

A. Yes, they would be affected by heavy or light loading.

Q. For example, if the tonnage handled in a particular year consisted in large part or to a more considerable extent than in other years of such commodities as coal or ore, loading fifty tons to the car or somewhere in that neighborhood, would that have an effect upon the net tons per train?

A. Yes.

Q. Suppose that in another year the traffic consisted more largely of light loading commodities such as hay or lettuce would there be a corresponding or to some extent reduction?

A. Yes.

Q. In item 6 you speak of average capacity per freight-carrying car. Does that include only boxcars or does it include other type of equipment such as open-top equipment?

A. That includes everything, boxcars, flat cars, stock cars, gondola cars, etc.

Q. Oil tank cars if owned by the company?

[fol. 2193] A. Everything, all types of cars.

Q. Does it include refrigerator cars not owned by the company?

A. No.

Q. Is there any relation or coordination between the freight train speed in miles per hour appearing in line 7 and the gross ton miles per freight train hour appearing in line 8?

A. Yes, the faster you run your trains the more tonnage you get over the road within a space of time.

Q. Is there any interdependence as between the figures in line 8 and the figures in line 7?

A. Yes.

Q. Will you explain how the figures in line 8 are dependent, if they are, upon those in line 7 and what other factor enters into the gross ton-miles per freight train hour?

A. The gross ton-miles per freight train hour are determined by taking the gross ton-miles handled in the year and dividing that figure by the total freight train hours. A freight train hour represents the lapse of time from terminal to terminal. As I said before, the faster you run your trains over the road the more tons you will transport over that road in a specified time or in the time [fol. 2194] it takes the train to make the run between terminals. Does that answer your question?

Q. I think you have explained that the figure of gross ton-miles per freight train hour is a function of the speed of freight trains. Does it have anything to do with the loading of the freight trains?

A. Yes.

Q. Perhaps I should ask the question this way, will the figures in line 8 expressing gross ton-miles per freight train hour tend to increase or decrease as the trains become longer and contain more gross tonnage?

A. The more tonnage you cram in a train, the more your gross ton-miles per freight train hour will increase.

Q. Provided you also continue or increase the speed, is that correct?

A. Yes, assuming that we have the same speed as shown in 1939, 16.7, and assuming that we had a greater tonnage moved within the same space of time as is taken into this calculation, the figure shown in 1939 instead of being 36,364 would have been somewhat greater. Does that clear it up?

Q. Yes, I think it does. What is the significance of the figure in line 9, is that equally the function of train speed [fol. 2195] and loading?

A. Yes, and my remarks regarding item 8 would apply with equal force to item 9.

Q. Is item 9 to any extent affected by the character of the commodities handled, whether predominantly light loading or heavy-loading commodities?

A. Yes, it would be.

Q. Do the figures in item 8 have within them any similar effect?

A. Yes, item 9 is included in item 8.

Q. Referring to item 10, what is the significance of the showing of gross ton-miles per ton of fuel?

A. That indicates an economy of operation.

Q. Will you say whether from your experience as an accounting officer the figure of gross ton-miles per ton of fuel is in any respect, and, if so, to what respect, an index of the efficiency of locomotive operation?

A. The more work you can get out of a locomotive for a ton of fuel the less will be your expense for that fuel. Therefore, if you have got more gross tons over the road as this indicates over the period of years per ton of fuel, you are certainly saving yourself some money in the oper-
[fol. 2196] ation of the railroad.

Q. Do I understand you to say that all of these operations relate to both main and branch line operations?

A. Yes sir.

Q. Do the lengths of branch line trains enter into the average figure of freight cars per freight train in line 3?

A. Yes, sir.

Mr. Mason: Have you any questions, Mr. Strouss, before we pass to another exhibit?

Mr. Strouss: I think I would rather take up the whole cross-examination at once.

Mr. Mason: Mr. Mason, have you before you an exhibit in one sheet bearing title similar to that of exhibit No. 162, this exhibit relating to the Tucson division for six years since and including 1930?

A. Yes.

Mr. Mason: May this be marked for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 163 for identification.

Mr. Mason: Was that prepared in the same manner as exhibit No. 162?

[fol. 2197] A. Yes.

Q. I notice that you show a different source. Will you explain the source of the figures in these several items?

A. Exhibit No. 162 as stated was taken from the OS-A reports and the annual reports to the Interstate Commerce Commission; that covers the entire system. There is no corresponding report by divisions but there is a report

rendered according to the same manner that is prepared by divisions for purposes of the management of the company.

Q. Is that form 521 referred to in the source?

A. Yes.

Q. Is form 521 kept monthly and accumulated by months and by years?

A. Yes.

Q. It is kept by divisions, is it?

A. Yes.

Q. By the system as a whole?

A. Yes.

Q. Do the figures on form 521 correspond to the figures reported to the Interstate Commerce Commission on the OS forms to which you have referred?

A. The basic figures do.

The Court: This particular report that you referred to is not prepared for the Interstate Commerce Commission, [fol. 2198] it is merely for the use and enlightenment of the company itself?

A. Yes, it is prepared as I say according to the method prescribed by the Interstate Commerce Commission. As a matter of fact, it is a breakdown of the Interstate Commerce Commission figures.

Mr. Mason: Do the same figures appear on the form 521, plus some others which appear on the forms OS-A, OS-B, and OS-E?

A. Yes.

Q. I understand, and will you correct me if I am incorrect, that form 521 has been requested by and furnished to Mr. Strouss for the Tucson division as well as the system for several years past?

A. Yes.

Mr. Strouss: That is right, I have them.

Mr. Mason: Is form 521 a condensed record regularly kept in the ordinary course of the company's business?

A. Yes.

Q. Based upon individual reports of various matters rendered by the divisions and other sources of original information?

A. Yes.

Q. Are the forms 521 preserved as permanent records [fol. 2199] of the company over a considerable period of years?

A. Yes.

Q. Have you available the forms 521 from which exhibit No. 163 for identification was prepared?

Mr. Strouss: I have copies of them myself.

A. We have them in the city but they are not in court inasmuch as they have already been furnished to counsel and I thought it unnecessary to bring them into court.

Mr. Mason: Has exhibit No. 163 been compared against these underlying sources?

A. Yes, sir.

Q. There are certain computations which are indicated and appear on the face of the exhibit. Have those computations been checked?

A. They have.

Q. Will you say whether or not the exhibit is true and correct as reflecting the underlying sources?

A. To the best of my knowledge and belief it is correct.

Q. As to line 6, I will ask you if line 6 is the same for the corresponding years as line 6 of exhibit No. 162?

A. Yes.

Q. Why is that?

[fol. 2200] A. Cars are not assigned to divisions; they are used all over the system. Therefore, the Tucson division has access to the same class and type of cars that other divisions have.

Q. As to average tractive power per locomotive, is that based upon divisional figures?

A. That is based upon assignment of locomotives to a division.

Mr. Mason: Have you any questions on exhibit No. 163, Mr. Strouss?

Mr. Strouss: No, I have none.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 163.

Mr. Strouss: I do have one question. I notice that exhibit No. 162 relates to years 1922, 1924, 1926, 1928, and 1939 and that exhibit No. 163 does not include those first four years, that is, 1922, 1924, 1926, and 1928.

A. I am glad you asked that question, Mr. Strouss. The facts are these, the limits of the Tucson division were changed several times. The division as now constituted was determined or prescribed as of August 1, 1930. To make these figures comparable, we began with 1930 and when you review these figures for 1930 you will not find them on the 521 that was rendered for the year 1930 but [fol. 2201] you will find them on the 521 that was rendered for the year 1931, at which time the figures were restated to make them comparable because of the change in the limits of the division.

Mr. Mason: Your 521 for the year 1931 would contain figures for the prior year for the purpose of comparison?

A. Yes.

Q. So the 1930 figures appear in the 1931 form?

A. Yes, that is what I meant to convey.

Mr. Mason: Does that answer your question, Mr. Strouss?

Mr. Strouss: Yes.

Mr. Mason: Is the exhibit admitted, Your Honor?

The Court: Yes, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 163.")

Mr. Mason: Are the figures in column 1 on this exhibit, the per cent of increase and so forth, susceptible of comparison with the figures of per cent of increase appearing on exhibit No. 162?

A. Yes.

Q. Are they predicated upon the same class and method of computation?

A. Yes.

[fol. 2202] Q. The underlying figures which are compared represent the same things, do they?

A. They do.

Q. These variations in mileage in line 1 as between 1930 and subsequent years are simply due to abandonment of branch lines?

A. Yes.

Q. Do those figures include branch line operations on the Tucson division as well as the main line?

A. Yes.

The Court: You will not be able to finish with this witness before noon?

Mr. Mason: No, Your Honor.

The Court: We will recess at this time until 2 o'clock.

(Thereupon the court stood at recess until 2 o'clock P. M. this day, January 14, 1941.)

[fol. 2203] 2 P. M., January 14, 1941.

All parties being present as heretofore noted, proceedings were resumed as follows:

Mr. Mason: Mr. Strouss, this morning in connection with certain testimony or questions of the witness I think I stated there were no valid differentials for mountain districts and for engineers in freight service. I have consulted the agreement with the Brotherhood of Locomotive Engineers and I find there are distinctions between valley districts and mountain districts in Sections 2 and 3 of Article 1 of the engineers' agreement, effective January 9, 1931, but the mountain districts are defined and they do not include any territory in either Nevada or Arizona except that part of the Sacramento division west of Sparks, approximately eighteen or nineteen miles between the California state line and Sparks, I have forgotten just what the distance is.

Mr. Strouss: I assume before you rest your case you will have all of those exhibits?

Mr. Mason: We will have all of those rates of pay in here by exhibit. I will show you the paragraph to which I was referring. I don't want that statement of mine as to lack of differentials to appear in the record although it wouldn't [fol. 2204] materially affect the situation we were discussing this morning. I have also here the current firemen's, conductors', and trainmen's agreement which covers the rates of pay for brakemen, conductors, and firemen which will indicate the rate per 100 miles in each of the districts with which we are concerned, but those are likewise shown by exhibit in connection with our later showing.

Q. Mr. Masson, I think I asked you during the course of the examination this morning if you would make a calculation of the average cars per train in Arizona during the

four-year periods which are referred to on exhibit No. 151, 160, and 161 for the purpose of making the comparisons in showing the trends of averages of freight operating and freight transportation expenses. Have you those figures as calculated from exhibit No. 149?

A. Yes.

Q. What was the average cars per train in Arizona calculated from exhibit No. 149 for the period 1922 to 1925, inclusive?

A. 54.42.

Q. What was the average cars per train for the years 1936 to 1939, inclusive?

A. 53.85.

Q. Referring to exhibit No. 150. For the four-year [fol. 2205] period, 1922 to 1925, inclusive, what was the average cars per train for the state of Nevada?

A. 53.09.

Q. That is the figure that corresponds to the 54.42 you just recited?

A. Yes, sir.

Q. What is the average cars per train for Nevada for the four years, 1936 to 1939, inclusive?

A. 76.28.

The Court: Does the Nevada Train Limit Law, which I understand is somewhat similar to the Arizona law, have any bearing on the figures you have just given?

A. No, sir, the Nevada Train Limit Law never became operative.

Mr. Mason: Your Honor, as the report will show in the Federal court, 18 Fed. 2nd 393, we obtained a temporary injunction shortly before the effective date of the statute which was continued in effect pending the trial and was followed by a permanent injunction dated February 23, 1937, so that the Nevada law never actually became effective and was never observed.

Q. Our last exhibit was No. 163, was it not?

A. Yes.

Q. I hand you a statement in one sheet entitled "South- [fol. 2206] ern Pacific Company-Pacific Lines, Freight Service Operating Averages, Salt Lake Division." May that be marked No. 164 for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 164 for identification.

Mr. Mason:

Q. From what sources was exhibit No. 164 prepared?

A. As shown in the lower section of the exhibit. The basic data were computed first from the form 521 and item 5 is based on the locomotives assigned to the division. Item 6 is the same as is shown on exhibit No. 162 for the system.

The Court: Mr. Masson, with reference to this exhibit No. 164 and the previous one, when you referred to the Tucson division and Salt Lake division do you have reference to that territory embraced in what is designated as a division in exhibit No. 154?

A. Yes, sir.

Mr. Mason: I will ask you, is exhibit No. 164 for identification made up in the same way and from sources exactly similar to those used in preparing exhibit No. 163?

A. Yes.

Q. Except that the forms 521 here used are those pre-
[fol. 2207] pared for the Salt Lake division?

A. For the Salt Lake division.

Q. It goes back to the year 1930, I notice. Is that in order to make it comparable with exhibit No. 163 relating to the Tucson division?

A. Yes, inasmuch as we began the exhibit with 1930 for reasons that I stated, the Salt Lake division was confined to the same period of years for comparative purposes.

Q. Do I understand that these forms 521 are kept by operating divisions rather than by states?

A. By operating divisions, yes, sir.

Q. Would it be possible to prepare from the forms 521 a showing for the state of Nevada or the state of Arizona as distinguished from either of these two divisions?

A. No.

Q. Is that the reason for showing the Salt Lake division instead of the state of Nevada?

A. Yes, sir.

Q. And the same way for the Tucson division instead of the state of Arizona?

A. Yes.

[fol. 2208] Mr. Mason: Has the showing on exhibit 164 been checked as to the original figures, and checked also as

to the computations to determine whether they are true and correct?

A. They have been spot-checked by me.

Q. Will you say whether or not, in your opinion, the exhibit is true and correct?

A. It is correct to the best of my knowledge and belief.

Q. Is it also true that the forms 521 for the Salt Lake Division for the years covered here have been furnished to Mr. Strouss?

A. Yes.

Mr. Mason: Is that correct, Mr. Strouss?

Mr. Strouss: Yes, I have them.

Mr. Mason: Have you any questions, Mr. Strouss, before the exhibit is offered?

Mr. Strouss: Yes, I have one.

Q. Mr. Masson, are there any formulae that enter into the preparation of this exhibit?

A. No, there is no formula as such. Miles is a straight record; the figures freight-train-miles is an accumulated figure from wheel reports, the net ton-miles the same, the average tractive power of locomotives is a record figure, average capacity of freight carrying cars is of record in [fol. 2209] the annual reports, the freight train speed is simply a computation from the form 521.

Q. Well, these items now that are in the annual reports, they are not computed according to any formula of the Commission of Nevada?

A. Well, this is—the average tractive power for locomotives is not computed according to the I. C. C. or any formula laid down by the I. C. C. It is simply the tractive power of engines assigned to the division, divided by the number of engines.

Q. I don't mean that. Is there any one item of these ten items here which would be computed or in which the computation would involve a formula required by the Nevada Commission similar to the allocation of expense and revenues?

A. No.

The Court: In other words, I think what Mr. Strouss is getting at, the Company prescribes the formula rather than any state commission.

A. No, sir. These figures are computed in the same manner, using the factors of the same nature as is used in pre-

paring information for the Interstate Commerce Commission on Form OS-A. This is well known and established statistics that have been used over a long period of years, [fol. 2210] it has been known and almost, you might say, evolved from constant use back over a period of years that the train-miles shall be accumulated from the wheel reports.

The Court: Let us put it another way, Mr. Masson: Now, you testified with reference to certain other exhibits that they were not exactly comparable by reason of the different requirements of the State regulatory commissions?

A. Yes, sir.

Q. However, now you are submitting an exhibit one that shows this statistical data for the Tucson Division, and this last exhibit, No. 164, the statistical data for the Salt Lake Division; now, at least as to those two exhibits, the one covering the Salt Lake Division, and the one covering the Tucson Division, they are prepared; I take it, that is, they are prepared in accordance with exactly the same formula.

A. The same formula doesn't apply to this. The formula prescribed by the states prescribes the allocation of revenues and expenses. This is simply mathematical computation from those basic figures that have been determined from those formulae.

The Court: Then these figures are comparable.

[fol. 2211] Mr. Mason: Are there any formulae involved in accumulating miles of freight trains operated?

A. No.

Q. Are there any formulae involved in accumulating freight car-miles operated?

A. No.

Q. Those are figures that appear on basic reports?

A. That is true.

Q. The wheel reports. Is there any formulae other than a straight division of freight train car-miles, or freight train miles in getting freight train car-miles?

A. No.

Q. His Honor asked whether the formula or method, he might have said, involved in obtaining the results on exhibit 164, are the same as or in any respect differ from those used in obtaining the results on exhibit 163?

A. No, no difference.

Q. They are identical basic records?

A. Yes.

Q. Except that the basic records, such as the showing of train operations and train loading for the Tucson Division, are used in one case, and the one for the Salt Lake Division [fol. 2212] is used in the other?

A. Yes.

Q. This does not involve any use at all of State Commission formulas as to the two states?

A. No.

Q. Does the State Commission of Nevada in the case of the Salt Lake Division, or the State of Arizona in the case of the Tucson Division, have anything at all to do with these figures appearing on exhibits 163 and 164?

A. No, it doesn't.

Mr. Mason: Does that make it clear?

The Court: Yes.

Mr. Mason: I will offer the statement as Defendant's Exhibit No. 164 in evidence.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 164.")

Mr. Mason: Mr. Masson, are there any particular figures on Exhibit 164 to which you wish to direct attention in connection with Exhibit 163?

[fol. 2213] A. Yes, the comparison drawn from the last column which expresses the per cent of increase.

Q. Comparing 1939 with 1930?

A. Yes; the freight cars per freight train in Arizona decreased.

Q. In Arizona, or on the Tucson Division?

A. On the Tucson Division, I should say, decreased 2.2 per cent; on the Salt Lake Division, they increased 10.8 per cent. The net tons per train, net tons per freight train on the Tucson Division increased 10.2 per cent. On the Salt Lake Division they increased 17.7 per cent. The average tractive power for locomotives on the Tucson Division increased 11.6 per cent, and on the Salt Lake Division it increased 35.5 per cent. The average capacity of the freight carrying cars, of course, are the same for the System as on all divisions. The capacity of freight carrying cars increased .2 per cent on the System. On the Tu

son Division and on the Salt Lake Division. Freight train speed on the Tucson Division increased 21.7 per cent, on the Salt Lake Division 21.1 per cent. Gross ton-miles per freight train-hour increased on the Tucson Division 28.3 per cent; on the Salt Lake Division 41.8 per cent. Net ton-[fol. 2214] miles per freight train-hour increased on the Tucson Division 33.8 per cent; on the Salt Lake Division 42.2 per cent. Gross ton-miles per ton of fuel increased on the Tucson Division 8.8 per cent; on the Salt Lake Division 15.3 per cent.

Q. Have you before you, Mr. Masson, a statement in one sheet entitled "Average Freight Revenue Per Train-Mile, Car-Mile, and One Thousand Revenue Ton-Miles, Pacific Lines, Compared with States of Nevada and Arizona, Respectively?"

A. Yes.

Mr. Mason: May the statement be marked "Defendant's Exhibit 165 for identification?"

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 165 for identification.

Mr. Mason: Did you prepare exhibit No. 165, or have it prepared, Mr. Masson?

A. I had it prepared; it was prepared under my supervision and direction.

Q. From what sources?

A. Items 1, 2 and 3, annual reports to the Interstate Commerce Commission, Public Service Commission of [fol. 2215] Nevada, and Corporation Commission of Arizona.

Q. Do the figures in items 1 and 2 for the System, and each of the two states, appear as such in the annual reports?

A. Items 1 and 2, years 1923 to 1935, inclusive, appear in Schedule 531, entitled, "Statistics of Rail-Line Operations" of the annual report to the Interstate Commerce Commission, and the corresponding schedules of annual reports to the respective states. However, as such averages are not required in the annual reports for the years 1936 to 1939, they have been computed for the purposes of this exhibit.

Q. Is that computation straight division of total freight revenue divided by the total freight service train-miles or the total loaded freight train-miles in the other as reported to the several commissions?

A. Yes, the basic figures appear in the annual reports.

[fol. 2216] Mr. Mason: Are the figures for 1936 to 1939 for the two states reported as such or are they computed figures as well?

A. They are computed figures.

Q. They are all computed figures for the last four years?

A. Yes.

Q. Revenue per 1,000 ton-miles of freight, is there in the annual report an entry of the average revenue per ton mile?

A. Yes.

Q. You obtained these figures here simply by moving the decimal point three places?

A. Yes.

Q. Has the exhibit been checked against the underlying sources?

A. Yes, sir.

Q. Where such computations are reflected in these figures, have those been checked?

A. Yes, sir, they have been spot-checked by me.

Q. Will you say whether or not in your opinion the exhibit is true and correct?

A. It is correct to the best of my knowledge and belief.

Mr. Mason: Have you any questions, Mr. Strouss?

[fol. 2217] Mr. Strouss: No questions.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 165.

Mr. Strouss: I object to it as irrelevant and immaterial.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 165.")

Mr. Mason:

Q. As between the items designated by the column headings 1, 2, and 3 on exhibit No. 165, Mr. Masson, which of the three, if any, is affected by increases or reductions in average train lengths?

A. Column 1, item 1.

Q. Item 1 being "Freight Revenue per Freight Service Train-Mile"?

A. Yes.

Q. Does the item of "Freight Revenue per Loaded Freight Car-Mile" in and of itself bear any result of long or short train operation?

A. No.

Q. Would the same be true as to revenue per 1,000 ton-miles?

A. Yes.

Q. Primarily what factors, if any, are determinative of [fol. 2218] the level figure per 1,000 ton-miles of freight in any year?

A. Rate has something to do with it and the length of haul.

Q. The length of haul being set aside for the moment, does the average revenue per 1,000 ton-miles or the average revenue per ton-mile reflect to any extent the average level freight rate?

A. Yes.

Q. And of the freight rate structure?

A. Yes.

Q. Does that factor plus any other factor enter into the figure of freight revenue per loaded freight car-mile, speaking of that figure in a generic sense?

A. Yes, it does.

Q. What is the other factor that enters into the revenue per loaded freight car-mile in addition to the revenue per ton-mile?

A. The distance hauled.

Q. Does the distance hauled enter into the unit revenue per car-mile?

A. Yes, it does, and the loading has something to do with it.

Q. Isn't it a fact that it is the loading times the revenue per ton-mile that enters into it?

[fol. 2219] A. I don't understand it that way. In determining this you would simply use as a factor your total car miles and your total revenue.

Mr. Strouss: Pardon me just a moment. I don't like to object to leading questions but I will have to on questions like the last one.

The Court: Yes, it was leading.

Mr. Mason: I know it was leading and I didn't like to ask it in that form.

Q. As between two successive years, whether it be for the system or either of the states, Mr. Masson, what factors affect the unit revenue per loaded car-mile?

A. The revenue for the load and the miles hauled.

Q. Will the miles hauled have any effect upon the revenue per mile?

A. It will, yes.

Q. How? I don't think my question is clear to you. I would like to have you explain that to me.

A. The longer distance you haul a car for a stated revenue the less your revenue per car mile will be.

Q. But here we have, Mr. Masson, a revenue per ton-mile?

A. Yes.

[fol. 2220] Q. That revenue per ton-mile doesn't depend upon distance, it is just a division as I understand it between the total revenue and the total number of ton-miles made, isn't that correct?

A. Yes.

Q. You just take all your ton-miles on the one hand and all your freight revenue on the other and divide and you get the figure here?

A. Yes, and you do the same thing with your car-miles.

Q. I don't think you have understood me. Having a unit revenue per ton-mile, does that figure combined with any other consideration affect the revenue per freight car-mile?

A. Naturally it would.

Q. What is that other consideration?

A. The rate, if you have a lower rate, naturally your revenue per ton-mile will be low.

Q. I am getting at the revenue per car-mile. You have the revenue per ton-mile and that as I understand you is an expression of the rate?

A. That is true.

Q. Having that and your loaded freight car-mile, what factor combined with the revenue per ton-mile produces the revenue per car-mile, if you please?

[fol. 2221] A. I am sorry, I don't understand the question.

Q. All right, I will not lead you any further, I thought it would be perfectly obvious. Mr. Masson, of what is the load in a freight car made up expressed in weight?

A. Tonnage.

Q. Perhaps we can return to the subject again. Having expressed already revenue per ton for the movement of that car one mile, what factor combined with that revenue figure would you use in determining the revenue for the movement of the car one mile if it contains that tonnage?

A. I would use the revenue for that tonnage.

Q. How would you obtain the revenue for the total tonnage loaded in the car if you had the revenue for one ton?

A. Multiply it by the tons.

Q. By the loading?

A. By the loading, yes.

Q. To put it in one sentence, isn't freight revenue per loaded freight car-mile a combination of loading plus revenue per ton-mile?

A. Yes, certainly it is. I thought that was obvious.

Mr. Mason: It was, but it wasn't in the record.

[fol. 2222] Q. Let's go to column 1 because there we will obtain the result of some other computations. Having the revenue per loaded car-mile, which I think we have established as the product of ton-mile revenue plus loading——

A. (Interrupting:) It is not the profit.

Mr. Mason: I understand it is not the profit, it is the gross.

A. I understood you to say "profit."

Mr. Mason: "Product" is what I said.

A. I beg your pardon.

Q. Having established how the freight revenue per car-mile is affected by loading and ton-mile revenue, is there any factor combined with the revenue per freight car-mile which affects revenue per train-mile?

A. Yes, the number of cars in a train affects it.

Q. Provided only that they were revenue cars, I take it.

A. Naturally.

Q. Will you turn to a statement entitled "Revenue Freight Carried by Pacific Lines, Year 1939"?

A. Yes.

Mr. Mason: May we have that marked No. 166 for [fol. 2223] identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 16 for identification.

Mr. Mason: Did you prepare exhibit No. 166 or cause it to be prepared?

A. Yes, I caused it to be prepared.

Q. From the source as shown in the note at the foot of the exhibit?

A. Yes.

Q. This exhibit is similar in form to exhibits introduced by witnesses for other carriers who have testified here; is it not?

A. Yes, sir.

Q. Are there any computations on the face of the exhibit which you yourself made?

A. The line entitled "Total perishable products of agriculture Classes 110 to 143, inclusive" are additions made by me or at my direction.

Q. What figures were added to produce the totals shown in that line?

A. The figures from Classes 110 to 143 as shown in column A.

Q. In each of the columns C to G, inclusive, are the figures in the lines 110 to 143 added together to produce the figure next below?

[fol. 2224] A. Line 800, you speak of?

Q. No.

A. In each of the columns the total opposite line, total perishable products of agriculture, the total therein shown or opposite that line shown is the sum of classes 110 to 143.

Q. Are those figures which appear as the totals of classes 110 to 143 included within the totals appearing on lines 800 and 850?

A. Yes.

Q. These figures are taken, except as to that addition, directly from the annual report to the Interstate Commerce Commission?

A. Yes.

Q. Has the exhibit been checked against the original sources?

A. Yes.

Q. The additions have been checked, have they?
A. Yes.

Mr. Mason: Have you any questions, Mr. Stronss?
Mr. Stronss: No questions.
Mr. Mason: We offer the statement as defendant's exhibit No. 166.
Mr. Stronss: I object to it as irrelevant and immaterial.
[fol. 2225] The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 166.")

Mr. Mason: Will you turn to a statement entitled "Revenue Freight Carried within the State of Arizona, Year 1939"?
A. Yes.
Q. Did you prepare this exhibit or cause it to be prepared?
A. I had this exhibit prepared and it was prepared under my supervision and direction.
Q. From the annual report to the Corporation Commission of the state of Arizona?
A. Yes.
Q. Are there any computations on the face of the exhibit?
A. The total of items 110 to 143 appearing in columns C, D, E, and F are computations.
Q. Column C, you say "Cars Originating on Line within the State:", Just what does that mean?
A. The explanation of the column is shown at the bottom of the exhibit.
Q. Those are cars originated by the Southern Pacific, are they?
A. Yes, sir.
[fol. 2226] Q. And originating at points in Arizona?
A. Yes, sir, exclusively.
Q. Column D, are those cars handled by the Southern Pacific but not originated in Arizona?
A. Yes.
Q. What does column E indicate with relation to columns C and D?
A. That is a total of columns C and D made up of cars originating on the lines and all other cars handled within the state.

Q. As to column F, your explanation indicates that they are included within the preceding columns?

A. Yes, sir.

Q. Those are cars delivered within the state, are they?

A. Yes.

Q. If a car originated on the Santa Fe in Arizona and was received by the Southern Pacific at the junction and handled thence by the Southern Pacific, within which column would that appear?

A. Column D.

Q. If this car originated at a point in California and was handled across Arizona and delivered at a destination beyond Arizona, in which column would it appear?

[fol. 2227] A. Column D.

Q. If a car originated at Yuma and was handled by the Southern Pacific Company to a destination by the Southern Pacific Company to a destination beyond the state, where would that appear?

A. In column D.

Q. If it originated at Yuma?

A. It would appear in column C.

Q. If it originated at Yuma and was delivered at Tucson, would it also appear in column F?

A. Yes.

Q. Has the exhibit been checked to determine its correctness?

A. Yes.

Q. Will you say whether or not it is true and correct?

A. It is true and correct to the best of my knowledge and belief.

Mr. Strouss: Does this include cars originating in Mexico?

A. Handled through the state or into the state, yes.

Mr. Mason: We offer the statement in evidence as defendant's exhibit No. 167.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and [fol. 2228] marked "Defendant's Exhibit No. 167.")

Mr. Mason: Have you a statement before you in one sheet entitled "Revenue Freight Carried within the State of New Mexico, Year 1939"?

A. Yes.

Mr. Mason: May we have that statement marked "Defendant's exhibit No. 168" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 168 for identification.

Mr. Mason: Did you prepare exhibit No. 168 for identification or cause it to be prepared?

A. I had this exhibit prepared, it was prepared under my supervision and direction.

Q. From the annual report to the New Mexico commission?

A. The annual report to the Corporation Commission of the state of New Mexico.

Q. For the year 1939?

A. Yes.

Q. Was this prepared in the same manner as exhibit No. 167?

A. Yes.

Q. And the significance of the columns is as explained in the footnotes?

A. Yes.

[fol. 2229] Q. And the same as corresponding columns on exhibit No. 167?

A. Yes.

The Court: Mr. Masson, you may not be able to answer this question, but does the fact that in column C there are no figures there and it appears blank, which would indicate that the state of New Mexico produces none of these perishable products, does that mean that your lines don't haul them or that none are actually produced in the state?

A. That means that our line did not originate any of these perishable products in New Mexico. The state may produce them.

The Court: Your records do not disclose that?

A. Our records show that we originated no such traffic in New Mexico.

Mr. Mason: It is indicated there that the company did originate a certain number of cars of agricultural products within the state but those were all other than perishable?

A. All other than perishable as identified by these items 110 to 143.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: I don't know that the record shows, but if not, [fol. 2230] will you state whether the annual report to the New Mexico commission for the year 1939 is available here in the courtroom or in the city at the present time for Mr. Strouss if he wishes to examine it?

A. Yes, they are in the city.

Mr. Strouss: I would like to get it when you have finished with your testimony.

Mr. Mason: This report and any of the other New Mexico commission reports that we may use will be furnished.

Q. You show all other cars handled on line within the state in column D here, Mr. Masson. Would that include cars which in the year 1939 moved or were handled in the state of Arizona, if not delivered in that state, and which moved over the Arizona-New Mexico boundary?

A. It would include a majority of those cars which originated in Arizona and moved out of the state.

Q. Which are shown on exhibit No. 167 as "All Other Cars Handled on Line within the State of Arizona" if those cars moved over the Arizona-New Mexico boundary?

A. Eastbound it would include those cars.

Mr. Mason: We offer exhibit No. 168 in evidence.

[fol. 2231] Mr. Strouss: I object to it as irrelevant and immaterial.

The Court: Objection overruled, it may be received.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 168.")

[fol. 2232] Mr. Mason: Mr. Masson, have you a statement in one sheet bearing the title "Revenue Freight Carried Within the State of Nevada, Year 1939?"

A. Yes.

Mr. Mason: May we have the statement marked "Defendant's Exhibit No. 169 for identification?"

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 169 for identification.

Mr. Mason: Did you prepare Exhibit No. 169, Mr. Masson?

A. That exhibit was prepared under my supervision and direction.

The Court: Mr. Mason, just what is the purpose of these two last exhibits, the one showing the perishables and agricultural products handled in the state of New Mexico and the state of Nevada?

Mr. Mason: Well, they complete the picture of the Company's traffic as between perishable products and other freight, which is first of all contained in Exhibit 166; that is for the System, of course, then continued on Exhibit 167, which shows what the nature of the traffic handled in Arizona is as between perishable products, agricultural traffic [fol. 2233] and other classes.

The Court: Well, that is just a break-down then of 166 by states?

Mr. Mason: Yes, it is really a showing of how much of this traffic and how much of it by classes—of course, agricultural and perishable products are segregated here—is carried in the three states. Now, in the complaint, or, rather, in the answer, the allegation is made that a large part of the traffic handled by the Company is perishable traffic and it is further alleged that a large part of the traffic handled on the line affected by the Arizona law is perishable traffic, and that a large part of the Company's business consists of agricultural products which must, as we further allege and which we shall show by other witnesses, receive expedited service in order to reach the market. We also show that a large part of the perishable traffic and a large part of the traffic across Arizona is interstate. We have previous exhibits which show the break-down between interstate and intrastate. Here we show how much of this perishable traffic is of the total, and how much of that is intrastate and handled across the state. The New Mexico showing is re- [fol. 2234] lated to the same through line which crosses Arizona, which in previous testimony is part of a through line across Arizona to principal markets. Then, in our answer we have also alleged that the traffic across Nevada, which state of course we shall undertake to compare with Arizona, is similarly largely perishable traffic and largely interstate. This showing as to Nevada tends to carry forward that the character of the Nevada traffic not in the total is not simply similar as to volume but in its characteristics it is similar. I think you will find an allegation in the answer that covers what we attempt to show by Exhibit 169.

Q. Was Exhibit 169 for identification prepared in the same manner as Exhibits 167 and 168?

A. Yes.

Q. And the source is the Annual Report to the Nevada Public Service Commission for 1939?

A. Yes.

Q. Will you say whether or not the explanation made of the preceding exhibits as to those sources apply also to this exhibit?

A. It does, yes.

Mr. Mason: Have you any questions on No. 169, Mr. Strouss?

[fol. 2235] Mr. Strouss: Just one question.

Q. The grand total of carload traffic, that means the total amount of carloads of traffic, column C, which originated in that state in 1939?

A. On our line.

Q. All of the different types of traffic?

A. Yes; originating on our line, the Southern Pacific; not all traffic originating in the state which may have moved over our line. All types of traffic is shown in column C.

Q. If it came to you from some other carrier but originated in the state it wouldn't be there?

A. Not in column C, no, it would be in column D.

Q. The two, then, combined would cover all traffic which originated in the state of whatever type?

A. No; the two combined would include traffic originating on our line within the state, traffic originating on foreign lines within the state handled by our lines, traffic handled through the state by our lines.

Mr. Strouss: That is all.

Mr. Mason: Is that clear now?

Mr. Strouss: I think so.

Mr. Mason: We offer the exhibit as No. 169.

[fol. 2236] Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 169.")

The Court: We will take our mid-afternoon recess at this time.

(Thereupon, a short recess was taken, after which the witness L. J. Masson was recalled to the stand, and proceedings were resumed as follows:)

Mr. Mason: Now, referring to Exhibit No. 169, Mr. Masson, does that exhibit indicate the percentage or any percentage which may exist as between interstate and intrastate carload traffic in the state of Nevada for the year 1939?

A. Well, taking the traffic as a whole, out of 201,497 cars handled on the line within the state, that is in and out and through, only 5,351 cars originated in the state on our line; so that this exhibit indicates the predominance of interstate traffic within the State of Nevada.

Q. Is there any substantial volume of intrastate Nevada traffic received from connections in that state on our rail-
[fol. 2237] road and moved by our railroad?

A. There is no substantial volume, no.

Q. Would it affect the indicated relationship of interstate and intrastate on this exhibit to any appreciable degree?

A. No.

Q. Have you made studies other than the study represented by exhibit 169 of and predicated upon records of the Company with relation to the relative volume of interstate and intrastate traffic handled in the state of Nevada?

A. I did make a study of that kind some time ago, some years ago. The fact is, I know that the interstate traffic was about ninety per cent, way over ninety per cent.

Q. Was it between 90 and 95 per cent, or more than 95 per cent?

A. I have some data here, if you will let this question rest I will give you a definite figure later on.

Q. Is the showing of relative percentages of possible intrastate and interstate traffic on exhibit 169 fairly representative of other years which you have stated?

A. Yes, it is.

[fol. 2238] Mr. Strouss: Are you about to leave this exhibit?

Mr. Mason: Yes.

Mr. Strouss: I would like to ask one or two questions.

Mr. Mason: Certainly.

Mr. Strouss: I am now again confused on this freight originating within the state. Did I understand you to say that the number of cars shown in column C related to the number of cars shown in column D would indicate the percentage of interstate and intrastate traffic?

A. Yes, it would be an indication of it. Intrastate and interstate, notice that there are 5,351 cars originated in the state.

Q. But that is not just intrastate traffic, it may originate there but move again out of the state and, if so, would be interstate traffic, would it not?

A. If any one part of that moved out of the state, it would be interstate, yes.

Q. So that the figures 5,351, representing the cars originating on the line within the state, do not necessarily mean intrastate traffic?

A. No; no, I didn't mean to convey that. What I meant to convey was that this was an indication of the predom-
[fol. 2239] inance of interstate traffic.

Q. You mean predominance of interstate in the sense of traffic using Nevada as a bridge state compared with traffic originating within the state?

A. Yes.

Q. That is the sense in which you were referring to it?

A. Yes.

Mr. Mason: I think his answer was this, Mr. Strouss, that the 5,351 is the highest possible figure of intrastate cars that could have moved originating on our railroad in 1939, because those are the cars that originated within the state and, of course, as indicated, although not expressed in the answer, if any of those moved beyond the state, the figure of intrastate originating and terminating within would be somewhat smaller.

Mr. Strouss: I was just trying to find out if that is the highest number of cars of intrastate.

Q. Did you understand me correctly when I asked you, before the exhibit was received in evidence, this only rep-
[fol. 2240] resents cars which originated on your own line?

A. That is true.

Q. If there were other cars which originated on other lines than your own, then delivered to you as a connecting carrier and you in turn carried those but only within the

state, they would still be in column D, but would be intrastate traffic?

A. That is true.

Q. So that column D may include intrastate traffic as well as interstate?

A. It may.

Mr. Mason: Now, as a matter of fact, Mr. Masson, are there any short-line connections of the Southern Pacific in Nevada, and, if so, name them in 1939.

A. Short-line connections?

Q. Yes.

A. That excludes our connections with the Western Pacific?

Q. I am going to ask you about those as well.

A. We have at Cobre, Nevada, the Nevada Northern Railway.

Mr. Strouss: Where is that?

A. Cobre.

Mr. Mason: That line lies entirely within Nevada, does [fol. 2241] it?

A. Yes. Nevada Copper Belt Railroad at Wabuska; the Tonopah and Goldfield at Mina. Those are about the only short lines.

Q. Is there the Virginia & Truckee at Reno?

A. Yes, there is.

Q. Now, are there any trunk line connections?

A. The Union Pacific at Wells, and the Western Pacific at several points.

Q. The Western Pacific at Reno and at all points between Winnemucca and Wells?

A. Yes.

Q. Now, does the Southern Pacific receive any substantial volume of intrastate traffic from any of those four short-line connections that you have mentioned?

A. We receive no substantial amount; just how much I can't say, at present.

Q. Well, would it exceed 500 cars a year from all four of them, intrastate traffic?

A. I question whether it would.

Mr. Strouss: You say from all four of them?

Mr. Mason: Yes, the Nevada Northern, the Nevada Copper Belt Line, the Tonopah and Goldfield, and the Virginia & Truckee.

Mr. Strouss: You are not including the Union Pacific [fol. 2242] or the Western Pacific?

Mr. Mason: No, those are trunk-line connections. I distinguished between trunk-line and short-line connections.

The Witness: I think I have something here that will enable me to answer your question. The study I made sometime ago on traffic moving from 1930 to 1934 showed that 99 per cent of the traffic, of the freight revenues in the state of Nevada were interstate, were derived from interstate traffic, and about the same percentage of ton-miles within the state of Nevada represented interstate traffic.

Q. Now, do you know, and if so, will you state whether the Southern Pacific receives from the Union Pacific or the Western Pacific any substantial volume of carload traffic originating at and destined to points within the state?

A. No, I don't believe there is any substantial amount of traffic.

Q. By substantial, I mean in excess of, let us say, fifty or 100 cars a year?

A. I am not in position to answer that definitely.

Q. You say that your studies previously made indicate [fol. 2243] that 99 per cent, approximately, of the revenue received by the Company from freight service and the ton-miles handled in Nevada, were interstate?

A. Yes.

Q. That applies to all traffic, whether inter-line or local traffic, does it?

A. Yes.

Q. I will ask you to refer to the annual report to the Nevada Commission for the year 1939, to schedule 710, and to line No. 1, Item 101, on page 700 of that annual report, and state the figures reported to the Nevada Commission as to revenues earned within the state on intrastate traffic and on interstate traffic?

A. Revenues earned within the state of Nevada on intrastate traffic for the year 1939 was $58,878; revenues earned on interstate traffic within the state of Nevada was $18,300,291. The total freight allocated to the state of

Nevada in the year 1939, total freight revenue I should say, was $18,323,903.

Q. Are those revenues apportioned to the State on the prorate basis that you spoke of?

A. Those revenues are apportioned to the State on a mileage prorate basis.

[fol. 2244] Q. Is that the same as is used in Arizona in proportioning revenue?

A. Yes.

Mr. Strouss: You mean the same formula in each state?

A. Yes, apportioned to the state, apportioned according to the mileage hauled within the state, the ratio of miles in the state to the total miles hauled.

Q. The same formula is used in Nevada?

A. Yes.

Mr. Mason: Has No. 169 been offered and received?

The Court: I don't think so, Mr. Mason.

The Clerk: It was admitted, yes, just before we took our recess.

Mr. Strouss: Might I ask, we haven't developed what the cars, total cars originating in the state, both on your line and connecting lines is. Could you get that figure without a great deal of trouble as to all three states?

Mr. Mason: Cars originating on line and on connecting lines within the state?

Mr. Strouss: Within the state, originating within the state.

The Court: May I suggest to the witness, because appar-[fol. 2245] ently he hasn't some of this data available to give the information, that he have it tomorrow morning.

Mr. Strouss: I meant, could it be gotten without too much trouble.

The Witness: No, we have to re-work the details.

Mr. Mason: These figures, as I understand, are taken, so far as cars originating on line are concerned, are taken from annual reports?

A. Yes.

Q. And are readily available there, but to get the statistics for these three states of cars from connecting lines within the state——

A. We would have to pick out the cars originating on foreign lines. We make no distinction of that kind in our statistics.

Q. What would that involve, a check of waybills?

A. Yes, it would, a check of the movement going back to the waybills.

Mr. Strouss: If it is a great deal of trouble, I won't ask for it.

The Witness: It can be had, you know.

Mr. Mason: Would it be a special job as distinguished [fol. 2246] from these statistics in the ordinary course?

A. Yes, sir.

Mr. Mason: Would you still wish it?

Mr. Strouss: No, I will waive it.

Mr. Mason: Now, as to the next exhibit, have you a statement before you, Mr. Masson, in one sheet entitled "Segregation of Freight Car-Miles in States of Nevada and Arizona and for Pacific Lines as a Whole?"

A. Yes.

Mr. Mason: May we have that marked No. 170?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 170 for identification.

Mr. Mason: Did you cause Exhibit No. 170 for identification to be prepared, Mr. Masson?

A. Yes.

Q. From what sources?

A. It was prepared from the underlying records in our office. The total agrees with the annual reports, as shown in the footnotes, and items 1 to 4 are simply a break-down of the total as between these various classes of cars.

Q. When you say "underlying records" in your office, are those the wheel reports or the intermediate computa- [fol. 2247] tions prepared from the wheel reports?

A. The accumulated records from the wheel reports.

Q. Are those regularly prepared in the office of the auditor of Equipment Service Accounts?

A. Yes.

Q. Are these computations of movement of foreign line, Pacific Fruit Express Company and other private car line cars necessary in the course of the Company's business?

A. Yes.

Q. Do you base car rental payments to any extent upon the statistics of car-miles for P. F. E. and other private car line cars?

A. Yes; not only that, taxes are assessed on the basis of miles made by private line cars within states.

Q. Are the mileages within the several states necessary for these several purposes?

A. Yes.

Mr. Mason: Mr. Strouss, will you wish those intermediate records for the purposes of this exhibit?

Mr. Strouss: No.

Mr. Mason: Has the exhibit been checked against the underlying records, Mr. Mason?

[fol. 2248] A. Yes, sir.

Q. And what as to the computations in columns D, F and H; were these made by yourself?

A. Those were computations made at my direction and under my supervision to indicate the percentage of the respective classes of miles made.

[fol. 2249] Mr. Mason: Are these computations made from the total figures on the figures by classes which appear in columns C, E, and G?

A. Yes.

Q. So that the percentage figures in column D for the lines 1, 2, 3, and 4 add up to one hundred in each case in line 5?

A. Yes.

Q. Have these percentages and other computations been checked as well as the original entries?

A. Yes, they are correct according to the best of my knowledge and belief.

Q. These other private car-line cars, would that include only refrigerator cars or would other types of equipment be included?

A. It would include tank cars and private refrigerator cars owned by packing houses and so on.

Q. Would it include F. G. E. refrigerator cars?

A. Yes, sir, S. F. R. D. cars.

Q. Would S. F. R. D. cars go under "private car lines" or under "foreign lines"?

A. Private car lines, they are on a mileage basis—pardon me, your question just dawned on me, you asked if

the S. F. R. D.'s would go under foreign lines or private car lines and my answer was wrong. It should go under foreign lines, S. F. R. D., the Santa Fe owned refrigerator [fol. 2250] cars.

Q. Does this include empty as well as loaded movement of these cars?

A. Yes, sir.

Q. Is there any formula used to apportion these mileages to the several states or what is the method of obtaining the mileages for the several states?

A. It is the actual miles made within the state as computed from the wheel reports.

Q. Are these figures in essence simply an aggregation of the mileage appearing on the individual wheel reports?

A. Yes.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: I notice item 4, cars owned by Pacific lines, do you distinguish between Pacific lines and Southern Pacific Company there?

A. There would be no distinction there because all cars owned by the Southern Pacific Company are all operated by Pacific lines or affiliated lines. These are cars of Southern Pacific ownership making miles on Pacific lines.

Mr. Mason:

Q. Do you distinguish in that connection between cars [fol. 2251] stencilled with the name "Texas and New Orleans" or the other Texas and Louisiana companies?

A. Yes, that is distinguished as shown by that note. The Texas and New Orleans cars are included in the foreign line cars.

Q. Suppose that a car of Pacific Electric ownership is handled on the company's lines, where is that shown?

A. That is shown in foreign lines.

Q. Suppose it is a Northwestern Pacific car?

A. That is shown in foreign lines as the note indicates, includes cars owned by Texas and New Orleans Railroad Company and other separately operated companies solely controlled by the Southern Pacific Company.

Q. Do I understand that these cars whose movement is shown in line 4 includes only those cars that are stencilled

"Southern Pacific Company" without any reference to one of the affiliated companies?

A. That is correct.

Mr. Mason: Have you any other questions, Mr. Strouss?

Mr. Strouss: No other questions.

Mr. Mason: Your Honor, I may explain that this exhibit undertakes to show the important part played in the [fol. 2252] movement on the lines as a whole and in Nevada and Arizona of the refrigerator cars and the Pacific Fruit Express Company and also as an indication of the perishable traffic and also that our company handles the cars of other railroad ownership on its lines in both states as well as on the system generally. We offer the exhibit as defendant's exhibit No. 170.

Mr. Strouss: I object to it as irrelevant and immaterial.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 170.")

Mr. Mason:

Q. Mr. Masson, have you before you a statement in two sheets bearing title, "Lines and Operations Abandoned under Authority of Interstate Commerce Commission (Exclusive of Electric Lines in California and Oregon), Period January 1, 1930, to December 31, 1939, Inclusive"?

A. Yes.

Q. Did you prepare this exhibit?

A. Yes, I did.

Mr. Mason: May we have it marked No. 171 for identification?

The Court: It may be marked.

[fol. 2253] The Clerk: Defendant's exhibit No. 171 for identification.

Mr. Mason: Q. What sources were employed in its preparation?

A. This was made from our basic mileage records.

Q. Do your basic mileage records show the actual date of abandonment of these several pieces?

A. Yes.

Q. From what source did you obtain the information shown in column G?

A. That was taken from our records also which were posted as and when these orders came along.

The Court: Mr. Masson, do I understand that your railroad, the Southern Pacific, or any other line cannot abandon any of its mileage, any of its roads without the consent of the Interstate Commerce Commission?

A. Absolutely correct.

The Court: Does that also require the consent, say in Arizona, of the state corporation commission?

A. No. When the application is made to the Interstate Commerce Commission the state commissions are informed of that application by copy of the application and if they have any objections they then state them to the Interstate [fol. 2254] Commerce Commission. In the absence of any objection or comment by the state commissions the Interstate Commerce Commission acts on the application after hearing.

The Court: On its merits?

A. On its merits, yes.

The Court: But there is no dual control, by that I mean the state commission couldn't veto the action of the Interstate Commerce Commission?

A. That circumstance would not arise because of the cooperation between the Interstate Commerce Commission and the state commissions. I have never known the Interstate Commerce Commission to override a state commission in matters of this kind.

The Court: In other words, do you mean to say if the Southern Pacific proposed to abandon some short line in Arizona and the Arizona Corporation Commission protested that request that the Interstate Commerce Commission would deny the request?

A. If the state of Arizona did not produce a satisfactory reason for its objection, the Interstate Commerce Commission would issue the authority to abandon. In other words, the Interstate Commerce Commission would take into consideration the arguments and facts presented by the state [fol. 2255] commission in determining its judgment.

The Court: Then there is a distinction between the abandonment of a line and the type of service that may be rendered on a line?

A. Yes.

The Court: In other words, I just noticed by the newspapers, for instance, that you proposed on the Arizona Eastern road from Bowie into Globe to cease running a passenger train that has been running. Now that is a matter over which the Arizona Corporation Commissions has exclusive jurisdiction I take it?

A. That is true.

The Court: But if you sought to abandon the line from Bowie into Globe then the Interstate Commerce Commission has the sole say.

A. That is the idea, yes, that is according to the Interstate Commerce Commission Act.

Mr. Mason: As a matter of fact, Mr. Masson, some of these abandonments, for example, going to sheet No. 2, in the state of Nevada were accomplished in spite of the protest of the Nevada Public Service Commission, were they not?

A. Yes, from Tonopah Junction to Nevada-California state line.

Q. I take it that each one of these Interstate Commerce [fol. 2256] Commission finance docket numbers is reported in the published and printed reports of the Interstate Commerce Commission?

A. Yes, sir.

Q. And what you have shown here are the finance docket numbers without the citations of the Interstate Commerce Commission's volumes?

A. That is true.

Q. Has the exhibit been compared against the record of the proceedings and against your mileage record to determine whether it is true and correct?

A. Yes.

Q. Have you checked these Interstate Commerce Commission finance docket numbers in column G?

A. Yes, I have spot-checked them.

Q. Are the dates shown in column F the dates upon which operations on the lines actually ceased and the lines themselves abandoned so far as operations were concerned?

A. Yes.

Q. You show totals for the various states. Are those to some extent an explanation of the variations in mileage in

the several states as to which you show mileage statistics for several years?

A. They enter into that calculation.

Mr. Mason: Have you any questions on the exhibit, Mr. [fol. 2257] Strouss?

Mr. Strouss: I notice this only covers a period from 1930 to 1939 while most of your other exhibits go from 1922 to 1939. Was there any particular reason for that?

A. Yes, prior to 1930 our abandonments were not very extensive.

The Court: Speak a little louder, please.

A. I say, prior to 1930 we didn't abandon very many lines. Our activities in respect to abandonment of unprofitable lines in the interest of economy really date from 1930.

Mr. Mason: We offer the exhibit in evidence as No. 171.

Mr. Strouss: I object to it as irrelevant and immaterial.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 171.")

Mr. Mason: Mr. Masson, I direct your attention to an exhibit in sixteen sheets the title of which is "Net Railway Operating Income and Rate of Return on Investment (Book Value), Calendar Years 1925 to 1939, Inclusive." Have you that statement before you?

[fol. 2258] A. Yes, sir.

Mr. Mason: We ask that this be marked for identification, defendant's exhibit No. 172?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 172 for identification.

Mr. Mason: Referring to the first sheet of the exhibit No. 172 for identification, was the exhibit in its entirety prepared by you or under your direction?

A. It was prepared under my supervision and direction.

Q. As to the first sheet, from what sources were the figures on that sheet taken?

A. The items 1 to 12, inclusive, were taken from the monthly reports of revenue and expenses rendered by the Pacific lines to the Interstate Commerce Commission. We have those reports in the courtroom.

Q. And the territory covered by the exhibit, that is the lines to which the exhibit relates, are the lines west of El Paso, Tucumcari, and Ogden and south of Portland which you have heretofore identified as the Pacific lines?

A. Yes.

Q. Does this include all main and branch line operation [fol. 2259] of that property?

A. Yes.

Q. It relates only to its carrier operations, as I understand it?

A. Yes.

Q. These revenues are only those which are derived from operation as a railroad?

A. Yes.

Q. Apart from any hotel or lumber company or oil property operations, is that correct?

A. That is correct?

Q. From what sources do you obtain the figures in line 14?

A. Fourteen is taken from the annual report and other sources that are explained on sheet 2 to 16?

Q. Is the figure for the year 1925 found in line 14 explained in detail on sheet 2 of the exhibit?

A. Yes.

Q. Then the figures in line 15, how are they arrived at?

A. That is the quotient of a division of the item of revenue, item 12, by item 14.

Q. For instance, as to the year 1925, you divide a figure shown opposite line 12, net railway operating income, by figures shown opposite line 14, book value at close of year, [fol. 2260] and obtain the percentage figure in line 15?

A. Yes.

Q. And the same for each of the other figures in line 15?

A. Yes.

Q. Going to sheet 2, I will ask you first if your explanation of sheet 2 is generally applicable to the succeeding sheets, 3 to 16, inclusive?

A. Yes, this was arranged so that anyone can follow the figures from the reports that are stated at the bottom of the sheet, the annual report to the Interstate Commerce Commission, the stockholders' reports, and the balance sheets are all here in court. That was prepared primarily to indicate and show the court what makes up the Pacific

lines of the Southern Pacific Company and to assist the attorney for the opposition in tracing the figures through.

Q. Let's go further into sheet No. 2, first referring to line 1, you show the name of "Southern Pacific Company." Do I understand that the annual report to the Interstate Commerce Commission or the annual report to the stockholders show that as of the end of 1925 it had a total investment in road and equipment as indicated in column C, line 1?

[fol. 2261] A. Yes.

Q. And that figure is further broken down into a total investment in the railroad properties known as the Pacific lines as indicated in column D?

A. Not that figure, no, but added to that figure are the investments in other lines that comprise the Pacific lines.

Q. The Southern Pacific Company as a corporation had invested in Pacific lines the fiure shown in line 1, column D?

A. Yes.

Q. And that same corporation as a corporation and considered not as a railroad for the moment, had an investment elsewhere of the figure shown in column E, is that correct?

A. Yes.

Q. You have explained column E by a footnote reference?

A. Yes.

Q. Does the addition of columns D and E for line 1 appear in some other column on the exhibit?

A. Column C.

Q. Columns D and E are the breakdown of column C?

A. Yes.

[fol. 2262] Q. In line 2 you refer to the name of the corporation, Alamogordo and Sacramento Mountain Railway Company. What is that company or what was it?

A. That was a wholly owned subsidiary of the Southern Pacific Company.

Q. Did it as a corporation own certain fixed property or equipment as of the end of the year 1925?

A. The amount shown in line 2, columns C and D.

Q. What was the Arizona Eastern as of December 31, 1925?

A. A wholly owned subsidiary of the Southern Pacific Company owning fixed property as shown in columns C and

D which were operated under lease by the Southern Pacific Company.

Q. What as to the rest of these companies shown in lines 4 to 21?

A. The same explanation applies to each and every one of them. In other words, all of these companies shown from line 2 to line 21 represent wholly owned subsidiaries of the Southern Pacific Company owning property with a book value as shown in columns C and D, whose properties are operated under lease by the Southern Pacific Company. The exception to that is the Inter-California Railway Com- [fol. 2263] pany which owns property both in the United States and in Mexico and only the lines in the United States are operated under lease by the Southern Pacific Company as part of the Pacific lines.

Q. Are the lines of the Inter-California Railway Company in Mexico indicated on exhibit No. 1?

A. I can't see from here, but I think they are.

Q. These lines between Mexicali and Lower California and Algodones in Lower California, both points being on the international boundary line?

A. Yes.

[fol. 2264] Q. Now, passing from Account 701, Investment in Road and Equipment, what is the explanation as to Account 702, Improvements on Leased Railway Property?

A. Those were expenditures made by the operating company on property leased by it, expenditures representing additions and betterments to leased properties.

Q. Now, as to Account 708, what does that represent?

A. That is actual cash.

Q. Apparently none of these subsidiaries had any money, is that correct?

A. No, they are dormant corporations so far as operations are concerned; their properties are operated by the Southern Pacific Company and the Southern Pacific Company pays all of their corporate expenses; therefore, they have no cash on hand.

Q. And what is Account 716?

A. Material and Supplies, an operating stock of materials and supplies.

Q. Would that be such stock as spare ties awaiting insertion in the track?

A. That includes everything of an operating nature: rails, ties, locomotive parts, bridge parts, in fact, all types [fol. 2265] of material used in the operation and repair of a railroad.

Q. Would it include fuel oil on hand in the company's possession?

A. Yes.

Q. Would it include locomotives and cars?

A. No.

Q. Where are they included?

A. They are included in Column C, they are in the investment account.

Q. Would they also appear in Column D?

A. Column D, yes.

Q. I notice that when we get over to Sheet 16, and I think it is true of some of the intervening sheets, that instead of having the number of company lines 2 to 21, inclusive, that the number has been reduced so that you have only eight other than the Southern Pacific Company. What has happened to the rest that are not shown?

A. The others have been consolidated. Through the period of years covered by this exhibit it has been the aim of the company to simplify its corporate structure, and in that process if has transferred the properties of one company to another and disincorporated that company, and, in other words, it has reduced the number of corporate entities owning the railroads.

[fol. 2266] Q. Does that account for this disappearance of the South Pacific Coast Railroad Company, for example?

A. Yes; the South Pacific Coast Railroad Company was acquired by the Southern Pacific Company.

Q. What has happened to the Inter-California; what has become of its United States properties?

A. The line in the United States were acquired by the Southern Pacific Company, and the lines in Mexico are operated independently.

The Court: Well, Mr. Masson, the Court is a little confused on your corporate structure here. The defendant in this case, I take it, is the Southern Pacific Company.

A. Yes, sir.

Q. Now, referring to Sheet 2, on Line 1, you list there the Southern Pacific Company; down on Line 20 you have the Southern Pacific Railroad Company, and then the over-

all designation of the entire exhibit is the Southern Pacific Company.

A. Pacific Lines.

Q. Pacific Lines? It doesn't so state.

Mr. Mason: No, the Southern Pacific Company.

The Court: (Continuing) Now, having in mind that the whole is no larger than its component parts, why do you [fol. 2267] list the Southern Pacific Company on Line 1 if the Southern Pacific Company actually owns all the subsidiaries shown there between lines 1 and 20?

A. The Southern Pacific Company owns certain railway properties which are part but not all of the Pacific Lines. The remaining lines that are operated as the Pacific Lines are owned by these respective subsidiary companies. The investment of these separate organizations is kept separate in our accounts. To determine the full investment value of all Pacific Lines, we must naturally go to the books of each company that makes up those lines. That is why it is shown. There is no duplication in these figures, nor is there, you might say, any relationship except through the instrumentality of a lease, first, of these properties by the Southern Pacific Company and, next, the stock ownership by the Southern Pacific Company of these various subsidiaries. Is that clear?

Mr. Mason: Do I understand, Mr. Masson, that the Southern Pacific Company owns the entire stock of each of these subsidiaries which, for the year 1939, are shown on Sheet 16 in Lines 2 to 9, inclusive?

A. Yes.

[fol. 2268] Q. And has caused them to lease all of their physical properties to the Southern Pacific Company?

A. Yes.

Q. Does the Southern Pacific Company control the amount of investment, the betterment which may be made on any of these leased properties?

A. Yes, it does.

Q. Through its stock ownership?

A. Yes.

Q. And the entire property, owned and leased, then is what constitutes the Southern Pacific Company, Pacific Lines, railroad system?

A. Yes.

The Court: I still don't understand why—take Sheet 16, why you list the Southern Pacific Company on Line 1, then set up in the various schedules there the financial structure, when you have just testified that all of these lines are owned and controlled by the Southern Pacific, and your exhibit shows that the Southern Pacific Company, being the same company, I take it, that is listed on Line 1, actually owns the whole. Maybe I don't make myself clear.

A. Yes, I think I understand. First, let us make a distinction of ownership. The Southern Pacific Company [fol. 2269] owns the stock of all of these subsidiaries. We have shown here the book value of the investment of the Pacific Lines, the investment in road and equipment, physical properties. In arriving at that figure we cannot take the value of the stock that is owned by the Southern Pacific Company; we must take the value of the properties used by the Southern Pacific Company. Now, the value of these properties used by the Southern Pacific Company is not on the books of the Southern Pacific Company; only the stock value is on the books of the Southern Pacific Company. Therefore, when we make a consolidated investment figure we must go to the books, first, of the Southern Pacific Company, where we will find only the value of a small part of the Pacific Lines; then we must go to the books of each one of these other subsidiaries to get the total value invested in the physical properties that is separate and apart from the stock ownership of these companies.

Mr. Mason: Now, may I ask some questions in that connection, and they may be leading, Mr. Strouss, but I think they will develop the points we have in mind.

Q. Do I understand, Mr. Masson, referring to Sheet 16, Line 2, that the Arizona Eastern Railroad Company is a [fol. 2270] corporation separate from the Southern Pacific Company?

A. It is.

Q. And it holds legal title to certain property having an investment value as indicated in Column D, Line 2?

A. Yes.

Q. That property is then leased under a long-term lease to the Southern Pacific Company?

A. Yes.

Q. Which latter then operates it as part of a railroad system.

A. Yes.

Q. Now, the Southern Pacific Railroad Company is a corporation separately organized apart from the Southern Pacific Company?

A. Yes.

Q. Chartered in Arizona, as a matter of fact, isn't it?

A. Yes.

Q. And it owns legal title to certain properties?

A. Yes.

Q. Which are leased for a long period of years to the Southern Pacific Company, the so-called parent company? [fol. 2271] A. That is correct.

Q. And the same as to each of these other properties in lines 3 to 8, inclusive?

A. Yes.

The Court: Of course, the parent company not only leases it, but owns the capital stock of the subsidiary corporation.

A. They own the stock, yes, but that doesn't give them authority to operate the property.

Mr. Mason: Referring to Line 1 on Sheet 16, and comparing the figure in Column D, line 1, with the figure in Column D, Line 10, is the figure in Line 1, Column D, the investment value of the properties to which the Southern Pacific Company as the corporation—the physical properties to which that company as a corporation holds legal title?

A. Yes.

Mr. Mason: Does that make it clear, your Honor?

The Court: I think I see it. One other question: The Southern Pacific Company, the parent organization, so-called, must be distinguished from this Southern Pacific Railroad Company down here on Line 9?

A. Yes.

[fol. 2272] Q. That is an entirely separate corporation?

A. Two different corporations.

Mr. Mason: Mr. Masson, just as a matter of explanation, why are these corporations or some of them kept alive while others are discontinued; do you know?

A. Mostly because of outstanding mortgages and bond issues, bond issues outstanding.

Q. Now, these figures in Line 14 correspond to the figures shown in Column D, Line 10, of each of these succeeding pages, do they?

A. Yes.

Q. Where are they found?

A. Well, the figure—take 1939, the figure in the last column opposite Line 14 on Sheet 1 is the same figure as will be found in the last column on Sheet 16.

Q. Column O?

A. Column O.

Q. Being the total investment, including cash, material and supplies.

A. Yes, sir.

Q. That is investment in fixed property, cash on hand.

A. What is ordinarily known as working capital, consisting of material and supplies, and cash.

[fol. 2273] Q. Do I understand then each of the sheets 2 to 16, inclusive, is a break-down of the investment figure of line 14 in Sheet No. 1?

A. Correct.

Mr. Mason: Have you any questions on the exhibit?

Mr. Strouss: We are about to adjourn. I would like to look this over tonight.

Mr. Mason: Would you prefer that I defer the offer until tomorrow morning?

Mr. Strouss: Yes, I would.

The Court: The court will be at recess until ten o'clock tomorrow morning.

(Thereupon, the court stood at recess until Wednesday, January 15, 1941, at ten o'clock A. M.)

[fol. 2274] January 15, 1941, ten o'clock A. M.

Proceedings were resumed at this time as follows:

Mr. Mason: Mr. Strouss, have you before you the transcript of yesterday's testimony?

Mr. Strouss: Yes.

Mr. Mason: Page 2189. Mr. Masson has called my attention to his answer in line 23 to a question which you addressed to him in connection with exhibit No. 162. His answer

was "No," and the question was, "On Item 1 you have an increase of mileage of road operated?" Now, obviously, the answer should have been yes. He says he clearly didn't understand the question.

The Court: You are asking permission, then, to change the answer?

Mr. Mason: I think the answer should be changed to "Yes," if you care to stipulate to that.

Mr. Strouss: Sure, I will stipulate to that. I didn't notice that in his answer to the question that he said "No."

The Court: The correction indicated, then, may be made.

Mr. Mason: Now, I think that we had about finished preliminary questions prior to an offer of the exhibit [fol. 2275] marked "Exhibit No. 172 for identification," but at the conclusion I withheld the offer because Mr. Strouss indicated that he desired to ask some questions, or, rather, preferred to look the exhibit over before the offer was made.

L. J. Masson was recalled to the stand, and testified further as follows:

Mr. Strouss: Mr. Masson, Item 14, book value at the close of the year, that is not the same valuation that Mr. Baker testified to?

A. No.

Q. Those were exhibits 111, 112, 113, and 114?

A. No, that is the book value, the value that we carry on our books. Mr. Baker's value is the valuation of the I. C. C. brought down to date.

Q. Now, in Item 10, Railway Operating Income, of course, rent paid to subsidiaries for lease of properties wouldn't be included in that item?

A. No.

Mr. Strouss: That is all.

Direct examination (Continued).

By Mr. Mason:

Q. As I understand, Item 10, Mr. Masson, is the income [fol. 2276] as indicated by the item shown of the properties taken altogether and operated as a railroad?

A. Yes.

Q. Regardless of the bare legal title being in one corporation or another?

A. Yes.

Q. Are all the underlying documents used in connection with this exhibit available for the examination of opposing counsel, if necessary?

A. Yes.

Mr. Mason: Has the Court any questions on the exhibit?

The Court: I think not.

Mr. Mason: We offer the exhibit in evidence as No. 172.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 172.")

Mr. Mason: Will you refer, please, Mr. Masson, to a statement in one sheet entitled "Southern Pacific Transportation System, Income Account for the Calendar Years 1925 to 1939, Inclusive?"

[fol. 2277] A. Yes, sir.

Mr. Mason: May we have that statement marked 173 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 173 for identification.

Mr. Mason: Did you prepare this statement, No. 173 for identification, or cause it to be prepared?

A. I caused it to be prepared, and it was prepared under my supervision and direction.

Q. And from what sources?

A. From the annual reports of the Southern Pacific Company to its stockholders.

Q. Are copies of the annual reports to the stockholders also furnished to the Interstate Commerce Commission?

A. Yes.

Q. Is the annual report to the stockholders maintained as a permanent company record?

A. Yes.

Q. Do you have copies of the annual reports for these years here for the use of opposing counsel?

A. Yes.

Q. Now, will you state just which lines are included in [fol. 2278] the transportation system as that title is used at the heading of the exhibit?

A. As shown in the heading of the exhibit, the transportation system of the Southern Pacific Company includes the Pacific Lines, the Southern Pacific Steamship Lines——

Q. Between which points do the steamship lines operate?

A. Between New York, New Bedford, Boston, Norfolk, New Orleans, Galveston and Houston; and also includes the Texas and New Orleans Railroad Lines running from New Orleans to El Paso.

[fol. 2279] Mr. Mason:

Q. The Texas and New Orleans Railroad is a railroad property?

A. Yes, it is a wholly owned railroad company operated independently.

Q. What is the relation between the Southern Pacific Company and the Texas and New Orleans Railroad Company from the standpoint of stock ownership?

A. A wholly owned subsidiary of the Southern Pacific Company. In other words, the Southern Pacific Company owns the entire outstanding capital stock of the Texas and New Orleans Railroad.

Q. Does the Texas and New Orleans maintain its own headquarters?

A. At Houston, Texas.

Q. Taking the year 1925, you show first a block of items entitled "Operating Income." What type of income is indicated by the figures in line 7?

A. That is the net railway operating income, or, in other words, the net revenue derived from transportation.

Q. Is that sometimes referred to as income from carrier operations?

A. Yes.

Q. What does line 1 purport to show?

[fol. 2280] A. Line 1 is the total railway operating revenues from transportation of freight and passengers and other miscellaneous revenues incident to the transportation business.

The Court: That is a gross figure?

A. Yes.

Mr. Mason: Line 2 is what?

A. Railway operating expenses incurred in connection with the transportation service rendered in earning the gross revenues.

Q. What does line 3 represent?

A. Line 3 represents the revenue or the difference between the gross revenue and the operating expense.

Q. Is line 3 the subtraction of item 2 from item 1?

A. Yes.

Q. What is item 4?

A. Item 4 are the railway tax accruals.

Q. Does that include state as well as Federal tax payments?

A. Yes.

Q. Do those include taxes on any properties other than those used in conducting transportation operation?

A. No.

[fol. 2281] Q. If there are income taxes or sales taxes not based upon property valuations, are those included in item 4?

A. Yes, if they are applicable to the companies included in this exhibit.

Q. What does item 5 represent?

A. Item 5 represents freight or passenger charges that were uncollectible from consignees.

Q. Are those amounts which were earned but not collected?

A. Earned but not collected is correct.

The Court: I thought the railroads collected in advance. How did that happen?

A. We don't always do that. We would like to, your Honor, but we have two classes of charges. A consignor may wish to pay the freight and we call that "prepaid freight." In the majority of cases charges are always collected at destination.

Q. Do you surrender the freight before collecting your charges?

A. We do not unless the consignee is protected by bond, but it so happens at times that at the time of delivery all charges may not be apparent, and in many cases there will be additional charges come along for one reason or another, the application of the wrong rate or a correction in the [fol. 2282] weight or some charge that may have accrued

enroute will come along later and we will find it rather difficult and sometimes impossible to collect those charges.

Q. The railroad company experiences difficulty with bad debts the same as many other businesses.

A. Your Honor, we are no different than the corner merchant, we have the same problems that he has except that they are more widely dispersed.

Mr. Mason: I will ask you, Mr. Masson, if it is not a fact that the amounts which go to make up uncollectible railway revenues are frequently very small in amount?

A. That is true.

Q. Not justifying the expense of collection in many cases?

A. That is true. We are obligated under the law to exhaust every possible means to collect our charges, even going to court, but many of the items are so small that it is not worth while.

The Court: The cost of collection would exceed the debt?

A. Yes. We are not expected to do an idle or an expensive act.

Mr. Mason: As to item 6, what does that represent?

[fol. 2283] A. That represents equipment and joint facility rentals. That is the per diem we pay. That is the net of the per diem or car rental that we pay other lines or collect from other lines for the use of our cars.

Q. Do those represent the balances by which the amount paid to other lines exceeds the amount received?

A. Yes, the joint facility rents represent the rentals that are paid for use of joint properties, properties owned by other lines which we use jointly with them.

The Court: Pardon me, Mr. Masson, reverting for the moment to the item, "Uncollectible Railway Revenues," evidently you must have improved your system as I notice for the years 1936, 1937, 1938, and 1939 no such items appear?

A. We were not any more fortunate in those years than we were in the past, but due to a change in the instructions issued by the Interstate Commerce Commission that account, uncollectible revenue, was canceled and we now

charge the uncollectible revenues against freight revenue or passenger revenue as the case may be.

Q. It is just a matter of bookkeeping then?

A. Just a matter of bookkeeping.

[fol. 2284] Q. You still sustain your losses?

A. We do, yes, sir.

Mr. Mason: I take it in these later years you simply do not show quite as much in item 1 as you otherwise would?

A. That is right.

Q. To illustrate equipment rents, if a Southern Pacific Company car is on the lines of the Santa Fe, does the Southern Pacific receive rental from the Santa Fe?

A. Yes.

Q. At an agreed rate?

A. A dollar per day.

Q. If the Santa Fe car is on the Southern Pacific lines, does the Southern Pacific Company pay rent for the car while it is on the lines?

A. Yes, at the same rate.

Q. And the same, of course, with every other railroad with which equipment is interchanged?

A. That is true.

Q. I take it that this item, No. 6, is largely made up of the balancing of these cross-accounts?

A. Yes.

Q. If the Southern Pacific participates jointly with other railroads at a terminal such as the Los Angeles union pas-[fol. 2285] senger terminal, is rental paid for the use of that terminal?

A. Yes.

Q. Does that enter into this item of joint facility rents?

A. Yes. I want to explain when I said a dollar per day I was speaking of freight cars.

Q. I understand there are different rental figures for different kinds of equipment of different ownership?

A. Yes.

Q. In obtaining your figure in item 7, will you explain what relation that bears to item 3 and how item 3 is reduced, if it is, in obtaining item 7?

A. Item 3 is the net remaining after applying operating expenses, that is, the cost of maintenance of way and equipment, traffic expenses, transportation expenses, general expenses. After applying that cost against the gross revenue,

we have item 3. Of this net remaining from transportation we have taxes to pay. That is a charge against the amounts shown in line 3. So also are uncollectible revenues and so also are equipment and joint facility rents. The sum of lines 4, 5, and 6 is deducted from line 3 to get line 7. Does that make it clear?

Q. Yes, I think it does. Proceeding now to the block of [fol. 2286] items entitled "Other Income," what is represented there?

A. Other income are items that are distinguished from operating revenues or expenses and are generally of a financial nature. They will include revenues from miscellaneous operations; income from lease of road and equipment; miscellaneous rent income, that is, rent that we collect from property in and around our rights of way.

Q. Would that, for example, include rentals from property leased to private persons for warehouse sites?

A. Yes.

Q. Would this other income include dividends on stock which the company may own?

A. Yes, I was coming to that.

Q. Would it include interest on bonds which the company may own?

A. Yes, income from securities the company may own.

Q. Would it include interest on bank deposits?

A. Yes, if we get any.

Q. Suppose that the company owns lands which produce oil or other minerals, where does the income appear?

A. That would go into "Other Income."

[fol. 2287] The Court: That is line 9?

A. Yes, sir.

Mr. Mason: How do you get line 11?

A. Line 11 is the addition of line 10 to line 7 which brings us to a figure of gross income, that is, receipts from all sources.

Q. I understand that this figure in line 11 is the corporate income of the transportation system?

A. Yes, the gross corporate income of the transportation system.

Q. That includes both operating and non-operating income?

A. Both operating and non-operating income.

Q. What items are placed in the next block which includes lines 12 to 16?

A. We have charges that would go against income items that are credited to other income, such as taxes on miscellaneous operating property; miscellaneous rents of one kind or another; miscellaneous tax accruals; tax accruals that apply to properties that are not strictly operating properties. We have other items such as the maintenance of an investment organization, an organization that looks after our investment securities and minor items of that kind.

Q. Would it be correct to say that this group, miscellane-
[fol. 2288] ous deductions from income, are the expenses and deductions associated with the non-carrier operations which yield the non-carrier income?

A. That is essentially correct.

[fol. 2289] Q. Now, what do you place in the block entitled "Fixed Charges," items 17 to 20?

A. Well, fixed charges include, first of all, interest on outstanding debts, funded debt or any indebtedness that the company may have.

Q. What do you mean by "funded debt?"

A. Funded debt is a debt that has been covered by securities and mortgages.

Q. Well, then, this item 17 represents essentially bond interest or interest on secured notes, does it?

A. It does, yes, sir.

The Court: While on that, Mr. Masson, I notice that between the years 1927 and 1939, there has been quite a substantial increase in spite of the fact that the interest rates have dropped. Now, does that mean that the company has increased its indebtedness during that period materially?

A. It does, yes, sir. When you say that interest has dropped——

The Court: I was taking that from the commercial world generally.

The Witness: (Continuing) We must bear in mind that the fixed obligations that have been outstanding for some time carry the same coupon interest today as they did several years ago, but besides that we had to increase our
[fol. 2290] indebtedness considerably. We borrowed from

the R. F. C.-Reconstruction Finance Corporation, and we also borrowed from the banks. We now owe each of those generous individuals eighteen million dollars apiece, so that is quite a sum outstanding.

Mr. Mason: And is there interest payable on these added borrowings that you have mentioned?

A. Yes.

Q. Does that enter into Item 17, the interest on funded debt, bonds and notes?

A. Yes, sir.

Q. You spoke of other fixed charges. Does that represent sinking fund payments?

A. No, it doesn't represent sinking fund payments; it represents, primarily, rents for leased road and equipment and amortization charges.

Q. Amortization charges on what type of obligation?

A. Well—I beg your pardon, there is no such item in that. You based your questions on 1925. I was following the 1939 report. I said there is no amortization, which is a fact, so far as 1939 is concerned. There happened to have been charges for "Amortization of discount on funded debt in years 1925 to 1938 inclusive". Whilst amortization charges is a part of fixed charges, we happen to have no [fol. 2291] charges of that kind in here, but the other fixed charges does represent, as I say, rent for leased road and equipment, and then interest on unfunded debts.

Q. When you speak of interest on unfunded debt, is that such matters as short term loans?

A. Yes, of one kind and another.

Q. Mr. Masson, you are familiar with the type of security or obligation sometimes called an equipment trust note?

A. Yes.

Q. For what purpose are equipment trust issues used?

A. Well, for the purchase of equipment.

Q. Do they become funded debts of the company?

A. Yes.

Q. Do they carry interest?

A. Yes.

Q. And where such interest is paid, in what item would it appear?

A. Interest on funded debt.

Q. Is it line 17 here?

A. Yes.

Q. How did you arrive at the figure on Line 20—

The Court: Mr. Mason, I don't think it will be necessary to go into that. It is quite evident from the exhibit itself.

[fol. 2292] Mr. Mason: Very well. Is it desirable to explain line 21? I imagine it is not, because it is shown by the division of line 16 by 19 on the face of the exhibit.

Q. Has the exhibit been compared against the original sources, Mr. Masson?

A. Yes.

Q. And are there any computations hereon which do not appear on the original sources?

A. The line 21 is a computation which indicates the number of times fixed charges were earned, as indicated there in dividing line 16 by 19.

Q. Mr. Masson, is a showing of this character prepared for the Southern Pacific Company, Pacific Lines, apart from the balance of the transportation system?

A. No.

Q. Could such a showing be prepared from the books of the company?

A. No.

Q. Could such a showing be prepared for the Texas and New Orleans Railroad Company considered as a unit and apart from the balance of the transportation system?

A. Yes.

[fol. 2293] The Court: I take it, from this exhibit, referring to line 22, that no dividends have been declared since the year 1932?

A. That is true, and if we don't do any better in the future we are going to be in the soup.

Mr. Strouss: I move that that be stricken.

The Court: Yes, that may be stricken.

Mr. Mason: Could a showing of this kind be prepared for the Southern Pacific Steamship Lines apart from the other two units shown here?

A. No.

Q. Will you state why you have prepared and presented the exhibit in this fashion showing the entire transportation system rather than for the Southern Pacific Company, Pacific Lines, as a separate unit?

A. The purpose of this exhibit primarily is to show the reduced earning power of the Southern Pacific Transportation System, on which the Southern Pacific Company's outstanding stock must depend for dividends. That is the reason why the exhibit was prepared in this form, to show the availability of earnings and the earnings power, as a matter of fact, that is behind the Southern Pacific Company stock now outstanding.

[fol. 2294] The Court: Well, Mr. Masson, in examining the exhibit, if I read it correctly, in spite of the fact that no dividends have been declared since 1932, it does appear from the exhibit, does it not, that there has only been three years during the period 1925 to 1939, inclusive, where there has actually been a net deficit?

A. That is so, too, yes, sir. May I point out, however, that in many of the other years there was very little left for dividend purposes.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: Not at the present time, no.

Mr. Mason: Has the Court any further questions?

The Court: I think not.

Mr. Mason: We offer the exhibit in evidence as No. 173.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: Overrule the objection. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 173.")

Mr. Mason: Will you refer, please, Mr. Masson, to a [fol. 2295] statement in one sheet entitled "Summary of Authorizations Granted by Interstate Commerce Commission Under Section 20A of Interstate Commerce Act?"

A. Yes, sir.

Mr. Mason: May we have this statement marked 174 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 174 for identification.

Mr. Mason: Did you prepare Exhibit No. 174 for identification?

A. Yes, sir, I prepared it personally.

Q. I will ask you to refer, if you will, to Mr. Russell's Exhibit No. 7, Defendant's Exhibit No. 7, which was presented on the first day of this trial.

A. Yes, sir.

Q. And also refer to Mr. Russell's testimony, his answer to a question with respect to the equipment trust obligations, which were apparently referred to under column K of his exhibit No. 7, headed "Trust Series." Did you prepare exhibit No. 174 for identification with reference to Mr. Russell's exhibit No. 7?

A. Yes.

[fol. 2296] Q. In what manner was it prepared?

The Court: Did I understand you to say No. 7, Mr. Mason?

Mr. Mason: Yes.

The Court: That has to do with locomotives purchased or built in company shops, does it not?

Mr. Mason: Purchased or built in company shops, yes, and this will relate to the purchase.

Q. Will you explain just how you prepared Exhibit 174 for identification with reference to exhibit No. 7?

A. First I referred to the trust agreements and there found the equipment as listed in Mr. Russell's exhibit No. 7. Then I referred to the orders of the Commission issued in each of these cases.

Q. Did you refer to the letter series shown on exhibit No. 7 as the indication of the various series of trust indentures that were shown as having been issued?

A. Yes.

The Court: That is column K?

Mr. Mason: Yes.

The Witness: (Continuing) And having reviewed the orders of the Commission, I abstracted column C and column D, the information shown in those columns, then I [fol. 2297] went to the published reports and abstracted the references that are shown in column E.

Mr. Mason: I think Your Honor will recall that Mr. Russell, in answer to my question asking him whether these various trust indentures or trust series shown by letter on his exhibit had been authorized by the Commission, said, "I understand that may have been," which answer was ob-

jected to as being hearsay. The purpose of exhibit 174 is to show, by calling to the Court's notice, by the Interstate Commerce Commission's published reports and orders, the fact in that connection.

Q. Were you able, by associating the letter series with the date and the finance docket number, to obtain the Interstate Commerce Commission orders and dates of issuance in connection with each of these letter series of these trust indentures?

A. Yes.

Q. Have you compared the exhibit against the Interstate Commerce Commission report?

A. I abstracted it personally from those reports.

Q. And you know it to be a true and correct reflection? [fol. 2298] A. Absolutely.

The Court: Well, do I understand, Mr. Masson, that the Southern Pacific Company cannot issue these trust indentures without the approval of the Interstate Commerce Commission?

A. That is correct; under section 20A, the I. C. C. has jurisdiction over all securities that any company might intend to issue.

Mr. Mason: You are referring to Section 20A of the Interstate Commerce Act?

A. Yes, sir.

Mr. Mason: I think that is now Section 20A of Part 1, of the Transportation Act of 1940, is it not, Mr. Strouss?

Mr. Strouss: I think so.

Mr. Mason: Have you any questions on No. 174, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: We offer exhibit No. 174 in evidence.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 174.")

Mr. Mason: I think that is all we have from Mr. Masson [fol. 2299] now, Mr. Strouss, if you wish to cross-examine.

Cross-examination.

By Mr. Strouss:

Q. Mr. Masson, the operation of branches has considerable bearing upon operating expenses of the division, does it not

A. Yes.

Q. And where the branch-line operations are in a territory that presents difficulties in operation such as severe grades and other things of that sort, that would tend to increase operating costs; that, of course, would also tend to increase operating costs on the division as a whole where you are calculating costs including both main line and branch service?

A. It would have a contributing effect, of course, on the cost.

Q. Do you segregate in your accounting system costs of operation for branch-line operations and for main-line operations?

A. Only as to maintenance of way.

Q. Prior to the year 1931 you did segregate those costs, operating costs as to branch and main-line operations, did you not?

[fol. 2300] A. Yes.

Q. Now, you have considerably more branch line operation in Arizona than you have in Nevada; isn't that true?

A. Yes.

Q. I think your exhibit 115 shows branch-line track in Nevada 153.60?

A. That is correct.

Q. Arizona, 464.96?

A. That is correct.

The Court: What exhibit was that, Mr. Strouss?

Mr. Strouss: 115.

Q. Now, your form 521 for the year 1931 shows your branch-line operations on the Tucson division at $1.305; on the branch line operations on the Salt Lake Division, 88.4 cents.

A. I haven't that form 521—1931?

Q. 1931.

A. I haven't that here. Can you suspend that question for a minute until I get that

Mr. Strouss: Yes, you may check that figure later.

The Court: We will take a recess at this time if you want to suspend while he gets that.

Mr. Strouss: Have you those here?

A. Yes, we have them here.

[fol. 2301] The Court: Very well. We will take a recess.

(Thereupon, a short recess was taken, after which the witness was recalled to the stand, and proceedings were resumed as follows:)

[fol. 2302] Mr. Strouss: Q. I am speaking of the cost per train-mile, Mr. Masson. For the year 1931, main line, Salt Lake division, the total was $1.047?

A. That is correct.

Q. And Tucson, $1.11?

A. That is correct.

Q. Branch lines, Salt Lake, $0.884?

A. That is true.

Q. Tucson, $1.305?

A. That is true.

Q. In 1930 on the Salt Lake division, main line, $1.062?

A. Correct.

Q. Branch lines, $0.904?

A. Correct.

Q. On the Tucson division, $1.13 for main lines?

A. The 521 that I have here for 1930 is not complete as to the year. What figure did you quote?

Q. $1.13 for main line.

A. I can't verify that figure because the form I have here doesn't show that. That is the year in which the limits of the division were changed.

Q. I think I took that off of your 1931—no, that wouldn't show in your 1931 recapitulation.

A. No, unless you computed it. What was the other [fol. 2303] figure?

Q. Branch lines, $1.392?

A. The cost on the Tucson division—I can't verify that.

Q. There are a great many items, of course, that enter into cost of operation, are there not, or that affect the cost of operation?

A. You mean train operation?

Q. Train operation, yes. For example, the number of tracks will have its effect upon costs?

A. As to whether or not there is sufficient track room for the trains that are operated?

Q. Single or double track, the costs may be affected by whether your operation is on single or double track?

A. Yes.

Q. Also the volume of traffic will have its effect upon costs?

A. The volume of traffic that can be put in one train.

Q. Volume of traffic available?

A. It will, yes, to a certain extent if the traffic is not enough to fill out the trains.

Q. Length of divisions or operating districts will have its effect upon costs?

A. I don't think that would have an material effect on [fol. 2304] costs.

Q. If you have a train, a freight train district where the operation of the freight train is for one hundred miles and another district of two hundred miles before there is a change of engines, wouldn't that longer division have a less cost, for example, in the cost of the preparation of the engine for its run?

Mr. Mason: I would like to have that question read.

(The question was read by the reporter.)

Mr. Mason: Your Honor, I don't think I have qualified the witness to testify regarding details of operation, and I don't believe that he undertook to so qualify himself. The exhibits that he presented are largely excerpts from statistical reports or statistical compilations and indicate the result of his research into those accounts rather than his own opinion as to how costs can be affected. I doubt that this can be properly considered as proper cross-examination and I object to the question as improper cross-examination.

The Court: If the witness can answer the question, he may do so, and if he doesn't know he may so state.

A. I would rather not express an opinion on that because [fol. 2305] I am really not expert at it.

Mr. Strouss: Different wage scales in different divisions would, of course, affect the cost?

A. Yes.

Q. Different fuel costs?

A. Fuel is about the same cost over the entire system.

Q. There would be a transportation charge in addition to the original cost which would be chargeable to the division, would there not?

A. We have an average price over all the system.

Q. You don't charge each division for the cost plus the transportation of the fuel to that division?

A. No.

Q. So that availability of the fuel to the division would not affect the cost then?

A. No.

Q. There would be an effect so far as fuel is concerned on the amount of locomotive miles on the division for helper service, would there not?

Mr. Mason: What is that question?

(The question was read by the reporter.)

Mr. Strouss: In other words, a helper engine requires fuel and that fuel cost adds to the cost of operation chargeable to that division?

[fol. 2306]

A. The more engine miles the more consumption.

Q. And the same would be true of wages for the engine crew in helper service?

A. Yes.

Q. And the same would be true of switching on the division?

A. Yes.

Q. And the availability of water would be a matter to be considered in that cost, that is, the cost of water by reason of its availability to the division?

A. I don't think that would affect it to any material extent.

Q. What about locomotive supplies, the availability of the market for the purchase of locomotive supplies?

A. That wouldn't have any effect.

Q. What about the difference in the percentage of empties to loads upon the different divisions?

A. That would have some effect, yes.

Q. It would have a material effect with respect to gross ton-miles, would it not?

A. Cost per gross ton-mile, of course the more empties you have to haul over the division the more trains you have to run.

[fol. 2307] Q. And the greater your gross ton-mile cost?

A. The greater the gross ton-mile cost.

Mr. Mason: Q. Would that increase the gross ton-mile cost because they were empties instead of loaded?

A. Not the unit cost, no.

Mr. Mason: I think that was the question and I wanted to be sure the answer was correct.

Mr. Strouss: I notice you have given the revenue for the different states and the operating revenue and the operating costs. It is a fact, isn't it, that over the same period covered by your exhibit here that the operating ratio, the trend so far as operating ratio is concerned, has been substantially the same on the Tucson division as on the Pacific lines and on the Salt Lake division?

A. I don't think so.

Q. You haven't prepared an exhibit on that?

A. I haven't prepared an exhibit on that. If you will name a few years, we can pull the reports and make a comparison or let's let it go and we will prepare an exhibit along that line.

Mr. Strouss: All right.

The Witness: That is, of course, if my counsel has no objection.

Mr. Mason: We will investigate the matter and I imagine [fol. 2308] if we don't, Mr. Strouss will investigate it, so the operating ratio and the trend in operating ratio will be revealed here. I think we have something already prepared which shows to some indication——

The Witness: That being the case, you will wait until this exhibit is presented before renewing your request?

Mr. Strouss: Yes. I would like, if you will do it, I don't want to take the time to go into each one of these now, but the years subsequent to 1931, if you will during the noon hour make a memorandum of the cost per train-mile on the Salt Lake division and on the Tucson division for the years subsequent to 1931. Subsequent to 1931 those costs included both main and branch line operation?

A. Yes.

Q. Could you do that during the noon hour?

A. Taken from the 521?

Mr. Strouss: 521.

A. Yes.

Mr. Mason: I think, your Honor, if the costs per train mile are to be shown, that is, if the plaintiff wishes to show them it should call its own witness and let me cross-examine [fol. 2309] that witness as to what he has done in preparing his showing. They are presenting a showing which we haven't undertaken ourselves and this is kind of a left-handed way of getting the showing. We may put in a showing of cost per train-mile on the two divisions with such explanation as the witness may care to make but this forces me to cross-examine my own witness upon an exhibit prepared by him.

Mr. Strouss: This witness has already testified to a comparison of operating costs on the two divisions.

The Court: Yes; the objection is overruled.

Mr. Mason: A comparison of operating costs?

Mr. Strouss: Yes, by states.

Mr. Mason: That is simply taken from the annual reports to the state commissions, I think.

The Court: To be frank, it does seem to the court if Mr. Strouss expects any new exhibits prepared by this witness or any other witness that he would then be in a position of having to call that witness as his own witness. I will give you full latitude to go into any matters that have been gone into on cross-examination.

Mr. Strouss: I am not asking him to prepare an exhibit. All I want him to do is to check their 521 forms so he can verify the figures. I asked him concerning their per train-[fol. 2310] mile costs on the two divisions.

Mr. Mason: And then you asked him to state them for the record or to be prepared after the recess to state them for the record. That is equivalent virtually to preparing an exhibit. It is certainly asking him to place in the record information which he has not hitherto shown. I don't understand he has testified, and I would like to have reference made to his testimony concerning operating costs on the Salt Lake division as compared to the Tucson division.

Mr. Strouss: The operating costs here have been, the comparison has been to the states as a whole. The Salt

Lake division covers the state of Nevada with a small part extending beyond that state. It happens that the Tucson division takes in practically all of the state of Arizona with the exception of the south line through Douglas. I am trying to get a comparison as near as I can from their own records as to their actual expenses.

Mr. Mason: The records are available, Mr. Strouss, and I suggest when the time comes that is a matter of affirmative showing. I agree that a comparison of the Salt Lake division and the Tucson division is highly pertinent and I take [fol. 2311] it that his request now is virtually a waiver of any objection to any comparison between the two states, but I think what he proposes to show is a matter of his own affirmative showing and might properly be introduced through his own witnesses at which time I could cross-examine the witnesses and develop any impairments, if impairments there be, as to a comparison of train-mile costs.

The Court: It would apparently be more expeditious if we are going into any detail on this to have such a schedule prepared in advance.

Mr. Mason: You understand your Honor, that the records from which he or his associates may prepare an exhibit and introduce it in his case are in his possession and I take it he has available to him a witness who is qualified to copy those figures off and place them in the record, just as qualified in that respect as he himself would be.

Mr. Strouss: I think I can find somebody to read those figures or copy them, but I want to say that Mr. Mason may think I have waived my objection as to the comparison, but what I have said is not in the way of a waiver. This evidence has gone in over my objection, and I have to [illegible]

The Court: The Court does not construe it as any waiver. [fol. 2312] You may proceed.

Mr. Strouss: We are on this question of whether he is going to look at this figures and be prepared to answer.

The Court: Well, on that, Mr. Masson, any data that can be readily procured, if counsel for the State desires, without great amount of labor I take it you will do that during the recess and be prepared to answer questions in connection with it.

A. Yes, your Honor.

The Court: By that I do not mean the preparation of any elaborate exhibits.

A. No, he simply wants me to draw up a memorandum of these costs.

Mr. Strouss: The totals, I am not asking for the detail. You may put that in if you want to, I have no objection to it.

Q. Yesterday you were asked concerning 490 cars at Yuma, how many trains of 70 cars and how many of 100 cars?

A. Yes, sir.

Q. Of course your answer to that question was on the assumption that that traffic was there available at the time?

A. Yes.

Q. In other words, in order to give the answer you did [fol. 2313] you would have to assume there were 490 cars of traffic available at Yuma at the time?

A. You would have to assume that there were 490 cars there, yes.

The Court: In other words, it was purely a hypothetical question?

A. As I understood it, yes.

Mr. Strouss: You were asked yesterday concerning gross ton-miles per freight train hour and the effect of speed on that item. Of course a train of two thousand tons at twenty miles an hour and a train of four thousand tons at ten miles an hour would get the same gross ton-miles per freight train hour, is that corect?

A. At ten miles an hour, yes.

Q. Lighter tonnage and faster speed would give you the same gross ton-miles per freight train hour as a heavier train at slower speed where the multiples of speed times tonnage give the same results?

A. Yes.

Q. Your hot-shots are examples of the lighter tonnage and faster trains?

A. And we get them over the road in a hurry.

Q. That is what I understand. Your exhibit No. 162, "Freight Service Operating Averages, Pacific Lines." I

[fol. 2314] believe you testified that item 4 includes non-revenue as well as revenue freight?

A. Yes.

Q. Is that item 1, does your exhibit No. 115 show the segregation of main and branch line mileage for the Pacific lines as a whole?

A. Yes.

Q. So that that can be determined from that exhibit?

A. Item 1 is the average over the year, average at the end of each month and the figure shown on No. 115 is the miles operated as of the close of the year. That is that difference there.

Q. The total of column 3 would give the total of the branch lines for the Pacific lines, I am speaking of exhibit No. 115 now?

A. Yes.

[fol. 2313] Q. And column 2 is the total main line?

A. Yes, as of the end of the year.

Q. Yes. Now, items—

Mr. Mason: (Interrupting) I think there is one thing more that his attention should be called to—I apologize for interrupting—one is the total mileage operated in steam, and the other is total mileage of road operated in freight service. I don't mean to interrupt your cross-examination.

Mr. Strouss: I am trying to find out what that item 1 represents. If there is a difference there I would like to know what the difference is in main lines operated and mileage of branch lines operated included in item 1 in exhibit 162. Can you give me that? This is freight service. If it is going to take a little time to determine it we can save time by doing it at the noon hour.

A. Just a minute, I may have it. No, it would take a little time to get that, Mr. Strouss.

Mr. Strouss: You don't need to take all of those years shown. If you will take the three last years, 1936, '38 and '39, when you get the segregation for those three years.

Q. Now, items 8, 9 and 10, those items, of course, are affected by availability of traffic, are they not?

[fol. 2316] A. Yes; if you didn't have traffic to fill out the trains—

Q. And item 10, of course, is affected by helper service that is required in a particular division?

A. Yes.

Q. And what about switching as affecting item 10?

A. Road switching.

Q. Road switching. Now, of course, that is true of that same item in exhibits 163 and 164?

A. Yes.

Q. By the way, I think I will only ask you to give me for the year 1939, but will you give me the segregation of main-line and branch lines shown in item 1 of each of those three exhibits?

A. Only for '39?

Q. Only for the year '39. Now, your exhibit 165, column 1, freight revenue per freight service train-mile. Branch-line operations would have an effect upon the amounts shown there, would they not?

A. In some degree, yes.

Mr. Strouss: Do you have any objection, Mr. Mason, on your exhibit 166 Mr. Masson has given a detail of perish-
[fol. 2317] ables, the total products of agriculture and grand total of carload lots. Now, I would like both as to cars and tonnage the totals for different headings set up in your annual reports like products of mines and products of manufacturing. Have you any objection to Mr. Masson giving that detail for each of those three states, four, I guess.

Mr. Mason: Let's see, there is the System, and Arizona, New Mexico, and Nevada. You would like to have each of the other major subdivisions which the Commission recognizes in its reports, products of mines, products of forests, products of manufacturing?

Mr. Strouss: Yes.

Mr. Mason: And what is the other, products of animals and products of miscellaneous?

Mr. Strouss: Yes.

Mr. Mason: No, I wouldn't have any objection.

Mr. Strouss: I would like to have total cars and total tonnage both.

The Witness: Could I just read that into the record?

Mr. Strouss: Yes, you may read it into the record.

Mr. Mason: That is quite a job.

[fol. 2318] The Witness: He just wanted totals.

Mr. Mason: You want the total cars and total tonnage?

Mr. Strouss: Yes.

Mr. Mason: Of course, 166 to 169 inclusive don't show tonnage.

Mr. Strouss: Yes, I realize that.

The Witness: You don't want it broken down by the various columns?

Mr. Strouss: No, just the totals.

Mr. Mason: I think that can be gotten readily. I think it would be better though, Mr. Strouss, to introduce it in the form of an exhibit rather than to read it into the record.

Mr. Strouss: Yes.

Mr. Mason: We will have it prepared.

Mr. Strouss: I am not going to be able to finish with Mr. Masson now; and probably will be several days. I want to examine the annual reports to Nevada and the annual reports to Arizona before I complete my cross-examination, and I don't believe I will be able to do that this week. Mr. Masson tells me he is going to Chicago Sunday night.

Mr. Mason: Yes, he has a very important meeting in Chicago, but we will recall him.

[fol. 2319] Mr. Strouss: It might be after I have finished examining those I won't have any further cross-examination, but I don't want to release him until I have determined that.

The Witness: Now, as I understand it, you only want that segregation of commodities by general classes for the one year 1939?

Mr. Strouss: That is right.

Mr. Mason: The cars and tons corresponding to the territories and subdivisions shown on exhibits 166 to 169 inclusive?

Mr. Strouss: That is right.

Q. Now, I asked you some questions concerning exhibit 169 yesterday, whether the total shown in column C would substantially represent the traffic originating within the state. I think that, in response to my question and in response to further questions by Mr. Mason, that your testimony is that with the exception of probably around 500 cars received from so-called short lines, and possibly a hundred which, as I remember it, you testified you couldn't be certain of that, but Mr. Mason's question was a hundred cars received from the Union Pacific and the Western Pacific, that this would represent the traffic originating in Nevada?

[fol. 2320] A. On our line.

Q. Well, adding to that the cars, around 500, originating on the short lines and, say, around 100 on the two transcontinental lines, if that is all the traffic that does originate on those connecting lines, that 600 added to this 5,351, then, would be the total of traffic originating in Nevada?

A. In the state, yes.

Mr. Mason: You mean, of course, originating in Nevada and handled wholly or partially by the Southern Pacific?

Mr. Strouss: Oh, yes. I realize this doesn't show traffic handled by the Union Pacific.

Q. And column C on Exhibits 166, 167 and 168 have the same general meaning?

A. Yes, they represent cars that originated on the line, on our line.

Q. Now, in Exhibit 172, is rent paid to subsidiaries reflected in any way in that exhibit either as income received or expenses paid?

A. The corporate expenses of subsidiaries are not in there.

Q. You have testified concerning rentals of properties from subsidiaries. My question is——

A. No, that is not in there; that would be rent for lease of [fol. 2321] road, that would be an income charge.

Q. But is it included in there as operating expense?

A. No, rent that we pay to a subsidiary for lease of road would be an income charge to the Southern Pacific Company and an income receipt to the subsidiary.

Mr. Mason: I think the question was whether—did you have in mind, particularly, Mr. Strouss, whether it would be included in item 6 on the first sheet?

Mr. Strouss: Yes, whether it is considered as an operating expense.

A. No, that is not an operating expense. The only rentals that are in there are the rentals for joint facilities of one kind or another, and those joint facilities are entirely with lines that are not leased, foreign lines, or lines that are not leased.

Q. And that is not an operating cost?

A. Rents of leased road is not an operating cost.

Q. I asked you earlier this morning about the valuation which you use here, and you testified that it is not the same

[fol. 2322] valuation as Mr. Baker used in his exhibits 111 to 114, inclusive. This is the book value.

A. That is the book value, yes.

Q. What does book value represent in the accounting system of the Southern Pacific Company?

A. Book value represents outlays of money for road and equipment.

Q. Actual money that has been spent over the whole period of years?

A. The whole corporate existence.

Q. The whole corporate existence. And the valuation that Mr. Baker testified to was the valuation allowed by the Interstate Commerce Commission, with additions to date?

A. That is correct.

Q. Which was the reproduction new, so to speak, of that property at the time that valuation was made?

A. I think it was, yes, sir.

Q. I noticed in your exhibit No. 173 that during the period 1925 to 1931 inclusive, you increased your funded debt by a little over four million dollars; is that correct?

A. Yes.

Q. And during that same seven-year period you paid out in dividends a total of one hundred seventy-seven million, [fol. 2323] eight hundred odd thousand dollars, approximately $178,000,000.

A. We paid out in dividends the amounts as shown in the respective columns.

Q. You haven't totaled it?

A. I haven't totaled it.

Q. Now, where in this exhibit, does rental on leased properties, properties leased from your subsidiaries appear?

A. That would go into miscellaneous deductions from income.

Mr. Mason: Will you identify it by line?

A. That would be included in item 14 there, in line 14.

Mr. Strouss: Now, while that is paid to a subsidiary which is wholly owned by the Southern Pacific Company, it only is shown in income where there has been a dividend paid by that subsidiary, is that correct?

A. That doesn't especially include rentals paid to subsidiaries. As a matter of fact, there is little or no such rental in that account, because our leases with the subsidiaries now provide that we simply make them whole for

such charges as they are obligated for. We pay their bond interest, we pay their corporate expenses. After every-
[fol. 2324] thing is said and done, there is little left to the subsidiary. The rents for lease of road, the majority of amounts there represent a piece of track we lease from other foreign roads.

Q. In other words, your leases with subsidiaries are not a lump-sum lease, but a lease in consideration of your paying the different named items of cost or expense?

A. Yes.

Q. This exhibit, of course, as is indicated at the top, is for the entire Southern Pacific Transportation system?

A. Yes.

Q. Which includes the steamship lines and all properties owned or operated by the Southern Pacific?

A. All properties operated by the Southern Pacific. Now, let me correct that; all properties that are operated by the Southern Pacific as part of its transportation system. The steamship lines and the P. & N. O. of course, are separately operated properties within the System.

Q. But are included in this exhibit?

A. Yes.

Q. The Pacific Electric?

[fol. 2325] A. No.

Q. Is not in here?

A. No.

Q. It is not operated by the—

A. It is not a part of the transportation system. While the Southern Pacific owns the entire outstanding capital stock of the Pacific Electric, it is not operated as part of the Electric, it is not operated as part of the transportation system.

The Court: We will take our noon recess at this time, and resume at two o'clock.

(Thereupon, the court stood at recess until two o'clock, P. M. this day.)

[fol. 2326] 2 P. M., January 15, 1941.

All parties being present as heretofore noted, proceedings were resumed as follows:

L. J. Massox resumed the witness stand.

The Court: You may proceed.

Mr. Mason: Your Honor will recall when exhibits No. 11 and No. 12 were offered objection was made on the ground that the underlying documents were not produced and available for purposes of cross-examination. Mr. Porter, who offered these exhibits, has since returned to New York City and now Mr. Strouss and I have reached I think an agreement which will obviate his being returned here and also obviates the objection so far as it was predicated upon incompetency. I understand that you still want to reserve your objection as to relevancy.

Mr. Strouss: Yes.

Mr. Mason: By stipulating as to exhibit No. 11 that column C, freight operating expenses, represents the total of the entries in the annual reports of the New York Central and its leased lines for the years shown as they appear in accounts 201 to 462, inclusive, including all intermediate [fol. 2327] numbers which appear on the form A, annual report, and that the figures for freight transportation expenses, column D, represent the totals as they appear in accounts 371 to 420, inclusive, including entries in intermediate accounts upon the same annual reports. Is there any stipulation we ought to enter into as to exhibit No. 12; the freight service operating averages?

Mr. Strouss: No, I think the questions I asked Mr. Porter when he was here covered that sufficiently.

Mr. Mason: With that understanding then, may the exhibits be received subject to the objection as to relevancy.

The Court: You are now again offering them subject to that objection?

Mr. Mason: Yes.

Mr. Strouss: I thought in reading over the records they were admitted in evidence.

The Court: The court indicated I was going to strike them.

Mr. Strouss: The record would now show that you have complied with the requirement to produce the underlying records.

The Court: That is right.

Mr. Mason: Or that the production of those records has [fol. 2328] been waived.

Mr. Strouss: Yes. Of course we still reserve our objection as to the relevancy and materiality.

The Court: Well, the objection as to the relevancy is overruled and the documents may now be considered in evidence, having been heretofore admitted in evidence and the defendant having met the objection that the Court raised in the matter at the time.

Mr. Mason: I will advise Mr. Porter accordingly and that part of the matter will be closed.

Mr. Strouss: I will say for the record so far as we are concerned we do not require Mr. Porter to return for further examination. When he left, there was a reservation that I could recall him but we now release him.

Mr. Mason: I would like to have the record show my appreciation of your courtesy, Mr. Strouss.

Mr. Strouss: Mr. Masson, did you get those figures that I requested?

A. The cost per train-mile?

Q. Yes, we have 1930 and 1931 in the record already.

A. 1930 I couldn't verify because I don't have the basic figure.

Q. 1932, Tucson division, $1.006?

[fol. 2329] A. Correct.

Q. Salt Lake division, $0.952?

A. Correct.

Q. 1933, Tucson division, $0.944?

A. Correct.

Q. Salt Lake division, $0.938?

A. Correct.

Q. 1934, Tucson division, $0.934?

A. Correct.

Q. Salt Lake division, $0.918?

A. Correct.

Q. 1935, Tucson division, $1,037?

A. Correct.

Q. Salt Lake division, $1.013?

A. Correct.

Q. 1936, Tucson division, $1.13?

A. Correct.

Q. Salt Lake division, $1,103?

A. Correct.

Q. 1937, Tucson division, $1.252?

A. Correct.

Q. Salt Lake division, $1.198?

A. Correct.

Q. 1938, Tucson division, $1.285?

A. Correct.

Q. Salt Lake division, $1.207?

[fol. 2330] A. Correct.

Q. 1939, Tucson division, $1.215?

A. Correct.

Q. Salt Lake division, $1.151?

A. Correct.

Q. These figures which we have just given from 1932 to 1939 are for main line and branch combined?

A. Yes.

[fol. 2331] Mr. Strouss: Now, did you get a break-down of those commodities by commodity?

A. No, I didn't do that. I will later on in this trial present an exhibit that will show that, if that is satisfactory to you.

Mr. Strouss: Yes, that is all right.

Q. Now, the main line operated and branch line operated, item 1, of the exhibits 162, 163 and 164.

A. 162 cover the System. I haven't any figures here, I may have them later on in the afternoon. I have asked San Francisco to furnish them. On 163, I understood you to say, you only wanted the last.

Q. 1939.

A. Yes, 1939. I have 1939. 1939, for the Tucson Division, Exhibit 163, Main Line, 629.30; branches 326.43, which totals the 955.73 shown on the exhibit. On exhibit 164 for the Salt Lake Division, miles of line operated, main line, 722.12, branches 356.20, which totals 1,078.32 shown on the exhibit.

Mr. Strouss: No further questions.

Mr. Mason: No further questions.

The Witness: Do I understand that you are not releasing me now?

[fol. 2332] Mr. Strouss: That is right. At this time I want to go over the Arizona items.

Mr. Mason: I think, your Honor, that I can defer any redirect examination until the cross-examination has been completed. It would probably be preferable.

The Court: All right.

Mr. Mason: So we can excuse Mr. Masson for the time being.

The Court: You may be excused for the time being. You may call your next witness.

Mr. Mason: We will call Mr. G. C. Baker.

G. C. Baker was called as a witness on behalf of the defendant and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Mason:

Q. Please state your name and official headquarters, Mr. Baker.

A. G. C. Baker, San Francisco, California.

Q. Are you employed by the Southern Pacific Company?

A. Yes, sir.

[fol. 2333] Q. In what capacity?

A. Assistant superintendent of transportation, Pacific Lines.

Q. How long have you been assistant superintendent of transportation?

A. Since August, 1939.

Q. Have you had previous railroad experience?

A. Yes.

Q. With what railroads?

A. Principally all my railroad experience has been on the Southern Pacific, that is, the lines which comprise the Southern Pacific such as the Arizona Eastern and the E. P. & S. W.

Q. You started with the Arizona Eastern?

A. Yes, sir.

Q. When?

A. 1916, as an operator on the old Globe Division.

Q. Then you worked for a while for the El Paso and Southwestern?

A. Yes, sir.

Q. When that was an independent property?

A. Yes, sir.

Q. Where did you work for the El Paso and Southwestern?

A. On the Western Division at various points between [fol. 2334] Douglas and El Paso.

Q. Did you work for a while at El Paso itself?

A. Yes, at the Union Depot for the Union Depot Company.

Q. When did you go to work on the Tucson Division of the Southern Pacific?

A. June, 1918.

Q. In what capacity?

A. As telegraph operator.

Q. And how long did you work as an operator and agent on the Tucson Division at that time?

A. From 1918 until 1923 I worked as an operator, and then I was assigned duties as a train dispatcher, and I continued as train dispatcher until 1932 at Tucson, when, due to reduction in forces, I was sent to El Paso as train dispatcher.

Q. Now, as operator and agent on the Tucson Division in the period between 1918 and 1923, did you serve at various points along the line?

A. Yes.

Q. You served, then, as dispatcher at Tucson for nine years, approximately.

A. Yes, sir.

Q. And then at El Paso for how long?

A. I was in El Paso on two different occasions. The first [fol. 2335] time about six months, and the second time about three months.

Q. After your experience at El Paso as train dispatcher, what positions did you next occupy?

A. I was brought to Tucson in October, 1936, as acting chief train dispatcher, and in December of the same year I was appointed chief train dispatcher for the Tucson Division.

Q. Did you serve as agent at Gila or Yuma?

A. Yes, I was agent at Gila a year, and I was agent at Yuma for two and a half years.

Q. Was that immediately prior to 1936?

A. Yes, sir.

Q. When you were train dispatcher at El Paso, were you employed on the Rio Grande Division?

A. Yes, sir.

Q. How long were you chief dispatcher at Tucson?

A. From October, 1936 until August, 1939.

Q. Since 1939 you have been assistant superintendent of transportation?

A. Yes, sir.

Q. Will you describe your duties as assistant superintendent of transportation?

A. Well, the superintendent of transportation, to whom [fol. 2336] I am assistant has jurisdiction over the distribution of freight and passenger equipment on the Pacific Lines. We distribute it so as to protect the traffic needs of the shippers, and the needs of the traveling public. We also make our passenger and freight schedules, supervise the maintenance of those schedules to see that on-time performance may be made as nearly as possible, and we also handle all car service matters and the interchange of traffic with our connecting lines.

[fol. 2337] Mr. Mason:

Q. Who is the superintendent of transportation?

A. W. B. Kirkland.

Q. Are you his immediate assistant next in charge of the department or bureau called "Office of the Superintendent of Transportation"?

A. Yes.

Q. Does your jurisdiction extend to all parts of the railroad system known as the Pacific lines?

A. Yes, sir.

Q. Are you familiar with the documents sometime heretofore described as the working timetables or employees' timetables?

A. Yes, I am.

Q. Are those prepared and kept of record in the Office of the Superintendent of Transportation?

A. They are in this way, we set up the schedules but the immediate work is done by the chief train dispatcher of each division.

Q. Have you yourself as dispatcher and as chief dispatcher participated in the preparation of timetables?

A. Yes.

Q. I have here a file and I will ask you to examine the file of timetables which bears at the top, "Southern Pacific [fol. 2338] Company, Pacific Lines, Timetable for the Western Division, 231, to take effect Sunday, September 29,

1940, at 12:01 A. M." Will you examine that and the other timetables and state whether this folder of timetables which you have before you is a complete set of the most recent employees' timetables for the Pacific lines including paired track territory?

A. They are with one exception, there is a later Western Pacific timetable out that was effective on January 5, 1941, that is the Western Pacific on paired track territory.

Q. That would replace the Western Pacific paired track timetable which is included within this group, would it?

A. Yes, sir.

Q. Does that later timetable for the Western Pacific make any changes or substantial changes so far as you know with respect to the operation of Southern Pacific trains?

A. None whatever in the operation of Southern Pacific trains. Their times are the same. They made a few changes in the Scenic Flyer.

Q. There is a train here referred to as the "Exposition Flyer"?

A. That is it.

Q. Their train No. 40?

[fol. 2339] A. Train No. 39 and 40, there are slight changes made in their schedules.

Mr. Mason: Have you any questions as to these timetables, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: We intend to offer them now as an exhibit by this witness. These or their predecessors in issue have been furnished during or prior to the start of the trial. We offer this group of timetables as one exhibit, your Honor.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 175.")

Mr. Mason:

Q. Mr. Baker, I notice that certain of these timetables, for example the Salt Lake division timetable, show the name of G. C. Baker as assistant superintendent of transportation. Are you the G. C. Baker whose name is shown there?

A. Yes, sir.

Q. That appears on others of these timetables?

A. Yes, sir.

Q. I think you spoke a few minutes ago in describing your duties, that the Office of Superintendent of Transportation deals with schedules of freight and passenger trains?

[fol. 2340] A. Yes, sir.

Q. I will ask you whether the Southern Pacific Company maintains or jointly with other carriers participates in maintaining through schedules for the movement of freight in transcontinental movement, that is to say, between the eastern part of the United States and the Pacific Coast territory?

A. Yes, it does.

Q. Addressing yourself to the map, exhibit No. 1, the enlargement of which is on the easel, over what routes do those schedules apply, as the routes appear upon that exhibit?

A. Our main route is the route between Roseville and Ogden, which we generally refer to as the "overland route" and over the southern route between Colton, California, and El Paso-Tucumcari, New Mexico.

Q. Those schedules between Roseville and Ogden and between Colton and El Paso-Tucumcari, do you have in mind particularly eastbound schedules?

A. Eastbound, yes.

Q. As to the westbound schedules, do those apply to Pacific Coast terminals?

A. Yes, except on your westbound schedules the schedules are extended to the Bay area, San Francisco-Oakland, [fol. 2341] on the overland route and to Los Angeles and San Francisco via southern route.

Q. Do the westbound schedules contemplate any delivery times at intermediate points, such as Sacramento, off direct route points, such as Fresno?

A. We don't have what is stated as an actual arrival time at those points, but we do have a day of arrival designated, for example, from Chicago to Sacramento as the fifth day, although it generally provides a sixth morning delivery. The same is in effect with respect to Fresno traffic.

Q. As to schedules eastward and westward through the southern route between Los Angeles or Colton, as the case may be, and eastern points, with what carriers at the El Paso gateway are these schedules jointly maintained?

A. Santa Fe, Texas and Pacific, and the T. & N. O. line.

Q. Do they extend to the eastern connections of those railroads at their terminals or junctions?

A. Yes, and their connections.

Q. With what carrier at the Tucumcari gateway?

A. The Rock Island.

Q. Does that contemplate through movement, Southern Pacific and Rock Island, to eastern consuming points?

[fol. 2342] A. Yes.

Q. Will you name some of those points?

A. The principal ones are Kansas City, St. Louis, and Chicago.

Q. Do the same schedules apply over alternate routes beyond the Missouri River, for example?

A. Yes.

Q. Will you indicate what some of those other routes might be?

A. Out of Kansas City we have the Alton; the Wabash; the Rock Island also operates east of Kansas City into St. Louis; the B. & O., I believe, I am not sure, I believe the B. & O. operates with a connection out of Kansas City.

Q. Would that be in connection with the Alton out of Kansas City?

A. Yes.

Q. Do those schedules apply with a delivery time at St. Louis?

A. Yes.

Q. Is there any schedule in connection with this movement over the southern route contemplating delivery at points like Washington or Philadelphia or New York City?

A. Yes, sir.

Q. What carriers would participate?

[fol. 2343] A. The principal perishable carriers east of Chicago generally referred to are the Erie, Pennsylvania, and New York Central lines, and out of St. Louis the Pennsylvania is one of the principal carriers.

Q. As to the movement through the Ogden gateway over the route from San Francisco or Roseville eastward, with what carriers does the Southern Pacific participate in movement through that gateway?

A. We make direct connections with the Union Pacific and the D. & R. G. W. at Ogden.

Q. The Union Pacific, it has been previously testified, terminates at Omaha?

A. Yes.

Q. Do the schedules apply in conjunction with the connections at Omaha or Council Bluffs?

A. Yes.

Q. What lines east of Council Bluffs?

A. Chicago & Northwestern, they have several lines there, Chicago & Northwestern; Illinois Central; and the C. & G. W.

Q. Do other Missouri River lines participate if there are other lines operating between Council Bluffs and Chicago?

A. Yes, they all participate in the through schedules.

[fol. 2344] Q. As to westbound schedules, do you have a corresponding participation in the same manner as the eastbound?

A. Yes, the same manner.

Q. Mr. Baker, have you before you a chart exhibit in one sheet bearing also some typewritten material and showing in the lower righthand corner of the sheet "Southern Pacific Company (Pacific Lines), Eastward Perishable and Westward Manifest Schedules"?

A. Yes, this is for the southern route.

Mr. Mason: May we have this chart marked as "Defendant's Exhibit No. 176" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 176 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 176 for identification or supervise its preparation?

A. Yes, I did.

Q. First of all I will ask you as to the information shown in the table at the righthand side of the sheet headed "Over-all Times." From what did you take that information?

A. That is the over-all time shown in our schedules which is the over-all time from departure, in this first case, [fol. 2345] from Chicago and Los Angeles.

Q. Is this information taken from the record of these schedules actually maintained in the Office of the Superintendent of Transportation?

A. That is right.

Q. Do these represent the present-day schedules?

A. Yes, sir.

Q. Going to the chart itself, do you show on the chart the names of certain cities or stations with figures? What is the significance of these names of towns and stations and why are they placed in this particular order?

A. The numeral appearing after those stations is the distance from Colton, California.

Q. Why are these stations placed in the order in which they appear? You place first Los Angeles, then Colton, then Yuma, and so on.

A. That is on a direct route in which they appear on our lines.

Q. What is the significance of the spacing between successive stations, that is, for example, you have Colton and Los Angeles fairly close together and quite a distance between Tucson and El Paso?

A. That is the mileage that was drawn to a certain mileage scale.

[fol. 2346] Q. Is this an approximate mileage scale all the way across from Los Angeles to Chicago and St. Louis?

A. Yes.

[fol. 2347] Q. Now, you show St. Louis once on the chart adjacent to New Orleans and then again on the chart at the extreme lower right-hand corner. Do those represent mileages to St. Louis by two different routes?

A. That is right; the first one to St. Louis, 1998 miles via Kansas City, and the other one to St. Louis, 2,458 miles is from Los Angeles via Corsicana. The first one there; 1,998 miles, is the mileage from Colton to Kansas City via—Colton to St. Louis via Kansas City.

Q. Now, the route via Kansas City, is that also the route via Tucumcari?

A. Yes, sir.

Q. And is a relatively direct route?

A. Yes, sir.

Q. Whereas the other is the route by the Texas & New Orleans via San Antonio and Corsicana?

A. Yes, sir.

Q. And then by what railroad?

A. The Cotton Belt, the St. Louis and Southwestern.

Q. Now, you show New Orleans adjacent to St. Louis on the chart. Is there merely because the mileage happens to fall close together?

[fol. 2348] A. Yes, sir.

Q. And, by the way, this mileage from New Orleans, is that 1,991 from Colton, or 1,991 from Los Angeles?

A. That is from Los Angeles.

Q. Now, on the right-hand side of the chart, you start out—I should say on the left-hand side of the chart, but it is also on the right-hand side, you show a series of blocks designated by horizontal lines and then the first, naught day, first day, and so on. Reading down from the top of the chart, what is the significance of that particular portion of the chart?

A. Each one of those blocks represents a twenty-four hour period.

Q. Now, let us go to the line which starts at a point on the vertical line opposite the word "Colton" and which is marked "3:00" in the upper left-hand corner of the chart, and which appears to continue with some breaks until it ends opposite the line which represents or appears opposite the name of Chicago between the sixth and seventh days in the lower right-hand corner of the chart, in other words, the upper slant line that runs from the upper left-hand corner toward the lower right-hand corner of the chart; what does [fol. 2349] that line indicate?

A. That line indicates the basic schedule of our Colton freight trains and the three dash zero, zero, represents three A. M. departure from Colton. On the first line there opposite Yuma, it shows 3:00 P. M. and 4:00 P. M.

Q. At Yuma?

A. At Yuma.

Q. How do you know that that is 3:00 A. M. at Colton? Is that because it is in the first part of the day?

A. That is right. It is near to the top of the block.

Q. And do you know it to be 3:00 P. M. at Yuma for the reason it is near the end?

A. Yes, sir.

Q. Would that explanation apply to other times shown on the chart?

A. Yes, clear through.

Q. What is the significance of the line which starts at the vertical line opposite Colton at a point designated "7:00" and which apparently would be 7:00 P. M.?

A. That is the rip-off schedule.

Q. Are those lines associated with the tabulation of overall times on the right-hand side of the exhibit?

[fol. 2350] A. Yes.

Q. Now, you show, for example, under column A, Colton Basic, and then under column B, Colton, then under column C, Chicago, then under column D, Hours and Minutes. Does the line marked "Basic" here correspond with that basic schedule from Colton?

A. Yes, that is a 3:00 A. M. departure from Colton on the first day with 12:30 A. M. arrival at Chicago on the seventh day, 139 hours 30 minutes.

Q. Is that the present-day schedule from Colton to Chicago?

A. The present-day schedule.

Q. You show here a figure "16 hours" which apparently is the time interval from 3:00 A. M. to 7:00 P. M. What is that 16 hours?

A. That is what we call—we have a sixteen-hour run-off.

Q. And that sixteen hours is the run-off time?

A. Yes, sir.

Q. Then you speak of a run-off schedule. What is the significance, then, of the run-off schedule?

[fol. 2351] A. Well, due to the large area in which these perishables are loaded, from our concentration point it runs from Colton up around 204 miles, we allow shippers to load the traffic up to 11:59 P. M.

Q. Would that be on zero day?

A. On zero day. It is obvious that at a point, for instance, the Santa Maria Valley, over 200 miles away, loading up to 11:59 P. M., that we couldn't get out of Colton at 3:00 A. M. So we allow, in order that all shippers in the Zone 1 territories, the concentration points, will be on a comparable basis, we have what we call the 16-hour run-off, which provides that any traffic arriving at concentration points at or prior to 7:00 P. M. after the day loaded, will be afforded the basic schedule of that day.

Q. Does that mean that you operate that train so as to make the same arrival at Missouri River and Chicago as if it had left at 3:00 A. M.?

A. That is right.

Q. What happens to that sixteen hours?

A. Well, that is run-off. The run-off time is prorated between the various lines according to mileage or run-off agreements.

Q. Here you show, for example, on this run-off schedule, [fol. 2352] you show times at Yuma, Tucson, El Paso

and Tucumcari. Does that mean that the train making the run-off schedule has to operate to make those times at those intermediate points?

A. That is right.

Q. You show here also in the table an Imperial Valley schedule, and I notice a reference to Imperial Valley Schedule in the sloping lines, this sloping line happens to be a line consisting of long dashes, what is the basic schedule of the Imperial Valley traffic and from what point does that apply?

A. The concentration point for the Imperial Valley traffic is Yuma, and it is a one day shorter schedule than traffic from Colton. The traffic basic schedule is due to leave Yuma at ten A. M. on day one, and arrive at Chicago at 12:30 A. M. of the sixth day, or 109 hours and 30 minutes, as shown in the table.

Q. In order to place this on the same chart, however, you seem to show the departure from Yuma on the second day. Would that be the first day following loading?

A. That is the first day following loading, yes.

Q. Now, do you have a run-off on the Imperial Valley [fol. 2353] Schedule?

A. Yes, we have a six hour run-off on that. That is because the distance that the traffic is loaded is not so far away from the concentration point, and we only allow six-hour run-off on that traffic.

Q. Here, finally, you show another set of sloping lines that appear to go only as far as El Paso, consisting of dot or short dashes, an apparently basic Arizona schedule. To what traffic does that apply? From what concentration point and origin territory?

A. That applies to the traffic from the Salt River Valley, for which Phoenix is the concentration point.

Q. What is your basic departure time at Phoenix?

A. 12:01 A. M. and that traffic has a 24-hour faster schedule than the Yuma schedule and two days shorter than the Colton traffic.

Q. Do you have any run-off time on the Salt River Valley traffic?

A. Yes, we have a five-hour run-off on that traffic, which is put in principally for allowing the pre-cooling of traffic from the Salt River Valley.

[fol. 2354] Q. These basic schedules shown on the right-hand side, do they correspond exactly to these sloping lines from the upper left to the lower right?

A. Yes, they do.

Q. Now, as to the lines from the upper right to the lower left of the chart, which are designated with various letters and appear close to an arrow marked "westward," what is the significance of those lines?

A. Those are our westbound manifest schedules over the Southern route.

Q. You show the times, the over-all times for these westward schedules in the tabular block on the exhibit?

A. Yes.

Q. And then what do the lines indicate with reference to the westward schedules?

A. Well, the same as the lines for the eastward schedules there. For example, our first line "SSW (Sunset West)" that schedule is due to leave New Orleans at 9:00 A. M. the first day. You can trace that through to where it is shown due to arrive in Los Angeles at 7:00 P. M. of the fifth day, an over-all time of 108 hours.

Q. Now, you show that line from New Orleans converging [fol. 2355] with the line from Chicago, they apparently meet at El Paso. Does the same schedule continue from El Paso with one line?

A. No.

Q. Yes, it is from St. Louis.

A. It converges with the line from St. Louis to Chicago; that is the St. Louis via Corsicana Route, which converges and is consolidated and assumes the same schedule as the S.S.W. from El Paso.

Q. Then this other line originates apparently at—is that twelve noon at Chicago?

A. Twelve noon at Chicago.

Q. That represents the Chicago through schedule via what route?

A. The Rock Island.

Q. Via Tucumcari?

A. Yes, via the Tucumcari Gateway.

Q. I will ask you this, Mr. Baker, is the information shown on exhibit 176 for identification, information which comes to you regularly and necessarily as a part of your duties as assistant superintendent of transportation?

A. Yes, sir.

Q. Do you participate yourself in the making of these schedules, or any of them?

[fol. 2356] A. Yes; I take part in all discussions prior to the final schedule meetings in which the schedules are actually approved.

Q. Were any of these schedules placed in effect before you assumed your present position as assistant superintendent of transportation?

A. Yes, the westbound schedules were, and also the eastbound schedules were all in effect except the 12:30 A. M. seventh day arrival at Chicago has been changed. When I was first appointed assistant superintendent of transportation, the basic schedule at that time provided for 7:00 A. M. seventh day arrival at Chicago.

Q. That is the Colton schedule?

A. That is the Colton schedule, yes.

Q. Were you, as chief dispatcher at Tucson, familiar with these schedules to any extent?

A. Yes, very much.

Q. Does the chief dispatcher's duties include any observance of schedules?

A. Yes, that is one of his most important duties.

Q. Will you say whether or not the exhibit is true and correct as a representation of the basic schedules, of the schedules as indicated as they apply at the present time?

[fol. 2357] A. Yes, to the best of my knowledge and belief, it is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: Yes.

Q. Mr. Baker, on the line at the top left-hand side, beginning with the vertical line opposite the name "Colton" three A. M. and in Yuma three P. M., then the line drops down, apparently, the train leaves there at four P. M.; is that what that indicates?

A. Yes, that indicates one hour terminal time at that point.

Q. For icing?

A. For icing and inspection of train.

Q. At El Paso there is three hours?

A. That is right.

Q. Those trains from there on apparently go on through without any terminal delays?

A. Well, of course, on the Tucumcari route we would have some terminal delay at division terminals such as Carrizozo, but I don't show that thing on here because we

don't in our schedules show Carrizozo, but we do show in our schedules El Paso to Yuma time.

Mr. Strouss: This probably would be more cross-exami-[fol. 2358] nation, but I would like to ask this question.

Q. Is there no perishables, are they iced after they leave El Paso going east before they reach Chicago?

A. That depends on the class of refrigeration under which they are moved. If they are moved under standard refrigeration, they are iced at all icing stations between El Paso and Chicago.

Q. And this difference in arrival and departure would be due to some extent to delays for icing and inspection of trains?

A. Yes.

Mr. Strouss: That is all.

Mr Mason: Mr. Strouss asked you just now, Mr. Baker, if the hour's delay at Yuma was due to icing and inspection. Is there any other element of railroad operation that creates delay at Yuma?

A. Yes.

Q. What is it.

A. We have to reduce practically all our eastbound trains at Yuma to conform with the 70-car limit law of Arizona.

Q. Does that take up part of that hour that is shown as being allowed there?

A. Yes.

The Court: Mr. Baker, which side of the river are your [fol. 2359] yards located and where does this change take place?

A. On the Arizona side, your Honor.

Q. In other words, you run long trains across the river into Yuma?

A. Yes, sir.

Q. You have met no objection to that movement?

A. No, sir.

Mr. Strouss: That has been the case for years?

A. Yes, sir.

Mr. Mason: The choice, Mr. Baker, was between operating long trains into Arizona or constructing a terminal on the California side, wasn't it?

A. On the California side, yes, sir.

Q. What, if anything, has ever been done about this operation of long trains into Yuma that you know of?

Mr. Strouss: If you know?

A. I just don't quite understand your question, Mr. Mason.

Mr. Mason: Do you know of anything ever having been done by the state, county or city authorities as to the operation of long trains across the bridge at Yuma?

A. Oh, No.

[fol. 2360] Q. But there is a long train operation in Arizona there?

A. Yes, across the river into the yards inside of Arizona.

The Court: I think we will take our mid-afternoon recess at this time, gentlemen.

(Thereupon, a short recess was taken, after which the witness was recalled to the stand, and proceedings were resumed as follows:)

[fol. 2361] Mr. Mason: We offer exhibit No. 176 in evidence at this time.

Mr. Strouss: I have no objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 176.")

Mr. Strouss: I have one further question I want to ask. You also take a full hour at Tucson as well as Yuma, do you not, Mr. Baker?

A. Yes, sir.

Mr. Mason: Mr. Baker, exhibit No. 176 as you stated in your references to it prior to its admission refers only to schedules on the so-called "southern route" or the route across Arizona, is that correct?

A. That is correct.

Q. I will ask you if the schedule eastward from northern California concentration points particularly Roseville on the eastward movement of perishables is the same so far as the over-all-time is concerned to Chicago and St. Louis?

A. That is correct, the basic schedule is the same from all California concentration points.

Q. What about the cut-off or run-off time from Roseville, is that the same?

A. It is the same.

[fol. 2362] Q. You show a present-day schedule, Colton to Chicago, of 139 hours and 30 minutes with a cut-off schedule of 123 hours and 30 minutes. Have those times always been the same as they are at present?

A. No, there have been numerous changes in those schedules. In April, 1918, they had an over-all schedule of 189 hours with no run-off.

Q. Did that apply alike at Roseville and Colton?

A. Yes.

Q. What provision, if any, was made as to the so-called "Zone 1 territory" or origin territory?

A. At that time there was only Zone 1 territory which was in close proximity to the concentration point, within fifty to one hundred miles.

Q. Are Colton and Roseville themselves points of heavy production?

A. No, there is heavy production in close proximity to those points, like the hillside fruit country around Roseville and the orange groves south of Colton and Riverside.

Q. What was the departure time at Roseville on the 1918 schedule of 180 hours?

A. That was 3 A. M. the first day.

Q. Was that the day following loading?

[fol. 2363] A. Following loading.

Q. And the arrival at Chicago?

A. 5 P. M. the eighth day.

Q. Was there any provision for run-off at that time?

A. No.

Q. Was there a similar schedule from Colton at that time?

A. Yes, from Colton we had 189-hour schedule providing for a six A. M. first-day departure from Colton to 5 A. M. the ninth-day arrival at Chicago with no run-off provided.

Q. When was the next change made in the basic schedule from Roseville and Colton and what did it amount to?

A. February, 1921, after the period of government control the basic Colton schedule was reduced to 154 hours and the Roseville schedule to 154 hours.

Mr. Strouss: Don't we have this in the record already, Mr. Mason?

Mr. Mason: I think not so far as the Southern Pacific is concerned, not the same history that the witness has before him now. We have some history but not in the same fashion so far as Southern Pacific is concerned. It addressed itself to the Santa Fe and the witness Fertig [fol. 2364] of the Rock Island gave some of the story of the schedules but all that either of them said so far as Southern Pacific was concerned was that all of the competing and connecting lines make the same schedules.

Mr. Strouss: I had forgotten that it didn't apply to the Southern Pacific.

Mr. Mason: I know that it does apply to the Southern Pacific but I don't know that the record shows it.

The Court: Let's shorten it if we can.

Mr. Mason: I will shorten it as much as possible and simply refer to the times and the dates.

Q. After 1921 was there a change to provide for a run-off time?

A. On the Colton schedule, in September, 1924, they provided a three-hour run-off schedule.

Q. With 154 hours basic?

A. 154 hours basic.

Q. When was the next change in the Colton schedule?

A. In the Colton schedule in 1927 a run-off time was increased to seven hours.

Q. Was there a change made in the Roseville schedule in 1926?

A. In 1926 there was a twelve-hour run-off established. [fol. 2365] Q. With the same basic time of 154 hours?

A. Yes.

Q. Will you refer to the 1929 changes?

A. On the Colton schedule in June, 1929, the schedule was reduced to 146 hours with a seven-hour cut-off and the Roseville schedule was also reduced to 146 hours basic schedule with a sixteen-hour run-off.

Q. That took place in June, 1929?

A. Yes.

Q. Was the Colton schedule later changed so as to provide also a sixteen-hour run-off?

A. Yes, that was done in May, 1932, and both schedules remained the same until May, 1940, when the present schedule of 139 hours and 30 minutes with a sixteen-hour run-off was established.

Q. What was the change made in August, 1937, insofar as perishable from Zone 1 territory was concerned? Was there a change made in August, 1937, in that respect?

A. Yes, there was a change made there to provide that perishable from Zone 1 territory which arrived at California concentration points up to 7 P. M. would be provided with what they call Zone 1 schedules which provide [fol. 2366] for 3 A. M. basic schedule first day after loading.

Q. Is the Zone 1 territory which concentrates at Colton and takes a schedule out of Colton the same territory as the Zone 1 territory which concentrates at Roseville and takes a schedule out of Roseville?

A. No, Colton is a concentration point for traffic as far north on the coast line, which includes the Santa Maria and Guadalupe districts, and as far north on the San Joaquin Valley route as Caliente.

Q. Caliente is a point just a short distance south of Bakersfield?

A. South of Bakersfield.

Q. What is the distance from Caliente to Colton?

A. It is approximately 215 miles.

Q. And from the Santa Maria Valley to Colton?

A. 260 some odd miles.

Q. Has the Zone 1 territory for Colton always included this extent of Zone 1?

A. No, at first it only embraced the territory in close proximity to Colton, such as the south branches from Los Angeles around Santa Ana and Riverside and those points.

Q. That would be the territory intermediate between [fol. 2367] Los Angeles and Colton?

A. Yes.

Q. When was the extension made to include the Santa Maria Valley?

A. That was made in May, 1932.

Q. What is the present extent of the Zone 1 territory from Roseville southward?

A. That extends as far south as the Arvin branch, which is just south of Bakersfield, on the Arvin branch out of Bakersfield, a distance of approximately 310 miles, I believe it is.

Q. Does it extend north of Roseville in the Sacramento Valley?

A. Yes, it comprises both sides, east and west side of the Sacramento Valley as far north as Tehama where the two lines converge.

Q. Does it include the San Francisco Bay district?

A. The Bay district and also the northwest Pacific territory as far north as Ukiah.

Q. Does it include the producing area around Salinas and Watsonville?

A. Yes, it goes as far south as Molus on the south line, which is a point just out of Salinas.

Q. You mean on the coast line?

A. On the coast line.

[fol. 2368] Q. Does it include the Santa Clara Valley around San Jose?

A. Yes.

Q. Has that Zone 1 territory for Roseville been extended from time to time?

A. Yes, that has been extended from time to time since July, 1926.

Q. Was it first established in July, 1926?

A. It was established before that but at that time it only took in a small amount of territory around Roseville.

Q. As far as Stockton?

A. Stockton and Walnut Grove branches and what they called the "hillside fruit," which is east of Roseville, and some traffic up as far as Marysville.

Q. Is there any extension of the release time of shipments past 11:59 P. M. of the day of loading by reason of precooling?

A. Yes, in California we have agreed to let the shippers precool up to 5 A. M. following the date of loading.

Q. Does that mean that the traffic need not be released by the shipper until 5 A. M.?

A. That is right.

Q. Does such precooled traffic released at or prior to 5 A. M. take the schedule originating at 3 A. M. of that [fol. 2369] day?

A. That is right.

Q. Does that apply from both northern and southern California?

A. Yes, sir, with the exception that there is very little pre-cooling done on the Colton traffic with the exception of Valencia oranges.

Q. Turning to the eastward schedules from the Imperial Valley and the Salt River Valley, when was the first schedule established on Imperial Valley traffic and what was the over-all time?

A. In May, 1918, an over-all time of 160 hours with no run-off.

Q. Was that from Yuma?

A. From Yuma, yes.

Q. To what point?

A. Chicago.

Q. Was that reduced in 1921?

A. Yes, that was reduced to 145 hours.

Q. When was the next reduction?

A. In May 1927, it was reduced to 134 hours and 30 minutes.

Q. Was it reduced again in May, 1929?

A. Yes, reduced to 127 hours and 30 minutes and provided a three-hour-and-30-minute run-off.

Q. When was the next reduction?

[fol. 2370] A. In September, 1935, it was reduced to 121 hours with the same run-off and in 1937 it was raised thirty minutes and provided a six-hour run-off. In December, 1937, the present schedule was adopted, which is 109 hours and 30 minutes with a six-hour run-off.

Q. Is there any provision for a later cut-off time on account of pre-cooling of traffic concentrating at Yuma?

A. Yes, Imperial Valley and Yuma traffic, we allow it to 2 A. M. to pre-cool it.

Q. When was the first schedule made effective on Salt River Valley traffic?

[fol. 2371] Q. When did that take place?

A. In March, 1927.

Q. Did you make a further reduction in December of the same year?

A. In December, 1927, it was reduced to 124 hours.

Q. What further reductions were made after that time?

A. In June, 1928, they were reduced to 123 hours; in May, 1929, to 115 hours and 30 minutes; in May, 1930,

to 11 hours and 30 minutes; in December, 1930, to 110 hours; in July, 1932, to 109 hours and 30 minutes with a three-hour run-off; in July, 1933, it was reduced to 109 hours and 30 minutes; in December, 1937, it was reduced to 95 hours and 30 minutes with a five-hour run-off.

Q. You now have a five-hour run-off on the basic schedule of 95 hours and 30 minutes?

A. Yes, sir.

Q. Do you allow additional time past the scheduled departure hour for pre-cooling of Salt River Valley traffic?

A. Yes, we allow until 2 A. M. for that traffic.

Q. Does this additional time allowance for the release of pre-cooled traffic have any effect of cutting down the actual [fol. 2372] time allowed for the transportation?

A. Yes, it does. Where this traffic is produced, of course it is not a very long distance from Phoenix, but at the same time when the shippers take full advantage of the 2 A. M. pre-cooling it takes from two to three to four hours to bring that traffic into Phoenix, ice it, and assemble it, and depart from Phoenix. It brings it to 5 or 6 A. M. departure of pre-cooled traffic during the peak season.

Q. Does the pre-cooling allowance on traffic concentrating at Yuma have any similar effect?

A. Yes, it has a similar effect.

Q. What about the pre-cooling allowance of traffic concentrating at Colton?

A. It has the same effect also, that is the reason why we have a much longer run-off time.

Q. I think you referred to manifest schedules westward. Do you also have eastward manifest schedules?

A. Yes, we have eastward manifest schedules but all of our manifest traffic is moved in perishable trains. It is a very rare occasion where we will operate a train identified wholly as an eastern manifest train.

Q. Does eastward manifest obtain the same movement, [fol. 2373] generally speaking, as eastward perishable?

A. Yes, they do.

Q. As to your west manifest schedules, when was the first schedule established on west manifest from Chicago to Pacific Coast lines?

A. I have a record back to November, 1918, a schedule of 226 hours. I have one in December, 1917, between Chicago and San Francisco, which provided a schedule of 218 hours and 30 minutes. In November, 1918, a schedule of

226 hours was established for traffic between Chicago and Los Angeles.

Q. Has that Chicago-Los Angeles schedule of 226 hours been reduced at various times since?

A. Yes, sir.

Q. Will you state the dates of the reductions and the over-all hours?

A. In March, 1926, between Chicago and Los Angeles the schedule was reduced to 198 hours and 25 minutes; in May, 1928, it was reduced to 162 hours, and on Chicago to San Francisco traffic in the same year it was reduced from 248 hours and 30 minutes to 161 hours and 30 minutes; in June, 1929, the Chicago-Los Angeles schedule was reduced to 137 hours and 45 minutes, and the Chicago-San Francisco schedule to 141 hours; in November, 1930, the Chicago-Los Angeles schedule was reduced to 134 hours and 15 minutes; [fol. 2374] in July, 1933, the Chicago-San Francisco schedule was increased one hour over the schedule of 141 hours that was in effect in June, 1929, and was increased to 142 hours; in February, 1934, the Chicago-Los Angeles schedule was increased one hour; in April, 1935, it was reduced to 134 hours; in November, 1935, it was reduced to 110 hours and the Chicago-San Francisco schedule was reduced to 118 hours.

Q. That was a twenty-four-hour reduction in each one at that time, was it?

A. Yes, in June, 1939, the Chicago-Los Angeles schedule was reduced one hour to 109 hours and in September, 1940, the Chicago San Francisco schedule was changed, reduced to 112 hours and 30 minutes; on June 3, 1940, we set up a schedule of sixth-morning delivery, Chicago to Los Angeles, and Chicago to San Francisco, which put the traffic from Chicago to both areas on a parity, although the over-all schedule may differ a few hours but the delivery time of 7 A. M. sixth morning is the same.

Q. Where perishable moves from concentration points that you have named, do you have any means of grouping or identifying the perishable cars as they move?

[fol. 2375] A. Yes, each concentration point's traffic is identified with a symbol.

Q. What is the symbol used for traffic originating at Yuma?

A. [illegible]

Q. At Colton?

A. "C."

Q. At Phoenix?

A. "A."

Q. "A" for what?

A. Arizona perishable.

Q. Besides that letter symbol do you use any other numerical symbol?

A. Yes, we start in the first day of the year and number the blocks consecutively throughout the year.

Q. Of what does a block consist?

A. It consists of the perishable traffic that is concentrated at that point and leaving on the basic schedule day of departure.

Q. Does that mean all cars that move on a particular day receive the same block number?

A. No.

Q. How many cars are there in a block?

A. There can be any number, two cars or one hundred cars.

[fol. 2376] Q. Does a block ever include more than 100 cars normally?

A. Quite often they do, yes.

Q. Do I understand that a block is all the cars moving in one particular train?

A. In one unit, each unit operated from concentration point is identified with one number and another following it is given the next number.

Q. Although they move on the same day?

A. Yes.

Q. What will be the identification block number of a group of cars moving from Yuma, what will it read like then?

A. For the first train operating out of Yuma on January 1st it will be "Y-1." That would be the identification of the train then and that identification is carried through to Chicago and Kansas City.

Q. Does the same apply on traffic originating at Colton?

A. Yes.

Q. And the first one would be "C-1"?

A. Yes.

Q. And so on to the end of the year?

A. That is right.

Q. What use do you make of that block identification [fol. 2377] number?

A. That is in order that proper records may be made. The chief dispatcher on a division issues what we call a morning train report and on this train report he refers to these trains by their symbol or identification and then that information is recorded in proper records in our office at San Francisco.

Q. Do you record the times that these blocks make at various terminals en route by block number?

A. Yes.

Q. Do you maintain a permanent record of their movement by block number?

A. We do.

Q. Is there any permanent record of their arrival at destination maintained in the same way?

A. Yes, that is made by the Pacific Fruit Express Company, who furnish us a weekly report showing the arrival of various block numbers at the various destinations, showing the amount of time ahead or late.

Q. Do you give any information to the shippers or owners of this perishable freight as to the movement of their particular shipment?

A. Yes, the Pacific Fruit Express, when the traffic leaves [fol. 2378] the concentration points, wires the block number and the number of cars giving the initial, car number, shipper, destination, icing instructions, and so forth, to all principal P. F. E. and off-line Southern Pacific agents in the East, such as Denver, Chicago, and Kansas City.

Q. Is the same information given to the agents in origin territory, too?

A. Yes.

Q. You say you have gotten this information to the agents or the carrier agents. What is done with it, if you know?

A. The information is given to the shippers.

Q. Or receivers?

A. Receivers, I should say.

Q. Do cars, for example, which are billed out of Colton or Yuma to Chicago as a destination always move to the billed destination?

A. Oh, no.

Q. What happens to them?

A. Cars are diverted enroute by the shippers or the owners of the cars, whoever it may be. It may be the shipper

may still own the car or if it is sold to someone in the East the receiver in the East may change the destination.

Q. How do they go about to change the destination?

[fol. 2379] A. The shipper or owner of the car who wishes to divert the car files what they call a "diversion" with the Pacific Fruit Express or any of our Southern Pacific agents.

Q. Are you familiar with those diversions yourself?

A. Yes.

Q. What happens then?

A. The P. F. E. then issues instructions, they know where this car is because it is operating on a certain block. They have the record in which the block is operating and if the car is due into El Paso at 7 A. M. on the fifth day of the month and they can catch it at El Paso they generally place the diversion at El Paso or they may place it at Tucson if they can do so in time to catch the car before it departs.

Q. Will that change the waybilling of the diverted car?

A. Yes, they change the heading, that is, the destination, or they may change the icing instructions enroute.

Q. Is El Paso a point at which many diversions are actually performed?

A. Yes, there are many shippers that bill their traffic to

[fol. 2380] El Paso. It is what they call "rolling traffic" which hasn't been sold or traffic that has been loaded out on a day and no sale for it and they bill it to El Paso and it is afterwards sold and they bill it for diversion after the car has departed the concentration point.

Q. Have you when you were agent at Yuma actually received such diversions?

A. Very many, yes.

Q. And yourself undertaken to wire them ahead so as to catch the cars?

A. No, at Yuma we have a P. F. E. agent and I transmitted this information to the P. F. E. agent at Yuma who took care of the actual diversion.

Q. Do you know and, if so, will you state whether diversions are of frequent occurrence in proportion to the traffic handled? Do they average as much as one per car or one for every other car or in about what proportion do they occur?

A. I wouldn't say in what proportion but there are many cars that are diverted.

Q. Are cars ever diverted more than once?

A. Yes, that is what I meant to state, that the cars are diverted several times before they reach their final destination.

Q. You have been agent at Yuma and chief dispatcher on the Tucson division, Mr. Baker, and in the course of your [fol. 2381] testimony here you mentioned briefly the fact that trains originating or moving from the Los Angeles division and received at Yuma were reswitched at that point. To what extent does that occur?

A. In our through perishable trains, those trains come in to Yuma all the way from seventy to one hundred or more cars and, as I stated before, it is necessary to reduce them at Yuma to the number of cars which the chief dispatcher wants to handle that is below seventy, or seventy on any east of Yuma.

Q. Are there any of these trains and, if so, in what proportion which are received from the west at Yuma which do not have to be reconsisted at Yuma?

A. There are none that do not have to be reconsisted that I remember of. Occasionally there might be a short stop train or something like that.

Q. I am referring to trains of perishable.

A. Practically all trains have to be reconsisted at Yuma.

Q. What is the primary reason for that reconsisting at Yuma?

A. The Arizona Train Limit Law.

Q. If it were not for the Arizona Train Limit Law, would [fol. 2382] reconsisting at Yuma be generally necessary on these eastward perishable trains?

A. Well, to some extent, yes, it would, but it would be a much more simple operation.

Q. Would there ever be the possibility of running trains from Yuma as they were received from the Los Angeles division?

A. Oh, yes, in a great many instances.

Q. In a great many instances, did you say?

A. Yes, sir.

Q. Will you refer for a moment to pasenger train operation. In your experience as chief dispatcher of this division and as agent at Yuma as well as assistant superintendent of transportation will you say whether or not there is any reconsisting of passenger trains at Yuma?

A. Yes, there is.

Q. For what reason?

A. In order that they may keep the train within the requirements of the Arizona Car Limit Law.

[fol. 2383]. Q. Will you by reference to example show this or state just how that occurs?

A. Well, in many cases it is necessary that, in order to—I will state it this way. At Yuma we have a standard sleeper operating between San Diego and Chicago, which moves from Yuma on Train 4, and at times it has been necessary that we handle this car on train 6 via another route through Gila instead of through Phoenix and in order to keep No. 4 within the 14 car limit.

Q. Do you ever have No. 6 come to Yuma with fourteen cars?

A. Yes.

Q. And No. 4 also arriving there with fourteen cars?

A. Yes.

Q. And your car from San Diego comes in by what route?

A. Over the San Diego route.

Q. It doesn't come in on either No. 4 or No. 6?

A. No.

Q. Comes in on a connection from San Diego?

A. Yes.

Q. Suppose No. 4 and No. 6 contain fourteen cars, what do you do with the San Diego sleeper?

A. It would be necessary then to split Train No. 4 and [fol. 2384] run two sections.

Q. Do you ever drop a car off of No. 4 and leave it at Yuma in order to handle this sleeper?

A. Deadhead equipment, yes.

Q. Suppose No. 6 comes in with fifteen or sixteen cars; what do you do with them?

A. Well, it is necessary that we split No. 6 also.

Q. Do you ever drop a coach out and run with one less coach?

A. Yes, there are times we have done that, we have crowded some of the passengers into the other coach, and taken the coach off and reduced the train.

Q. Do you know, and, if so, will you state whether any similar situation ever occurs at Lordsburg?

A. Yes.

Q. Will you cite a specific instance of recent occurrence?

A. I believe it was two weeks ago last Sunday I had a call from Tucson, we had a sixteen-car navy special operating into Lordsburg moving from some point in the East.

Q. What was its ultimate destination?

A. I am not sure, but I believe it was San Diego via [fol. 2385] Los Angeles and Santa Fe, I won't say for sure.

Q. It was a California——

A. A California train. And in setting up this operation, it was set up and approved by the Military Bureau at Washington, under whose instructions we are now working when handling troops.

Q. How many cars were on that train when it left El Paso?

A. Sixteen cars.

Q. Were they all occupied?

A. They were all occupied.

Q. How many cars were on the train when it left Lordsburg?

A. Fourteen.

Q. What happened to the occupants of the two cars?

A. It was necessary to transfer the men out of the last two cars into the other equipment and crowd them up until we got to Yuma, then we deadheaded two other tourist cars from Los Angeles to Yuma in order to take care of the men for the night ride.

Q. Have there been other examples of reconsisting [fol. 2386] trains, reconsisting passenger trains at Lordsburg?

A. Oh, yes, it happens quite often.

Q. What is the occasion or reason for such reconsistence?

Mr. Strouss: Just a minute. These general statements happen quite often; I assume you are going to have an exhibit.

Mr. Mason: Well, yes, but I wanted to lay the foundation by a witness who from his past and present experience is familiar with the situation.

A. The reason it is necessary to reconsist a train is due to the requirement of the Arizona Car-Limit Law.

Mr. Mason: The fourteen-car restriction?

A. Yes, the fourteen-car restriction.

Q. I wish you would refer again to exhibit No. 176. There is one feature of that exhibit which may require a little further explanation. I notice that the basic schedule and the run-off schedule from Colton, being those solid lines under the arrow marked "eastward" converge at Kansas City at seven P. M. on the fifth day. Does that mean that the run-off is intended to be entirely complete by the time——

A. The run-off has been accomplished.

Q. At Kansas City?

[fol. 2387] A. Yes.

Q. Now, I notice that the solid line then diverges from the other solid line and reaches St. Louis at nine P. M. on the sixth day, and Chicago at 12:30 A. M. on the seventh. What is the significance of that divergence of the solid lines after passing Kansas City?

A. Well, the line from Kansas City to St. Louis is the Rock Island route for traffic, and the line to Chicago is through direct connections to Chicago north of Kansas City.

Q. For example, this movement from Kansas City to Chicago might be Rock Island by any other Missouri River connecting line out of Kansas City?

A. Yes, might be any line. The schedule requirement applies to all Missouri River lines.

Q. I understand that the schedule from Kansas City to Chicago does not necessarily apply via St. Louis

A. No.

Q. This line from Kansas City to St. Louis may then be the Rock Island, as you stated?

A. May be, yes.

Q. Or any other connecting line across the state of Missouri?

A. Yes.

[fol. 2388] Q. Now, does the same explanation apply to the convergence of the basic Imperial Valley run-off schedules, which are shown as coming together at three P. M. on the sixth day at Kansas City?

A. Yes, that is right.

Q. And their divergence likewise?

A. That is right.

Q. Now, you have stated, I think, that these lines on the basic and run-off Colton schedule and the basic and run-off Imperial Valley schedules are those which apply for the Rock Island?

A. Yes, all these eastbound schedules I have here are figured on the Colton traffic routed via the Rock Island through the Tucumcari gateway.

Q. And these are the mileages via that gateway.

A. That is right.

Q. Will you say whether or not the same time schedules apply for traffic which originates or is concentrated at Colton and moves via the Texas-New Orleans and the Corsicana gateway, and the St. Louis Southwestern?

A. Yes, they have the same arrival and the same basic route.

Q. To St. Louis?

[fol. 2389] A. Yes.

Q. To Chicago?

A. Yes, sir.

Q. And for connection to New York or Washington?

A. That is right.

Q. Are you familiar with the concentration points on the other trunk lines in California?

A. Yes.

Q. What is the concentration point for Union Pacific traffic originating on the line formerly known as the Los Angeles and Salt Lake?

A. That is Colton.

Q. And over what route does that traffic move?

A. That is Union Pacific through Salt Lake.

Q. Salt Lake City and Council Bluffs?

A. Yes.

Q. Do you know and, if so, will you state whether that traffic makes a scheduled arrival time at Chicago similar to your Colton concentrated traffic moving via Tucumcari?

A. The schedules are identical.

Mr. Strouss: I think you have that all in.

The Court: I am wondering if there might not be a stipulation, if it be true that the operations here of the Southern [fol. 2390] Pacific with reference to all of these matters is similar to that of the other lines. The witnesses have testified, and it seems to me you are covering a lot of the

identically same ground that has heretofore been gone over.

Mr. Strouss: I will agree that the basic schedules from California east are the same over all these roads.

Mr. Mason: The only point I had in mind was that the Western Pacific concentrates at Sacramento and makes these same schedules through the Utah Gateway with its connection, and the Santa Fe makes the same schedules from San Bernardino and Bakersfield, either directly or with its connections.

Mr. Strouss: Yes.

Mr. Mason: Well, that has been testified to and I think it is undisputed. There is another matter.

Q. Are there schedules in effect from Oregon by the Nevada Lines and via the Ogden Gateway?

A. Yes, we have a perishable out of Medford Territory in southern Oregon; we handle that into Klamath Falls and then over the old Modoc line to Fernley to connect with [fol. 2391] the cut-off train from Roseville providing the same schedule as provided for in the Roseville blocks.

Mr. Strouss: When you use the term "cut-off train" you use that synonymously with "run-off"?

A. Yes, that is right.

Mr. Mason: I think that is all. There may be some more questions, but I will develop them in the morning.

The Court: The court will be at recess until tomorrow morning at ten o'clock.

(Thereupon the court stood at recess until January 16, 1941, at ten o'clock A. M.)

[fol. 2392] January 16, 1941, ten o'clock A. M.

Proceedings were resumed at this time as follows:

The Court: You may proceed.

G. C. Baker was recalled to the stand.

Mr. Mason: I may have some further testimony from Mr. Baker with regard to schedules, but it isn't ready yet to produce, Mr. Strouss, and I also intend to recall him to testify

on another topic entirely, not related to what he has so far testified to. Subject to that, if you wish to cross-examine him at this time on his schedule testimony, he is available for cross-examination.

Mr. Strouss: I just have one or two questions I might ask now to clarify one or two matters.

Cross-examination.

By Mr. Strouss:

Q. I notice yesterday in your testimony concerning the Imperial Valley Schedule that, if I understood you correctly, you said the pre-cooling time for Imperial Valley was up to two A. M.?

A. Yes.

[fol. 2393] Q. On your exhibit you show the basic schedule as beginning at ten A. M. in the morning?

A. Yes, sir.

Q. And the sixteen-hour run-off would be at four o'clock.

A. The six-hour run-off.

Q. I mean the six-hour run-off.

A. Yes.

Q. Then the pre-cooling extends beyond that to two A. M. of the next morning?

A. No, the two A. M. is allowed up to two A. M. after the day that the traffic is loaded. For example, traffic loaded on Monday in the Imperial Valley is allowed up until two A. M. Tuesday morning for pre-cooling, and that traffic is due out of Yuma on a basic schedule of ten A. M. Tuesday.

Q. Then the pre-cooling would come in ahead of the time that the basic schedule begins?

A. Oh, yes.

Q. Now, when you were talking about diversions, just what do you mean by that term? Let me just make clear my question: Does that necessarily mean that a car is cut out of a train that it is in?

A. No, a diversion—a shipper may, for example, bill a [fol. 2394] car to Chicago and he may find some better market advantage for that car at Fort Worth, and he will file diversion with the P. F. E. Company or one of our agents, and divert that car at Fort Worth, or he may have a diversion of the route, he may want it changed to a different route at El Paso; it may be originally billed Southern Pacific, Rock Island and St. Louis, and he will divert it at El Paso.

T. P., M. K. & T. or other routes, or there may be a diversion in the refrigeration.

Q. Now, you spoke yesterday about cars when they leave, say, Colton, and the waybill will be for El Paso?

A. Yes.

Q. The car has not been sold yet, but before it reaches El Paso that car is sold, say, to someone in Chicago. Now, that car, when it leaves Colton, is in a train of eastbound freight going to Chicago. All that would happen there would be that the way-bill would be changed to show the destination Chicago rather than El Paso?

A. That is correct.

Q. But that would be a diversion under the term as you use it?

A. That is right.

[fol. 2395] Mr. Strouss: That is all the questions I have.

Mr. Mason: Now, may we withdraw Mr. Baker at this time and recall him later? We will call Mr. Herbert.

W. P. Herbert was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you please state your name and official headquarters, Mr. Herbert?

A. W. P. Herbert, 65 Market Street, San Francisco, California.

Q. Are you employed by the Southern Pacific Company?

A. I am.

Q. In what capacity?

A. Assistant engineer, Bureau of Transportation Research, Southern Pacific Company.

Q. Is that the same Bureau of Transportation Research which was described by Mr. Sines in his testimony?

A. Yes, it is.

Q. Are you one of the regular staff of engineers in the Bureau of Transportation Research in the executive offices at the San Francisco?

A. Yes, I am.

Q. What has been your previous experience, Mr. Herbert? [fol. 2397] A. I started railroading in 1919 for a brief period in the El Paso yard as a yard clerk. That was just during the summer of 1919. My services with the Southern Pacific Company started in 1921 on the Tucson division with headquarters at Tucson, Arizona, in the engineering department. I successively served as rodman, instrument man, draftsman, general foreman of track maintenance, relief road master, and I was promoted to assistant engineer in 1927. In 1937 I entered the Bureau of Transportation Research at San Francisco.

Q. Your entire service except for the service in the yard at El Paso has been on the Tucson division?

A. Yes, it has.

Q. Up to 1937?

A. Up to 1937.

Q. And for the last three years or more with the Bureau of Transportation Research at San Francisco?

A. Yes.

Q. Are you a graduate of a technical institution?

A. I did not graduate, I attended the Texas School of Mines for three years after the World War. I entered that school through the Army.

[fol. 2398] Q. What was the character of your training at the School of Mines?

A. I majored in civil engineering.

Q. What is the scope of your duties at present as member of the engineering staff of the Bureau of Transportation Research?

A. We prepare cost studies and general transportation problems and other special studies that might be assigned. Many of these studies are required for court use or use before commissions and other regulatory bodies.

Q. Have you prepared such studies and testified to them in court or commission proceedings?

A. Yes, I have.

Q. Have you prepared certain exhibits in connection with the present case?

A. Yes, I have.

Q. I will ask you to refer, if you will, please, to a statement in one sheet entitled, "Average Cars per Freight Train versus Cost per One Thousand Gross Ton-Miles, Main and Branch Lines-Form 521, Freight Statistics, Tu-

son and Salt Lake Divisions for the Years 1937, 1938, and 1939.". Have you the sheet before you?

A. Yes, I have.

Mr. Mason: May the exhibit be marked for identification?

[fol. 2399]

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 177 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 177 for identification?

A. Yes, I did.

Q. Will you state from what sources it was prepared?

A. It was prepared from the Southern Pacific Company's form 521 and its predecessor, 522.

Q. This is for the years 1937, 1938, and 1939?

A. I beg your pardon, its predecessor would not be involved here.

Q. Is that the form 521 for those two divisions which has been referred to previously as having been furnished to Mr. Strauss?

A. Yes, sir.

Q. This statement appears to relate to the individual monthly statistics as compiled. Have you the file of the form 521 for each of the months represented by the exhibit?

A. Yes, I have.

Q. Does the form 521 contain charts of this character or are these charts of your own construction?

[fol. 2400] A. Form 521 does not contain charts; it contains the averages shown hereon and the charts are of my own construction.

Q. Have the figures shown hereon been taken from the form 521 or are they computations from figures taken from the form 521?

A. They have been taken from the form 521. There are computations here and those same computations appear on 521.

Q. Let us refer, for example, to the upper lefthand block. You show an average of cars per train and an average of cost per thousand gross ton-miles. Are those averages on the 521 or are they computed by you?

A. The average for the year?

Q. Yes.

A. That average is also shown on the annual figure for the 521. That would be the average for the twelve months.

Q. I take it that every figure here appears on the 521 under an appropriate heading?

A. That is right.

Q. Has the exhibit been checked against those underlying sources to determine its correctness?

A. It has.

Q. As to the construction of the exhibit as a chart, was [fol. 2401] that of your own doing?

A. Yes.

Q. Taking again the upper lefthand block as an example, will you explain just how the chart is constructed?

A. The cars per train are shown on the right-hand side of the block, starting at the bottom at fifty each square being representative of five cars. It runs sixty, seventy, eighty, ninety, up to one hundred cars. On the lefthand side the scale is shown per cost in cents per 1000 gross ton-miles, the weight of the locomotive and tender being excluded.

Q. Do those figures represent cost per thousand gross ton-miles?

A. Cost per thousand gross ton-miles in cents.

Q. You show at the bottom of the sheet a legend, I take it that the significance is that the solid line shows the trend of the cost figures by months, is that correct?

A. That is right.

Q. And the dashed line the trend of the train lengths expressed in average cars per train?

A. That is right.

Q. Are these averages inclusive or exclusive of caboose?

A. Including caboose.

[fol. 2402] Q. Do I understand that the dashed line relates entirely to the scale which appears at the right-hand side of the block of squares in each instance?

A. That is right.

Q. And that the solid line relates to the scale which appears at the lefthand side of the block of squares?

A. Yes.

Q. How do you determine how the line shall run?

A. The lines are determined by the plotting of each individual month on the graph as shown on the 521.

Q. That is to say, you find the points at which the cost figure, for example, would fall in each successive month on the scale?

A. Yes.

Q. And then draw a line to join those points?

A. Draw a line to join those points, yes.

Q. You show at the top of the upper lefthand scale, taking that as typical, and at the top of each of the others, figures in two columns reading from the left of the sheet, one bearing the style "Cars" and the other styled "Cost (Cents)"?

A. Yes, sir.

Q. Do those figures relate to points on the chart itself?

[fol. 2403] A. Yes.

Q. Will you select one of those and point out what point on the chart it relates to?

A. Take the first point under "Cost" on the upper lefthand block which would be the first point on the solid line. It shows 58.8 in the column you just referred to and it is plotted on this chart just below "60" which represents on the scale and is plotted to 58.8.

Q. Does this portrayal by scale and line represent any condensation of any other graph or set of lines or is this entirely an original production of your own?

A. This is entirely an original production.

Q. This is not in any sense a condensed profile?

A. No, it is not, it is taken entirely from the 521.

Q. It is to be entirely distinguished from any profile?

A. Yes. I might add that each scale of each block is the same, making the relative position of the lines comparable in each instance.

Q. In the lower half you show the Salt Lake division. Is the same scale used in plotting the points for the Salt [fol. 2404] Lake division as used for plotting the points for the Tucson division?

A. Yes, sir.

Mr. Mason: There are some further explanations I expect to undertake, Mr. Strouss, but I think they had better follow the introduction of the exhibit if it is received. Have you any questions before the exhibit is offered?

Mr. Strouss: No, I have no questions.

Mr. Mason:

Q. Will you say, Mr. Herbert, whether the exhibit is true and correct to the best of your knowledge and belief?

A. It is.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 177.

Mr. Strouss: It is objected to as irrelevant and immaterial, particularly the part which refers to the Salt Lake division.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 177.")

Mr. Mason:

Q. Mr. Herbert, I notice that you use three years. Are the years prior to 1937 available?

A. Yes, they are.

Q. Is the year 1940 available?

[fol. 2405] A. Well, it is right now; it was not available at the time I made this chart.

Q. Is there any reason for not having included years prior to 1937?

A. No, I concluded that three years were sufficient to show the picture.

Q. What is the purpose of the exhibit? To show absolute figures or to show trends?

A. Just to show trends, not absolute figures. Of course the absolute figures are there as reported in the 521.

Q. Do the figures pertain to main line operations on the divisions only or are they the result as well of branch line operations?

A. Main line and branch line operations as shown in the title.

Q. Does the exhibit include any costs or other results of passenger train operation or does it relate entirely to freight train operation.

A. Entirely to freight train operation.

Q. What items of cost are included in the cost figures shown here?

A. Fuel, enginemen wages, trainmen wages, locomotive supplies and expenses, engine house expenses, train supplies and expenses. Those are the direct train expenses.

[fol. 2406] Q. Does this include any cost for maintenance of way?

A. It does not.

Q. Does this include any cost for general or overhead?

A. No, just the direct train expenses.

The Court: Will you read the last answer of the witness as to what is included in the cost?

(The last answer was read by the reporter.)

The Witness: Instead of locomotive supplies and expenses it is "other locomotive supplies."

Mr. Mason: Are those the same items of cost for both the Tucson and the Salt Lake divisions?

A. Yes, they are.

Q. What precisely do you undertake to show here by reason of showing variations in train length and variations in unit cost per thousand gross ton-miles on the same chart?

A. I propose to illustrate and support our contention that the cost of operation per unit of performance varies inversely to the number of cars handled in train units and therefore justifies the conclusion that the lengthening of trains results in economy of operation.

Q. I notice that you use as the unit to which the cost is [fol. 2407] applied the gross ton-mile or thousand gross ton-miles, in this case, which I take it is the same thing, rather than the train-mile. As a company engaged in producing and selling transportation what does the company sell to the customer, train-miles or gross ton-miles?

A. They sell traffic expressed in gross ton-miles.

Q. Where does the train or train-mile come into the picture?

A. The train is the unit devised to convey traffic or to convey gross ton-miles.

Q. What is it that the company finally produces?

A. We produce the gross ton-mile or the car-miles.

Q. Is the car-mile similar to the gross ton-mile?

A. Yes, it is interrelated. We haul either light cars or heavy cars but the gross ton-mile is the most important unit in measuring cost.

Q. Is the gross ton-mile relatively constant and invariable as a measure of performance?

A. Yes, it is.

Q. What factors are there, if any, which produce a variation in the gross ton-mile, comparing one gross ton-mile [fol. 2408] as against another? If you transport a gross ton-mile over a grade of 2.2 per cent, over a mile having a grade of 2.2 ascending, and another over a mile having no grade at all, being completely level, would there be any variation as between those two gross ton-miles?

A. No, they would still be gross ton-miles.

Q. Would there be any variation in expense as between them? Would it cost more to produce the gross ton-mile on the ascending grade than to produce the gross ton-mile on the level?

A. I believe it would a little.

Q. Is there any other element which might produce a variation as between gross ton-miles?

A. I don't know just what you mean by "variation."

Q. Not all gross ton-miles are the same, are they?

A. No, the gross ton-mile is the gross tonnage that is hauled.

Q. Times the miles over which it is hauled?

A. Yes.

Q. And to the extent that those miles differ, one mile as against another mile, there would be a variation in gross ton-miles?

A. Yes, there would be a variation as to the distance.

[fol. 2409] Q. Would there be a variation as to the distance?

A. The distance would cause a variation in the gross ton-miles.

Q. It would cause more or less of them, yes, but isn't there a difference in the cost per gross ton-mile depending upon the character of the mile traversed, not the number of miles but the character of the miles traversed?

A. Yes, there would be a little difference.

Q. Is there a difference between train-miles, comparing one train mile against another train-mile?

A. There is a very slight difference, but as a rule train-mile costs are about the same in one location as another.

[fol. 2410] Q. You mean the average train-mile cost?

A. The average train-mile cost.

Q. But I am speaking of actual train-miles, not the average. Let us get away from the average for a moment. Now, are there factors associated with trains, that will cause any variation in train-miles so as to render that unit inconstant or is that always a constant unit? Well, perhaps my question isn't quite clear. Do trains vary in length?

A. Yes.

Q. From what to what?

A. Well, they will range from no cars to seventy cars in Arizona, and hundred cars or so in other states.

Q. May they even go as high as a hundred and fifty cars?

A. A hundred and fifty or a hundred and sixty cars.

Q. The movement of a train of 160 cars for one mile is a train-mile, is it?

A. Yes.

Q. And likewise the movement of an engine with caboose?

A. Yes.

Q. And the movement of a train consisting of an engine [fol. 2411] and caboose over a level or descending mile is still a train-mile, isn't it?

A. Yes.

Q. And the movement of a 160-car train up a two per cent grade, if it was moved, is still a train-mile?

A. Yes.

Q. Are there any variations, then, in train-miles which would render the train-mile an inconstant unit?

A. Yes, I see what you mean. The length of the train would be a factor.

Q. Are there variations of load as between trains of the same length?

A. Yes.

Q. Would that be a further factor inducing a variation?

A. Yes, sir.

Q. Do those variations of length and loading produce or enter into the picture where the gross ton-mile is considered?

A. No, they do not.

Q. How does the car-mile compare with the gross ton-mile as a measure of performance?

A. The car-mile is fairly constant.

Q. How does it compare with a train-mile as a measure [fol. 2412] of performance from the standpoint of variability?

A. It is more constant than a train-mile.

Q. Is the car-mile in any sense a measure of the output of the company?

A. Well, not as much so as the gross ton-mile. The car-mile is a measure of traffic or the density of traffic.

Q. I notice by referring to Exhibit 177, Mr. Herbert, that the cost on the Tucson division per thousand gross ton-miles appears to fluctuate within comparatively narrow limits, whereas, on the Salt Lake division the cost appears to fluctuate somewhat more widely. Can you ex-

plain by reference to the showing on the exhibit how that comes about?

A. Yes; that is due to a wider fluctuation, or a more violent fluctuation on the Salt Lake division in cars per train throughout the year, whereas, on the Tucson division, due to restrictions in the length of the train, the fluctuation in average cars per train is very mild.

Q. Have you an illustration of the fluctuation of cost upward or downward between wide limits on any one of these charts for the Salt Lake division?

[fol. 2413] A. Well, you can take any year, either 1937, 1938, or 1939; take the 1938, the month of August, on the Salt Lake division the average cars per train reached its peak at that month, and you will note that the cost expressed per unit of a thousand gross ton miles was at a low level. On the Tucson division, the same relation exists, but there is not the opportunity to make the economies on the Tucson division that there is on the Salt Lake division because of the restricted length of the trains.

Mr. Strouss: I move to strike that last statement as a conclusion.

Mr. Mason: I think that that is a proper inference to be drawn from the exhibit, and from the fact that the restriction does exist. The restriction certainly is not disputed.

The Court: The motion to strike will be denied.

Mr. Mason: Without undertaking to force cross-examination now, Mr. Strouss, are there any questions you would like to ask before we pass from No. 177?

Mr. Strouss: There is one question.

Q. When do costs begin to accrue against tonnage? For example, suppose that a carload of cattle is delivered [fol. 2414] to the Company for transportation, when do the costs begin to accrue on that; when the crew goes to pick that car up?

A. The train-mile as reflected here, you mean?

Q. Yes, this cost you are talking about here, cost per gross ton-mile.

A. When the car enters the train, these are costs for freight train operations expressed in the units of a thousand gross ton-miles, so when the car is in the train is when the costs begin to accrue.

Q. Your costs in picking up a car are not included in these costs?

A. Sir?

Q. The costs of picking up a car of freight are not included in these costs here?

A. No—well, I believe they would. Train expenses would be involved in the picking up of a car if it was at a way-point, but in the terminal it wouldn't.

Q. Take the situation in the Salt River Valley where you pick up citrus and melons and lettuce during the season when those products are being shipped, you have a crew there almost continually, don't you, going out toward Chandler and Mesa?

A. Yes, we have what we call roustabout service.

[fol. 2415] Q. Is that cost included?

A. In this exhibit?

Q. Yes, as part of your——

A. Yes, it is freight train cost, local as well as through trains.

Mr. Strouss: That is all.

Mr. Mason: Would the cost of placing the empty car for the loading of the stock, if performed by a freight train crew, be included here?

A. Yes.

Q. And the cost of switching the car into the train, if performed by the freight-train crew, would be included?

A. Yes.

Q. And the fuel of the locomotive, while performing the switching operation at the way-side point?

A. Yes, sir.

Q. Will you now turn to a statement in one sheet entitled "Main and Branch Line Freight Train Comparisons, Tucson and Salt Lake Divisions, and Pacific Lines, Cars per Train, Gross Ton-Miles per Train-Mile, Cost per One Thousand Gross Ton-Miles," being in one sheet. Have you that before you?

A. Yes, I have.

[fol. 2416] Mr. Mason: May we have it marked 178, if your Honor please.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 178 for identification.

Mr. Mason: From what source was Exhibit 178 prepared, Mr. Herbert?

A. From Form 521.

Q. Did you prepare it personally?

A. I did.

Q. Are these the annual 521's for the years indicated on the face of the exhibit?

A. Yes, these are the annual figures.

Q. Are the figures taken directly from the 521?

A. They are.

Q. And placed on the exhibit in the various columns and segregations as indicated?

A. Yes.

Q. The charts, I take it, are of your own construction?

A. Yes, they are.

Q. And were prepared, or, rather, drawn after locating the points in the same manner as you explained for No. 177?

A. That is right.

[fol. 2417] Q. Are there any computations on the exhibit?

A. All of the averages shown are computations but those computations do appear on Form 521.

Q. Are there any computations of your own on the exhibit as distinct from those which are necessary for the purposes of Form 521?

A. No, there are not.

Q. Now, you show at the left-hand side of each of these blocks a scale. Is that scale associated entirely with that particular block?

A. Yes, it is.

Q. Does the scale of the top block have anything to do with the scales on either of the other two?

A. No, it does not.

Q. There are three separate scales, are there?

A. Three separate scales on this exhibit.

Q. What do you undertake to indicate by the top graph?

A. The top graph shows average cars per train, including cabooses, Salt Lake division, Tucson division, and the Pacific Lines, for each of the years 1924 to 1939, inclusive.

Q. And the trend of the average train length?

A. It is intended to show the trend of the average length throughout these years.

[fol. 2418] Q. Now, the second or center chart.

A. The second chart or center block shows for the same territories, that is, the Salt Lake division, Tucson division, and Pacific Lines, the gross ton-miles per train-mile, excluding the weight of the locomotive and tender, and likewise shows a similar trend throughout those years, 1924 to 1939, inclusive. It is very closely related, of course, with the upper block.

Q. Now, the third chart undertakes to show what?

A. The third chart shows in cents the cost per thousand gross ton-miles, also excluding locomotive and tender.

Q. And what items are included in these costs?

A. The same items as I explained for the previous exhibit, No. 177.

Q. The so-called direct expenses of train operation?

A. Yes.

Q. Will you say whether or not the exhibit is true and correct in so far as it reflects the underlying figures on the forms 521?

A. To the best of my knowledge and belief, it is.

Q. Are the forms 521 for each of these years available [fol. 2419] here in the city or in the court room?

A. Yes. I might say here that prior to 1928 it was form 522, the predecessor of form 521. We also have those forms here in the court room.

Q. Does that carry the same information?

A. The same information, about the same information. It carries the same information, yes.

Q. I mean, in so far as this exhibit is concerned?

A. Yes.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: The Tucson division, during all of this period, included here, did not include the same territory at all times?

A. No. In, I think it was, August, 1930, the Tucson division was extended from Tucson to Lordsburg.

Q. Of course, this begins after the acquisition of the E. P. and S. W. and the Arizona Eastern?

A. Yes; the year 1924 shown here was restated on form 522 in 1925, so it is comparable to 1925.

Q. Now, these figures include both main and branch?

A. Yes, they do.

[fol. 2420] Q. And, so far as the Salt Lake and Tucson divisions are concerned, they are the same figures as Mr. Masson referred to in his testimony yesterday or the day before?

A. I don't—— If he referred to main and branch, they are.

Mr. Mason: I think we will both agree there have been some variations in the relationship and the total of main and branch line mileages over both divisions during those years, the 1931 figures being those which Mr. Masson——

Mr. Strouss: (Interrupting) He gave me 1931 for main line operations.

Q. Since 1931, you haven't broken down your costs, you don't show them as to main and branch lines?

A. That is right. That is why they cannot be made that way and be consistent throughout the years.

Mr. Strouss: That is all.

Mr. Mason: I will offer the exhibit as No. 178.

The Court: Any objection, Mr. Strouss?

Mr. Strouss: Yes.

The Court: The objection is overruled. It may be admitted.

[fol. 2421] (The document referred to was received in evidence and marked "Defendant's Exhibit No. 178.")

The Court: The court will be at recess until one-thirty.

(Thereupon, the court stood at recess until one-thirty o'clock this day.)

[fol. 2422] January 16, 1941, 1:30 o'clock P. M.

Proceedings were resumed at this time as follows:

The Court: You may proceed.

The witness, W. P. Herbert, was recalled to the stand and testified further as follows:

Mr. Mason: Referring to Exhibit 177, Mr. Herbert, and having in mind as well the preceding exhibit, I think that you stated this morning in your direct examination, that

the gross ton-mile as a measure of performance is relatively invariable, and that the train-mile as a measure of performance is variable. Now, I will ask you whether cost per train-mile on a particular district is a flexible or inflexible cost?

A. Cost per train-mile is inflexible, relatively.

Q. Why is that?

A. Well, you get a train on the road, there are certain costs that are incurred that would go on whether the train is long or short. For instance, you have wages of trainmen, enginemen, locomotive repairs, train supplies and expenses. However, your fuel will vary a little with the long or short train.

[fol. 2423] Q. Does it vary in proportion to the length of the train?

A. No, it will not.

Q. A light locomotive will consume considerable fuel?

A. Yes.

Q. That locomotive attached to a train will of course consume additional fuel?

A. Additional fuel, yes.

Q. Then, is it possible to vary the cost per train-mile by varying the length of the train to any considerable degree, that is, to vary the cost to any considerable degree?

A. No, it doesn't vary the cost per train-mile to any considerable degree.

Q. How do you produce gross ton-miles, Mr. Herbert? How does the Company produce gross ton-miles?

A. Well, by adding——

Q. No, I mean, how are they produced in the first instance?

A. Well, they are the tons multiplied by the miles traveled.

Q. Are they produced by the operation of trains?

A. Yes, they are produced by the operation of trains.

[fol. 2424] Q. Do trains vary in productiveness of gross ton-miles?

A. Yes.

Q. What causes the variation?

A. Well, the long or short train, in the first instance, there will be heavy cars and light cars, the more tons you have in a car, and then the more cars, in turn, you have in a train, the more gross tons you will have in a train. Expressing it in gross ton-miles, a train running so many miles

will produce so many more gross ton-miles with heavy cars and more cars per train.

Q. If a train is shorter in length relatively the gross tons will be less by the same token?

A. Yes.

Q. Is it possible to vary the cost per gross ton-mile and, in connection with this question, I recall to your mind the fact that this morning you testified that the gross ton-mile is itself a relatively invariable unit, but as to the cost per gross ton-mile, is it possible to vary that?

A. Yes.

Q. And how is that accomplished?

A. That is accomplished by adding more gross tons to your train or more gross tons per car and more cars per train, which is the same thing.

[fol. 2425] Q. With a fixed train-mile cost, how do you obtain a variable gross ton-mile cost?

A. By adding more gross tons to the train unit.

Q. Or, if you raise the gross ton-mile cost, how do you do that?

A. If you have less amount of gross tons per train unit.

Q. Now, to obtain a relatively low gross ton-mile cost, then what method do you pursue?

A. By having longer trains, expressed in cars.

Q. Where you have a fixed limit which you cannot exceed, Mr. Herbert, is it possible to obtain the same result in reducing gross ton-mile cost as where there are no such limits?

A. No, it is not possible.

[fol. 2426] Mr. Mason: Will you say whether your exhibits 177 and 178 just received indicate whether gross ton-mile costs do vary contemporaneously with variation in number of cars per train?

A. Yes, they do.

Q. Will you point to some examples of that?

A. The Salt Lake division cars per train as you will note in the upper graph shown on exhibit No. 178, the upper graph shown by the solid line, the cars per train have trended upward since 1924, whereas the costs per unit of thousand gross ton-miles as reflected by the solid line on the lower graph have trended downward over the same period.

Q. You spoke of longer trains as being a manner whereby each train-mile could be made more productive. Do you

have an illustration of the greater productive value of a train-mile expressed in gross ton-miles on exhibit No. 178?

A. Yes, that is shown by the middle graph. By the same token, taking the Salt Lake division for an example where such economies can be effected or such loadings can be effected due to the unrestricted territory with respect to cars per train, there you will see that the average gross tons per train have trended upward in about the same proportion that the cars per train have trended upward over the [fol. 2427] same period of time.

Q. I notice that the showing of average cars per train and gross ton-miles per train mile is less on the Pacific lines than on the Tucson division, year by year. What is the explanation of that fact?

A. That is due principally to the greater amount of local service in other divisions, that is, other than the Tucson and Salt Lake divisions, particularly the west coast divisions.

Q. Does branch line service enter into the picture at all?

A. Yes, branch line service has some effect.

Q. Is branch line and local service predominantly a short train operation?

A. Branch line is. Local service is usually a short train operation, a short run and a short train operation.

Q. Will you say whether the purpose of this exhibit is somewhat the same as exhibit No. 177?

A. Yes, it is, the only difference being that it shows it by years where the other exhibit, No. 177, shows the similar trends for each month of the year.

Q. This covers, as I see it, some sixteen years, does it not?

[fol. 2428] A. Yes, sir, 1924 to 1939, inclusive. There is one point I would like to bring out on this exhibit No. 178 and that is that the last three items in the gross tons per train-mile, the last four years, 1936, 1937, 1938, and 1939, I used an actual computation there rather than the figures shown in the 521 because in the 521, starting in 1936, the light train-miles were eliminated. In a graph of this kind I figured it was better to have the graph continuous one year as exactly related with the other, so therefore I made the actual computation.

Q. You added in the light train-miles before making the division?

A. Yes, sir.

Q. Is the figure representing gross ton-miles per train-mile sometimes referred to as "gross tons per train"?

A. Yes, it is the same thing.

Mr. Mason: I propose now to go to another exhibit, Mr. Strouss, unless you have some questions on exhibit No. 178?

Mr. Strouss: I want to have the 522's before I examine on this.

Mr. Mason: They will be furnished.

Q. Have you before you, Mr. Herbert, an exhibit in four [fol. 2429] sheets bearing the title on the first sheet; "Comparisons between Tucson Division, Pacific Lines, and Salt Lake Division Showing Trends in Freight Train Lengths and Freight Train Loading, and Effect on Operating Costs"?

A. Yes, I have.

Mr. Mason: May we have the statement marked "Defendant's Exhibit No. 179" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 179 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 179?

A. Yes, I did.

Q. From what sources?

A. It was prepared also from the 521, the company's form 521, "Operating Statistics."

Q. Was form 522 used for earlier years?

A. Yes, 522 for years 1924 to 1927, inclusive.

Q. Is this exhibit a companion to one of the preceding exhibits?

A. It is a companion to exhibit No. 178.

Q. Will you explain what the first sheet of the exhibit is with relation to the other three?

A. Sheet 1 is a summary of the three back sheets. It shows the Tucson division Pacific lines, the Salt Lake [fol. 2430] division, percentage increase in cars per train, percentage increase in gross ton-miles per train-mile, and percentage decrease in costs in cents per thousand gross ton-miles for each of those three districts divided into two groups, period groups. The first group, 1924-1925, com-

pared with 1928-1929; the second group being 1930-1931 compared with 1938-1939. Percentages shown are the total percentage change for the two groups.

Q. Are these calculations the results of which appear on sheet 1 shown in greater detail on the succeeding sheets?

A. Yes, sir.

Q. I will ask you if the figures in column B are figures taken from the 521 and 522 forms?

A. Yes, they are.

Q. And the same as to column C?

A. Yes.

Q. Column D?

A. Yes.

Q. And column E?

A. Yes.

Q. How do you obtain column F, is that a computation from the preceding figures or is that also on the 521?

A. That is a computation and also appears on the 521.

[fol. 2431] Q. Does it express a division?

A. Yes, it does.

Q. What two figures are divided?

A. Car-miles in column C divided by the train-miles in column B.

Q. That gives you what?

A. Average cars per train.

Q. In column F?

A. Yes.

Q. The gross ton-miles per train-mile, how do you get that?

A. Gross ton-miles per train-mile as shown in column G are a division obtained by dividing column D, gross ton-miles, excluding locomotive and tender, expressed in thousands, divided by the train-miles, column B.

Q. That gives you the result in column G?

A. That gives you the result in column G. I might add that that same computation follows down through the years to and including 1939.

Q. Are all the figures for each year where the several years are shown in the upper block of the exhibit obtained in the same fashion that you have described for 1924?

A. Yes.

[fol. 2432] Q. As to column H, is that also a division?

A. Yes, it is.

Q. Of what two columns?

A. It is a division of freight train cost as shown in column E divided by the gross ton-miles as shown in column D.

Q. And expressed in cents per thousand?

A. Expressed in cents per thousand gross ton-miles.

Q. And these expenses included in freight train costs, are they the same as the expenses you referred to in connection with exhibits Nos. 177 and 178?

A. Yes, they are.

Q. What have you done in the line designated as "Total 1924-1925"?

A. I am looking at the Tucson division, sheet No. 2, 1924-1925.

Q. Did you add those years together to get the result?

A. I added those two years together to get the result of those two years and the same averages are shown there for those two years as are shown for any individual year above, the same computation.

Q. As the averages obtained by computation?

A. Yes, the same type of computation.

[fol. 2433] Q. The same way for 1928-1929?

A. Yes.

Q. There is one figure that appears to be indistinct on my copy and it may have been rendered indistinct in reproduction. In line 2425, column F, it appears to be 54.6. Is that correct?

A. It is indistinct here but I am very sure that is correct. I will have it checked, however.

[fol. 2434] The Court: Mr. Herbert, let me get that straight. On those totals for 1924 and 1925, those are the actual totals for those two years, and not an average for the two years?

A. The totals are the actual totals, yes, sir.

Q. Not an average?

A. No.

Mr. Mason: But, of course, when we get into the column headed "Cars Per Train," or the column G, "Gross Tons per Train Mile," those are computed averages there?

A. Those are computed averages there. The last three columns on this sheet are computed averages where aver-

ages are shown, but the totals as shown for the two years 1924-1925 are actual totals.

The Court: I see.

Mr. Mason: Now, in getting the line headed "Per Cent Change Two Years 1924-25," and so forth, did you make the computations there?

A. Yes.

Q. By subtracting the lesser figure from the greater, and dividing the difference by the greater figure?

A. That is right.

Q. The same process was followed in getting the totals [fol. 2435] and the percentage changes for the lower block 1930-31 and 1938-39?

A. That is right.

Q. Now, what is the derivation of the figures in the line stated as "Total Per Cent Change For the Two Periods Compared?"

A. That is the total decrease of the last period compared with the first two periods.

Q. Now, in column G, gross ton-miles per train-mile, there appears to have been an increase, at least the figure "D" is not used. How is that obtained?

A. Well, that is obtained because the 58.4 as shown for 1938-39 is higher than the figure 57.8 as expressed in cars per train for the period 1930-31.

Q. In other words, you subtracted the smaller percentage from the larger, and the balance was the decrease?

A. Yes, sir.

Q. And in the next column, column G, you subtracted the decrease from the increase and had a net increase; is that the idea?

A. Yes.

Q. Then, in column H there was a large decrease in one [fol. 2436] period, and a small increase in the other, so you obtained a net decrease, is that the idea?

A. Yes.

Q. Now, turning to sheet 3, Pacific Lines, are the computations and percentage changes computations made in the same manner?

A. They are.

Q. And does the same explanation also apply to sheet 4?

A. Yes.

Q. On sheet 3, I notice that the percent change in each of columns F, G, and H, for the first period compared, or the second period compared, is all in the same direction, that is, there seems to have been increases in cars per train and the gross ton-miles per train-mile, but a decrease in the unit cost. How did you obtain the figures for the total per cent change? Is that a straight addition?

A. That is a straight addition, yes, sir.

Q. Then these figures on sheet 2 are obtained by algebraic additions, are they?

A. Yes.

Q. Now, are these straight additions on sheet 4 in your percentage change figures?

A. Yes, they are again straight additions.

[fol. 2437] Q. Now, are these figures in columns F, G and H the same figures which are used in plotting the trend lines shown on exhibit No. 178?

A. Yes, where I show the actual figures for the individual years.

Q. Now, what figures have you brought forward from sheets 2, 3, and 4, to make the showing on sheet 1?

A. I brought forward from sheets 2, 3, and 4, the last three figures at the foot of the columns F, G, and H. In other words, for the Tucson division, you will notice the first item on sheet 1 is a decrease of 0.43, which appears at the foot of sheet 2, column F; the next figure is percentage increase in gross ton-miles per train-mile, Tucson division, 3.95 per cent, that appears at the foot of column G in sheet 2. The next figure is decrease of 15.93, a percentage decrease in cost per thousand gross ton-miles. That appears at the foot of column H on sheet 2.

Q. And the same would apply to columns B and C on sheet 1?

A. Yes.

Q. Now, I notice that you compare 1928-29 with 1924-25, and then compare 1938-39 with 1930-31. Why do you have [fol. 2438] that break, so to speak, in your comparison? I am referring now to sheets 2, 3 and 4.

A. Because the Tucson division changed its limits in 1930; therefore, I chose to compare a period before that change and compare a period subsequent to that change, averaging the two periods by taking two-year groups at the head and at the end of each of those two groups. 1931, in

521 statistics, has 1930 restated, so I was able to show 1930 as though it had had the same operating conditions prevailing as in '31.

Q. The same operating limits of the division?

A. Yes.

Q. Why was the same showing or the same break in comparison made in sheets 3 and 4?

A. Well, in order to have them all the same, to have them comparable, I chose to have them all figured on the same basis.

Q. Does your exhibit No. 179 show any direct or inverse relationship as between average train lengths or average train loading expressed in gross tons per train on the one hand, and costs per thousand gross ton-miles on the other?

A. Yes.

Q. What is that relationship?

A. Well, you will note that on the Salt Lake division, for [fol. 2439] instance, the percentage increase, increase per train is 30.61.

Mr. Mason: I guess I haven't offered the exhibit, so I am a little ahead of my time in asking that question. I will ask that you suspend your answer to the question. Has the exhibit been compared, Mr. Herbert?

A. For correctness?

Q. Yes.

A. Yes, it has.

Q. Have the computations been checked?

A. Yes, they have.

Q. Will you say whether or not the exhibit is true and correct to the best of your knowledge and belief?

A. Yes, I believe it to be.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No, I haven't.

Mr. Mason: I offer this exhibit in evidence as 179.

Mr. Strouss: I object to it as irrelevant and immaterial.

The Court: The objection will be overruled. It may be admitted.

Mr. Strouss: I do notice that on the second, third, and fourth pages you refer to main and branch. What appears [fol. 2440] on the first page, also is main line and branch?

A. Yes, that is right.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 179.")

Mr. Mason: Now, I think that my question, addressed to you just before I offered the exhibit, was a request to state the relationship, inverse or direct, as between the items I mentioned. Will you please answer that question?

A. You will notice that—I think the answer was "Yes," on that. I think I answered it before.

Q. You said you discovered a relationship, and I ask you to state what it is.

A. On the Salt Lake division, there is a percentage increase in cars per train of 30.61 per cent, and the percentage increase in gross ton-miles per train-mile is 35.42 per cent, whereas the percentage decrease in cost per thousand gross ton-miles as expressed in cents is 27.72 per cent; and looking again at the Tucson division, you will find that the percentage increase in cars per train instead of being an increase is a decrease of 0.43 per cent—with only a 3.95 increase in gross ton-miles per train.

The Court: But in spite of that fact, you were successful [fol. 2441] on the Tucson division in decreasing your costs on a percentage basis 15.93?

A. Yes, that is right; and we were also able to increase our loading a slight amount, which is expressed by that 3.95 per cent.

Mr. Mason: The increase in gross ton-miles per train-miles as to the Tucson division, in the absence of the increase in train length, is accomplished in what way?

A. It is accomplished principally by loading the cars heavier.

The Court: There is a limit beyond which that can't go, I presume?

A. Well, yes. Certain cars are limited to certain weight restrictions and capacities.

Mr. Mason: I notice that your showing goes back to the year 1924. I will ask you to refer to the Salt Lake division showing on sheet 4: in that year the average cars per train on the Salt Lake division is 51.6?

A. Yes.

Q. Will you say whether or not the year 1924 was prior to the institution of long train operation on the Salt Lake division?

A. Yes, it started in about 1925, it had its full effect, started to have its effect in 1925.

[fol. 2442] Q. There were, as I think your exhibit shows, continuing increases in average cars per train after 1925 and for several years. What do those indicate?

A. On the Salt Lake division?

Q. Yes.

A. It indicates that the long train program is having its effect in the later years by hauling longer trains.

Mr. Mason: Have you any questions, Mr. Strouss, before we pass from Exhibit 179?

Mr. Strouss: No, not at present.

Mr. Mason: Have you before you a statement in one sheet consisting of a series of charts and bearing in the lower right-hand corner "Southern Pacific Company, Pacific Lines, Statistics of Main Line Operations, Tucson Division Compared with Salt Lake Division, and Pacific Lines, Years 1920-1939, Inclusive?"

A. Yes, I have.

Mr. Mason: May we have this statement marked Defendant's Exhibit No. 180?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 180 for identification?

Mr. Mason: Did you prepare Exhibit No. 180 for identifi-

[fol. 2443] cation, or cause it to be prepared?

A. Yes, I did.

Q. And from what sources?

A. From Form 521.

Q. Was the Form 522 used for prior years?

A. And the Form 522 as predecessor prior to 1928.

Q. Now, there are certain figures which appear in typewriting in each of the three blocks of the exhibit opposite the names Tucson division, the Salt Lake division, and Pacific Lines. Are these figures actually taken from Forms 522 and 521?

A. Yes, they were.

Q. Then, how did you make the chart shown, for example, at the top of the sheet?

A. By plotting thereon for each year shown in accordance with the scale as shown on the left side of each block, the figures as shown on the top of the block representing Tucson and Salt Lake divisions, and Pacific Lines. The Salt Lake division is shown by a solid line on each of the three blocks; the Tucson division by a dash line, and the Pacific Lines by a dotted line.

Q. Are the lines drawn so as to join the plotted points?

A. Yes.

[fol. 2444] Q. You determined the lines after you determined the points, is that it?

A. That is right.

Q. Do I understand that this exhibit relates entirely to main-line operations?

A. Main line only.

Q. What does the exhibit in miles per hour indicate? Is that the total time over the division or the time between particular points, or how is it figured?

A. It is the total time between terminals and does not include any time at terminals.

Q. Does it include time spent by freight trains at way stations between terminals?

A. Yes, it does.

The Court: In other words, it is elapsed time?

A. Yes, elapsed time on a freight train run from one terminal to another.

Mr. Mason: The cars per trains are obtained, I think you have explained previously, by the division of car-miles by train-miles; is that true here?

A. Yes, it is true here.

Q. How did you obtain the figure of car-miles per mile of road?

[fol. 2445] A. That is the freight car-miles divided by the road-miles in freight service, and also derived from the Form 521.

Q. Do you take the total of car-miles for the year?

A. Yes.

Q. And divide by the average number of road-miles operated in freight service?

A. During that year; yes, sir.

Q. Have the figures on the exhibit been compared against the original sources?

A. Yes, they have.

Q. Are the forms 522 and 521 available for the use of opposing counsel?

A. Yes, they are.

Mr. Mason: Will you want those records, Mr. Strouss?

Mr. Strouss: I want your 522's.

Mr. Mason: For years 1920 and following?

Mr. Strouss: Up to 1929. I have copies of the 521's up to 1931.

Mr. Mason: Well, we will furnish those that you don't have.

Q. Will you state whether or not the exhibit is true and correct, Mr. Herbert?

A. Yes, I believe it to be.

[fol. 2446] Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No, I have no questions.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit No. 180.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 180.")

[fol. 2447] Mr. Mason: Mr. Herbert, I notice the exhibit indicates that in 1938 and 1939 the average train speed of passenger trains on the Tucson division showed an upward tendency. Do you know of any particular factor which will account for that tendency?

A. In 1939 the Arizona overnight fast freight had some effect on the speed on the Tucson division.

Q. Between what points is that operated?

A. Between Yuma and Tucson via Phoenix.

Q. Is that operated at passenger train speed or approximately that speed?

A. Yes, it is.

Q. Is it classed as a freight train?

A. Yes.

Q. And appears in these statistics as such?
A. It is carried in the 521 as a freight train.

The Court: You mean that train is one train carrying perishables?

A. No, it carries L. C. L., less than carload freight; it is an overnight merchandise train from the west coast, Los Angeles, Yuma, Phoenix, and Tucson.

Q. Does it stop here?

A. This is the end of its run, it goes back from here. [fol. 2448] It runs on passenger train schedule.

Q. When you speak of it running on passenger train schedule, previous witnesses have testified I believe that the maximum speed obtained by a freight train was 40 miles per hour. That has no application to this train that you refer to?

A. No, this has a passenger locomotive and uses special cars which are equipped for higher speed.

Mr. Mason: Are those special cars assigned to this particular service?

A. They are assigned to this service.

Q. Used in no other service?

A. No other service.

The Court: Is that train still in operation?

A. Oh, yes.

Mr. Mason: You have been in the courtroom when Mr. Strouss has sometimes used the expression "hot-shot"?

A. Yes.

Q. Is this one of those trains?

A. Very much so.

Q. What is the particular service that the Arizona overnight undertakes, is it in connection with truck delivery?

A. Yes, it is less than carload lot merchandise service, store to door pickup in the various cities in Arizona, espe- [fol. 2449] cially put on for this state.

The Court: Is that train operated directly from here to Yuma or does it go through Phoenix?

A. It goes through Phoenix on account of the large amount of business in Phoenix.

Mr. Mason:

Q. Do you know and if so will you state what is the consist in cars of the Arizona overnight?

A. I couldn't say exactly, but I know it is very light compared with a freight train. It is more like a passenger train consist, seven or eight or ten cars; I believe. However, I am not certain as to that, it is all according to the business available.

Q. What actual speeds does the Arizona overnight make in the state of Arizona?

A. I believe it makes a maximum passenger train speed of sixty-five miles an hour.

Q. Does it operate in regular and daily service, Sundays perhaps excepted?

A. I believe Sundays are excepted.

Q. Is there any showing on exhibit No. 81[illegible] which would indicate whether the operation of longer trains or trains of increased lengths has any substantial effect upon average speed of freight trains, and, if so, what that effect is? [fol. 2450] A. It has the effect of speeding up trains.

Q. Where do you find that indicated?

A. As shown on the upper graph, as the cars per train increased, particularly on the Salt Lake division where it is more pronounced, you will find a steady increase in speed over the years.

The Court: There was a general trend of increased speed on all three of these divisions?

A. Yes, that is true.

Mr. Mason: Did the increasing length of trains on the Salt Lake division according to the exhibit have any effect as preventing increasing train speed?

A. No, it would not prevent increasing the speed.

The Court: You wouldn't say that it was conducive to increased speed?

A. Yes, I believe it is. The average speed over the district would be enhanced by the long train operation.

Mr. Mason: Can you name any factors which would contribute to that result?

A. You would have fewer units on the road, fewer meets and passes, and naturally faster time between terminals, which this exhibit shows on the upper graph.

[fol. 2451] Q. When you speak of increased interference, you mean the meetings and passings of traffic traveling on the same line?

A. Yes.

Q. Does a meeting with another train involve stopping one or the other train?

A. It usually does; one train has to take the siding on a single-track line.

Q. Does the passing of a slower train by a faster train involve stopping of one train or the other?

A. It usually stops the freight train; the freight train necessarily takes the side track, causing delay and interference.

Q. Do those delays due to a train stopping for a meet or pass enter into the calculation of speed in miles per hour?

A. Yes, sir, because those stops and passes are at way stations.

The Court: Is my recollection correct that on the Salt Lake division there is very little double tracking?

A. There is some paired track there that is operated as double track.

Q. That is the track that is used jointly by the Western Pacific?

[fol. 2452] A. Yes, sir.

Q. With that exception it is single track in the main?

A. By the main, yes. There are other stretches of double track, however, as shown on the map, exhibit No. 1.

Q. It would go without saying where you had a double track and didn't have to by-pass this oncoming traffic that you would be able to average more miles per hour speed of the train?

A. That would be true as to meets more or less but not passes. A passenger train would necessarily have to pass a slower freight train and the more units you have on the road there the more passes you will have.

Q. But it would eliminate the oncoming traffic?

A. Yes, it would.

Mr. Mason: I notice particularly in 1931 and following there is a considerable sag in the lines representing car miles per mile of road over a period of several years between 1930 and 1936. What is the explanation of that feature?

A. That is due to fewer cars on the road, principally due to the depression years.

Q. Does that apply alike to all three?

A. That applies alike to all three, the Tucson division, [fol. 2453] Salt Lake division, and Pacific lines.

The Court: In other words, that means less business during that period?

A. That is right.

Mr. Mason: Does the average train length have any effect upon the density of traffic as expressed in car-miles per mile of road and where do you find anything to show that on exhibit No. 180?

A. It is freight car-miles divided by the miles of road.

Q. Does that tend to vary, depending upon the average train length?

A. Yes, it would put the cars over the road faster.

The Court: To arrive at what is designated "car-miles" you divide the freight car-miles by the miles of road?

A. Freight car-miles divided by the miles of road.

Mr. Mason: Have you any questions on exhibit No. 180, Mr. Strouss, before we pass to the next exhibit?

Mr. Strouss: No.

Mr. Mason: Have you before you, Mr. Herbert, an exhibit in one sheet entitled, "Comparison between Short Train Operation on Tucson Division and Long Train Op- [fol. 2454] eration on Salt Lake Division, Showing Excess Train Miles Caused on Tucson Division by Short Train Operation, Main Line"?

A. Yes, I have.

Mr. Mason: May we have this exhibit marked No. 181 for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 181 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 181 for identification?

A. Yes, I did.

Q. From what sources?

A. This is also from the form 521, "Operating Statistics," on the Tucson and Salt Lake divisions.

Q. Is form 522 used for this exhibit at all?

A. Yes, the form 522 is here used prior to 1928.

Q. Referring to line 1, the figure in column C, from where is that taken?

A. Taken from the 522.

Q. For the Tucson division.

A. For the Tucson division.

Q. Is the figure in column D for the Tucson division taken from the same source?

A. It is.

[fol. 2455] Q. These are for main line operations only?

A. Main line only.

Q. The figure in column E is the quotient of column C by column D, is it?

A. Yes, it is.

Q. Where do you get the figures in column F?

A. The figures in column F, as shown on the heading, "Salt Lake Division, Cars per Train," are obtained from the form 521, 522, and 521 for the Salt Lake division.

The Court: Those same figures are shown on these other exhibits to which you have been testifying?

A. Those that show main line only, that last exhibit would have them on it, exhibit No. 180.

Mr. Mason: Where do you get the figures in column G?

A. The figures in column G are computed by dividing column C by column F.

Q. What does the figure in column G represent?

A. It represents the train-miles on the Tucson division had we been able to obtain the same cars per train on the average that we had obtained on the Salt Lake division.

Q. For the year 1925?

A. For the year 1925, or the same applies to each of [fol. 2456] the other years.

Q. Does it represent the number of train-miles which would have been produced on the Tucson division if the cars had been distributed into average trains the same as on the Salt Lake division?

A. That is right.

Q. How do you obtain the figure in column H?

A. Column H is column D, which is the actual train-miles on the Tucson division, minus column G in computed train-miles.

Q. What does column H represent?

A. It represents the excess train-miles obtaining on the Tucson division due to short train operation from the years 1925 to 1939, inclusive. At the foot of the column is the summation of all the figures shown above.

Q. You also show a total for columns D and G; are they summations?

A. They, they are also summations.

Q. As indicated by the footnote, column H is what? The total in column H in line 16 is what year? How do you obtain it? Does it represent the difference between columns G and D?

A. Yes, column D minus column G.

Q. Has the exhibit to the extent that it reproduces the original sources mentioned been compared with those [fol. 2457] sources?

A. Yes, it has.

Q. Have the computations been checked?

A. Yes.

Q. Will you say whether or not in your opinion the exhibit is true and correct?

A. Yes.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: I take if that the purpose of the exhibit is as indicated by the title and by the title of column H particularly?

A. Yes.

Mr. Mason: Your Honor, we offer the exhibit in evidence as defendant's exhibit No. 181.

Mr. Strouss: I object to it as irrelevant and immaterial.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 181.")

Mr. Mason: I don't know that it is quite clear in the record yet, Mr. Herbert, what is the primary basis of your exhibit No. 181?

A. Form 521 and its predecessor form, 522.

[fol. 2458] Q. Perhaps I should not have expressed myself that way. What is the primary theory upon which the exhibit is constructed?

A. It is based on the theory that the Tucson division, if it had not been for the restriction in train lengths, could at least obtain the same length of trains as obtaining on the Salt Lake division.

Q. You mean for main line operations?

A. For main line operation.

The Court: After all, though, it is merely a theoretical computation, is it not?

A. Yes, it is.

Mr. Mason: Of course, your Honor, we expect to develop later by other witnesses that it is feasible actually to operate as long trains on the Tucson division main line approximately as on the Salt Lake division, the law to the contrary notwithstanding. Do you wish to cross-examine now, Mr. Strouss? This is all we have at the moment for Mr. Herbert?

Mr. Strouss: No, I want to take the form 522 before I cross-examine Mr. Herbert.

Mr. Mason: You would like to have the witness withdrawn and recalled later for that purpose?

Mr. Strouss: Yes.

[fol. 2459] The Court: We will take our afternoon recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows:)

B. S. Sixes was recalled as a witness in behalf of the defendant and having been previously sworn testified further as follows:

Direct examination (Continued):

Mr. Mason: Mr. Sines, you have previously been sworn and testified in the present case?

A. Yes, sir.

Q. Have you before you an exhibit in one sheet entitled "Yuma, Arizona, to Lordsburg, New Mexico, Length of Freight and Passenger Trains Operated during the Six Month Period, January to June, 1942"?

A. I have.

Mr. Mason: May we have the statement just referred to marked for identification as defendant's exhibit No. 182?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 182 for identification.

[fol. 2460] Mr. Mason: Did you prepare this exhibit or cause it to be prepared?

A. I caused it to be prepared and it was prepared under my direction and supervision.

Q. From what sources?

A. From the Tucson division train sheets for the six months, January to June, 1912.

Q. Did you actually take those six months' train sheets into your possession and abstract the figures on this exhibit therefrom?

A. I did.

Q. Has the exhibit been checked against these train sheets to determine its correctness?

A. It has.

Q. Are there any computations which appear on the exhibit?

A. Only the computations showing the totals and percentage of totals at the foot of each of the two blocks.

Q. As to the aggregation of the number of trains in the various classes, is that done by simply adding up individual trains as they were shown on the train sheets?

A. That is right.

Q. You speak of trains by classes, for example, 41 to 50. Does that represent the average length of the trains shown [fol. 2461] in column C or the maximum cars in the trains at any one time between terminals?

A. That represents the maximum number of cars in the train at any one time between terminals.

Q. Then a train, for example, in column C may have left the terminal with ten cars and picked up forty cars, hauled them for a few miles, and then dropped them and proceeded with ten cars and it would still be shown in this group, would it?

A. That is right.

Q. This one appearing under the description of passenger trains, 14 cars and over, was that taken directly from the train sheets?

A. That comes from the same train sheets, yes.

Q. Each of these trains is designated or titled similar to what is shown here?

A. That is right.

Q. Is the exhibit true and correct?

A. It is.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No, I have no questions.

Mr. Mason: What is the purpose of the exhibit, Mr. Sines?

A. The purpose of the exhibit is to show the small num-
[fol. 2462] ber and small percentage of trains that were operated in the six-month period, January to June, 1912, which exceeded 70 cars in length if they were freight trains and which exceeded 14 cars in length if they were passenger trains.

Mr. Mason: We offer the exhibit in evidence as exhibit No. 182.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 182.")

Mr. Mason: I would like to have you refer back, if you will, Mr. Sines, to Mr. Masson's exhibit No. 149 already in evidence and I call your attention to the year 1912.

A. I have it.

[fol. 2463] Q. I call your attention to the fact that this exhibit shows the average number of cars per train in Arizona for 1912 to be 48.39?

A. That is right.

Q. How does your exhibit contrast with that exhibit?

A. My exhibit indicates that the highest percentages of trains in the blocks which I have chosen, that is, in the ten-car blocks, falls in the two blocks 41 to 50, column C, and in the other block, 51 to 60, column D. The percentage of trains falling within the block 41 to 50 is 33.59, and in the block 41 to 60 is 31.48. There is therefore indicated a check between Mr. Masson's exhibit 149 and my exhibit 182.

Q. Your exhibit, as you said, is based upon the maximum number at any one time?

A. Yes.

Q. Would your exhibit necessarily show the average length except by approximation?

A. That is right, just by approximation.

Q. Was the 75-car train the longest train that you could find on any of the train sheets?

A. It was.

Q. And only one of those?

A. Only one between Tucson and Gila operated in a west-
[fol. 2464] erly direction. It is indicated in column Q.

Q. Do you recall from the train sheet what its consist was?

A. No, I do not.

Q. Now, you show on the sheet also the number of trains classed as passenger trains exceeding fourteen cars in length. What is the total number, what is the total percentage of trains exceeding fourteen cars in length of all those classed as passenger trains?

A. There were fourteen trains exceeding fourteen cars in length, and the percentage of those fourteen trains to the total percentage of 3,118 is .44 of one per cent.

The Court: You said fourteen trains. Don't you mean sixteen?

A. Well, you will notice that the block at the foot of the page is entitled "Fourteen Cars and Over," whereas, Mr. Mason's question was as to those trains exceeding fourteen cars. To determine the figure that I used in my answer, you should go to the total commencing with column O and the line entitled "Grand Total" and adding the following figures——

The Court: I follow you now.

[fol. 2465] The Witness: (Continuing) My percentage of .44 of one per cent was determined in a similar manner.

Mr. Mason: You can add the percentage of excess, I take it, in columns O, P, Q, R and S, and get the .44 of one per cent?

A. Yes, sir.

Q. That figure of .44 per cent relates to what figure in the block relating to freight trains?

A. .38 of one per cent found in column F.

Q. What is the total percentage of trains of 61 cars or more operated in relation to the total freight trains?

A. 15.78, that figure being the total of the sum of 15.40 and .38.

Q. Now, Mr. Sines, I notice that of the trains classed as passenger trains of 15 cars or more, fourteen cars or more, of which sixteen are shown, there were eight bearing the designation "pay-trains." What were pay-trains?

A. Pay-trains were operated by the Southern Pacific Company in 1912 twice a month to pay the roadside em-

ployees outside of larger terminals. Pay-trains contained a pay-car. Along with that pay-car were a number of other official cars belonging to the officers of the division and [fol. 2466] sometimes store department cars, ordinary freight cars, and boxcars with company material in them which would be distributed along the railroad. These pay-trains were listed on the 1912 train sheets in the spaces ordinarily assigned to passenger trains. After making this exhibit, my attention was called to the fact that these pay-trains probably resembed work trains that are operated nowadays, and I shouldn't have counted them, but the exhibit as it is set up here, shows all of the trains that were operated for this six-month period.

The Court: In those days, did the company pay its employees by currency rather than by check?

A. I understand that it was currency and hard money.

Mr. Mason: Primarily in gold and silver rather than in currency, wasn't it?

A. Yes.

Q: Were these pay-trains operated in revenue service, carrying passengers?

A. No, there would be no revenue passengers on these pay-trains.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

[fol. 2467] Mr. Strouss: No, no questions.

The Witness: I would like to point out that, as indicated by the lower block of the exhibit, there were no regular passenger trains which exceeded fourteen cars in length. There was a special reason for the operation of every one of those extra-length passenger trains.

Mr. Mason: Will you refer now, Mr. Sines, to an exhibit entitled "Tucson Division, Yuma, Arizona, to El Paso, Texas, Locomotives in Service, January to June, 1912?"

A. Yes.

Mr. Mason: May we have this statement marked Exhibit 183 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 183 for identification.

Mr. Mason: Did you prepare this exhibit or cause it to be prepared?

A. I assisted in its preparation and caused it to be prepared.

Q. From what sources was it prepared?

A. From the same 1912 train sheets of the Tucson division referred to in connection with the previous exhibit, No. 182.

Q. Are the train sheets to which you have referred [fol. 2468] available for the use of opposing counsel?

A. Yes, sir, they are in my possession here in Tucson.

Q. And they can be made available if counsel desires?

A. That is right.

Mr. Mason: If you will indicate, Mr. Strouss, whether you want them or not, we will bring them if you so ask.

Mr. Strouss: I don't know that I do now. I will see what other evidence goes in.

Mr. Mason: Does the exhibit or, rather, does the underlying source, the train sheets, indicate the use, whether regular or occasional, of the various types of locomotives indicated?

A. Yes, that is one of the essential items that is recorded on the train sheets at the beginning of each train's operations. The train dispatcher working the district covered by the train sheets heads up the trains with the conductor and engineer's name, the number of the train and the number of the locomotive. That practice has been invariable for at least the 28 years that I have had occasion to examine Southern Pacific Company train sheets.

[fol. 2469] Q. Can you determine from the locomotive numbers what types they are or were?

A. Yes, those numbers have been carried right down to the present day on the same locomotives; the numbers haven't changed on individual locomotives.

The Court: You don't mean to say that there were locomotives that were in use in 1912 that are still in use?

A. Oh, yes.

Mr. Mason: They are not in the same use, I take it.

A. No, not many of these locomotives see main line service nowadays, but that is not unknown either.

Q. Now, you show—first, I will ask you, has exhibit 183 been compared and checked to determine its correctness?

A. It has.

Q. You show in column D numbers. Do those numbers actually appear as the destination of these locomotives on the train sheet for the periods studied?

A. They do.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: What do the figures indicate in Column F [fol. 2470] under head "passenger"?

A. They indicate the number of units that were operated, or that I found were operated during that six months' period.

The Court: And column E.

Mr. Mason: The Court asked as to column E. Does that indicate the same thing?

A. The same thing.

Q. You say here "occasional"; what does that mean as applied to the first line?

A. There were two units of Mogul 4's operated. They usually appeared in passenger service, but we found them occasionally hauling freight trains, from which I concluded that the regular assignment was passenger service, but as occasion arose, they could be used in freight service. The same practice prevails today.

Q. Does that same explanation apply to the word "occasional" in columns E and F otherwise?

A. That is right.

The Court: Well, Mr. Sines, coming to your total column down there though, do I understand that during the period January to June of 1912 there were 125 freight and passenger trains that operated over these lines shown here on the exhibit?

A. No, that is not right. During that time there were, [fol. 2471] referring to exhibit No. 182, there were 4,187 freight trains, and 3,118 passenger trains, but these trains were hauled with 125 locomotives, which are indicated on Exhibit 183.

The Court: Oh, I see.

Mr. Mason: As a matter of fact, Mr. Sines, do these locomotives generally receive repeated daily use?

A. That is right.

Q. Subject, of course, to such roundhousing or shop work as may be necessary from time to time?

A. Yes.

The Court: In other words, what this exhibit really shows, take line 8 there, for instance, in which you have 40 freight locomotives of the consolidation 9 type, wheel arrangement 2-8-0?

A. That is right.

Mr. Mason: Now, I will ask you to refer—Well, I will introduce the exhibit first. We offer the exhibit in evidence as Defendant's Exhibit No. 183.

Mr. Stgouss: I have no objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 183 in evi-[fol. 2472] dence.")

Mr. Mason: I will ask now to refer to Exhibit No. 5.

A. All right.

Q. Do you find some or all of the types indicated on exhibit 183 shown on exhibit 5 and in that connection, will you also please refer to exhibit 6, which shows the passenger types?

A. On the two exhibits, 5 and 6, we find the Mogul locomotive, the Consolidation; on exhibit 6 we find the ten-wheel; on exhibit 5 we find Consolidation locomotives. We don't have the 12-wheel locomotives on exhibits 5 and 6.

The Court: In other words, what is designated on exhibit 6 as the Pacific passenger locomotive and on exhibit 5 as the Mikado freight locomotives were not then in use?

A. Yes, they were in use at that time elsewhere on the Southern Pacific, but not here in Arizona on the Tucson division. We don't find the Atlantic type on the exhibit No. 6, which is devoted principally to passenger locomotives, whereas, when I examined the 1912 train sheets I found that the Atlantic type was the principal passenger locomotive in use on the Tucson division. I therefore put the note at the foot of the exhibit to the effect that the [fol. 2473] Atlantic type 3 had and has—we still have a couple of them in service—a tractive effort of 24,680 pounds.

Mr. Matson: Where do you obtain that information of the tractive effort of the A-3 type?

A. That is from the Southern Pacific record of locomotives.

Q. Is that a small black book regularly kept?

A. Yes, it is.

Q. And circulated for the use and information of officers?

A. That is right.

Q. Have you a copy of it available here?

A. I don't have one in the court room, but we have several in the office.

Mr. Mason: (Addressing Mr. Strouss) Would you like to see it?

Mr. Strouss: No.

The Witness: I wanted to continue with the observation that the 24,680 pounds noted for the Atlantic type indicates that that engine is somewhat smaller that the ten-wheel locomotive shown on exhibit No. 6, whose tractive effort is shown as 25,260 pounds.

Mr. Mason: I will ask you now, Mr. Sines, to refer to an [fol. 2474] exhibit in one sheet entitled, "Full Crew Laws, States of Nevada and Arizona."

A. Yes.

Q. Have you that exhibit before you?

A. I have.

Q. Did your prepare this exhibit, or cause it to be prepared?

A. I did.

Mr. Mason. May this be marked No. 184, for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 184 for identification.

Mr. Mason: From what source did you take the information shown hereon?

A. From the revised codes of the two states, Nevada and Arizona, in the possession of the Southern Pacific Law Department.

Q. Have the texts of the statutes which purport to be shown here been checked against the original published volumes?

A. They have.

Q. Will you state whether or not the exhibit is true and correct?

A. It is.

Mr. Mason: Your Honor, I will state that the purpose of the exhibit, of course, is to show that the requirements [fol. 2475] of the states, of the two states as to the crews of freight trains are substantially the same, and thus to indicate to that extent a similarity between the two states, and to lay a further foundation for comparisons between the two states heretofore made and hereafter to be made. Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit No. 184.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 184.")

The Court: Do I understand then, Mr. Mason, from this last exhibit that at the same general election at which the train-limit law was referred to the people and passed, that the Arizona full-crew law was also approved at that same election? It would appear so from this exhibit.

Mr. Mason: It would appear so from the exhibit and, while I never had that called to my attention before, I think that is unquestionably the fact. We might look at the Revised Code.

The Court: Never mind, I will look it up.

[fol. 2476] Mr. Mason: Have you before you, Mr. Sines, a statement in one sheet bearing the title "Southern Pacific Company, Summary of Freight Train Operations of Trains of Seventy Cars and Less, and Seventy-One Cars and Over in Specific Districts," and so forth?

A. I have.

Mr. Mason: May we have this statement marked Defendant's Exhibit No. 185?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 185 for identification.

Mr. Mason: How was this exhibit prepared, Mr. Sines?

A. This exhibit was prepared at my request and under my direction by the office of the auditor of freight service accounts.

Q. Did you supervise its preparation?

A. I did.

Q. From what underlying sources was it prepared?

A. From the conductors' wheel reports.

Q. Was it prepared directly from the wheel reports?

A. It was.

Q. Does it purport to show the cars by classes, the trains [fol. 2477] by classes, according to the maximum number of cars in the train at any one time between the points shown?

A. That is right.

Q. Where do you obtain the mileage figures in column C?

A. From the mileage records of the Company, based on engineering records, and also mileage records in the auditor of freight service accounts' office.

Q. Now, will you explain how the figures in columns D and E were actually obtained from the wheel reports?

A. By the laborious process of counting the number of cars on each conductor's wheel report to determine the highest number handled at any one time between the points indicated.

Q. Who made the selection of the points between which the trains should be studied?

A. Those freight districts are districts which the auditor of—I just noticed I have stated several times that it is the office of the freight service accounts—it is the auditor of the equipment service accounts who did this job.

Q. Do they use these same terminal points or boundary lines for various purposes in accounting?

[fol. 2478] A. They do.

Q. Do they split their accounting at state lines?

A. Yes. The railroad is divided up in these districts and they make a series of reports on car-miles, train-miles, locomotive-miles, gross ton-miles, and net ton-miles. The whole system of railroad accounts is built according to the districts indicated on this exhibit.

Q. Now, you show here, for example, from California-Oregon line to Klamath Falls, and then further down from Dunsmuir, California-Oregon line (Cascade); are those two separate parts of a continuous district between Dunsmuir and Klamath Falls?

A. Yes, they are.

Q. And some of the trains between Dunsmuir and the California-Orgeon line continue on into Klamath Falls, or vice versa?

A. That is right.

The Court: But there is no duplication?

A. There is duplication, yes.

Mr. Mason: Where is that duplication?

A. Because these trains run very often in more than one district, but the accounting has to be performed in these [fol. 2479] districts in order that no trains will be missed.

The Court: In other words, the same train may be counted through each division through which it passes?

A. Yes, sir.

[fol. 2480] Q. Then where a state line cuts across a freight train district the same train may appear on one side of the state line and on the other side of the state line?

A. Yes, sir, the reason for our counting in that manner is to enable us to prepare each state's statistics, and carrying it to the ultimate conclusion we pay certain taxes based on operations on each side of the state line, taxes on the same freight train.

Q. Looking at lines 27 and 28, you show San Francisco to Watsonville Junction, line 28, San Francisco to Redwood. Would the trains which run from San Francisco to Redwood be included within the trains running from San Francisco to Watsonville Junction?

A. No, they would not. The San Francisco-Redwood territory, while it follows the same route is a separate series of trains which run up and down the Peninsula in local service, some of them crossing the San Francisco Bay on the Dumbarton Bridge and then coming around to Oakland. From San Francisco to Watsonville Junction, the through trains operate through San Jose. Note the next district, Watsonville Junction to San Luis Obispo.

Q. Is that a continuation of the San Francisco-Wat-[fol. 2481] sonville Junction district?

A. Yes, a slightly larger number of trains indicating generally that those trains are operating through from San Francisco to points south of Watsonville Junction.

Q. Your showing, I notice, relates to four months of the year 1939. Will you say why only four months are shown instead of the entire year?

A. I thought that the four months represented a typical cross-section of the year's operation, and it is customary to select these particular four months to make showings of this kind and relieve ourselves of the burden of performing a lot of unnecessary work.

Q. Is the work of checking the wheel reports for the purpose of this showing a considerable job?

A. Yes, the magnitude of the task of preparing this exhibit can be appreciated by adding the two figures together at the bottom of the sheet, 45,000+ and 16,000, indicating there were over 61,000 conductors' wheel reports examined and the cars were individually counted on those wheel reports. Many of the wheel reports consist of four, five, and six sheets each.

Q. This was only for four months?

A. That is right.

[fol. 2482] Q. The job for a year would have been how much larger?

A. Three times larger.

Q. Who made the computations in column F and how are they made?

A. They were made by people under my supervision and were made by totaling the figures in columns D and E and dividing the figure in column E by the sum.

Q. So that column F represents the proportion of long trains, using that term to indicate trains of more than 70 cars?

A. Yes.

Q. Are these trains exclusive of caboose or inclusive of caboose?

A. These trains are exclusive of caboose, corresponding to the language of the Arizona law, which says "70 cars exclusive of caboose."

Q. You show here under item 37, Indio to California-Arizona line. Is that the operation between Indio and the bridge or does that include whatever mileage these trains may have operated after crossing the bridge and within the limits of Yuma?

A. It does; a part of that 122 miles is in the state of Arizona.

[fol. 2483] Q. And except for that and the showing in line 39 is the state of Arizona represented on this exhibit at all?

A. That is the only representation that Arizona has on this exhibit.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: We offer the exhibit as defendant's exhibit No. 185.

Mr. Strouss: I object to it as irrelevant and immaterial.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 185.")

Mr. Mason: Mr. Sines, I call your attention to the fact that in Oregon the percentage of trains of 70 cars and less in some of the districts particularly between Eugene and Brooklyn and between Klamath Falls and California Oregon line and between Ashland and Eugene is somewhat greater than of the trains of 71 cars and over. Is there a local or gathering service in those territories?

A. That is right. In 1939 and for some years prior to 1939 we have not operated any through service over our [fol. 2484] Oregon line going through Ashland. The trains represented in the districts you have indicated are local trains wholly.

Q. Is that true between Eugene and Brooklyn?

A. No, that is not true between Eugene and Brooklyn. Our through service between California, Eugene and Portland, is over the Cascade line through Klamath Falls and Chemult.

Q. Does that through service also pass through Eugene and thence to Brooklyn?

A. Yes.

Q. What other service is rendered in the territory between Eugene and Brooklyn besides this through California-Oregon service.

A. We run a very extensive local service in that part of Oregon, particularly in the lumber and logging business. Many of the trains indicated on this exhibit are made up almost entirely of logging cars.

Q. Are those predominantly long trains or predominantly short trains?

A. Those trains will very seldom approach 70 cars so they are predominantly short trains.

Q. You show in California in many districts a predominance of trains of 70 cars and less. Will you explain how that comes about?

[fol. 2485] A. There again the short trains that were run in California are more apt to be local hauler and gathering trains than through trains. We endeavor whenever possible on all of our main line operations in California to build the trains up to the full capability of the engines and this means in most instances that the trains will exceed 70 cars in length.

Mr. Mason: Have you any question before we leave the exhibit, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Will you [illegible] Mr. Sines, please, to a statement in one sheet entitled "Summary of Freight Train Operations by Various Lengths between Sparks, Nevada, and Ogden, Utah"?

A. Yes.

Mr. Mason: May we have the statement marked "Defendant's Exhibit No. 186"?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 186 for identification.

Mr. Mason: Did you prepare defendant's exhibit No. 186 for identification or cause it to be prepared?

A. I did.

Q. From what sources?

[fol. 2486] A. From the conductors' wheel reports in the territories indicated.

Q. Does this cover main line territory entirely?

A. It does.

Q. Between Sparks and Ogden?

A. Right.

Q. Will you say whether or not the method of the preparation of the exhibit was substantially the same as exhibit No. 185?

A. Exactly the same.

Q. How was the segregation into groups as shown by columns A to I, inclusive, made?

A. By determining the highest number of cars handled at any one time by our trains and tallying the trains according to the number of cars indicated in those groups.

Q. Did you supervise the preparation of the exhibit?

A. I did.

Q. Have you checked it?

A. Yes.

Q. Will you say whether or not it is true and correct?

A. It is.

Q. I notice in column 1 you show a classification, 121 to 130?

[fol. 2487] A. Yes.

Q. Were there no trains in excess of 130 cars operated?

A. No, there were none in the four months that we have tabulated. The reason I answer that way is that trains of over 130 cars are not unknown in Nevada or in the territory covered by this exhibit.

Q. You have shown on the exhibit the four months, January, April, July, and October. Did you select those particular months?

A. Yes.

Q. For what reason?

A. Because it gives a typical cross-section of the year's operations. I might point out also that those four months embrace a winter month, a spring month, a summer month, and a fall month, and I have also assisted in making compilations and summaries for those particular four months in reports to the Interstate Commerce Commission. The JA-JO months, as we call them, are the months commonly used in making exhibits of this character.

The Court: Mr. Sines, the territory covered by this exhibit No. 186 is in what is known as the Salt Lake Division?

A. Yes, sir.

[fol. 2488] Q. But these subdivisions you have made into those three different units, are those freight divisions or why did you cut it up into these three subdivisions shown here?

A. The territories chosen on exhibit No. 186 are the same as the territories shown on exhibit No. 185. I refer you to line 42 of exhibit No. 185 where you will find a total number of trains operated by adding 467 and 1,225, or 1,692 trains. That is the total shown in the Sparks, Nevada-Carlin,

Nevada, district on exhibit No. 186. Similarly, the trains between Carlin and the Nevada-Utah line total 1,268 on both exhibits.

Q. Are those freight divisions?

A. No, they are not. Sparks, Nevada, and Carlin, Nevada, embrace two freight train districts but as I explained in connection with exhibit No. 185 Sparks-Carlin district is a district which our auditor of equipment service accounts uses in compiling his statistics. I didn't necessarily have to follow that system of districts, but it was convenient to do so. Sparks-Carlin freight district was originally established by the auditor of equipment service accounts because it embraced those two freight districts and was a territory which they simply found convenient to set up.

[fol. 2489] Q. Then the real answer to the Court's question is that it is set up in this manner because that is the manner in which the company keeps the records.

A. Yes, sir.

Mr. Mason: You show Carlin to the Nevada-Utah line, the split at the state line is for accounting purposes as between the two states?

A. That is right.

Q. And for the purpose of rendering reports to the two states?

A. That is right.

Q. Carlin to the Nevada-Utah line embraces what freight train district?

A. The freight train district from Carlin to Montello embraces the district Carlin to Nevada-Utah line.

Q. Carlin to Nevada line includes other mileage besides the Carlin-Montello district?

A. Isn't my recollection correct that the state line is west of Montello?

Q. Your recollection is wrong, the state line is east of Montello as I think Exhibit No. 1 shows.

A. That is right, I have confused Lucin with Montello. The Carlin to Nevada-Utah line does embrace the Carlin-Montello freight district.

[fol. 2490] Q. And some mileage between Montello and the Nevada-Utah line?

A. Yes, sir.

Q. And the balance of the mileage in the Montello-Ogden district is between the Nevada-Utah line and Ogden?

A. Yes.

Q. Does this include all of the main line mileage between Sparks on the west and Ogden on the east, all of the principal main line of the Salt Lake division?

A. Yes.

Q. Have those computations been checked to determine their correctness?

A. They have.

Q. Will you say whether or not that exhibit is true and correct?

A. It is.

Mr. Mason: We offer the exhibit subject to questions by opposing counsel as defendant's exhibit No. 186.

Mr. Strouss: I object to it as irrelevant and immaterial.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and [fol. 2491] marked "Defendant's Exhibit No. 186.")

Mr. Mason: Does your exhibit show in any one calculation the total number of trains of 71 cars or more and the total number of trains of 70 cars and less operated in the territory covered and during the months referred to?

A. No, it does not. It is necessary to add up three figures shown in the recapitulation to answer your question.

Q. You would have to add up the total trains of each class?

A. Yes.

Q. And the total trains and then make the calculation?

A. That is right.

Q. Could it be done from the face of the exhibit without difficulty?

A. Yes.

Q. Have you a statement in one sheet entitled, "Maximum Number of Cars Handled in Various Main Line Passenger Trains, January, April, July, and October, 1939"?

A. Yes.

Mr. Mason: May we have this statement marked as "Defendant't Exhibit No. 187" for identification?

[fol. 2492] The Court: It may be marked.

The Clerk: Defendant's exhibit No. 187 for identification.

Mr. Mason:

Q. Was this exhibit prepared under your supervision?

A. It was.

Q. In what manner?

A. By examination of the passenger conductors' wheel reports and tabulating the maximum number of cars handled at any one time in the blocks indicated.

Q. Are the passenger conductors' wheel reports the source of the information shown?

A. They are.

Q. Who made the selection of the period studied?

A. I did.

Q. For what reasons?

A. For the same reasons previously indicated in connection with the prior exhibits.

Q. What is the basis of the car count or classification of the lengths of trains? Does this indicate the average length or maximum length at any one time?

A. Maximum length at any one time. I may say with respect to our main line through passenger trains that in [fol. 2493] many cases the maximum number is also the number for the entire trip of the train. Some trains don't make any set-outs or pick-ups enroute.

Q. You mean at points on our line?

A. Yes.

Q. Are some of these trains operated through in connection with other railroads?

A. Yes.

Q. Which ones particularly of those shown on this exhibit?

A. Trains on the Ogden route; the Ogden route is the only east and west route on this exhibit.

Q. You do not show here the operation over the route from Los Angeles east. Is that to be shown elsewhere?

A. That is handled on the next exhibit.

Q. Has the exhibit been checked against the underlying sources?

A. It has.

Q. Will you say whether or not it is true and correct as reflecting those sources?

A. It is.

Q. There are certain computations, percentages, shown here. Did you make those computations or cause them to be made under your supervision?

[fol. 2494] A. They were made under my supervision.

Q. How were they made? What figures were used in making them?

A. The figures in each of the columns were added to give totals. The totals were then cross-footed with the totals in column Q and percentages were figured, using the total in column Q as one hundred per cent. The percentages indicated in the middle of the sheet and between the blocks are arrived at by adding the number of trains in the percentages over 14 and under 15.

Q. You show between columns M and N a somewhat heavier line. Is that of any particular significance?

A. Merely to call attention to the fact that that is where the Arizona Train Limit Law applies.

Q. That marks the boundary line between 14 and 15 cars, does it?

A. That is all.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 187.

Mr. Strouss: I object to it as irrelevant and immaterial.

[fol. 2495] The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 187.")

Mr. Mason: Will you refer, please, to an exhibit in one sheet entitled, "Number of Passenger Trains of Different Lengths between Los Angeles, California, and El Paso, Texas, Year 1939"?

A. Yes.

Mr. Mason: May we have this statement marked as "Defendant's Exhibit No. 188" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 188 for identification.

Mr. Mason:

Q. Did you cause this exhibit to be prepared, Mr. Sines?

A. I did.

Q. From what sources?

A. From the passenger conductors' wheel reports for the trains indicated.

Q. Was the exhibit prepared under your supervision?

A. It was.

Q. I note that you show an entire year here, why is that? [fol. 2496] A. This covers the southern route which embraces Arizona and we made the showing complete for one year.

Q. Will you say whether or not this exhibit was prepared in similar fashion to exhibit No. 187?

A. Exactly the same.

Q. And is the showing a maximum number of cars at any one time between the points referred to?

A. That is right.

Q. Does this include special trains or extra sections of regular trains or only regular trains themselves?

A. Only the regular trains; that same observation applies to exhibit No. 187.

Q. There are no special trains shown there?

A. No.

Q. Although such special trains may have been operated as extra sections of regular trains?

A. And undoubtedly were in many instances.

[fol. 2497] Q. If a train, for example, of the character referred to by Mr. Baker, operated especially for the transportation of government troops had moved during the year 1930, would such a train have been shown on this exhibit?

A. No.

Q. Did you make, or check the computations which appear in the total and percentage columns in the recapitulations?

A. I had them made and checked them.

Q. Will you say whether the exhibit is true and correct?

A. It is.

Q. I notice that some of the eastward trains, all of the eastward trains: 2, 4, 6 and 44, between Yuma and El Paso, are shown as operating 364 rather than 365 times during the year. What is the explanation of that?

A. We had some washouts on the Southern route that caused us to suspend operations. For one day trains were annulled, and we didn't run any passenger trains. Apparently the westbound trains managed to get through, may be they got through before the railroad was washed out.

Q. At any rate they were not annulled?

A. Not the westbound.

[fol. 2498] Mr. Mason: Have you any questions, Mr. Strauss?

Mr. Strouss: No.

Mr. Mason: We offer the exhibit as Exhibit 188.

Mr. Strouss: No objections.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit 188.")

Mr. Mason: Have you——

The Court: Pardon me a minute. Mr. Sines, the pleadings indicate, at least, that it is the contention of the defendant that the Arizona law has an extra-territorial effect. Does this exhibit 188 reflect that condition in any way?

A. Only by inference and in this manner: Train 2, the Sunset Limited eastbound, operated 29 times with consists of over 14 cars between Los Angeles and Yuma. It operated no times between Yuma and Lordsburg with consists of over fourteen cars, and it then operated three times between Lordsburg and El Paso with consists of over fourteen cars. Something happened to that train to make it run with fourteen cars and less in Arizona, and with over fourteen cars immediately outside the state.

Mr. Mason: Now, I think his Honor's question was asked [fol. 2499] as to extra-territorial effect.

A. As to conditions between State Line and Lordsburg, at least, there is an extra-territorial effect where that train didn't exceed fourteen cars.

Q. Is there any way that No. 2 running between Yuma and Lordsburg could have been built up to more than fourteen cars at the Arizona-New Mexico boundary?

A. Not conveniently.

Q. Is there any terminal at the Arizona-New Mexico boundary which is passed by No. 2 on its eastward course?

A. No.

Q. Carrying out the possibilities of extra-territorial effect, Mr. Sines, how many times out of a total of 365, was No. 1, the Sunset Limited, operated from El Paso to Lordsburg with an excess of fourteen cars?

A. Six times.

Q. Out of 365?

A. Yes.

The Court: It won't be necessary to go into all those figures. I think the exhibit speaks for itself.

Mr. Mason: Will you take up, there, the statement Mr. [fol. 2500] Sines, entitled "Cars Received and Forwarded at El Paso, Texas, Years 1930 to 1939, Inclusive, and at Ogden, Utah, Year, 1939."

A. Yes, sir.

Mr. Mason: May we have this statement marked Defendant's Exhibit No. 189 for identification?

The Court: It may be marked.

The Clerk: Defendant's No. 189 for identification.

Mr. Mason: Did you prepare this exhibit or cause it to be prepared, Mr. Sines?

A. I caused it to be prepared.

Q. From what sources?

A. The figures opposite the word "Refrigerators" are taken from the records of the Pacific Fruit Express Company, their car accountant; the other figures are taken from the Southern Pacific Company interchange records covering El Paso and Ogden.

Q. Now, those cars that are received at El Paso eastward, are those cars which have passed through the State of Arizona?

A. That is right.

Q. Do those figures represent cars which have moved into El Paso from the west over the lines which extend through Arizona and New Mexico?

[fol. 2501] A. Yes.

Q. Would that include any cars originating at Lordsburg or at Deming or at branch line points served out of Lordsburg or Deming?

A. It would.

Q. Or any cars originating at points on the south line between Rodeo and El Paso?

A. Yes, sir.

Q. Is there any substantial volume of such traffic?

A. No, that is very sparsely settled territory.

Q. Now, as to cars forwarded at El Paso westward, does that include cars moving from El Paso into or across Arizona?

A. It does.

Q. Would it also include cars destined to Deming and Lordsburg?

A. Yes.

Q. And points on the south line east of Rodeo?

A. Yes.

Q. Is there any substantial volume of that traffic?

A. No.

Q. Why do you show the cars received at Ogden and forwarded at Ogden?

A. Because that is a point comparable to the Nevada [fol. 2502] territory, that is a point which stands to the Nevada territory in the same relation as El Paso stands to the Arizona territory; it is the gateway to Nevada just as El Paso is the gateway to Arizona.

Q. So far as the Southern Pacific Company lines are concerned?

A. Yes.

Q. Why do you show the distribution here as between loads and empties, and between refrigerator cars and other cars?

A. Well, those were the principal classifications of interest in examining in making an analysis of traffic moving in any territory.

Q. What class of loading moves in the refrigerator cars in eastward movement?

A. The perishable commodities originating in California and in Arizona and moving largely in, well, if it is an eastbound load, it moves entirely in Pacific Fruit Express Company cars. If it originated on Southern Pacific lines.

The Court: Well, according to this exhibit, Mr. Sykes, your eastward movement through El Paso, you have twice as many refrigerator cars as all other types of freight cars put together?

A. That is right.

The Court: I was astounded at the number of empties [fol. 2503] going east. How do you account for that?

A. Well, I am going to answer your question indirectly, if I may. The business of these east and west transcontinental lines is largely devoted to hauling perishables eastward and manufactured products westward. Certain manufactured products—too large a proportion, we think, do not lend themselves to loading in empty refrigerator cars, so that the refrigerator cars have to return west empty. By the same token, you cannot load perishable business in the ordinary boxcar which is used to haul the

manufactured products west; therefore, we have an unbalanced movement of empty boxcars east.

The Court: You do have the right, though, under your agreements with connecting carriers, any car that might belong to any of these eastern roads that came loaded west, by the same token you could load it east if you had the cargo to put in it?

A. Not only could we but we are obligated by our agreements with the A. A. R. and with other railroads to do that very thing. This simply means that we didn't have enough dead loads, as distinguished from perishable loads, to put in those cars.

[fol. 2504] The Court: Well, you did have a huge traffic in empties both east and west?

A. Yes.

The Court: And that is, of course, non-revenue producing?

A. That is right.

Mr. Mason: Do I understand, then, Mr. Sines, that the empties east are largely boxcars made empty in western destination territories for which there is no appropriate eastbound load?

A. Yes.

Q. And the empties west are largely refrigerator cars which are required in the western origin territory and cannot be used within the time limits or because of the nature of the loading for the western movement?

A. That is right.

The Court: But do I understand that there are types of freight that you are permitted to haul westward in your refrigerator cars?

A. Yes, sir. Now, just a little bit further in that line: A large part of our business eastward which does not consist of perishable business consists of lumber loading from Oregon and Northern California. That requires a very fine type of car, a weather-tight car, and the Southern [fol. 2505] Pacific Company has to furnish those cars largely itself, because after we get those cars out here on the Coast that have handled these manufactured products westward, we cannot load lumber in them, they are not

suitable for lumber loading. That is again the reason why we find 44,076 empty cars going back east. We might put lumber in those cars if they were capable of——

Mr. Mason: 44,076, you said?

A. That is wrong; that is 28,370.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: I offer it in evidence as No. 189.

Mr. Strouss: I object to it as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 189.")

Mr. Mason: Have you a statement in one sheet entitled "Loaded and Empty P. F. E. and Other Car-Miles, States of Nevada and Arizona, Main and Branch, Freight and Mixed," Mr. Sines?

A. I have.

Mr. Mason: May we have this statement marked No. [fol. 2596] 190 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 190 for identification.

Mr. Mason: Was this exhibit prepared by you or under your direction, Mr. Sines?

A. This was prepared under my supervision.

Q. From what source?

A. Again the records with respect to Pacific Fruit Express Company cars come from the car accountant of the Pacific Fruit Express Company, and the other figures come from our auditor of equipment service accounts' office.

Q. Are those records of accounts, which are regularly kept for taxation and reporting purposes to the state commissions of the two states?

A. They are, that is one of the purposes.

Q. Has the exhibit been checked against the original records in these accounting offices for the purpose of determining its correctness?

A. It has.

Q. I notice certain computations in column 8. Are those made from figures on the face of the exhibit?

A. They are.

Q. Will you indicate with reference to line 1929 how [fol. 2507] you obtain the figure for that year in column 8; for example, for the state of Nevada?

A. Divide the——

The Court: I don't think you need to go into that, Mr. Mason. The Court follows it. It is a mere mathematical computation.

The Witness: That is right.

Mr. Mason: It is a mere division of a certain figure in order to get the P. F. E. percentage?

A. That is right.

Q. Is the exhibit true and correct to the best of your knowledge and belief, Mr. Sines?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit No. 190.

Mr. Strouss: We object to it as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit 190.")

Mr. Mason: Mr. Sines, I notice that Exhibit 190 indicates that the percentage of P. F. E. cars in the year 1929 [fol. 2508] was 42.7 of the total moving in Nevada, and 46.4 of the total moving in Arizona, I should say the percentage of car-miles made by P. F. E. cars as stated in these percentage columns, whereas in the year 1932 the percentage of car-miles made by P. F. E. cars was 58.0 in Nevada and 64.2 in Arizona, and there appeared to be other fluctuations up and down for various years. Can you explain those fluctuations?

A. Yes. During the depression years, the perishable business between California and Arizona and eastern territories held up better than the general average of railroad business, which resulted in a greater percentage of

P. F. E. cars and car-miles than existed prior and has existed subsequent to the severe depression years.

Q. Do the trends of the percentage of P. F. E. cars to the total cars handled as expressed in car-miles made in the two states follow along the same line in both states for the various years?

A. They are closely parallel.

Q. Have you before you, Mr. Sines, a statement in one sheet entitled "Average Number of Freight Trains Per Day Per Mile of Road for Selected Months of Years 1928 to 1939, Inclusive?"

A. I have.

Mr. Mason: May we have this statement marked Defend-
[fol. 2509] ant's Exhibit 191 for identification.

The Court: It may be marked.

The Clerk: Defendant's Exhibit 191 for identification.

Mr. Mason: Did you prepare this exhibit or cause it to be prepared?

A. I caused this exhibit to be prepared.

Q. Was it prepared under your direction?

A. It was.

Q. Will you state the source?

A. The source of these figures is the Southern Pacific forms S-1232, entitled "Efficiency of Freight Locomotive Loading."

Q. Have you the forms S-1232 for the years 1928 and following which are shown on this exhibit?

A. Yes, we have them here in Tucson, and they can be made available if desired.

Mr. Mason: Mr. Strouss, will you state whether or not we haven't furnished you with forms S-1232 for some of the years shown here?

Mr. Strouss: That is what I was going to ask. I think I have them for the last ten years.

The Witness: We gave you the annual statements for the entire railroad for the years 1930 to 1939.

Mr. Mason: But these are two months of each of these
[fol. 2510] years, are they?

A. Yes, these are monthly statistics.

Q. They would be considerably more voluminous than what you gave Mr. Strouss?

A. That is right.

Q. Again, these are by two freight districts, which as indicated here, are particular main lines of two divisions?

A. That is right.

Mr. Strouss: I have them by months too, haven't I?

A. I don't think so; you might have.

Mr. Mason: You say this is computed from these underlying sources, Mr. Sines?

A. Yes.

Q. Now, you have shown only back to the year 1929. Were prior years available?

A. No.

Q. Form S-1232 is not compiled?

A. No.

Q. Why do you show February and October for the Sparks-Ogden territory?

A. February is the month of lightest traffic, and the month of October is the month of heaviest traffic in the Sparks-Ogden territory.

Q. You show the months of August and June for the [fol. 2511] Yuma-Lordsburg district; why is that?

A. They are the similar months for the Yuma-Lordsburg territory.

Q. Which is the light, and which is the heavy month?

A. August is the light month, and June is the heavy month.

Q. Precisely what line or lines between Yuma and Lordsburg are covered by this showing?

A. The main line via Gila and Bowie.

Q. This doesn't include the alternate line via Phoenix?

A. No.

Q. Or any part of the line between Mescal and Douglas, and so on, to El Paso?

A. No.

Q. Did you make the computations for the last five years shown in the block at the foot of the exhibit?

A. I did.

Q. From the face of the exhibit itself?

A. No, that has to be made from the basic figures in order to avoid making an average of averages.

Q. Has the exhibit been checked?

A. It has.

[fol. 2512] Q. Is it true and correct?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Mr. Sines, why did you select the Yuma-Lordsburg line, the Yuma-Gila-Bowie-Lordsburg line, as you have defined it, for the purposes of this comparison on this exhibit?

A. That is the principal freight route across Arizona.

Q. And is the Sparks-Ogden route the principal freight route across Nevada and Utah?

A. It is.

The Court: Did I understand you to say that any trains that were sent from Yuma via Phoenix would not be included in this?

A. No, they are not.

Mr. Strouss: Just one question. When you say "per mile of road," just what do you mean by that?

The Court: I want to find that out, too.

A. A mile of road is just a unit of distance on the route, and the figure indicated on this exhibit was determined by adding the total train-miles in the district, and then dividing by the distance from one terminal to the other, [fol. 2513] which gives an average figure of average trains per mile of road.

[fol. 2514] Mr. Mason: To get that for a month, for example, February, 1929, would you then divide by 28?

A. Yes.

Q. So that to get the figure for February, 1929, you take first the total train-miles eastward between Sparks and Ogden?

A. That is right.

Q. And divide by the number of road-miles?

A. That is right.

Q. And divide again by 28?

A. That is right.

Q. Why did you divide by 28?

A. In order to reduce the trains per month to the trains per day.

Q. And in October you divide by 31?

A. That is right.

Q. Of course to get the westward movement you would perform the same operation on the westward train-miles?

A. That is right.

Q. Taking the territory between Yuma and Lordsburg, if a train is operated from Yuma intended to go to Phoenix, would you take into account the train-miles between Yuma and the junction at Wellton?

[fol. 2515] A. No, on the form S-1232 there is a district, Yuma to Tucson via Phoenix, so that those trains which also operate from Phoenix to Tucson would be excluded.

Q. Suppose that a train was operated from Phoenix to Tucson and then went on from Tucson to Lordsburg, would it be in here so far as it operated from Tucson to Lordsburg?

A. Yes, it would. May I make this observation, that it seems as though there is a lot of arithmetic mixed up in this exhibit, but really all it means is that on any one mile of railroad between Yuma and Lordsburg, for instance, there was an average during February, 1928, of three trains east and 2.77 trains west. If you had been standing at any one point, three trains would have passed you going east and 2.77 trains would pass you going west; and the exhibit is designed to give a conception of density of traffic in number of trains operated per day.

The Court: Of course, getting back to the question which I asked be stricken, that means trains reaching Tucson eastbound, if they were routed for your El Paso southwestern route, are not shown on the exhibit because it merely states "Yuma to Lordsburg"?

[fol. 2516] A. Yes.

Mr. Mason: I don't know that I have offered Exhibit No. 191; if not, I now offer defendant's exhibit No. 191 in evidence.

Mr. Strouss: I object to it as irrelevant and immaterial.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 191.")

Mr. Mason: Your Honor, I am about to pass to another exhibit which might take some time. I am perfectly willing to continue, but if Mr. Strouss wants to get back tonight—

The Court: Yes, the court will be at recess until Tuesday morning, January 21, at 10 A. M.

(Thereupon the court stood at recess until 10 A. M., Tuesday, January 21, 1941.)

[fol. 2517] January 21, 1941, Ten o'clock A. M.

All parties being represented as heretofore noted, proceedings were resumed at this time as follows:

The Court: You may proceed.

Mr. Mason: Your Honor may recall that on November 27th, when Mr. Kirk of the Missouri Pacific was on the stand, there were offered for identification but not in evidence at that time, Exhibits Nos. 24 and 25, Exhibit 24 being in one sheet and entitled, "Missouri Pacific Railroad Company, Freight Operating and Freight Transportation Expenses Related to Traffic, Calendar Years 1922 to 1939, Inclusive," while Exhibit No. 25 is entitled, "Missouri Pacific Railroad Company, Freight Service Operating Averages, Calendar Years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 and 1939." Your Honor, Mr. Kirk has returned to Tucson for the purpose of supplying certain underlying documents which had to do with the preparation of another succeeding exhibit, No. 26. We had planned to have come with him at this same time an accounting officer of the Missouri Pacific, who would bring with him the annual reports Form A to the Interstate Commerce Commission and the Forms OS-A and Forms OS-E used in [fol. 2518] preparation of Exhibits Nos. 24 and 25. The witness whose attendance was planned died very suddenly last week, and we haven't made any arrangements as yet for another witness. However, I have discussed with Mr. Strouss the matter of stipulating to the sources of the information shown on Exhibit 24, and as to certain questions which might be asked and answered as to those exhibits with the thought of dispensing with the necessity of bringing on such an accounting witness, much in the same manner as we stipulated with reference to Mr. Porter of the New York Central, and the stipulation that we have discussed and which I think is satisfactory with Mr. Strouss, that as to Exhibit 24 for Identification, it may be understood that the information shown on the face of the exhibit in columns C and D, represents the total—first, as to column C, represents for each year the total of the amounts shown as freight expense and apportioned to freight expense to accounts 201 to 462, inclusive, of Schedule 320, Railway Operating Expenses of the Missouri Pacific, for each of the years shown, that as to column D, the figures represent

the total of accounts 371 to 420, inclusive, as apportioned to freight operating expense, also a part of schedule 320 of [fol. 2519] the Annual Report to the Interstate Commerce Commission for the Missouri Pacific for each of the years as shown. Is that correct, Mr. Strouss?

Mr. Strouss: That is correct.

Mr. Mason: These in column D are the total of the figures in Accounts 371 to 420, freight transportation expense, as—transportation rail line as apportioned to freight transportation expense. Now, as to Exhibit No. 25, it is stipulated that the variation in the total of miles of line operated in freight service as shown in Item 1 of that exhibit has varied as between the years shown, and particularly has decreased in 1939 as compared to prior years, when the figure was greater, because of the abandonment, largely because of the abandonment of unprofitable branch-line mileage.

Mr. Strouss: With that stipulation we will waive our objection based on the grounds that the basic records were not produced.

Mr. Mason: Reserving the objection as to the relevancy and materiality

Mr. Strouss: Yes.

Mr. Mason: I offer the exhibits in evidence subject to the [fol. 2520] objection as to relevancy and materiality.

The Court: The objection as to relevancy will be overruled. Exhibits 24 and 25, heretofore marked for identification, may now be admitted in evidence.

(Thereupon, the documents referred to were received in evidence and marked, respectively, as Defendant's Exhibits Nos. 24 and 25.)

Mr. Mason: Now, as to Exhibit 26, as I said before, Mr. Kirk is here. I will now recall him to the stand, in connection with Exhibit No. 26.)

[fol. 2521] Mr. Mason: I will recall Mr. Kirk who has been previously sworn and testified.

W. F. Kirk was recalled as a witness in behalf of the defendant and having been previously sworn testified further as follows:

Direct examination (Continued).

By Mr. Mason:

Q. Mr. Kirk, on your previous appearance on the stand in connection with exhibit No. 26 which was then offered and received in evidence subject to objection, you testified that the records from which the exhibit was taken were not in court, those records being as you previously testified the dispatchers' train sheets for the districts and covering the dates shown on the exhibit and the profiles of record in the engineering department. I will ask you now if you have with you and present in the courtroom the dispatchers' train sheets from which is taken the information shown on exhibit No. 26 and likewise the profiles of the Missouri Pacific between the points shown?

A. I do, the train sheets are in those bundles there and the condensed profile is here.

[fol. 2522] Mr. Mason: Your Honor, we now tender for the examination of opposing counsel the train sheets and condensed profiles concerning which the witness has just testified.

Mr. Strouss: I would want to go over those; I will try and do it tonight.

Mr. Mason: We will ask Mr. Kirk to withdraw then pending your examination of the profiles. Have you any other questions you wish to ask him at this time?

Mr. Strouss: Not at this time.

The Court: Are you offering it in evidence at this time?

Mr. Mason: Your Honor, the exhibit was received in evidence but at page 448 the Court indicated a serious doubt in his mind as to the admissibility and we are undertaking to allay that doubt and supply the missing records.

The Court: Very well. You may step aside, Mr. Kirk, and be cross-examined later.

(Witness excused.)

Mr. Mason: Your Honor, at page 1987 of the transcript during the cross examination of Mr. Mahoney on January 8th of this year there was offered in evidence the book of

the Santa Fe entitled "Instructions for Operating and Maintaining Air Brake Apparatus," being Form 2591 [fol. 2523] Standard, published by the Santa Fe. At that time Mr. Mahoney agreed to supply additional copies of the book so that one copy might be made of record as an official exhibit and additional copies supplied to counsel and the Court. Mr. Mahoney has now supplied us with four copies of that book.

Mr. Strouss: Mr. Mason, in talking with Mr. Booth after that, we had sort of an understanding that each side would indicate the parts of the book that they wanted in evidence so as not to encumber the record with a lot of stuff that was not necessary. Did Mr. Booth talk to you about that?

Mr. Mason: No, I don't recall that he said anything to me directly about that. The book was received in evidence as exhibit No. 152.

Mr. Strouss: That is true, but he and I were talking about it later.

Mr. Mason: I suggest, then, that each of us go through the book in due course and we can stipulate to withdraw the book and substitute as exhibit No. 152 such excerpts as we severally consider should be part of the evidence.

The Court: Gentlemen, I think that should be done. We surely don't want to encumber the record with the entire book, a large portion of which will have no bearing on this [fol. 2524] case.

Mr. Mason: The printing and reproduction of this book as part of the appeal would be a terrific expense and largely useless. Shall we withhold the offer until the book has been severally examined and the parts indicated and we can have those parts copied.

Mr. Strouss: That is agreeable with me.

Mr. Mason: I will supply a copy of the book to the clerk which will be No. 152 for the time being.

Mr. Strouss: When we have determined the parts each desire, we can stipulate it into the record.

The Court: My recollection is, as the record now stands, the entire book is marked as an exhibit in evidence.

Mr. Mason: It is, yes. Mr. Mahoney was also asked at that time to supply copies of the operating timetables or more correctly identified as the employees' working timetables for the New Mexico division of the Western lines, the Albuquerque-Arizona-Los Angeles divisions of the

Coast lines, and a group of working timetables was given exhibit No. 153. He has now supplied us with several copies of these working timetables and I suggest that the entire group be physically made a part of the record as exhibit [fol 2525] No. 153.

The Court: Without objection, that may be done.

Mr. Mason: At page 1992, Mr. Mahoney was asked to supply the consists of passenger trains during the summer months for the past year, 1940, and agreed to supply them. The request was made by Mr. Strouss and it was then stated by myself that we could introduce the consists as an exhibit with an appropriate number at the time they were received. Mr. Mahoney has now supplied us with a mimeographed publication of several sheets, twenty-three pages including the title page, showing the consists as of June 2, 1940, of his passenger trains. This is a publication which as the title page shows is issued by Mr. Mahoney himself. I think it will be exhibit No. 192.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 192.")

Mr. Mason: Mr. Mahoney also stated in his letter with which he forwarded this material it should be understood, and I think Mr. Strouss will agree, that the consists as shown in this publication of consists are the minimum consists of these particular schedule trains.

[fol 2526] Mr. Strouss: Yes.

Mr. Mason: I will recall Mr. Sines.

B. S. Sixes was recalled as a witness in behalf of the defendant and having been previously sworn testified further as follows:

Direct examination (continued).

By Mr. Mason:

Q. Mr. Sines, I think at the conclusion of the last session you had completed your discussion of exhibit No. 191, had you not?

A. That is right.

Q. Have you now before you a statement in one sheet entitled, "Gross Ton Miles per Train Hour and Net Tons per

Train, Salt Lake Division, Tucson Division and Pacific Lines"?

A. I have.

Mr. Mason: We ask that that statement be marked for identification as "Defendant's Exhibit No. 193."

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 193 for identification.

Mr. Mason:

Q. Was this exhibit prepared by you or under your direc-
[fol. 2527] tion?

A. It was prepared under my direction.

Q. From what sources?

A. From the Southern Pacific form 521.

Q. As to years prior to 1928 was the same form used?

A. Form 522 was used prior to the year 1928.

Q. The exhibit appears to consist of both a chart as well as a series of figures. Are the figures shown in the various blocks taken directly from the forms 522 and 521?

A. They are.

Q. What relation do the blocks bear to the figures?

A. The blocks indicate by their height the relationship existing between the figures.

Q. Are the blocks drawn to scale?

A. The blocks are drawn to the scale indicated at the left-hand side of the chart.

Q. How are the blocks related to the particular divisions or to the entire line?

A. In accordance with the legend appearing at the bottom of the sheet, the full black indicating the Salt Lake division, the hatched block indicating the Tucson division, and the blank block indicating the Pacific lines.

[fol. 2528] Q. Why was the showing confined to the years since and including 1923?

A. This information was not compiled prior to 1923.

Q. Has the exhibit been compared with the original sources?

A. It has.

Q. Are these the same original sources which were either furnished or agreed to be made available to Mr. Strouss in earlier testimony?

A. They are.

Q. Will you say whether or not the showing on the exhibit is true and correct?

A. It is.

Q. Will you explain the—first of all, the purpose of the showing in the upper block, in general terms?

A. The purpose of the showing in the upper block is to demonstrate the result of the increased train loading on the Salt Lake Division in comparison with the result of a fixed train loading on the Tucson Division in terms of gross ton-miles per train hour. These figures are available for the main lines, for the two divisions and for the System, so the branch lines were excluded.

Q. And what is the purpose of the lower block of the [fol. 2529] exhibit?

A. The purpose of the lower block is the same as for the upper block, but the comparison is expressed in another unit, net tons per train, net tons being the amount of load, pay load, and non-revenue load carried in the train, and is to indicate the advantage which the Salt Lake division obtains by increased train loading as compared with the train loading held at practically the same level on the Tucson division.

Q. Now, I refer you to Mr. Herbert's exhibit No. 178. Have you a copy of that at hand?

A. Yes.

Q. Perhaps it would be better to refer to exhibit No. 180, where there is a somewhat similar showing.

A. All right.

Q. I will ask you whether or not your exhibit No. 193 is to be read in connection with the showing of cars per train year by year for the two divisions and for the Pacific Lines as indicated by the center block of exhibit No. 180?

A. Yes, there is a direct relationship between the cars per train shown on Exhibit 180, and the train loading expressed in the two units shown on my exhibit No. 193.

[fol. 2530] Q. Now, the gross ton-miles takes into account what particular totals?

A. It takes into account the tonnage of the train and speed of the train.

Q. Well, does it take into account the tonnage of the locomotive?

A. No, it does not.

Q. Does it take into account the weight of the cars as well as their contents?

A. Yes.

Q. And when you speak of the speed of the train, to what particular feature of the showing on the upper block of this exhibit do you refer?

A. Referring to exhibit

Q. 193.

A. In miles per hour.

Q. Now, when you speak of net tons per train, I think you said it referred to the pay load.

A. And the company freight.

Q. Does the showing in the lower block exclude the weight of the equipment itself?

A. It does.

Q. Is this, in other words, the contents of the car?

A. That is right.

Mr. Mason: Have you any questions, Mr. Strouss, before [fol. 2531] the exhibit is offered?

Mr. Strouss: This is just the main line operations?

A. That is right.

Q. Does it include, so far as the Tucson division is concerned, the line through Phoenix?

A. It does, yes.

Q. What lines in the Salt Lake division? Is there any other than that between Sparks and Ogden?

A. Yes, the Fernley Line from the end of the Salt Lake Division at Alturas to Fernley. That is classified as main line on the Salt Lake Division.

Q. It does not include, of course, the so-called South line in Arizona, the Tucson-Douglas line, that is part of the Rio Grande division?

A. No, but only because it is not part of the Tucson division.

Mr. Strouss: Yes.

Mr. Mason: This exhibit shows the divisions year by year, as I understand it, Mr. Sines, although division limits may have been changed in intervening years?

A. That is true, and there was a change in the Tucson division limits in 1930 when the east end of the Tucson division was moved from Tucson to near Lordsburg.

[fol. 2532] Q. Does it also include any changes that may have been made in the Salt Lake division by naming a line as main line which was formerly branch line?

A. In November, 1929, the Fernley line was placed in main line service. Prior to that time it had been a branch line.

Mr. Strouss: Just to get this clear in the record, now, prior to 1931, what lines were included in the Tucson division?

A. Prior to July 1930?

Q. 1930.

A. The lines included in the Tucson division extended from Yuma to Tucson via Gila and from Wellton to Picacho via Phoenix, and the end of the Tucson division was located about, well, a few miles east of Tucson, just two or three miles east of Tucson.

Q. And in 1929, the Fernley line was made a main line on the Salt Lake division. What was the Salt Lake division prior to that, what lines were included?

A. Prior to November, 1929, the main line on the Salt Lake division extended from Lawton, Nevada, to Ogden, Utah, and in November, 1929, the Fernley line which, prior [fol. 2533] to that time had been a branch line, was thrown open to through main line service as a part of the route from Oregon, and that part of the Fernley Line between Fernley and Alturas belonging to the Salt Lake division was made a part of the Salt Lake division main line.

Mr. Strouss: That is all.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit No. 193.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 193.")

The Court: Mr. Sines, in examining this exhibit No. 193, I note that in the upper block practically without exception the Tucson division reached a higher level than the Pacific main lines, whereas, in the lower block, with the exception of the first three years, the Pacific Lines reaches a higher level than the Tucson division. Is that same showing made on Exhibit 180, I mean is that reflected there?

A. No, that is not apparent on Exhibit 180.

Q. Well, how do you account for that condition in this [fol. 2534] lower block?

A. The difference in loading characteristics of the business handled on the Pacific Lines as a whole, as compared with the particular business which is handled on the Tucson division, a large part of which consists of relatively light-load perishables from California and Arizona eastbound.

Mr. Mason: Has the exhibit been received?

The Court: Yes.

Mr. Mason: Mr. Sines, does the average loading of the cars handled in main line traffic enter into the showing in the lower block of Exhibit No. 193?

A. Yes.

Q. Just in what way does the actual loading of the car affect the showing on the lower block?

A. The perishable business across the Tucson division during the entire seventeen years shown on the exhibit has bulked large in the tonnage handled on that division, but the loading on the System as a whole is influenced by lumber loading in California and Oregon, by petroleum products, and the average per car on the System, average net tons per car on the System has shown a greater fluctuation than the average net tons per car on the Tucson division.

[fol. 2535] Q. Now, you spoke of the influence of perishable loading on the net tons per train. Is that because the perishables load on the average less tons per car than other types of nonperishable freight?

A. Yes.

The Court: Well, do I understand then, Mr. Sines, that in computing the gross ton-miles per train hour, eliminating the locomotive, that includes, I take it, the gross weight of the train itself, that would be the cars and the contents of the cars?

A. Yes.

Q. Whereas, in the lower block the net tons per train, that merely includes the load of the car?

A. Yes.

Q. Rather than their gross weight?

A. That is right.

Mr. Mason: Now, Mr. Sines, has the influence of preponderant perishable business, which you have mentioned for the Tucson division, in any way affected the net tonnage per train on the Salt Lake division?

A. That same influence would be felt on the Salt Lake division, but it would be less marked because the lumber [fol. 2536] business that I mentioned eastbound, originating in Oregon and California, moves eastward to a greater extent over our Ogden route.

Q. Would ore loading, if there is any substantial amount of ore, or concentrates, affect the net tons per train?

A. Yes, and there is an ore movement on the Ogden route between Cobre and Ogden.

[fol. 2537] Q. Is there also a movement of ore or other heavy loading commodities on the Tucson division?

A. Yes, out of Gila and Tucson.

The Court: What does that consist of?

A. Concentrates from Ajo.

Mr. Mason:

Q. What is the reason that there are more net tons per train in the years since 1926 particularly on the Salt Lake division than on the Tucson division?

A. There are more cars per train on the Salt Lake division than there are on the Tucson division, which permits us to build up the net ton load per train on the Salt Lake division.

Q. What is the reason for the showing of more gross ton-miles per train hour on the Salt Lake division since the year 1924 than on the Tucson division?

A. Once again that is the result of a greater number of cars per train on the Salt Lake division.

Q. What is the reason why the gross ton-miles per train hour on the Tucson division is indicated as being somewhat heavier or greater in each year than for Pacific lines as a whole?

A. The factors influencing that are found on exhibit No. 180 where in the first block is shown the average speed in miles per hour on the Tucson division as somewhat higher [fol. 2538] than the average speed in miles per hour on the Pacific lines and the average loading in cars per train on the Tucson division is slightly higher than the average on the Pacific lines although that would be influenced by the factor which we have discussed heretofore of loading per car. The net result of those three factors, cars per train, net tons per car, and speed in miles per hour, is shown in the first block

on exhibit No. 193, and even there it will be noticed that the years subsequent to 1936 show the Pacific lines closer to the Tucson division than we were at the beginning back in 1923, 1924, and 1925.

Q. I wish you would refer to Mr. Masson's exhibit No. 165. Have you a copy of that?

A. Yes.

Q. I will ask you to refer to the first block of his exhibit headed with the figure (1), "Freight Revenue per Freight Service Train Mile," and ask you whether the showing of net tons per train as between the Tucson and Salt Lake divisions finds any reflection in the comparative figures of revenue per train-mile for the states of Nevada and Arizona as shown on that exhibit?

A. Yes, the freight revenue per train-mile shown on ex-
[fol. 2539] hibit No. 165 is a direct product of the loadings expressed in net tons per train shown on exhibit No. 193.

Q. Just why is that? Is the revenue related to the amount of freight in the train?

A. That is right, it is. I want to call attention to the fact that exhibit No. 165, starting about the year 1929 in the columns B and D, indicates a close relationship between the Pacific lines and the state of Arizona in freight revenue per train-mile. The explanation for that is found, of course, on my exhibit No. 193 where the net tons per train are very nearly the same. However, starting with the year 1925 the freight revenue per train-mile for the state of Nevada, column C on exhibit No. 165, begins to draw away from the revenue on the Pacific lines and the state of Arizona and thereafter the difference is an increasing difference; the state of Nevada outstrips the Pacific lines and the state of Arizona just as it does on my exhibit No. 193 where the Salt Lake division net tons per train far exceeds the Tucson and Pacific lines loading.

Q. Does that complete your discussion of exhibit No. 193, Mr. Sines?

A. Yes.

[fol. 2540] Mr. Mason: Do you have any questions, Mr. Strouss, on the exhibit?

Mr. Strouss: Not at this time.

Mr. Mason:

Q. Have you a statement in one sheet, Mr. Sines, entitled "Classes and Number of Employees, Tucson Division, Years 1934, 1938, and 1939"?

A. I have.

Mr. Mason: We ask that this statement be marked "Defendant's Exhibit No. 194" for identification.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 194 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 194 or cause it to be prepared?

A. I supervised its preparation and had a lot to do with its compilation myself.

Q. You show the sources from which it was prepared. Will you identify those sources, please?

A. The sources are as indicated in the note in parentheses in the title, "Data abstracted from I. C. C. Wage Statistics, Forms A and B, Monthly Report of Employees, Service, and Compensation."

Q. Have you the reports to the Interstate Commerce Commission covering the Tucson division for the twelve [fol. 2541] months of each of the years 1934, 1938, and 1939?

A. I have them in my possession in Tucson and I will have them in the courtroom here at eleven o'clock, about ten minutes from now. I overlooked the fact that I was going to present this exhibit; I intended to bring them over.

Q. Has the information shown on this exhibit been checked from the underlying forms that you have just referred to?

A. It has.

Q. You show in the title the words, "Averaged to Annual Basis." Why is that?

A. That is because the carriers including the Southern Pacific Company make monthly reports to the Commission without making a summary annual report. I undertook to make a summary annual report by averaging the figures reported monthly by our company.

Q. Did you do that by taking a straight average of the figures reported for the middle of each month?

A. Yes, because the count that I have made is the number of employees receiving pay checks—no, my reply should be "No," it is not the averaging number of employees during the month but it is the number of employees receiving [fol. 2542] pay checks.

The Court: Irrespective of the amount of that pay check?

A. Yes.

Mr. Mason:

Q. This is the number of employees who received compensation for personal services to the company during each of the months of each of the three years shown averaged for each year?

A. That is right.

Q. It is not the I. C. C. middle of the month count, then?

A. No.

Q. It is the payroll count?

A. That is correct. There are two bases on these forms, A and B, reported to the Interstate Commerce Commission. One is the middle of the month count that you speak of and the other is the number of employees receiving pay checks, which I used as the basis.

Q. Have you checked the computations by which these average figures were determined?

A. I have.

Q. Will you say whether or not that is a true and correct reflection of the figures appearing in the underlying documents as summarized by computation in the manner you have described?

[fol. 2543] A. It is.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No, I have no questions.

The Court: This includes branch lines as well as main line?

A. Yes, sir.

Q. What year was the main line completed to Phoenix?

A. It seems to me it was 1926.

Mr. Mason: It was placed in service approximately the first of November, 1926, was it not?

A. I don't recall. We have a record of it.

Mr. Strouss: I think it is in the record already; it seems to me it was 1925. Why did you take the years 1934, 1938, and 1939?

A. A year ago we were preparing for a case which we thought we might have in the Federal court. 1938 was the last complete year at that time. Then I went back five years to 1934 to show how many we had in 1934 and last year I just added another year to the showing.

Mr. Strouss: You don't have that for the periods prior to that, say, 1929 and 1925?

A. I haven't it worked up, but the records are available. I don't have those records in Tucson, but they are available [fol. 2544] in our San Francisco office.

The Court: Would it be quite a job to prepare this exhibit, Mr. Sines?

A. Oh, yes, the work sheet has to show columns of figures for every one of the twelve months of the year and then they have to be computed across and footed and totaled.

Mr. Mason:

Q. You have undertaken here to show by the number and classification. Does that involve additional computation?

A. Yes, each classification is a computation in itself, of course.

Mr. Mason: We offer the exhibit as defendant's exhibit No. 194.

Mr. Strouss: Just one other question. 1934 was in a sense an abnormal year because you were more or less in a period of depression so far as volume of business is concerned?

A. That is right, we were experiencing a mild recovery by 1934.

Mr. Strouss: I object to it as irrelevant and immaterial.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 194.")

[fol. 2545] Mr. Mason:

Q. Mr. Sines, is it possible to make from the face of this exhibit a computation of the number of employees directly engaged in train service as opposed to yard service?

A. It is.

Q. You made that computation for the year 1939?

A. I haven't made the computation but the figures are on the face of the exhibit and can be determined by inspection. Looking at line 42, we find enginemen-yard service for the year 1939, 50.

Q. That includes both engineers and firemen, does it?

A. Yes. Line 46 shows trainmen-yard service for the year 1939, 115. Adding those two together, we have 165 men employed in yard service; deducting 165 from 809 leaves 644 employees engaged in other transportation services.

Q. You speak of 644, that includes engineers and firemen, conductors and brakemen, does it?

A. Yes.

Q. And only those classes?

A. Only those classes.

Q. It does not include any officials such as the assistant superintendent or train master or road foreman of engines who ride the trains?

A. No.

[fol. 2546] Q. Or any yard employees at all?

A. No, they are taken out in the 165.

The Court: We will take our mid-morning recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows.)

[fol. 2547] The Court: You may proceed.

Mr. Mason: Mr. Sines, referring to exhibit No. 194 further and particularly to transportation employees, I think you gave the figure of 644 as those who were in all train service, is that correct?

A. That is correct.

Q. Now, have you a further subdivision of those employees as between passenger service and freight service?

A. Yes; passenger-service employees are shown in line 39; with 47 for 1939, and line 43 with 49 for 1939, gives us a total of 96, subtracted from 644, leaves 548 employees in through and local freight service.

Q. Now, those 96 are the employees who manned the train subject to the 14-car limitation, is that right?

A. That is correct.

Q. Now, as to the freight service, have you a subdivision as between through freight service and local freight service?

A. Yes: local freight service employees are shown in line 41 with a total of 17 for 1939, and line 45, 32 for 1939, giving the total of 49; subtracting that from the 548 leaves 499 [fol. 2548] employees in through freight service.

Q. And that is the total of lines 40 and 44, is it?

A. That should be the total of lines 40 and 44, and it is 499.

Q. Now, are those 499 employees who manned the trains affected by the 70-car limit law?

A. Yes, they are. I suppose that some of the local trains operating on the main line occasionally have their length governed by the 70-car law, but those on the branch lines, it would be infrequent that the 70-car provision became a factor in those trains, so that the 499, by this process of deduction we have arrived at 499 as the number of those who are directly affected by the 70-car limit of the Arizona law; and I want to call attention to the fact that this 499 compares with a total of all employees on the Tucson division of 2,693.

Q. You have 499 employees in through freight train service, and 96 in passenger service, that is that correct, on the Tucson division?

A. Yes.

Q. A total of 595?

A. Yes.

Q. Who manned the trains affected by the fourteen or [fol. 2549] 70-car limitation?

A. Yes.

Q. Excluding for the moment local freight service?

A. Yes.

Mr. Mason: Have you any questions on Exhibit 194 at the present time?

Mr. Strouss: No.

Mr. Mason: Mr. Sines calls my attention to the fact that he now has in the court room the monthly reports of employees, service and compensation, rendered by the com-

pany to the Interstate Commerce Commission, and covering the Tucson division for the year 1939, which are, for the year 1939, the underlying documents testified to by him as being used in preparing exhibit No. 194, and we offer those for the examination of opposing counsel.

The Witness: I am sorry to say they have only the year 1939, the other two years are still not in the court room.

The Court: You will produce them this afternoon.

Mr. Mason: I will make the further statement that as to the balance, we will produce those as soon as possible and [fol. 2550] probably at the afternoon session.

Q. Is that all that you have at this time on No. 194, Mr. Sines?

A. Yes, sir.

Q. Have you a statement in six sheets, or, rather, an exhibit in six sheets, the initial page of which bears the title, "Interstate Commerce Commission Orders Concerning the Matter of Method and Form of Records to be Kept by Carriers Relating to the Time on Duty of Employees and the Movement of Trains"?

A. I have.

Mr. Mason: May we have this exhibit marked as Exhibit 195 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 195 for identification.

Mr. Mason: Now, of what do the first four pages of Exhibit No. 195 for identification consist, Mr. Sines?

A. The first four pages——

Q. The first four sheets, I should say?

A. The first four sheets consist of reproductions of an order of the Interstate Commerce Commission.

Q. Aren't there in fact two orders, one dated May 2, [fol. 2551] 1921, and the other dated February 13, 1922?

A. That is right.

Q. And are these the photostatic reproductions or the equivalent of photostatic reproductions of the text of the Commission's orders?

A. They are.

Q. And are they the entire orders of the Commission? Have you made any omissions?

A. No, with respect to the subject matter covered by the orders, these are the entire orders.

Q. Now, what is sheet 5 of Exhibit 195 for identification?

A. Sheet 5 is the Southern Pacific adaptation of the Interstate Commerce Commission's order shown on sheet 2 of the exhibit. The title of the report is "Time Return and Delay Report of Engine and Train Employees" in both cases.

Q. Is this form a form regularly and continuously used by Southern Pacific employees?

A. It is.

Q. Is it a form rendered to the Commission and thereafter kept in the Company's records?

A. It is.

Q. Who renders the report?

A. The conductor in charge of each train crew.

Q. Is a similar report rendered by engineers where there [fol. 2552] is a movement not in charge of a conductor?

A. The conductor is in charge of each train crew for the train service employees and the engineman in charge of each engine crew, which consists of an engineman and fireman for the engine crew. Occasionally, there is a flagman who may work on one or more trains and who may render his own time return and delay reports. That is very occasional, however.

The Court: But do I understand that in the normal train operations with the average crew, that it is only the conductor that makes the reports?

A. No, both the engineer and the conductor.

Q. But the other individual employees such as your brakeman or fireman wouldn't submit an individual report?

A. No.

Mr. Mason: Now, as to sheet No. 6 of exhibit No. 195 for identification, what is that?

A. That is the Southern Pacific adaptation of the Interstate Commerce Commission's order shown on sheet 4 of the exhibit and is the dispatcher's record of movement of trains, commonly referred to as the dispatcher's train sheet.

[fol. 2553] Q. And this particular adaptation, which forms a part of this exhibit, is it associated with any particular district or territory?

A. It is for that part of the Tucson division between Gila and Tucson, and Tucson and Lordsburg, the territory being divided into such train districts for convenience in

handling train sheet, and also because those are the freight districts upon which freight trains operate.

Q. Do you know and, if so, will you state whether this form of train sheet which is reproduced as Sheet 6 of Exhibit 195 is in regular and daily use on the Tucson division?

A. Yes, it is.

Q. Have you seen it in use?

A. Yes.

The Court: This sheet is similar but on a smaller scale to the train dispatcher's sheet herefofore marked for identification in this case, but not admitted in evidence?

A. That is right.

Mr. Mason: I will ask you this, Mr. Sines, if sheet 6 of Exhibit 195 for identification is a reproduction in exact size or reduced size?

A. It is a reduction.

Q. Why was the reduction made?

[fol. 2554] A. Simply to cut down the bulk of the exhibit.

Q. For convenience in reproduction, or presentation here?

A. Yes.

Q. Has the material in Exhibit 195 been checked against the sources which it purports to reproduce?

A. It has.

Q. Will you say whether or not it is a true and correct reproduction of the matter which it purports to reproduce?

A. It is.

Q. What is the purpose of reproducing the Commission's orders and the blank forms?

A. The purpose is to indicate the sources and the types of information which forms the basic record of train movements, and of service by the train service employees.

Q. Are these orders reproduced on Exhibit 195 for identification the latest orders of the Interstate Commerce Commission pertaining to this subject?

A. They are.

Q. Are they the orders now in effect?

A. They are.

Mr. Mason: Have you any questions, Mr. Strouss?

[fol. 2555] Mr. Strouss: No questions.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit 195.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 195.")

Mr. Mason: Mr. Sines, reverting back for a moment to Exhibit 194, do you now have with you the reports of employees, service and compensation, for the years 1934 and 1938 for the Tucson division?

A. Yes, I have, and I have delivered them to Mr. Strouss.

Q. Mr. Sines, have you made or supervised the making of any study or studies for the purpose of determining upon the character of the operations which would be conducted by the Southern Pacific Company if the law were not in effect?

A. I have.

Q. Briefly, what is the short title or short name of those studies?

A. A redispatching study.

Q. Precisely what do you mean, first, in general terms, by "redispatching study?"

A. A redispatching study consists of a detailed analysis [fol. 2556] of each of the freight and passenger trains actually operated to determine the consist, that is, the number of cars and contents, their destinations, the amount of local work to be performed by each of the trains, to determine also other factors having a bearing upon the operation of the trains, such as weather conditions, the amount of interference from trains traveling in the opposite direction, also trains which may pass and be passed, and all other essential features of operations of trains, and, having determined all such factors, the redispatching study also consists of the complete rearrangement into redispatched trains of the cars and traffic actually moved so as to conform the operations to conditions which would have obtained if the law were not in effect.

Q. Did you for the purposes of the present case make more than one such study?

A. I did.

Q. How many redispatching studies did you make or supervise?

A. Six.

Q. Have you an exhibit in one sheet which lists briefly the studies so made?

A. I have.

[fol. 2557] Q. Will you state the title of the exhibit which has been referred to?

A. "Redispatch and Other Studies Made to Determine Effect of Arizona Train Limit Law on Freight and Passenger Operations."

Mr. Mason: May we have this statement marked as Defendant's Exhibit No. 196 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 196 for identification.

Mr. Mason: Mr. Sines, did you prepare Defendant's Exhibit No. 196?

A. I did.

Q. For the purpose of giving a short summary of the studies undertaken and indicating their nature and period?

A. Exactly.

Q. Did you prepare the exhibit personally?

A. I did.

Q. I take it that in your further testimony you will go into each item and explain it in more detail?

A. I will.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

[fol. 2558] Mr. Mason: I will say that the exhibit is merely offered as a convenient way of summarizing and placing on one sheet and in one place the several studies concerning which the witness will testify personally. We offer the exhibit as Defendant's Exhibit No. 196.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 196.")

Mr. Mason: Mr. Sines, will you state how you first came to undertake any redispatching studies for the purpose of Arizona operations?

A. I was detached from my regular assignment as an executive assistant on the president's staff, and placed in charge of the redispatching studies which were about to be made in connection with an action which we filed in the Federal Court in the spring of 1939.

Q. When were you actually detached from your regular assignment and assigned to the preparation of that particular case?

A. May 1, 1939.

Q. Now, did you in that connection have any conference [fol. 2559] with officials of other departments preliminary to undertaking the actual studies?

A. Yes, at various times during that month I had conferences with representatives of the vice-president of operations, Mr. J. H. Dye, who testified here last week.

Q. Did you also confer with your fellow officers in the executive department?

A. Yes, and with members of the mechanical department, also.

Q. With whom particularly did you confer in the executive department?

A. Mr. V. S. Andrus, manager of the Bureau of Transportation Research, who is also a member of the president's staff.

Q. What were the reasons for holding these prior conferences?

A. In order to determine what the plan of operation would be in Arizona in event the Arizona Train Limit Law were set aside.

Q. Was it necessary to determine what character of locomotives or motive power should be used?

A. Yes.

Q. What other factors were particularly essential to determine for the purposes of your study?

[fol. 2560] A. There were three essential elements that had to be determined immediately. One of them was the locomotives which you have mentioned, and the other was the length of freight train which would be operated in each direction, because the length of the individual freight train depends upon the locomotive, and a third factor was the length of siding, the physical plant which would be provided for the operation of the trains in the territory.

Q. Did you have to make any determination as to the revision or rebuilding of engine house or roundhouse facilities?

A. Yes, that was considered subsequent to the choice of the locomotive.

Q. In connection with the siding extensions, did you have to decide where they should be placed?

A. Not as a result of those preliminary conferences; that came along later.

Q. Now, as a result of those preliminary conferences, did you yourself reach any conclusion as to the type of locomotive which should be used?

A. Yes.

Q. What type of locomotive was decided upon?

A. A locomotive similar to the articulated Consolidation locomotive which we were then purchasing, and which is commonly referred to as the AC-8. We had some under [fol. 2561] construction, and they were delivered to us late in the summer, and fall, of 1939.

Q. I will ask you to refer if you will, please, to Mr. Russell's Exhibit No. 5, also to his Exhibit No. 7.

A. Yes.

Q. Do you have reference to locomotives similar to the AC-8 referred to on his exhibit No. 5?

A. Yes.

Q. And by reference to Exhibit No. 7, are there any AC-8 locomotives referred to there?

A. Not directly, but they are the 28 locomotive shown in line 43, the 4-8-8-2's.

[fol. 2562] Q. Did you as a result of your conference reach any conclusion as to the length of trains to be operated?

A. Yes, it was decided that the general length of train to fit this locomotive would be one hundred loaded cars eastward between Yuma and El Paso and 125 empty cars westward between El Paso and Yuma.

Q. What about the length of westward trains not consisting of empties?

A. Trains with loaded cars would have their length varied in accordance with the capacity of the locomotive to haul the train, but generally 125 cars would be the maximum train operated.

Q. Were these limits of 100 cars in one direction and 125 in the other set as definite maxima or as mere guides?

A. As guides. There was no hard and fast rule as to the length of trains in either direction, but we generally followed the plan of redispatching 100 cars east and 125 cars west.

Q. Having decided upon the length of trains to be operated in each direction, were you then able to determine upon your siding extensions, if any?

A. Yes, after the redispatching party, the men who performed the redispatching study were called together and [fol. 2563] we reviewed the side-track situation on the Tucson and Rio Grande divisions and picked out those sidings which should be extended in order to permit of a complete long train operation.

Q. Of train lengths such as you have indicated?

A. Yes.

Q. You speak of calling the redispatching party together. Did you undertake to collect a force of assistants to carry on the redispatching study under your supervision?

A. I did.

Q. Of whom did this party consist, referring now to the study which, as you have indicated, was undertaken after your assignment on May 1, 1939?

A. The party consisted of three chief dispatchers in the territory between Los Angeles and El Paso, Mr. J. A. Day, chief dispatcher of the Los Angeles division; Mr. G. C. Baker, who was then chief dispatcher of the Tucson division; and Mr. L. D. Herrell, chief dispatcher of the Rio Grande division. Mr. Baker brought along with him to assist him a trick dispatcher from Tucson and we also had the services of a trick dispatcher who had worked on the Rio Grande division and had dispatched trains on the territory between Tucson and Lordsburg and Lordsburg and El Paso. [fol. 2564] Q. Did you have any clerical help?

A. That was the dispatching force. I had the assistance of Mr. W. T. Herbert, assistant engineer in the Bureau of Transportation Research, and a representative from the timekeeping department, Mr. H. C. Gaverick, and other clerical and stenographic assistance as required. Because of the number of exhibits, charts, and graphs that were prepared, it was necessary to detach a draftsman from the engineering department and assign him to my party also.

Q. I take it you are referring to the redispatching study which is shown as item 1 of exhibit No. 196 and do you have in mind also the item 2 or, the passenger redispatching study?

A. That was made by the same party during the summer of 1939, yes.

Q. Was item 3, the analyses of passenger operations for the year 1938, also made about the same time?

A. Yes.

Q. What as to item 4, the freight redispatching study, Phoenix to Tucson, month of December, 1939?

A. That was made in the fall of 1939 by Mr. Henry Cassady, who had succeeded Mr. G. C. Baker as chief dispatcher of the Tucson division. He joined our party in San Fran- [fol. 2565] cisco and was responsible for the freight redispatching study, item 4, and also assisted in making the passenger redispatching studies, items 2 and 3. I believe Mr. Baker was promoted to assistant superintendent of transportation in the latter part of August.

Q. 1939?

A. 1939.

Q. Were any data and records assembled for the purposes of the studies?

A. Yes.

Q. Will you describe generally what they were?

A. The records that we assembled were the dispatchers' train sheets for the territory Los Angeles to El Paso for the Los Angeles, Tucson, and Rio Grande divisions for the months of June and August, 1938, for item 1, and for the entire year 1938 for items 2, 3, and 4. We also had the conductors' time return and the delay reports for the Tucson and Rio Grande divisions for the entire year 1938. We had the freight conductors' wheel reports for the months of June and August for the Tucson and Rio Grande divisions and for the month of December for the Tucson division. We had the passenger conductors' wheel reports for the entire year 1938. We had the timetables [fol. 2566] which had been in effect during the year 1938 on the Los Angeles, Tucson, and Rio Grande divisions. We had yard records at Yuma and Tucson.

Q. Did you have any terminal delay reports or log books maintained at any of the terminals?

A. Yes, those at Yuma and Tucson.

Q. Were there any files from the dispatchers' offices assembled for the purpose?

A. We had the conductors' daily correspondence and telegraphic files for the entire year 1938 for Tucson and Rio Grande divisions.

Q. You say the conductors', you mean the dispatchers'?

A. The chief dispatchers', yes.

Q. When was the active work of conducting the 1938 redispatching study, item 1, commenced and where?

A. May 15, 1939, the party assembled in Los Angeles.

Q. Did you conduct the study thereafter at Los Angeles or did you move to San Francisco?

A. We worked there for several weeks and determined that the interest of the Los Angeles division and the freight redispatching study was very slight so I then moved the entire party to San Francisco.

[fol. 2567] Q. When was the 1938 freight redispatching study completed, approximately?

A. In September.

Q. Was the party continuously at work from the fifteenth of May until September in connection with the study?

A. It was, yes.

Q. Your exhibit No. 196 indicates that you studied the two months of June and August, 1938. Why were those two months selected for the purpose of the study?

A. June is the month of heaviest traffic and August is the month of lightest traffic for the year 1938 for the territory between Yuma and El Paso, and by studying the heaviest and lightest months I obtained a cross-section of the year's business.

Q. How does the total business handled over the district during the months of June and August, 1938, compare with the business for the year, if you know?

A. The business handled between Yuma and El Paso equalled 17.89 per cent of the year's business handled during 1938.

Q. Is that expressed in car-miles or ton-miles?

A. That computation was made in either car-miles or [fol. 2568] gross-ton-miles. I will have to answer that question specifically after I have looked at one of my exhibits.

Q. You will have an exhibit later which shows the exact relation?

A. It shows the derivation of the 17.89 per cent. One-sixth of the year's business would equal 16.67 per cent; the amount by which these two months depart from an average is slightly over one per cent.

Q. You have stated that for the purpose of the redispatching study you determined certain sidings to be extended?

A. Yes.

Q. Have you prepared an exhibit showing an outline map of the lines between Los Angeles and Tucumcari?

A. I have.

Q. Showing the stations and certain other information?

A. Yes.

Q. Is this a statement in one sheet bearing the title, "Present and Proposed Siding Capacities Expressed in Number of Cars"?

A. Yes, sir.

Mr. Mason: May that statement be marked for identification as "Defendant's Exhibit No. 197"?

[fol. 2569]

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 197 for identification.

Mr. Mason:

Q. Was exhibit No. 197 prepared under your supervision?

A. It was.

Q. What do the figures without circles opposite the names of stations on the map indicate?

A. They indicate the present car capacity of sidings.

Q. What do the figures in circles indicate?

A. They indicate the proposed car capacities or the lengths to which those particular sidings are to be extended.

Q. How did you arrive at the determination of the sidings to be extended and the lengths of the extensions?

A. Our chief dispatchers, that is, Mr. Baker for the Tucson division and Mr. Herrell for the Rio Grande division, indicated the particular sidings which it would be necessary to extend in order to permit a complete long train operation in accordance with our plan of operating 100 cars east and 125 cars west as general train lengths.

Q. Did you make any study jointly with these chief dis-

[fol. 2570]

patchers of the situation on these two divisions?

A. Yes, I examined the employees' time cards and the profiles of the railroad and discussed each case individually with the dispatchers to find out and satisfy myself as to how the particular extensions indicated would fit into the general over-all operating plan.

Q. Are you yourself personally familiar with all or a portion of the line here from having had experience in connection with it?

A. I am intimately familiar with the territory east of Tucson, having worked on the Rio Grande division for eight years. I suppose I have been on the ground at every one of the sidings in that territory during that eight years. I am generally familiar with the territory west of Tucson.

Q. Have you made personal inspections of that territory as well?

A. Yes, both on freight and passenger trains.

Q. Will you say whether or not the showing on exhibit No. 197 represents the lengths of the sidings as they exist or would exist for the purposes of complete long train operation?

A. It does.

Mr. Mason: Have you any questions, Mr. Strouss?

[fol. 2571] Mr. Strouss: No questions.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 197.

Mr. Strouss: I object to it as irrelevant and immaterial and calling for an opinion and conclusion of the witness and purely speculative.

The Court: I will overrule your objection as to this particular exhibit but I do think from the statements of this witness as to this exhibit some of these matters may be objectionable on the line that you indicate, Mr. Strouss. If I correctly interpret this exhibit, it gives two classes of information: first, it gives the present capacity, does it not, Mr. Sines, of the sidings on the route from Los Angeles to El Paso?

A. It does.

The Court: And then in circles it gives the proposed increases that you would make if it were not for the Arizona Train Limit Law as to those sidings where the circles are shown?

A. Yes, and which had to be made in order to permit us to make our redispatching studies.

The Court: I will overrule the objection as to this exhibit, it may be admitted in evidence.

(The document referred to was received in evidence and [fol. 2572] marked "Defendant's Exhibit No. 197."

The Court: I notice, Mr. Sines, with possibly two or three exceptions on your Douglas route and on the Phoenix route there are no proposed extension of sidings?

A. That is right. There is only one extension on the Phoenix route at Topaz and there are none on the Douglas route. The one which you may think is on the Douglas

route is the one at Conrad, but that is really a station on the north line, three sidings west of Lordsburg.

The Court: We will take our noon recess at this time. The court will be at recess until two o'clock.

(Thereupon at twelve o'clock noon the court stood at recess until two o'clock P. M. this day, January 21, 1941.)

[fol. 2573] January 21, 1941, two o'clock P. M.

Proceedings were resumed at this time as follows:

The Court: You may proceed.

The witness B. S. Sines was recalled to the stand and testified further as follows:

Mr. Mason: Mr. Sines, you have testified as to the fact that your redispatching study contemplated the use of AC-8 locomotives in place of those in use on the division in June and August, 1938?

A. Yes, sir.

Q. For freight service?

A. Yes, sir.

Q. Did you contemplate any change in the locomotives to be used on passenger trains, for the purposes of your redispatch study of the passenger train operations?

A. No, the passenger locomotive assignment was the same in the passenger redispatch study as those used in actual operation.

Q. Now, you have also testified, I think, that certain changes in roundhouse and turntable facilities were contemplated in the redispatching studies?

A. That is right.

[fol. 2574] Q. Why would that be required?

A. Because these AC-8 locomotives are somewhat longer than the locomotives in use, and the turnfables installed at Yuma and El Paso would have to be lengthened to accommodate the longer locomotives. The turntable at Yuma would have to be lengthened but not the one at El Paso, that has already been lengthened.

Q. You have testified that your plan of redispatching contemplated the extension of certain sidings as shown on the exhibit last introduced, No. 197?

A. Yes.

Q. Now, I will ask you whether in the plan adopted for the redispatching study of 1938, you contemplated any changes in the conditions of operation as they prevailed on the divisions in June and August, 1938, other than those that you have just mentioned and, of course, the absence of the 70 and 14-car restrictions?

A. No, there were no other changes in the physical plant or in the equipment contemplated in our redispatch study.

Q. What traffic was studied for the purpose of the redispatching study, of the 1938 freight redispatching study?

[fol. 2575] A. Exactly the same traffic was handled in the redispatch study as the traffic that actually moved over the railroad during those two months.

Q. And how was this traffic handled for the redispatching study? Did you make any difference in the trains in the redispatched trains as between those and the actual trains?

A. The only difference that existed between actual handling and that contemplated under the redispatch study was the length of the train.

Q. Well, was the traffic redistributed into longer trains?

A. The traffic was redistributed into longer trains, yes.

Q. Did the plan contemplate different departure time of the redispatched trains?

A. There were different departure times from intermediate terminals, such as Gila, Tucson and Lordsburg, due to the different arrival times at those intermediate terminals after the trains had worked their way across the railroad from the initial terminals of Yuma and El Paso. The departing times at Yuma and El Paso, eastward trains at Yuma and westward at El Paso, corresponded very closely with the departure times of the trains actually operated.

[fol. 2576] Q. Were there more trains in the redispatching study or less trains than there were in the actual operation?

A. There were less trains on the redispatched study than in actual operation.

Q. At what point did the redispatching of eastbound traffic commence?

A. At Yuma.

Q. At what point did the redispatching of the westbound traffic commence?

A. At El Paso, Texas.

Q. Who was directly and actively in charge of the redispatching of the traffic eastward from Yuma?

A. G. C. Baker, chief dispatcher of the Tucson division.

Q. And who was actually and actively in charge of the redispatching of the traffic west from El Paso?

A. L. D. Herrell, chief dispatcher of the Rio Grande division.

Q. How far did Mr. Herrell handle the redispatched westbound traffic?

A. As far as Lordsburg, New Mexico.

Q. And who received it at that point?

A. Baker.

[fol. 2577] Q. How far did Mr. Baker handle the eastward traffic?

A. From Yuma to Lordsburg.

Q. What was done with it then?

A. It was there turned over to Mr. Herrell.

Q. As the chief train dispatcher of the Rio Grande division?

A. Yes.

Q. Did the redispatching study contemplate any rearrangements of traffic handled on the South line between Tucson and El Paso via Douglas?

A. Yes.

Q. Was this in connection with the study of the North line?

A. Yes, it was carried along simultaneously with the redispatch study which was performed for the North line. Actual operating conditions were simulated from day to day, and Herrell surveyed the entire situation west of El Paso, taking into consideration both the north and south lines and the distribution of traffic which he had originally made in actual operations and which he proposed to redispatch in the redispatch study; likewise, Baker, in redispatching trains from Tucson eastward, took into consideration the distribution which he had orginally made [fol. 2578] between the two lines and redispatched that traffic as between the north and south line.

Q. Well, on what sort of records were the redispatched train movements shown?

A. On train sheets, on fresh train sheets the same as those that are used in the ordinary course of business.

Q. Was a redispatch train sheet made for each day covered by the redispatching study?

A. Yes, exactly the same as is done in actual train operation.

Q. What information, generally speaking, was shown on the redispatch train sheets?

A. The redispatch train sheet shows the identity of the train by designation, that is, whether it is a perishable train, a manifest train, a drag, or a stock train; by its position on the train sheet if is also possible to tell whether it is a freight train or passenger train, the train number, the operating train number was shown, the locomotive number or, rather, on the redispatch study the locomotive type.

Q. Was one number employed to designate all of the locomotives used for the redispatched trains?

A. All the AC-8's were referred to as 4100's. Helpers [fol. 2579] and other locomotives not of the A.C-8 type were indicated by their types but not by individual or specific numbers.

Q. Will you give me an example? Suppose that an F type locomotive was used, would some serial number be used to indicate it?

A. 3600.

Q. Or if a Mikado?

A. 3200.

Q. Were names of crews shown on the redispatch train sheets?

A. I don't know whether the chief dispatcher's breakdown showed crew names or not. They did keep crew books and whether as part of that bookkeeping they used names or numbers or letters, I cannot at the moment, say. An inspection of the train sheets will indicate, however.

Q. Have you at your disposal all the train sheets?

A. Yes.

Q. Covering the redispatching study of 1938?

A. Yes, sir.

Q. As well as those covering the redispatching study of 1940 that you have referred to?

A. Yes.

Q. How did the chief dispatcher, Mr. Baker, handling [fol. 2580] the train sheets at Yuma, find out the consists of the trains or of the traffic to be moved from Yuma by the redispatched trains?

A. In mentioning the records, which we assembled at the beginning of the redispatching study, I said that we had the conductors' wheel reports for the Los Angeles division trains entering Yuma. We took these wheel reports and analyzed them into half a dozen different groups to indicate the character of traffic in the cars. That analysis was made for every train entering Yuma from both the Indio line and also from the Imperial Valley. An individual—rather, a special work sheet was set up for that particular operation. That work sheet showed the train designation arriving and the arrival time of the train in addition to the consist of the arriving train, then loads that orginated at Yuma, or company material such as oil and bridge material which doesn't move on through billing but which may appear for movement at any time at a terminal such as Yuma, were picked off of the switch list of the departing trains. In addition to that, we had the pull record, a book which is kept by the Yuma yard office, indicating the time when perishable loads are ready to move from Yuma. With all this information, Mr. Baker [fol. 2581] then knew what time the cars were available for movement east of Yuma, what time they had moved actually, and then he reassembled or reconstituted and redispatched the business in his new long trains.

[fol. 2582] Q. Was it ever possible to take a train coming from the Los Angeles division into Yuma and move it on eastward into Yuma without change or substantial change of consist?

A. Yes, that was a frequent occurrence.

Q. How did you take care of traffic not moving through beyond points on the Tucson division?

A. As the traffic was picked off of the conductors' wheel reports for the trains actually operating between Yuma and Gila and Gila and Tucson, Tucson-Lordsburg and Lordsburg to El Paso. The conductor's wheel reports show in each instance the destination of the cars that that conductor has handled. That called for another analysis to be made of the conductors' wheel reports and once again statements were made to indicate the short business which the chief dispatcher would have to provide for in redispatching the long trains.

Q. Were you able to rearrange the train service given to those short loads, so-called, short cars?

A. Yes, that was concentrated as much as possible on one train instead of spreading it over several trains.

Q. Why would it be spread over several trains in actual [fol. 2583] handling and possibly concentrated in one train in redispatch handling?

A. With a car limit we have to operate with the idea that business should move whenever the opportunity presents itself, whereas without the limit such compulsion is not as evident, we have an opportunity to let one train do the local work to a greater extent than when there is a limit.

Q. What plan did you follow as to the picking up of business originating at points east of Yuma along the division?

A. There, again, the conductors' wheel reports of the trains actually operated were the sources of information to show the cars picked up enroute by the trains. This information was developed by the dispatcher or given to him by those assisting him and in reconstituting the day's business he would indicate on which trains he wanted the business picked up.

Q. What did the redispatching plan contemplate as to the provision of crews for trains in passing through such terminals as Gila and Lordsburg?

A. The redispatching plan contemplated that exactly the same problems would arise as those that occur in actual operation, that is, that it would be necessary to balance power and crews by double heading engines and dead-head- [fol. 2584] ing crews to the terminals where they were needed or from the terminals to which they had worked but where they were not needed.

Q. When does such dead-heading of crews and double heading of power occur in actual practice?

A. To give a simple illustration, if a chief dispatcher by means of his advance line-ups discovers that within any twenty-four hour period he is going to have [illegible] trains west from Gila and only four trains operating into Gila from the west, he knows that he will have to get an engine and a crew at Gila in order to take care of that fifth train back, otherwise he will be out of balance, so he will very often double head an engine either on a freight train or on a passenger train over to Gila in order to get the engine and the engine crew over there and he will dead head a train crew either on a freight train or on a passenger train over to Gila so that it will be available for this fifth train.

Q. Why is it necessary to send crews to Gila?

Q. Gila is the away-from-home terminal for crews operating in the territory Yuma to Gila.

Q. Is it also the away-from-home terminal for crews operating out of Tucson to Gila?

[fol. 2585] A. That is right. This illustration which I have given would work in the same manner.

Q. Is there any pool or reservoir of trainmen and enginemen other than those who have come in on road trains maintained at Gila?

A. That is all.

Q. What is the situation at Lordsburg?

A. Lordsburg is the away-from-home terminal for crews operating out of Tucson and El Paso.

Q. If a conductor and the brakeman comprising the crew are moved dead-head, say, from Yuma to Gila to protect a westward movement, what about the caboose in which they travel? Is that traveled with them?

A. Yes, that will be sent over on a freight train so as to arrive in advance of their departure also.

Q. You spoke of double-heading locomotives. Is that the only method employed where necessary to get a locomotive to a division terminal to protect an oncoming train?

A. They can run light or with a caboose, with what is known as a "caboose hop," just an engine and caboose together.

Q. Do those instances appear on the train sheets covering actual operations during June and August, 1938, in-

[fol. 2586] stances of dead-heading crews or locomotives?

A. Yes, where the business was unbalanced and it was necessary to provide more crews in one direction than in another, the redispatching study shows that the chief dispatchers did double-head engines and dead-head crews.

Q. Was that the same general practice as is followed in actual operations?

A. Exactly the same.

The Court: Do I understand, Mr. Sines, when this extra engine is sent over to this terminal to take care of the balancing of this traffic, that the engineer and fireman do not ride that engine, that is just pulled as a car would be?

A. No, sir, the engineer and fireman operate the engine.

Q. It steams up?

A. Oh, yes.

Q. You really have two engines then on that train?

A. Yes, sir.

Q. You would still call that dead-heading?

A. No, that is double-heading. You only dead-head——

Q. (Interrupting) You have me confused, you spoke of [fol. 2587] sending the train crew over, as I understand it, on some passenger train or freight train and then getting their caboose and engine over there. I was a little confused on the movement of the engine itself.

A. You usually double-head an engine and that means that the engineer and fireman are on that engine and the engine operates to all intents and purposes as though it were pulling a train along.

Q. In other words, it aids in pulling that train?

A. Yes, sir.

Q. That is what you call double-heading?

A. Yes, sir, if it so happened, however, that there was an engine at Gila with no engine crew to run it we would dead-head an engine crew over on a freight or passenger train to operate the engine.

Q. And they would be paid wages from the time they left Tucson or Yuma as the case might be?

A. That is right. Those instances are less frequent than where you double-head the engine and engine crew together.

Mr. Mason:

Q. The other confusion, I think, was the fact that you spoke of dead-heading the train crew. I take it when you referred to the train crew as distinguished from the engine [fol. 2588] crew you meant the conductor and brakeman?

A. Yes.

Q. They will move under pay but not on duty from their home terminal to the away from home terminal to undertake duty at the latter point?

A. That is right.

Q. And that is the example of dead-heading?

A. Yes.

The Court: Would it ever happen in your train movements that the engine might be moved from Tucson to the point that you indicate, Gila, without steam being up and without it aiding in pulling that train?

A. Not for the purposes we have indicated. That would be movement of a dead engine and in almost all instances it would be because the engine had something mechanically wrong with it.

Q. If you intended to use that engine at the point to which it was being taken, it would be sent over there as a live engine?

A. Under steam, yes, sir.

Mr. Mason:

Q. Mr. Sines, when an engine is double-headed in this way in order to get it to the away-from-home terminal for subsequent use in a train, is such an engine actually necessary to the operation of the train?

[fol. 2589] A. No.

Q. Is that rule again subject to some exception in some parts of the territory?

A. Yes, except in the helper territories.

The Court: There is a need for it in the helper territories?

A. Yes.

Q. In this other instance there is not a need?

A. That is right.

Mr. Mason:

Q. Will you illustrate the movement of an engine going to Lordsburg to be attached to a westbound train and which is in addition to the train engine of the eastbound train, Tucson to Lordsburg, the points at which it does necessary work, and the points at which it is an excess engine?

A. Let's say we have 70 cars with a Southern Pacific road engine accompanied by a Southern Pacific engine double-heading. Both of those engines would work at or near their full capacity between Tucson and Mescal.

The Court: Because that is an up-grade?

A. Yes. Going downhill from Mescal to Benson you would only need one engine to operate the train, although they would go down together. Going uphill from Benson to Dragoon both engines would be working at or near capacity, [fol. 2590] that would be helper territory, but from Dragoon I think into San Simon only one engine would be required. The double header would assist the road engine from San

Simon to Steins in that helper territory and it would be unnecessary again from Steins to Lordsburg although it would of course accompany the road engine.

Mr. Mason:

Q. Is helper service regularly provided in those helper districts you have mentioned, Tucson, Mescal, Benson, Dragoon, and San Simon to Steins, where single-engine trains are operated over the balance of the district?

A. Yes, for the train I have described, 70 cars of perishable on a Southern Pacific engine, a helper would be provided.

The Court: You have no helper districts across the state of Arizona so far as passenger trains are concerned, of course?

A. No.

Q. But you do have regular helper districts that you have heretofore described across the state?

A. Yes.

Q. On freight operation?

A. Yes, I would like to make one more observation with [fol. 2591] respect to providing crews at away-from-home terminals. We have spoken up to now of providing an engine and crew to bring the train back, but we might have five trains eastbound to Gila and only four returning and in order to get that fifth crew back from Gila to Yuma, to its home terminal, we would dead-head that train crew and double-head that engine if necessary. It works both ways.

Mr. Mason: Why would you bring a train and engine crew back from the away-from-home terminal after they had taken a train there if there were no returning trains in sight for them? Why not leave them there until the train came along?

A. Because after the expiration of sixteen hours they go back on pay again, whether they are in service or not.

Q. What is that type of compensation called?

A. Held-away-from-home terminal time, and every twenty-four hours thereafter they get paid eight hours whether they work or not.

Q. Did you contemplate in the redispatching study that you would have to do some such dead-heading or double-heading as the case might be?

A. Yes; I heard the dispatchers talk about H. A. H. T. almost as frequently as I heard them talk about dead-head-
[fol. 2592] ing and double-heading.

Q. Was it part of your instructions that these particular features of the service should be given full contemplation in the redispatching study?

A. Yes, that should be handled in exactly the same manner as it is handled in actual operation.

The Court: Mr. Sines, if the railroad company were permitted longer train operation, speaking of freight trains, would it increase the length of your helper districts?

A. They would not change at all.

Q. That would remain constant?

A. Yes, sir.

Q. That is governed entirely, of course, by the grade; is it not, and the weight of the train?

A. Well, by the grade and by our contracts with the organizations which specify where we may have two engines operating without penalty payments to the train crews.

Mr. Mason:

Q. Mr. Sines, as between the operations with a fixed maximum limit of 70 cars and operations without any such fixed maximum limit, which leads to the greater lack of balance, greater unbalance of power and crews?

A. The limitation of 70 cars leads to the greater unbalance of power and crews.

[fol. 2593] Q. What is it that brings about an unbalance of power and crews?

A. The lack of flexibility which the law imposes on the operations, the arbitrary fixing of the number of trains which may be operated to handle a given amount of traffic.

The Court: You said "trains"; I take it you meant "cars"?

A. I don't think so. Will you read my answer?

(The last answer of the witness was read by the reporter.)

A. (Continuing): "Trains" in this way: Suppose we had 700 cars in one direction one day to be operated out of Tucson and we are operating with a 70-car limit. If we can put 70 cars in every one of those trains, we will operate ten trains. The law then fixes the number of trains we will

have to operate, but supposing that day that we had eight trains coming eastbound into Tucson, we had eight engines and crews available to take those trains west, we could divide the 700 by eight, get an average——

The Court (Interrupting): I see your point. There is no law that fixes the number of trains; it is an indirect effect you are referring to?

A. Yes, sir.

[fol. 2594] Mr. Mason:

Q. Does the unbalance of power arise because the movement of the cars in one direction is greater than the movement in the other?

A. Yes, sir.

Q. And because as you have illustrated in your answer to the question from the Court, in Arizona the cars must be subdivided into not less than one train for each 70 cars?

A. Yes, that is right.

Q. Is it possible if a fixed limit is not imposed to balance the trains in opposing directions even though there be an unbalance of cars in opposing directions?

A. Yes.

Q. Did your redispatching study contemplate that there would be a complete balancing of train-miles and trains in opposing directions or that you would have an unbalance of power and crews?

A. The balance of power and crews was much better in the redispatching study than it was in actual operation, but it was not perfect. We still had to dead-head crews and double-head engines to and from away-from-home terminals.

Q. Did you in the redispatching study contemplate that helper locomotives would be used in the present helper districts?

[fol. 2595] A. Yes.

Q. How did you determine the number of helper engines and helper crews to be assigned for such service?

A. There again the chief dispatchers worked in exactly the same manner that they do in actual operations and increased or decreased the number of engines and crews at helper stations in accordance with the demands of the traffic.

Q. By "demands of the traffic" you mean the volume of the trains operated?

A. The number of trains to be operated.

Q. Will you say whether or not in actual practice there are certain crews and certain locomotives definitely assigned to helper service at particular points?

A. There are.

Q. Where are they assigned? What is the character of the station at which the helper crew waits? Is it the station at the top of the grade or at the foot of the grade?

A. On the Tucson division it is the station at the foot of the grade.

Q. What are those particular stations on the Tucson division?

A. Gila, Tucson, and San Simon.

[fol. 2596] Q. How far do the helper crews stationed at Gila operate?

A. They run to Estrella; I think that is something like fifteen miles.

Q. What do they do then?

A. They detach their engine from the train and return to Gila.

[fol. 2597] Q. And how far do the helper crews and locomotives stationed at Tucson operate?

A. Helper crews operate out of Tucson as far as Dragoon, a distance of approximately seventy miles. At Dragoon they detach their engine and return to Tucson. Because of the Arizona Full Crew law, we are not permitted to run light engines a distance greater than 25 miles without providing a flagman, who, in effect, escorts the engine helper crews returning from Dragoon.

Mr. Strouss: I didn't know that law was being attacked.

Mr. Mason: No, it is not being attacked. It is only an explanation of the crews that we have.

The Witness (Continuing): Helper crews returning from Dragoon were either provided with flagmen at Benson to flag the light engine in from Benson to Tucson, or else they were coupled with westbound trains at Benson or Dragoon and operated into Tucson.

Q. Is that the same method that is used in actual operation?

A. Exactly.

Q. And you followed the same method in the redispatching study?

[fol. 2598] A. Yes.

The Court: Then, do I understand that each helper crew would manage its own engine; there would not be an exchange of men on a given engine in a given territory?

A. No, the same engineer and fireman would operate that engine from Tucson to Dragoon and back to Benson, where they might be——

The Court: Relieved?

The Witness: No, joined by the flagman who would escort them into Tucson.

The Court: I see.

Mr. Mason: Now, Mr. Sines, do the helper crews at points like Gila and San Simon ever make more than one helping trip during the course of a tour of duty?

A. Yes, in those districts which are relatively short, it is not unusual that one helper crew, consisting of an engineer and fireman, will help two trains from the bottom to the top of the hill and return, all within their eight-hour tour of duty.

Mr. Strouss: Did you give the distance that the helper crew at San Simon operates?

A. That is fourteen miles from San Simon to Steins.

[fol. 2599] Mr. Mason: What happens at Steins with the helper engine?

A. The helper engine is detached and returns alone to San Simon.

The Court: Then there are only three helper districts across the state on your lines?

A. Yes.

Mr. Mason: Are there other districts where helpers are provided for in the agreement; but not used in actual service?

A. That is right.

Q. Then the districts from Gila to Estrella, Tucson to Dragoon, and Steins to San Simon, are the helper districts in which helper locomotives are actually in use?

A. Yes, sir.

Q. Are there any westbound helper districts where helper locomotives are used?

A. Not where helper locomotives are used almost invariably to the same extent that they are eastbound. There are helper districts such as Benson to Mescal where, when

these eastward helpers couple into a westbound train, the helper engine assists the train engine going up the grade.

The Court: I believe you said, Mr. Sines, in response to [fol. 2600] a question from the Court a few moments ago, that even if you are permitted to haul longer trains, if this law, in other words, were not in force and effect, it wouldn't have the effect of increasing the number of your helper districts?

A. That is right. This operation that I spoke of at Benson, as being performed actually from Benson to Mescal, we also made provision for on our redispatched trains; we didn't add any new districts.

Mr. Mason: Mr. Sines, I think the Court has in mind that the trains of 100 cars eastward or 125 westward would be substantially heavier, have more tonnage than the trains now being operated under the 70-car law. I will ask you whether the type of power that is contemplated in the redispatching study takes into account the operation of these heavier trains?

A. That is right. The road engine which we are providing would be increased in the same proportion, and the necessity for helping those trains would be no greater than the necessity for helping the trains actually operating.

Q. You spoke of westward helper districts. Have you in [fol. 2601] mind the district between Mondel and Steins, just over the New Mexico line, as an occasional helper district?

A. Yes, that is right, there is a four-mile pitch there where we can operate two engines, according to the agreement.

Q. Is there any in actual practice? Are helpers used there to any great extent?

A. No.

Q. Now, in the plan followed in the redispatching study, Mr. Sines, what particular instructions and methods were followed in determining the speed over the road of the redispatched trains?

A. That determination was made by the trick dispatchers under supervision of the chief dispatchers and relied upon a comparison which was made between trains actually operated and trains which were operated on the redispatching study. The mechanics of making that comparison were as follows: In the column on the train sheet alongside of the column in which the redispatched train was to be entered,

the trick dispatcher indicated or copied off of the conductor's delay report the progress of the train actually operated, showing the time of departure from the original terminal and the times at which the train arrived at intermediate stations, and, finally, his arrival at the final termi- [fol. 2602] nal. At the bottom of the sheet usually was indicated all of the notations which the conductor of the actual train had seen fit to make or which he made in accordance with instructions on the back of that delay report, so that the trick dispatcher was fully informed of all of the obstacles and delays which the actual train met in its operation from one terminal to the other; then, in the column for the redispatched train, the dispatcher worked that train across the railroad in accordance with the speeds made by the actual trains in accordance with the delays that the redispatched train ran into.

Q. You mean the redispatched train or the actual train?

A. Both the actual train and the redispatched train ran into in encountering the redispatched operation.

Q. I will ask you if each redispatched train was matched, so far as possible, with a train departing from the same terminal on the same day and at or near the same time?

A. Yes, that was done almost in all cases, in accordance with the designation of the actual and the redispatched train. For instance, Colton block No. 412, might have left [fol. 2603] Yuma at 6:00 A. M. some date. Our redispatched Colton block 412 probably left Yuma at six A. M., and thereafter, the running of the redispatched train was matched with the running of the actual train.

Q. Now, suppose, that Colton block 412 or the train in which Colton block 412 was carried, the actual train had run into an unforseen delay, for example, because of a grade crossing collision, would that unforseen delay have been reproduced in the running of the redispatched Colton block 412?

A. Yes.

Q. Suppose that the redispatched train, containing Colton block 412, had only seventy per cent of the engine rating of the AC locomotive handling it, whereas the actual train 412 had ninety per cent of the engine rating of the AC locomotive handling it, would you have made any difference in their speeds over the road and, if so, at what points or under what circumstances?

A. In that event, the redispatched train, I call your attention to the fact that you have provided for a difference of twenty per cent.

Q. Yes.

A. The redispatched train would have been permitted to make up a small amount of time on the ascending grades.

[fol. 2604] Q. Why would you have operated the redispatched train on the ascending grades at greater speed than the actual train?

A. Because on level and descending grades both trains would have been able to operate up to the maximum allowable speed as permitted in the timetable and according to speed boards located alongside the track.

Q. But would the same condition prevail between two trains where the ratio of load to tonnage rating is different on ascending grade?

A. No, on ascending grades, the train with the heavier percentage of engine rating would run slower than the train with a lighter percentage of engine rating.

Q. Now, what method was followed in determining relative speeds of actual and redispatched trains on ascending grades as between percentages of tonnage rating?

A. The trick dispatchers performing the redispatching computed the tonnage of the train actually run and redispatched, and where the redispatched train was within ten per cent, either ten per cent over or ten per cent under the percentage of tonnage to rating of the actual train, no variation was permitted in the running time between [fol. 2605] designated points, and by designated points I mean where there was no occasion to make any difference in the running of the dispatched train as compared with the actual train.

Q. You mean points designating the beginnings and ending of ascending grades?

A. Yes, that would be one way of choosing the points. Another way would be to say that nothing had occurred to the actual train between A and B, and nothing would occur to the redispatched train between A and B, therefore, between those two points, as long as the percentage of tonnage to the rating was within ten per cent of each other, no allowance would be made in increasing the speed of the redispatched train or showing up the speed of the redispatched train, because we ran these trains faster and,

slower both, whichever way the percentages happened to work out.

Q. Now, where you found a difference in the ratio of tonnage to rating as between a redispatched train and to the actual train with which it was matched, did you make a difference in time on the ascending grades, that is apart from unforseen occurrences, or anything else, which might interfere with the progress of the train?

A. Yes. In all of the districts except that between Lordsburg and El Paso, where the difference exceeded ten per cent, we permitted trains to make up or lose as much as fifteen minutes in any train district. In the Lordsburg-El Paso district, the maximum to be made up or lost was somewhat greater than that, because of the physical characteristics of that district. Even there the chief dispatcher was working under a maximum which I do not at the moment recall.

[fol. 2606]

Q. That will be developed in the testimony of that dispatcher?

A. Yes.

The Court: We will take our mid-afternoon recess at this time.

(Thereupon, a short recess was taken, after which the witness was recalled to the stand, and proceedings were resumed as follows:)

The Court: You may proceed.

Mr. Mason: Mr. Sines, in your testimony prior to the recess you spoke of the occasions when a train crew, consisting of the conductor and brakemen, have to be deadheaded either to or away from a home terminal, that the caboose also had to be handled to or from that point?

A. That is right.

Q. How is such a caboose ordinarily handled?

[fol. 2607]

A. That is handled on a freight train.

Q. If handled on a freight train, is the deadhead caboose simply counted as a caboose or part of the 70-car consist permitted by the law?

A. Counted as one of the seventy cars permitted by the Arizona law.

Q. Does it displace a loaded car in that event?

A. It displaces a loaded car if occasion arises.

The Court: Does the conductor ride that caboose?

A. Not necessarily. The train crew is usually given the choice of riding a passenger train if a passenger train is available, or the caboose. If a passenger train isn't available, of course, the conductor and brakemen will ride the caboose; on the other hand, they generally ride the passenger train if the passenger train will get them over to the terminal in time to catch the run that they are called for.

Mr. Mason: Now, in the operation of the redispatched trains, Mr. Sines, was any provision made for stops for inspection enroute between terminals?

A. Yes, provision was made for inspection stops in [fol. 2608] exactly the same manner that inspection stops were made during the actual operation of the trains.

Q. Suppose that the redispatched train consisted of 95 cars, whereas the actual train with which it was matched consisted of less than 70 cars, would you allow the same time or more time for the inspection stop?

A. No, when the redispatched train exceeded 90 cars in length the inspection stop was increased from five to ten minutes in length.

Q. When you speak of these inspection stops, what character of inspections do you refer to?

A. Those are stops which are made by the trains for the purpose of permitting the train crew, that is, the conductor and brakemen, to walk around the train inspecting the wheels, running gear, brakes, in fact, the entire equipment, to make sure that it is in running condition.

Q. That is the so-called train crew inspection, is it?

A. Yes.

Q. Are there other inspections made of cars and trains as they pass along the division?

A. Yes, all employees of the railroad who have occasion to work along the right-of-way or in stations, are instructed [fol. 2609] and they do watch the trains as they run by them. I am speaking particularly of the section forces. I used to work in the maintenance department and I have also observed station employees making the same kind of running inspection of trains as they go by them.

Q. Are there inspections made at terminals as trains stop or prior to their departure?

A. At terminals such as Gila and Lordsburg, a running inspection is given the departing trains by the train crews of those trains. At terminals such as Yuma, Tucson, and El Paso, inspections are made by car department inspection forces prior to the departure of the trains.

Q. Are those repairmen in the car repair department?

A. They are in the mechanical department and they are often referred to as car knockers. I think they are car repairmen.

Q. You have seen them making those inspections, have you, frequently?

A. Yes.

Q. Are similar inspections made at Douglas, if you recall, by car forces?

A. No, I don't know whether it is the train crew or car inspectors who take care of the trains in Douglas.

[fol. 2610] Q. In the redispatching study, did you contemplate any different character of inspections of the trains than those which were made of trains actually operated?

A. No, we contemplated that the redispatched trains would receive full and complete inspections the same as those accorded actual trains.

Q. And that the necessary time would be allowed for that purpose?

A. Yes.

Q. Now, in the operation of the redispatched trains, was any provision made for the meeting of opposing traffic, opposing trains?

A. Yes, redispatched trains took siding to meet redispatched trains and to meet other redispatched trains or to permit other redispatched trains to pass them also.

Q. How did you make allowances for time consumed in taking sidings or waiting for meets and passes, did you use any different method than is followed in actual practice?

A. No, the train dispatchers in handling the operation of trains from their dispatching office and in putting out orders, must estimate the length of time that will be re-

[fol. 2611] quired by trains to go into sidings, to make these meets and get out again and proceed on their way. The train dispatchers handling the redispatching study had to perform the same mental calculations as when they were actually working a trick.

Q. And did they do so in redispatching the trains?

A. They did.

Q. What did the redispatching study contemplate as to the time of the redispatched trains through the intermediate terminals between Yuma and El Paso?

A. Time at intermediate terminals was determined from the amount of work or the operations which the redispatched trains had to perform in the intermediate terminals and was based upon the train dispatcher's and the chief dispatcher's knowledge of operating conditions.

The Court: You frequently used the term "trick dispatcher": what did you mean by that?

A. In describing the party that performed this redispatching study with me, I mentioned two trick dispatchers who assisted the chief dispatchers. A chief dispatcher of a division concerns himself primarily with the calling of trains and ordering of engines and crews and getting [fol. 2612] the trains started from initial terminals. He indicates to the trick dispatchers, working under him, when he wants these trains to start, and thereafter it is the responsibility of the trick dispatchers to issue the necessary orders to get those trains started on the road, and to progress them across the division, meeting and passing other trains. The trick dispatchers then issue orders and make a running record of the progress of those trains as they go across a division, and as the trains are reported back to them on the telephone or by telegraph from the wayside stations.

Q. Is the trick dispatcher the man who sits at the telephone or telegraph key and actually records the movement of the trains and gives directions for their further movements?

A. Yes, and in our redispatching study, our chief dispatchers were concerned mostly with the consisting of the trains, the number of cars in the trains, the engines that were provided for those trains, and the time of departure from the initial terminal, then the trick dispatchers worked those trains across a division on our redispatch train sheets.

Q. Did the trick dispatchers work closely with the chief dispatcher in carrying out this operation of the redis- [fol. 2613] patched trains on the redispatch train sheets?

A. Oh, yes, that work was done under the direction and supervision of the chief dispatchers.

Q. And in their immediate presence?

A. Yes, we were all in one large office there in San Francisco when this job was being done.

Q. Was it all done under your immediate supervision, in accordance with the plan you have been outlining here?

A. That is right.

Q. Mr. Sines, do you know and, if so, will you state whether there is a difference as between engineers, individual engineers or individual conductors in the speed with which they will handle their trains and the facility with which they will perform their duties along the road?

A. That is right, there is a difference, depending upon the skill, training and experience of the engineers in the way in which they will handle the engines, and that is reflected in the speed of the trains and the ability of the trains and engines to get over the road. Then the work that is done at the local stations depends upon the conductor and brakeman who are going to do that work on the ground. Some crews will take longer to perform certain operations [fol. 2614] at stations than other crews.

Q. In the redispatching study, were you able to take into account any of these individual differences? If so, how was that accomplished?

A. Those individual differences were taken account of, but it was automatic, because as the redispatched train was matched with the actual train, the redispatched train's progress depended upon the actual train's progress. If it happened that the actual train had a skillful engineer, then the redispatched train would have a skillful engineer, or if the actual train had a less experienced train crew, our redispatched train would also be delayed in its station work to the same extent.

[fol. 2615] Mr. Mason: Mr. Sines, you said previously that the result of the redispatching study was to operate fewer trains than were actually operated?

A. Yes.

Q. Was that due to the redistribution of the same traffic into longer trains?

A. That is right.

Q. Did that result in the elimination of any of the actual trains?

A. Yes.

Q. Suppose that an actual train had suffered a delay enroute because of having to flag a block; but in the redis-

patching study that actual train was eliminated. What did you do with the delay suffered by that train; did you forget about it?

A. No, that delay would then be assessed against a train of the same class operating at or about the same time. No delays of that character were eliminated by the redispatching study.

Q. Did any of the actual trains suffer delay because of a broken knuckle, do you recall any such instances?

A. I don't know whether we had any broken knuckles or not.

Q. Suppose one of your actual trains did suffer delay because of a broken knuckle, would that delay be assigned [fol. 2616] to a redispatched train and, if so, in what manner?

A. That would have been assigned to the redispatched train handling the equipment that the actual train handled.

Q. If it was C-413 that had a broken knuckle, which redispatched train would be assigned that?

A. C-413 would be assessed the delay.

Q. Did you for the purpose of the redispatching study contemplate having any additional train order offices over and above those which were open and available during June and August, 1938?

A. No.

Q. Did you contemplate having any fewer such train order offices?

A. No.

Q. I think you have stated that the redispatching train sheets were prepared for each day covered by the 1938 redispatching study?

A. That is right.

Q. Did you prepare a form of work sheet from the actual and redispatching train sheets?

A. We did.

Q. Have you a sample of the work sheets so prepared governing one particular district or day?

A. I have.

[fol. 2617] Q. Will you state what the title of this sheet is?

A. The title of this sheet is "Sample Copy of Work Sheet A (Page 167 of 1938 Redispatching Study)."

Mr. Mason: May we have this sheet marked for identification as "Defendant's Exhibit No. 198"?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 198 for identification.

Mr. Mason:

Q. Mr. Sines, is this defendant's exhibit No. 198 a sample of the work sheets used in the carrying on of the redispatching study?

A. Yes, this is an intermediate compilation sheet which stood in between the train sheets and the other sheets upon which our final answers appear and was used for consolidating the information both as to actual operation and redispatch operation.

Q. This is shown as page 167. How many work sheets of the same type as this were used for the purpose of the 1938 redispatching study or were compiled in that connection?

A. We used 848 work sheets A for the June and August freight redispatching study and we used 94 sheets for our 1938 passenger redispatching study.

Q. Is exhibit No. 198 for identification typical of the [fol. 2618] 848 work sheets used in the freight redispatching study of 1938?

A. It is.

Q. From what sources was this work sheet actually prepared?

A. The information in the top half of the sheet headed "Actual" and down as far as the word "Total" is abstracted from the actual train sheets for the territory Tucson to Lordsburg for this particular sheet No. 167.

Q. And the balance of the information?

A. Was taken from the redispatch train sheets for the same territory.

Q. Does that include all the information on this sheet or only that information up to and including column 15?

A. That only includes information up to and including column 15 and for the actual train sheets the names of conductors and engineers were abstracted and placed in column 28.

Q. Does the information in column 28 also include the names of flagmen, if any are used?

A. Yes, the flagmen that I have described as operating between Tucson and Benson.

Q. Who placed the information shown in columns 0 to 15, inclusive, on work sheet A?

[fol. 2619] A. The trick dispatchers who were assisting the chief dispatcher in the redispatching study.

Q. Was this done under your immediate supervision?

A. Yes, we all took turns at entering and checking this information but the bulk of it was done as I have described by the trick dispatchers.

Q. Going to columns 16 to 27, inclusive, how was that information placed on the sheet?

A. That information was furnished by the timekeeper, Mr. H. C. Garverick, whom I have mentioned before, who secured that particular data from the conductors' time returns and delay reports.

Q. Then the information shown in columns 16 to 27, inclusive, are the wages claimed or payable to the crews as shown on the time returns and delay reports?

A. The wages actually paid.

Q. You show here in column 16, basic train engine, and then show in column 17, variable amounts. What is the significance of those two terms?

A. For purposes of the redispatching study we had to analyze the wages of every one of those crews to make a separation between the basic amounts covering the payment of the crews because of their operation from the [fol. 2620] initial to the final terminal, which does not vary with the length of time or the service that is performed in either the initial or the final terminal. The variable amounts covered such items as overtime, if there was any, and service performed in the initial and final terminal which does not depend upon the operation of the train from the initial to the final terminal.

Q. Such payment as might be made, for example, for initial switching or terminal switching?

A. Yes.

Q. Would the variable amounts include any payment made because of local switching enroute?

A. Well, that would be reflected in the basic train wage in column 16 when the character of the service changes from through to local.

Q. Suppose that any of these crews became entitled to "held away from home terminal pay." Where would that appear?

A. That would appear in the variable column 17 for engineman and in column 24 for trainmen.

Q. Will you refer, please, to column 19 and explain what you mean by "helper engine attached and light" as applying to the wages shown there?

A. The first amount shown opposite Kennedy's name is for the movement of a helper engine 439 miles, indicated [fol. 2621] in column 8, the engine having been engine 3322. One hundred thirty-nine miles is the distance from Tucson to Dragoon and return and the amount shown in column 19 is the entire payment for that engine crew by reason of its service attached to a train going from Tucson to Dragoon and light returning from Dragoon back to Tucson. The next amount shown opposite Bagley's name indicates that it was paid for a trip of 30 miles by engine 3313. Thirty miles is the round trip distance for a helper engine crew from San Simon to Steins and return to San Simon. Occasionally, well, it is not so occasionally either, it is quite frequently, helper engines would be coupled with westbound trains at Benson to return to Tucson and in that event the operation of the eastbound train would be charged with the movement of the helper engine from Tucson to Dragoon and return to Benson and the balance of the payment to the engine crew would be charged against the operation of the westbound train from Benson into Tucson. That was the case with the third item in column 19, which is shown one line below, engine 3202, engineer Wheeler.

Q. What is the significance of the initials in parenthesis following Mr. Wheeler's name there?

[fol. 2622] A. Those are the telegraph call letters for stations which are printed on the train sheets and which chief dispatchers and trick dispatchers use as kind of a shorthand in indicating the names of the stations.

Q. Does UN mean a particular station?

A. UN means Tucson; DR means Dragoon; and B means Benson; meaning that engine 3202 negotiated 91 miles with engineer Wheeler from Tucson to Dragoon and return to Benson and they were paid the amount shown in column 19 therefor.

Q. What about the information shown in columns 0 to 15, inclusive, of the redispatched portion of exhibit No. 198 for identification, from what source was that taken?

A. That information was abstracted from the redispatched train sheets.

Q. You show, for example, under the heading (4), "Train Engine Number," 4100. What does that signify?

A. That signifies that an engine of the 4100 class, AC-8 was used to operate on the redispatched train.

Q. You show in column 7, "Helper Engine No." a single number 5000. What does that mean?

A. That an engine of the 5000 class, that is S. P. 4, 2, [fol. 2623] or 3, was used as a helper to help the redispatched train between the stations indicated, the first one, Tucson, Dragoon, and back to Benson.

Q. You show in that same column for two redispatched trains the word "single." What does that mean?

A. These particular trains operated the entire trip from Tucson to Lordsburg without the assistance of helpers either out of Tucson or San Simon.

Q. When you get over to the wage columns, 16 to 27, inclusive, there is certain information on the sheet. Where was that taken from?

A. Those are the basic wages which I have previously described which can be determined in accordance with the contracts with the employees applying against these particular train and engine movements.

Q. These redispatched movements?

A. Redispatched movements and were placed there by our timekeeper, Mr. Garverick.

Q. Why is the amount shown for the movement, for example, the first item under "redispatch" you show the basic train engine wages as a certain figure. Why is that amount larger than the basic train engine wages for the first movement of the actual train?

[fol. 2624] A. Because the enginemen are paid in accordance with the weight on drivers on the locomotives.

Q. Is the 4100 class locomotive heavier on drivers than the 5000 class?

A. Yes.

Q. As shown on Mr. Russell's exhibit No. 5?

A. Yes, sir.

Q. You show no variable amounts for wages of enginemen or trainmen for the redispatched trains. What is the explanation?

A. They were handled in another manner in a lump sum calculation which will appear on a subsequent exhibit.

Q. Do you have the other 942 sheets which relate to the 1938 freight and passenger redispatch study?

A. Yes, we have them in our office across the street.

Q. Will they be available for the study of opposing counsel?

A. They will.

Q. Will the redispatch and actual train sheets which you have mentioned as a source of white work sheets, such as exhibit No. 198 for identification, also be available for the study of opposing counsel if they desire?

[fol. 2625] A. Yes, sir.

Q. Do you also have the time returns and delay reports which were used in making up these white work sheets?

A. Yes.

Q. Are they likewise available?

A. Yes, all of the basic documents covering the actual operations as well as the work sheets in connection with our redispatch operations we intend to make available to opposing counsel.

Q. I don't know if I have mentioned it, but I suppose that you have the original train sheets, the dispatchers' train sheets?

A. Yes, they are here in Tucson also.

Q. I take it that the purpose of this exhibit is to indicate the methods employed in one of the steps in developing the redispatching study rather than to portray the information as to this particular day and district?

A. That is right, this is merely to demonstrate the mechanics of making this redispatching study and to indicate my part in it and also the part of the other members of the party of course.

Mr. Mason: Do you have any questions, Mr. Strouss?

Mr. Strouss: This doesn't show any place on it, does it, [fol. 2626] the tonnage which was included in any train?

A. No.

Q. That would be a rather important thing to know in knowing how your train was to be handled, wouldn't it?

A. That is right. That information is shown on the original train sheet and on the redispatch train sheet and is one detail that I haven't discussed here completely although it seems to me I did mention it. The first thing that the trick dispatcher did after he was notified by the chief dispatcher of the consist of the redispatched trains was to compute the tonnage of the redispatched trains and the actual trains and to enter it on those redispatch train sheets at the head of those columns in order that he might

determine what the per cent relationship was, both of the actual train and the redispatched train, of tonnage to engine rating. It could have been put on here, but it would have been so much extra work and wouldn't have served any particular service in further compilation. That item, however, was one of the very important considerations in connection with this redispatching study.

Mr. Mason:

Q. Do I understand that the tonnage handled in the [fol. 2627] various trains was not a necessary item in the particular step undertaken by the work sheets, of which this is one of the steps?

A. That is right. At the time the white work sheet was drawn off we had progressed beyond the tonnage stage. From that point on we were making a record of the movement and were trying to get train-miles, locomotive-miles, and money.

Mr. Strouss: You are a little ahead of time on this exhibit then.

A. I don't follow you there.

Mr. Strouss: It has to assume that the train sheets of the assumed operation are correct, that the tonnage which is not shown here could be handled in the way you have indicated on here.

A. I don't know that I will agree with you in your choice of the word "assumed." I have spent a couple of hours here describing the mechanics of this redispatching study. There isn't very much assumption about it. The chief dispatchers and the trick dispatchers knew what they were doing every minute.

Mr. Mason: I think what Mr. Strouss means is this, that the white work sheet was drawn off after the operation had been completed.

A. I will agree with that.

[fol. 2628] Mr. Mason: And was a step after the operation had been completed, isn't that what you had in mind, Mr. Strouss?

Mr. Strouss: Yes, but in order to show the data that you do here you do assume that the redispatched tonnage could be handled as shown on the redispatched train sheets without showing the tonnage here.

A. Subject to my qualification of the word "assumed" I will agree with you.

Mr. Mason:

Q. This represents that the tonnage has actually been handled in these redispatch trains, does it not?

A. As far as I am concerned it has, yes.

The Court: Putting it another way, in the upper block there, which I understand represents the actual train movements, you have there, I don't know just how many more but a few more trains than what you show on your redispatch movements below?

A. That is right.

The Court: But all of the traffic, if I may use that broad term, reflected in the upper block has been moved in this theoretical movement of your redispatch in the lower block?

A. That, generally, is a true statement, yes, sir.

[fol. 2629] Mr. Strouss: What do you mean by "generally"?

A. Because if you look at the tables in column 12 you will find that the total loaded cars was 546 actual and 584 redispatch. From one end of the month to the other end of the month we had moved the same volume of business but within any twenty-four hours we would not necessarily move the same volume.

Mr. Mason: Does that mean that some business which was moved actually in the twenty-four hours, midnight to midnight, June 18, may have been moved slightly before midnight of June 17-18 and redispatched?

A. Yes.

Q. Or the opposite; it may have moved after midnight on June 19, for example?

A. That is the idea.

Mr. Strouss: I noticed a little while ago you testified concerning numbers as identifying classes of engines used on the redispatch. Did you identify all the different classes of locomotives used?

A. On our redispatch train sheets?

Mr. Strouss: Yes.

A. Yes, sir.

Mr. Strouss: You did?

A. Yes.

[fol. 2630] Mr. Mason: What did you have in mind, Mr. Strouss? I think he identified the 4100's as the train engine class which was contemplated by the redispatched plan.

Mr. Strouss: I didn't understand at the time he was giving them all. I thought he was giving typical examples; I didn't take them down but I can get them from the transcript. These numbers would mean something to me.

Mr. Mason: I think I can develop that a little bit but in order that the record may be clear, Mr. Sines, what type of locomotive was contemplated to be used as to train locomotive on your redispatch trains between Yuma and El Paso?

A. AC-8.

Q. What does the number 4100 indicate?

A. AC-8 locomotives.

Q. You didn't assume any particular AC-8 locomotives; did you?

A. No.

Q. But just that you would have a group of AC-8 locomotives otherwise called "4100" class locomotives?

A. Yes.

Q. Your previous testimony did not mention it but you show here the use of 5000 class locomotives as helpers?

[fol. 2631] A. Yes.

Q. Was that a part of the redispatching plan that the S. P. type or 5000 class locomotive would be used in helper service?

A. Yes.

Mr. Mason: Does that make it clear to you now, Mr. Strouss?

Mr. Strouss: Yes. Are the tonnage ratings of those locomotives shown on your timetables for this division?

A. All except the AC-8, that is not shown on the tonnage rating tables of the Tucson or Rio Grande divisions for these districts. Generally, however, the tonnage rating of the AC-8 is 165 per cent of the rating of an F-4 locomotive, within two or three per cent one way or the other.

Mr. Strouss: Of an F-4?

A. Of an F-4. I can give you that rating over the ruling grades either now or later on.

[fol. 2632] Mr. Mason: I was going to develop that anyway, but I think we have an exhibit which is pending here.

not introduced, and if you have no more questions on the exhibit, Mr. Strouss——

Mr. Strouss: No.

Mr. Mason: Has your Honor any questions?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as Defendant's No. 198.

Mr. Strouss: I object to it as irrelevant and immaterial, calling for the opinion and conclusion of the witness, and speculative.

The Court: I will hear you, Mr. Mason, on that objection. The court doesn't know, of course, just how far you intend to pursue this line. Up to date we have dealt with actualities; now we are getting over into the realm, as I take it, of what the Southern Pacific would have done had they not been confronted with the Arizona law, how they would have handled this traffic, which is purely theoretical.

Mr. Mason: Not entirely theoretical; it is no more theoretical, your Honor, than, for example, would be the plans of an architect who had built a building, who had drawn the plans and had a building constructed, let us say, eight [fol. 2633] stories high, if he were suddenly confronted, with an ordinance that the building must not be more than six stories high, that it must have the same floor space and accommodate the same number of tenants as previously accommodated. Now, in order to resist that ordinance, if you like, it might be necessary to show how the building would have to be constructed and cut down in order to meet the terms of the ordinance, and what the cost would be, and how the operation, if it were undertaken, could be undertaken. Here we have the architects, or their counterparts in the chief dispatchers and trick dispatchers who actually ran the trains subject to the 70-car limit, and its extra-territorial effect over the district covered by the redispatching study. We have the same men undertaking to run the same traffic over the same territory, in the same period, and under the same conditions, except as those conditions would be changed by the elimination of the 70-car restriction. Perhaps my illustration of the imposition of a new restriction is the reverse of what we have here. Here we have produced an architect who has previously been faced with a six-story limit and who is now called upon to prepare the plans for an eight-story building because the [fol. 2634] restriction has been lifted and who wants to

show that it is practicable to build an eight-story building. He therefore prepares the plans and shows what those plans would be. We have nothing different here.

I want to call to your Honor's attention that in the first Arizona train limit case, as a reference to the opinion will show, a redispatching study was presented. It was presented by Mr. Andrus. I am not referring to the Santa Fe redispatching study presented by a gentleman from that railroad. Mr. Andrus of our railroad presented a redispatching study as applied to certain traffic in 1927, I think it was. The evidence was received in 1930—Mr. Strouss may correct me if my memory is a little hazy—Mr. Andrus presented such a study, and it formed the foundation for many of the conclusions and findings of the court and it is mentioned in the opinion. When we came to the Nevada train-limit case, we were, of course, faced there with the imposition of a new restriction upon operations hitherto unrestricted. We then presented—and your Honor has been furnished with a copy of the findings—a redispatching study, and the findings of the court which relate directly to that redispatching study and the results of the redis- [fol. 2635] patching study, as indicating the burden upon the commerce handled across Nevada and the delays imposed upon that commerce, and the added expense which the law would impose, are all predicated upon the redispatching study which was introduced in the Nevada case; introduced, I may say, by Mr. Sines and the train dispatchers who worked with him and developed them. I had intended to develop by Mr. Sines that the redispatching studies here were developed largely as they were in the Nevada case. The use of redispatching studies in a train-limit case of this kind is certainly proper, if the opinion of the courts which have considered the matter is to be taken as any guide, and particularly if their reliance upon the redispatching studies is to be taken as any guide. I would like to refer your Honor particularly to finding No. 17 in the Nevada Case which appears on Page 30 of the print, and which reads as follows: If I may impose upon you by quoting it. It is headed "17. Effect of the Train Limit Law upon Plaintiff's Operations. The Redispatching Study.

"To determine the effect of the Train Limit Law upon its operations, plaintiff conducted a study of the trains and traffic handled over its Nevada lines during the months [fol. 2636] of February and October, 1934." I interpolate

to say that this case was heard commencing in 1935, and that the evidence with respect to the redispatching study was introduced during September and October of that year. Continuing the quotation: "The two months selected were typical and representative of the year 1934. February was the month of the lightest traffic volume and October the month of heaviest traffic volume. The volume of the traffic handled in the two months taken together constituted slightly less than one-sixth (15.709 per cent) of the total for the entire year. The study of railroad operations thus made is referred to herein as 'The Redispatching Study'," those three words being in quotations. "This study involved a detailed analysis of each of the freight trains actually operated by plaintiff over Nevada lines as to consists, speed, and other essential features of its operation; and the complete rearrangement, into "redispatched" trains, of the cars and traffic actually moved, so as to conform the plaintiff's operations for the purpose of the study, to the conditions which would be created and compelled, if the law were enforced.

[fol. 2637] "In making said study it was assumed that all the conditions which actually prevailed upon said lines during the two months mentioned would have continued to prevail, except to the extent that the limitations imposed by the law would have required modifications of plaintiff's operating methods, and certain changes in the types of locomotives used. The redispatching study was carefully conducted under the direct supervision of experienced and qualified operating and executive officers of the plaintiff, by chief train dispatchers who now and for many years past, have supervised the operation and movement of plaintiff's trains on the Nevada lines. The result of this study presents as accurate a determination as possible of the effects of the law, in the following particulars: (1) in requiring additional train service to be operated by plaintiff on the Nevada lines; (2) in creating or aggravating delays to and interference with plaintiff's trains and cars and the traffic transported thereon; and (3) in imposing additional expense upon plaintiff's operations."

That is substantially all of the finding in Paragraph No. 17. There are additional findings which go into the detail [fol. 2638] as shown by the redispatching study, referring to the additional train mileage made, the extra-territorial effect of the law as shown by the redispatching study, de-

lays at intermediate points, delays enroute, operation of additional trains, and reduction of train lengths, and financial burdens, all of which of course were dependent upon and directly related to the redispatching study and shows the result of it. Now, in the present case, we simply have the counterpart of the Nevada situation. In place of reconsisting or recasting the operations, so as to meet the conditions as affected by the limitation of the law, we recast them so as to meet the conditions which would prevail if the limitations of the law were removed; and, just as changes in the locomotives would be required for the short train operation in Nevada, so changes in the locomotives would be required for the longer trains operated in Arizona, and that change is part and parcel, as Mr. Sines stated in his testimony, of the redispatching operation. But in essence this redispatching study is just like the one in Nevada, carefully conducted and, paraphrasing from the language of the Court, "under the direct supervision of experienced and qualified operating and executive officers of the plaintiff, by chief train dispatchers who now [fol. 2639] and for many years past, have supervised the operation and movement of plaintiff's trains on the Arizona lines as affected by the Arizona Train Limit Law. It seems to us that by no other method could *be* as accurate a determination of the effect of the law, as alleged in paragraph 3 of our affirmative answer, be determined. Even if you were to operate trains in defiance of the law and risk the penalties, you would not get a complete answer because you would have to redispatch the long trains that you had operated into shorter trains in order to determine just how much you had saved by your long train operation. Furthermore, a long train operation in defiance of the law, let us say for a test month, would require the transfer of locomotives, would require the lengthening of sidings, would require therefore a very heavy investment. We can achieve the same result by comparing redispatched operation with the use of these new locomotives and with the use of long sidings, and compare it with what actually transpired, and obtain the results just as accurately as though we had violated the law and operated such trains. I will say, by reference to the exhibit received, No. 196, that we have a redispatching study based upon a period in April, [fol. 2640] 1940, when trains were operated without regard to the law, but at that time we didn't have long sidings,

which are part and parcel of the 1938 redispatching study; and we didn't have the AC power. We didn't use the AC power, we used the same locomotives for those long trains during April, 1940, that we used before and have used since for the shorter trains, but we have in this 1940 redispatching study a showing of the saving effected by that period.

The Court: Do I understand that during the month of April, the Southern Pacific Company operated their trains as though the law was not on the books?

Mr. Mason: For a period of twenty-seven days we operated approximately 300 trains, which did not comply with the provisions of the Arizona Law.

The Court: Both freight and passenger?

Mr. Mason: No, the passenger train operation was for a period of nearly two months; the freight train operation began on April 4th, I believe, and ended, I believe, on April 30th.

The Court: Then, does this study involve actual operations? What I am driving at is this, this statement as to the freight traffic, you say you did actually operate for a month or more?

[fol. 2641] Mr. Mason: Yes, 27 days freight train operation.

The Court: As though the law were not on the books?

Mr. Mason: Not entirely as though the law were not on the books. If the law were not on the books, of course, we would have undertaken siding extensions and transfer of power; we didn't do that.

The Court: You didn't transfer your heavier locomotives here?

Mr. Mason: No.

The Court: And made no improvement in your sidings?

Mr. Mason: No.

The Court: And no improvements in the roundhouses?

Mr. Mason: No. We have a redispatching study separate and apart from the one that Mr. Sines has been testifying to so far, which takes the trains as operated in 1940, and then redispatches those trains to the shorter length which would have been operated if the law had been fully observed; and then we have a redispatching study which takes those trains as operated and redispatches that traffic into trains which would have been operated if longer sid-

[fol. 2642] ings and heavier locomotives had been available.

The Court: Go ahead, Mr. Strouss.

Mr. Strouss: I have a long distance call that came about a half an hour ago.

(Thereupon, Mr. Strouss left the court room, and proceedings were suspended until his return.)

The Court: Well, Mr. Mason, before you continue with your presentation of this matter, maybe if the court asked two or three questions I might indicate what is in my mind. Of course, you will keep in mind, gentlemen, that while you have been through the mill before, this type of case, this is a case of first impression with the Court. I wish you would indicate just briefly and generally just the scope that you intend to cover with this. I am also concerned with whether you propose to put on the witness stand here the dispatchers and others who participated in this conference, in this study which took weeks and months. Now, Mr. Sines here has very frankly stated as he has testified, he would very frequently say, well, we did that and we decided that, and so on. Now, this study here, is it his conclusion or is it the conclusion of the group who conducted the redispatching study?

[fol. 2643] Mr. Mason: I think we are perhaps getting a little ahead of our story in discussing the admissibility of the redispatching studies at this time. Now, to answer your question, we do intend to call the chief train dispatchers. We intend to call four chief train dispatchers who participated in this study, particularly the chief dispatchers who successively occupied that position on the Tucson and the Rio Grande divisions. We have only had the subject presented by Mr. Sines initially, because he was the man in charge. Perhaps I should have identified him as the man in charge of the Nevada studies as well, so as to qualify him as a man of experience. We intend to call the chief dispatchers. Now, going to this exhibit, this exhibit after all is part and parcel of the description of the method which has been given here orally in very large part and, as your Honor will recall, without any running objection or any objection at all; and the objection occurs only when the exhibit is offered, although its purpose was stated to be illustrative of method, rather than an attempt to show actual results, particularly for the 18th day of June, 1938, on this particular district.

The Court: Then it is merely an illustration.

[fol. 2644] Mr. Mason: This is a short cut. By verbal testimony it could be done in the same way, but it would take an enormously long time to put this in by question and answer when it can be so quickly done by an exhibit. So as to this exhibit, when we argue the admissibility of the redispatching study, we are getting a little ahead of the story. The argument should come after the chief dispatchers and the timekeeper have testified.

The Court: Mr. Strouss, you have made this objection. The Court will hear you if you care to be heard.

Mr. Strouss: I want to deny that the oral testimony that has gone in is without objection. With what is contained in here, all that has been testified to so far are the headings of the different subject matters of the exhibit.

Mr. Mason: I didn't mean that. I meant as to the methods followed in the redispatching study. Up to the point where we struck Exhibit 198, Mr. Sines had testified at considerable length in that regard, and, as I understand, without objection. This is nothing but an exemplification of methods followed.

The Court: The contents of this particular exhibit in all this is relatively unimportant, it is a matter of the [fol. 2645] system used to illustrate the manner in which this redispatching study was conducted.

Mr. Strouss: At the same time, it puts in evidence for this 12-hour period their redispatching of the trains. Now, while it may be put in only for the purpose of illustrating the method of doing the work, it has more than that in it. It is what Mr. Sines testified that the actual train sheet for that 12-hour period contained, and what they did in the redispatching for that period.

The Court: Well, Mr. Strouss, even though it may be premature, it is evident that the Court is going to be confronted with this testimony and is going to have to rule on the matter. What is your view and attitude toward a redispatching study?

Mr. Strouss: I am coming to that.

The Court: All right.

Mr. Strouss: There are one or two other things I want to say ahead of that. The Arizona case of ten years ago is referred to again, and I again want to say to the Court that it is beyond me to see any rule of evidence in that

case. Now, the master in that case stated—and if counsel doesn't agree with me, I will be glad to bring the tran-
[fol. 2646] scripts here. I have them in my room, to read a statement of the master at the very beginning that whenever an objection was made that he was not going to rule on any objection, he would admit all evidence and have the matter later determined by the Court. Now, it never was determined by the Court. There was an ex-parte hearing in San Francisco, which the Company's attorneys attended, and the attorneys for the State did not attend, and which the Supreme Court later said was not a hearing later. Certainly, that opinion cannot be cited as any rule of law. Now, in the Nevada case, so far as I have been able to determine from this opinion and reading the record, the objections I have made here were not made in that case; certainly, there is no ruling upon it in this opinion, findings of fact, or conclusions of the Court. Now, this exhibit, as Mr. Sines has testified, the dispatchers after a conference decided upon this redispatching of trains. In the other case it was called the "assumed operation," and I beg your pardon for using that here.

The Court: I would say it was at least a reshuffling.

Mr. Strouss: But the actual operation of these trains, the dispatcher as the traffic comes up has to move the
[fol. 2647] traffic along, and these trains were operated in a twelve-hour period as shown, and over the two months, twenty-four hours each day for the two months' period. Then we have a gathering here in conferences which lasts from May to September to work out what they figured they would have done had the law not been in effect. Now that to me is purely speculative, purely opinion testimony by employees and officers of the defendant company here testifying as to a situation which did not exist as to what their opinion would have been if it had existed. That, I think, is not competent evidence.

Mr. Mason: Well, your Honor, I can only say as to the Arizona decision, that though the Supreme Court may have said that the decision was a mistake, nevertheless, the opinion has been published, and referred to with approval by at least one other three-judge court. Certainly, there is no fault to be found in the finality of the Nevada Train Limit Law case. Opposing counsel perhaps has the record in the Nevada case. Somewhat the same objection was

there made by the defendant attorney general, and what I have heard today is a faithful echo of that objection. There is nothing speculative, of course, about the redispatching of trains by experienced train dispatchers. In [fol. 2648] fact, they have to figure in advance what they are going to do with trains before they operate, otherwise the trains would get out on blind sidings and try to get around each other. They have to plan about the traffic before a train ever moves.

The Court: That is what happened at Dragoon the other night when I went home, it was held up about twenty minutes.

Mr. Mason: And it sometimes happens when a dispatcher overlooks his hand. He has to plan his work before the train ever moves and to speculate, if that is the proper word; anyway, he figures on what he is going to do. With a known condition confronting him, and with conditions as they existed tabulated for the purpose of his studies, there is no more speculation about the redispatching of the trains than there was about the dispatching of those trains in the first instance, perhaps somewhat less. In the redispatching he know- what difficulties he is going to encounter, while in the original dispatching he has to somewhat guess at that. It is opinion testimony based upon studies made by experts, by the men best qualified by experience by actual handling to express that opinion.

The Court: Mr. Mason, the thing that seems a little odd [fol. 2649] to the Court, I confess I don't see how you could avoid it in this type of study, but here is a group of men, of experts, who spend months making a certain study, each of them a specialist in his own field. Now, you call Mr. Sines as your first witness. Of course, you can't do this all at once, I recognize that; then he proceeds to give to the Court not only his opinion but the combined opinion of the experts there assembled.

Mr. Mason: Your Honor, he hasn't testified that is, not except perhaps as incidental, and then certainly not with the idea that it should intentionally appear; it is simply as to the methods which he and the members of the party undertook to use.

The Court: I think he is surely qualified as to the results, he got down to that more than once this afternoon, that he could handle that traffic with fewer trains and less expense.

Mr. Mason: I don't think he has testified as to expense. We will show the exact figures. I think that the conclusion is obvious that you could handle the traffic with less trains if you were not faced with a limit law. That is the expression of the expert; but it is also the opinion, the expression [fol. 2650] of the people who passed this law in the first place. They wanted more trains.

The Court: Other than the two cases you have cited, have counsel any authority on the matter of this study being admitted to prove a certain point, to illustrate it, and that evidence may be introduced as a result of that study. The Court will be at recess until ten o'clock tomorrow morning, at which time I will rule on the objection.

Mr. Mason: Of course, Your Honor will understand we do not intend merely to present some final figures and say, "We made a study and this is it." We will present each of the men who made the study to explain his methods. We will present all of the steps by which the result was achieved, and we will present to the opposition all of the train sheets, actual and redispatched, all of the work sheets of which the exhibit before you is merely an example, all of the other material mentioned by Mr. Sines in his testimony as having been used, so that they may, if they wish, go through the same process that we did or so much of it as they like, and find out whether we have done our work honestly and well.

The Court: There is one other comment I will make, and I am through. Of course, up to date, while this record [fol. 2651] is replete with figures and statistics, we have dealt in actualities, they are figures taken from your books, records and reports. Now, it seems to me that we might go far afield if we encumber this record with a lot of data, statistical and otherwise, as to what might have been done if the law had not been in existence. In other words, the reshuffling of these trains and their operation. While in one sense your comparison of the architect's problem is a good one, as a matter of fact, in this instance these trains were not operated under the reshuffling arrangement of your redispatching study; it is the opinion of these skilled men that had they had a free hand here is what they could have done. Now, is that proper; that is the question.

(Thereupon, the court stood at recess until Wednesday, January 22, 1941, at ten o'clock A. M.)

[fol. 2652] January [illegible] 1941, Ten o'clock A. M.

Proceedings were resumed at this time as follows:

Mr. Mason: Your Honor, the question before us at the adjournment last night, the specific question before us was as to the admissibility of Exhibit 198, the objection being that it was an expression of an opinion and conclusion of the witness. Now, perhaps Exhibit 198 in so far as it does show the results of the actual redispatching for June 18th between Tucson and Lordsburg eastward is an expression of results, and the witness who actually did the redispatching has not yet testified; so that the offer is premature in that respect. However, it wasn't offered, as I explained at the time, for the purpose of showing results, and that is entirely incidental. It is for the purpose of showing methods, and is merely an example of thousands of these work sheets that were used in the course of this redispatching operation. Perhaps, in order to obviate the objection at this time, it would be well to withhold for the time being the actual offer of the exhibit in evidence. It has been offered for identification, and when Mr. Baker, who was in 1938 and 1939 the chief train dispatcher of the Tucson division, has [fol. 2653] testified, then it will be appropriate to offer the exhibit as an expression of what he did.

The Court: I think it is premature at this time.

Mr. Mason: After the dispatchers have testified there will be before the Court a fuller explanation of what they themselves did in the redispatching study. So far, we have attempted to confine Mr. Sines' testimony to the matter of method and what the man in charge of the redispatching studies asked the dispatchers to do.

The Court: You may proceed.

Mr. Mason: We have prepared, along the lines suggested in your Honor's last statement recorded at the end of yesterday's proceedings, a brief memorandum of some authorities, text-book authorities.

The Court: Mr. Thompson handed that to me.

Mr. Mason: A copy has also been handed to the opposing counsel. In addition, I believe certain case citations have been made available.

The Court: You may proceed.

Mr. Thompson: I will furnish those to Mr. Strouss also.

[fol. 2654] B. S. SINES, resumed the witness stand for further

Direct examination (Continued).

By Mr. Mason:

Q. Will you refer to exhibit No. 196, please, Mr. Sines?

A. Yes.

Q. I believe that so far your discussion has mainly directed itself to item No. 1, the freight redispatching study for 1938 covering the months of June and August of that year on the principal main line via Gila and Lordsburg, is that correct?

A. That is right.

Q. Was there also made under your supervision a passenger redispatching study for the year 1938?

A. Yes.

Q. What territory did that cover?

A. From Los Angeles, California, to El Paso, Texas.

Q. What dispatchers participated in the making of that study?

A. Chief dispatcher Day of the Los Angeles division, chief dispatcher Cassady of the Tucson division, and chief dispatcher Worrell of the Rio Grande division.

[fol. 2655] Q. Did you follow substantially the same methods in the passenger redispatching study for the year as in the freight redispatching study for the two months' period?

A. The preliminary examination of the trains actually operated was as thorough with respect to passenger trains as it was with respect to freight trains. Thereafter, however, the mechanics of performing the redispatching study differed, and we set out only those operations which would have been changed by reason of elimination of the 14-car provision of the Arizona law.

Q. Was it necessary to make any change in the locomotives used to handle the trains, the type of locomotives?

A. No, the passenger locomotive assignment was the same under the redispatching study as it was under actual operation.

Q. Were any alterations or extensions of sidings contemplated as being essential to the passenger study?

A. That was not involved.

Q. Were any passenger trains eliminated from consideration for the purposes of the redispatching study?

A. As I indicated, the preliminary examination em-
[fol. 2656] braced every passenger train and second and extra sections that were run during the year 1938 to determine primarily whether or not any second or extra sections could have been eliminated. Having determined which section or extra sections might have been eliminated, further study was made to determine what the operations would have been if the extra or additional section had not been operated.

Q. That represents the extent of the passenger redispatching study, does it?

A. That is right.

Q. Was it necessary to operate the redispatched passenger trains with the same detail on redispatch train sheets as in the case of the freight redispatching study?

A. No, that was not done either. The work was carried forward to the white work sheet A, the form similar to the exhibit No. 198 for identification.

Q. You show as item No. 3 of the studies undertaken and listed on exhibit No. 196 an analysis of passenger operations for the year 1938. Will you explain, generally, just what this analysis consisted of and how it was undertaken?

A. Yes. In order to comply with the provisions of the
[fol. 2657] 14-car limit for passenger trains in Arizona, it is frequently necessary to perform switching which otherwise would not be performed at such terminals as El Paso, Tucson, Phoenix, Yuma, and Los Angeles. We examined the records to locate instances where such switching had been performed and where it would not have been necessary had there not been the 14-car limit and wrote complete histories of those instances and then analyzed and classified those instances and have set them out in an exhibit.

Q. This was not in the nature of an operation of the same trains or the same traffic in reconstituted trains in lieu of those actually operated, was it, this particular analysis?

A. It involved that consideration also because very often switching had been performed at Yuma which would have been unnecessary had the trains been permitted to run through Arizona with a consist in excess of 14 cars.

Q. Who performed this work of analysis of passenger operation, item No. 3 of exhibit No. 196, in addition to yourself?

A. One of the trick dispatchers assigned to the redispatching party and the chief dispatchers of the three divisions who also performed the passenger redispatch study [fol. 2658] listed here as item No. 2.

Q. Was this analysis undertaken at the same time or during the same working period of 1939 which you have previously mentioned as being used for the freight redispatching study?

A. Yes, it was.

Q. You show as item No. 4 a freight redispatching study, Phoenix to Tucson, month of December, 1938. Was that performed under your jurisdiction and supervision?

A. It was.

Q. By whom was that performed?

A. Chief dispatcher Cassady of the Tucson division.

Q. What was the reason for selecting the month of December, 1938?

A. That is the month when the perishable business is at its peak in the Phoenix territory and when trains of more than 70 cars could advantageously be run between Phoenix and Tucson.

Q. Was the redispatching study of the Phoenix-Tucson line undertaken along the same lines and along the same general principles as the freight redispatching study, item No. 1 of exhibit No. 196?

A. It was, although there again it was not necessary to [fol. 2659] set up the redispatched operations on redispatch train sheets. There were only one or, at the most, two trains involved in each direction in any one day, and the work was carried forward directly on to the white work sheet A.

[fol. 2660] Q. Now, will you please refer to Item 5?

A. Yes.

Q. I note that the period referred to is April 4th to April 30th, 1940. Why was that period selected?

A. That was the period when the Company disregarded the 70 car provisions of the Arizona Train Limit Law.

Q. As to freight trains?

A. As to freight trains, yes.

Q. And what operations were compared, what was undertaken in the redispatching study, Item 5?

A. We endeavored there to ascertain what the savings had been to the Southern Pacific Company by reason of its

long-train operation, and in order to do that it was necessary to recast the business or redispatch it in short trains to find out how many more train miles and locomotive miles would have been required to handle the same amount of business if it had been handled in the shorter trains.

Q. Did you make any assumption or differentiation as to the character of the locomotives used in your redispatched trains as compared with the actual trains operated during the period April 4th to 30th, 1940?

[fol. 2661] A. No.

Q. Did you make any assumption as to siding lengths, any changes in siding lengths?

A. No.

Q. Did you make any assumption as to change of conditions other than the assumption that for the purpose of the redispatching study the 70-car law would be observed instead of being disregarded?

A. That was the only consideration.

Q. What plan was followed with respect to the operation of your redispatched short trains of 1940 as to time through terminals?

A. The trains were dispatched from the initial terminals at the same times as the trains had operated actually; times through intermediate terminals depended upon the amount of work to be done on the trains in accordance with the experience and judgment of the dispatchers that were handling the redispatching study.

Q. By the way, what dispatchers handled the redispatching study for the 1940, particularly Item 5?

A. Chief Dispatcher Cassady of the Tucson Division, and Chief Dispatcher Herrell of the Rio Grande Division.

Q. Were they assisted by trick dispatchers?

[fol. 2662] A. They were.

Q. Did you otherwise follow the same outline of principles and procedure that you have presented in detail with respect to Item 1 of exhibit No. 196?

A. Quite generally, with this exception that whereas in 1938 the dispatchers had matched the operation of the redispatched train with an actual train on the basis of percentage of tonnage to rating of locomotive, the dispatchers didn't do this in the short trains redispatched for 1940, but set up the time of dispatching between terminals and points on the railroad in accordance with the performance of

trains as they had observed them for the past ten or fifteen years in actual operation.

Q. Were there any other differences between the manner in which the redispatching study, Item 5, was conducted, and the manner in which the redispatching study of 1938, Item 1, was conducted?

A. None of any moment, that I can recall now.

Q. You show here as Item 6 a further redispatching study relating to the operation between April 4th and April 30, 1940. Will you state just what the redispatching study thus undertaken was?

[fol. 2663] A. Yes. As a result of the redispatching study indicated in Item 5, it was apparent that the limitation placed on the long-train operation during the period April 4th to April 30th by reason of the fact that sidings were still short and that the power that we had then was not capable of handling complete long train operations, it was apparent that the railroad had not benefited to the full extent that would be possible had the Arizona Train Limit Law been set aside and had we entered a full long-train program.

Mr. Strouss: I move that that be stricken, Your Honor, that is a conclusion of the witness.

The Court: That is as to the fact that they were not——

Mr. Strouss: Whether they had been fully benefited or not.

Mr. Mason: Your Honor, I submit that the witness is an expert who has made a study and who is expressing results which were apparent to him from that study, and he has carefully described the study. Now, he is also merely laying the foundation or stating the reason for the further study that was made.

The Court: The motion to strike will be denied.

[fol. 2664] A. We undertook still another study of the business handled in April, 1940, once more to determine what we could have done with an AC-8 locomotive as the principal road locomotive, and with sidings extended as we had contemplated extension for the June-August, 1938, redispatch.

Q. Did you, for the purposes of your study, identified as Item 6 of Exhibit 196, contemplate the same siding extensions which are shown as contemplated on Exhibit 197?

A. Yes.

Q. And did you contemplate the use of AC-8 power as the principal type of road locomotive?

A. Yes.

Q. On the entire division?

A. Yes.

Q. On the entire district, I should say.

A. Between Yuma and El Paso.

Q. By whom was the actual redispatching under Item 6 performed?

A. By Chief Dispatcher Cassady of the Tucson division, and Chief Dispatcher Herrell of the Rio Grande division, assisted by two trick dispatchers. The makeup of the party was the same in our 1940 study as it was in the 1938 study.

Q. With the exception of Mr. Baker?

[fol. 2665] A. Yes.

Q. Now, when were the two 1940 studies conducted?

A. From July 15, 1940 to about November 15, 1940.

Q. Did you follow the same plan of making the study as you have described for Item 1?

A. Yes.

Q. As to the matter of time between terminals, meets, passes, assignment of delays, and so forth, were there any differences in principle observed as between Item No. 6 and Item No. 1?

A. None at all.

Mr. Mason: Your Honor, at this time I will ask permission to withdraw Mr. Sines. He will return to the stand, of course, in order to present, after the dispatchers have testified, the results of the redispatching study. However, if Mr. Strouss desires to cross-examine him at this time on what has been presented so far, of course he is tendered for cross-examination.

Mr. Strouss: No.

The Court: You may withdraw the witness.

Mr. Mason: There is one other question I perhaps should ask him before he leaves the stand at this time.

[fol. 2666] Q. Was the south line between El Paso and Tucson via Douglas included in the redispatching study for 1940, or either of the redispatching studies for 1940?

A. No.

Mr. Mason: That is all at this time.

The Court: The operations from Yuma to Phoenix were not included either, were they?

A. No.

Q. But there is the one study made of the operations from Phoenix to Tucson?

A. For 1938, yes.

The Court: Call your next witness.

Mr. Mason: We will ask Mr. Baker to resume the stand.

[fol. 2667] Mr. Mason: Your Honor, it occurs to me that I promised last night to qualify Mr. Sines as having supervised and participated in the Nevada Train Limit case redispatching study. I don't suppose there is any doubt in the mind of Mr. Strouss that that is a fact.

Mr. Strouss: I read quite a few pages of record that were under his name.

Mr. Mason: Perhaps without his resuming the witness chair I can ask him now before Mr. Baker testifies as to his participation.

The Court: You may do so.

Mr. Mason: Mr. Sines, will you state whether or not you participated in the Nevada Train Limit case?

A. I did.

Q. Was a redispatching study made for the purpose of the Nevada Train Limit case?

Mr. Strouss: I object to this as immaterial.

The Court: Objection overruled.

A. There was.

Mr. Mason:

Q. Under whose immediate supervision was that study conducted?

A. My own.

Mr. Strouss: My objection goes to all of this.

The Court: Yes.

[fol. 2668] Mr. Mason: It is understood that it does.

Q. Did you assemble a party for the purposes of making that study?

A. Yes, we had a party there that consisted of the chief dispatcher of the Sacramento division——

The Court: (Interrupting) Mr. Mason, I don't think it is necessary that we go into great detail on that. The witness has testified that he did make such a study or it was done under his direction, and I presume, Mr. Sines, it was carried out very similarly to your study that was made here in this case?

A. Very much.

Mr. Mason:

Q. Did you follow substantially the same methods and principles in the Nevada study that you have described as having been followed in connection with the Arizona studies?

A. Yes, the principal difference there being that we were redispatching long trains into short trains.

Q. Whereas in the present case with one exception you were redispatching short trains into long ones?

A. Yes.

Q. I take it, then, that the redispatching study, No. 5 of your exhibit No. 196, was a redispatching study very [fol. 2669] similar to the one undertaken in Nevada?

A. That is right, it was a counterpart of that study.

Mr. Mason: I think that is all.

(Witness excused.)

G. C. Baker was recalled as a witness in behalf of the defendant and having been previously sworn testified further as follows:

Direct examination (Continued).

By Mr. Mason:

Q. Mr. Baker, you have previously stated that you were a dispatcher and subsequently chief dispatcher on the Tucson division?

A. Yes.

Q. You have also had experience as the agent at Yuma?

A. Yes, sir.

Q. And as a dispatcher at El Paso on the Rio Grande division?

A. Yes.

Q. Will you describe the primary duties of the chief dispatcher of a division or district?

[fol. 2670] A. The chief dispatcher arranges for and supervises the movements of trains over the division of which he has jurisdiction; provides the necessary crews and power at various terminals and helper stations to protect the movement of trains; supervises the work of train dispatchers, telegraphers, station agents, and arranges with the yard masters at the various terminals as to the amount of tonnage and class of power to be furnished each train and also watches the time of livestock in transit in compliance with the Federal law; also provides for the picking up of loads and empties at intermediate points and the distribution of empty cars to protect the requirements of the shippers; watches very closely the schedules of the various freight and passenger trains in order that the schedules will be maintained or recover as much time as possible under existing conditions, such as weather conditions, track conditions, tonnage being handled, and so forth.

Q. Does he supervise directly the work of the train dispatchers?

A. Yes.

Q. You heard the testimony of Mr. Sines yesterday as to the work performed by trick dispatchers, did you?

[fol. 2671] A. Yes, sir.

Q. Are the trick dispatchers immediately under the jurisdiction and direct supervision of the chief train dispatcher?

A. Yes, sir.

Q. Mr. Baker, is it necessary to make separate provision day by day for the crews and locomotives to handle passenger trains?

A. No, not the regular passenger train crews; the crews are regularly assigned for those particular runs, trains that operate every day.

Q. Where extra passenger trains are to be operated, what does the chief train dispatcher do?

A. It is necessary then to provide the proper power and crews for those extra trains.

Q. Turning to freight trains, are main line through freight trains operated with the same regularity as passenger trains?

A. No, their departure from the terminal is governed to a large extent by the amount of tonnage that is available to move received from the connecting divisions and also as a

rule in handling unidentified trains, such as drags and empty reefers, the chief dispatcher generally lines up that operation to fit in with the opposing movement in order that he may protect his power and crew

[fol. 2672] Q. Does the amount of traffic to be moved have any effect upon the number of freight trains to be operated?

A. Yes.

Q. Does the number of freight trains operated on the division fluctuate from day to day?

A. Yes, it does.

Q. And the number operated out of a particular terminal in a particular direction may fluctuate from day to day?

A. Yes, sir.

Q. For example, in determining the number of freight trains to be operated eastward out of Yuma on a particular day what special considerations govern?

A. We receive advance line-ups or flashes at Yuma in this particular case from the chief dispatcher at Los Angeles and we then arrange to reconsist the trains in order that the number of cars may be moved in the least number of units possible and the train is lined up out of Yuma in order that they may take care of any short traffic to be picked up between terminals.

Q. In lining up your trains to be moved out of Yuma, do you have in mind schedule or time requirements on the eastbound traffic?

[fol. 2673] A. Yes, the schedule is the main requirement with identified freight trains.

Q. Do similar considerations govern as to the trains operated westward out of Lordsburg?

A. Yes.

Q. In originating trains at Tucson either eastward or westward, what do you have in mind?

A. We have to give the same consideration as to how the trains are on schedule and the power available and whatever work there is to be performed on the line in the picking up and setting out of traffic at intermediate stations.

Q. Do you obtain in advance information from the Los Angeles division?

A. Yes.

Q. How far in advance of the arrival of the traffic at Yuma does your information usually reach you?

A. Our first information giving a tentative line-up is received from sixteen to eighteen hours in advance of the actual arrival of the train at Yuma.

Q. What does that advance information include, what information as to the trains or the traffic?

A. It generally gives the identification of the train and [fol. 2674] the approximate arrival of the train at Yuma.

Q. Do you receive similar advance information from the Rio Grande division?

A. Yes, sir.

Q. How far in advance of arrival at Lordsburg do you generally get that information?

A. Approximately the same time, sixteen to eighteen hours, our first information.

Q. Do you receive any supplementary information from those divisions?

A. Yes, these line-ups are supplemented from time to time in order that after the trains have actually departed from El Paso or Los Angeles and Colton we will know the actual number of units that are to be received at those points, either at Yuma or at Lordsburg.

Q. Do the yard masters at points such as Colton where trains are made up give you any information?

A. Yes, as soon as the eastward perishable trains leave Colton, we are furnished with the information as to the number of perishable, manifest, dead loads, and empties that are in that train leaving Colton.

Q. How far in advance of arrival of the Colton blocks at [fol. 2675] Yuma would the information from the Colton yard master reach you?

A. Approximately nine to ten hours, sometimes twelve hours in advance.

Q. Does the yard master at Yuma send out advance information after trains have arrived or trains have been made up at Yuma?

A. Only the consist. When the train departs from Yuma, the information is given to the trick dispatcher by the operator at the Yuma yard, showing the time that the train departs from Yuma. However, the information as to what the train consists of, there is a detailed consist filed by the yard master and transmitted immediately upon departure of the train.

Q. To whom is that transmitted?

A. The chief dispatcher at Tucson and the chief dispatcher at El Paso.

Q. That is flashed ahead to El Paso?

A. Yes, sir.

Q. Is a similar advance flashed of the consist of the train as it departs made up at Tucson and sent on ahead of the train to El Paso?

A. Yes, as soon as the train departs from Tucson, then a detailed consist is filed by the yard master at Tucson addressed to the yard master at Lordsburg and the chief dis- [fol. 2676] patcher and yard master at El Paso.

Q. Is similar advance information given by yard masters, for example, at El Paso covering the movement of westward trains?

A. Yes, sir.

Q. What use does the chief train dispatcher, and yourself as chief train dispatcher particularly, make of this advance information?

A. Well, I use these consists to plan my operations for the day, that is, of the traffic that is to be received, taking into consideration at Yuma, for example, the number of cars which I am permitted to handle or the class of power that I have and the tonnage which that certain type of power could handle and the number of loads that I may have to pick up at intermediate stations in order that the proper number of cars may be ordered on these trains out of their various terminals.

Q. Are there any away-from-home terminals for train and engine service employees on the Tucson division?

A. Yes, the away-from-home terminal for the crews operating east out of Yuma is Gila and Gila is also the away-from-home terminal for the crews operating westward from Tucson. Lordsburg is the away-from-home [fol. 2677] terminal for the crews operating eastward from Tucson.

Q. Do you have to make provision for crews to be present at those points in order to move trains which change crews there?

A. Yes, I have to make arrangements well in advance in order that the proper power and crews will be available at these away-from-home terminals to protect the traffic moving.

Q. Do you maintain a pool or reserve of locomotives at Gila and Lordsburg?

A. No, we occasionally may have what we call a "drop-back" engine in order to expedite the movement of trains through those terminals.

Q. You don't maintain any substantial number of locomotives there to protect the movement?

A. No, it is merely a protection engine.

Q. How do you arrange to have crews and locomotives available at those away-from-home terminals to handle the movement of trains?

A. The number of crews required is determined by these advance line-ups that we receive from the connecting divisions and then we see the number of trains that we have to operate westward, the number of trains that we have to protect eastbound, I am talking about Gila now, and unless the power and crews will balance at those points it is neces-
[fol. 2678] sary in order to get power to double-head the train and dead-head the crews to Gila in order to balance the unbalanced trains.

[fol. 2679] Q. Do you have to take these steps, or double-head and deadhead, in other words, in getting the engines and crews to Gila substantially in advance of the arrival of trains?

A. Yes, in case of our train crews, it is necessary that they arrive at the outside terminals in time that they may be fully rested in accordance with the Federal law or local agreements with the brotherhoods.

Q. About how much time in advance do you have to make arrangements for the departure of crews from the home terminal in order to protect an unbalanced movement?

A. Well, it depends on the districts, the district or the away-from-home terminal at Yuma, it is necessary that we know at least from 12 to 16 hours in advance of the requirements at that point in order to get the crews there so they will get the proper rest.

Q. Suppose you have to move crews and power to Lordsburg, what advance notice do you have to have?

A. Well, at least 20 hours.

Q. Does it ever happen that there are more trains moving westward to Gila than are moving eastward from Gila?

A. Yes, that is the case quite often.

[fol. 2680] Q. What happens to the surplus locomotives and surplus crews in that case?

A. Well, then we are required to doublehead the surplus locomotives back east and deadhead the surplus crews back to their home terminal at Tucson.

Q. Do you move the engines back coupled to another train when you speak of doubleheading?

A. We do unless the tonnage in the train exceeds the rating of the heaviest locomotive, then we are required to run the engine light, except over the helper district between Gila to Estrella, we can couple them in there without penalty.

Q. You run the engine light. Does that mean without any cars?

A. Yes.

Q. You speak of deadheading crews. Are crews and cabooses particularly assigned one to the other?

A. Yes.

Q. When you deadhead a train crew as distinguished from the engine crew, do you also deadhead a caboose?

A. Yes.

Q. Now, what happens if a train and engine crew is held at Gila without any work to do because of having gone there [fol. 2681] with a train and finding no train on which to return for service?

A. Well, unless the service is not required, why, we deadhead them back. However, there are times when we have no way to deadhead the crew back, or it may be that we may wish to hold this crew at Gila an excessive length of time to avoid the deadheading of another crew from Tucson. However, when that is done and the crew is at Gila, is away from home terminal more than 16 hours, then he starts drawing pay and he draws eight hours' pay in every 24 hours after that he is held at that away-from-home terminal.

Q. And what do you call that type of compensation?

A. Held away from home terminal.

Q. What are some of the circumstances that lead to an unbalance of trains in opposite directions over the Tucson division?

A. Well, the perishable movement, or shortly after the perishable movement commences there is a heavy return movement of empty refrigerator cars westward, which return through the Tucumcari and El Paso Gateway and which it is necessary for us to work as far north as up in

the Santa Maria Valley and San Joaquin Valley, and also [fol. 2682] take care of the requirements in the Salt River Valley, Yuma Valley and Imperial Valley, and the number of cars operating westward is much in excess of the eastward movement, which causes an unbalance of train-miles.

Q. Why does it cause an unbalance of train-miles? Why not make the westward trains longer than the eastward trains?

A. Well, we are restricted to seventy cars through Arizona under the Arizona law.

Q. Is there any preference as to movement of trains over the division as between particular types or kinds of trains?

A. Yes, passenger trains are given first preference. They have preference to freight trains and our west manifest trains, which are on a very fast schedule, are usually given preference over our perishable trains, and, of course, perishable trains are given preference over drag or freight trains of less importance, in which no schedule is required to be made.

Q. Does the chief dispatcher have anything to do with the designation of preferences as between trains?

A. Yes, he generally issues necessary instructions, or, however, the dispatchers know generally the class of trains [fol. 2683] which is to be given preference and handles his trains accordingly over the road in order that the preferred train will receive the best possible handling.

Q. Now, I think you stated initially that the chief dispatcher supervises the movement of trains. Who actually issues the orders for the movement of trains out of terminals and over the road?

A. The trick dispatchers.

Q. And what is the primary problem of the chief dispatcher and the trick dispatcher with reference to the movement of trains?

A. Well, the principal problem is to move the trains over the dispatcher's district or the district in which he is handling the trains in the manner in which delays for meeting and passing will be at a minimum, and keep his passenger trains on time, on schedule, or handle them in a manner so that they will recover it if they are late, giving freight trains the benefit of any late time that the passenger trains may be operating. In fact, the idea is to get the trains off the district as quick as he can so that he won't be bothered with them; that is the idea.

Q. On a railroad such as the Tucson Division, I take it that the big problem in getting the trains off the division [fol. 2684] is getting them by each other?

A. That is correct.

Q. Is the problem of meets and passes one of the principal problems facing the dispatcher operating the trains?

A. Yes, that is his chief problem.

Q. Is that problem simplified or rendered more complicated if more trains are operated?

A. Well, the more trains that are operated, why, the problem of the trick dispatcher is very much multiplied, more meets and more passes, why, his work is multiplied to that extent.

Q. Is there always a trick dispatcher on duty at division headquarters?

A. At all times, yes.

The Court: We will take our morning recess at this time.

(Thereupon, a short recess was taken, after which the witness was recalled to the stand, and proceedings were resumed as follows:)

The Court: You may proceed.

Mr. Strouss: If you want to put in the record now——

Mr. Mason: With respect to Exhibit 13. Your Honor, as a result of discussion with Mr. Strouss, during the inter- [fol. 2685] mission, we have reached an understanding with respect to Exhibit No. 13. Your Honor will recall that that was introduced by General Manager Wright of the New York Central, and at the time the train sheets were not available. We have made arrangements to have the train sheets brought here by Mr. Wright, by another witness equally qualified, but now Mr. Strouss states that he is willing to waive the production of the train sheets, and so far as his objection to No. 13 was predicated upon the failure to produce the underlying records, that objection may be considered withdrawn.

Mr. Strouss: Yes.

The Court: Then you are re-offering the exhibit?

Mr. Mason: Yes. It has previously been received, but your Honor indicated some doubt as to the propriety of the ruling first made. That ruling, I take it, may now stand as to the objection to competency. The objection as to materiality and relevancy is not withdrawn, I understand.

The Court: That completes them, does it not?

Mr. Mason: I believe that completes all the exhibits so far tendered along this line.

Q. Mr. Baker, are the train sheets made up under the [fol. 2686] supervision of the chief train dispatcher?

A. No, that is the duty of the trick dispatchers. I understand you mean the heading up of the train sheets?

Q. What I mean is this, this is one of the duties of the trick dispatchers, is it?

A. Yes.

Q. And is performed by them at the office of the chief dispatcher and trick dispatcher?

A. Yes, sir.

Q. Like their other duties, is it performed under the supervision of the chief dispatcher?

A. Yes.

Q. Is the chief dispatcher familiar with the train sheets of his division?

A. Yes, that is where the chief dispatcher gets his information as to the number of cars that he is operating and also the condition of the train, that is, with respect to schedules, the tonnage, and so forth.

Q. Does the chief dispatcher make regular and daily use of the entries on the train sheets?

A. Yes, he refers to that many times during his tour of duty.

Q. And the train sheets are kept in the chief dispatcher's [fol. 2687] office, are they?

A. Yes.

Q. How many train sheets are there for each district for each 24-hour period?

A. There is one train sheet for each 24-hour period for each district worked. However, there is occasion when a trick dispatcher may have two train sheets to work with, due to the length of his district or it may be necessary that two train sheets be provided.

Q. There will be a train sheet for each portion of the district which he is working?

A. Yes.

Q. Now, what entries are particularly recorded on the train sheets?

A. Well, the sheets are headed up, first it shows the train number, and then it is followed with the conductor, the

engine crew, and the engine number, and then the first entry, of course, is the time of departure at initial station, showing the number of cars and tonnage which the train has leaving that point.

Q. Is that detail recorded for each train operating over the district?

A. Yes, every train must be recorded on the train sheet, every movement.

[fol. 2688] Q. Now, are the times at other stations recorded to show the progress of the train?

A. At all open telegraph offices where the train is reported the time is reported on the train sheet.

Q. Do you show the identification of the train as well as its number, if there be a separate identification?

A. Yes, we show for instance, in the case of a perishable train, the identity of the train.

Q. Suppose a train leaves the terminal tonight, let us say, at eight o'clock, where is the movement of that train carried if it continues on the district after twelve midnight?

A. It is continued on that same sheet through to its destination.

Q. Then, after midnight there might be two train sheets before the same trick dispatcher covering the same district?

A. Yes, sometimes four train sheets, he may have to work with four train sheets.

Q. That is where he has two separate districts covered by two separate train sheets?

A. Yes.

Q. Does the train sheet show the time that it arrives at its final terminal?

[fol. 2689] A. Yes.

Q. Suppose a second locomotive is attached to the train, does that information appear on the train sheet?

A. Yes, all that information is carried on the train sheet, and shows what particular train it is attached to. There is a column provided for that purpose on the train sheet.

Q. Are light engine movements shown on the train sheet?

A. Yes.

Q. Do you show any of the details of the consists of freight trains on the train sheets?

A. No, nothing other than the table of loads and empties and their tonnage.

Q. Do you show distribution as between perishables, manifests, and livestock?

A. No, not on the train sheets.

Q. Do you show any classification as between company materials and other non-revenue freight and revenue freight?

A. No.

Q. Do you show any of the car numbers?

A. No.

Q. How does the dispatcher obtain the information as to the time that the train arrives at or departs from interme-
[fol. 2690] diate stations along the route

A. We have progress of the train reported by station agents or telegraphers at various points along the line.

Q. Now, how does the dispatcher arrange for changes in the movement of a particular train, or instructions as to its movement?

A. By the use of train orders.

Q. How does he get those train orders to the train?

A. They are transmitted to operators at various points along the line and addressed to the conductor and the engineer of the train to which the instruction refers, and in case of a train stopping they are generally delivered to the train conductor. However, at points at which trains do not stop, they are handled by means of a train order hoop, one order being delivered to the engine crew and one to the train crew on the caboose.

Q. Train orders are delivered in that manner to the engine and caboose of the train for the engineer and conductor both?

A. Yes.

Q. Is that done without the necessity of the train stop-
[fol. 2691] ping?

A. Oh, yes.

Q. How does the agent or operator advise the train that orders are on hand for that train?

A. Well, that is done by means of a train order signal or semaphore. When there are no orders for a train after a train reaches a point close to the train order office, if there are no orders or instructions for this train, the semaphore signal is put in a proceed position.

Q. That is with the arm down?

A. With the arm down; and if there are train orders or instructions for the train, the signal is left in a stop posi-

tion, or horizontal position. Then before a train can pass a train order office with the train order board in a stop position, it is necessary that they proceed to clearance, as we call it. On that board, it may not contain orders but it is necessary that he obtain a clearance from the operator on duty, which carries the signature of the chief train dispatcher, that they have or have not orders for this train unless he obtains this clearance.

Q. Can he obtain that clearance by having the orders handed up to him by the hoop?

A. Yes.

[fol. 2692] Q. Then he doesn't actually have to stop because the train order board is in the stop position?

A. No, as long as he receives a clearance permitting him to pass the train order signal.

The Court: But if there was any slip-up, and the train is in motion, the agent or operator there at the station failed to connect with him and give him his orders, then he would have to immediately stop?

A. Yes, he has to stop and back up and receive the clearance on the train-order sheets.

[fol. 2693] Q. By "slip-up," for example, would be where the hoop was missed?

A. The hoop was missed or the operator at the back end didn't hear the train coming or something.

Q. You have heard the expression and I think you have used the expression "drags" or for unidentified trains. What does the term "drag" mean?

A. "Drag" generally is referred to as a train that does not carry an identifying symbol, such as manifest trains, Colton fruit block. It generally consists of dead freight, company material, company oil, empties; it is an unidentified train is what it is and they are referred to as "drags."

The Court: All other trains would be given the right of way over this "drag"?

A. Yes, sir.

Mr. Mason:

Q. When a train is given preference over another train, the two moving in the opposite direction, what actually happens at the meeting point?

A. The inferior train, it is necessary for the inferior train to take siding. The superiority of trains is determined in several different ways, one is by timetable schedule or special instructions in the timetable over train orders.

Q. The chief dispatcher working through the trick dis-
[fol. 2694] patcher can establish the superiority?

A. Yes, you can reverse the superiority of any train.

Q. Can you give a perishable or manifest train the right to hold the main line as against a drag or unidentified train?

A. They generally do. You can by train order give a freight train, establish a freight train and make him superior to the passenger train or any other train on the road by train order.

Q. Is it part of your duty as chief train dispatcher to be familiar with the physical characteristics of the lines subject to your jurisdiction?

A. Yes, that is very necessary.

Q. Precisely what do you mean by the term "physical characteristics," or, in other words, with what physical characteristics are you particularly familiar?

A. It is necessary that we be familiar with the grade conditions, curvatures, side track capacities, location of train order offices, location of signal maintainers, section forces, bridge forces, location of our wrecker or relief outfits.

Q. Do you have to know where double track begins and ends?

[fol. 2695] A. Yes, sir.

Q. Do you have to know the mileage between stations?

A. Yes, sir.

Q. The location of junction points and the mileages to and from them?

A. That is right.

Q. Do you have to know anything about the ability of locomotives to handle tonnage over various parts of the line?

A. Yes, we have to be familiar with the tonnage rating of all locomotives.

Q. Do you have to be familiar with their ability as related to particular portions of the line?

A. Yes, sir.

Q. You spoke in your previous testimony the fact that you receive advance line-ups several hours in advance of

the actual arrival of the trains at the terminals of the division and that you do know in advance in order to make provision for crews at away-from-home terminals. I will ask you whether as chief dispatcher or as supervisor of the work of the trick dispatchers you make in advance plans otherwise for the handling of traffic over the division? [fol. 2696] A. Yes, in this way. At Tucson we have shops maintained by the Pacific Fruit Express in which we store a large number of reefers and we operate these empty refrigerator trains out of Tucson westward at an hour which will best fit in with the eastbound operations. Of course, those are trains which are not included on any line-ups received from any connecting division.

Q. Speaking of the line-ups, do you use this line-up from connecting divisions for any purpose in planning your day or do you simply let the trains go without any particular plan for the day?

A. No, we use those line-ups to plan our operations for the day, for the next twenty-four or forty-eight hours as far as that is concerned.

Q. Do you plan ahead as far as twenty-four or forty-eight hours for train movement on your division?

A. Yes, sometimes as much as three days in advance you have to plan your operations.

Q. Having planned your operations in advance, does that plan stand without any change?

A. No, that is changing constantly all the time.

Q. What is it that causes it to make changes?

A. Several things can cause a train to be delayed, such [fol. 2697] as washouts, derailments, or other unforeseen operating delays, or it may be that the traffic that the connecting chief dispatcher had in mind did not materialize due to weather conditions or they couldn't harvest their crops, such as lettuce and other commodities. Innumerable things can enter into the change in the original line-up.

Q. When these changed conditions arise, you have to meet them, do you?

A. Yes.

Q. What do you do with your contemplated plan of operation?

A. We have to change it to conform with the latest line-up. It may be that we have to dead-head crews or double-head power to away-from-home terminals and it

may be necessary in order to avoid heavy penalties to probably return the same crews at times.

Q. Without any work for them to do?

A. Yes.

Q. You heard the testimony of Mr. Sines as to the redispatching study of 1938, item No. 1 of his exhibit No. 196?

A. Yes, sir.

Q. Do you recall his having mentioned your name as one [fol. 2698] of the party participating in the study?

A. Yes, sir.

Q. Do you recall approximately when you went to Los Angeles for the purposes of the study?

A. As I recall, it was about May 15, 1939.

Q. You were then chief train dispatcher of the Tucson division?

A. Yes, sir.

Q. You heard the testimony of Mr. Sines as to the methods evolved and plan contemplated for the purpose of that 1938 redispatching study?

A. Yes, sir.

Q. You heard his testimony as to the instructions laid out to be followed in working out the study?

A. Yes, sir.

Q. I will ask you whether, as the chief dispatcher for the Tucson division participating in the study, you followed that plan and conformed to those instructions in performing that study?

A. Yes, I did.

Q. Did you personally make the entries in the redispatched train sheets showing the distribution of the traffic into the redispatched trains?

A. Yes.

[fol. 2699] Q. Was the movement of the redispatched trains conducted under your supervision as the chief train dispatcher?

A. Yes.

Q. Mr. Baker, I take it there are certain definite methods and principles which dispatchers, including yourself as a former trick dispatcher and chief dispatcher, necessarily follow and employ in performing their duties as dispatchers. Now I will ask you whether in the redispatching study and for the purposes of the redispatching study you followed any different methods and principles than

those which you follow and have followed in the conduct of actual operation?

A. No, they were essentially the same except the train dispatcher did not issue actual train orders, but as far as the lining up or consisting of trains it was the same except that we consisted the train of greater length than we did in actual operation.

Q. You made up trains to fit the AC power which was contemplated in the redispatching study?

A. Yes.

Q. And to fit the longer sidings contemplated for that purpose?

A. Yes.

[fol. 2700] Q. Without regard to the 70-car or 14-car restriction, as the case might be?

A. That is right.

Q. Did you in the course of the redispatching study undertake to maintain a balance of power and crews?

A. Yes.

Q. Did you follow any different method for this purpose than you follow in actual practice?

A. No, the same method.

Q. Did you dead-head crews and double-head locomotives where necessary to obtain a balance?

A. Yes.

Q. Did you maintain a record of power and crews for that purpose?

A. Yes, we did.

Q. Is that record a part of the papers of the redispatching study?

A. Yes, sir.

Q. Mr. Baker, you have before you the movement of an actual train over the district, let's say from Yuma to Gila, as recorded on the actual train sheet, the tonnage of the train being 90 per cent of the engine rating of the locomotive handling it, and you have before you on the redispatched train sheets a train to be moved from Yuma to [fol. 2701] Gila, the tonnage of which is likewise 90 per cent of the engine rating of the AC-8 type locomotive between Yuma and Gila. Will you say whether or not you can determine from the movement of the actual train the time which may and will be taken by the redispatched train?

A. Yes, they would conform very closely, practically the same; under similar operating conditions they would be the same.

Q. Suppose the contemplated movement of the redispatched train was on the same day as the movement of the actual train with which it is compared, what would be the result then?

A. I would figure that that train would make the same speed over the district as the actual train.

Q. Suppose that the redispatched train was required to meet a similar number of westbound trains that were actually met by the train on the actual train sheet, what would be the effect on the total time enroute?

A. The amount of delay that was incurred by the actual train, of the train that was eliminated, would be deducted from the redispatched train to enable them to reach their terminal that much sooner. They wouldn't be delayed [fol. 2702] by this train that was eliminated, that delay would be eliminated.

Q. The elimination of meets and passes, then, would lead to a better or shorter time enroute?

A. It would be a better performance and a shorter time on the district.

Q. Suppose instead of having the redispatched train with the same percentage of tonnage rating as the actual train with which it is matched, you have a redispatched train with a lesser tonnage rating again between Yuma and Gila eastward, that is, a redispatched train having 75 per cent tonnage rating, whereas the actual train had 90 per cent of tonnage rating, would you be able to determine the time which would be taken by the redispatched train as compared to the actual train?

A. Yes, by observation over a long period of years, a train in actual operation you can determine very closely the time that a train will make, that is, with the percentage of engine rating, we can figure that a train powered by a locomotive of approximately 70 or 75 per cent engine rating will make the maximum allowable speed and whenever a train is loaded, by actual observation in handling these trains, we know approximately the amount of time they will use. In this particular case you mention, we did [fol. 2703] allow a train of lesser tonnage to recover a

little time over ascending grades, such as Mohawk and Sentinel in the district between Yuma and Gila.

Q. As contrasted to an actual train with a heavier percentage of tonnage rating?

A. Yes.

Q. Suppose that the redispatched train had practically one hundred per cent of tonnage rating, say, a 95 per cent of tonnage rating, and was to be compared with an actual train having only 70 per cent of tonnage rating moving on the same day, would the redispatched train be operated so as to take more time than the actual train with which it was compared?

A. Yes, that was taken into consideration. We figured it would use more time over the district.

Q. Suppose that an actual train was delayed because of an engine failure, would that fact be shown on the actual train sheet?

A. Yes, that delay would be duplicated or it was duplicated.

Q. It would — shown on the actual train sheet?

A. Yes.

Q. For the redispatched train sheet, would you assign that delay to a redispatched train?

[fol. 2704] A. Yes.

Q. Just which redispatched train would it be assigned to?

A. If the engine failure was on an identified train on the actual, we would assign the engine failure to the identical train on the redispatching study, and in the case of a drag or some unidentified train we would assign it to a drag operating closely at the time that the drag on the actual operation was operated.

Q. For example, suppose the train containing the block identified as C-413 experienced an engine failure between Yuma and Gila, would your assign that same delay due to engine failure to the redispatched train containing C-413?

A. Yes, sir.

Q. Did you make provision for the use of helpers on your redispatched trains on the helper districts on the Tucson division?

A. Yes.

Q. Did you observe any different methods than are observed in providing helpers from day to day?

A. No, we observed the same method. The amount of traffic determined the number of helpers we would have to assign to helper stations.

Q. And the tonnage of the train in relation to the engine [fol. 2705] rating, did that have any effect upon whether a helper would be used or not?

A. Yes, sir.

Q. Departing for a moment from the redispatching study, you recall that in your previous testimony there was introduced, as one of defendant's exhibits, exhibit No. 175, the employees' timetables for all of the divisions of the Pacific lines with the Southern Pacific and as well the timetables of the Western Pacific Railroad Company covering operations of the Southern Pacific trains on the paired track territory in Nevada where Western Pacific rails are used for eastward movement, and at that time you testified a new Western Pacific timetable had become effective on January 5, 1941?

A. Yes.

Q. I will ask you whether you have since obtained further information as to that Western Pacific timetable?

A. Yes, due to protest being filed by other lines, that effective date has been indefinitely postponed, and the timetable shown in that exhibit of the Western Pacific is the current operating timetable.

Q. So that exhibit No. 175 includes all of the operating [fol. 2706] timetables, including the Western Pacific timetables as of the date of its introduction into evidence here?

A. That is right.

The Court: While you are on this timetable matter, did I understand you to testify this morning in response to a question from Mr. Mason that freight trains were not operated on any given schedule?

A. No, that was not the intent of it. What I meant to say was they were not operated with any degree of regularity like a passenger train is on schedule. However, in our operating timetables we have schedules for operating freight trains.

The Court: That is what confused me. I have before me this exhibit No. 175 on your Tucson division and I notice there on the second page of your eastward movement that you list out of Yuma, for instance, four freight trains, 846, 902, 844, and 842, which leave daily at a given

hour. Do I understand that that schedule is not necessarily maintained, that you actually run these trains when there is business to warrant it in spite of the showing here in these timetables?

A. That is right. These schedules are set up for the convenience of the train dispatcher in operating his trains and [fol. 2707] does not necessarily mean that these schedules have anything to do with our perishable or manifest schedules insofar as the schedules are concerned. It is merely for the convenience of the train dispatcher. If he didn't have these schedules in here, it would be necessary for him to operate all his trains as extras. These are merely set up for the convenience of the train dispatcher in handling his freight trains.

The Court: Of course with the passenger trains where you have the public to deal with the passenger can absolutely rely on the fact that a train will leave, we will say, Los Angeles or any given terminal at the hour stated in the schedule.

A. That is right, its advertised schedule to the public.

The Court: That is not true with your freight operation?

A. No.

The Court: Even though you may show here and do show on page 2 four freight trains operating eastward daily. As a matter of fact, those trains would not operate unless there was a volume of traffic to warrant it?

A. That is right. It may be that any one of these second-class schedules shown on page 2 may be annulled [fol. 2708] by the train dispatcher and not used at all.

The Court: Taking it by and large, is that schedule I have referred to here in the main maintained? Are there four trains operating eastward out of Yuma carrying freight on each day?

A. Yes, there is practically every day out of Yuma when business is normal, there are one or more sections of each one of these schedules operated.

The Court: But they don't necessarily leave at the hour stated in this schedule?

A. No, just so they leave within twelve hours of the departing time they are operated on that schedule.

(Mr. Mason:

Q. These schedules to which the Court refers are sometimes known as "phantom" schedules, Mr. Baker?

A. Yes, sir.

Q. That, of course, is mere slang or a vernacular term, is it?

A. Yes, sir.

Q. What actually is done in order to operate freight trains on the schedules shown in the Tucson division time-tables from Yuma to Gila?

A. When there is only one section operating, it is only [fol. 2709] necessary to authorize that train by giving them a clearance card showing the train number and the number of orders at that point. However, if there is more than one section, it is necessary that each section be given an order stating the engine number and what schedule he will assume from his initial terminal.

Q. Do you tell him to run so many hours and minutes late on a particular schedule?

A. Yes, that form of order is used. There are several forms of orders that can be used, but that is one of them.

Q. Will you recite a typical form or order authorizing a train to move as a second section of a scheduled freight train from Yuma to Gila.

A. Take 846, you would give him an order, a signed order number and addressed to engine 3660 and the address, and in the body of the order you would state, "Engine 3660 run as second 846 Yuma to Gila," or in case another section of that train is to be run, it could be modified by saying, "Engine 3660 will display signals and run as second 846 Yuma to Gila," which then gives the train dispatcher authority to originate another section of that schedule at Yuma.

Q. Does your order authorizing the engine to run also [fol. 2710] give him a departure time?

A. No, unless this 846 is due to leave Yuma on the schedule, 4:50 P. M., and it may be that this train is called to depart from Yuma at 6 P. M.; the train dispatcher in order to move westward freight trains against that schedule will issue an order reading, "First 846 run one hour and ten minutes late Yuma to Gila."

[fol. 2711] Q. That will be a separate order?

A. That is a separate order.

Q. And he can issue a corresponding separate order to each other section of 846

A. Yes, or he may include all sections in that one order, stating the time that each section will leave Yuma or the

number of hours or minutes that he will operate late on his schedule.

Q. Suppose that the dispatcher does order the first section to run, let us say, one hour late; then what does the engineer, or what do the engineer and conductor do in their operations?

A. They have to respect this schedule by adding the one hour late, they will respect the one-hour later schedule at all times shown on this schedule between Yuma and Gila.

Q. Simply use the phantom schedule set up in the time-table, adding to it the amount of the time of their running late?

A. That is right.

The Court: Mr. Baker, there is one other question. This is asked purely out of curiosity as to the mechanics of it. Does the dispatcher have before him, the trick dispatcher, a board or chart on which the progress of the train across his division is shown by means of pins or some other [fol. 2712] method, so that at all times at a glance he can tell where those trains are?

A. That is shown on his train sheet. He has his train sheet in front of him, and the time that each train departs from the terminal or passes an open telegraph office, the time is transmitted to him by operators and transcribed on his train sheet, so that he knows all the time, practically all the time, where all his trains are at.

Q. But it is from the train sheet rather than from any chart or board?

A. Yes, from the train sheet.

Mr. Strouss: An experienced dispatcher can tell by just glancing at his train sheet where practically every train on his district is?

A. Yes; in fact, he has them in his head. He doesn't have to look at his train sheet, he knows where his trains are all the time.

Q. That to them is just like a board with pins?

A. That is right.

Mr. Mason: Can you, as chief dispatcher, coming into the room where the train dispatchers are working, tell where the positions of the trains are by looking at the train sheets?

A. Yes, by experience I know almost as well as the train dispatcher where his trains are.

[fol. 2713] Mr. Strouss: There is one other thing. On your schedule there, that information is also for the use of opposing trains when a late order is issued, isn't it?

A. Yes, that is the purpose of it, to operate the trains in both directions.

Mr. Mason: Is this late order of the kind that you have dictated into the record transmitted also to opposing trains or trains in the same direction whose movements may be affected by the train running late?

A. Just to trains of inferior class moving in the opposite direction, except in the case of passenger trains, which are first-class trains, then a copy of that order is given to trains in the same direction, or inferior trains.

The Court: Do any of your divisions in this territory cover more than one different time area? By that I mean like the Pacific Time, or Mountain Time, or is that taken into consideration in forming your divisions?

A. No, the time change on the Tucson division is at Yuma. The Los Angeles division train dispatchers use Pacific time and the Tucson dispatchers use Mountain time.

Q. Well, it happens in this instance, that your time change [fol. 2714] is at Yuma?

A. Yes.

Q. Which is a division point?

A. Yes.

Mr. Mason: The same is used all the way from Yuma to Tucumcari, is it not, Mr. Baker?

A. Yes.

The Court: I should think that the Santa Fe, for instance, where their time changes at Seligman, which is not a division point, they would experience some difficulty in the change of time there?

A. Yes, they would unless they have made some special arrangements for it.

Mr. Mason: Mr. Baker, those schedules that are shown there for second-class trains, referring to the Tucson division timetable which you have before you, suppose that no train is run on the schedule shown for No. 844, is any order issued with respect to that?

A. Yes, an order is addressed to No. 844 at Yuma, and a copy of that order then is given to all westward extra

trains on the line between Yuma and Gila, and at Gila for any other extra trains that may be operated, and the order will read, "No. 844" of such a date, "is annulled Yuma to Gila."

[fol. 2715] Q. Then the schedules shown must either be fulfilled or cancelled by order, is that correct?

A. They are fulfilled or annulled, yes.

Q. Mr. Baker, referring back to the matter of schedules for the handling of perishable eastward and manifest westward, which were discussed in your testimony the other day, I believe that you have testified that you received reports at Southern Pacific terminals and interchange points of the arrivals of scheduled trains moving eastward and at terminal points on the Pacific Coast of the arrivals of scheduled trains moving westward?

A. Yes.

Q. Is that a regular daily report made to the superintendent of transportation?

A. Yes, that is a daily report, that is, on schedules terminating on Pacific Lines we get a daily report of their arrivals.

Q. Now, do you receive a current report of the performance of eastbound perishable scheduled trains as to arrival at Ogden, El Paso and Tucumcari?

A. Yes, daily.

Q. Have you those reports at hand either in the court room or in Tucson?

[fol. 2716] A. Yes, I have them in the court room.

Q. Have you made a study of the number of scheduled trains operated and of the number which made running time in accordance with schedule for the year 1939?

A. Yes, I have.

Q. I wish you would refer first to the identified manifest train known as C. S. Over what route does that train operate?

A. That train operates between——

Q. That is, over what route of the Pacific Lines?

A. Between Ogden and San Francisco.

Q. And how many C. S. trains were operated in 1939?

A. In 1939 we had 688 sections of the C. S. between Ogden and San Francisco.

The Court: I didn't catch, Mr. Baker, what you mean by that symbol "C. S." Has it any particular significance?

A. Yes, that is the identification of our west manifest train that operates between Chicago and San Francisco. It means "California Special," but it is shortened by calling it the C. S.

The Court: We will take our noon recess at this time until two o'clock.

(Thereupon, the court stood at recess.)

[fol. 2717] January 22, 1941, two o'clock P. M.

Proceedings were resumed at this time as follows:

The Court: Will the witness who was on the stand resume the stand?

Mr. Mason: Your Honor, before we resume with Mr. Baker, Mr. Strouss and I have agreed that Mr. Kirk, who returned here from St. Louis with the Missouri Pacific Train sheets, need not remain here for further cross-examination, he and his records may be released.

Mr. Strouss: That is correct.

The Court: Then, Mr. Kirk, you may be released with your records.

Mr. Kirk: Thank you.

The Witness G. C. Baker, was recalled to the stand and testified further as follows:

Mr. Mason: Mr. Baker, I think you had just started at the conclusion of the morning session to refer to the number of identified trains operated, and I believe that you were referring first to the C. S. train over the Ogden route? How many of those were operated, first, as regular sections during 1939?

A. 365.

[fol. 2718] Q. And how many extra sections of the C. S were operated during that year?

A. Three hundred thirty-five.

Q. Or a total of 700?

A. That is right.

Q. Now, of the regular sections operated, how many made their running time in accordance with schedule?

A. Three hundred forty-five, or 94.6 per cent.

Q. And how many of the extra sections made their running time in accordance with schedule?

A. Three hundred twenty-three, or 96.5 per cent.

Q. Is there an identified manifest train known as the S. S. W.?

A. Yes, the Sunset West.

Q. Is that one of the trains referred to by schedule on your exhibit No. 176?

A. Yes, if is.

Q. How many regular sections of the S. S. W. were operated during 1939?

A. Three hundred sixty-five.

Q. And how many of those made their running time in accordance with schedule?

A. Three hundred forty-six, or 94.8 per cent.

Q. Did you operate extra sections of the S.S. W. during [fol. 2719] 1939?

A. Yes, there were 48 sections operated.

Q. How many of the extra sections made their running time in accordance with their schedule?

A. Forty-six, or 95.9 per cent.

Q. You also refer on exhibit No. 176 to a train called the G. B. W. or Gold Ball West; is that also operated over the route through Arizona?

A. Yes.

Q. How many of those did you operate during 1939, first, as regular sections?

A. Three hundred sixty-five regular sections.

Q. And how many of those made their running time in accordance with schedule?

A. Three hundred twenty-six, or 89.4 per cent.

Q. Did you operate extra sections of the G. B. W. during 1939?

A. Yes, there were 411 extra sections operated.

Q. How many of those made running time in accordance with schedule?

A. Three hundred fifty, or 85.2 per cent.

Q. How many identified fruit blocks were operated eastward from Roseville over the Ogden route in 1939?

A. Sixteen hundred eight.

Q. And how many of those made running time at Ogden [fol. 2720] in accordance with schedule?

A. One thousand four hundred twenty-eight, or 88.8 per cent.

Q. How many identified fruit blocks were operated from Colton to El Paso in the year 1939?

A. Well, including the train that was split at Yuma, there were operated into El Paso 1,528 Colton blocks.

Q. How many of those Colton blocks made running time at El Paso in accordance with schedule?

A. One thousand two hundred sixty-one, or 82.5 per cent.

Q. Now, were a number of these Colton blocks also operated on to Tucumcari?

A. Yes, they were consolidated at El Paso, that is, the Rock Island traffic taken out, and there were 800 blocks operated east of El Paso through Tucumcari.

Q. And how many of those 800 made running time at Tucumcari in accordance with schedule?

A. Seven hundred fifty-eight, or 94.8 per cent.

Q. Are these totals all taken from the records in the office of the superintendent of transportation to which you referred in the beginning of this portion of your testimony?

A. Yes, that is correct.

[fol. 2721] Q. And the computations, I take it, are your own?

A. Yes.

[fol. 2722] The Court: Before you leave that, just what was the purpose of this last testimony?

Mr. Mason: Your Honor, we have had testimony from each of the other railroads as to performance in accordance with schedules. Of course, a schedule, if placed on paper, doesn't mean much unless it is lived up to, at least reasonably lived up to and the purpose is to show that we not only published and provided these schedules for the handling of manifest westward and perishable freight eastward but that we also performed in accordance with these schedules a substantial and, in fact, a very great proportion of the time.

The Court: You were seeking to draw any comparison between the traffic routed over the Arizona route on your southern lines and that routed through Ogden?

Mr. Mason: I think that such a comparison is possible, yes, and the figures over the two routes might very well be contrasted for the purpose of showing whether performance over the southern route is as good or better or worse than the performance over the more northern route. Of course the testimony is particularly pertinent in showing that schedules are maintained and on-time performance realized with long-train operation across Nevada where

[fol. 2723] the testimony already established that such operation prevails. That supports one of our allegations in the affirmative answer substantially to that effect, that with the long-train operation it has been possible to shorten schedules and make on-time performance.

Mr. Strouss: If that is the purpose, I want to show an objection that it is irrelevant and immaterial.

The Court: The objection is overruled.

Mr. Strouss: Did I understand the performance as to Roseville, to where was that?

Mr. Mason: to Ogden. Wasn't that correct, Mr. Baker?

A. Yes, sir.

Mr. Mason: I think my question referred to Ogden.

Q. Mr. Baker, I think in your testimony this morning you stated that you supervised generally the work of the trick dispatchers who worked jointly with you in performing the redispatching study so far as the Tucson division was concerned. Is that correct?

A. That is right.

Q. Did you yourself place certain of the entries on the redispatched train sheets?

[fol. 2724] A. Yes, I placed the crews, class of power, and the time of departure from Yuma, and also the number of cars to be handled; also entered upon the train sheets for the information of the trick dispatcher the points at which trains would set out and pick up at intermediate points.

Q. Did the trick dispatcher make certain other entries upon the train sheet?

A. Yes, the trick dispatcher, to start with, entered the performance of the actual train in the column adjacent to the column reserved for the operation of the redispatched train, and he entered the times at stations as the redispatched train progressed across the district, he entered the times at the various stations on the district.

Q. He actually operated the redispatched train across the district after you had started it, is that it?

A. Yes.

Q. Did you supervise the making of such entries by the trick dispatcher?

A. Yes, I supervised the work of the redispatched trains that the trick dispatcher performed just the same as I would in actual practice.

Q. After the entries had been made by the trick dispatcher, did you check such entries to see whether they were [fol. 2725] correct?

A. Yes, I did.

Q. What was the reason or purpose of your checking the entries made by the trick dispatcher showing the progress of the train?

A. I thought that I was personally responsible for that redispatching study that had been assigned to me the same as I would have the same responsibility in actual practice.

Q. Did you determine whether or not the operation of the redispatched trains was in accordance with the established principles of dispatching and particularly the conditions governing at the time the actual and the redispatched trains were run?

A. Yes, I did.

Q. Did you check particularly as to the times over the road taken by the redispatched trains?

A. Yes.

Q. Did you check on the meets and passes which were made by such trains?

A. Yes, I did,

Q. Did you make any check of the use of helpers on those trains?

A. Yes.

Q. Did you make any check of the times spent by the trains at intermediate terminals or in passing through terminals?

[fol. 2726] A. Yes, that was one of my duties, to determine by the amount of work that would line up for those particular trains, the amount of time that would be used through any particular terminal.

Q. Will you state whether or not the entries on the redispatched train sheets for the 1938 redispatch which were made by you or under your supervision reasonably and accurately represent the operation of those redispatched trains as it could and would have occurred under the conditions governing the redispatching study?

A. Yes, to the best of my ability I tried to and did supervise that work, the redispatching of the trains, just the same as I did in actual practice.

Mr. Mason: That is all we have for Mr. Baker.

Mr. Strouss: I think it is preliminary to again offering the exhibit so I will ask a few questions.

Mr. Mason: As to the reoffer of exhibit No. 198?

Mr. Strouss: Yes.

Mr. Mason: We will have Mr. Sines back on the stand before we reoffer No. 198 because I will have the witness who made the entries of wages also testify as to just how [fol. 2727] he did that.

The Court: You may cross-examine then, Mr. Strouss.

Mr. Strouss: Just a few questions I want to ask at the present time. I don't want to finish my cross-examination but on this particular thing I would like to ask a few questions.

Cross-examination.

By Mr. Strouss:

Q. Mr. Baker, in dispatching trains or redispatching trains here, the availability of traffic is an important item?

A. That is right.

Q. Your dispatching of trains depends to a great extent upon the traffic which is available?

A. Yes.

Q. And when available?

A. That is right.

Q. So that in order to properly dispatch trains you have to know what traffic is available and when it is available?

A. That is right.

Q. And that would include the character of the traffic, would it not?

A. Yes, sir.

[fol. 2728] Q. You would also want to know the traffic that is to be picked up or set out enroute, would you not?

A. That is right.

Q. That is over the division that is under your supervision?

A. That is right.

Q. Of course you would want to know the operating characteristics of the power that is to be used, that is, its tonnage rating on your particular division?

A. That is right.

Q. And its possibilities of speed, that would be an element in the dispatching of your trains, that is, the time element?

A. Yes, the time element.

Q. And the tonnage, of course, that is being moved, that is another thing that would be necessary to know in the dispatching of your trains?

A. That is correct.

Mr. Strouss: That is all for now.

Mr. Mason: Do you wish Mr. Baker to remain at Tucson to be called further for cross-examination?

Mr. Strouss: Yes, I haven't gone into the matters he testified to the other day. The questions I asked now, I [fol. 2729] took it that the examination of Mr. Baker today has been more or less preliminary to a reoffering of exhibit No. 198 for identification.

Mr. Mason: Yes, it has been preliminary to that, but it has been for the purpose of laying the foundation for the entire redispatching study.

Mr. Strouss: If you desire Mr. Baker to leave, I will check over his previous testimony this evening and try to release him tomorrow morning.

Mr. Mason: All right, thank you very much.

The Court: Call the next witness.

[fol. 2730] Mr. Mason: We will call Mr. Herrell.

L. D. Herrell was called as a witness on behalf of the defendant and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you please state your name and residence to the reporter, Mr. Herrell?

A. L. D. Herrell, El Paso, Texas.

Q. What is your position with the Southern Pacific Company?

A. Chief Train Dispatcher, Rio Grande Division.

Q. How long have you occupied that position, Mr. Herrell?

A. Since February 1, 1937.

Q. What was your previous experience in railroad service?

A. I began with the Louisville and Nashville on the S. & N. A. Division, the headquarters of which are at Birmingham, Alabama, in 1908 as a telegrapher. In June, 1913, I

was promoted to train dispatcher and remained in that position with the L. & N. until January, 1925, at which time, on account of reduction in force I was again reduced to [fol. 2731] the rank of telegrapher, of extra telegrapher, I may say and worked very little until I came with the Southern Pacific on the 5th day of October, 1915, on the Tucson division as telegrapher, and in May, 1916, was promoted to dispatcher, working at El Paso and Tucson, until October of the same year, at which time I was transferred to the Arizona Eastern at Globe and remained in Globe until November 24, 1924, at which time we were absorbed by the Southern Pacific along with the Southern.

Q. You mean the El Paso and Southwestern?

A. Yes, along with the El Paso and Southwestern. I worked as train dispatcher at El Paso from 1924 until about 1931, when I assumed what we call the first relief position. On that position, I worked three days per week as trick dispatcher, one day per week as chief dispatcher, and two days per week as assistant chief dispatcher, until I was given the chief dispatcher's job on February 1, 1937.

Q. Mr. Herrell, you heard the testimony of Mr. Sines, did you, as to the redispatching study undertaken in 1939 with respect to 1938 traffic?

A. I did.

Q. Are you the L. D. Herrell mentioned by Mr. Sines in [fol. 2732] his testimony as having participated in that study?

A. I am.

Q. How far did your jurisdiction as chief dispatcher extend in 1938?

A. Extends from Tucumcari, New Mexico, to Lordsburg, New Mexico, and from El Paso, Texas to Tucson, Arizona, on the line via Douglas, that is, the dispatchers working under my jurisdiction handle the westbound main track from Mescal to Tucson.

Q. And do you handle all train operations east of Mescal on the south line?

A. I do.

Q. And on the north line your jurisdiction extends westward from El Paso to Lordsburg?

A. Correct.

Q. Now, in the 1938 redispatching study, Mr. Herrell, where did you start the operation of the redispatched westward trains?

A. From El Paso.

Q. And so far as you were concerned, where was the redispatching of the eastward trains commenced?

A. From Lordsburg.

Q. From whom did you receive the traffic at Lordsburg?

[fol. 2733] A. The chief dispatcher of the Tucson division, Mr. Baker, at that time.

Q. In actual practice, Mr. Herrell, do you receive any advance information from the Tucson division or divisions further west as to the trains which will reach you thereafter?

A. I get my information from the chief dispatcher at Tucson. I also receive a consist of each freight train from Yuma very soon after its departure from that point.

Q. Is that sent to you by telegraph?

A. Teletype, which is used in place of telegraph, replacing it.

Q. Now, what information is shown on the consists that are teletyped to you from Yuma?

A. The train identification number, that is, the block number, also the perishable and manifest loads for the Rock Island, perishable and manifest loads for the T. & N. O., perishable and manifest loads for the Texas and Pacific, also any cars that might be routed via the Santa Fe from either Tucumcari or El Paso, and usually includes the short loads; in fact, the consist shows the destination of all cars on the train out of Yuma.

Q. You speak of short loads. Just what do you mean by that?

[fol. 2734] A. Well, cars for Tucson, for Douglas, Bowie, or any other intermediate points.

Q. Will it also show cars for intermediate points on your own division, such as Deming or Alamagordo?

A. Yes, it will. However, they are very few.

Q. Does your consist also show cars destined for interchange with the Mexican Railroad at El Paso?

A. They do not.

Q. They don't show that?

A. They do not. Now, I say they do not, I don't believe I have any recollection of ever having seen one for the Mexico and Northwestern or any of those lines, especially

on the freight trains. Now, we do on the passenger trains, we get that information. However, the consist would probably show the destination as El Paso, but by other means I have obtained the information as to where the car is going.

Q. In actual practice, do you use this lineup for any purpose in arranging your trains out of Lordsburg?

A. I do.

Q. We have a line-up form which we use in El Paso when we receive these consists from Yuma. The first column [fol. 2735] will show how many cars east of Tucson on this particular train. Then we show the loads for the Rock Island, two columns, we have a separate column for perishable and one for manifest; in the same manner for the T. & P. and in the same manner for El Paso, because El Paso is quite a diversion point and some shipper may bill in one block 15 or 20 cars of perishables to El Paso for diversion, and on the Yuma consist, the destination of those perishables will be shown as El Paso. However, from experience I know that that is not the final destination of that perishable. We may pick up practically all of it via the Rock Island.

Q. You say that you make a line-up in accordance with this form?

A. We do.

Q. Do you actually determine the number of trains you are going to operate as a result of the information thus given to you?

A. As nearly as possible. That is the only information that we have, say 24 hours in advance as to how many trains it is going to be necessary for us to operate out of El Paso via Tucumcari.

Q. Does this information tell you how many trains you [fol. 2736] are going to operate out of Lordsburg to El Paso?

A. Ordinarily, yes, sir.

Q. How much in advance of the arrival of the traffic at Lordsburg does the information reach you?

A. Well, we consider the average run from Yuma to Lordsburg as 20 to 22 hours, therefore, I usually have the information, I would say, 19 or 20 hours in advance of the arrival of the train at Lordsburg.

Q. Do you plan the train movements out of Lordsburg as long as 19 or 20 hours in advance of actual movement?

A. I do.

Q. Why do you have to do that?

A. It is necessary that I have that information in order to get the necessary amount of power and crews at Lordsburg to protect the eastward perishable trains, as they must be on hand before the arrival of the trains, the crews rested ready to go to work.

Q. You say you must place the power and the crews at Lordsburg?

A. I must have the information in order to get them at Lordsburg from El Paso.

Q. And why do you have to move the men and locomo- [fol. 2737] tives to Lordsburg?

A. El Paso is our home terminal, Lordsburg is the away-from-home terminal, we don't have any surplus power or crews at Lordsburg in the ordinary run of operations.

Q. Does the information that you receive from the west have any influence on the number of trains you will operate westward from El Paso toward Lordsburg?

A. Yes, at times it is a controlling factor.

Q. Why is that?

A. Well, because we may not have enough westbound business to operate enough units with full tonnage or full crew limit as we use it over there. Now, we are running 100-car trains on most of our drags, so if I am out of balance at Lordsburg and need to get another engine and crew at that point, then I have to have at least two hours to get the train started from El Paso, and approximately seven or eight hours for the run, and then the crew must have more than eight hours off duty before they can be called back to work.

Q. By the way, Mr. Herrell, were you present when Mr. Baker described the scope of the duties of the chief dispatcher and the trick dispatcher?

A. I was.

[fol. 2738] Q. And did you hear his testimony in that regard?

A. I did.

Q. Does the scope of the duties performed by you as chief dispatcher and of your trick dispatchers correspond to what Mr. Baker stated?

A. Yes, with some variations. I have connecting lines at El Paso that I have to give the necessary information to the same as I would if it were a connecting division.

Q. Do you receive information from connecting lines as to prospective arrivals at El Paso as well?

A. I do also from the Rock Island at Tucumcari.

Q. Now, in the redispatching study, Mr. Herrell, did you receive advance information from the chief dispatcher of the Tucson division as to the trains which would be operated into Lordsburg in the redispatched operation?

A. I did.

Q. How was that information conveyed to you?

A. Well, we were working there in the same room together and we worked just like we would if we were on our normal positions. When he started his trains out of Yuma, why, that gave me the advance information as to when they [fol. 2739] would reach Lordsburg and about what their consist would be.

Q. Was the information as to these trains leaving Yuma passed to you as the Rio Grande division chief train dispatcher?

A. It was.

Q. In the westward operation, do you give advance information to the Tucson division as to trains which are to reach Lordsburg in the near future?

A. I do.

Q. Do you give him that information before the trains leave El Paso?

A. I do.

Q. Just how do you do that?

A. By line-ups; We make at least three line-ups daily, every eight hours, to the chief dispatchers and others concerned at Tucson, giving them as nearly as possible at the time the line-up is made out how many trains, especially the manifest trains, we will deliver them at Lordsburg the next day. This is given, our first line-up is given 22 to 24 hours in advance, and we have telephone connections that we use to confer with each other several times daily, that is, during the entire 24-hour period we are [fol. 2740] in communication with each other any time it is necessary.

Q. Now, you base these line-ups on information reaching you from your eastward connections?

A. That is correct.

Q. Do you receive information in advance of actual arrival of trains from the Rock Island, for example?

A. We do, we receive a line-up from the chief dispatcher of the Rock Island at Dalhart as to what time the G. B. W. will reach Tucumcari the following day. However, that consist doesn't show the loads, as we practically always operate only one train west with manifests from Tucumcari, especially since we have the larger power.

Q. Now, do you receive a line-up for consists from Tucumcari as to trains operating westward from that point to El Paso?

A. I do.

Q. Is that sent you by teletype?

A. It is.

[fol. 2741] Q. Do you receive advance information from the dispatcher of the Texas and New Orleans as to traffic which will be delivered at El Paso?

A. I do.

Q. How is that received?

A. By a line-up which is passed from his desk to mine, as we are both located in the same office.

Q. Do you receive similar information from the Texas and Pacific?

A. I do, I receive a consist of the Texas and Pacific manifest train soon after it leaves Fort Worth.

Q. Did you in the redispatching study communicate advance information of trains to be operated out of El Paso on the redispatched train sheets?

A. I did.

Q. To the dispatcher of the Tucson division?

A. I did.

Q. How did you give that information to him?

A. Usually our operation in the redispatch was as to our manifest trains, the same as it was in actual practice.

Q. You mean as to times of departure?

A. Times of departure. The only difference that we made in those trains was that we filled them with empties.

[fol. 2742] Q. Up to what number of cars?

A. Usually 85 or 90. I tried to stay within the tonnage ratio of the larger power the same as I do with the present power. In other words, we tried to build the trains at El Paso so they would not have to be touched at Lordsburg and there would be nothing except change engines and caboose.

Q. In eastward operations from Lordsburg to El Paso of the redispatched trains, did you observe any particular maximum train length for the purpose of redispatch study?

A. As a usual thing I handled the trains as they were delivered to me by the Tucson division.

Q. Was it necessary to make changes of consist at Lordsburg?

A. Sometimes they have short cars for Lordsburg or Clifton where it is necessary that the cars be cut out. There are at times a few cars to be picked up at Lordsburg, and we picked them up.

Q. Apart from those instances, were there any other changes necessarily made in the redispatched trains as received from the Tucson division?

A. Not necessarily.

Q. Were these instances of short cars to be set out or picked up at Lordsburg frequent or comparatively rare?

[fol. 2743] A. Well, it is a daily occurrence.

Q. Are there very many such cars?

A. Not very many.

Q. You spoke of having operated some 100-car trains westward from El Paso to Lordsburg. Do you do that at the present time irrespective of the redispatching operation?

A. We have for the sixteen years I have been in El Paso.

Q. Are those trains always built up to 100 cars at El Paso or are they sometimes built up to that length at a point a short distance west of El Paso?

A. No, we can build up a train to 100 cars at El Paso, but on the redispatch in order to handle 125 cars on our westbound drags which included mostly empties it was necessary to build 100-car trains at El Paso, or, rather, when we accumulated more than two or three hundred empties I would run a short turn-around service, as we call it, from El Paso to Strauss, which is approximately 18 or 19 miles west of El Paso, and at which we have trackage to hold more than two hundred cars without blocking the siding and we would set these cars out at that point. Then, when we operated our 100-car drags west from El Paso, we would have them pick up whatever we wanted [fol. 2744] them to at Strauss by instructing the conductor, usually not more than 125 cars out of Strauss.

Q. So the train would be 125 cars from Strauss to Lordsburg?

A. That is correct.

Q. And one hundred out of El Paso?

A. One hundred out of El Paso.

Q. This method was used in redispatch operation, was it?

A. It was.

Q. Do you ever use a similar method in actual operation?

A. Not for that same purpose. We do, when we get blocked at times, have stored cars at Strauss on numerous occasions.

Q. Do I understand that this filling at Strauss was only westbound drags consisting principally or entirely of empties?

A. I believe there are probably two or three occasions where I had a manifest train pick up a few cars at Strauss, in order to fill, as they were light out of El Paso. That was a rare occasion.

Q. Other than those occasions, the picking up was confined to the drags or empties?

A. The drags, and the train which we operate out of El Paso each night known as the "north line merchandise." [fol. 2745] It is the merchandise cars from the El Paso house or Deming, Lordsburg, and Clifton, and points on the Globe branch.

The Court: Mr. Herrell, with these actual operations you would build up a surplus of cars at Lordsburg of your empties, would you not? Where you were taking trains out of El Paso in excess of 70 cars, say, 100-car trains of those empties, you run those to Lordsburg and then you are confronted with the Arizona law so you would have to whittle that train down to the requisite number of cars, wouldn't you?

A. That is correct. Every two drags I run in there, he has to run about three out.

Mr. Mason:

Q. I think you should make it clear that the problem of cutting down the cars at Lordsburg is the problem of the Tucson division.

A. That is right; when I deliver the train to him at Lordsburg, I am through with it.

Q. It becomes Mr. Baker's or Mr. Cassady's problem?

A. It becomes the problem of the Tucson chief dispatcher. Lots of times we get them too full over there and have to

cut them down to 70 cars at Deming. In other words, we have to handle those same cars twice and later on I have [fol. 2746] to let some train out of El Paso light enough to pick up those cars which I have reduced at Deming. That also causes us, at times when the flow of refrigerators arrive El Paso faster than the Tucson division can handle them and we can't handle them in the El Paso yard, to run two hundred of them out to Strauss and store them out there until the flow has equalized itself enough to where the Tucson division can move them out of Lordsburg, which will give me room to move them into Lordsburg.

The Court: One other question, I take it from the testimony given by you and Mr. Baker that there is only one chief dispatcher in each division?

A. That is correct.

The Court: However, there must be a dispatcher on duty twenty four hours out of each day?

A. Those are assistant chief dispatchers. I have two assistant chief dispatchers, one comes on at four o'clock and works until midnight; another comes on at midnight and works until eight A. M. until relieved by me.

The Court: These assistant train dispatchers are in addition to the so-called "trick" dispatchers?

A. Yes, sir.

[fol. 2747] The Court: In other words, there are two dispatchers on duty at all times, either yourself as chief or one of your assistants and a trick dispatcher?

A. That is correct, one or more trick dispatchers.

Mr. Mason:

Q. How many trick dispatchers do you have altogether in the headquarters of the Rio Grande division at El Paso?

A. I have six trick dispatchers and one relief dispatcher, who works six days per week and another relief dispatcher who works three days per week, two assistant chief dispatchers and myself. Ten permanent positions and one which is termed an extra position because it is only three days per week.

Q. Out of those ten people, how many as a minimum are on duty in the dispatcher's office at any one time?

A. Three.

Q. In actual operation you receive the eastbound perishable trains at Lordsburg from the Tucson division in units of not more than 70 cars, do you?

A. That is correct.

Q. Do you build those eastbound perishable trains up [fol. 2748] to greater lengths at Lordsburg?

A. We do.

Q. How frequently do you do that?

A. I would say just as often as we can, that is one of our main duties.

Q. How often can you do it?

A. It depends upon the schedule, Mr. Mason, whether or not I can do that and arrive El Paso, maintain schedule with that train, but I would say one of the main features of that is whether or not I am long or short of crews and power at Lordsburg. Sometimes I will take that chance of making a consolidation of three trains into two at Lordsburg and not have a unit of protection over there for each train and we get away with it in nice shape. Sometimes we might do that and not do so well.

Q. Do you ever have to operate trains in units of 70 cars or less straight through Lordsburg to El Paso in order to make schedule?

A. That is our most frequent operation.

Q. Is that more frequent than the consolidation?

A. Oh, absolutely.

Q. How much more frequent according to your experience?

A. I would say 75 per cent of the trains operated eastward out of Lordsburg are 70 cars or less.

[fol. 2749] Q. Are they substantially the same trains that are delivered to you by the Tucson division at Lordsburg?

A. They are.

Q. What is it that causes your inability or failure to hold them for consolidation at Lordsburg?

A. The fact that they are not arriving close together or not in good enough shape as to time for consolidation or it may be that I have a surplus of crews and power at Lordsburg which it is necessary to return to El Paso. There are many controlling factors.

Q. Did you in the redispatch operation undertake any consolidation of eastbound trains at Lordsburg for the purpose of running longer trains on the Rio Grande division

than the redispatched trains that were run on the Tucson division?

A. As I remember it, the opportunity for consolidation at Lordsburg was very rare.

Q. Did you yourself make any of the entries upon the redispatch train sheets covering redispatch operations on the Rio Grande division?

A. I made them all, I had no assistance. I did all the work myself.

Q. Did you yourself actually operate the trains between [fol. 2750] El Paso and Lordsburg?

A. I did.

Q. Did you make the entries as to times at intermediate points?

A. I did. I did the work of a trick dispatcher as well as chief dispatcher.

The Court: Mr. Herrell, who is the immediate superior of the chief dispatcher?

A. He reports only to the superintendent.

The Court: You mean the superintendent of the division?

A. Superintendent of the division, yes, sir.

Mr. Mason:

Q. Mr. Herrell, did you plan and calculate all of the meets and passes of the redispatched trains?

A. I did.

Q. And worked out the points at which such meets and passes would take place?

A. That is correct.

Q. Did you undertake to match up your redispatched trains with actual trains?

A. I did.

Q. For what purposes?

A. Because we had to match the runs. I was instructed to handle the redispatch the same as I would in actual practice and that is what I tried to do.

[fol. 2751] Q. Could you match the run of a redispatched train with tonnage rating or a definite percentage of tonnage rating with the run of an actual train having tonnage rating or an equivalent definite percentage of tonnage rating?

A. I did.

Q. Was that done on each day?

A. On each day.

Q. Were you present in the courtroom when Mr. Sines testified as to the general method laid down for the conduct of the redispatching study?

A. I was.

Q. Will you say whether or not you participated in the conferences described by Mr. Sines preliminary to the actual redispatching work?

A. I did, not in all of them but in some of them.

The Court: All of them affecting your division?

A. As I remember, your Honor, we were called to San Francisco for a conference preliminary or prior to beginning this work and that is the conference to which I am referring. Then when we actually went to Los Angeles to begin the work, we had several conferences as to the [fol. 2752] methods we would use, which were naturally being something new to us, we had to come to some agreement so we would be in accord with our connecting divisions.

Mr. Mason:

Q. I think the Court asked you if you participated particularly in all the conferences relating to the handling of the redispatch operation on your division?

A. I did.

Q. Did you in your conduct of the redispatching study, referring particularly to the 1938 study for the Rio Grande division, follow the same principles and practices which were outlined and described in Mr. Sines' testimony?

A. I did. There may be some slight variations.

Q. What would those variations relate to?

A. As well as I remember Mr. Sines stated in the run of these redispatched trains a differential of 10 per cent or less was disregarded.

Q. You mean a differential of 10 per cent or less in relation to the tonnage to engine rating?

A. Yes, and I broke mine at 10 percent. In other words, if a redispatched train had 90 per cent and the actual train had 80 per cent, then I allowed the redispatched train five minutes longer to make the run from Lordsburg to Wilna and two mintues longer from Myndus to Aden.

[fol. 2753] Q. Suppose the differential was the other way, expressed in ratio of tonnage to rating, the redispatched trains were 10 per cent or more lighter than the actual trains, did you make the same differential in time in favor of the redispatched trains?

A. I did.

Q. Did you make other differentials at other points along the line?

A. I did not use any differential on the westward trains out of El Paso because there were not enough of those trains operated where the differential was more than 10 per cent. The usual rating or the usual loading of our manifest trains was two or three or four per cent lighter than they had upon the actual operation.

Q. That is your redispatch manifest trains expressed in ratio of tonnage to engine rating were two to three to four per cent lighter than the actual trains?

A. That is correct, generally speaking. I made no difference in the running time of the westward trains. I might correct that by saying as a usual thing it was not much over that amount of difference. It might have been heavier or it might have been lighter, but as a usual thing the load-[fol. 2754] ing was about what we are attaining at present.

Q. Have you seen a copy of Mr. Sines' exhibit No. 197 showing present and proposed siding capacities?

A. I have.

Q. Did you participate in the conferences at which the siding extensions for the purpose of the redispatching study were determined upon?

A. I did.

Q. Will you look at exhibit No. 197, I take it you have examined it before?

A. I have.

Q. Will you say whether or not having particular reference to the district between Lordsburg and El Paso on the Rio Grande division the siding extensions and increases in sidings there shown are necessary for the purpose of permitting the operation of trains of the lengths contemplated by the redispatching study of 1938?

A. They are.

Q. Does the showing there represent your own best judgment as to the extensions which would be required or were required for that purpose?

A. Yes, sir.

The Court: In other words, you would only have to increase your siding capacity on eight stations between El [fol. 2755] Paso and Lordsburg?

A. That is correct.

The Court: We will take our mid-afternoon recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows.)

[fol. 2756] The Court: You may proceed.

Mr. Mason: Mr. Herrell, you heard the reference by Mr. Sines to redispatching studies undertaken involving the year 1940?

A. I did.

Q. Did you participate in any such studies?

A. I did.

Q. Did you perform the same character of work in connection with those studies as in connection with the 1938 studies?

A. I did.

Q. In the same manner?

A. I did.

Q. Now, referring first to the 1940 study, in which the long trains actually operated were redispatched as short trains, did you prepare redispatch train sheets?

A. Yes, sir.

Q. Receiving the traffic at Lordsburg in the same manner?

A. Yes, sir.

Q. And handling the traffic over the Tucson division at Lordsburg in the same manner?

A. Yes, sir.

The Court: May I ask if during the month of April, 1940, when these long train operations through Arizona [fol. 2757] were actually being made by the defendant here, if that covered the entire lines of the Southern Pacific across the state or if it was merely from Tucson west? I am merely asking that of counsel.

Mr. Mason: It covered the entire territory. I think it also included some operations on the South line, although I was about to ask the witness.

Q. Did the redispatching study, Item No. 5, of Mr. Sines' exhibit No. 196, relate also to operations on the south line?

A. I don't believe it did as to freight trains, Mr. Mason, for the simple reason that during April, 1940, we were handling slag in large quantities, and that is a very heavy product. I didn't have much opportunity to fill the trains beyond 70 cars. Now, I may not be exactly correct in that statement, but that is, as I remember it at the present time.

Q. Do you recall whether in April, 1940, there was any operation of trains in excess of 70 cars on that part of the Rio Grande division within Arizona?

A. Yes, there were some.

Q. And to the extent that such trains were operated they were redispatched to 70-car maximum?

A. They were.

[fol. 2758] Q. You participated in that study?

A. I did.

Q. In the same manner that you have described for the 1938 study?

A. Yes, sir.

Q. When you had completed the redispatched train sheets, Mr. Herrell, which I understand were all your own personal work——

A. That is correct.

Q. —what did you do with them?

A. I left them in San Francisco.

Q. Did you leave them with any particular person?

A. Mr. Sines.

Q. You delivered them to Mr. Sines?

A. I did.

Q. Does that apply to all of the studies that you have participated in?

A. That is correct.

Q. Now, did you participate in the redispatching study for 1940 which is mentioned at Item 6 on Exhibit 196, the redispatching of the trains into still longer trains with the use of A. C. power and extended sidings?

A. I did.

Q. And in the same manner as you have described for [fol. 2759] the 1938 study?

A. Yes, sir.

Q. Were the entries made by you in the redispatch train sheets checked with or by anyone else to determine whether

the operation had been conducted in accordance with the principles established for the redispatching study?

A. No, I believe I was wholly responsible for that. At times it was probably necessary to confer with Mr. Sines. If so, I did.

Q. Did you check them over yourself to be certain that you had followed the proper principles and all of the other conditions contemplated?

A. I did.

Q. Can you say whether or not you followed those principles and complied with the conditions contemplated for the redispatching study?

A. To the best of my ability and knowledge I did.

Q. I think I have overlooked also the passenger redispatching studies, Items 2 and 3. Mr. Herrell, you heard those mentioned by Mr. Sines, referred to in his testimony in connection with his Exhibit 196?

A. I did.

Q. Did you participate in those studies?

[fol. 2760] A. Yes, sir.

Q. Did you make entries on redispatch train sheets for that purpose; for the purpose of the passenger redispatching studies?

A. No, sir, they were not made on what we call train sheets, they were on, I believe, another form was used for that, a white sheet.

Q. You made the redispatch entries directly on the white sheet, did you?

A. I won't say that I made all of them.

Q. Well, in so far as the Rio Grande division is concerned, did your either make them or supervise their making?

A. I did.

Q. Did you make any check of the entries which were made by any other person?

A. Yes, sir.

Q. What other person made them, another dispatcher working under your supervision?

A. Another dispatcher.

Q. Will you say whether or not the entries made in so far as they relate to the Rio Grande division which form the passenger redispatching study of 1938 represent your own best judgment?

A. They do.

Q. Did you participate in the analysis of passenger oper-
[fol. 2761] ations, Item No. 3, on Mr. Sines' exhibit 196?

A. May I see that, please? Yes, sir.

Q. And in so far as that analysis relates to the Rio Grande division or points on the Rio Grande division, what does it represent as to your own efforts?

A. The same as I would have done it had I actually done the work, as it was under my supervision.

Q. Does it represent your own conclusions gained from an examination of the train sheets and other documents?

A. It does.

Q. Had there been supplied to you a statement showing the rating of A. C.-8 locomotives, over the Rio Grande division, or over those portions of the division which are involved in the redispatching study?

A. I had it, yes, sir.

Q. Generally speaking, what was the rating of AC-8 locomotives in tons or by percentage, as compared to the F-4 type locomotive?

A. Approximately 150 per cent of the F-4 type. The rating of the AC-8 between Lordsburg and El Paso is 12,000 M's.

[fol. 2762] Q. 12,000 M's of 1000 pounds each?

A. Yes, sir.

Q. How does the rating of the AC-8 locomotive compare with the rating of the S. P.-type locomotive of the 5000 numeral series?

A. The rating of the 5000 series is 8,850 M's between Lordsburg and El Paso, which would make the AC-8 approximately 135 per cent greater.

Q. Did you work with those ratings, with that rating of the AC-8 locomotive in the redispatching studies in which those locomotives were employed?

A. I did.

Q. Mr. Herrell, I show you a bound volume of documents and ask you to state for the record what that bound volume is?

A. This is the Rio Grande Division train sheets for the month of June, 1938, of actual operations.

Q. Now, does that include the district between El Paso and Lordsburg?

A. It does; this is it here.

Q. Are there a separate group of the train sheets?

A. Yes, sir.

Q. As well as the district between Tucson and Douglas and Tucumcari and El Paso?

A. Between Tucson and El Paso via Douglas, and El [fol. 2763] Paso to Tucumcari, and El Paso to Lordsburg.

Q. If I understand correctly, the El Paso to Lordsburg sheets were the ones you particularly used in the redispatching study covering 1938, the month of June?

A. That is correct, also the train sheets from Tucson to El Paso via Douglas.

Q. For what purpose, with respect to the movement?

A. In June, 1938, we handled long trains on the south line, we moved some refrigerators via the south line which were in actual practice moved over the north line.

Q. So that you operated redispatched trains over both lines in excess of seventy cars?

A. In June, 1938, we did.

Mr. Mason: Your Honor, we now tender and I ask the record to show the tender of actual train sheets for the Rio Grande division for the month of June, 1938, for the examination and use of opposing counsel for the purpose of cross-examining the witness.

Q. Now, I wish you would select, if you will, the redispatch train sheets for the Rio Grande division covering the month of June, 1938, concerning which you have previously testified.

[fol. 2764] A. These train sheets are for the district Lordsburg to El Paso for the month of June, 1938.

Q. Do you also have the redispatch train sheets for the district Tucson to El Paso via Douglas for the same month?

A. They are here.

Mr. Mason: Your Honor, we now tender to opposing counsel, and I ask that the record show the tender of the redispatch train sheets for the Rio Grande division for the month of June, 1938, for the two districts mentioned. Now, do you have before you a volume containing the Rio Grande division train sheets for actual operations for the month of August, 1938?

A. I have.

Mr. Mason: Will you hand that to Mr. Strouss, please? May the record show the tender of the August, 1938, train sheets as well covering the actual operation?

Q. Do you have also here before you, Mr. Herrell, the redispatch train sheets for the Rio Grande division covering the month of August, 1938?

A. I have.

Q. Now, are those the redispatch train sheets concerning which you have previously testified?

[fol. 2765] A. They are.

Mr. Mason: Will you please hand those likewise to Mr. Strouss, and may the record show that these redispatch train sheets for August, 1938, are likewise tendered at this time.

Mr. Strouss: Of course, these records don't show the traffic available at the point of origin of the train.

Mr. Mason: The showing of the traffic available will be made, it will be supplied for the record.

Mr. Strouss: I want to say this to the Court now, I don't think it is incumbent upon me to have loaded on me a bunch of records if that is not available. I think if Exhibit 198 is to be at any time admissible, I doubt if it can be; but there is one further objection I want to make, that it assumes facts not in evidence. As Mr. Baker has testified that, of course, in dispatching trains it is necessary to know the traffic available, when it arrived, and the character of that traffic, and for opinion evidence to be given upon a set of facts or an experiment that has not been made, but the opinion as to what the result of that experiment would be if made, certainly all of the facts that are necessary to be [fol. 2766] known with respect to that must be put in evidence, including here the traffic available and when it became available, the tonnage, the tonnage in the trains actually operated and the tonnage in the trains under the assumed or redispatched operation. Now, I don't think that that is work that they can put on to me to dig out. That is a matter that is necessary for the admissibility of their evidence.

Mr. Mason: Of course, we put this information in the record by witnesses who are competent to put it in, not necessarily all at once. We have developed by the last two witnesses their part in the redispatching operation.

The Court: There is nothing before the Court now.

Mr. Strouss: Of course, I am making the further objection, and I have prefaced it by advising counsel what the purpose of that objection is.

Mr. Mason: We are glad to have the advice that the statement as to the traffic available will be demanded. I think, as a matter of fact, we undertook several months ago to furnish that information to opposing counsel.

Mr. Strouss: I don't think that I asked for that. As I say now, I don't think that that is a matter for me to dig out. As the Court has said, that is not before us at the [fol. 2767] present time.

The Court: You may proceed.

Mr. Mason: I would like to have you state, Mr. Strouss, just what you mean when you use the term "traffic available," what sort of showing you are going to demand to be made.

Mr. Strouss: I am not going to be unreasonable. I know that it takes a great deal of records but, at least, as to the typical days here I think there should be a showing. No doubt you have the traffic that is in these trains, take the eastbound movement here under redispatched operations, you have, of course, you know what your traffic is, that is, in those trains. Now, your records will show when that traffic became available at Yuma, what the character of it is, the tonnage in the train, when it arrived there. That is the information I want.

Mr. Mason: All that appears on the actual train sheets, doesn't it?

Mr. Strouss: I don't think it does on your Tucson division when it arrives at Yuma.

Mr. Mason: Mr. Strouss, what the redispatching study purports to show is the operation not of some more or some less traffic than was operated in the actual trains, but the same cars that were operated in the actual trains. Now, [fol. 2768] what point would it be to show that the actual trains left behind a half dozen cars at Yuma which were not handled in the redispatched train. Suppose there were half a dozen cars left behind on a particular day? Would that have any effect on the redispatching? How could it?

Mr. Strouss: It might have some effect on whether that was a proper redispatching or not. Mr. Baker has testified that the time of arrival of traffic has a great deal to do with the redispatching of it.

Mr. Mason: Mr. Baker also testified that the redispatched trains left Yuma at practically the same times as the actual trains with which they were matched. Now, that gives

the actual trains a break, a break against the defendant and in favor of the State, if you like.

Mr. Strouss: There is a part of that train that didn't, because if it is a longer train, then actually part of it didn't leave at the same time the actual did.

Mr. Mason: Then, it is leaving ahead, isn't it?

Mr. Strouss: Well, I don't know. That is what I want to find out. I don't think to take a few typical days in this [fol. 2769] operation certainly wouldn't be any great burden.

Mr. Mason: Well, if I understand what you mean by "traffic available" you mean the number of cars, for example, at Yuma on the day the redispatching study started and the number of cars——

Mr. Strouss: And when it arrived there.

Mr. Mason: ——that were available to move and when it arrived there. Do you want that information yourself, or do you think it should be made of record here?

Mr. Strouss: I think as a matter of admissibility of your exhibit that it certainly should be made of record to make that exhibit admissible, if it can be made admissible. I don't mean to say that it would make it admissible, but that is one of the factors that certainly would have to be shown before it is admissible.

The Court: Let me get it clear. Do the records which you now tender to counsel showing the actual operations give the information that you think should be available on this assumed operation?

Mr. Strouss: No.

The Court: In other words, what you are objecting to is that the availability of traffic——

[fol. 2770] Mr. Strouss: This is the operation of the trains assuming that the traffic was there to so operate.

Mr. Mason: It just seems to me that Mr. Strouss doesn't understand at all what a redispatching study is. A redispatching study, as the witnesses have testified, is the movement of the same cars which moved in the actual trains by means of redispatched trains. Now, of course, if the traffic was there and moved in actual trains, it must have been available to move in redispatched trains. That seems so obvious that it doesn't seem to me worth discussing any more. That is the traffic that was there available. If more traffic was there that might have moved in redispatched trains, we have given Mr. Strouss a break and weighted

the scales against ourselves by failing to move it in the redispatched trains, but we haven't moved more traffic in the redispatched trains than in the actual trains.

Mr. Strouss: Maybe I misstated it. I want to know when the traffic that is moved, of course, it would be the same traffic, that is the testimony at least, the same traffic that was moved by actual was to be moved by the redispatch, when that traffic came into Yuma or El Paso and became [fol. 2771] available; I would like to know whether there was any delays in the movement of any of this traffic by reason of this redispatch. There is no way of telling that by taking the trains as rebuilt without any information as to when those cars came in. Then I want to know the tonnage. That information probably is on the actual sheets, but whether it is on the——

The Court: Well, is it on the actual sheets?

Mr. Strouss: Yes, they show their tonnage on the actual. I don't know whether it is on the redistributed.

The Court: Well, this witness should be able to answer those questions.

Q. Mr. Herrell, is the actual tonnage shown on the sheets that depict the actual operations?

A. In most cases, or on the sheets which I worked there is at the top of the train sheet shown the percentage of engine loading on the actual train with which the run was compared, and the percentage of engine rating on the redispatched train over the same distance.

Mr. Mason: Is that a reflection of the tonnage, Mr. Herrell? Is the percentage of engine rating a reflection of the tonnage in the train?

A. It is, it is a percentage, the exact M's.

[fol. 2772] Mr. Strouss: You also show with each train the tonnage handled, don't you?

A. This is the actual tonnage, and here is the percentage of engine rating. In other words, this train actually had 57 per cent, and on the redispatch he had 44 per cent, he was 13 per cent lighter.

Q. This is one of your redispatch sheets?

A. This is one of the redispatch sheets.

Q. Is this figure here the tonnage of that train as redispatched?

A. That is right, 46 loads and 22 empties.

Q. The actual sheets which show the tonnage of the train actually run?

A. They would.

Q. That is what I mean.

A. Yes. This is not in all instances shown on the eastward trains or on the drags, because we just fill the drags to 125 cars and we usually run about 6,500 M's. You can figure, some estimate empty P. F. E.'s at 51 M's, some will estimate them at 52, and others at 53. I estimated them at 53 M's to the car for empty refrigerators.

Mr. Strouss: Now, I think that we should have the tonnage of all of these trains. That becomes important so [fol. 2773] far as the comparison of helper operation is concerned.

Mr. Mason: There are no helper districts on the Rio Grande division.

Mr. Strouss: I am speaking now of the operation from Yuma to El Paso, there are helper districts in Arizona.

Mr. Mason. We haven't yet tendered the Rio Grande train sheets.

The Court: You may proceed, gentlemen. I don't think there is anything before the Court to rule on.

Mr. Mason: I want to make this reference to yesterday's testimony, page 2625, and the preceding page, 2624. It was stated, in effect, that all of the redispatch and actual train sheets and all of the other basic documents covering the actual operations as well as the work sheets in connection with the redispatched operations would be made available to counsel. Now, in due course I shall identify through witnesses the basic documents showing the consists of trains arriving at Yuma and the time of their arrival, and the cars of the various types, perishable, manifest, empties, and so forth, which were in those trains, which furnished the basis, as Mr. Baker testified, with which he started [fol. 2774] his redispatching studies at Yuma.

The Court: If that showing is made, you may overcome the objection that Mr. Strouss is now raising.

Mr. Mason: I hadn't intended to make a showing in the record because primarily the redispatching study is the transportation of the same cars.

The Court: I think the Court understands that and I am sure Mr. Strouss does.

Mr. Mason: It is not an attempt to get more traffic over the road at the time, but only to handle the traffic which was actually handled, and with that understanding, the necessity for the times of arrival at Yuma and so forth, it seems to me, disappears because the study doesn't attempt to eliminate or to treat with the times which might have been taken in Yuma as between the arrival of trains from Colton and the departure of such trains from Yuma, except as that feature may be involved in the reconsisting operations of Los Angeles Division trains at Yuma to fit them to Tucson division requirements.

[fol. 2775] Mr. Strouss: Let me suggest this, in order that we might not burden the Court with too much of our troubles at the present time. Suppose you give me the information which I have indicated I want and after recess I can give you some typical days and let me look it over and let me determine whether it is necessary to put it in the record. I haven't any desire to load this record with a lot of unnecessary information.

Mr. Mason: I am perfectly willing to hand these to counsel right now only I wish to identify them. I will give the entire file to Mr. Strouss and let him select the typical days. Perhaps Mr. Sines better identify these, he knows exactly what they are.

B. S. Sixes was recalled as a witness in behalf of the defendant and testified further as follows:

Direct examination (continued).

By Mr. Mason:

Q. Mr. Sines, will you state the character of the documents showing the trains into Yuma and into other division points where trains are made up, which are to be furnished to Mr. Strouss at this time?

[fol. 2776] A. If Mr. Strouss wants them he can have the forms 1216, which are the conductors' wheel reports of the Los Angeles division on the trains entering Yuma. As I explained yesterday, however, we recapped those conductors' wheel reports into recap sheets for the use of Mr. Baker. Those sheets we intend to give to Mr. Strouss. Those sheets show the identification of the train and the

arrival at Yuma and the train split up into perishable cars, merchandise, and manifest Phoenix loads, Tucson and south line shorts, and Bowie shorts—the information that Mr. Baker or the Tucson division chief dispatcher ordinarily has to have when he is casting up his day's business in advance. When Mr. Baker got those trains started out of Yuma, thereafter there wasn't any necessity for further analysis of the conductors' wheel reports except to ascertain the pick-ups and the set-outs as they occurred in actual operation along the road. We made a further analysis of the conductors' wheel reports to determine those and have set them down on these sheets and we intend to give that to Mr. Strouss. We were going to give him the forms 1216 for the whole trip from Yuma to El Paso, if he wanted them, we just didn't get around to it until thirty minutes [fol. 2777] ago.

Q. Do you have those recapitulations, forms 1216, entering Yuma and also at other points?

A. Some of them I have here in the courtroom. I have everything over in the office and all you have to do is ask for it.

Mr. Strouss: I will take this summary you are talking about.

Mr. Mason: The one which we have now and which I am handing counsel covers as I view it the month of August, 1938, which is one of the two months covered by the redispatching study.

Q. Do we have here also the recapitulations for June?

A. Yes, sir, these smaller files are the set-outs and pick-ups enroute.

Q. The documents I have handed to Mr. Strouss are the recapitulation sheets covering not only Yuma but other division terminals as well?

A. In addition to that, there is also a statement I have in my file, I haven't got it here, but it is here in Tucson, showing the business on hand at Yuma as of 12:01 A. M. at the beginning of June and the beginning of August when we said, "Let's start this redispatch."

The Court: The business accumulating from day to day [fol. 2778] thereafter?

A. No, the business that was there at that particular moment when Mr. Baker started his 30-day redispatch. A

few cars that happened to be on hand in the Yuma yard and which had to be accounted for along with thousands of other cars that came in from day to day as the trains were redispatched.

Mr. Strouss: That is a small number?

A. Very small.

Mr. Mason:

Q. I take it that all the other cars that came in and were moved out are shown on the train sheets?

A. Yes, they are on the train sheets, but we went to the extra trouble and effort to recap every train that came into Yuma from the west for the two months of June and August, 1938, and for April, 1940. I guess I might as well finish this story. For the westbound business, Mr. Herrell didn't use recap sheets like that but he used forms 1216 and entered that information right on the train sheets themselves, you will find if listed on there, on the redispatched train sheets.

Mr. Mason:

Q. Do you wish those forms 1216, which as Mr. Sines has stated were used by Mr. Herrell?

Mr. Strouss: Not if the information is here.

[fol. 2779] Mr. Mason: It is not before you in the recaps because it was not recapitulated.

Mr. Strouss: It is on the train sheets.

Mr. Mason: Yes, it is on the train sheets. I think that is all we have of Mr. Herrell. Do you wish to cross-examine, Mr. Strouss?

Mr. Strouss: I think I prefer to have a look at these first.

Mr. Mason: I might call Mr. Baker in order to identify the Tucson division train sheets so he can turn those over to you if you wish.

The Court: Gentlemen, inasmuch as the Court has before it the dispatchers' records of actual movements of trains over the Rio Grande division, not that I have any desire to glutter the record, but do you have any objection to Mr. Herrell at the close of court explaining this system which is followed to the Court?

Mr. Mason: Certainly not.

The Court: Will you be kind enough to do that?

Mr. Mason: Yes. You may step aside for the moment, Mr. Herrell. Will you take the stand, Mr. Baker?

[fol. 2780] G. C. Baker resumed the witness stand for further direct examination as follows:

Mr. Mason:

Q. Mr. Baker, when you had completed the entries or the supervision of the entries made by the trick dispatcher upon redispatch train sheets concerning which you have previously testified what did you do with those train sheets?

A. I turned them over to Mr. Sines.

Q. Have you made an examination of exhibit No. 197, the exhibit showing siding extensions?

A. Yes, I have.

Q. Did you participate in conferences or a conference with Mr. Sines and others with respect to the question of the siding extensions which would be required on the Tucson division for the purpose of operating long trains according to the plan contemplated during the months of June and August, 1938?

A. Yes.

Q. Will you say whether or not the showing of siding extensions and of sidings to be extended as indicated on exhibit No. 197 represents your own view and judgment as to the sidings which would be required and the siding extensions which would be necessary for that purpose?

[fol. 2781] A. That is correct.

Q. Mr. Baker, I show you a volume of documents bearing on its outside cover the style "Gila to Tucson, Tucson to Lordsburg, August, 1938," and ask you whether this volume contains the train sheets of actual operation for the month of August, 1938, upon those portions of the Tucson division identified by the title?

A. They do.

Q. Will you please hand that to Mr. Stronss?

(Witness hands document to counsel.)

Q. I show you also a bound volume of documents bearing on its outside cover, "Yuma to Gila, Wellton to Phoenix,

Tucson to Nogales, August, 1938," and ask you if that is a volume of the original train sheets of the Tucson division for the month of August, 1938, covering those parts of the Tucson division referred to in the title?

A. It is.

Q. Will you hand that also to Mr. Strouss?

(Witness hands document to counsel.)

Q. I show you a bound volume of documents not contained in a cover and ask you whether this is the redispatched train sheets covering the movement of redispatched trains for the district between Yuma and Gila during the month of August, 1938, the first sheet bearing the [fol. 2782] date, Sunday, July 31, 1938?

A. It is.

Q. Will you hand that to Mr. Strouss?

(Witness hands document to counsel.)

Q. I show you now a volume of documents not bearing any title but apparently relating to the operations on the Tucson division between Gila and Tucson and ask you if those are the redispatched train sheets covering the redispatched operations on the Tucson division between Gila and Tucson during the month of August, 1938, the top sheet bearing the date, July 31, 1938?

A. They are.

Q. Will you hand that also to Mr. Strouss?

(Witness hands document to counsel.)

Q. I show you a volume of documents relating to the Tucson division apparently being the redispatched train sheets covering the operation of redispatched trains during the month of August, 1938, for the district Tucson to Lordsburg and ask you if those are the redispatched train sheets for that month?

A. They are.

Q. Will you hand that also to Mr. Strouss?

(Witness hands document to counsel.)

[fol. 2783] Q. I show you two volumes, one of them bearing title, "Gila-Tucson, Tucson-Lordsburg, June, 1938," and the other, "Yuma-Gila, Wellton-Phoenix, Tucson-Nogales, June, 1938," and ask you if those two volumes are

the volumes containing the actual train sheets covering actual operation on the Tucson division for the districts referred to in the titles for the month of June, 1938?

A. They are.

Q. Will you please hand those to Mr. Strouss?

(Witness hands document to counsel.)

Q. I show you a volume of documents the first of which bears the date, May 31, 1938, and refers to the district between Tucson and Lordsburg and Gila and Tucson and I will ask you if this volume contains the train sheets covering the redispatched operations for the month of June, 1938, between Gila and Tucson and between Tucson and Lordsburg?

A. They do.

Q. Will you hand that to Mr. Strouss?

(Witness hands document to counsel.)

Q. I show you a bound volume of documents the first of which bears the title, "Tuesday, May 31, 1938," and refers to the district between Yuma and Gila and also between Wellton and Phoenix and ask you if this volume contains the redispatched train sheets for the month of [fol. 2784] June, 1938, concerning which you have testified?

A. They do.

Q. Will you hand that to Mr. Strouss, please?

(Witness hands document to counsel.)

Q. Are the documents which you have just identified and handed to opposing counsel the actual train sheets or the redispatched train sheets, as the case may be, used by you or prepared by you or under your supervision and concerning which you testified earlier?

A. Yes, they are.

Mr. Mason: Your Honor, we ask that the record show the tender of these documents to opposing counsel. I also tender to Mr. Strouss for his use a copy of employees' timetable No. 109 for the Tucson division which is identified as having taken effect February 13, 1938, at 12:01 A. M., and I will ask Mr. Baker if that is the employees' timetable which was in effect in June and in August, 1938, at the period covered by the redispatching study of 1938?

A. Yes, that is the timetable.

Mr. Mason: Will you hand that to Mr. Strouss also?

(Witness hands document to counsel.)

[fol. 2785] Mr. Mason: Your Honor, I should like to have the record show that we have in the courtroom available for the use of opposing counsel, if they so desire, the conductors' time returns and delay reports covering the period to which the 1938 redispatching study relates on the Tucson division. I have as sample bound volumes here for the inspection of counsel and all the remaining time returns and delay reports will be made available if he so desires. Will you indicate if you do desire?

Mr. Strouss: When I finish my reading this evening.

Mr. Mason: Whenever you wish them, if you will advise us we will be glad to make them available. I also wish to state for the record we have in the courtroom three bound volumes of the white work sheets A together with certain recap sheets, the work sheets being numbered consecutively exclusive of the recap sheets from number one to 848, inclusive. These sheets, it appears, are similar in form to the typical sheet which was marked for identification as defendant's exhibit No. 198 and we tender these work sheets for the examination and use of opposing counsel.

Mr. Strouss: I would like to have those, I would like to have those with the tonight.

[fol. 2786] Mr. Mason: You are quite welcome. Mr. Sines asked me to say they are much easier to read and understand than the redispatched train sheets and, as he testified yesterday, they have been prepared directly from the redispatched train sheets and from the actual sheets, of course.

Mr. Strouss: I would like to have those, I will take the Tucson division train sheets and redispatched train sheets tonight, together with these recaps of the traffic into Yuma. There is no use in me taking the Rio Grande tonight.

The Court: I think we should recess now so you will have time to do that. The court will be at recess until ten o'clock tomorrow morning.

(Thereupon the court stood at recess until ten A. M., Thursday, January 23, 1941.)

[fol. 2787] January 23, 1941, Ten o'clock A. M.

Proceedings were resumed at this time as follows:

Mr. Mason: Your Honor, I will ask Mr. Sines to resume the stand for a moment, to make one correction in yesterday's testimony, and also to identify an exhibit.

B. S. Sines was recalled to the stand and testified further as follows:

Direct examination (Continued).

By Mr. Mason:

Q. Mr. Sines, at page 2666 of the recorded proceedings, you were asked in respect to the scope of the redispatching studies for 1940, particularly as to whether the South line via Douglas, was included in either of them, and I think that you stated that it was not. Do you wish to make a correction in that?

A. That is right, the redispatching study covered by Item 5 on Exhibit 196 did include the South line because some long trains had been run during the period between April 4th and April 30th. However, the redispatching study cov-
[fol. 2788] ered by Item 6 did not include the South line.

Q. That is, you didn't attempt to redispatch those long trains on the South line into still longer trains?

A. No.

Q. Now, I will ask you to refer to your exhibit No. 196 and particularly to Item 3 of that exhibit.

A. Yes.

Q. I recall that in your testimony you referred to the analysis of the passenger trains, Los Angeles, California, to El Paso, Texas, and so forth. Has that analysis been compiled in the form of an exhibit?

A. It has.

Q. Will you state the title of the exhibit?

A. "Los Angeles, California, to El Paso, Texas; Analysis of Passenger Operations for Year 1938, Showing Unnecessary Interference, Switching Delay, Adverse Routing, Reassignment of Passenger Car Space, Splitting and Consolidation of Trains, Cancellation of Assigned Car Movements, Excess Passenger Car Miles and Additional Helper Service Caused by Observance of Arizona Fourteen-Car Limit Law, Year 1938."

Q. That title then corresponds substantially to Item 3 [fol. 2789] of Exhibit 196, does it not?

A. Yes.

Q. The exhibit to which you have referred consists of 33 sheets?

A. Yes.

Q. And you have read the title from the first sheet?

A. I have.

Mr. Mason: May we have this exhibit identified as Defendant's Exhibit No. 199?

The Court: It may be marked for identification.

The Clerk: Defendant's Exhibit 199 for identification.

Mr. Mason: Did you prepare or supervise the preparation of No. 199 for identification, Mr. Sines?

A. I prepared a large part of it and supervised the preparation of the entire exhibit.

Q. What other persons worked with you in the preparation of Exhibit 199?

A. The trick dispatchers heretofore referred to in my description of the redispatching party, and the chief dispatchers of the three divisions, Mr. J. A. Day, Chief Dispatcher of the Los Angeles division, Mr. Henry Cassady, Chief Dispatcher of the Tucson division, and Mr. Herrell, [fol. 2790] Chief Dispatcher of the Rio Grande division.

Q. Has the exhibit been checked by any or all of those gentlemen?

A. It has been checked by each of the three chief dispatchers with reference to the territory under his supervision.

Q. Have you yourself checked it as well?

A. Yes.

Q. What underlying documents were used in its preparation?

A. The train dispatchers' train sheets for the entire year 1938 for the territory Los Angeles to El Paso, the passenger conductors' wheel reports for the territory Los Angeles to El Paso for the year 1938, the chief dispatchers' daily message and correspondence files for the entire year 1938, and log books from Yuma, Phoenix and Tucson, these log books being the running record kept by the terminal trainmasters of work performed on trains passing through the terminals.

Q. Are all of those records available for the use of opposing counsel?

A. Yes, they are here in Tucson and are available to opposing counsel.

Q. Where are these records now being kept for the time being?

[fol. 2791] A. In my office across the street, at 90 Church Street.

Q. Are they so arranged so as to be easily inspected or readily inspected by opposing counsel at that place?

A. That is right. We also have some of them stored in fireproof vaults, located on Southern Pacific property down near the station. In addition to the records that I mentioned, we had also the passenger conductors' time returns and delay reports.

Q. Is the passenger conductor's time return and delay report a document similar to the sample sheets in your Exhibit 195?

A. Yes.

[fol. 2792] Q. About how many documents or how much bulk is involved in the underlying records which you have referred to as having been used for the purpose of exhibit No. 199?

A. I imagine it would make a pretty good load for a five-ton truck, thinking of it in volume. It would probably weigh pretty close to five tons also.

Q. I take it it would be possible though hardly practicable, to bring it into the courtroom?

A. We could do it.

Q. Would you prefer to make them accessible to opposing counsel at their present location?

A. I would.

Q. I take it that he would also. Insofar as exhibit No. 199 presents the matters shown upon the train sheets and other underlying documents, will you say whether or not it is a true and correct presentation of the matters shown thereon?

A. It is.

Q. And has been checked for the purpose of determining that it is true and correct?

A. Yes, sir.

The Court: Mr. Sines, this particular exhibit No. 199 has wholly to do with actual operations and nothing to do

[fol. 2793] with the redispatched or assumed operations?

A. That is partly true in that it is an analysis of actual operations from the standpoint of interference, delay, switching, and the other things named in the title which would not have been necessary had we not been observing the Arizona 14-car limit law.

Q. But the data are taken from actual records and actual operations?

A. Yes, sir.

Q. You may have drawn certain conclusions here but those conclusions are not drawn from any assumed operations?

A. I will say "assumed" today. We had to assume there was no Arizona 14-car limit in order to find out what would not have been necessary, but in the first instance we had to make a complete record of the moves and movements and all that is based on actual performance.

Q. Last evening you presented here in connection with another exhibit the dispatchers' sheets covering the redispatch study that was made?

A. Yes, sir.

Q. Is any of this data in this exhibit taken from any of those redispatched sheets or is it all from actual operation? [fol. 2794] A. No, it is not all from actual operation. There always has to be the assumption that such and such would have been unnecessary had we not been required to comply with the 14-car limit.

Q. Were any of the redispatched sheets which were referred to in yesterday's testimony used in the compilation of this particular exhibit?

A. The redispatched sheets that we were talking about yesterday had to do with a freight redispatching study in June and August, 1938, and we set up assumed passenger operations or redispatched operations along with our redispatched freight operations for those two months. Some of those redispatched operations are abstracted into this exhibit.

The Court: You may proceed.

Mr. Strouss: I had a question along the same line I intended to ask, it puts at a little different than the Court has asked it. Disregarding the title of your different sections and subdivisions, the matter which is set forth in those titles is an abstract or summary of actual records?

A. Yes, everything occurred actually that is listed on this exhibit.

Q. The only thing that is not in the summary or abstract of record is the conclusion which is expressed in the [fol. 2795] titles?

A. That is right.

Mr. Mason:

Q. I am going to ask you, Mr. Sines, if the conclusion which is expressed in the title or otherwise in the exhibit as to the possibility of having avoided these occurrences represents your own conclusion arrived at after examination of the train sheets and other underlying documents?

A. Primarily it represents conclusions of the chief dispatchers. Understand in this redispatching study not only the passenger redispatching study but the freight redispatching study, I was in the position of saying, "Me, too," after they had shown me that such and such a redispatched operation was a practical common-sense operation. I insisted upon having these things proven to me, but the chief dispatchers are the ones responsible in the first instance.

Q. Do these statements represent the conclusions of the chief dispatchers as submitted to you and concurred in by you?

A. Yes.

Mr. Mason: I will ask permission to withdraw Mr. Sines at the present time. I want to substantiate the exhibit by [fol. 2796] calling the chief dispatchers as well.

Q. Mr. Sines, in the course of the preparation of exhibit No. 199 for identification, did you prepare work sheets as an intermediate step to the preparation of the final exhibit?

A. We did.

Q. Have you those work sheets in court with you?

A. I have.

Q. Approximately how many work sheets are there?

A. I suppose there are in the neighborhood of forty or fifty work sheets in this bundle that I have in my hand.

Q. The work sheets themselves are approximately the size of an ordinary train sheet, are they?

A. It is half of a train sheet.

Q. Are those work sheets available for the use of opposing counsel in their study and possible cross-examination upon exhibit No. 199 if the exhibit is received?

A. They are.

Q. Will you tender those to Mr. Strouss?

(Witness hands document to counsel.)

Mr. Mason: May the record show that the work sheets referred to by the witness have been handed to opposing [fol. 2797] counsel.

Mr. Strouss: If you are going to take Mr. Sines off the stand for the purpose of showing that these conclusions are the conclusions of the chief dispatchers——

Mr. Mason: I have asked Mr. Herrell already by identifying this by item No. 3.

Mr. Strouss: I will say to you now that while I think there might be some objection to their testifying, it is their conclusions, I am not going to object to this exhibit on the ground, when you have offered it, that it is a conclusion because I understand from Mr. Sines that the facts from which those conclusions are drawn are in the exhibit.

Mr. Mason: I think they are recited in some fashion.

Mr. Strouss: I will have an opportunity later if I so desire to examine the chief dispatchers as to this exhibit.

Mr. Mason: Yes. In view of what you have said, if it may be understood that a proper foundation has been considered laid, I will offer the exhibit and that will dispense with some of our legal gymnastics here.

The Witness: I think I might make an explanation which [fol. 2798] would assist Mr. Strouss.

Mr. Mason: I wish you would.

The Witness: These work sheets which I have handed Mr. Strouss contain 173 numbered items which were analyzed in full detail during the year 1938 and which are recapped onto exhibit No. 199 for identification. A complete history of each occurrence will be found in the work sheets. The recapping is made onto the exhibit. It will be necessary to examine exhibit No. 199 for identification along with the work sheets in order to get the complete story.

Mr. Mason: In view of what has been said I will now offer exhibit No. 199 as defendant's exhibit.

Mr. Strouss: I have no objection with the understanding I will have the opportunity to cross-examine later.

The Court: It may be admitted in evidence. Counsel for the State will be given full opportunity not only to cross-examine Mr. Sines but the chief dispatchers who aided in the preparation of this exhibit.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 199.")

[fol. 2799] Q. Mr. Sines, will you take up Exhibit 199. Perhaps a little explanation as to the construction of the exhibit itself would be in order. What are sheets 1 and 2 of the exhibit?

A. Sheets 1 and 2 are summary sheets of the other 31 sheets.

Now, taking section 1 on sheet 3 as an example, how do you summarize the showing on section 1 so as to bring it forward to the summary which appears with the same identification on sheet 1?

A. The title of section 1, sheet 3, is brought forward to the first summary sheet, sheet 1, and repeated verbatim. The totals of section 1 shown on sheet 3 are then brought forward to sheet 1 in the appropriate columns. For instance, character of interference, column A, sheet 1, is shown at switching, and a review of sheet 3, column E, shows that in all instances the character of interference is switching, except in the very first one, and even there the operation of splitting up trains is a switching operation. The number of instances, column B, is indicated as 12 on sheet 1, and the total of column A also indicates 12 on sheet three.

The Court: Now, this summary covers the passenger [fol. 2800] operations for the entire year 1938 in the territory shown?

A. Yes, sir.

Mr. Mason: Now, is each of the other sections summarized on sheets 1 and 2 brought from the title of the section in the same manner as you have explained for section 1?

A. That is right.

Q. How did you arrive at the total shown at the foot of sheet one?

A. That is a mathematical computation the same as all the figures above.

The Court: Well, Mr. Sines, would you be kind enough, on sheet 3, to elaborate just a little on the totals shown there, analyze that to the Court, please. I am referring now just to the totals.

A. Yes. There were twelve items, or rather twelve instances during 1938 when we discovered interference as indicated in the title of section one. The dates of those occurrences are shown in column B. The trains involved are shown in column C by number, and counting the number of trains, it will be found there were twenty-three trains.

The Court: In other words, there were twelve instances [fol. 2801] when there was this conflict, and it involved 23 trains, is that it?

A. That is right. The reason for that is that when a train approaches the Arizona-New Mexico state line with a consist in excess of fourteen cars, or when it is known that the train after crossing the line is going to pick up cars which would put its total over fourteen cars, some provision must be made in advance of crossing the state line; so that train must set out cars which will be handled in some other train whose limit will not exceed fourteen cars, or another extra train must be run to take care of the excess cars, so, in almost all instances it means there are two trains involved; the train surrendering the cars and the train picking up the extra cars.

The Court: Now, the other totals to the right.

A. Yes. As I recall, the train dispatcher's train sheet, or else it was the conductor's delay report, some one of the records that I mentioned that we had at hand indicated that in occurrence No. 111 one of the trains had been delayed ten minutes at Lordsburg, and another one had been delayed eight minutes while this exchange of cars or making up of new trains occurred, so we added that up and we have just [fol. 2802] the two trains which were delayed eighteen minutes, or an average of nine minutes per delay. Now, I said that speaking of columns G and H, I said that usually it means one train is ing to surrender some cars when it approaches the state line and we have added up the number of cars which had to be set out, and you find there were 29 cars that were set out by trains coming up to the Arizona state line. There were 35 cars picked up, however, and that is because when the second section is operated, or when an extra section is operated, we don't like

to put the passenger car right up against the engine, and we put a buffer car in between the engine and the cars with the passengers in. Sometimes that car is an empty car or it may be a baggage car or an express car, but the net result is that we are going to handle more cars than we ordinarily would have handled from one point to another, and in the six instances here we had to take another car for part or all of the distance across Arizona.

Mr. Mason: Now, is the showing in sections 8 to 14 inclusive somewhat different from that in sections 1 to 7B inclusive? You use a different form of summary, I notice, on sheet 2.

A. Yes.

[fol. 2803] Q. How do you obtain the totals which are indicated there?

A. That is true, Mr. Mason, the character of information abstracted in sections 8 to 14 is somewhat different than the information in sections 1 to 7B, and the reason for that is that generally in sections 1 to 7B we are concerned primarily with trains, whereas, in sections 8 to 14 we are analyzing movement of individual cars. Now, you asked some question about a total, Mr. Mason.

Q. How were the total figures arrived at in the totals shown on sheet 2 for each of the items?

A. Well, it would be necessary to refer to section 8, for example, which is found on pages 15 and 16 of the exhibit and where the totals found at the foot of sheet 16 are either the result of counting or of adding mathematically the figures appearing above.

Q. Is the same process followed as to each of the other sections other than section 14?

A. Yes.

The Court: Referring there to section 8 for a moment. You use the expression "unnecessary delay to deadhead equipment." Just what do you mean by that, Mr. Sines?

A. Equipment not in service, equipment which is being [fol. 2804] moved from one part of the railroad to another part of the railroad, or from one part of the country to another part of the country in anticipation of its need at some other point, or following a trip in service.

Mr. Mason: Is Pullman equipment ever moved in that fashion, Mr. Sines?

A. Yes, a large part of this equipment noted here as deadhead was Pullman equipment.

Q. Why would that be moved deadhead?

A. Well, that is the result of special movements, sometimes conventions on the Coast, taking large parties to California. When they get over there the parties may break up, you don't need as many cars in California to take that group back all at one time as when going over there.

The Court: That would be comparable to your empties in your freight operations?

A. That is right.

Mr. Mason: Have you any further questions, Mr. Strouss?

Mr. Strouss: Not at the present time.

Mr. Mason: We will withdraw the witness with the understanding, of course, that cross-examination may be had of any of the witnesses who would testify in connection with this exhibit.

[fol. 2805] Mr. Strouss: I want to say that there is a lot of stuff now that is coming up and I am going to simply have to have time to prepare for cross-examining the witness.

The Court: That is what we have the week-end for.

Mr. Strouss: I am afraid it is going to require more than a week-end.

Mr. Mason: Do you care to cross-examine any of the witnesses who have so far testified?

Mr. Strouss: The only one that I could is Mr. Herbert.

Mr. Mason: He is going to appear again in connection with some additional exhibits.

Mr. Strouss: I worked as much as I could last night in reading this stuff.

Mr. Mason: We are somewhat anxious to get Mr. Baker released as soon as possible because his superior has been taken to the hospital in that department.

Mr. Strouss: I could probably take him and ask some questions now, with the understanding that if later I wanted him to come back, I could have him. This exhibit that has just gone in——

Mr. Mason: Mr. Baker didn't participate, as I recall, in exhibit 199.

[fol. 2806] Mr. Strouss: Oh, he didn't?

Mr. Mason: Although it was submitted to him for review and check. Mr. Cassady actually participated in its preparation.

Mr. Strouss: I think I could probably take him for cross-examination. Of course, I don't like to say that I will release him entirely because I don't know what may come up in connection with these assumed operations.

Mr. Mason: He can come down here for further cross-examination.

Mr. Strouss: That is just what I can't anticipate in matters that may still come up.

Mr. Booth: I would like to state, in fairness to counsel, that we would like to have all of the cross-examination of our witnesses concluded before the close of our case, which is reasonably near, and particularly because some of our witnesses are reserve officers and we don't know what may happen about their being called into service during the vacation. We don't want their testimony to be in the position where it might be subject to be stricken out because of the lack of opportunity for cross-examination.

Mr. Strouss: I appreciate that, Mr. Booth. As you realize, these records that are given me, there is just so [fol. 2807] much that a person can do, and that is all.

Mr. Booth: There is a limit to a man's eyes.

Mr. Strouss: That is right. I have the profile maps over there that I am trying to get an opportunity to go through, and whenever I would get a few minutes to check and go over the testimony of the witnesses who have testified to prepare for cross-examination, but this matter that came up here yesterday and today, there is so much of that, I will have to go into those records before I will know what I am going to do.

The Court: That is apparent. I am sure that can be worked out, Gentlemen.

Mr. Booth: We have tentatively thought that we might be able to close our case by the 7th of February with the possibility of its running over into the next week, and making allowance for some cross-examination. Of course, counsel may conclude that the best cross-examination is rebuttal, I don't know.

The Court: Mr. Booth, when you say the 7th of February, you mean that would be closing your defense in this matter, including the safety angle, by that date?

Mr. Booth: Yes. It might be the following week, but we [fol. 2808] had hoped that, making allowance for cross-examination, we might be able to conclude by the seventh of February. It is in sight now. It is right in the immediate prospect; we can count noses and just about estimate the length of time that will be required for our direct examination.

Mr. Strouss: The reason I mentioned the possibilty of time this morning, when Mr. Booth told me last night that they might finish by the seventh, of course, as your Honor mentioned, we have these week-end recesses, but I have an office in Phoenix that I do have to at least drop into occasionally, but when you told me that last night—it sometimes will save time to take an extra recess and I thought it may be possible here that we can save time. I can tell a little later, by taking the recess a day or two earlier so that I can have a chance to examine these and see what I would want.

Mr. Booth: Yes, we want to accommodate ourselves to counsel. That might be the solution, to have a whole week's recess and then come back.

The Court: The Court is of the opinion that that would be the best way, to give you a week intervening between the close of their present defense and your cross-examina-[fol. 2809] tion of these Southern Pacific officers and employees.

Mr. Strouss: That is fine. If they prefer to have me take that time earlier, it doesn't make any difference to me, but it is apparent to me now that I am going to have to ask for some time in there. I appreciate that counsel has been very kind in that respect.

Mr. Booth: Yes, this testimony is being poured in in a very highly concentrated form.

The Court: You may proceed. Call your next witness.

Mr. Mason: Do you wish to go on with Mr. Baker now?

Mr. Strouss: I started to say that I think at two o'clock I can take him. I believe I can probably complete it so he won't have to come back at all.

Mr. Mason: Then we will call Mr. Cassady at the present time.

The Court: Come forward.

[fol. 2810] HENRY W. CASSADY was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you please state your name and employment to the reporter?

A. Henry W. Cassady, chief dispatcher, Tucson division, Southern Pacific Railroad.

Q. Are your headquarters at Tucson, Mr. Cassady?

A. Yes, sir.

Q. How long have you been chief dispatcher of the Tucson division?

A. Since the twenty-fourth day of August, 1939.

Q. Were you previously in service as a dispatcher or assistant chief dispatcher on the Tucson division?

A. Yes, sir, since the twentieth of February, 1917.

Q. What was your previous experience in railroad service prior to 1917?

A. I had worked as agent, operator, car distributor, chief dispatcher.

Q. You have been at Tucson in the dispatching force of [fol. 2811] the Tucson division since 1917?

A. I have, yes, sir, except for a short period of time I was detached from the dispatcher's office and used as a train rules examiner.

Q. What duties does the train rules examiner perform?

A. He examines all employees as to their knowledge of the operating rules of the company.

The Court: Is that an individual examination that you make?

A. Individual personal examination, yes, sir.

Q. You don't conduct a class or school in connection with it?

A. No, not in that case, that is in the case of a new employee or a promoted man, a brakeman to a conductor or operator to a dispatcher; fireman to an engineer.

Q. You test his knowledge of the rules and regulations of the company covering his position?

A. That particular position, yes, sir.

Mr. Mason:

Q. You have been chief dispatcher since 1939 and prior to that were assistant chief dispatcher at Tucson?

A. For several years, yes, sir, perhaps ten or twelve years.

Q. You heard the testimony of Mr. Baker as to the ex- [fol. 2812] tent of the jurisdiction of the chief dispatcher at Tucson?

A. I did.

Q. Did you hear his description of the duties and responsibilities of the chief dispatcher?

A. Yes, sir.

Q. And of the trick dispatcher?

A. Yes, sir.

Q. Will you say whether or not that description is applicable to your present position?

A. It is.

Q. Did you hear the testimony of Mr. Sines as to the redispatching study of 1938 relating to the Phoenix line?

A. I did.

Q. Are you the Mr. Cassady referred to in his testimony as having performed or supervised the redispatching of the December business on the Phoenix line in 1938?

A. I am.

Q. For the purpose of the redispatch on the Phoenix line in 1938, did you contemplate the use of any different type of locomotive than was in actual operation in December, 1938?

A. No, I did not.

Q. Did you contemplate any siding extensions on the [fol. 2813] Phoenix line other than at the station immediately north and west of Picacho?

A. No, I did not.

Q. Will you state the name of that station?

A. Topaz.

Q. What, if any, conditions did you contemplate for the purpose of the redispatch as to the availability of traffic at the start and during the course of the month of December, 1938?

A. For the redispatch study we had a yard report showing the cars on hand for movement at both Phoenix and Tucson and for the entire period we moved car for car that was handled via this route.

Q. Did you contemplate there would be any more or less traffic available at either terminal for movement via Phoenix route?

A. No, not in this case.

Q. You were also mentioned in Mr. Sines' testimony, I think, as having participated in or supervised the redispatching studies for the year 1940?

A. That is right.

Q. Were you the chief train dispatcher at Tucson during the months of March and April, 1940?

A. Yes, sir.

Q. Did you supervise the conduct of the two redispatch-
[fol. 2814] ing studies of 1940 which are mentioned on Mr. Sines' exhibit No. 196?

A. I did.

Q. Have you a copy of that exhibit before you?

A. Yes, sir.

Q. I refer you first to item No. 5. At what point did you start your redispatching study of eastward traffic during the period covered by item No. 5 of exhibit No. 196?

A. Yuma, Arizona.

Q. What traffic was handled commencing on April 4th from Yuma?

A. All traffic on hand at Yuma at 12:01 A. M., April 4th, and all arriving and originating at Yuma or Somerton.

Q. Is that the same traffic that was actually handled in the trains operated out of Yuma on April 4th?

A. Yes, sir.

Q. Did you during the period following April 4th operate a number of trains eastward out of Yuma or over the district between Yuma and Gila, Gila and Tucson, with more than 70 cars?

A. Eastward?

Q. Yes.

A. I don't think so.

[fol. 2815] Q. If there were trains operated eastward between Yuma and Tucson of more than 70 cars, what was done with the extra cars in your redispatching study corresponding to item No. 5?

A. They were moved on trains other than the actual train operated.

Q. In the redispatching study did you observe the 70-car restriction?

A. We did.

Q. In connection with the redispatching study, item No. 5, at what point did you start your redispatching study of westward traffic?

A. Lordsburg, New Mexico.

Q. Did you also redispatch traffic moving westward and arriving at Tucson via south line?

A. We don't have any jurisdiction over the south line on the Tucson division, no, sir.

Q. Traffic handled via south line and coming to your division at Tucson would be included in your westward redispatch?

A. Westward redispatch from Tucson, yes, sir.

Q. Did you actually operate trains westward from Lordsburg or westward from Tucson consisting at times of more than 70 freight cars?

A. Yes, sir.

Q. And in the redispatching study did you observe any [fol. 2816] restriction as to the length of the redispatched trains?

A. We did.

Q. What restriction did you observe?

A. 70-car limit for freight trains.

Q. Did you in the redispatching study handle any more or less or different traffic than was handled in your actual trains during the period from April 4th to April 30th, 1940?

A. The identical same traffic was handled in actual and redispatched.

Q. Does that mean that the same cars were handled?

A. The same cars would not be handled on the same trains, it would be necessary to operate additional trains from time to time in order to take care of the reduction from the over-size trains operated.

Q. By "over-size" you mean more than 70 cars?

A. More than 70 cars.

Q. For the purpose of the redispatching study covered by item No. 5 of exhibit No. 196, did you contemplate the same siding facilities as existed during that period?

A. Yes.

Q. Are they the same or substantially the same siding [fol. 2817] facilities that exist today?

A. That is right.

Q. Did you contemplate the use of the same locomotives or the same class of locomotives?

A. That is right.

Q. Are they the same locomotives which were in service following April 30 and likewise today?

A. Yes, sir.

Q. Did you yourself make all of the entries on the redispatched train sheets for the purposes of the redispatching study, item No. 5, of exhibit No. 196?

A. I did not.

Q. Were some of those entries made by some other person?

A. Yes, sir.

Q. By whom?

A. By a trick dispatcher that I had with me.

Q. Was this trick dispatcher working under your supervision?

A. He was.

Q. What, if any, check of the entries made by the trick dispatcher did you yourself make?

A. They were all checked.

Q. Was the trick dispatcher's work done under your supervision?

[fol. 2818] A. Yes, sir.

Q. What was the character of the entries made by the trick dispatcher?

A. The time at way stations or intermediate stations between terminals; the arriving time at the district terminal; the transcript of the conductor's delay report of the actual train as compared with the redispatched train; the additions or subtractions from this delay report as the case might be.

Q. Did you yourself make the entries as to departure times from originating terminal?

A. In most all instances I made them myself or instructed as to the time they should set to depart.

Q. Did you yourself determine the consist of the redispatched trains?

A. I did.

Q. You have heard the testimony of Mr. Baker and Mr. Sines as to the variations in train speed over the road assigned the redispatched trains as compared with actual trains on account of the ratio of the loading to the tonnage rating of the locomotive handling the train?

A. Yes, sir.

Q. Did you follow the same principles as described by [fol. 2819] them in assigning the train speed to the redispatched trains?

A. I did.

Q. Mr. Cassady, with respect to the matter of tonnage rating in general, is that a matter with which the dispatchers and chief dispatcher is familiar?

A. Absolutely.

Q. Is that necessary to his job?

A. Absolutely, yes, sir.

Q. Tonnage rating of a locomotive over a particular district is an expression of just what feature? I want you to describe it in terms which I as a layman and Mr. Strouss as a layman may understand easily.

A. It is the amount of tonnage that a locomotive can pull over any given section of the road.

Q. Of the particular stretch of road to which the rating relates?

A. That is right.

Q. The same locomotive, then, or the same type may have a different rating westward from Tucson to Gila than it has eastward from Tucson to Lordsburg, is that correct?

A. That is right.

Q. What causes that difference in the rating of the same [fol. 2820] locomotive?

A. A difference in the grade.

Q. Then I take it that the rating varies according to the physical characteristics of the district over which the locomotive is to run even though the tractive effort of the locomotive is constant, is that correct?

A. That is correct.

Q. Is the rating of a locomotive over a particular district determined by computation or by experiment and experience?

A. It is determined by a mechanically operated device used for test purposes with one particular type of locomotive.

Q. Is each type rated by the use of this test?

A. That is right.

Q. You say a mechanically operated testing machine. What is the name of that device?

A. I wish you hadn't asked me that because I can't remember the name of it now.

Q. May I suggest the dynamometer car?

A. That is right.

The Court: In other words, after a locomotive has been tested by this dynamometer car, you know what it would do, you don't have to hitch it to a train and run it over [fol. 2821] a given stretch of territory to see whether it would pull the load?

A. No.

Q. You know exactly what it will do?

A. That is right.

Mr. Mason:

Q. Is the tonnage rating virtually the maximum hauling capacity of the locomotive over the particular district?

A. No, it is the standard.

Q. Standard of its hauling capacity?

A. Yes, there is some tolerance in the load. The locomotives will handle in excess of the rating as shown in our working timetables, but we fix the rating for a locomotive so that it will be able to handle a train at fair speed.

Q. Referring to item No. 6, the freight redispatching study for April 4th April 30th, 1940, all as indicated in more detail on defendant's exhibit No. 196, will you say whether or not you made or supervised that study insofar as the Tucson division was concerned?

A. I did.

Q. Was that conducted by you in the same manner as the other redispatching study?

A. It was.

Q. Did you also in that case make out redispatched train sheets?

[fol. 2822] A. Yes, sir, we did.

Q. Who made the entries upon the redispatched train sheets?

A. The trick dispatchers assisting me and myself.

Q. Did you supervise the entries made by the trick dispatchers?

A. I did.

Q. Did you check the entries made by them as to their propriety and correctness?

A. I did.

Q. As to the entries on the redispatched train sheets made by these trick dispatchers as to items Nos. 5 and 6, will you say whether or not you vouch for them?

A. I do.

Q. Were the same principles of dispatching and operating trains from the standpoint of the dispatcher observed in these redispatching studies which you made or supervised as observed in the actual conduct of the railroad?

A. Yes, sir, just the same.

The Court: We will take our mid-morning recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows.)

[fol. 2823] The Court: You may proceed.

Mr. Mason: Mr. Cassady, in the redispatching studies which you conducted, particularly the freight redispatching studies, did you undertake to match up your redispatched trains with trains as actually run?

A. Yes.

Q. You state on the redispatching study corresponding to Item 5 you ran additional trains?

A. That is correct.

Q. Were they matched up with any actual trains?

A. No, they couldn't be.

Q. Did you work out or check the work at the points at which meets and passes would take place for the redispatched trains?

A. No.

Q. Who prepared that work?

A. Dispatchers.

Q. The trick dispatchers?

A. The trick dispatchers, yes, sir.

Q. Did you check their work after it had been entered on a redispatch train sheet?

A. Yes, sir.

Q. Will you say whether or not their working out of meets and passes and other items of the run correspond to your own judgment as proper or not?

[fol. 2824] A. They did.

Q. In the actual operation between April 4th and April 30th, 1940, Mr. Cassady, generally speaking, what particular description of trains were run in units of more than 70 cars?

A. Drags.

Q. Did you run any of your manifest trains with more than 70 cars?

A. A few.

Q. Did you undertake to run trains of more than 70 cars in both directions during that period?

A. We did.

Q. At the same times and on the same days?

A. Well, perhaps approaching the end of the district, as Mescal to Tucson, you will find trains of more than 70 cars in each direction, and there are a few cases where we operated trains of more than 70 cars in each direction between Tucson and Gila, taking advantage of a few long sidings that we did have.

Q. Generally speaking, you operated the long trains in one direction or the other on the same district on the same day?

A. That is correct.

Q. But not in both directions. What train length did you observe as to trains moving against the long-train [fol. 2825] direction, if I may call it that?

A. In our term, we call them siding clearance trains.

Q. By siding clearance trains, what do you mean?

A. We mean perhaps sixty-five to sixty-seven cars, depending upon the length of the cars involved in the train.

Q. By "siding clearance" you mean trains that could get into almost any of the sidings in order to make a meet; is that correct?

A. That is correct.

Q. I may not have mentioned, but did you participate in the passenger redispatching studies of 1938, that is, the redispatching study and the analysis mentioned as Items 2 and 3 of Exhibit 196?

A. I did.

Q. And in the passenger redispatching study, did you follow the same principles which have been stated here and which you have stated that you observed as to items 4, 5 and 6?

A. Yes, sir, that is correct.

Q. Did you assume or contemplate the use of any different type of locomotives for the operation of passenger trains?

[fol. 2826] A. No, sir.

Q. Have you reviewed and checked the showing which is now in evidence as Mr. Sines' exhibit No. 195?

A. Yes, sir.

Q. And in so far as that exhibit relates to the Tucson division, will you say whether or not it expresses your own conclusion predicated on your experience?

A. Yes, sir, it does.

Q. I take it that you are familiar with the ratings of the types of locomotives now in use on the Tucson division in freight service. Are you also familiar with the rating of the AC-8 class of locomotives over the Tucson division?

A. Yes.

Q. Generally speaking, how does the rating of the AC-8 class locomotive compare with the rating of the F-4 class, expressed in percentage relationship?

A. About 165 per cent, I guess, something like that.

Q. And, generally speaking, how does the rating of the AC-8 locomotive compare with the rating of the 5000 class S. P. type locomotive?

A. I have never worked that out, I don't know just [fol. 2827] exactly what it would be. About—I have worked it out some place, I don't remember where we worked it out.

(The witness made some calculations off the record, during which he mentioned some figures which were inaudible to the reporter.)

Mr. Mason: You speak of the approximate rating of the S. P. as 4350?

A. Yes, from Tucson to Dragoon.

Q. And you spoke of the AC-8 locomotive class as approximately 6200, didn't you?

A. That is right.

Q. Then the percentage relationship can be figured from those two figures?

A. Yes, that is right.

Q. Now, will you say whether or not the redispatching studies which you have supervised and in which you have participated as described by you, represent to the best of your judgment the manner in which trains and traffic would have been operated and handled and could have been so operated and handled at the times covered by such studies and under the conditions contemplated by the several redispatching studies?

A. Absolutely, yes, sir.

Q. Mr. Cassady, when you had completed, or, rather, [fol. 2828] when the redispatch train sheets for the various redispatching studies had been completed with all of the entries thereon; did you turn those redispatch train sheets over to anybody?

A. Yes.

Q. To whom did you hand them?

A. Handed them over to Mr. B. S. Sines.

Q. In connection with the passenger redispatching study, Item 2, did you make redispatch train sheets there, or just work sheets?

A. Just used work sheets.

Q. Did you turn those work sheets over to Mr. Sines?

A. Yes, sir.

Mr. Mason: Your Honor, I would like at this time to tender to Mr. Strouss the actual and redispatch train sheets covering the redispatching studies for 1940 for the Tucson and Rio Grande divisions. Unfortunately, we are still making some use of those and they won't be available until Monday. I want the record to show that they are available, and we will tender them just as soon as possible.

Mr. Strouss: The record may show that you have tendered them and then when I get to where I can use them I will advise Mr. Sines and take them. Some of the rec- [fol. 2829] ords that were tendered to me yesterday are left with Mr. Sines because I couldn't use them all at once. I will indicate when I am ready to use them.

Mr. Mason: It perhaps would be better that the record do show that we do tender them and Mr. Strouss may have them when he wishes, with that reservation as to next Monday.

Q. Mr. Cassady, have you seen Mr. Sines' exhibit No. 197, which is the outline map of the divisions with the siding extensions indicated?

A. Yes, sir, I have.

Q. Have you reviewed that exhibit?

A. Yes, sir.

Q. Did you participate in the conferences at which these siding extensions were determined?

A. Not in San Francisco, no, or Los Angeles.

Q. Have you reviewed the exhibit since or reviewed the determination since it was made?

A. I have.

Q. Now, will you say, basing your answer upon your own experience and familiarity with the division and your qualifications as dispatcher and chief dispatcher, whether or not the showing of siding extensions on Exhibit No. 197 in so far as that exhibit relates to the Tucson division, [fol. 2830] reasonably expresses the sidings and siding extensions which would be necessary for the operation of trains according to the plan contemplated for the 1938 redispatching study?

A. It does.

Q. And whether or not the same would be true as to the plan contemplated for the 1940 redispatching study, in which the use of the AC-8 type of locomotive and the operation of trains corresponding to that locomotive was contemplated?

A. Yes, sir, it does.

Mr. Mason: I think that is all we have of Mr. Cassady at this time.

Mr. Strouss: I will reserve my cross-examination.

The Court: You may step aside. Call your next witness.

Mr. Mason: We will recall Mr. Herbert.

W. P. Herbert was recalled to the stand and testified further as follows:

Direct examination (continued).

By Mr. Mason:

Q. Mr. Herbert, have you before you a statement in one sheet entitled "Southern Pacific Company Grade Cross- [fol. 2831] ings Within the State of Arizona as Reported to Corporation Commission of the State of Arizona, Year Ended December 31, 1939. By Southern Pacific Company," and so forth?

A. Of the State of Arizona, yes, sir.

Mr. Mason: May we have this statement marked for identification No. 200?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 200 for identification.

Mr. Mason: Did you prepare Exhibit No. 200 for identification, Mr. Herbert?

A. Yes, I did.

Q. And from what sources?

A. From the annual reports for the various years shown as reported to the State of Arizona by the Southern Pacific Company.

Q. Are the classifications of the crossings, as shown in lines 1 to 10, shown on the report?

A. Yes, they are exactly as shown on the report.

Q. Do you have the reports made to the Corporation Commission from which the exhibit was prepared?

A. Yes, we do.

Q. Now, as to the detail of the exhibit in columns D and E, are those the details as to numbers added and numbers [fol. 2832] eliminated shown in the annual report?

A. Yes, they are.

Q. Will you say whether or not the exhibit is true and correct?

A. Yes, I checked it myself and made it myself.

Q. And is the total in line 11 a reported total or computed total?

A. It is a summation of those shown above, and is also shown in each report.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: As I understand it, this is the resume of the report to the Corporation Commission as to grade crossings?

A. Yes, it is a resume and is practically a copy, or is a copy of the method and manner in which it is reported to the Commission.

Mr. Mason: Does this include grade crossings on branch lines as well as on main lines?

A. Yes.

Q. Does it include crossings over spurs or industrial tracks as well as those over main track?

A. Yes.

The Court: Just what do you mean by "grade crossing," Mr. Herbert?

A. A grade crossing, Your Honor, is a road or high- [fol. 2833] way that crosses the railroad tracks at grade

or, in other words, along the same level as the level of the rails.

Q. There has to be a road, otherwise you would not classify it as a grade crossing?

A. That is right; it is a road or highway over which vehicular traffic might cross.

Q. That might be a private way into some man's ranch?

A. No, this is just public crossings, public grade crossings. Private crossings are usually covered by a separate agreement with the farmer on either side of the railroad. However, I might check into that. My understanding is that this is just public crossings.

Mr. Mason: These are the crossings as reported to the Commission?

A. Yes, as reported.

Mr. Strouss: When you speak of spur tracks, do you mean switches to industrial plants?

A. Occasionally there will be found a grade crossing over a spur track.

Q. Suppose you have a road that crosses a number of railroad tracks, that would only be considered as one crossing?

A. Yes, that is right.

[fol. 2834] The Court: How about driveways? I don't know the situation on the Southern Pacific, but I know on the Santa Fe that periodically they make provision for the crossing of livestock, possibly not a road there. Would that be counted as a grade crossing, or do you have any such?

A. Well, I believe that comes under the heading of private crossings in most instances in out-of-the-way places where we permit private crossings to be constructed by agreement with the cattle owners of property owners on either side of the railroad track or right-of-way fence. In those cases, they usually have gates which have a sign on them which prohibits public use of those gates without proper authority.

Q. Your right-of-way is fenced the entire distance?

A. No, not the entire distance. There are spaces where there are no fences.

Mr. Strouss: This report to the Corporation Commission doesn't segregate in any place these crossings so far

as congested districts and uncongested districts are concerned, that is, their location; they may be in a congested community like the Salt River Valley?

A. No, it does not.

[fol. 2835] Q. Of course, when you say that it covers branch lines, it covers grade crossings within cities and just communities of that sort?

A. Yes.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit No. 200.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 200.")

Mr. Mason: Have you before you, Mr. Herbert, a statement in one sheet entitled "Grade Crossings Within the State of Nevada as Reported to the Public Service Commission of the State of Nevada, Year Ended December 31, 1939," and so forth?

A. Yes, I have.

Mr. Mason: May we have this statement marked as defendant's Exhibit No. 201 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 201 for identification.

Mr. Mason: Did you prepare Exhibit No. 201 for identification, Mr. Herbert?

A. Yes, I did.

Q. And from what sources?

A. From the annual reports, for the various years shown [fol. 2836] and reported to the Public Service Commission of the State of Nevada by the Southern Pacific Company.

Q. Does this exhibit cover the same character of grade crossings and by similar segregations as shown on Exhibit No. 200?

A. Yes, it does.

Q. And, I take it, was prepared from a corresponding series of reports?

A. That is right.

Q. Are these figures taken directly from the reports themselves?

A. Yes, they are.

Q. Has it been checked against the reports?

A. Yes, it has.

Q. Does this include branch line or spur track crossings as well as main line crossings?

A. Yes.

Q. I take it that it includes only those crossings where the road or highway and the railroad track are on the same level?

A. That is right.

Q. Has the exhibit been checked to determine its correctness?

A. Yes, it has.

Q. Will you say whether or not it is a true and correct [fol. 2837] reflection of the underlying reports?

A. Yes, I believe it to be.

Q. Are the reports available?

A. Yes, they are.

Q. In the city?

A. Yes.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: We offer Exhibit No. 201 for identification as defendant's exhibit with that number.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit 201.")

The Court: Refer to your Arizona exhibit for a moment. Where is it that you maintain the watchman on duty alone?

A. I believe at the crossing at Benson, but I am not certain as to that.

Q. I believe you stated that you didn't know how many of these crossings were on main line and how many on branch lines?

A. No, I don't have any such segregation shown.

[fol. 2838] Q. Do you recall the mileage—it is in evidence here somewhere—of the Southern Pacific Lines in the state of Arizona?

A. No, I don't recall that.

[fol. 2839] Mr. Mason: Exhibit No. 115 shows the operated steam mileage by states, your Honor.

The Court: All right, thank you.

Mr. Mason: And shows the total of all tracks including sidings, the Nevada total of all tracks including sidings and including the Western Pacific mileage of 177 miles over which we operate is 1231.43, column 10 of that exhibit. The Arizona grand total, all tracks including sidings, is 1702.49.

The Court: That would make a grade crossing every three miles, on the average. I was somewhat astounded as to the number of them.

Mr. Mason:

Q. Mr. Herbert, have you before you an exhibit in one sheet entitled, "Yuma, Arizona, to El Paso, Texas, Increased Investment in Siding Extensions Incident to Long Train Operation"?

A. Yes, I have.

Q. Did you prepare this statement?

A. Yes, I did.

Mr. Mason: May we have this marked No. 202 for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 202 for identification.

[fol. 2840] Mr. Mason:

Q. Mr. Herbert, does this exhibit correspond to any exhibit previously offered and received of record here?

A. Yes, it does.

Q. Will you refer to that exhibit, please?

A. It corresponds to exhibit No. 197.

Q. Having exhibit No. 197 in mind, what steps have you gone through in preparing exhibit No. 202 for identification?

A. It was decided as testified by Mr. Sines and I believe the various dispatchers that certain sidings would necessarily have to be extended in order to comply with the program set out to make the redispatch. I set out to make the estimated amount of money required to extend those sidings.

Q. Have you shown here as items 1 to 48 and item 50 the stations in column B at which siding extensions are contemplated as indicated by exhibit No. 197?

A. Yes.

Q. And column C the milepost locations?

A. Yes, sir.

Q. What does column D indicate?

A. That indicates the present length expressed in feet.

Q. What does column E represent?

[fol. 2841] A. The present length expressed in car lengths.

Q. Is column E based upon any computation with respect to column D?

A. It is. It is an average of 46 feet per car. However, it is the exact figure as shown in the current timetable prevailing in 1938.

Q. Is column D based upon measurements or records in any particular office?

A. Yes.

Q. Where and what records?

A. They are based upon records in the chief engineer's office and also records in the division office here at Tucson.

Q. I notice here, for example, you show at Fortana a siding length and a corresponding length in cars. At Gael you show the siding length in feet as the same figure but the length in cars is shown as one car more?

A. Yes. However, that is due to the fact that the timetable had it that way and I show column E exactly the way the current timetable had it set up.

Q. Does the same explanation that you have just made as to the apparent disparity between lines 3 and 4 apply to any other cases where a similar or corresponding disparity appears?

[fol. 2842] A. Yes, I believe it will.

Q. For example, I notice in line 13 the siding of 3,946 feet is shown as having 77 cars while in the next line one only 30 feet shorter is shown as having four cars less capacity?

A. That is right.

Q. That disparity or inconsistency is between the actual record of length and the timetable showing?

A. Yes, sir.

Q. Between what points is the length in feet computed as shown in column D? Is that from switch point to switch point?

A. Yes, sir.

Q. The siding capacity in cars, does that depend upon any other features of the siding itself other than its length, switch point to switch point?

A. Yes, it does.

Q. What other feature, for example?

A. It depends upon the length in the clear. Many times although a siding might be 3,800 feet, for instance, there might be a spur or a derail at one end or the other of that siding that might impair its clearance and that derail is not always the same distance from the point of switch, thereby [fol. 2843] causing in one instance more cars for the same length of siding than another.

Q. Now as to proposed length in column F. How is that figured?

A. The length in column F is the proposed length expressed in feet for the various proposed lengths. In order to explain that I will be a little historical, maybe. It was decided by the chief engineer's office that in order to make a 70-car capacity siding it should be four thousand feet in length from switch point to switch point. That involves the following computation, 70 cars at 46 feet will equal 3,220 feet. Two hundred twenty-five feet was then provided at each end for clearance, making a total of 450 feet. An engine length and a caboose, taking an engine in this case of 126 feet, will be 166 feet. Then providing for an operating stop of 164 feet will total 4,000 feet.

Q. How do you get the additional length for 125-car sidings?

A. For all additional cars added thereto over the 4,000 feet an average length of 46 feet per car was provided. Therefore, taking the siding length of 6,530 feet as shown at Yuma or Fortuna, taking the 70 cars at 4,000 feet, add 55 [fol. 2844] cars at 46 feet per car, or 2,530 feet, will give you the 125 cars or the 6,530 feet.

Q. With the provision for the locomotive and caboose?

A. Yes.

Q. And the clearance?

A. And the clearance.

Q. And the operating stop that you mentioned?

A. Yes, sir. The same thing applies to the 100-car sidings except for the additional 55 cars you only have an additional 30 cars.

Q. Having obtained column F and column G in this manner, how did you obtain the figures in column H. For example, in line 2 you show a figure in column H in feet, what does that represent?

A. By subtracting the present length from the proposed length gives the length of the extension in feet.

Q. Did you make any personal inspection of the places at which the siding extensions were contemplated for the purpose of the redispatching study?

A. Yes, I did.

Q. What was the nature of your inspection.

A. In addition to my intimate knowledge of the territory involved, having worked, you might say, on the track for [fol. 2845] some fifteen or sixteen years in this territory, I made a special trip by track motor car or inspection car for the sole purpose of making this estimate.

Q. Did you stop at each of these sidings to determine whether an extension was practicable or not?

A. Yes, I did.

Q. You show in column I under the heading, "Length of Extension," the words "East or West." What does "East or West" as it appears in column I signify?

A. That signifies which direction the siding would be extended. I determined that on the ground from my own judgment as to whether the siding should be extended eastward or westward.

Q. What factors did you take into consideration in determining which direction the extension should be made?

A. There are many factors involved there, mostly those of practicability and economy. You take into consideration your grading, whether or not the switch points as proposed would be located on a curve or on a straight track, bridges and other obstacles that might be in the way in one direction or the other.

[fol. 2846] Q. If, for example, there were a rather high fill at one end of the siding and comparatively little fill at the other end, which direction would the extension be made?

A. I would take the end that involved the least cost and was the most practical. I would take the end that had the least fill.

Q. Suppose there were a wash or creek or arroyo at one end and no such natural feature at the other, which would you select?

A. I would take the one at the end that did not have that natural barrier.

The Court: Are any of these sidings shown on this exhibit No. 202 on which you propose to increase the length of the siding located on the Wellton-Phoenix route?

A. Not on the Wellton-Phoenix route.

Q. On the southern route east of here via Douglas?

A. Before I go to that, I thought you meant only the district between Wellton and Phoenix. On that route there is one called Topaz. As to the south line, there are none but there is on the double track which is on the former E. P. & S. W. line at Vail, which is on the westward main track.

Mr. Mason:

[fol. 2847] Q. Are these the same stations which are identified on exhibit No. 197 and no others?

A. That is right, the same ones.

Q. What type of rail did you contemplate for use in these siding extensions?

A. Second-hand ninety pound.

Q. You show in column H, "Miscellaneous Moving Pole and Pipe Lines and Other Structures." What does that signify?

A. That signifies the amount of money necessary for those items at the various locations shown.

Q. What moving of poles and pipe lines did you have in mind? Will you give me an example?

A. There are instances in extending tracks of moving switches where our telephone and telegraph poles or signal poles might be in the way and other pipe lines in towns or villages that might have to be moved in order to extend the side track and it also includes road crossings that might have to be crossed by the side track as well as the main track in its extended form.

Q. What does the item of "Grading" cover?

A. It covers all the grading necessary to extend the side track.

Q. Does that include whatever ballast might be necessary to replace?

[fol. 2848] A. No, it does not. Ballast is included in item J.

Q. Did you make any survey to determine the quantities of material that would have to be moved for the purpose of grading?

A. Yes, on the trip I just mentioned I made an on-the-ground survey at each place to determine the amount of grading and its cost per yard.

Q. How long did you take to make the inspection trip you have referred to?

A. It took about two weeks or over.

Q. As to track, how did you arrive at the figures in column J?

A. We have in the railroad a unit cost for track, that is bare track, including ballast, which I obtained from the chief engineer's office and which is in use in this territory and which I know to be correct and conforms to good engineering practices.

Q. Does it conform to your own experience?

A. Yes, it does.

Q. Is this the multiplication of the extension in feet by the unit cost per foot or per yard of track?

A. As far as the track, column J, that is correct.

[fol. 2849] Q. The column headed "Bridges," was it necessary to relocate, strengthen, or widen bridges for the purpose of these extensions?

A. It was necessary to widen certain bridges over which the side track would have to pass if extended.

Q. What as to the item of "Signals," how did you arrive at that and what does that represent?

A. Moving the location of a main line switch, which in each case would be involved here, it is also necessary to make certain adjustments in signals. Each switch is tied into the signal block layout.

Q. How do you obtain the cost figures for the movement of signals?

A. I worked in collaboration with the signal engineers of the company going over each item in detail and those were the figures that conformed to the latest estimates as to the moves that had to be made in each case.

Q. Are those based upon experience in the movement or removal or replacement of signal installation at sidings in this territory?

A. Yes, sir, they are.

Q. Based upon actual figures of record?

A. Yes, sir.

[fol. 2850] Q. Did you use work sheets in preparing exhibit No. 202 for identification?

A. Yes, I have work sheets.

Q. Which cover the details of each of these items?

A. Yes, they do.

Q. I take it that the total cost in column M is the summation of the costs which appear in the previous columns H to L, inclusive?

A. That is right.

The Court: How does it happen there is such a variance in the cost of track per foot ranging in line 24 at Vail of $3.22 to $10.21 at Raso, line 33?

A. That is due, as you will note, at Raso you have an extra heavy bridge expense, where at Vail you have only twenty dollars, at Raso you have $4,400. Going to the next item in column I, signals, at Vail the expenditure for signals was only forty dollars, whereas at Raso an expenditure of $3,400 was necessary and so on through the general cost items.

Mr. Mason:

Q. At Vail I take it you made the extension away from the existing signal mast at the opposite end of the siding?

A. Yes, there was no signal mast at the switch that I [fol. 2851] chose to extend at that point.

Q. Is that because that track is used in one direction only?

A. Yes.

Q. And the track at Raso is used for both east and westbound, is it?

A. Yes, sir.

Q. I take it that the figures in column N are obtained by division. Will you state what items are used in that division?

A. They are the cost per track foot. It is the track feet of the extension, which would be column H, dividing the cost, the total cost into column M.

Q. It would be column M, dollars, divided by column H, feet?

A. Yes, sir.

The Court: We will take our noon recess at this time until two P. M.

(Thereupon the court stood at recess until two o'clock P. M. this day, January 23, 1941.)

[fol. 2852] January 23, 1941, two o'clock P. M.

Proceedings were resumed at this time as follows:

The Court: Gentlemen, before we commence, time drags heavy on my hands at times. I wonder if you would have any objection if the Court saw fit to personally visit the dispatcher's office in Tucson just to see at first hand how it operates?

Mr. Strouss: No, we haven't.

Mr. Booth: We certainly have not.

The Court: I am sure the dispatcher here would be willing to show me the office.

Mr. Strouss: It would be perfectly all right with us.

The witness, W. P. Herbert, was recalled to the stand and testified further as follows:

Mr. Mason: Taking up Exhibit No. 202 for identification again, Mr. Herbert, I take it that line 51 showing the totals are simply a summation of the total in line 49 plus what you show for the Phoenix Line to Topaz?

A. That is right.

Q. And the total in line 49 is simply a summation of the items appearing above?

[fol. 2853] A. Yes, sir.

Q. Now, you show in line 52 an item for contingencies with the factor "plus ten per cent" mentioned; the ten per cent is applied to what figure?

A. It is applied to the total in line 51, column M.

Q. Why do you add that allowance? Is that an actual expense?

A. No, that is a percentage that is usually, in fact, invariably added to estimates of this nature.

Q. In your experience as assistant engineer on the Tucson division, have you calculated the cost of projected changes or improvements?

A. Yes.

Q. Frequently?

A. Yes, quite frequently.

Q. Was that part of your duties as assistant engineer?

A. Yes.

Q. And have you in the calculations represented by Exhibit No. 202 followed the same methods and practices?

A. Just about the same, yes.

Q. Including the inspection on the ground?

[fol. 2854] A. Yes.

Q. Now, does this item in line 52, is that one which you added in making your other estimates or plans?

A. Yes, the same percentage figure is always added, ten per cent for contingencies.

Q. Now, did you yourself make the selection of the points at which the siding extensions were to be constructed or were those the points given to you by Mr. Sines or others?

A. They were agreed upon by Mr. Sines and the dispatchers and given to me.

Q. Mr. Herbert, are the costs represented on Exhibit No. 202 the costs as of 1938, or as of 1940, or 1941?

A. They represent the cost as reflected by prices prevailing in 1939.

Q. Do you know and, if so, will you state whether there has been any substantial or material variation as between 1938, 1939, and 1940, in so far as these particular items are concerned?

A. There isn't any substantial variation.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: Yes.

Q. You say that this inspection was done as you ordinarily do in your practice of estimating for the improve-

[fol. 2855] ments on the road?

A. Yes.

Q. Do you ordinarily inspect 125,000 feet of extension in locating 50 different points in two weeks?

A. No, if we were going to do it in two weeks we would make the inspection, yes.

Q. And get all the data that is necessary for an estimate?

A. Yes, sir.

Q. Now, these costs per track foot, what did you say that represents?

A. That is just a calculation made on the face of this exhibit, showing the amount of money shown in column M, which is the total cost divided by the proposed extension.

The Court: Column H.

A. Column H.

Mr. Strouss: It is not the unit then that is used to arrive at the cost?

A. No, no, these units were developed here from the cost figures and just shown on there as a matter of information.

Q. I understood you to say that the reason that this unit of $10.21 is so high is because of the bridge and signal cost there?

[fol. 2856] A. Yes, as compared with the smaller cost at Vail, which the Court asked about.

Q. I notice at Lordsburg yard, the cost per track foot is $5.05 with practically the same bridge and signal cost at Raso.

A. Yes, but the track footage of extension is a whole lot greater, therefore making a smaller average per foot.

Q. These costs were based upon labor, material, and everything that enters into it as of 1939 cost?

A. Yes, sir.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 202.

Mr. Strouss: It is objected to as an opinion and conclusion of the witness.

The Court: The objection is overruled. It may be admitted.

(Thereupon the document referred to was received in evidence and marked, Defendant's Exhibit No. 202.")

Mr. Mason: For the sake of convenience, if your Honor please, I should like to withdraw Mr. Herbert at the present time in order to present another witness from out of the city.

The Court: There is another question the Court would like to ask of Mr. Herbert.

[fol. 2857] Mr. Mason: Yes.

The Court: Refer back a moment to exhibit No. 200, Mr. Herbert. I notice that in the ten-year period shown on the exhibit covering the years 1930 to 1939, there has been a

reduction in the number of grade crossings to the extent of 82, that being the difference between 654, the figure shown in column F, and the corresponding figure shown in column .

Q. Would we infer from that that by underpasses or overpasses 82 of these crossings have been taken care of, or have some of them been entirely eliminated?

A. Some have been influenced by the construction of grade separations which you refer to as overpasses or underpasses, and others have been just entirely eliminated, some through abandonment of branch lines, some others eliminated as unnecessary crossings. The railroad is always trying to get rid of unnecessary road crossings.

Q. Are you familiar with the lines in Nevada?

A. Not as much as I am in Arizona. I have been over them many times.

Q. Isn't it true that comparing Exhibit 200 with No. 201, that Arizona has proportionately altogether more grade crossings than does Nevada as based on the total mileage? [fol. 2858] A. Yes, I believe so, I haven't made that calculation, but I believe you are right.

Q. How would you account for that; does the fact that the territory through which you run in Arizona is more thickly populated, more towns than you find in corresponding territory in Nevada account for it?

A. I believe that is the principal cause, and more grade crossings per mile.

Q. Well, those crossings come as a result of need, do they not?

A. Yes.

Q. As a result of roads that may exist?

A. Yes.

The Court: I think that is all.

Mr. Mason: Mr. Herbert, does the relocation of roads have anything to do with the elimination of grade crossings?

A. Yes, the highway department in the state both in Nevada and also in Arizona have entered upon a campaign in recent years to eliminate unnecessary grade crossings, particularly on their main highways in the state. Not only do they eliminate them by grade separations but by highway line changes, and they have done considerable work in both states in that respect.

[fol. 2859] The Court: Take Highway No. 80 that traverses northern Arizona here, how many times does that

main highway cross your main lines, where there is not either an underpass or overpass?

A. In the state of Arizona?

Q. Yes. Are there any such crossings?

A. I don't believe there are any such at this time on that particular highway where it is necessary to cross at grade.

Q. In other words, a tourist could go through the state of Arizona on that highway without crossing your road, the main line?

A. There might be some spur tracks that might still be at grade, but I believe the main tracks are all provided with grade separations at this time.

The Court: If there are no further questions, you may step aside. Call your next witness.

Mr. Mason: Before the witness is called, there is certain information from our profiles which we have worked up at Mr. Strouss' request, and I now furnish it to him, and I ask also, with the concurrence of Mr. Strouss, that this information may be copied into the record at this point. Will that be satisfactory to you, Mr. Strouss? This was worked up for you from the profile.

[fol. 2860] Mr. Strouss: Yes, I didn't understand that this is the information that I was receiving. It is all right if you want to put it in. I have no objection to its going in.

Mr. Mason: Well suppose that we have it copied into the record at this point. You have no objection to its appearing as a truthful statement of record?

Mr. Strouss: No. I haven't examined it. I don't mean to say that I don't think it is a true statement.

Mr. Mason: Well, subject to any check you may have, then.

Mr. Strouss: My understanding from Mr. Sines was that he had some information already worked up, which he would let me have to see if it wouldn't answer the purpose I had in mind.

Mr. Mason: This is some of that information, and I think he has some more that he is preparing to work up, but he isn't certain of just what you want. Perhaps, if you will, advise him——

Mr. Strouss: Is this going in as part of Mr. Kirkbride's testimony? If you are putting this in as part of your evidence, I would want it connected with some witness so

when I come to cross-examine I would know what I am [fol. 2861] cross-examining about.

Mr. Mason: Well, we will furnish you the information then—well, I did want to have it a part of the record.

The Court: You might have it marked for identification, and have it introduced when Mr. Kirkbride returns.

Mr. Mason: No, it was prepared by Mr. Sines from the profiles in order to furnish the information for Mr. Strouss.

Mr. Strouss: Of course, that is not an accurate statement. It is not—I think Mr. Sines will agree with me that I was having some difficulty in getting the information I wanted off the profiles, and asked him to give it to me, and he told me he had some figures that would help me get the information I want; and would give that to me for my inspection to see whether it gave me the information I was trying to get off the profiles.

The Court: In other words, the information itself is already in the record by exhibit or otherwise?

Mr. Strouss: No.

Mr. Mason: No, I don't think it is. Suppose we reserve the offer for the record until you have had a chance to ex- [fol. 2862] amine it, then we may be able to stipulate to put it in.

[fol. 2863] Mr. Booth: Call Mr. Browning.

Arthur C. Browning was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Booth:

Q. Will you state your name and residence?

A. Arthur C. Browning, Chicago, Illinois.

Q. What position do you occupy with the mechanical division of the Association of American Railroads?

A. I am secretary.

Q. How long have you been secretary?

A. Since January 1, 1941.

Q. Previous to your appointment, what position did you occupy?

A. Assistant to the secretary.

Q. Since what date?

A. Since July, 1919.

Q. Beginning with 1932, did you have anything to do with the interchange rules of that division?

A. Yes, sir, I have edited the interchange rules since the starting of 1932 up to the present time.

[fol. 2864] The Court: What do you mean by "interchange rules," Mr. Browning?

Mr. Booth: We will introduce this in evidence, your Honor, in just a moment. You may answer the question.

A. The rules governing the interchange of cars between railroads.

Mr. Booth:

Q. Have you occupied any position during that ten years with the arbitration committee of the association?

A. Yes, sir, I have acted as secretary of the arbitration committee.

Q. What, briefly, is the arbitration committee?

A. The arbitration committee has jurisdiction over these rules, that is, they recommend any changes that they think are necessary in the rules from time to time as well as arbitrate disputes between the members in connection with the rules.

Q. To what body, if any, are those recommendations submitted?

A. The recommendations of the arbitration committee are submitted in annual reports to an annual meeting of the division and are acted upon at the annual meeting.

Q. And the division is composed of what members, generally?

[fol. 2865] A. Composed of railroad members of the United States, Canada, and Mexico.

Q. Did you act during that period as secretary of the committee on prices for labor and materials?

A. Yes, sir, I did.

Q. Has that committee any jurisdiction over recommendations for changes in the rules?

A. Yes, sir, particularly those rules dealing with the prices for labor and materials that are charged for repairs to cars.

Mr. Booth: I have handed the clerk a printed book consisting of 343 pages including the five-page index, the title

page of which reads, "Association of American Railroads, Code of Rules Governing the Condition of and Repairs to Freight and Passenger Cars for the Interchange of Traffic, Adopted by the Association of American Railroads, Operations and Maintenance Departments, Mechanical Division, Effective January 1, 1941, Revised 1940, Published by Association of American Railroads, 59 East Van Buren Street, Chicago, December, 1940." I ask that this be marked defendant's exhibit No. 203 for identification.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 203 for indentification.

[fol. 2866] Mr. Booth:

Q. Mr. Browning, what is exhibit No. 203 for identification?

A. It is the current code of the book commonly known as the "A. A. R. interchange rules."

Q. Are those rules in whole or in part adopted or promulgated by the Interstate Commerce Commission?

A. No, sir, they are not.

Q. They are filed with the Commission as a matter of information, are they not?

A. Yes, copies are furnished to the Interstate Commerce Commission and also the Railway Commission of Canada as a matter of information.

Mr. Booth: I think that clears up the question that came up on the examination of Mr. Leriche earlier in the case.

The Court: There was an objection to certain of his testimony on the ground that the record was the best evidence as to these rules?

Mr. Booth: Yes, but also he was under the impression, though not a very strong impression, that these rules were adopted by the Interstate Commerce Commission and I said I would clear that up later.

The Court: I see.

Mr. Booth:

Q. Mr. Browning, will you state in general what this book [fol. 2867] of rules, exhibit No. 203 for identification, covers?

A. That is published in the rules themselves in the preface on page 10.

Q. Will you read that into the record?

A. (Reading) "Preface. These rules are formulated as a guide to the fair and proper adjustment of all questions arising between car owner and handling company with the intent of

1. Making car owners responsible for and therefore chargeable with the repairs to their cars necessitated by ordinary wear and tear in fair service; by the safety requirement and by the standards of the Association of American Railroads.

2. Placing responsibility with and providing a means of settlement for damage to any car, occurring through unfair usage or improper protection by the handling company.

3. Providing an equitable basis for charging such repairs and damages."

Q. What rule, if any, governs the obligation of a company to accept or its privilege of rejecting a car offered in interchange which does not conform to these rules?

A. Rules 2 and 3 are directly associated with that question. Rule 3 contains the requirements to which cars must [fol. 2868] conform to render them acceptable in interchange or from the car owner.

The Court: If a New York Central freight car, for instance, were being carried over the Southern Pacific Company lines and a wreck occurred damaging that car, upon whom would the loss for repairs fall?

A. It would probably fall upon the handling line. There are certain conditions—I don't know exactly what you mean by "wreck"—if there is a derailment, there is no question, it is the handling line. Rule 32 states the conditions which are considered unfair usage and which are the responsibility of the handling line.

Q. In his Honor's question the handling line would be the Southern Pacific Company?

A. Yes, sir.

Q. You stated that these recommendations are adopted or passed upon either favorably or unfavorably by the annual meeting following the submission of the recommendations, is that correct?

A. That is right, the report is presented and passed upon at the June annual meeting each year.

Q. Each year since 1911 at least has a book of rules similar to exhibit No. 203 for identification been issued and distributed by the association?

[fol. 2869] A. That is correct.

Q. Have you here in the courtroom each of those books from and including the year 1911 to an- including exhibit No. 203?

A. I have them in booklet form for all except one year and that year they were published in the proceedings for the year 1915.

Q. Have you at the Pioneer Hotel in this city a trunk containing the proceedings of the annual meetings at which these rules were adopted?

A. Yes, sir, the master car builders proceedings up to 1919 and then it was the American Railway Association.

Mr. Strouss: It was then changed to Association of American Railroads?

A. Yes.

Mr. Booth: We will make these books present in the courtroom available to counsel and inasmuch as the witness and counsel are stopping at the same hotel we will ask that they be made available to counsel at the hotel.

Mr. Strouss: I think we can arrange that.

Mr. Booth:

Q. Mr. Browning, have you prepared an exhibit showing the chronological history of certain rules relating to air brakes, axles, brake beams, brake beam hangers, couplers, draft gears, trucks, underframes, and wheels as they appear [fol. 2870] in the series of rule books from 1911 down to exhibit No. 203 for identification?

A. I have.

Mr. Booth: We have this in typewriting and I would like to file a copy of this exhibit as defendant's exhibit No. 204 for identification with the privilege, if it is admitted in evidence, of substituting a photostatic copy in more convenient form.

The Court: If it is admitted, the substitution may be made.

The Clerk: Defendant's exhibit No. 204 for identification.

Mr. Booth: I have purposefully refrained from offering this book of rules in evidence. I would like to have it remain with the clerk with the understanding that either side may either during its own case or at any other time copy and offer in evidence any rule from this exhibit No. 203 for identification. I would just as soon have the entire book go in evidence, but in order not to encumber the record——

Mr. Strouss: That is agreeable to me. I would have no objection to the introduction of the book itself in evidence and I agree with Mr. Booth that only those parts which [fol. 2871] are pertinent or desired by either side should be part of the record as evidence.

The Court: The record may show the stipulation. The exhibit will be marked merely for identification, but either the plaintiff or defendant may extract therefrom any pertinent excerpts which they deem necessary to present their view of the case.

Mr. Booth: I assume it may also be done by reading a rule to a witness in the course of a witness' examination?

Mr. Strouss: Yes, that is agreeable.

Mr. Booth: Instead of introducing the rule as an exhibit?

The Court: Yes.

Mr. Booth:

Q. Taking up the first subdivision of exhibit No. 204 for for identification, Mr. Browning, does this show that there was in the rule book of September 1, 1911, rule 53 relating to the character of air brakes which should be present on freight cars offered in interchange?

A. Yes, sir, it does.

Q. Then does it show on that page and on the ten pages succeeding that page, that is, up to and including page 11, the successive changes in that rule relating to air brakes [fol. 2872] until they culminated in the present rule which is in exhibit No. 203 for identification?

A. Yes, sir.

Q. Those changes year by year are shown, are they not, in the rule books which you have here in the courtroom as

well as in the proceedings of the association by which the rules were adopted?

A. They are shown in the book of rules which we have here. They are not all published in the proceedings. They were only published in the proceedings I believe up to 1917 and after that just the individual book was issued.

Q. By the way, how large a distribution has this book of rules?

A. At the present time we print close to sixty thousand copies and they are practically all distributed, all railroad companies in the United States, Canada, and Mexico, as well as private car lines, naturally have to have copies of them.

Q. Are all Class I railroads in the United States parties to these rules?

A. Parties to the freight car rules, yes, sir.

Q. Are all or practically all private freight car companies also parties to the rules?

A. That is correct.

[fol. 2873] Q. Is the list of subscribers to the freight car rules given, beginning at page 277 of exhibit No. 203 for identification?

A. Yes, sir, 277 to 305, inclusive.

Q. That includes the Southern Pacific Company and the Pacific Fruit Express Company?

A. Yes, sir.

Q. What classes of private car owners are listed; name some of the private car owners that are parties to these rules?

A. The Armour Car Lines, Union Tank Car Company, Pacific Fruit Express——

Q. (Interrupting) I don't mean by name but by character of car.

A. They are mostly tank cars or refrigerator cars or special cars of some different types, like some of these covered hoppers or poultry cars, but the majority of them are either tank cars or refrigerator cars.

Q. They are non-railroad owned cars?

A. Yes, sir.

Q. Do they have cars to transport wine?

A. Yes, sir.

Q. Milk, vinegar, and molasses?

A. Yes.

Q. Turning to exhibit No. 204 for identification, to the [fol. 2874] subdivision thereof entitled "Axles," was there any rule prior to October 1, 1915, relating to the axle equipment of cars that would be acceptable in interchange?

A. No, sir, there was no rule as to the type of axles required on cars in interchange service prior to October 1, 1915.

Q. The rule then adopted is shown near the top of the first page of the section of this exhibit headed "Axles," is it?

A. That is correct.

Q. And the latest amendment to that rule was effective January 31, 1939, and is shown on the fourth page of that section, is that correct?

A. That is correct.

Q. Turning to the next section headed "Brake beams," was there any rule in interchange prior to October 1, 1914, relative to the class of brake beams on cars that would be accepted in interchange?

A. No, sir.

Q. Is the rule which was adopted on October 1, 1914, shown near the top of the first page of the section headed "Brake beams"?

A. That is correct.

Q. Is it correct that the rule as it exists today was adopted on August 1, 1937, and is shown on page 7 of that [fol. 2875] section—January 1, 1939, I should say, effective as of that date?

A. Yes, sir, that is correct.

Q. Between the original adoption of the rule and its amendment in 1939, there are a number of changes as shown in that section?

A. Yes, sir.

Q. Turning to the next section, "Brake beam hangers," was there any rule prior to January 1, 1930, relative to brake beam hangers and brake beam hanger pins?

A. There was no rule as to the type of brake beam hangers or pins required on cars in interchange.

Q. The rule was adopted for the first time effective January 1, 1930, was it?

A. That is correct.

Q. The latest rule as shown on page 2 of that section was adopted when?

A. January 1, 1938.

Q. Turning to the next section headed "Couplers," was there any interchange rule in effect from September 1, 1911, to October 1, 1914, with respect to the type of couplers required on cars in interchange?

A. No, sir.

[fol. 2876] Q. When was the coupler rule first adopted?

A. Adopted effective October 1, 1914.

Q. And shown in this section of the exhibit, is that correct?

A. That is right.

Q. And the latest rule on the subject is shown on page 7 of that section, is that correct?

A. That is correct.

Q. When was the latest rule on the subject of couplers adopted?

A. There was an extension of the effective date of August 1, 1940, paragraph C-11, extended to January 1, 1942, on August 1, 1940.

Q. So the rule as to couplers adopted August 1, 1938, and shown on page 6 of that section of the exhibit will be in effect a year from now, January 1, 1942, is that correct?

A. That is correct, yes, sir.

Q. And the rules preceding that are shown on this exhibit?

A. That is correct.

Q. Turning to the section of the exhibit headed "Draft gear," was there any interchange rule in effect prior to January 1, 1934, relative to draft gears?

A. There was no rule as to the type of draft gears re-[fol. 2877] quired on cars in interchange prior to January 1, 1934.

Q. The rule effective January 1, 1934, is shown near the top of the first page of the section headed "Draft gears"?

A. Yes, sir.

Q. And the rule at present in effect was adopted when?

A. Effective August 1, 1937, was the last revision.

Q. That is shown on page 1 and the first three lines of page 2 of that section of the exhibit?

A. Yes, sir.

Q. Did the interchange rules in effect from September 1, 1911, to January 1, 1928, contain any provision with respect to the type of trucks required under cars in interchange?

A. No, sir.

Q. When was the rule first adopted with respect to trucks on such types of cars?

A. Effective January 1, 1928.

Q. Is that shown near the top of the section of this exhibit headed "Trucks"?

A. Yes, sir.

Q. When was the rule now in effect adopted with respect to trucks?

A. The last revision was effective January 1, 1941.

[fol. 2878] Q. And that is shown near the bottom of page 6 and the first four lines of page 7 of that section of the exhibit?

A. That is correct.

Q. Turning to the section of the exhibit headed "Underframes" was there any rule in effect with respect to underframe requirements on cars in interchange prior to January 1, 1927?

A. No, sir.

Q. Is the first rule effective January 1, 1927, shown near the top of the section headed "underframes" in this exhibit?

A. Yes, sir.

Q. Please refer to that section of the exhibit and state what the present rule, the rule now in effect is with reference to underframes?

A. The last modification was effective January 1, 1940, and after that there was an extension of effective date of the requirement in one paragraph to January 1, 1942. That extension was made on August 1, 1940.

Q. The last section of this exhibit is headed "wheels." Was there a provision in the interchange rules with respect to the types of wheels required on cars in interchange prior to January 1, 1925?

A. No, sir.

[fol. 2879] Q. And is the rule which was made effective January 1, 1925, shown in the upper half of the first page of the section of the exhibit headed "Wheels"?

A. Yes, sir.

Q. By the way, there is a peculiar section which I wish you would explain. It says, "A car will not be accepted in interchange if any of its wheels have the letter 'C' chipped out of the legend 'M. C. B.' or the letter 'R'

chipped out of the legend 'A. R. A.'" Why was it necessary to put in that rule?

A. And the present rule says, "A. R. A. or A. A. R.," which means the same thing. In the manufacture of wheels, they are not permitted to stamp the letters "M. C. B." or "A. R. A." or at present "A. A. R." on the wheel, unless it meets the specification of manufacture, but in casting them, those letters are cast on it, then in the inspection, if the inspector finds the wheel doesn't meet the specification, he chips the letter "C" out or the letter "R" out and that indicates to any railroad inspector that the wheel doesn't meet the A. A. R. specification.

Q. The M. C. B. stands for what?

A. That was the Master Car Builders' Association.

[fol. 2880] Q. That was the predecessor of your present association?

A. Yes, that was the Master Car Builders. In 1919 it became the American Railways Association, A. R. A., which is now the American Association of Railroads, A. A. R.

Q. You say when the inspector finds it not up to standard. Who employs the inspectors?

A. The railroads or the purchaser of the wheel. It might be a private car line. There are various methods, some concerns hire inspectors of certain Bureaus to do this inspecting. They make a practice of visiting the foundries and inspecting the wheels, like the Hunt concern in Chicago is one of them, the Pittsburgh Casting Laboratory is another one that has inspectors for that purpose that are subject to hire by different railroads or private car owners purchasing wheels.

The Court: Mr. Browning, the exhibit 204, about which you have testified, has to do wholly with the rules governing freight cars?

A. That is right.

Q. Whereas, the exhibit 203, that covers both the freight and passenger cars?

A. Yes, sir.

Q. I take it, then, Mr. Browning, that it behooves the owner of any car, railroad car, that he expects to be put into general use in traffic, to have that car conform to these requirements, or else any connecting carrier might refuse to accept them?

A. That is correct.

Mr. Booth: Well, generally speaking, in what circumstances may a connecting carrier repair the car of another carrier?

A. Well, if there are any defects which require repairs as a result of damage or wear, or even unfair usage, in connection with the safety of the car or the safety of the lading to be loaded in the car he can make the repairs.

The Court: Is there any time limit, Mr. Browning, under these rules within which a car must be returned to the owner?

A. No, sir.

Q. In other words, for illustration, a car from the New York Central might leave those lines and not return to it for a year or two?

A. Yes, sir.

Q. Does that frequently happen?

A. Well, I don't think, not for that period of time, but it is not unusual for a year of two for a car to be away from [fol. 2887] home. Of course, it is earning per diem all that time.

Mr. Booth: The railroad that is using the car pays the railroad that owns the car a certain per diem for the use of the car?

A. That is right.

The Court: Any needed repairs that were due to wear and tear would be chargeable to the owner?

A. That is right.

Mr. Booth: That matter of car supply and the regulation of per diem charges and related matters is under the car service division of the Association of American Railroads, is it not?

A. The operating transportation division have authority over the per diem rules, and the car service division over the car supply.

Q. Something with which your division has nothing to do?

A. No, sir.

Mr. Booth: Any questions on Exhibit 204, Mr. Strouss?

Mr. Strouss: No, I have no questions.

Mr. Booth: We offer Exhibit No. 204 in evidence, Your Honor.

Vol. III

TRANSCRIPT OF RECORD

(Pages 1569 to 2352)

Supreme Court of the United States

OCTOBER TERM, 1944

No. 56

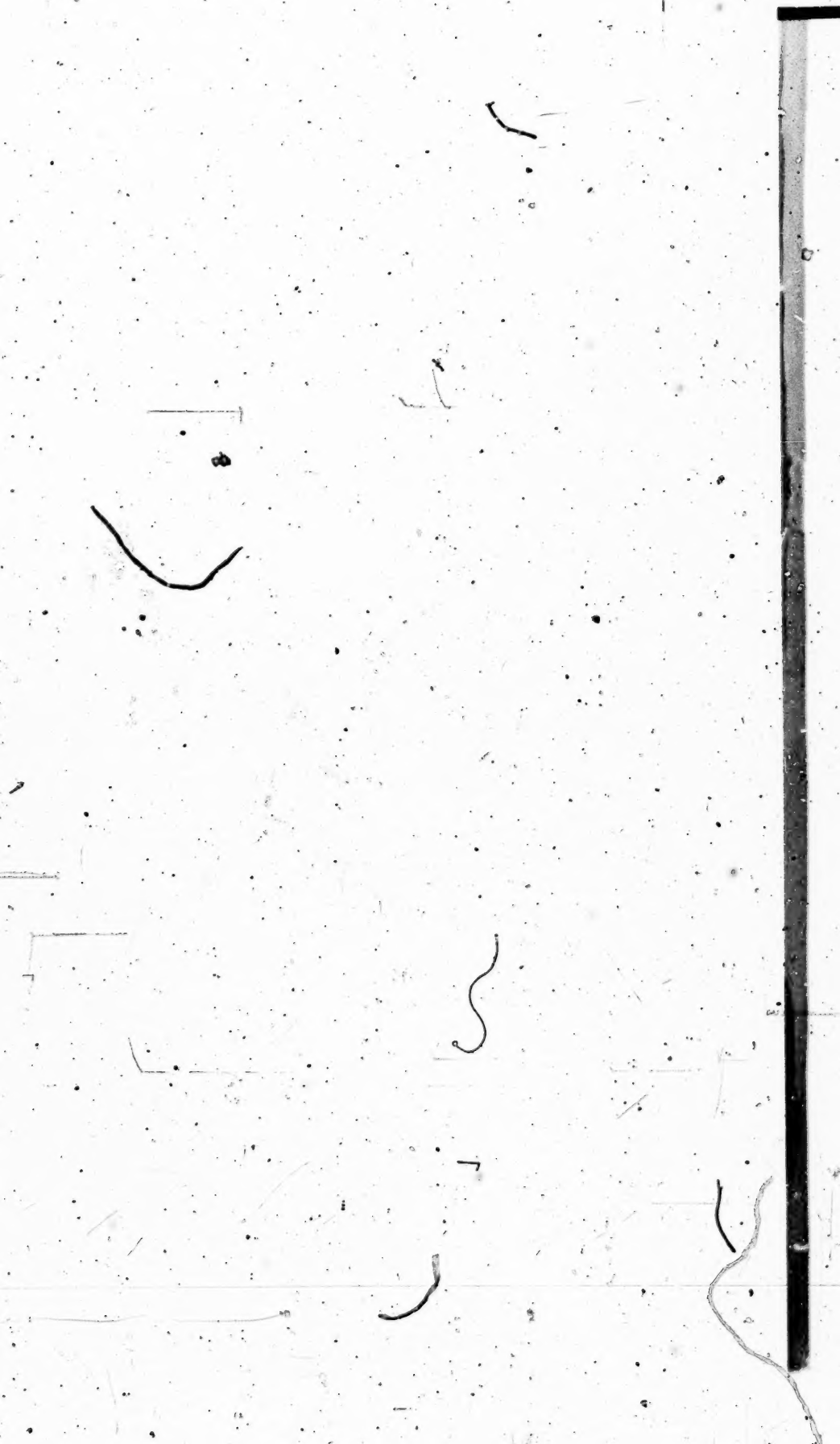
SOUTHERN PACIFIC COMPANY, APPELLANT,

vs.

STATE OF ARIZONA, EX REL. JOE CONWAY, ATTORNEY GENERAL OF THE STATE OF ARIZONA

APPEAL FROM THE SUPERIOR COURT OF THE STATE OF ARIZONA, COUNTY OF PIMA

FILED APRIL 12, 1944



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Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and [fol. 2883] marked, "Defendant's Exhibit No. 204.").

Mr. Booth: Are there any questions, Mr. Strouss?

Mr. Strouss: You mean on cross-examination?

Mr. Booth: Yes.

Mr. Strouss: I would prefer to defer my cross-examination until I have looked at these other books this evening.

Mr. Booth: Mr. Browning has an appointment in Montreal next Tuesday, a meeting of the Association, and if you could examine him tomorrow morning so that he could catch that eleven o'clock train out, he would be very much obliged to you.

Mr. Strouss: I think I can do that.

Mr. Booth: You are both at the same hotel, and if there is anything you want in the way of information from the files he has with him, which I think are complete, you can arrange for that after adjournment.

Mr. Strouss: Yes.

The Court: Mr. Browning, would it be profitable, or is it done by any of the roads, to actually construct more cars than they themselves might need in their business, with the thought that these cars might be scattered over other systems and used by them?

[fol. 2884] A. Now, your Honor, that is a question of policy of the railroads. Some roads do, or, rather, some roads are lending roads and some are borrowing roads.

Q. So far as cars are concerned?

A. Yes, sir.

The Court: You may step aside. We will take our mid-afternoon recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows:)

The Court: You may proceed.

W. P. HERBERT was recalled to the stand and testified further as follows:

Direct examination (Continued).

By Mr. Mason:

Q. Mr. Herbert, will you refer to Exhibit 202, please? I think you stated in your direct examination that you spent approximately two weeks on an inspection trip for the purposes of making the study which led to this exhibit?

A. Yes, that is right.

Q. Does that two weeks represent all of the time you spent in making the study and the calculations which en-
[fol. 2885] tered into the making of this exhibit?

A. No, it didn't. I spent several months doing the entire job and making the estimates.

Q. Did you gather the truck and station plans at the various stations for the purpose of studying the work to be done?

A. Yes, from the records that I have at my office. Such estimates as these in most cases can be made without any field investigation. However, the field investigation was made as more of a check than anything else.

Q. Does the exhibit represent as well the result of your knowledge gained from your sixteen years on the division?

A. Yes, sir.

Q. Have you before you a statement in a single sheet bearing the title "Yuma, Arizona, to El Paso, Texas, Increased Investment in Water, Round House and Shop Facilities Incident to Adoption of Long Train Program"?

A. Yes, I have.

Mr. Mason: May we have this statement marked, if your Honor, please, Defendant's Exhibit 205 for identification?

The Court: It may be marked.

[fol. 2886] The Clerk: Defendant's Exhibit No. 205 for identification.

Mr. Mason: Did you prepare defendant's exhibit No. 205 for identification, Mr. Herbert?

A. Yes, I did.

Q. Does it represent largely your own work rather than preparation from records?

A. It is preparation from my own work and from records.

Q. What type of records, and what records did you use for the purpose?

A. Well, we have standard plans of the various facilities that are to be installed as shown on this exhibit; and prices for those various facilities, in collaboration with the chief engineer's office, working together on it, we were able to estimate in each case the amount of money required.

Q. Does this represent another type of construction with which you are familiar?

A. Yes, sir.

Q. Now, will you refer, please, to the exhibit itself and, first, to block No. 1. Just what construction or reconstruction did you study in connection with Block No. 1?

A. Block No. 1 shows the amount of money necessary to extend five stalls and pits 65 feet at Yuma and Tucson; [fol. 2887] and build seven new stalls and pits to the roundhouse over the existing roundhouse tracks at El Paso.

The Court: That would be to take care of these larger and longer locomotives and trains that you refer to?

A. Yes, that is the purpose of the exhibit: to take care of the larger power that would be necessary.

Mr. Mason: Did you make a study of the existing facilities at Tucson, Yuma and El Paso, preparatory to this study?

A. Yes.

Q. Did you prepare plans for the construction which would be required if the facilities were to be fitted to the newer and larger power?

A. I had plans prepared for that purpose.

Q. Now, as to Item No. 2, what does that represent?

A. Block No. 2 shows the cost to install 126-foot turntable at Yuma, and Tucson, to replace existing 100-foot turntable.

Q. Why would turntables 126 feet long be necessary in place of 100-foot turntables?

A. Because the A.C. power as contemplated on the redispatching studies requires a turntable of that length. [fol. 2888] Q. Are turntables of that length in use on those districts where A.C. power is now in use?

A. Generally, yes, where they turn the engines on the turntable.

Q. Are these engines sometimes turned by the use of Y's instead of turntables?

A. Yes, sir.

Q. Is a Y a practical installation where you have to roundhouse engines?

A. No.

Q. From what sources were the cost figures for item No. 2 taken?

A. They were taken from the same sources as explained in No. 1, from our various standard plans that we have for such work and from field investigation.

Q. Have you studied or confirmed the results of the cost figures as applied here, from your own experience?

A. Yes, I have.

Q. Now, what as to Item 3?

A. Item 3 shows a transfer of the T. & N. O. erection shop to Pacific Lines property at El Paso, Texas. That T. & N. O. erection shop is a building that is not now [fol. 2889] used, but has certain machinery in it at El Paso which would be transferred to another location where it could be used and would be used for this larger power.

The Court: Does that refer to Texas and New Orleans?

A. T. & N. O. means Texas and New Orleans, yes, sir.

Mr. Mason: Is this a structure now at El Paso which would be transferred and thereafter necessarily used in the servicing of the AC-8 locomotives?

A. Yes, sir.

Q. Now, why do you transfer the T. & N. O. erection shop instead of building a new building at the location where you desire to have the installation for the servicing?

A. Because at El Paso at the present time we have now a 126-foot turntable at the location where those engines are now turned, and where the principal shops are located for servicing those engines used east of El Paso at the present time. Therefore, it is necessary that other engines, if assigned to the territory between Tucson and El Paso would be also turned on that turntable rather than building another one.

Q. Does this represent a lesser expense than to build [fol. 2890] a new building or build a new turntable at the present location of the erection shop?

A. Yes, it would be a lesser expense.

Q. What does Item 4 represent?

A. The installation of an additional water column and a 65000-gallon water tank at Benson, Arizona, that being necessary in order to pass long trains at that point.

Q. Then in connection with this exhibit it should be understood, should it, that the item covering the location of the water column and tank is at Benson opposite Item 4 and as indicated by column D?

A. That is right, yes.

Q. Why would these additional water supply facilities be necessary at Benson?

A. At the present time, the water columns at Benson wouldn't be a sufficient distance apart to permit the train standing on the side track, a long freight train standing on the side track, to take water without cutting the train in half and pulling back. So it was, therefore, necessary to provide this additional water column.

Q. What about the additional gallonage capacity, a 65000-gallon tank?

A. The tank was also deemed necessary. We figured it was cheaper to build a tank up near the new column rather [fol. 2891] than to build an expensive pipe line, which would necessarily have to be around a ten-inch line. It was cheaper to build a second-hand 65000-gallon watertank than to build a pipe line for the distance it would have to be built from the present water supply.

Q. You were faced with the choice of building another tank or of extending the pipeline from the present water storage tank to the new water columns?

A. That is right?

Q. And this is the cheaper alternative, is it?

A. Yes, it is.

Q. Have you yourself personally gone over these figures to determine whether they truly and correctly represent substantially the cost of bridges built or installing these particular facilities?

A. Yes, I have.

Q. Will you say whether or not, according to your information and experience, they are true and correct?

A. Yes, they are.

Q. Are these costs as of the year 1938 or the year 1946, or some other period?

A. They represent, as in the exhibit I previously put in, No. 202, costs and prices as of 1939.

[fol. 2892] Q. Will you say whether or not the 1939 costs and prices are fairly representative of those in 1938 or 1940?

A. Yes, they are.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: Items 3 and 4, where you contemplate the use of second-hand or used materials, what about items 1 and 2, are there any second-hand materials contemplated in those instances?

A. No; the 126-foot turntables are all new as well as the roundhouse pits installed would have to be new.

Mr. Strouss: That is all.

The Court: Well, Item No. 3 really consists, then, of a purchase in part?

A. Yes, it would have to be taken from the T. & N. O. and transferred to another railroad; it would be the same thing as purchasing second-hand material.

Q. Is the Texas and New Orleans a subsidiary of the Southern Pacific?

A. Yes.

Mr. Mason: Do I understand that there is any cost of material, or is this all the cost of labor in Item No. 3.

A. Well, Item No. 3 is principally a labor item in the [fol. 2893] whole. I possibly was wrong in saying that it was a purchase, it is just a transfer from one property to another.

Mr. Mason: Have you any further questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: We offer the exhibit in evidence as defendant's Exhibit No. 205.

Mr. Strouss: Objected to as irrelevant and immaterial, and as calling for a conclusion.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 205.")

Mr. Mason: Do your wish to cross-examine Mr. Herbert now, Mr. Strouss?

Mr. Strouss: I had better take Mr. Baker first.

Mr. Mason: Very well.

The Court: Step aside. Call your next witness.

Mr. Mason: I will ask Mr. Baker to resume the stand.

[fol. 2894] G. C. Baker was recalled to the stand and testified further as follows:

Cross-examination.

By Mr. Strouss:

Q. Mr. Baker, referring to exhibit No. 196, which items of the redispatching study did you participate in?

A. Item No. 1.

Q. Item No. 1. What about Item No. 4?

A. No, I didn't participate in that study.

Q. Now, that was the redispatching study of Yuma, Arizona, to El Paso, Texas, excluding the Phoenix line, June and August, 1938, Freight Operations?

A. That is right.

Q. And, as I understand it, you took the traffic which was on hand on the first day of each of those months and the traffic that was received at Yuma during the period, and the traffic which originated at Yuma during the period, and that was the traffic which you redispatched?

A. Yes, sir.

Q. Now, in redispatching that traffic, did you balance the tonnage or balance the cars?

[fol. 2895] A. Well, I balanced the cars although I did take into consideration the tonnage, that is, in estimating the tonnage by scanning the consists or the tonnage shown on the consists of the actual trains, the consists that were filed by the train conductors which showed the actual tonnage of the actual trains, and I estimated my tonnage on that traffic.

Mr. Strouss: I asked that because yesterday I was trying to balance the tonnage on exhibit for identification 198, and Mr. Sines saw my difficulty and informed me last night that the balance was of cars and not of tonnage.

Q. That tonnage does show on the train sheets of actual operation?

A. Yes, it shows the actual tonnage.

Q. And on your train sheets for the redispatching the tonnage also shows for the trains redispatched?

A. It does on the district from Tucson to Lordsburg, which was the same as, or the tonnage was figured the same as it was on the district from Yuma to Tucson, which was merely an estimate based on the actual tonnage handled by averaging the cars and tonnage.

Q. Now, taking the operation which is covered by exhibit [fol. 2896] 198, that is one day. If it were desired to see how the tonnage balances as between the actual and the redispatched operation for the period covered by that exhibit, that tonnage can be taken from the sheets of that actual operation, the train sheets?

A. Yes.

Q. And the tonnage for the redispatch from your train sheets for redispatched trains?

A. Yes.

Mr. Strouss: Either you or Mr. Sines could give me that tonnage if I desire it?

Mr. Mason: I think, in answer to your question, Mr. Strouss, I believe that Mr. Sines could give you that information.

Mr. Strouss: Now, in redispatching trains, I think you testified you also took into consideration the traffic to be picked up and to be set out enroute?

A. That is right.

Q. And in the redispatching, if I remember your testimony, the AC-8 locomotive was used as the principal locomotive?

A. Yes, sir.

Q. Were there certain definite specific locomotives assigned to this operation by number?

[fol. 2897] A. No, we indicated the locomotive only by type or class. We designated them as 4100 class which is an AC type locomotive. We didn't assign any particular numbers to the locomotives.

Q. Of course, at the time the actual operation was had, that was in June, 1938, and in August, 1938, the Southern Pacific Company didn't operate any AC-8 locomotives?

A. No, those engines at that time were being built.

Q. They weren't acquired by the company until sometime in 1939?

A. That is correct.

Q. Had never been operated on the Tucson Division at the time you made the redispatch of these trains?

A. No, they had not.

Q. When was the test made of the locomotive by the dynamometer car to determine its tonnage rating?

A. Well, that tonnage rating was furnished us by the vice-president in charge of operations' office.

Q. Well, it wasn't the tonnage rating then determined by the use of dynamometer cars that Mr. Cassady testified this morning?

[fol. 2898] A. Not that particular type, the AC-8, no.

Q. What was the tonnage rating used for the AC-8's on the Tucson division?

A. Eastbound from Yuma to Gila was 11,000 M's, and, if I recall correctly, between Gila and Estrella 7,180 M's, and Estrella to Tucson 11,000 M's, and Tucson to Dragoon——

Q. 6,220?

A. 6,220. That is from Benson to Dragoon. I don't recall offhand the rating between Tucson and Mescal, but it is——

A. 7,800 is what was given to me.

A. Yes, that is correct.

Q. Now, of course, the rating of 6,220, there is no rating given here as between Steins and Lordsburg?

A. Well, that would be 11,000 M's or more, because it is on descending grade.

Q. And westbound between Tucson and Yuma?

A. 12,000 M's, and Lordsburg to Tucson over the ruling grades from Mondel to Steins and Benson to Mescal was 6,220 M's.

Q. Now, since no definite numbers were given to these locomotives, how did you know what locomotives you had on hand when you were redispatching?

[fol. 2899] A. Well, I kept track of these by keeping—I figured that I had an engine for every crew. I did dispatch the train crews, and any time that it was necessary to balance my train crews, or where it would have been necessary to deadhead an engine crew, I always deadheaded that engine back, so at all times I kept even on my power in accordance with the number of train crews that I had to operate with.

Q. If they were all designated as 4100's, how could you designate one engine from the other?

A. Well, I couldn't tell one from another, but I knew that of the number of trains I had operating, the number

of engines that I would receive at Lordsburg westbound, for example, that those engines would operate through to Yuma, and in cases where the train would terminate at Tucson westbound, I would have that number of locomotives left over. I felt at no time with the amount of business being handled and the number of AC locomotives assigned to that district, that we were ever short of locomotives.

Q. Now, when a locomotive made a trip you say you kept track of it by the train crew. In other words, you designated, so far as keeping track of that locomotive was [fol. 2900] concerned, you designated it by its train crew?

A. That is right.

Q. That was all right after the locomotive came into operation, but how did you identify the locomotives that you had available for operation before you assigned a crew to that so that you knew what power you had available?

A. Well, when this operation or this redispatching study was set up, we assumed that we had this number of locomotives on hand to protect traffic at both Tucson and Yuma.

Q. In other words, what you did, you determined the trains you were going to operate, then assumed you had the power there to operate them?

A. That is right.

Q. And whatever was necessary, the locomotives were there for you?

A. That is right, and in cases where it was necessary to deadhead crews from Tucson west to Gila, why, we knew that there was an unbalanced condition and it would be necessary to doublehead power to Gila to protect the eastbound trains.

Q. That is a lot more generous than they are in ordinary practice with power, isn't it?

A. No.

Q. You don't always have all the power that you want? [fol. 2901] A. There are times we would run short, yes, that we would be a little tight on it, but not really tied up.

Q. This operation was on the assumption that the power was always there?

A. That is right.

Q. Now, if I understood your testimony correctly, in making this redispatch, you were to operate in units of a maximum of 100 carloads and 125 cars and empties where the empties were predominant in the train.

A. That was the plan set up, but it exceeded the 100 cars eastward on a few occasions from Yuma with our slow scheduled Yuma blocks in just a few occasions, I forget just the number.

Q. Of ourse, the movement westward is predominantly empties?

A. Yes.

Q. And if you were to follow the principle of 100-car trains loaded with 125-car empties, that would eventually unbalance your power and cars?

A. No, it would tend to make a more balanced condition because your heavy traffic direction is westward, and with your empty cars moving west and if you would handle [fol. 2902] 125 cars westward and 100 cars eastward, it would more balance your power and cars.

Q. Is that true at all times?

A. Yes.

Q. That you would have 25 per cent greater traffic west than you would east?

A. Well, at least that much. During the perishable season we move a great many light engines, or double-head engines eastbound, in order to handle the excess train miles west.

The Court: Pardon me just a minute. Then this surplus, these surplus cars, this 25 per cent excess westward movement, what happens to them, does it eventually go out east again through the Ogden gateway?

A. Well, it can, yes, but it generally is empty refrigerators moving to the Yuma and Imperial valleys and to the P. F. E. shops at Colton, where the supply for the Santa Maria Valley and San Joaquin Valley supply is generally supplied from, and these cars are returned, are generally returned to us through the gateways in which they are received loaded, due to agreement with connecting lines.

[fol. 2903] Mr. Strouss:

Q. You mean that 25 per cent of your westward traffic returns east on some other route?

A. No.

Q. Wouldn't that have to be true, those cars don't remain on the West Coast, do they?

A. I am talking about the perishable season. There are other times of the year when the situation is reversed.

Q. That is what I asked you a little while ago, whether that is true all the time?

A. It is practically. Your train-miles or car-miles are westward the biggest percentage of the time, but there may be a short period where the operation might be reversed, where your train-miles eastward would predominate.

Q. If these cars don't remain on the West Coast, they either have to come back over your line or go over some other road?

A. Yes, they can be worked up and they are worked north to go through Ogden and we also, as late as this last perishable season, moved empty refrigerators over the Ogden route into the Imperial Valley due to our inability to get them through the El Paso gateway.

Q. Is it the usual practice for traffic going westward [fol. 2904] empty, that those cars will not return over your lines?

A. No, they may not all return over the same route, they may go the northern route.

Q. I mean return over the Tucson line?

A. Not necessarily all of it, no.

Q. Twenty-five per cent of it?

A. I wouldn't say as to the exact percentage, but a large amount of it would.

Q. When you made this study in 1939, these AC-8 locomotives had never been operated on the Tucson division?

A. No.

Q. There never had been any long trains operated on the Tucson division?

A. Not that I knew of.

Q. Unless it was before 1912. So far as you know, had any of those AC-8's been operated on any part of the Southern Pacific system in 1939?

A. No, not that particular class, I don't think they had. I think the AC-7 was the largest power we had at that time.

Q. Of course, in redispatching these trains you did determine the speed at which they would operate?

A. Yes.

[fol. 2905] Q. How did you do that?

A. That is something that is based on experience that a train dispatcher has over several years' experience by estimating the speed which a train will make. If you have a locomotive, take an AC-8 for example, rated at eleven thousand M's, if he has in the neighborhood of eight or nine

thousand M's you can figure he will make the maximum speed restrictions on a level grade or descending grade.

Q. That is, if he is carrying his tonnage rating?

A. Yes, over ascending grades an engine with lighter tonnage will make better speed than an engine with a full rating.

Q. What about a locomotive that had never been operated in your district so that you never had experience with actual operation of that locomotive? How did you determine that, just on its tonnage rating?

A. On its tonnage rating, assuming that it would operate the same as any other locomotive and with the percentage of the tonnage to its rating.

Q. Of course the tonnage rating here was not a tonnage rating determined as Mr. Cassady testified this morning [fol. 2906] by operating the engine over the territory with a dynamometer car?

A. No, I think that was determined by the superintendent of motive power as I understand it based on the tractive effort of the locomotive.

Q. It is a fact, isn't it, that a heavier train will take a greater distance to stop than a light train?

A. I won't say that because I have never had any road experience. I don't know.

Q. You don't know whether it takes longer for a heavy train to get under way, get up speed, than a lighter train?

A. It all depends on what power you have. If the engine rating is comparable on a long train to the rating of the locomotive on a short train, I would say he could get under way as quickly as a short train if his tonnage is equal.

Q. Not equal but in proportion to the tonnage rating?

A. Yes.

Q. Assuming that it takes longer to stop or slow down a heavier train than it does a light one, of course then a heavy train approaching a curve or in speed restricted districts will have to begin slowing down quite a distance from those speed restricted districts than a lighter train, wouldn't it? [fol. 2907] A. If that is the case, it would take a longer time.

Q. I am assuming that it does without any question.

A. Well, it would, yes.

Q. It would take a long train longer to pass through a speed restricted district than a short train?

A. Yes.

Q. Was that taken into consideration in the determination of the speed movement of your trains?

A. No, because with the additional twenty-five to thirty cars which we operated on our eastward trains we didn't estimate it would take any longer for those trains to stop or get started or pass through any restricted district. At that time we had no other restrictions except those speed restrictions as shown in our timetable and we made no allowance for them.

Q. What about sidings? It would take longer for the long train to stop and pull into a siding and clear a siding than a short train, wouldn't it?

A. It might take a few minutes more, I would say probably a couple of minutes.

[fol. 2908] Q. It would take longer to get out of the siding?

A. It might, yes.

Q. Was any consideration given to that?

A. I don't recall just whether we gave any consideration to that or not, although I know we did at times allow a little more time at some points in making our meets and passes.

Q. By the way, who selected those sidings or the extending of the sidings?

A. You mean who designated the sidings?

Q. The points where the sidings were to be increased in length?

A. Myself and the trick dispatcher went over the train sheets and working timetables and estimated the points at which the long sidings would be to best advantage for long-train operation.

Q. When did you do that?

A. That was after we first met in Los Angeles, approximately May 15th or some time there. We had two or three days' preliminary discussion before we started the actual redispatching study.

Q. Did you designate those sidings before you made your redispatching study?

A. Oh, yes.

Q. What about the icing? Was consideration given to the icing of perishables?

[fol. 2909] A. Yes, sir.

Q. Where are your icing sheds?

A. At Yuma and Tucson.

Q. What are their capacities?

A. I don't just recall the exact capacity of the tracks. At Tucson I believe on each side we have approximately 70 cars and at Yuma I believe the icing tracks are somewhat longer, I can't recall the exact number.

Q. The memorandum which was given me gives your icing tracks at Yuma, each side, 70 cars. Then there is a notation——

Mr. Mason (Interrupting): Isn't that the platform rather than the track. The figures you have I think are the length of the platform.

Mr. Strouss: It says, "Icing platforms and tracks."

A. Well, of course the tracks are longer than the platforms. You have some space on each end of your icing tracks or platform.

Mr. Strouss: In parentheses is the figure "67" and then "70." I guess I will have to have an interpretation of that. At least it is not over 70 cars at Yuma?

A. No, I believe that is right, on each side of the icing deck.

[fol. 2910] Q. With a train over 70 cars that requires the dividing of that train in order to ice it?

A. Yes, if they all require icing.

Q. The tonnage rating of the other engines which were used are the tonnage ratings given in that timetable?

A. That is given in the Tucson division timetable No. 109 which was given you yesterday, the tonnage ratings are all listed in that timetable.

Q. This redispatching, what it really is or what has been done is, to summarize it, is your opinion of how you would have moved those trains or moved this traffic, rather, assuming there had been no train limit law and assuming the power which you had, using your opinion as to the speed at which the trains would have moved although that power never had been used nor any trains operated in that division before; isn't that true?

A. That is right.

Mr. Strouss: I think that is all the questions I have.

Redirect examination.

By Mr. Mason:

Q. Mr. Baker, I show you the locomotive book and ask you whether or not the tractive power of the AC-8 type

[fol. 2911] locomotive acquired in 1939 is not the same, being 124,300 pounds, as the tractive power of the AC-6's acquired in 1930, the AC-7's acquired in 1937? Will you look at the locomotive book and tell me whether that is not the fact?

A. Yes, that is correct, they have the same tractive power.

Q. Would you expect the tonnage ratings of the AC-8 locomotives to be substantially the same as the AC-6's or AC-7's in view of the identity of tractive power?

A. Yes.

Q. The AC-6's and the AC-7's have been operated on the Southern Pacific in various districts for some time prior to 1938, have they?

A. Yes, they have.

Q. Have you, as dispatcher or chief dispatcher, ever had to undertake the operation of trains over your division with locomotives which up to that time you had never used on that division?

A. Oh, yes.

Q. Frequently?

A. Yes.

Q. Can you give some recent instances?

A. Just after I became chief dispatcher there were several F-4 and F-5 engines that were transferred to the [fol. 2912] Tucson division that hadn't been in use here before and engines with which the dispatchers had no previous experience on this division.

Q. Were you a dispatcher on this division when the 5,000 class was first used on the division?

A. Yes, sir.

Q. Were you a dispatcher here when the F type locomotive replaced the smaller type preceding it?

A. Yes.

Q. Did you have any difficulty then dispatching your trains with these new and up to that time strange type of locomotive?

A. No, none whatever.

Q. Given the tractive effort and other characteristics of the locomotive which is given to you to use, are you able as a dispatcher to work with that locomotive even though you have never used it before?

A. Yes, sir.

Q. I think you indicated in your testimony that generally there was an unbalance of traffic westward and particularly during the perishable season?

A. Yes, sir.

Q. Are there other seasons of the year when the unbalance [fol. 2913] is eastward?

A. There are times when there is a shortage of refrigerators moving westbound in which the preponderance of the traffic would be eastward for a short period of time. That happens generally in the early spring or the late fall periods, that is, on the Tucson division.

Q. From time to time during the year the balance of the traffic may vary so that the preponderance is eastward at one time and westward another?

A. Yes.

The Court:

Q. You don't mean to infer that the preponderance of the traffic or the cars causing that are just put out of commission and not used over on the West Coast?

A. No, I don't.

Mr. Mason:

Q. Does the company, if you know, have any control over whether the balance will be eastward or westward?

A. No, that is controlled entirely by the traffic conditions.

Q. That is the movement of the traffic as billed by the shippers, is it?

A. Yes, for example, we bring many empty boxcars through the Ogden gateway that move into the Northwest. [fol. 2914] A lot of that traffic moves down through the southern gateway after it is loaded and goes the southern route.

Q. That would produce an unequal distribution of traffic, would it, as between the Ogden route and the El Paso route?

A. Yes.

Q. You spoke of working to 100-car trains east and 125-car trains west during the redispatching study. Does that mean all of your westward trains were built up to 125 cars?

A. Oh, no.

Q. You observed that more or less as a standing maximum?

A. Yes.

Q. Does it mean that on your eastward trains you were held to 100 cars as a rigid maximum?

A. No.

Q. Was there necessarily any 25 per cent greater movement westward than eastward?

A. I won't say as to the percentage, although I think during those months if I recall, the westward movement was heavier, that is, the number of cars moved was in greater proportion westward than they were eastward.

Q. Whatever it was, in the actual operation during June [fol. 2915] and August, 1938, it was reproduced on your redispatching study, was it?

A. Yes, sir.

Q. Now as to the number of locomotives, meaning the number of the different engines or the number of engines which were actually used for the purpose of the redispatching study, as I understood your answer to Mr. Strouss you contemplated that an adequate number of locomotives was available at the start of the redispatching period and an adequate number continued to be available throughout the redispatching period?

A. That is correct.

Q. There was no engine shortage at any time?

A. No.

Q. Was there any engine shortage experienced actually during the same periods?

A. No.

The Court: Did you use a greater number of engines in your redispatching study than what was actually used in your operation?

A. No, we used a less number due to the less number of trains it was necessary to operate.

Mr. Strouss: Since there were no definite numbers assigned to the engines, you cannot determine that from your work sheets?

[fol. 2916] Mr. Mason: I will say for the information of the Court and counsel, we will have a showing which will show the exact number of locomotives required and used and I think it will be quite clear how it was worked out.

Mr. Sines will have the showing. There is a way of determining the number from the work sheets, at least I think there is, it has been determined before.

Mr. Strouss: You couldn't by taking an engine number and definitely applying it to any particular engine?

A. No, we didn't assign any particular engine numbers to this redispatching study.

Q. Did you use 4100, or whatever the number was and the engine went out on the division and came back again and another went out or it may have been the same one?

A. Yes.

Q. Are you operating any AC-8's on this division now?

A. No, we are not.

Q. Have you operated any on this division?

A. Yes, we have operated them westward when we were bringing these new locomotives westward, we put those into service at El Paso and worked them west.

[fol. 2917] Q. Just in transportation?

A. Yes.

Q. One thing I overlooked on my cross-examination. The water tank capacity was larger on the AC-8's?

A. Yes, they have a tender of possibly 22,000 gallons capacity.

Q. Those AC-6's and AC-7's that you spoke about are not shown on exhibits Nos. 4 and 5?

Mr. Mason: No, I think for the sake of brevity we showed the AC-4; then the AC-8, which is typical of the AC-6 and 7 as to tractive effort.

Mr. Strouss: Have the AC-6's and AC-7's ever been put in operation on this division?

A. No.

Mr. Strouss: That is all.

Mr. Mason:

Q. Mr. Baker, after the acquisition of the AC-8's in 1939, did you make any further survey of the redispatching study of 1938 in the light of the performance of those locomotives?

A. I didn't understand that question.

The Court: Read the question.

(The question was read by the reporter.)

Mr. Mason.

Q. Did you make any recheck of your redispatching study [fol. 2918] in the light of the performance of the locomotives as operated by the company?

A. No, I was assigned to other duties before we received the AC-8 engines and I never made any other check of the redispatching study.

Q. You have reviewed the redispatching study prior to testifying in this case recently, haven't you?

A. Yes.

Mr. Mason: I think that is all. Did you want to have Mr. Baker remain here tomorrow?

Mr. Strouss: No, I think I can release him with the understanding that if something should arise and I should want to cross examine him further I can call him back again.

The Court: You may be excused, Mr. Baker, subject to call. The court will be at recess until ten o'clock tomorrow morning.

Thereupon the court stood at recess until ten a. m. Friday, January 24, 1941.

[fol. 2919] January 24, 1941, ten o'clock A. M.

Proceedings were resumed at this time as follows:

The Court: You may proceed.

ARTHUR C. BROWNING, was recalled to the stand, and testified further as follows:

Cross-examination.

By Mr. Strouss:

Q. Mr. Browning, I believe you testified that you are, and have been, since January 1, 1941, secretary of the Association of American Railways?

A. Of the mechanical division.

Q. And prior to that time you were assistant secretary since 1919?

A. That is correct.

Q. Now, what is the Association of American Railways?

A. It is an association of the railroads to handle problems that are common to all railroads.

Q. Those problems are investigated by the Association of American Railways?

A. Through its committees, yes.

Q. And directors of research?

[fol. 2920] A. We used to have a director of research, but that position was abolished several years ago.

Q. When the investigations are completed, then reports are made?

A. As far as that applies to the mechanical divison, that is a customary practice.

Q. Then what is the procedure?

A. Well, the procedure, if a new specification is devised and they think it is desirable to put it into effect, it is submitted to a letter-ballot vote of the member railroads.

Q. The reports then are submitted to the member railroads of the Association?

A. That is right.

Q. And a ballot taken, and if it is favored it is adopted?

A. Yes.

Q. Now, are the proceedings of the Association recorded?

A. You mean of the mechanical division?

Q. Of the mechanical division, yes.

A. I don't just understand what your mean by recorded.

Q. As part of the basic records which you handed to me, the basic records from which the exhibits put in evidence [fol. 2921] yesterday, Exhibits 203 and 204, upon which those exhibits were based, are books entitled "Proceedings of American Railways Association, Division V, Mechanical."

A. Yes, sir. It shows the reports of the committee and the action taken on them at the annual meeting.

Q. And these are records upon which you based your testimony and the exhibits which were put in evidence yesterday?

A. Yes, sir.

Mr. Booth: Only as to interchange rules. I didn't refer to those reports for anything and everything that might be in them.

Mr. Strouss: Of course, there are parts of this that I desire to have made a part of the record here. I don't want to make the entire book a part of the record.

Mr. Booth: Well, we called this witness for the sole purpose of proving what the interchange rules of the Associa-

tion were as to interchange of cars between railroads at the present time, and also to prove the development of those rules since 1911 as the rules were promulgated and distributed to the member lines and other persons. Now, the witness under the foundational evidence rule brought with him the annual proceedings of the Association to show that [fol. 2922] those interchange rules were actually adopted by the Association. We made those available to counsel solely for that purpose, not for the purpose of putting in anything and everything or identifying anything and everything that he might choose as part of his own case. I see perfectly well what counsel is leading up to, but I think it will prove to be absolutely improper cross-examination.

Mr. Strouss: Of course, the exhibits that were put in go a little further than Mr. Booth has stated here. The second exhibit was the historical, chronological development of these rules, and as the witness testified, they are adopted, the rules, and then there are amendments by action of the Association in their annual meetings, and their action is recorded; the action leading up to it as well as the adoption of the rules. Now, I think that we have a right to anything relating to the subjects which are included in Exhibit 204, that we have a right to have that part of those reports identified as the record of the proceedings relating to those subjects and when opportunity arises to offer them in evidence, the question of whether they are then admissible in evidence will come up on the offer. These are the basic [fol. 2923] records on which the exhibits were made, as the witness has testified.

The Court: Mr. Strouss, do you propose to go into any matters other than the matters covered by direct examination, that is, those things having to do with the rules and their development?

Mr. Strouss: I intend to offer—I will have to, I don't want to, but if compelled to I will have to ask that each of those volumes be marked as an exhibit for identification in order to afford me opportunity to offer parts of it. I intend to offer the reports of committees and the director of research upon the tests and investigations respecting the air-brakes, the development of air-brakes leading up to the rule adopted in 1933, which is set out in the rule book.

Mr. Booth: Well, we submit that that would be entirely improper cross-examination. We offered the rules and

only the rules. The proceedings were brought in here to make sure that the rules offered were the rules adopted, it is the foundational rule that has been invoked so often in this case, but that counsel can go outside of that we submit would be entirely improper cross-examination, and equally improper to impound records in court that have nothing to [fol. 2924] do with the exhibits we offered.

Mr. Strouss: That is a debatable question, whether they do or do not.

Mr. Booth: Counsel is simply trying to put in in our case something that should be offered independently by him. It is getting in evidence, we might say, insidiously or by left-handed methods of cross-examination.

The Court: What is the question before the Court?

(A reference to the record was made by the reporter.)

The Court: There is nothing before the Court.

[fol. 2925] Mr. Strouss:

Q. In exhibit No. 203, Mr. Browning, I notice on page 16 the rule of interchange covering air brakes. Will you read that rule which appears in exhibit No. 203?

A. (Reading) "Air brakes meeting requirements of A. A. R. Specifications for Air Brakes adopted in 1933, required on all cars built new on or after September 1, 1933, and on all cars rebuilt on or after August 1, 1937. From owners. Air brakes meeting requirements of A. A. R. Specifications for Air Brakes adopted in 1933 or A. A. R. standard triple valves, required on all cars built new between January 1, 1919, and September 1, 1933; and, on all cars rebuilt between July 1, 1928, and August 1, 1937. In interchange. On and after January 1, 1945, all freight cars in interchange service must be equipped with air brakes meeting the requirements of the A. A. R. Specification for Air Brakes adopted in 1933. Each car owner shall make a report semi-annually to the Association of American Railroads showing by months the number of freight cars acquired and the number of freight cars on which brake equipment is converted, which information will be filed semi-annually with the Interstate Commerce Commission.

"Note.—The design of air brake equipment designated [fol. 2926] as "AB" meets all of the requirements of the

A. A. R. Specifications for Air Brakes adopted in 1933. Cars built prior to September 1, 1933, and equipped with "AB" brakes should be so stenciled; for cars built on or after September 1, 1933, and rebuilt on or after August 1, 1937, the date built or rebuilt will govern."

Q. The specifications referred to in this rule do not appear in these rules, do they?

A. No, they are part of the standards of the Association.

Q. Can any air brake appliance be used on a car in interchange without the approval of that appliance by the A. A. R.?

A. No, sir.

Q. When an appliance is used, it must have been tested?

A. It must be adopted as a standard. The rule requires that the A. A. R. standard be used.

Q. This rule which requires meeting the specifications from 1933 of course is a rule adopted after tests and investigation by the Association of American Railroads?

A. That is correct.

Q. Isn't it a fact that in 1924 and 1925, beginning in one of those years, pursuant or under an order of the [fol. 2927] Interstate Commerce Commission the Association of American Railroad began tests of air brakes?

A. It was around that time, I don't remember the exact date.

Q. And those continued through 1932?

A. Yes, sir.

Q. There were first "rack" tests?

Mr. Booth: We object, if the Court please, as improper cross-examination. We introduced the rules and nothing else.

Mr. Strouss: I think we should have a right to find out what this means.

The Court: Overrule the objection to the last question.

Mr. Strouss:

Q. There were rack tests, first, and then road tests?

A. There were laboratory tests followed by road tests.

Q. And different reports of those tests or investigations appear in these records of the annual proceedings, mechanical division, of the Association of American Railroads?

A. Yes, sir.

Q. Who is Harley Johnson?

A. He was director of research of the Association for [fol. 2928] a period of, I should say, seven or eight years.

Q. He made the reports concerning those tests and investigations?

A. He was in charge of all research work including those tests.

Q. When tests and investigations were completed, did he make what was known as an abstract report which was printed and published by the Association of American Railroads?

A. Yes, sir.

Q. Mr. Browning, I hand you plaintiff's exhibit No. 206 and ask you if that is a true and correct copy of the report made by Mr. Johnson and printed and published by the Association of American Railroads?

Mr. Booth: Just a moment, I don't want to put any obstacle in the way of counsel proving any publication of the A. A. R. or any of its committees and for that reason I don't object to this question but I certainly will object to any attempt on cross-examination to offer this report or any portion thereof.

The Court: We cross that bridge when we get to it. Proceed.

A. Yes, sir.

[fol. 2929] Mr. Strouss: Mr. Booth, I would like to have marked for identification certain parts of these records of the annual proceedings. I don't like to have the book itself made a part of the record.

Mr. Booth: I think that is exceedingly unfair here, to impound these records. A witness comes in making merely formal proof that he has with him the proceedings of the Association from which these rules were taken; there isn't any question as to the authenticity of the rules, the rules are published in these books and the series of books is produced. Now counsel for some purpose of his own wants to take these records and impound them in court here for use two or months hence. They are records of the Association and we think that is going entirely beyond the foundational rule.

Mr. Strouss: I don't exactly want them impounded in court, if your Honor please, but I may have to in order to have them available for offering in evidence parts which

I think are pertinent here. There are parts of the records which I want to make part of this record here. I don't mean to necessarily offer them in evidence but to identify them as part of that record. If counsel will agree that the parts I desire may be sustituted and these withdrawn, [fol. 2930] then there will be no reason for impounding these. I talked to Mr. Browning this morning and asked him about retaining the records here for a few days and he told me it would be all right.

Mr. Booth: The thing is I don't want them to go into the custody of the clerk. We can retain them here in our office.

Mr. Strouss: That is all right if you will stipuate that the parts I indicate may be put in as an exhibit for identification.

Mr. Booth: No, we won't stipulate that they may be introduced as an exhibit. We will keep the reports here and when the time comes for you to offer an exhibit you may offer them. I don't know what they are.

Mr. Strouss: If, when the time comes for me to use these records, you will stipulate that they are the records of the meetings?

Mr. Booth: Certainly, because many public libraries have copies of these proceedings.

Mr. Strouss: But those are not here and identified by the witness and these are. If you will stipulate these are the records which Mr. Browning has identified——

Mr. Booth: If you will specify what the reports are, we [fol. 2931] will undertake to have those reports or duplicates of them available for use during the trial.

Mr. Strouss: And will stipulate that they are the annual reports testified to by Mr. Browning in his testimony this morning, the same ones which I am now indicating by years?

Mr. Booth: Those are the reports, aren't they, Mr. Browning?

A. Those are the proceedings, yes.

Mr. Strouss: For the years 1929, 1930, 1931, 1932, and one volume which combines 1938 and 1939.

Q. These specifications adopted in 1933, Mr. Browning, referred to in subdivision 4 of rule 3, are those specifications contained in any other publication?

A. Yes, sir, they are contained in the Manual of Standards and Recommended Practice of the mechanical division.

Mr. Strouss: I think we should have those specifications as a part of the record.

Mr. Booth: I think inasmuch as the rule has been read and the specifications are part of the rule the specifications should be before the Court. We will undertake to furnish them.

Mr. Strouss:

Q. Do you know whether any brake other than the AB [fol. 2932] brake has been approved by the Association of American Railroads as meeting the specifications adopted in 1933?

A. No, sir, not to date.

Q. No other brake to date?

A. No, sir.

Mr. Strouss: That is all the questions I have.

The Court: Mr. Browning, you are associated with the same organization of which Dr. Parmelee is a director?

A. Yes, sir, but a different division.

Redirect examination.

By Mr. Booth:

Q. There is a brake known as the "K-type triple," isn't there?

A. Yes, but that doesn't meet the 1933 specifications.

Q. That K-type triple is permitted on cars in interchange?

A. Yes, it is standard for cars built prior to that date in 1933.

Q. And fully permissible in interchange?

A. Yes, sir.

Mr. Strouss: Until what date?

A. The date set in here is 1945.

[fol. 2933] Mr. Mason:

Q. Your division, Mr. Browning, is the mechanical division of the Association, is it?

A. That is correct.

Q. And Dr. Parmelee's division is the Bureau of Statistics?

A. Yes, sir.

Q. You maintain your headquarters in different cities?

A. That is right.

(Witness excused.)

W. G. Reid was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you please state your name and residence to the reporter?

A. W. G. Reid, El Paso, Texas.

Q. Are you in the service of the Southern Pacific Company?

A. Yes, sir.

Q. In what position?

A. Master mechanic, Rio Grande division.

[fol. 2034] Q. With headquarters at El Paso?

A. Yes, sir.

Q. Over what lines does your jurisdiction as master mechanic extend?

A. It extends from Lordsburg, New Mexico, to Tucumcari, New Mexico, and from El Paso via south line to Tucson.

Q. What has been your previous experience in the service of the Southern Pacific Company?

A. I started with the Southern Pacific in 1903, served an apprenticeship as a machinist and later advanced to journeyman, and I was with the Arizona Eastern for a number of years in various capacities, foreman, general foreman, and master mechanic.

Q. Has your experience been entirely in the mechanical department?

A. Practically all my experience has been in the mechanical department.

Q. How long have you been master mechanic at El Paso?

A. Since November, 1924.

Q. What are the duties of the division master mechanic in the position you now occupy?

A. The master mechanic is responsible for the power and equipment on his division and various classes of employees [fol. 2935] under his supervision. He reports to the superintendent of the division and the superintendent of motive power of the district.

Q. Does the master mechanic supervise the repair and reconditioning of rolling equipment used on the division?

A. Yes, sir.

[fol. 2936] Q. Is it part of the duties of the master mechanic to be familiar with the construction, condition and capabilities of the locomotives assigned to his territory?

A. Yes, sir.

Q. Does the master mechanic supervise the reconstruction and repair of cars?

A. In a supervisory capacity, yes.

Q. Do you have on the Rio Grande division an employee known as a car foreman?

A. Yes, sir.

Q. Is he under your jurisdiction?

A. Yes, sir.

Q. Do you have on the Rio Grande division repair tracks and other repair facilities for the inspection and repair of freight cars?

A. Yes, sir.

Q. Do those come under your jurisdiction?

A. Yes, sir.

Q. How are the employees classified and titled who have to do with the inspection and repair of freight cars?

A. We have what is known as car inspectors, car men, we have two classes, Class A and Class B car men.

Q. You have helpers?

[fol. 2937] A. Oh, yes, there are helpers.

Q. And electricians?

A. Electrical department electricians which have to do with cars.

Q. Now, these car men, are they actually repair men?

A. Yes, sir.

Q. Do you have, in addition to these car inspectors and car repairmen, other forces engaged in the repair of locomotives or the inspection of locomotives?

A. Yes, sir.

Q. Are they under your jurisdiction as well?

A. Yes, sir.

Q. For what purpose do you have these inspectors; what do they do?

A. Well, the purpose of the inspector is to inspect the locomotive or car to see that it is in safe and suitable condition, and meets the requirements and laws of the Interstate Commerce Commission.

Q. When you speak of rules, what rules do you have in mind?

A. As to what; as to cars?

Q. As to cars.

A. Well, the rules set forth by the A. A. R. Association, [fol. 2938] which governs the type and classes of cars, the various parts of the cars accepted.

Q. Are you familiar with the code of rules of the Association of American Railroads, which has been offered here for identification as defendant's exhibit No. 203?

A. Yes, sir.

Q. Do you have on the Rio Grande Division points at which freight cars are interchanged with other carriers?

A. Yes, sir.

Q. Will you name those points?

A. At Tucumcari, New Mexico, the Rock Island; El Paso, Texas, T. P., Texas Pacific, and Santa Fe, A. T. & S. F.

Q. And Texas and New Orleans Railroad?

A. The Texas and New Orleans.

Q. Do you interchange at Deming?

A. Yes, sir, we set out cars at Deming for the Santa Fe at that point, we don't have an inspector for interchange purposes there other than the agent.

Q. Now do you make inspection of cars which are received by you from connecting carriers at El Paso and Tucumcari?

A. Yes, sir.

[fol. 2939] Q. For what purpose do you make these particular inspection of cars received on interchange?

A. To see that the cars offered on interchange company with the rules contained in the manual.

Q. You mean Exhibit 203 for identification?

A. Yes, sir, and also meet the requirements of the Interstate Commerce Commission on safety appliance standards.

Q. Suppose that a car inspected at the interchange point fails to meet the requirements of Rule 2 or 3 in that it contains or has attached to it appliances or devices which do

not comply with the standards prescribed by rules 2 and 3 of Exhibit 203 for identification, what do you do with that car?

A. If that car doesn't meet the requirements of the rules, we reject them.

Q. What happens to the lading of such a car in case it doesn't meet such requirements?

A. It would have to be transferred to a car that would be accepted.

Q. Is every car that is tendered to you for interchange at Tucumcari or El Paso, inspected before movement over Southern Pacific lines?

A. Yes.

Q. Has that practice prevailed throughout your oc-
[fol. 2940] cupancy of the position as master mechanic?

A. Yes, sir.

Q. From your experience, will you state approximately how frequently and under what circumstance you have, during the past year, for example, rejected a car tendered to you on interchange?

A. When not complying with the rules?

Q. For not complying with the Association rules?

A. I don't recall of rejecting any car in the past year.

Q. Now, does that mean that cars tendered to you have been inspected and found to comply with these rules?

A. Yes.

Q. Will you say whether or not, in making these inspections, you have in the past and you do now comply strictly with the interchange rules as set forth in Exhibit 203 for identification and the preceding issues?

A. Yes, sir.

Q. I take it, that the code of rules as it exists at present, or has existed in the past, is virtually your bible on interchange inspections.

A. That is correct; we are governed by it solely.

[fol. 2941] Q. Do you maintain car forces for the purpose of making inspection of freight cars at various points on the division?

A. At our main terminals we have inspection forces.

Q. Now, irrespective of the inspections on interchange, do these forces inspect cars in freight trains before such trains leave those terminals?

A. Yes, sir.

Q. Do you maintain such forces at Douglas?

A. Yes, sir.

Q. At Lordsburg?

A. No, sir.

Q. Did you in the past maintain them at Lordsburg?

A. We did. I think the force at Lordsburg was discontinued in 1929 or '30.

Q. Did you heretofore maintain such forces at Carrizozo?

A. Yes, sir.

Q. Are they now maintained?

A. No, sir.

Q. When were they discontinued, if you recall?

A. Well, I can't recall definitely. They were discontinued [fol. 2942] prior to my time, along about 1923, that is not definite.

Q. Do you make inspections of freight cars and freight trains as they arrive at the principal terminals?

A. Yes, sir.

Q. As well as prior to departure?

A. That is right.

Q. Are the inspections by car forces at the present time as frequent either in point of time or as to miles traveled as in prior years?

A. How far back?

Q. Well, to 1924?

A. No.

Q. What fact, if any, has permitted you to reduce the frequency of inspection by car forces?

A. The improvement in the type of equipment handled.

Q. Mr. Reid, I think you stated that one of the necessary duties or qualifications of the master mechanic is to be familiar with the characteristics and capabilities of locomotives assigned to the division?

A. Yes, sir.

Q. And does that include knowledge of their pulling power?

A. Yes, sir.

[fol. 2943] Q. And the work which they will perform under various conditions?

A. Yes, sir.

Q. Is pulling power substantially the equivalent or the same as tractive effort?

A. That is right.

Q. And the work which will be performed under different conditions corresponds to the tonnage rating, does it not?

A. Yes, sir.

Q. Will you state whether or not the use of the dynamometer car is necessary to determine the tonnage ratings of locomotives if their tractive effort is known?

A. No, sir.

Q. Have you found it necessary to use the dynamometer car on the Rio Grande division in order to determine tonnage rating of locomotives?

A. Not to determine tonnage rating alone; we have used the dynamometer car last year on AC-9 locomotives to determine the tonnage that they can haul; the efficiency of fuel, water evaporation, and many other things that go along with the dynamometer car test.

Q. Were you on the division when the 5000 Class locomotives were first placed in service?

[fol. 2944] A. Yes, sir.

Q. Was it necessary to use a dynamometer car to determine their ratings?

A. No, sir.

Q. Are you familiar with the locomotives of the classes designated as AC-6, and 7, and 8?

A. I am familiar with them by knowledge, but not from practical operation.

Q. You are familiar with locomotives of the Southern Pacific generally, are you, Mr. Reid?

A. Yes, sir.

Q. Now, taking the AC-6, 7 and 8 designations as typical, does the designation of one series as AC-6 and another as AC-7, necessarily signify any substantial difference between the locomotives classed as 6's and those classed as 7's?

A. Not in the type of locomotive, no.

Q. Does the designation of still a more recent series of locomotives, as the AC-8, mean that they differ essentially from the AC-6 and 7?

A. Not to a great extent, no.

Q. Do the Southern Pacific 5000 class locomotive, is there any substantial difference between the SP-2 and SP-3 class?

A. No, sir.

Q. What is the significance of this series number, so to [fol. 2945] speak?

A. Well, when the locomotive is first purchased, say in 1910, they designate it as AC-7.

Q. I think the AC-7 was brought out in 1937.

A. That was for illustration. Later on, they may purchase the same type locomotives with some minor improvements on that locomotive which will change the seven to an eight, for illustration.

Q. There will be preserved perhaps the same wheel arrangment?

A. Yes, sir.

Q. The same tonnage rating?

A. Yes, sir.

Q. The same boiler pressure?

A. Yes, sir.

Q. You are familiar, of course, with the S. P. type locomotives, are you?

A. Yes, sir.

Q. They are in continuous use on the Rio Grande division, are they not?

A. Yes, sir.

Q. Now, with reference to the S. P. 2 type of locomotive which is referred to on Exhibit No. 5 do you recall, by the way, when the SP-2 was first placed in service on the Rio Grande division?

A. No, I can't recall, I think it was along in 1930, somewhere along in there, 1932.

[fol. 2946] Q. Do you recall the numeral series of the SP-2 type assigned the 5000 numbers?

A. Yes, 5000 on to 5039.

Q. That includes all the SP types?

A. Yes, sir.

Q. Mr. Russell's exhibit No. 7 shows that in 1926 locomotives numbered 5016 to 5038 were purchased. Would that be the SP-2 type?

A. That might be the SP-3,—let's see, probably the SP-2 followed by the SP-3.

Q. I show you the Southern Pacific locomotive book. Will you state by reference to the locomotive book when the SP-2 type was purchased?

A. 1926.

Q. Now, having the SP-2 type of locomotive in service, followed by the purchase, a year or more later, of the SP-3 type, which, according to exhibit No. 7 has the same tractive effort and substantially the same weight on drivers, would it be possible when the SP-3 type arrived on the division, to determine in advance the performance which you could reasonably expect of it, basing that determination upon the performance already had of the SP-2 type?

A. Yes, sir.

[fol. 2947] Q. And the fact that there was a difference in the numeral series, as between the two and three designation, wouldn't handicap you in that determination, would it?

A. Not at all. It would be governed by the tractive power of the locomotive just the same.

Q. The locomotive being similar as to wheel arrangement?

A. Yes, sir.

Q. And other essential characteristics?

A. That is correct.

Q. Then having the AC-8 class with the same tractive effort as the AC-6 and 7, would the same results follow?

A. Yes, sir.

Q. Mr. Reid, I think you mentioned in your statement of the character of the inspection given, that your employees at the interchange points inspect for compliance of I. C. C. standards?

A. Yes, sir.

Q. Just what standard do you have in mind there?

A. That is all safety appliance standards, such as handholds, steel steps, high and low couplers, defective wheels, brake hangers, brake beams, anything that is specified by the law.

[fol. 2948] Q. Suppose that an inspector discovers a safety appliance defect, is that the term you use, by the way?

A. Yes.

Q. Suppose an inspector discovered such defect on a car as it is inspected at the receiving point, what action is taken?

A. That defect must be corrected before the car is permitted to go forward.

Q. Does that mean an immediate repair?

A. Yes, sir.

Q. Or, if repair cannot be accomplished, what is done with the lading in the car?

A. If the repair could not be made in the train yard, the car would be sent to the repair track.

Q. Does that sometimes mean a transfer of the lading?

A. Well, those cases are rather remote.

Q. You mean the transfer of the lading is comparatively rare?

A. Yes.

Q. Safety appliance defects are capable of repair usually in the train yard or light repair track?

A. Yes, that is right.

[fol. 2949] Q. Suppose that inspection reveals some damage to the car not affecting either A. A. R. standards or safety appliances, what is done with the car?

A. Well, if the repair is not made, a defect card is issued stating the defects existing on the car at the time of inspection. It is either forwarded to destination or if the car was homeward bound it would go to the owner where he would make repairs at the first available point and bill the line responsible for such repairs under the rules of the A. A. R. Association, mechanical section.

Q. Now, that repair card you speak of being issued in the case of this particular class of defect is actually tacked on the car as it goes forward, is it?

A. That is correct.

Q. Can you give an example of a class of defect which would not involve either a safety appliance defect or a defect calling for rejection on interchange?

A. Well, we can take on our P. F. E. cars, the wood upper structure, the wood sheating and a raked siding as we call it, there may be four or five boards in the siding raked to a depth where they are condemnable and hence need to be renewed but would not damage the contents of the car [fol. 2950] while enroute.

Q. And wouldn't involve any safety appliance defect?

A. No, sir.

Mr. Mason: You may cross-examine.

Cross-examination.

By Mr. Strouss:

Q. With respect to your testimony concerning boiler pressure, of course, difference in boiler pressure will affect

the power of an engine?

A. That is right.

Q. The greater the boiler pressure, the more power the engine has?

A. Yes.

Q. When you said that tonnage rating is governed by tractive effort only, do you mean that exactly?

A. Well, that is the formula used in determining the tonnage rating of a locomotive, it is taken, starts from the tractive effort of the locomotive.

Q. Tonnage rating is the tonnage that the locomotive will pull, isn't it?

[fol. 2951] A. Yes, at a given speed. The speed is determined, as to the maximum, say at twelve miles an hour, or fifteen.

Q. In other words, that is the drawbar pull?

A. Yes.

Q. And the tractive effort wouldn't take into consideration the weight of the locomotive itself?

A. Oh, yes, sure; yes, weight, cylinder size, boiler pressure, weight on drivers is effort.

Q. In the tractive effort, do you consider the weight of the engine?

A. The weight would have to be primarily used to determine the tractive effort.

Q. Isn't the difference between the drawbar pull, that is, the pull of the engine after taking away the effort necessary to move the engine itself?

A. Well, the drawbar pull excludes the locomotive, I understand it.

Q. Isn't that the difference between the tractive effort and the drawbar pull?

A. Well, I can't answer that question whether it is figured exactly that way or not.

Mr. Strouss: That is all.

[fol. 2952] Redirect examination.

By Mr. Mason:

Q. When you speak of the weight of the engine entering into the tractive power, you have in mind the weight of the engine causing adhesion to the rail?

A. That is right.

Q. That is calculated in before the final units of tractive effort is arrived at, is it not?

A. I understand that.

Q. And the tractive effort bears a direct relation to the tonnage rating, which is the amount of the tonnage which the engine will move at a particular speed and over a particular district?

A. That is right, you would have the power of the locomotive to determine the tonnage it will haul over a given grade at a given speed.

Q. Tractive power is the same for a locomotive wherever it may be?

A. Yes.

Q. But tonnage rating is what it will do under certain conditions?

A. Yes, at a particular speed.

Mr. Mason: That is all.

Mr. Strouss: That is all.

(Witness excused.)

[fol. 2953] The Court: We will take our recess at this time.

(Thereupon, a short recess was taken, after which proceedings were resumed as follows:)

[fol. 2954] A. F. Burke was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you please state your name and residence to the reporter?

A. A. F. Burke, Tucson.

Q. What is your position with the Southern Pacific Company?

A. Master mechanic, Tucson division.

Q. How long have you been master mechanic of the Tucson division?

A. Since January, 1925.

Q. Or for sixteen years?

A. Yes, sir.

Q. Did you have experience prior to that time in the mechanical department of the Southern Pacific Company?

A. Yes, sir.

Q. With the car or engine repair forces?

A. In the locomotive department.

Q. You heard Mr. Reid's description of the duties and responsibilities of the master mechanic of the Rio Grande division, did you?

[fol. 2955] A. Yes, sir.

Q. Are your duties and responsibilities as master mechanic of the Tucson division similar?

A. Yes, sir.

Q. Does your jurisdiction extend over the entire lines of the Tucson division?

A. Yes, sir, from Yuma to Lordsburg through Phoenix and through Gila.

Q. What points on the Tucson division are there at which you interchange freight cars with other carriers?

A. Phoenix, Arizona, and Nogales.

Q. Do you maintain inspection forces at those points?

A. Yes, sir.

Q. Do you make inspections for the determination whether cars offered in interchange comply with A. A. R. requirements?

A. Yes, sir.

Q. What standards would such cars meet? Is it set down in any publication?

A. According to the Code of Rules of the A. A. R. and safety appliance.

Q. Is that the Code of Rules which has previously been identified here as exhibit No. 203 for identification?

[fol. 2956] A. Yes, sir.

Q. You also inspect for compliance with the safety appliance rules of the Interstate Commerce Commission?

A. Yes, sir.

Q. In the same manner as has been described?

A. Yes, sir.

Q. In your experience how frequently do you find it necessary to reject a car offered in interchange because of failure to comply with the A. A. R. Code of Rules?

A. In checking up I can't find that we had any in Phoenix that the A. A. R. don't comply with.

Q. You never have had any at Phoenix in your experience?

A. No.

Q. What about Nogales?

A. We have occasionally where they come out of Mexico that they will put a defect card on and route it to us and we make the repair.

Q. Where a defect card is put on, does that mean that the car can be moved and repaired at the first repair point?

A. Yes, sir, providing it is safe.

Q. Where you find a car defective as not complying with Interstate Commerce Commission safety appliance require-

[fol. 2957] ments, what do you do with it?

A. We always repair them.

Q. At once?

A. At once, if it is at a terminal where we have car men; if not, then the crews are notified to that effect. At the first place they arrive they are repaired.

Q. Do you maintain car inspection forces on the Tucson division at points other than Nogales and Phoenix?

A. Yes, we have them at Yuma and Tucson.

Q. What inspections do your car forces make at Yuma and Tucson?

A. On all trains arriving and departing.

Q. For what defects do they inspect?

A. For the wheels, running gear, draft gear, safety appliances, see that they conform to the A. A. R. rules.

Q. If you find a car not conforming to the A. A. R. rules, what do you do with it?

A. We tag it and repair it before it moves.

Q. Suppose you found some car, for example, at Tucson on your inspection which has arch-bar trucks instead of side frames, what do you do with that car?

A. That car cannot be moved off the division.

[fol. 2958] The Court:

Q. These inspections that you and your forces make are rather thorough inspections, not just casual inspections?

A. No, our car inspectors are all familiar with the Code of Rules and also have their gauges and make a thorough inspection of wheels and equipment.

Q. Does that require them to get down under these cars?

A. They do, to look at the brake rigging as they go by; yes, sir.

Mr. Mason:

Q. You say that a car with arch-bar trucks cannot be moved off a division. Is that because arch-bar trucks have been outlawed?

A. Yes, sir.

Q. By the A. A. R. code?

A. By the A. A. R. code, yes, sir.

Q. Are you familiar with the locomotives generally in service on the Southern Pacific lines and particularly those on the Tucson division, Mr. Burke?

A. Yes, sir.

Q. Are you familiar generally with the tractive effort and tonnage ratings of the various types previously or presently in use on this division?

A. Yes, sir.

[fol. 2959] Q. Do you know and, if so, will you state whether in your sixteen years as master mechanic here the dynamometer car has actually been used for the purpose of obtaining tonnage ratings of locomotives on the Tucson division?

A. No; the car has never been here for that purpose during my time.

Q. Were the F-4 types of locomotives brought to the division for use here since you have been master mechanic?

A. Off and on. They were here prior to my time and then they were away and came back.

Q. They are now in use here?

A. Yes.

Q. Was it possible to determine their tonnage rating by reference to their tractive effort?

A. Yes, sir.

Q. Did you follow the same process when the S. P. type locomotives were placed in service here?

A. Yes, sir.

Q. Will you say whether or not the locomotives in use on the Tucson division at the present time are equipped with power reverse gears?

A. Yes, sir. Not all the locomotives are, those that weigh 150,000 pounds on the drivers or over are equipped with power reverse gears.

[fol. 2960] Q. Would that include the Mikado type?

A. Yes, sir.

Q. And the F type?

A. Yes, sir.

Q. And all later types?

A. Yes, sir.

Q. Are they equipped or any of them equipped with the so-called "8-ET" brake equipment?

A. Yes, sir, that is the latest locomotive brake, the T equipment.

Q. Is that equipment on all these locomotives in main line service?

A. Yes, sir.

Q. Are these locomotives or any of them equipped with back pressure indicators?

A. Yes, sir.

Q. Is that universal?

A. No, that is on the later type and they are putting it on some of them as they go through the shop.

Q. Commencing with what series or type?

A. We have some F 4 with the back pressure gauge on. I don't think there are any of them smaller than that.

Q. Are they on the S.P. type?

A. Yes, on some of them.

[fol. 2961] Q. Is it on the Mountain type?

A. No, sir, I don't think so. They run right through here, I think some of them are equipped; in other words, they intend to equip all of them as they go through.

Q. Are you familiar by observation with the coal-burning locomotives used by the Southern Pacific?

A. Yes, sir.

Q. Are these equipped with mechanical stokers?

A. Yes, sir.

Q. Are the S.P. locomotives on the Tucson division equipped with feed water heaters?

A. The majority of them.

Q. Super-heaters?

A. Yes, sir, all super-heated.

Q. Are they equipped or any of them equipped with speed indicators?

A. None of them are on the Tucson division, no, sir.

Q. There is an appliance known as the "valve pilot," is there not?

A. Yes, sir.

Q. Are you familiar with it?

A. Yes, sir.

Q. Is that coming into use on the later types?

[fol. 2962] A. All power now being received has that equipment.

Q. You have seen it applied on the newer types as they pass through Tucson?

A. Yes, sir, and I also visited El Paso and looked over one of them.

Q. What is the function of the valve pilot?

A. Showing the back pressure that is working against the pistons in operating the locomotive and also the speed recorded.

Q. It is a speed recorder, is it?

A. Yes, sir.

Q. You spoke of an inspection by car forces at Tucson. Is that inspection given to all cars whether refrigerator cars or of other ownership?

A. All cars are given the same inspection, thorough inspection.

Q. Mr. Cartmill of the Pacific Fruit Express Company in his testimony testified as to inspections made by car forces employed by the Pacific Fruit Express Company. I will ask you whether the inspection made by your car forces is combined with or in addition to that made by the Pacific Fruit Express Company forces?

A. No, they are separate inspections.

Q. Are the points at which car force inspections are [fol. 2963] made today the same as in 1925 when you became master mechanic?

A. Yes, sir, the same.

Q. You haven't made any reduction in the inspections?

A. No, sir, not on the division.

Mr. Mason: I think that is all, thank you.

Mr. Strouss: No cross-examination.

(Witness excused.)

F. P. McDONALD was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you please state your name and residence to the reporter?

A. F. P. McDonald; residence, Glendale, California.

Q. Your official headquarters?

A. Los Angeles.

Q. What position do you occupy?

A. Master mechanic, Los Angeles, division.

Q. How long have you been master mechanic?

A. Since July 1, 1923.

[fol. 2964] Q. Did you have prior experience in the mechanical department of the company?

A. Yes, I started as machinist apprentice and worked as a machinist prior to coming to the Southern Pacific in 1903.

Q. You have been with the Southern Pacific Company since 1903?

A. Since September 27, 1903, as roundhouse foreman, general foreman, assistant master mechanic, and master mechanic.

Q. For eighteen years approximately you have been master mechanic at Los Angeles?

A. Eighteen years approximately.

Q. You heard the testimony of Mr. Reid and Mr. Burke as to the duties and responsibilities of the division master mechanic, did you?

A. Yes.

Q. Are your duties and responsibilities the same as testified to by them?

A. Yes, sir, the same responsibilities.

Q. As master mechanic, do you become familiar with the use and capabilities of locomotives in service on your division?

A. Yes, sir.

Q. Have you had or do you now have in service on the Los Angeles division locomotives of the AC type, particu- [fol. 2965] larly identified as the AC-6, AC-7, and AC-8?

A. We have had AC-6 and AC-7's operating on the Los Angeles division. We now have the AC-8.

Q. From your experience with these AC locomotives, will you say whether there is any substantial difference in performance as between the AC-6, AC-7, and the AC-8?

A. There is no difference in the performance. There is some difference in the gadgets or appliances on the locomotives which has developed a more modern method of operation.

Q. Mr. Burke testified that locomotives being recently received are equipped with the valve pilot. Is that one of the characteristics of the AC-8?

A. That is one of them.

Q. Is that a difference as between the AC-8 and the AC-6?

A. Yes.

Q. Are the other differences between the two locomotives of the same character, generally speaking?

A. They have gauges that indicate the heating of the fuel oil and gauges that will indicate the water level or gallons of water in the tender.

[fol. 2966] Q. As to boiler pressure and hauling capacity, the two are the same, are they?

A. The same tractive effort.

The Court: What do you mean by "valve pilot"?

A. That indicates the speed of the locomotive, also it indicates the back pressure, exhaust pressure or resistance of the pistons to the cylinder head and also the pressure at the steam chest where the steam gets egress to the cylinder.

Q. All that is registered at a point where the engineer can readily see it?

A. Yes, sir.

Mr. Mason:

Q. I take it that the valve pilot is something like a speedometer or other gauge on the dashboard of a motor car, as an assistance to the operator?

A. Yes, even better.

Q. It does not affect the hauling capacity or other characteristics of the locomotive?

A. No, it makes it easier for the locomotive engineer to do a better job in operating the locomotive.

Q. You heard Mr. Burke's testimony as to the appliances, such as feed water heaters, back pressure indicators, power reverse gears, and so forth. Are those likewise applied to locomotives in general use on the Los Angeles division?

[fol. 2967] A. The new or heavier locomotives come to us with the air reverse and the back pressure indicators. The older types of locomotives are now having the air reverse applied, or what they call the "power reverse."

Q. Does that relieve the locomotive engineer of some of his manual labor?

A. It has increased the efficiency of the locomotive.

Q. You heard Mr. Burke's testimony as to the 8-ET brake equipment. Is that also in use on your locomotives?

A. Practically all of the later type locomotives and with the possible exception of a few of the Consolidation type.

Q. Is the 8-ET brake equipment applied to substantially all of your locomotives in main line freight service?

A. Yes, sir.

Q. And in main line passenger service?

A. Yes.

Q. Do you have any points on the Los Angeles division at which freight cars are interchanged as between Southern Pacific and connecting carriers?

A. Los Angeles and Colton.

[fol. 2968] Q. Those are your principal interchange points, are they?

A. Yes.

Q. Do you maintain inspection forces at those and other points for the purpose of inspecting cars?

A. Only at Los Angeles.

Q. Where cars are received at Colton, what is done with those cars?

A. We accept the inspection of the delivery line.

Q. Of what employees do those inspection forces consist at Los Angeles, what character of employees?

A. Car inspectors.

Q. Car forces as distinct from train service employees?

A. Yes, car forces.

Q. Are they under your immediate jurisdiction?

A. Yes, with the exception I have a master car repairer under my supervision.

Q. Are these inspectors also accompanied by car repair men?

A. Do I understand your question—do we have car repair men?

Q. Yes.

A. Yes, we have car repair men.

[fol. 2969] Q. The inspectors themselves sometimes make minor repairs, do they not?

A. Yes.

Q. For what purpose do you make these inspections on interchange at Los Angeles?

A. To have assurance that the cars meet all the requirements of the A. A. R. rules and safety appliances.

Q. And incidentally for any defects which do not involve A. A. R. rules or safety appliances?

A. Any other cause which would be a contributing cause to accidents.

Q. If a car does not conform to the standards set up in the A. A. R. Code of Rules governing the interchange of cars, what do you do with it?

A. If the defect was such as a weak siding or damaged siding, we would place a defect card on it.

Q. Suppose that a car arrives with arch-bar trucks, what do you do with it?

A. It would be immediately removed from service.

Q. You reject that on interchange?

A. Right there.

Q. In your experience do you find it necessary to reject cars on interchange from time to time?

A. No, in the year 1940 we haven't a record of one car [fol. 2970] rejected.

Q. Does that mean that they have been found after inspection to comply with A. A. R. standards?

A. Yes, sir.

[fol. 2971] Q. What are the railroads with which you interchange at Los Angeles?

A. The Union Pacific and the Santa Fe interchange.

Q. Do you interchange with the same railroads at Colton?

A. The Pacific Electric and the Union Pacific and the Santa Fe at Colton.

Q. When your inspection reveals safety appliance defects, what do you do with the cars?

A. Well, we cut out and set over for repairs.

Q. Before being moved?

A. Before being moved out of the yard, or if it is an important load and had to require unloading to make such repairs, why, the car would be sent in to the unloading track with instructions to all concerned as to what the defect was.

Q. Then the car would not be moved away from Los Angeles without being repaired?

A. No.

Q. Do you maintain inspection forces other than at Los Angeles and Colton for the purpose of inspection of cars in trains?

A. No.

Q. You don't maintain any force at Santa Barbara?

[fol. 2972] Or Indio?

A. No, we have, I might say, repairmen at that point.

Q. Do they make inspection of trains on arrival or prior to departure?

A. No.

Q. What is the purpose of maintaining car repairmen at those points?

A. Any defect or any damage through accident otherwise, such as water cars or maintenance of way cars on that district that require attention, or cars such as experience a cut journal, it would be necessary to change a wheel out any time, they would be changed out and these forces would be used for such attention.

Q. Are they in the nature of forces for emergency or running repairs?

A. Yes, emergency repair forces.

Q. Have you used the dynamometer car on the Los Angeles division for the purpose of obtaining tonnage rating, Mr. McDonald?

A. Yes, they have used it there.

Q. Recently?

A. No, not recently. They used it for obtaining efficiency ratings on GS engines, the difference between an engine lubricated with oil and lubricated with grease; the [fol. 2973] driving parts of it.

Q. But only for the purpose of obtaining the results of different types of lubrication?

A. Yes.

Q. And not for the purpose of obtaining different engine ratings. By the G. S. locomotive you mean a 4400?

A. Yes.

Q. That is a passenger type?

A. Yes, sir.

Q. What is the wheel arrangement?

A. 4-8-4.

Q. I take it that the dynamometer car may be used for other purposes in connection with locomotives than merely to obtain tonnage ratings?

A. Yes, sir.

Q. What are some of these other results that can be obtained?

A. Well, efficiency and fuel consumption.

Q. Water consumption?

A. Yes, water, of course, that fits in with fuel.

Q. The results of lubrication?

A. And lubrication, yes, on friction, journal friction.

Q. Is the use of a dynamometer car necessary in order [fol. 2974] to determine tonnage rating, or can you arrive at tonnage rating without it?

A. A locomotive is designed for certain tractive effort, and if there is any question or any difficulty experienced in a locomotive handling that allowed tonnage, why, the dynamometer car is called into use for a test to ascertain why the locomotive will not handle the allotted tonnage.

Q. Then it is used more as a check than for the purpose of determining the rating in the first instance, is that correct?

A. That is right.

Mr. Mason: That is all. You may cross-examine.

Mr. Strouss: No questions.

(Witness excused.)

Mr. Mason: We will now call Mr. Judson.

Mr. Booth: If the Court please, Mr. Judson is the last of our witnesses on what I term the first branch of our case. He would have been on the stand before, but he was called away from Tucson when he was here formerly.

[fol. 2975] W. W. Judson was called as a witness on behalf of the defendant and, being first duly sworn, testified as follows:

Direct examination.

Mr. Mason:

Q. Will you please state your name and residence, Mr. Judson?

A. W. W. Judson, St. Paul, Minnesota.

Q. Are you employed by the Northern Pacific Railway Company?

A. Yes, sir.

Q. In what capacity?

A. General manager of lines east.

Q. What has been your experience with the Northern Pacific, and in railroad service generally, Mr. Judson?

A. I have been with the Northern Pacific for 26 years in various positions, in the engineering department to start with, special assistant to the vice-president, train master, assistant general manager, superintendent, and general manager.

Q. As general manager of lines east, how far does your jurisdiction extend?

A. As far west as Livingston, Montana.

Q. Does that include all of the lines west of St. Paul [fol. 2976] and Ashland, Wisconsin?

A. Yes, sir.

Q. In your prior positions in the operating department, has your jurisdiction, or the scope of your duties extended to all parts of the System?

A. Yes.

Q. Will you say whether or not you are familiar as an operating officer with the entire system of the Northern Pacific?

A. I am.

Q. I take it, you have travelled over it many times?

A. Yes, sir.

Q. As general manager, do you now travel over the lines frequently?

A. Yes, sir, the lines east.

Q. There has been heretofore offered for identification a map in one sheet marked as Defendant's Exhibit No. 50,

witness Gregory, which is, according to its title, a map of the Northern Pacific Railroad Company. Have you previously seen a copy of that map, Mr. Judson?

A. Yes, sir.

Q. Will you say whether or not it is a reasonably accurate outline of the Northern Pacific Railway Company lines [fol. 2977] and the territory which it serves?

A. I believe so.

Q. And indicates the principal points with reasonable fidelity as to location?

A. Yes, sir.

Mr. Mason: We offer the exhibit as Defendant's No. 50.

Mr. Strouss: The same objection as made to the previous exhibits from foreign roads.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 50.")

Mr. Mason: Mr. Judson, in your trips over the line, do you ride entirely in passenger trains?

A. No, sir.

Q. Do you ever ride in freight trains?

A. Yes, sir, passenger trains, freight trains and special trains.

Q. When you ride in a freight train, do you use a business car?

A. Usually.

Q. Where do you have it placed on the train?

A. Usually on the rear end, but I have ridden behind the locomotive.

Q. Do you make any selection of the type or size of freight [fol. 2978] train to which the car is to be attached?

A. No, not as to size, the nature of the train usually.

Q. You prefer a through train to a local?

A. Oh, no, but there is usually some reason for riding the freight train. Often, it is the more important train.

Q. Do you make any distinction as to length of the train, whether it be over 70 cars, in attaching your business car?

A. No, sir.

Q. Will you say whether or not you have made trips in your business car attached to the rear end of freight trains of substantially more than 70 cars?

A. Yes, sir, I have.
Q. How frequently?
A. Oh, maybe once or twice a year.

Mr. Strouss: The record may show that my objections are going to this.

The Court: Yes, the record may show the running objection that the State heretofore made to the testimony of these witnesses from other roads.

Mr. Mason: Mr. Judson, does the Northern Pacific Rail-[fol. 2979] way Company's operating department have a book of rules for the guidance of transportation department employees?
A. They do.
Q. Is that a printed code?
A. It is.
Q. Issued to employees for their guidance?
A. Yes, sir.
Q. Are you familiar with the standard code of rules of the Association of American Railroads?
A. In a general way.
Q. Will you say whether or not the Northern Pacific Rule Book corresponds to the Association Code?
A. It follows it very closely, not exactly the same. There are certain rules that are some different.
Q. Is the main line of the Northern Pacific equipped with block signals?
A. Yes, sir.
Q. Throughout?
A. Yes, sir.
Q. Will you describe them as to type?
A. We have the older type which on the Northern Pacific is the upper quadrant three position arm, the newer type [fol. 2980] are the three color light signals, the later installations.
Q. You use either one or the other over the entire main line, do you?
A. Yes, sir.
Q. Do you have any installation of cab signals on the line?
A. No, sir.
Q. Any centralized traffic control?
A. No, sir.
Q. Is your line predominantly double track or single track?

A. Predominantly single track.

Q. You have stretches of double track?

A. Yes, sir.

Q. Where are the stretches of double track found?

A. Well, they are in various locations. There is double track out of St. Paul to Staples, and from Staples to Fargo. Fargo is not shown on this map.

Q. Fargo is at the point where your line enters North Dakota, is it not?

A. Yes, sir, right on the line. Then double track on the mountain from Livingston to Logan with the exception of the Bozeman Tunnel. There is double track from Garrison [fol. 2981] to Missoula. There is double track from Seattle to Portland, and a few other small locations, I mean a few other small mileages at other locations.

Q. I take it that the double track is largely in the neighborhood of important division terminals?

A. That is right.

Q. This line from Seattle to Portland, is that the line used jointly with the Union Pacific and the Great Northern?

A. It is.

Q. Mr. Judson, I will ask you to refer, if you will please, to Defendant's Exhibit 2. Have you heretofore been furnished with a copy of that exhibit?

A. I have.

Q. First I will ask you if you are generally familiar with the freight equipment owned and used by the Northern Pacific?

A. I am.

Q. Will you say whether or not the development in the construction of the boxcars of the Northern Pacific has proceeded along lines substantially similar to those indicated by Exhibit No. 2?

A. Very much the same. The dates of changes are in [fol. 2982] some cases different, and all of the new features as shown in the column here have been adopted by the Northern Pacific with the exception of, I believe, only two. We have no metal running boards on the boxcars and we have no steel floor plates as yet. Other than that I can find nothing in here that is different.

Q. Does the Northern Pacific now have in revenue service any cars with wooden underframes?

A. Yes, I believe so.

Q. You have some wooden underframe cars still in service?

A. Yes, sir.

Q. Are they restricted to particular localities?

A. Yes, particular service.

Q. What are the localities and service to which they are restricted?

A. They are used for outfits, work outfits, and there are some used in company material service.

Q. If they are handling company material or work outfits, they are not strictly in revenue service, are they?

A. No, that is right.

The Court: Do you have any such wooden underframe cars in revenue service?

A. I don't recall any. We did have, but I don't think [fol. 2983] so, now.

Mr. Mason: Will you refer, please, to exhibit No. 4, and state whether or not the development of the passenger carrying cars of the Northern Pacific has proceeded along substantially the same lines as indicated by Exhibit No. 4?

A. It is up to the point of the articulated car, articulated unit, or the single unit of stainless steel, we have none of that class.

Q. Your standard passenger carrying car is now the steel car of more or less conventional type, is it?

A. Yes, sir.

Q. Do you still run in main line passenger service any cars not of steel construction?

A. Yes, sir.

Q. In main line passenger service?

A. Yes, sir, under certain conditions.

Q. Do those cars ever leave the lines of the Northern Pacific?

A. No, sir.

Q. Does the Northern Pacific operate Pullman cars in its passenger trains?

A. Yes, sir.

Q. Are those of the same general type that are in use on [fol. 2984] other railroads as you have observed them?

A. Yes, with the exception that we do not have the newer stainless steel cars used in streamlined trains, we don't have streamlined trains.

Q. Do you operate Pullmans in through service jointly with other railroads?

A. Yes, sir.

Q. Will you refer, please, to exhibit No. 5, which shows the development of freight locomotives for the Southern Pacific?

A. Yes, sir.

Q. Do you have, or have you previously had in service on the Northern Pacific freight locomotives corresponding generally to those shown on Exhibit No. 5?

A. Well, generally so, yes. There are some types here that we don't have.

Q. Have you had a Consolidation Type of Locomotive, or do you now have one?

A. Yes, sir.

Q. And with tractive effort substantially the same as indicated here, or something different?

A. A little bit heavier than the heaviest shown here.

Q. I was referring to the Consolidation type, the two at the top of the sheet.

[fol. 2985] A. Oh, the Consolidation type.

Q. Have you had those locomotives in service?

A. Yes, sir, about the same type, a little bit less tractive effort.

Q. Have you used the Mikado locomotive?

A. Yes, sir.

Q. Do you use the 2-10-2 type?

A. No, sir.

Q. Either large or small, shown here?

A. No, sir.

Q. What is your heaviest freight locomotive now in service?

A. It is an articulated simple Mallett 2-8-8-4 wheel arrangement.

Q. And what is the tractive effort?

A. 140,000 without the booster, and 153,000 with the booster.

Q. As a 2-8-8-4 it corresponds in wheel arrangement to the A. C. 9 shown on this exhibit then?

A. Yes, sir.

Q. Do your locomotives use coal for fuel or oil?

A. We have a few oil-burning locomotives on the west coast, otherwise they are all coal burning.

[fol. 2986] Q. Are your coal-burning locomotives in main line service equipped with automatic stokers?

A. Yes, sir.

Q. Are they equipped with power reverse gears?

A. Yes, sir, practically all of them; they are not all of them, all the larger ones in main line service are.

Q. With super heaters?

A. Yes, sir.

Q. Feed water heaters?

A. Yes, sir.

Q. What type of brake equipment is applied?

A. I couldn't tell you that.

Q. Other than your articulated type of locomotive, what type of freight locomotives do you use principally in freight service?

A. The Mikado, we have two of the articulated Malletts though, we have a 4-6-6-4.

Q. What is the tractive effort of the 4-6-6-4?

A. About 104,000.

Q. Then your Mikados, what is their size from the standpoint of tractive effort?

A. About sixty-three, between sixty-three and sixty four thousand.

Q. Now, looking at Exhibit No. 6, have you any locomotive types in passenger service now or have you had in the [fol. 2987] past, which correspond or resemble those shown on Exhibit No. 6?

A. Yes, we have the ten-wheeler 4-6-0, we have the Pacific type, and the Golden State type as shown on this exhibit.

Q. You call the Golden State type by some other name, don't you?

A. Yes, we call it the Northern.

Q. It has the same wheel arrangement as this?

A. 4-8-4, yes.

Q. How do your 4-8-4 locomotives compare in tractive effort?

A. About 5000 more. It is a 69,000 locomotive.

Q. Your Pacific type locomotives, are they larger or smaller than those shown?

A. Very similar, within a few thousand pounds of what is shown here, I believe.

Q. Do you run refrigerator cars in the freight trains, on your railroad?

A. I didn't hear the question.

Q. Do you have refrigerators in the freight trains on your railroad?

A. Yes, sir.

Q. What is the identification of the refrigerator cars principally in use?

A. N. R. C. cars, Northern Refrigerator cars.

[fol. 2988] The Court: Mr. Mason, I don't presume you will be able to finish the direct examination.

Mr. Mason: No.

The Court: The court will be at recess until two o'clock.

(Thereupon, the court stood at recess until two o'clock, P. M. this day.)

[fol. 2989] 2 P. M., January 24, 1941

All parties being present as heretofore noted, proceedings were resumed as follows:

W. W. Judson resumed the witness stand.

Mr. Mason:

Q. Mr. Judson, do you have Pacific Fruit Express Company cars on your railroad from time to time?

A. We have a few of them, yes, but we don't use them ourselves.

Q. Do your N. R. C. cars resemble the P. F. E. cars?

A. I think so, yes.

Q. You once in a while operate cars of Southern Pacific ownership?

A. Oh, yes.

Q. Your Northern Pacific cars from time to time move over Southern Pacific lines, do they?

A. Yes, sir.

Q. About what are the length of the runs of your freight locomotives in main line service?

A. Well, it varies from 100 miles to 300 miles.

Q. Where would the 300-mile run take place?

A. We have one from Northtown, that is the freight terminal at St. Paul, to Mandan.

[fol. 2990] Q. That is in the western part of North Dakota, is it not?

A. Yes, it is 106 miles east of Dickinson shown on the map. That is our longest freight engine run and that is being operated now as an experiment and that is about 600 miles. The 300 miles I mentioned before was our regular operation, but this particular one is 600 miles.

Q. In a general way, Mr. Judson, will you describe the nature of the traffic carried by the Northern Pacific, first, eastbound on its main lines.

A. For the most part eastbound, it is grain, fruit, live stock, lumber. I believe that covers the principal commodities.

Q. Is that generally a through main line movement from origin territories to eastern destinations or interchange points?

A. Yes, sir.

Q. What is the general character of the westbound movement?

A. General freight westbound and a large empty car movement westbound.

Q. Is the movement of loaded freight heavier eastbound than westbound, generally speaking?

A. Heavier eastbound.

[fol. 2991] Q. Do you have any substantial westbound movement of empty refrigerator cars?

A. Yes, sir.

Q. As well as empty boxes?

A. Yes, sir.

Q. Do you handle any substantial amount of mineral traffic, products of mines?

A. Yes, sir, but not in through movement over the entire line of the railroad.

Q. You serve a mineral-producing territory in Idaho and Montana, do you not?

A. Yes, sir, and also in Minnesota.

Q. Do you have some coal movement out of North Dakota?

A. Yes, sir, a large coal movement.

Q. Does the Northern Pacific maintain or participate in schedules for the handling of freight eastward and westward?

A. I don't know as I understand your question.

Q. Do you have published over-all time schedules for freight from your western terminals to your eastern interchange points?

A. Yes, sir.

Q. For example, do you have a schedule from a point such as Seattle and Tacoma to the Twin Cities?

[fol. 2992] A. Yes, sir.

Q. Will you state the over-all time that you observe for those schedules from the western terminals to eastern points?

A. I would have to check that up; over the entire railroad I can't say offhand. It is comparable, though, to the schedules of the other northern lines.

Q. You maintain substantially the same scheduled over-all time as the Great Northern, for example?

A. Yes, sir.

Q. Do you maintain westbound schedules of the same character?

A. Yes, sir.

Q. And on a competitive basis with the Great Northern?

A. And the Milwaukee and the Union Pacific.

Q. Have you before you, Mr. Judson, an exhibit in one sheet entitled, "Northern Pacific Railway Company, Typical Examples of Freight Trains Handled," and so forth?

A. Yes, sir.

Mr. Mason: Your Honor, may we have this exhibit marked with the next number in order?

The Court: It may be marked.

[fol. 2993] The Clerk: Defendant's exhibit No. 207 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 207 or cause it to be prepared?

A. Yes, sir.

Q. From what sources was it prepared?

A. From the train sheet record of the train movements.

Q. As to the ruling grades shown in column D, from what is that taken?

A. From our track profiles and from the time cards.

Q. Do you have with you in the courtroom the dispatchers' train sheets to which you have just referred?

A. I have.

Q. And track profiles as well?

A. I have.

Q. Do you also have the current operating timetables?

A. I have.

Q. Does exhibit No. 207 for identification show all trains operating between the points indicated in columns A and B during the period referred to?

A. Yes, sir.

[fol. 2994] Q. That would include local trains which operate less than the entire distance as well as those which operate between the termini?

A. That is correct.

Q. Has the exhibit been compared against the underlying sources to determine its correctness?

A. Yes, sir.

Q. Will you say whether or not it is true and correct?

A. It is correct.

Q. I notice that the period shown as October 1 to 10, inclusive, 1939. Did you select that period for the purposes of this study?

A. Yes, sir.

Q. Why did you select it?

A. It is a representative period and it has been used quite frequently on our road for similar studies.

Q. Does it represent a fair cross-section of the traffic handled during the month of October?

A. Yes, sir.

Q. Does the month of October represent a fair cross-section of the traffic for the year?

A. October is a little higher than the other months of the year, the fall months are the heavier months.

[fol. 2995] Q. This would be a period, then, of better than the annual average of traffic, would it?

A. That is correct.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: I have no questions.

Mr. Mason:

Q. Mr. Judson, are the underlying documents to which you refer available for the use of opposing counsel if they desire in examining the exhibit or for cross-examination?

A. Yes, sir, they are the original and only record.

Mr. Mason: Your Honor, we tender these records for the use of opposing counsel in connection with exhibit No. 207. We offer the exhibit in evidence with that number.

Mr. Strouss: The same objections as heretofore given to similar exhibits of foreign roads.

The Court: The objection is overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 207.")

[fol. 2996] Q. Referring to Exhibit 207, Mr. Judson, are any of the districts shown in the "From" and "To" columns on the exhibit, columns A and B, double track territory?

A. Yes, sir.

Q. Which one?

A. From Lixingston to Logan is partially double track. From Helena to Missoula is partially double track, Missoula to Garrison is double track.

Q. And from Dickinson to Glendive?

A. That is single track.

Q. That is single track. Now, I will ask you to refer, in connection with exhibit 207, to Defendant's Exhibit 50. Does the heavy line shown on Exhibit 50 indicate the districts which are refefred to on Exhibit 207?

A. They do.

Q. Are any of these districts shown on Exhibit 207 helper districts?

A. Yes, sir.

Q. Will you indicate which ones?

A. Between Livingston and Logan, partial helper district, between Logan and Livingston partial helper district in the other direction, betwen Helena and Logan is partially [fol. 2997] a helper district, and Helena to Missoula is partially a helper district. That is all.

The Court: I notice, Mr. Judson, that practically all of the operations shown on this exhibit No. 207, are covering operations in the state of Montana. In view of the fact that your lines cover quite a number of states, is there any particular reason for selecting the Montana area rather than the other districts of your road?

A. The districts selected have been used in many studies on the Northern Pacific. The one between Dickinson, North

Dakota, and Glendive, Montana, is the district used because it represents the districts where we use our heaviest Mallett types. The district between Livingston and Missoula is a mountain operation.

Mr. Strouss: When you were answering as to double track, I notice there were certain places like Bozeman, Montana, to Logan, that would be double track, or would it? I noticed you said Livingston to Logan was partially double track. Now, Bozeman is in between.

A. Well, between Livingston and Bozeman is double track. Between Bozeman and Logan it is single track, alternate line operation, there are two lines between Bozeman and
[fol. 2998] Logan, a freight line and passenger line, but it is not double track.

Mr. Mason: Mr. Judson, while this exhibit relates only to the districts shown in heavy line on Exhibit No. 50, I will ask you whether or not trains in excess of 70 cars are operated on other portions of the System as well?

A. Yes, and to a greater extent.

Mr. Strouss: It is understood my objection is going to the testimony without it being repeated.

The Court: Yes, that is understood.

Mr. Mason: I think, with reference to your testimony on locomotives, no discussion was had of the Northern type. You show a Northern type locomotive on exhibit 207 in column E. What is the Northern type?

A. The Northern type is the 4-8-4 passenger locomotive. At this time, in 1939, the Northern type were used entirely in passenger service. We have since that time put them into freight service, and this particular one shown on exhibit No. 207 was a locomotive out of the shop which was being broken in or it handled a small train that happened to be probably a stock train, something of that kind.

Q. Did you state the wheel arrangement of these Mallett locomotives?

[fol. 2999] A. One is between Glendive and Dickinson, which is the larger of the two, is a 2-8-8-4 wheel arrangement. The one between Livingston and Helena and between Helena and Missoula is a 2-6-6-4.

Q. What is the tractive effort of the 2-6-6-4?

A. About 104,000.

Q. And the other, I think you stated, is something in excess of 130,000?

A. 140,000 and 153,000 with the booster.

Q. These are an articulated type?

A. Yes, sir.

Q. Have you before you, Mr. Judson, a statement in one sheet entitled "Northern Pacific Railway Company, Maximum Number of Cars Handled in Various Main Line Passenger Trains, October 1st to 10th, 1939, Inclusive?"

A. I have.

Mr. Mason: May we have this exhibit marked as defendant's Exhibit No. 208 for identification?

The Court: It may be marked for identification.

The Clerk: Defendant's Exhibit No. 208 for identification.

Mr. Mason: Did you prepare this exhibit, Mr. Judson, or have it prepared?

A. I had it prepared and checked it.

[fol. 3000] Q. From what sources was it prepared?

A. From the train sheet record of the train movements, and also from the conductors' reports of cars sent out and picked up.

Q. Are those records likewise available in the court room?

A. The train sheet records are.

Q. And is all of the information shown on the exhibit likewise shown in detail on the train sheet records?

A. Yes, sir.

Q. Has the exhibit been compared with the original records to determine its correctness?

A. Yes, sir.

Q. Will you state whether it is true and correct?

A. It is.

Q. As to these mileages, are they likewise shown?

A. Yes, sir—on the train sheet?

Q. Yes.

A. No, they would have to be added up off the train sheet. They don't show any one mileage as shown on the statement.

Q. From Fargo to Billings, you would have to add up from three or four train sheets, for example?

[fol. 3001] A. Yes, sir.

Mr. Strouss: That is shown on your timetable, I take it.

A. Yes.

Mr. Mason: Why do you select these particular districts, as shown in column B?

A. May I correct one of my statements?

Q. Yes.

A. This exhibit is a System exhibit for the entire system. The train sheets are not here for the entire system. I will have to correct that, they are here for the freight exhibit and not for the passenger exhibit.

Q. Have you the passenger conductors' reports covering these trains?

A. No, sir, I haven't.

Mr. Strouss: I will say to you I will waive that objection to that.

Mr. Mason: Very well.

Q. Now, why did you select these particular points to show the study of the train; for example, you show one train, but show its consist from point to point over eight different districts?

A. These are the places at which the train was broken up and cars either taken from it or added to it.

[fol. 3002] Q. Are these the points at which the changes in consist are customarily and regularly made, if made at all?

A. Yes, sir.

Q. Did you likewise make the selection of the period stated on exhibit No. 208 for identification?

A. Yes, sir.

Q. Why did you select this particular period for study in connection with passenger trains?

A. Well, because we just took the same period that we took for the freight.

Q. Is the period October first to tenth heavier than average period, so far as concerns passenger traffic?

A. It is lighter than average.

Q. Is it fairly representative of the month of October?

A. It is.

Q. Now, are the trains shown as No. 1 and 2 companion trains, one eastward and one westward?

A. Yes, sir.

Q. What is the name of that train?

A. That is what we call the North Coast Limited.

Q. Are the trains No. 3 and 5 likewise companion trains?

[fol. 3003] A. They are.

Q. What is the name of those trains?

A. Formerly called the Alaskan, but we don't use that name any more, we don't have any name for it now.

Q. Are there any other through transcontinental trains from the Twin Cities to Seattle operated over the Northern Pacific?

A. No, sir.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: I want to say we appreciate the courtesy of opposing counsel in waiving the production of the underlying passenger train records for this exhibit. We offer the exhibit in evidence as Defendant's Exhibit No. 208.

Mr. Strouss: The same objection, except the objection as to the competency is waived.

The Court: Overrule the objection. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 208.")

Mr. Mason: Mr. Judson, do trains Nos. 1 and 2 carry head-end cars as well as passenger-carrying cars?

A. They do.

[fol. 3004] Q. Now, you show, for example, No. 2, Butte to Billings, with a consist varying from 15 to more than 17 cars in that train over that stretch. How many cars, generally speaking, would be other than passenger-carrying cars?

A. Oh, on the average of about four.

Q. Does that proportion generally obtain throughout the run of the train from Seattle to St. Paul?

A. No, I think the through run will probably average nearer three on the through run.

Q. Does the train also carry coaches?

A. Yes, sir.

Q. And a dining car?

A. Yes, sir.

Q. And standard or tourist Pullmans?

A. Both.

Q. Do trains Nos. 3 and 4 carry the same class of equipment?

A. No, sir, they don't carry any standard equipment on the through run, they don't carry a diner, they have a cafe

coach instead, and they do not have any observation car.

Q. Do Nos. 3 and 4 carry any greater number of head-on cars?

A. Yes, sir.

[fol. 3005] Q. What sort of weather do you get along your line across North Dakota, Montana, and Minnesota in the winter-months?

A. Well, it is very severe. I have railroaded in Montana at 56 below.

Q. Is that a regular experience every winter?

A. No, that is an exceptional case.

Q. Does the temperature descend below zero frequently during the winter?

A. Yes, I have seen it for more than a month at a time when it never got above zero.

The Court: You don't have Tucson weather in your territory?

A. No, not anywhere near approaching it.

Mr. Mason: I notice that you have at times here operated the North Coast Limited with more than 15 cars though not, according to this exhibit, 208, during the month of January or February. Do you operate in the winter months with consists similar to those shown on Exhibit 208?

A. We do.

Q. Do you make any limitation of the length of your passenger trains because of the cold weather?

A. Yes, to make our time we have limited it to twenty [fol. 3006] cars out of Twin Cities. We have that quite frequently, but that is to enable us to make the scheduled time.

Q. Is that for the purpose of reducing tonnage to conform to the rating of the locomotive?

A. Well, it is more to comply with the weather conditions. The locomotive will handle more, but when the wind is blowing, and snowing hard, we cut the tonnage down so as to enable us to make the time.

[fol. 3007] Q. Is that because of wind resistance?

A. Partly.

Q. Do you make any reduction of your passenger trains to any particular length because of the problem of heating the rear cars of the train?

A. No, because we in general hold them down to twenty cars and we have never had any trouble with that number.

Q. Mr. Judson, in general what considerations determine the lengths of the freight trains that you operate?

A. There are several factors, the physical characteristics of the districts over which they operate; the class of train, that is, whether it is an expedited freight train or otherwise; and the business offered for handling and the weather conditions.

Q. You speak of the character of the district over which it is operated. By that you mean the grades that you are to encounter?

A. Yes.

Q. Does that mean you adjust the tonnage of the train in accordance with the available power to handle it?

A. Yes, sir.

Q. And that, in turn, determines the length?

[fol. 3008] A. That is correct.

Q. Now as to the matter of expedition, do you again adjust the tonnage in accordance with the engine rating for faster or slower movement?

A. Well, on what we term our time freights we don't run as heavy a tonnage as we do on what we call the drags, coal drags, with the same power.

Q. Will you say whether or not the adjustment of the train is a matter of adjusting the tonnage rather than as to the number of cars?

A. It is entirely a tonnage proposition. Of course two trains of the same tonnage would make some difference but we adjust and operate on a tonnage basis.

Q. Not to the number of cars?

A. No, sir.

Q. You spoke of weather conditions, do you have in mind wind resistance as a factor in the operation?

A. Wind resistance, snow, slippery rail, sleet, all weather conditions that would tend to retard a train.

Q. Will extreme cold weather cause you to reduce tonnage?

A. Yes.

Mr. Mason: I think that is all, thank you, Mr. Judson. [fol. 3009] Do you wish to cross-examine now or would you rather have the train sheets first, Mr. Strouss?

Mr. Strouss: I prefer to see the train sheets first.

Mr. Mason: Your Honor, may the record show we have handed to opposing counsel the train sheets which form the basis for the information generally shown on exhibit No. 207 together with the operating timetables of the Northern Pacific.

The Court: The record may so show.

Mr. Mason: And that Mr. Judson is to be recalled for cross-examination after Mr. Strouss has had the opportunity to examine those documents.

(Witness excused.)

H. C. Garverick was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you state your name and residence to the reporter?

A. H. C. Garverick, San Francisco.

Q. Are you employed by the Southern Pacific Company? [fol. 3010] A. I am.

Q. In what capacity?

A. At the present time I am connected with the Bureau of Transportation Research.

Q. Have you been employed by the company as a timekeeper in the accounting department?

A. For the past thirty-one years.

Q. Were you ever timekeeper at the headquarters of the Tucson division?

A. I was.

Q. What years?

A. I entered the service in the year 1910 at Tucson as an accountant and remained in that position until some time in the year 1912. I was timekeeper from 1912 to 1915; 1915 to 1918 as head timekeeper; 1918 to 1922, back to San Francisco in the auditor of disbursements office as an accountant; from 1922 to 1927 I was timekeeper on the Sacramento division; from 1927 to 1932, assistant head timekeeper, Sacramento division. In the year 1932 they consolidated seven timekeeping divisions under the supervision of the auditor of disbursements at San Francisco,

and I was transferred to San Francisco and made head clerk in charge of one of the timekeeping subdivisions [fol. 3011] which was broken up into four or five divisions, one division being train and engine and yard; another division being broken up into maintenance of way; another division broken up into motive power and car department; and another division broken up into station force and telegraphers.

Q. Will you continue with your experience up to date?

A. That was in 1932. From 1932 to the present date I have been assigned various duties. I was disengaged temporarily from my duty as head clerk to that of clerk in charge in the preparation of statements for the Federal coordinator and in the preparation of back payrolls. Right at that time there were numerous decisions from labor tribunals which required the payment of back pay to both train, engine, and yard men for all divisions, I might say, with the exception of the Tucson and Rio Grande.

Q. That was computed at El Paso, I take it?

A. They were consolidated, Tucson and Rio Grande divisions were consolidated practically about the same time at El Paso. It was not in the jurisdiction of San Francisco, due to the long distance in preparing payrolls, and a short payroll period time in getting out pay checks, as [fol. 3012] the Arizona law was shorter than the California.

Q. Since 1932 and up to 1939 have you been engaged in a series of special duties in the office of the auditor of disbursements in connection with payrolls and payroll accounts?

A. Payrolls, payroll accounts, special statements, also the initial preparations for the government in the pension department and setting up their wheels of machinery for the railroad pension fund; also for the state of California for the California unemployment insurance.

Q. Have you in the course of your experience become familiar with the manner in which the rates of pay for trainmen and enginemen are arrived at and applied in computing their wages?

A. I have been in constant touch with the trainmen and enginemen and yardmen's agreement since I entered the service of the railroad.

Q. Have you used the provisions of those agreements for the purpose of setting up the wages of the individual trainmen and enginemen?

A. Yes, sir, I have.

Q. Are you familiar with the rates of pay heretofore and presently in effect in the various districts of the Tucson and Rio Grande divisions?

A. I am.

[fol. 3013] Q. Have you before you a statement in one sheet entitled, "Basic Rates of Pay for Standard Days and Certain Runs on the Tucson and Rio Grande Divisions"?

A. I have.

Mr. Mason: May we have this statement marked as "Defendant's Exhibit No. 209"?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 209 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 209 for identification, Mr. Garverick?

A. I did.

Q. From what sources?

A. This exhibit was prepared from the working agreements of both the train and enginemen, current train and enginemen's agreements in effect as of today.

Q. Does this undertake to show the rates of pay as in effect upon the various districts of the Tucson and Rio Grande divisions for the various services which are indicated here?

A. It does.

Q. Do you have the basic agreements from which this information is taken available in the courtroom?

[fol. 3014] A. Yes, sir, I have.

Q. Is the exhibit merely a summary of the provisions as they appear in those agreements?

A. Yes, sir, it is.

Mr. Mason: I take it that opposing counsel will not require the production of these basic agreements, they are matters of very wide circulation.

Mr. Strouss: No.

Mr. Mason: If you do not object, I will supply the witness's copy to the judge so he may follow the testimony.

Mr. Strouss: All right.

Mr. Mason: Your Honor, I am placing before you the agreements governing the conductors, trainmen, firemen, and engineers for the Southern Pacific Company which are currently in effect and I will ask the witness, are the agreements which you produced and which I have placed before the Court the agreements for the several crafts; those four crafts mentioned, which are now in effect?

A. The agreements are still in effect.

Q. Are the rates of pay which are in effect today and which were in effect in 1938 shown in the copies which have been placed before the judge?

A. I might state that the conductors, as shown on the [fol. 3015] face, will show that it was in effect somewhere in 1939. The trainmen are in 1939, the firemen are in 1939, and the engineers is in process of being printed today with the current rates. You will see that the rates shown in the engineers' agreement dated back to about 1928 and there have been several increases since then. However, there have been tabulations put out by the management to bring those rates up to date, and it has been made a part of that agreement until it is made in its entirety in book form.

Q. Does the copy which was handed to the Court contain the rates which were current in 1938?

A. With the exception of the engineers' agreements.

Q. Your copy of the engineers' agreement has not been revised?

A. No, sir.

Q. There is nevertheless a revision of the printed rates, as shown in the engineers' agreement, which is effective as of 1938 and to date?

A. Yes, sir, I have a mimeographed copy of the new rates.

Mr. Mason: Mr. Strouss, I think we both understand that the printed agreement has been revised to reflect certain in- [fol. 3016] creases which became effective in 1937 and such other intermediate increases as may have been made.

Mr. Strouss: Yes.

Mr. Mason: Mr. Garverick, there are on the face of exhibit No. 209 for identification certain calculations from the basic figures which appear in the agreement, are there not?

A. Yes, sir, there are.

Q. For example, take line 3, the first item of money in column A. What does the figure in line 3, column A indicate?

A. That will represent the compensation to an engineer and fireman on a consolidation engine who have traveled 123 miles in through freight service from Yuma to Gila.

Q. Is there any figure on the exhibit which you multiply in order to obtain that figure in line 3, column A?

A. Yes, sir.

Q. What is that figure?

A. Take line 1, the basic (through), $15.04 100 miles; 15.01 per mile and multiply it by 123 you will develop $18.46.

Q. Does the figure in line 1 represent the payment to the engineer and the fireman for the service in operating the engine 100 miles?

A. Yes, sir, it does;

[fol. 3017] Q. Is that the basic day?

A. That is the basic day, one hundred miles or eight hours.

Q. Suppose that the operation is in local service, do you take the figure in line 2?

A. Line 2, which is 15.93 or $15.93 per 100 miles and multiply it by 123, as shown in item 4 between Yuma and Gila, and you will develop $19.59 for the entire trip to an engineer and fireman.

Q. I notice that you show a variation in the figures of basic wages, taking line 1, basic (through), in the various columns A to I, inclusive. Why is there that variation or increase from one column to the next?

A. Engineers and firemen are paid the rates shown in their agreement in accordance with the weight on the drivers of the various classes of power that they are operating. For instance, in column A there is a Consolidation engine; column B is a Mikado; column C is an F-1 type; column D is a Mountain type; column E is an F-3 type; column F is an F-4 type; column G is an F-5 type; column H is an SP type; column I is an AC-8 type, and as they vary with the weight on the drivers the rates fluctuate.

[fol. 3018] Q. Does the rate increase as the weight on drivers increases?

A. It does.

Q. And is that according to blocks or brackets of weights?

A. Yes, it is.

Q. For instance, is there a block or bracket between 200 and 250 thousand pounds?

A. That is the way the agreement is worked around a fifty-thousand-pound differential.

Q. If the locomotive on which the engine crew is running weighs 240,000 pounds on the drivers, they will receive the 200 to 250 thousand pound bracket, will they?

A. That is correct.

Q. If the weight on drivers is 240,000, they will be in the same bracket?

A. They will be in the same bracket.

Q. You show also a basic wage for trainmen in column K. Is that calculated from the conductors' and trainmen's agreements?

A. Yes, sir, it is.

Q. Does this include the figures of the conductor as well as the brakeman?

A. Item 1 will include the conductor and three brakemen.

[fol. 3019] Q. Is there a variation between through and local rates in the basic?

A. That is correct.

Q. How do you obtain the figure, for example, in line 3, column K?

A. If you will refer to the bottom of the form under the caption "Conductors' and trainmen's rates of pay," it will be noted that the freight districts on the Tucson division vary in rate per 100 miles or rate per mile. The rate in item 4 will come under the district Yuma to Gila, Gila to Phoenix, Gila to Tucson, or Phoenix to Tucson.

Q. You group all of those in one group as west of Tucson?

A. West of Tucson.

[fol. 3020] Q. Then, in the lower bracket you show the rates for the conductor and the rates for each trainman, do you?

A. Yes, sir.

Q. And you group them in line 1 as one round sum for the four men?

A. Yes, for the miles travelled between those two freight termini.

Q. And the figures then in line 3 are simply a multiplication of 123 miles times the rate shown, taking 100 miles shown in line 1?

A. Yes, sir.

Q. And the same for the others down to and including line 10?

A. That is correct.

The Court: Did I understand you to say that the figure over in column K represented the combined pay of the conductor and two brakemen?

A. Line K calls for three brakemen. You will notice in column J, it covers two brakemen.

Q. In other words, in this particular territory west of Tucson, there are no runs that only employ two brakemen?

A. No, there are no runs that employ only two brakemen in that territory.

Mr. Strouss: That might or might not be true, might [fol. 3021] it not?

Mr. Mason: It would depend on the length of the train. It is not figured here, Mr. Garverick, as I understand.

A. It would be possible that they could use two, but they always assign three brakemen.

Mr. Strouss: If you had a train under 40 cars, you wouldn't assign three brakemen?

A. It would have to be what we term a made-up crew. All assigned crews are assigned with a conductor and three brakemen, if they only had the caboose.

Mr. Mason: Answering the Judge's question, the figures in column K are all for the four men comprising the train crew as distinct from the engine crew?

A. That is correct.

Q. Now, turning to the district, the district shown in lines 21 and below, did you make the computations in the same manner?

A. I did.

Q. And likewise for lines 26 and 27?

A. Yes, sir.

Q. And these figures for helper crews in lines 24 and 25, are they on the basis of actual miles?

[fol. 3022] A. That is on the basis of just actual miles.

Q. Then your notation indicates a certain minimum payment?

A. Yes, ones [illegible] would mean a day's pay.

The Court: Mr. Garverick, you testified that the rate of pay of the engine men, which, as I understand it, includes

the engineer and fireman, is predicated upon the weight of the locomotive, that is, the weight on the drivers. Does the weight of the locomotive have anything to do with the basic pay of the conductor?

A. No, it doesn't.

Q. Does the tonnage of the train have anything to do with it?

A. No, it doesn't.

Mr. Mason: As I understand it, Mr. Garverick, the exhibit is divided between lines I and J into two entirely separate blocks and all of the information to the left of line I, except, of course, the columns which indicate the districts, relates entirely to engineers and firemen?

A. Yes, sir.

Q. And all of the information in column J and K relates to trainmen?

A. Yes, sir.

Q. Do I understand, Mr. Garverick, that the agreement [fol. 3023] provides a different basic rate for 100 miles for conductors and brakemen in the territory east of Tucson than prevails in the territory west?

A. Yes, there is quite a differential in there as shown at the bottom of the exhibit.

Q. You show also the rates for deadheading where these employees are moved to points to commence work?

A. Yes, sir. I might call your attention, that a conductor working between Yuma and Tucson receives $7.14 a hundred miles. Now, if that train conductor would work east, Tucson to Lordsburg, he would receive $7.43 for one hundred miles.

Q. That is in through freight service?

A. Through freight service.

The Court: The only reason for that is, that that is the agreement between the brotherhoods and the railroads?

A. That is the agreement. It has been decreased and increased as increases have been paid through different wage controversies.

Mr. Mason: Has the exhibit been compared against the agreements to determine its correctness, Mr. Garverick?

A. It has.

[fol. 3024] Q. Will you say whether or not it truly and correctly reflects the rates of pay shown in the agreements

and, as to the particular districts to which reference is made, the rates payable for the services indicated according to the agreements?

A. I have checked it and it is absolutely correct.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit 209.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 209.")

The Court: Well, now, Mr. Garverick, I noticed east of Tucson, as shown by this exhibit, at least in two areas, the El Paso-Lordsburg and the El Paso-Strauss turnaround, that apparently trains are operated with conductor and two brakemen?

A. Yes, between El Paso and Strauss and between El Paso and Lordsburg.

Q. That again is a matter of agreement.

A. That is a matter of agreement and also state laws.

Mr. Strouss: Of course, we are getting into something [for 2025] now at this time—as a matter of fact, I think counsel will admit there is no full-crew law in New Mexico.

Mr. Mason: I understand there is no full-crew law in New Mexico, and trains may be operated in New Mexico with less than three brakemen, but the showing is merely of the amount which would be payable without undertaking to discuss what the requirements might be, the amounts payable for those particular services.

The Court: Then the answer to it, Mr. Strouss, is the difference in the laws of the two states?

Mr. Strouss: I assume it has some effect.

Mr. Mason: I didn't undertake to qualify the witness as to whether we do operate or do not operate. The figures are merely here to show that those payments would be made if the circumstances arose in that way.

Mr. Strouss: Yes, I understand.

Mr. Mason: Mr. Garverick, I ask you to refer to the exhibit heretofore marked as No. 198 for identification when Mr. Sines was on the stand. In the course of his testimony,

Mr. Sines stated that certain of the entries on this exhibit had been made by yourself. Now, will you point to the portions of that exhibit which represent entries made [fol. 3026] by you on the original white work sheet A, of which this is a reproduction?

A. All entries were made by me personally from columns 16 to 27 inclusive.

Q. Now, from what source did you take the information from which you made the entries in the actual half of the sheet, that is, the half above the line which crosses the sheet just above the word "redispatch" in columns 16 to 27?

A. From Form 2370, time returns and delay reports, originally rendered by either the conductor or the engineer who made the trip.

Q. Are those original time returns and delay reports covering the operation of these actual trains?

A. That is correct.

Q. You took simply the amounts shown on the face of those time returns and delay reports as claimed by the conductors and engineers as wages of themselves and crews?

A. That is correct.

The Court: Do I understand from that, Mr. Garverick, that each day as the trainmen complete their day's work, they turn in a slip with the number of hours that they have worked, and the amount of pay that they claim is due?

[fol. 3027] A. Yes, turn in what we term a Form 2370 Time Return and Delay Report.

Mr. Mason: I show you, in connection with the Court's question, sheet 5 of Exhibit No. 195. Will you advise the Court whether that is the form to which you have reference?

A. That is the form that I have reference to, an identical form for both engineer, trainman and yardmen.

Q. Is that sometimes known as the time slip?

A. Known as the time tag, as we call it, or time slip.

The Court: That answers the question.

Mr. Mason: Was the information shown in the columns to which you have referred in so far as exhibit 198 for identification is concerned checked against the original time cards and delay reports?

A. They were originally transcribed from the 2370 time return and delay report and checked against the current rates of pay.

Q. Did you perform the same character of work on each of the other white work sheets A, which were prepared as testified by Mr. Sines?

A. I did.

Q. Using in so far as the actual half of those sheets is [fol. 3028] concerned the original time returns and delay reports?

A. Yes, sir.

Q. Now, from what source and in what manner did you make the entries in the column 16? Taking column 16 as an example in the half of the exhibit below the line separating the actual from the redispatch.

A. Well, the first information which we must have at hand in making allowances for train engine is the class of power that they are operating with and the first item under the redispatch, this engineer and fireman used a 4100 class AC-8 engine. That engine weighing more than 550,000 pounds on the drivers calls for a rate that I have indicated on Exhibit 209 as $17.82 per 100 miles or 17.82 cents per mile for an engineer and a fireman. We multiply by the distance travelled, which was 164 miles from Tucson to Lordsburg, will develop $29.23.

Q. Is that the figure shown for the AC-8 Class locomotive in column 1, line 13 of exhibit 209?

A. That is correct.

Q. Does that same explanation apply to each of the other amounts shown in column 16 as the basic wages for the engine crew?

[fol. 3029] A. That is correct.

Q. You say "Train engine." What do you mean by "train engine?"

A. Well, the distance between Tucson and Lordsburg from station to station is 164 miles.

Q. And the train engine, I take it——

A. —is the main engine.

Q. Which handles the train?

A. Which handles the train.

Q. Over the entire district?

A. Or an engine which is double-heading the entire distance.

Q. Now, how do you arrive at the amount shown, the first amount, for example, shown in column 19 under the redispatch, the amount of $15.99?

A. That represents the amount of money for compensation allowed an engineer and a fireman.

Mr. Strouss: I want to make one little objection here. We are, of course, reading into the record now parts of this exhibit, which is only an exhibit for identification and not admitted in evidence.

The Court: Yes, the objection on that ground is perfectly good.

Mr. Mason: I simply used the figure "$15.99" without associating it with anything in particular.

[fol. 3030] Mr. Strouss: I have no objection to using it to identify it, but I don't want you to put it in to show what the exhibit shows.

The Court: I will sustain the objection on that ground as to any concrete figures that may be used.

Mr. Mason: We will go to another amount in the same column. I only want to make the explanation and not to establish these figures of record until the exhibit is offered.

Q. Take the second amount shown in column 19. How did you obtain that?

A. That is obtained by getting the rate applicable to a 5000-class engine in helper service.

Q. The rate for a 5000-class locomotive in service, as indicated by line 1, column H, of exhibit No. 209 is $15.99?

A. That will also apply to column H, did you say?

Q. Yes.

A. An SP-type engine $15.99.

Q. Now, do you use the same multiplier to obtain the figure which is indicated here, this second figure in column 19 in exhibit 198?

A. The same calculation I referred to in arriving at basic rates under column 16.

[fol. 3031] Q. You multiply the rate times miles traveled?

A. That is true.

Q. And if the figure happens to be less than $15.99, it means that the miles traveled were less than a hundred?

A. I will have to go into more detail to explain what those figures are. It is simply the amount of money allowed an engineer and fireman on the face of this sheet,

this exhibit, for the miles that are shown that he helped at the rate and the class of power used.

Q. Now, in obtaining the wages of trainmen, did you use the rate between Tucson and Lordsburg times the miles?

A. That is correct.

Q. For both the actual and the redispatched?

A. That is correct.

The Court: We will take our mid-afternoon recess at this time.

(Thereupon, a short recess was taken, after which, the witness was recalled to the stand, and proceedings were resumed as follows:)

The Court: You may proceed.

Mr. Mason: Mr. Garverick, in making the entries in the lower half of exhibit 198 for identification, did you follow [fol. 3032] the same process for each of the other entries that you have described for the particular entries you have already referred to?

A. Yes, I did.

Q. And referring to the other white work sheets A, it has been testified here that there were altogether 943; and somewhat less, or 848, that related entirely to freight train operation. Did you follow the same methods on each of the other white work sheets, using the same sources as you have described in connection with Exhibit 198 for identification?

A. I did.

Q. Did you check the computations in so far as they applied to the redispatch portion of the sheet?

A. Yes, I did.

Q. When you had finished your work on the white work sheets A, did you turn them over to Mr. Sines?

A. Yes, I did.

Q. Will you say whether or not the entries in so far as they were made by you on the white work sheets A, and particularly on Exhibit 198 for identification are true and correct?

A. To the best of my ability.

[fol. 3033] Q. In column 17 and again in column 24 on exhibit 198 for identification, under the actual, you show

certain amounts as variable amounts. Did you make those entries yourself?

A. I did.

Q. Now, what is represented by these variable amounts. By the way, are those also taken from the time returns and delay reports?

A. They were.

Q. What do they represent?

A. They represent initial or terminal delay, switching, overtime, roundhouse miles to and from the roundhouse, held-away-from-home terminal time.

Q. These are amounts not directly associated with the operation of the train from the starting point to the finishing point other than, of course, the overtime?

A. That is correct.

Q. Was it necessary to make any calculations or simply to copy from the time returns and delay reports?

A. Simply copy.

Mr. Mason: That is all. Thank you, Mr. Garverick. Do you wish to cross-examine him?

Mr. Strouss: No cross-examination.

The Court: Step aside. Call your next witness.

[fol. 3034] Mr. Mason: Your Honor, at this time, the foundation having now been laid, we offer defendant's Exhibit 198 in evidence as typical of the white work sheets A, which have already been tendered to and delivered to Mr. Strouss for his examination and use.

Mr. Strouss: We renew the objection heretofore made to this exhibit.

The Court: Do either of you care to be heard on it? I am not asking for any lengthy argument; I prefer to hear from Mr. Strouss. When the matter was originally presented here, of course, it wasn't actually tendered in evidence, it was marked for identification. We had some discussion about it. Now, after two days there has been considerable evidence introduced explaining and clarifying the exhibit. It seems to me we have come down now to the basic question as to whether a redispatching study and the result thereof is admissible. The upper portion of it, of course, is actual operations. I take it, you have no objection to that.

Mr. Strouss: No, except, of course, the upper part doesn't contain all of the information which we feel should be on there. I mean the matter stated there, we don't question [fol. 3035] that that is correct tabulation of those matters from the train sheet, but using that and I suppose putting on the same sheet for the purpose of comparison a redispatch, which, of course, must be the opinion of the persons who redispatched the trains as to what would have been done, and certain facts which, certainly from the evidence as we see it, would be necessary for the redispatching of that train are not in here. Part of the facts are stated, but not all of them, tonnage for one thing is not shown on here. It is a matter which, as the dispatchers have stated, is necessary to be considered in redispatching trains. Now, we are assuming that the tonnage in these redispatched trains are tonnages which those trains with the power here shown would carry over that territory. The facts are not in there to support that, it is assuming that there are facts without putting the evidence in there to show them. I don't think the foundation has yet been laid for the admissibility of the exhibit.

Mr. Mason: The objection now made appears to be a criticism of its value rather than as to its admissibility. First of all, as to the objection to the actual, of course, the underlying train sheets which are the original records— [fol. 3036] The Court: To save time on it, Mr. Mason, the Court's mind is pretty well made up. It seems to me now that the basic testimony from the dispatchers who participated, together with the evidence of the last witness, the items of pay, that the exhibit is now admissible in evidence. I think your statement is true that probably some of these objections go to the weight of it rather than to its admissibility. As to just how valuable a redispatching study will be to the Court, of course, that is difficult to say at this time. Evidently, a lot of time and effort have been put into it, and there have been brought to the Court the basic underlying sheets, the data which constituted this study, and for what it is worth, I am going to admit the exhibit. The objection is overruled.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 198.")

(Discussion between counsel off the record.)

Mr. Mason: The record may show that Mr. Herrell and Mr. Cassady are excused pending recall.

Mr. Strouss: Yes.

W. P. Herbert resumed the witness stand for

Cross-examination.

[fol. 3037] Mr. Strouss: Mr. Herbert, I think in your direct testimony you testified in preparing your exhibits 177, 178, 179, 180, and 181 you used the unit of cost per gross ton-mile rather than train-mile because a train-mile is an inconstant unit, is that correct?

A. Yes, a train-mile as a unit is variable.

Q. It has factors, in other words, such as the character of the mile, that is one of the reasons that it is variable?

A. No, it is more the fact that the train in one instance might have one car and the next instance have 160 cars and which thereby renders it unfit as a unit of measure.

Q. Of course the gross ton-mile does vary according to the difference in the character of the mile?

A. The gross-ton-mile will be a gross ton-mile regardless of what kind of a mile it might be operated over.

Q. But its cost will vary according to the difference in the character of the mile?

A. Yes, its cost is something else. As to the cost per gross ton-mile or per thousand gross ton-miles, as my exhibits show, the cost on a thousand gross ton-miles is flex-[fol. 3038] ible, whereas the cost per train-mile is not flexible.

Q. The cost would vary according to the character of the loads?

A. Yes, per gross ton-mile, yes.

Q. Whether your cars were loaded to capacity or not. I mean if you have a car loaded at full capacity and one at 50 per cent capacity that would affect the cost per gross ton-mile?

A. I don't see just how you mean it will affect the cost per gross ton-mile.

Q. I was asking whether it would or not.

A. Yes, I believe it will to some extent because the more load, the more trailing load as we sometimes call it, be-

hind the locomotive and tender the less cost per thousand gross ton-miles we will obtain.

Q. The factors which enter into the cost per gross ton-mile, I believe you testified, are fuel, enginemen's wages, trainmen's wages, engine house, and other locomotive supplies, train supplies and expenses?

A. Yes, sir.

Q. Those are the six items which are considered in that cost?

A. Yes, sir.

Q. You take the total of the six items for all freight [fol. 3039] operations and divide by the total gross ton-miles?

A. Yes, sir, the total gross ton-miles excluding the weight of the locomotive.

Q. Of course, fuel being an item of that cost it means fuel for all freight operations, doesn't it?

A. All freight train operations, yes.

Q. Loads and empties?

A. Yes.

Q. So that the number of empties would enter into that to some extent and affect the cost?

A. Yes, it would.

Q. The amount of locomotive-miles required and used in helper service, that would affect the cost?

A. In this exhibit it would have a little effect in the cost of fuel oil.

Q. What about enginemen's wages?

A. Yes, it would have an effect there, too.

Q. Whenever a locomotive is used in helper service, it is only considered a helper when it is cut into the train and helping, isn't that correct?

A. The cost of helper service is the entire cost.

Q. I mean so far as locomotive-miles are concerned, locomotive-miles in helper service are the miles when it is [fol. 3040] actually cut into the train helping and when it is cut out and returns to a station it is running light, those are locomotive-miles light, isn't that right?

A. Yes, they are light miles, but this exhibit deals with gross ton-miles and the freight train cost.

Q. I understood you to say on one exhibit you had added in the last four years the locomotive ligh' because they were included in previous years?

A. They were included on all the years but they had been excluded on the 521's in that computation showing gross tons per train-mile.

Q. That is what I meant; they were included in previous years on the 521's but for these four years had been excluded?

A. Yes, but I included them on my exhibit No. 179.

Q. Then wouldn't a helper engine returning to its station after it is cut out of a train, the locomotive-miles would be classed as light?

A. Yes.

Q. That cost would also be a cost that would enter into this?

A. Yes.

Q. Road switching costs. Road switching as distin- [fol. 3041] guished from yard switching is when the train crew itself does the switching, is that correct?

A. Yes, that is correct.

Q. Road switching would be an item that would enter into those costs?

A. Yes.

Q. And the crew and engine fuel, engine supplies, that might enter into it and would be included there?

A. Yes, they would.

Q. What about volume or density of traffic?

A. In what way?

Q. I mean if the traffic is not available so that your locomotive is not loaded to capacity, that would have some effect upon costs?

A. You mean in ordinary territories or territories restricted to 70 cars?

Q. In territory where the cause of your engine not being loaded to capacity is the lack of traffic?

A. Yes, if the cause is the lack of traffic then that lack of traffic would have some effect.

Q. And, of course, efficiency of the locomotive itself?

A. Yes.

Q. Some locomotives might be more efficient than others [fol. 3042] and use less fuel?

A. Yes, there are various things that affect costs such as that.

Q. And the ratio of branch line to main line?

A. Yes, branch line has its effect or a slight effect. In this particular exhibit it has a very slight effect.

Q. Do you have your 521's here?

A. In the courtroom?

Q. Yes.

A. No, I do not. I am sorry.

Mr. Strouss: I didn't think when I said I could cross-examine Mr. Herbert that I didn't need those.

Mr. Sines: Which ones do you want? I can get them in five minutes.

Mr. Strouss: I want them for the two divisions for the year 1937.

Q. With reference to this density of traffic, there are two main lines, one of which carries heavy traffic and the other light. Of course, the line that carries the light volume of traffic would affect the cost on the other main line where they are both considered together?

A. They were both considered together, on the Tucson division I suppose you are talking about.

[fol. 3043] Q. I am speaking about the Phoenix line and the Maricopa line. It is a fact that on the Phoenix line you don't operate your through freight trains on the Phoenix line, do you?

A. There are through freight trains operated through there, yes.

Q. I mean as a usual practice, the greater percentage of your through freight trains go through Maricopa?

A. That is right.

Q. And your freight trains which are operated on the Phoenix line are mostly what you might call "gathering trains"?

A. Yes, there is more gathering service on the Phoenix line than on the freight main.

Q. In a great many ways it is operated much like a branch line, I mean freight service not passenger service?

A. It has less traffic, I will say, than our freight main; but it is equipped for through freight service and there is through freight service operated on that line.

Q. But your trains which are operated there are lighter and shorter trains?

A. That is right.

Q. And that would have its effect upon the cost, upon [fol. 3044] the operation as a whole on the Tucson division?

A. Yes, it would.

Q. Mr. Herbert, referring to form 521 for the year 1937, the total helper service, main and branch, on the Salt Lake division, locomotive-miles, was 107,757 locomotive-miles, is that correct?

A. That is correct.

Q. On the Tucson division that item was 207,574 locomotive-miles, is that correct?

A. Yes, that is correct.

Q. The car-miles, main and branch loads, Salt Lake, 118,691,150?

A. That is correct.

Q. Empties, 67,847,451?

A. Yes, sir.

Q. That is car-miles, a total of 186,538,601?

A. Yes.

Q. And on the Tucson division, loads, 85,648,095?

A. Yes.

Q. Empties, 53,000,379?

A. Yes.

Q. Total loads and empties, 138,648,474?

A. That is right.

[fol. 3045] Q. Road switching, freight, total Salt Lake, main and branch, 102,648 locomotive-miles?

A. That is right.

Q. Tucson, 118,494?

A. That is right.

Q. Do you have the year 1938, Salt Lake helper locomotive-miles, 86,656?

A. 83,656.

Q. Tucson, 192,867?

A. No, that is for last year. 208,892.

Q. The car-miles, loads and empties, loads 101,080,199, Salt Lake?

A. That is right.

Q. Empties, 59,555,854?

A. That is right.

Q. Total, 160,636,053?

A. That is right.

Q. Tucson, 77,183,015?

A. That, again, is last year's, 83,598,395.

Q. What is the empties?

A. 55,914,520.

Q. And the total?

A. Loaded and empty, 139,569,915.

Q. Road switching?

A. I guess I am in error. I have the wrong year for [fol. 3046] Tucson. You gave the right figures for those.

Q. Will you call those again; Tucson division, loads?

A. 77,183,015.

Q. Empties, 50,201,472?

A. That is right.

Q. Total, 127,384,487?

A. That is right, and on the helper miles it would be 192,867.

Q. Road switching, Salt Lake division, for 1938, 69,288 locomotive-miles?

A. Yes, that is right.

Q. Tucson, 108,666?

A. That is right.

Q. 1939, helper, Salt Lake, 99,479 locomotive-miles?

A. That is right.

Q. Tucson, 208,892?

A. That is right.

Q. Car-miles, loads, Salt Lake, 115,547,105?

A. That is right.

Q. Empties, 67,087,547?

A. That is right.

Q. Total, 182,634,652?

A. That is right.

Q. Tucson, loads, 83,598,395?

[fol. 3047] A. That is right.

Q. Empties, 55,911,520?

A. That is right.

Q. Total, 139,509,915?

A. That is right.

Q. Road switching, Salt Lake, 65,298 locomotive-miles?

A. That is right.

Q. Tucson, 121,902 locomotive-miles?

A. That is right.

Q. Now availability of materials and supplies, of course that would affect costs to some extent?

A. Availability of supplies?

Q. For example, your water costs for locomotives differ on the two divisions?

A. Yes, they will differ slightly.

Q. That will affect your costs?

A. It does not affect this cost as shown on these exhibits however, as that particular account is not included in these direct costs as shown on the 521.

Q. It is not a locomotive supply?

A. It is, but it is not one of the selected costs as selected on this 521.

Q. It is not one of the costs selected as a train cost, is that what you mean, in the form 521?

[fol. 3048] A. No, sir.

Q. It is a train cost, however?

A. Yes, sir, it is.

Q. I notice on exhibit No. 177, taking the year 1937 for example, you have on the Tucson division cost, September and October, the cars per train as identical but your costs varied approximately three cents?

A. Yes, that is true.

Q. So that costs would vary even though your train lengths didn't vary?

A. There are, as I stated before, various factors that affect costs but here I was attempting and I believe I did show the trend lines of cost rather than trying to depict any particular variation from one month to another.

Q. On referring to these exhibits, 177, 178, and 179, you have stated car loadings would affect the cost?

A. Yes.

Q. And if my calculation is correct, Mr. Masson's exhibits 163 and 164, the tons per car on the Tucson division for the year 1939 was 12.4 tons, Salt Lake, 13.8 tons; 1938 on the Tucson division, 12.28, and on the Salt Lake, 13.48, which would show there was at least a ton more per car [fol. 3049] being loaded on the Salt Lake division than on the Tucson division, isn't that true?

A. If that calculation is correct, that would be true.

Q. I wouldn't guarantee my calculations but I am using to get that figure, line 3 of exhibit No. 163, which shows on the Tucson division, 1939, average freight cars per train, 56.7, and net tons per freight train, 702. If line 3 were divided into line 4, that would give the tons per car, wouldn't it?

The Court: Mr. Reporter, when the witness finds the exhibit, will you read back Mr. Strouss' question, please?

(The last question was read by the reporter.)

The Witness: What year, may I ask?

Mr. Strouss: I was using the year 1939.

The Court: The principle, of course, would be the same in every year.

Mr. Strouss: Yes.

The Witness: Yes.

Mr. Strouss:

Q. And the same would be true, dividing line 3 into line 4 on exhibit No. 164 would give you the net tons per car on the Salt Lake division in each of those years?

A. Yes, sir.

[fol. 3050] Mr. Mason: That is assuming that these are freight cars per freight train, exclusive of caboose here.

Mr. Strouss: It is your exhibit.

Mr. Mason: I know, and the record should show whether they are inclusive or exclusive of caboose. The record doesn't show.

The Court: Well, we won't quibble over the caboose at this hour.

Mr. Strouss: Now, exhibit No. 181 is main line only?

A. Yes.

Q. But main line on the Tucson division of course does include the Phoenix line?

A. Yes, it does.

Q. And would be affected by the lighter volume of traffic and shorter trains on that division or on that branch?

A. It would be influenced by the traffic on that line.

Q. Now, this exhibit No. 200, grade crossings in Arizona, and exhibit No. 201, grade crossings in Nevada, you don't have those in such form as to show the location of the crossings with relation to the line itself?

A. No, I do not.

[fol. 3051] Q. Were you a witness in the Nevada case?

A. No, I was not.

Mr. Strouss: It is my recollection that is was presented that way there. I think that is all.

The Court: Any further redirect?

Mr. Mason: Well, I am not certain. In view of the lateness of the hour, I would like to reserve the privilege of recalling the witness.

The Court: The court will stand at recess until January 28th at ten A.M.

(Thereupon the court stood at recess until January 28th, 1941, at ten o'clock A.M.)

[fol. 3052] January 28, 1941, ten o'clock A. M.

All parties being represented as heretofore noted, proceedings were resumed at this time as follows:

W. W. Judson was recalled to the stand, and testified further as follows:

Cross-examination.

By Mr. Strouss:

Q. Mr. Judson, on your Exhibit 207, I notice that there are points, Livingston to Logan, and then Livingston to Bozeman, Livingston to Bozeman is an intermediate point between Livingston and Logan?

A. Yes, sir.

Q. There has not been any duplication, that is, trains haven't been counted twice by reason of using intermediate terminals there?

A. Well, I don't see the Livingston to Bozeman one that you mention.

Q. Bozeman to Logan.

A. No, there is no duplication in there.

Q. Now, I notice in your average consist that your loads are mostly other than perishables. What commodities [fol. 3053] made up those loads mostly there, do you know?

A. You meant other than perishables?

Q. Other than perishables. It would be under column B of average consist.

A. Well, I wouldn't know what these particular loads were.

Q. At that time of the year, is there any particular commodity which you carry on your lines?

A. Well, there would be some wheat moving at that time of year, lumber.

Q. Coal?

A. Coal.

Q. Would you take coal over these two districts that you have used here?

A. Yes, sir, company coal, principally company coal.

Q. What about ore, would there be any ore moving at that time over those districts?

A. As far as Missoula to Helena, very little east of Helena and Butte because the ore out of the Wallace district moves into Helena and Butte, which would show on this exhibit as far as Helena.

Q. How many through trains do you have scheduled over this territory?

A. One in each direction. That is, scheduled.

Q. Yes. You refer in your testimony to alternate line [fol. 3054] operations, page 2997, what do you mean by that term, Mr. Judson?

A. I can explain that on the map, I believe. Between Bozeman and Logan there are two lines of railway. One is used as a passenger line and a westward freight line, and the other is used as an eastward freight line, Logan to Bozeman. They are separate lines of railway.

Q. And the term of "alternate line operations," just refers to that district?

A. Well, there are others. Between Logan and Garrison are alternate lines, one via Helena and one by Butte, but the Butte line doesn't enter into the exhibit, because it is not the through freight line. Through freight operates by way of Helena.

Q. Will you just refer to the exhibit and tell me which of the districts shown in columns A and B are double track. Dickinson to Glendive?

A. Single track.

Q. Livingston to Logan?

A. Double track from Livingston to Butte and alternate line from Butte to Logan, I mean Livingston to Bozeman double track, and alternate line Bozeman to Logan.

Q. Now, Logan to Helena?

[fol. 3055] A. Single track.

Q. Helena to Missoula?

A. It is double track out of Helena for about twelve miles, then single track to Garrison and double track Garrison to Missoula, which is about 68 miles.

Q. It is double track, Garrison to Missoula?

A. Yes.

Q. Now, in operating your trains, do you operate as much as you can so as to use your double track for passing?

A. Well, I don't know as I understand your question.

Q. Well, to try to get your trains so that when they pass, they are passing on double track, I mean meeting and passing on double track rather than on single track.

A. Well, it very often happens that they meet on double track and we do call trains at the terminals, so that that can be done if it is convenient, but it is not an iron-clad rule of any kind.

Q. Your double-tracking was not spaced with that idea in mind?

A. The double-tracking in this particular territory, you will notice, from Missoula to Garrison is double-tracked and Garrison is the junction of the two lines. That gives us. [fol. 3056] a double track up to the junction point and then on the other end of the alternate line at Logan it is double-tracked and has an alternate line into Livingston and that permits of a free flow of traffic via either line with double tracks on each end.

Mr. Strouss. That is all.

Mr. Mason: No further questions.

The Court: May this witness with his records be excused?

Mr. Strouss: Yes.

The Court: It is so ordered.

Mr. Mason: Do you have some further cross-examination of Mr. Herbert?

Mr. Strouss: Yes, I have some other questions.

[fol. 3057] W. P. Herbert was recalled as a witness for further

Cross-examination.

By Mr. Strouss:

Q. Mr. Herbert, on your exhibits Nos. 178 and 180 I notice that there appears to have been a dip downward in cars per train, gross ton-miles per train, and car-miles per mile of road in the years 1925, 1926, and 1927. That

was the period immediately following the acquisition of the Arizona Eastern, was it not?

A. Yes, it was.

Q. When the operation over the so-called "Phoenix line" began?

A. Yes, that is true.

Q. Wouldn't the amount of bridge traffic have some effect on costs?

A. What way do you mean bridge traffic?

Q. If the percentage of bridge traffic on one division were greater than as compared with another division, wouldn't that have some effect upon the costs? Can't bridge traffic be handled at a lesser cost than traffic which is picked up on the division so far as division costs are concerned?

A. Ordinarily I would say "Yes."

[fol. 3058] The Court: Mr. Strouss, what do you mean by "bridge traffic"?

The Witness: Bridge traffic is traffic that originates on another division and is bridged over, for instance, the Tucson or Salt Lake division, and then terminates on some other division.

The Court: Non-revenue company traffic?

Mr. Strouss: No, it is revenue traffic. Isn't that correct, revenue traffic which originates on another division and simply passes over that particular division as a bridge to carry through?

A. Yes, that would be more economically handled than traffic originating on the division.

Mr. Mason: I think we should understand the term, "bridge traffic," as having nothing to do with the revenue or non-revenue characteristics. The term, "bridge traffic," simply applies to traffic which originates outside the territory considered and is delivered outside the territory considered.

Mr. Strouss: That is true.

The Court: I wanted to be certain I got the meaning of your term.

Mr. Strouss:

Q. The Court asked you concerning double tracking in Arizona and Nevada. The only double tracking in Arizona

[fol. 3059] is a few miles between Yuma and Wellton and then some just out of Tucson?

A. Tucson to Mescal.

Q. Those two places are the only double tracking in Arizona?

A. The only two that are strictly termed double track. However, we have two lines in Arizona, as you can see by the map, exhibit No. 1.

Q. As I understood the testimony, however, your through freight, very little of it is carried over the Phoenix line?

A. That is right.

Q. In Nevada there is double tracking from the state line to Sparks?

A. Yes.

Q. And from Perth to Rose Creek?

A. Yes, I believe that is correct.

Q. Then you have the paired track operations from Weso to Alazon?

A. Yes.

Q. The operation there is similar to a double-track operation, isn't it?

A. Yes.

Q. Then you have what additional double tracking in Nevada?

A. We have double tracking from Cobre to Teconna and [fol. 3060] some across the Great Salt Lake, it doesn't show on this exhibit the exact stations.

Mr. Mason: I think the Great Salt Lake is all in Utah.

A. That is right. There is a small part east of Wells, possibly about ten miles.

Mr. Strouss:

Q. In your testimony you testified and in your charts you show the trend of costs on the two divisions, costs as shown including both main-line and branch-line operation?

A. Yes.

Q. From your form 522 which prior to 1931 showed or segregated both main-line and branch-line costs, I have taken the main-line costs, on the two divisions which I would like to read to you and ask you to check them to see if these are correct. I think you can check them afterwards, it may take a little time.

A. All right.

Q. Salt Lake, main line, .877.

Mr. Mason: What year is this?

Mr. Strouss: 1920.

Mr. Mason: What is the cost? Per what?

Mr. Strouss: It would be 8.77 for that year per hundred gross ton-miles; 1921, per thousand gross ton-miles, still [fol. 3061] Salt Lake, .814; 1922, .735; 1923, .606; 1924, .596; 1925, .48; 1926, .38; 1927, .37; 1928, .359; 1929, .384. Tucson division, 1920, per hundred gross ton-miles, 9.90; 1921, shown at per thousand gross ton-miles, .90; 1922, 746; 1923, .661; 1924, .676; 1925, .582; 1926, .50; 1927, .454; 1928, .468; 1929, .466. That is all the questions I have.

[fol. 3062] Redirect examination.

By Mr. Mason:

Q. Mr. Herbert, you were asked to confirm for the record certain statistics of helper locomotive miles for the Tucson and Salt Lake Divisions for the years 1937, 1938, and 1939. Now, I will ask you if by reference to the Forms 521 for the two divisions for the two years you have computed the percentage ratio of the helper-miles on each division to the total locomotive-miles on each division for each of those years?

A. Yes, I have.

Q. And will you state for 1937 the ratio of helper-miles to total locomotive-miles for the Tucson division?

A. For the Tucson division, 6.6 per cent.

Q. For 1938?

A. 7.1 per cent.

Q. For 1939?

A. 6.9 per cent.

Q. Now, for the Salt Lake Division for 1937, what is the ratio of helper-miles to total locomotive miles?

A. 3.6 per cent.

Q. For 1938?

A. 3.5 per cent.

[fol. 3063] Q. For 1939?

A. 3.7 per cent.

Q. You were also asked, in this connection, to verify the road-switching-miles of freight service performed on the two divisions. Have you computed the ratio of road-

switching-miles to total miles for locomotives for the two years?

A. Yes, sir.

Q. What is the figure for the Tucson division for 1937?

A. 3.6 per cent.

Q. For 1938?

A. 3.9 per cent.

Q. For 1939?

A. 3.9 per cent.

Q. What are the corresponding figures for the Salt Lake Division for those three years?

A. 1937, 3.3 per cent; 1938, 2.8 per cent; 1939, 2.4 per cent.

Q. Those represent the ratio of the road-switching-miles to the total of locomotive-miles reported on 521?

A. Yes, but, I might add, in order to get the total averages computation, I added the road-switching-locomotive-miles to the total.

Q. So that the total which you have used as a basis for [fol. 3064] the ratio represents the locomotive-miles in freight service plus the road-switching-miles.

A. Yes, sir.

Q. And the total locomotive-miles themselves are applied as the divisor in obtaining that ratio?

A. Yes, sir.

Q. Now, it was also suggested in your cross-examination that the availability of traffic or its non-availability, rather, and the presumed consequent effect upon locomotive loading would have some effect on cost. I will ask you if the total of the car-miles made on a division as reported after they are made on the Form 521 in any way indicates the amount of traffic on hand to be moved?

A. No, it doesn't.

Q. What does it indicate as to the amount of traffic?

A. It indicates in a general way the amount of business moved.

Q. Does it indicate the amount that was moved?

A. The amount of cars that were moved, it would indicate that in some way, but it doesn't indicate, for instance, the amount of cars that could be moved in any one train. [fol. 3065] Q. Does the total of car-miles, as shown on 521, in any way reflect the train lengths?

A. No, it doesn't.

Q. Now, again, it was suggested in your cross-examination,——

The Witness: (Interrupting) I might make something else clear there, that even though Arizona might have fewer car-miles than Nevada, it is the aggregate over a year, it doesn't necessarily show or say that we could not, if the law were unrestricted, handle the same number of cars per train as handled in Nevada.

Q. It doesn't indicate one way or the other as to that?

A. No, it doesn't.

Q. As a matter of fact, the showing of car-miles on 521 is a history of past performance and not a showing of prospects, is that right?

A. That is correct.

Q. It was suggested in your cross-examination that the loads per car as between loading to capacity and loading at half capacity might have some effect on the gross ton-mile cost. I will ask you if the car loadings can have any effect on the cost per gross ton-mile for moving the [fol. 3066] car, or whether that effect would be solely on the cost per net ton-mile?

A. It would be practically all on the net ton-mile costs, except to a slight extent in Arizona, because of the restriction in train lengths.

Q. You were asked to verify certain figures as to total car-miles and empty car-miles for each year on the two divisions. By each year, I mean each of the three years 1937, 1938, and 1939. I will ask you if you have computed for each division for each of those years the ratio of the empty car-miles to the total car-miles made?

A. Yes, sir, I have.

Q. What is the ratio of empty car-miles to total car-miles made on the Tucson division for 1937?

A. 38.2.

Q. In per cent?

A. Per cent.

Q. And for 1938?

A. 39.4 per cent.

Q. 1939?

A. 40.1 per cent.

Q. Now, for the Salt Lake Division for 1937, what was the ratio?

A. 36.4 per cent.

[fol. 3067] Q. For the year 1938?

A. 37.1 per cent.

Q. And for 1939?

A. 36.7 per cent.

Q. It was suggested during the course of your cross-examination, pages 3036 to 3050, that the lighter density of traffic on the Phoenix Main Line might have some influence upon the unit cost upon the Tucson Division. Now, I will ask you if there is on the Salt Lake Division, and as part of that Salt Lake Division, a line classed as main line which is likewise of lighter traffic density than the principal main line?

A. Yes, the line from Alturas to Fernley is a line of light density traffic.

Q. What is the length of the line from Alturas to Fernley?

A. Approximately 180 miles on the Salt Lake Division.

Q. That line is all a part of the Salt Lake Division from Alturas to Fernley?

A. Yes.

Q. And since 1929 has entered into the cost, main line costs, for the Salt Lake Division?

A. That is right.

Q. I think it was suggested in your testimony, though [fol. 3068] I haven't the precise transcript reference, that the cost of water for train locomotives was not included in the costs entering into the computations on your exhibit 177 and following. I recall some testimony on that point. Will you say whether the cost for water for train locomotives is or isn't included in the figures leading to the cost of per thousand gross-ton-miles as shown on your exhibit?

A. Yes, I made a check on that, and I find it is included in the 521.

Q. What general subdivision and in what particular accounts?

A. The accounting department has grouped three accounts there included in "Other Locomotive Supplies," 397, water for train locomotive, 398, lubricants for train locomtive, and 399, other supplies for train locomotives.

Q. They are called collectively what?

A. Other Locomotive supplies.

Q. This morning you were asked as to the extent of double track on the Tucson and Salt Lake divisions. Do you know, Mr. Herbert, and if so will you state whether the preponderance of passenger traffic on the Tucson division passes over the Phoenix line or Gila line?

[fol. 3069] A. Over the Phoenix line.

Q. Do you know what the daily separation is as to passenger traffic over the two lines?

A. I believe there is one train in each direction a day over the Gila line.

Q. What does that mean over the Phoenix line?

A. Three regular passenger trains a day on the Phoenix line in each direction.

Q. Or six altogether in both directions?

A. There are four altogether. When I said one in each direction, I meant one train. It might be one train of one number in one direction, and one train of another number in the other direction on the Gila line.

Q. In any event, of the four regularly scheduled passenger trains between Yuma and Tucson, in each direction, three are regularly scheduled over the Phoenix line and one only over the Gila line; is that correct?

A. Yes, except No. 30 and 29, which now operates on every odd day, I believe it is, which is the new Arizona Limited, operates between Tucson and Phoenix in addition to those other regularly scheduled passenger trains mentioned.

Q. That is half a train a day each way, from Tucson to Phoenix?

[fol. 3070] A. Yes, sir.

Q. Then there are each way three-and-a-half trains daily on the Phoenix line, and only one on the Gila line?

A. That is right.

Q. I will ask you whether this separation of the passenger traffic over the Phoenix line, and the freight traffic over the Gila line, except for the Phoenix service, is a help or a hindrance as to the matter of interference as to freight and passenger train operation?

A. It is a help to the main freight line to have the passenger trains out of the way, because there is less interference. Passenger trains having the right-of-way in most cases over freight trains, naturally causes the freight trains to be set aside for them at meets.

Mr. Mason: That is all. I expect to recall Mr. Herbert later for additional testimony that has not yet been developed.

Recross-examination.

By Mr. Strouss:

Q. You say that in calculating the percentage of road switching you added the road switching in each division [fol. 3071] to get the total. Did you do that also in determining the ratio of helper-miles?

A. Well, in helper-miles the total included the helper-miles on the 521, and I didn't have to do that.

Q. In the helper-miles, did you also consider the helper-locomotive, the miles light returning after it had been cut out of the train?

A. No, I just showed the helper-miles as shown on the form 521, and as picked out by you in my cross-examination.

Q. Now, you referred to the Alturas-Fernley main line. Of course, the effect of the main line having trains of lighter traffic would have upon the balance of the main line would vary according to the amount of traffic there might be on a particular light traffic section, wouldn't it?

A. Yes; it is merely pointed out here to show that Salt Lake division does have a main line with light traffic on it.

Q. It is true that the traffic on the Phoenix line is of considerably greater density than that on the Fernley-Alturas line?

A. I couldn't say as to that off-hand, whether it would be considerably or not.

Mr. Strouss: That is all.

(Witness excused.)

[fol. 3072] Walter Bohnstengel was called as a witness on behalf of the defendant and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Mason:

Q. State your name and residence.

A. Walter Bohnstengel, Topeka, Kansas.

Q. Are you employed by a railroad company?

A. I am.

Q. Which company?

A. The Atcheson, Topeka and Santa Fe Railway.

Q. In what capacity?

A. As engineer of tests.

Q. How long have you been employed by the Santa Fe?

A. The first in 1906-1907, at Dodge City, in the roundhouse, and since January 1, 1912, in the test department at Topeka, Kansas.

Q. Your experience, then, is 28 years continuous, plus some prior experience?

A. Isn't that 29 years?

Q. 29 years, that is correct. Is that right, 29 years continuous?

A. Yes, sir.

Q. Do you hold any engineering or scientific degrees, [fol. 3073] Mr. Bohnstengel?

A. I do.

Q. Will you state what they are?

A. Bachelor of science in mechanical engineering, University of Kansas, 1910, and mechanical engineer from the University of Kansas, 1920.

Q. You have been engineer of tests for how long?

A. Since July first, 1940.

Q. And prior to July 1, 1940, what was your position with the Santa Fe.

A. Beginning January, 1912, I was test department assistant, later laboratory foreman and assistant to engineer of tests, then assistant engineer of tests from about 1917 or 1918, and engineer of tests; on promotion of Mr. Chapman, the then engineer of tests, to Chicago, I was appointed engineer of tests at Topeka.

Q. Have you assisted or supervised tests of railroad equipment during your employment by the Santa Fe?

A. I have, sir.

Q. For how long?

A. Most of the time that I have been in the test department, I have done individual work to a good extent, but [fol. 3074] also supervised the work of others in that line.

Q. Do you belong to any technical associations or societies having to do with your work as engineer of tests?

A. I do.

Q. Will you name some of these societies to which you belong?

A. I belong to the American Society of Mechanical Engineers as a member, American Society for Testing Materials, the American Railway Engineering Association, and the Association of American Railroads.

Q. Any particular section of the latter?

A. The mechanical section of the latter.

Q. Will you list some of the types of railroad equipment or material which you have tested or assisted in testing?

A. It has to do with materials such as—my earliest work in the test department was in connection with steel, rails, ties, ballast, then car and locomotive equipment, operation and functioning of ventilators and ventilating cars, locomotive tests about 1914 between Chicago and Chillicothe, and later Chillicothe to Shopton, Iowa.

Q. Have you tested such parts of equipment as wheels?

[fol. 3075] A. I have, yes, sir.

Q. Tires?

A. Yes, sir.

Q. Axles?

A. Yes, sir.

Q. And fixed material such as bridge timbers?

A. Yes, sir.

Q. Track material?

A. Yes, sir.

Q. Ties?

A. Ties, joint bars or angle bars as they are called, track bolts, rails.

Q. Have you ever ridden on railroad trains or cars for the purposes of these tests?

A. Not particularly the material tests, but the check of riding and equipment such as locomotives, cars, and action of these in service.

[fol. 3076] Q. Have you ridden on locomotives for the purpose of testing equipment?

A. Yes, sir.

Q. Can you state the approximate number of miles that you have ridden for the purpose of tests or verification of tests?

A. For tests including going to and from work, checking riding equipment with and without instruments, say from 35 to 75 thousand miles a year. I think 75 is the high. Last year in line of duty it was a little under 50,000.

Q. Have you made any tests of locomotives in actual service in the handling of trains?

A. Yes, sir, particularly power performance and tonnage performance.

Q. Have you ever ridden on freight trains for the purpose of making tests of equipment other than locomotives?

A. Yes, sir, in connection with riding qualities of locomotives and cars, snubbers and spring action, and the longitudinal action, such as occurs in connections between equipment cars, as draft gears, etc.

Q. Have you ridden on freight trains of various lengths for this purpose?

A. Yes, sir.

[fol. 3077] Q. What lengths?

A. Possibly from fifty to one hundred cars or over.

Q. On what railroad lines were those trains being operated?

A. Mostly Santa Fe.

Q. Have you ridden on trains on other railroads as well?

A. For that purpose, no, but in connection with tonnage tests on the Frisco when I was accompanying our dynamometer car about 1917 or 1918, December of 1917 and January of 1918 as I recall.

Q. Have you ridden over the Santa Fe pretty generally in making your test observations?

A. Yes, particularly the main lines.

Q. What part of the freight trains have you ridden, that is, the head or rear of where?

A. The last freight train I was on was a 106-car train from Emporia to Argentine. That was on September 23rd, as I recall it, because I had a little difficulty getting on.

Q. 1940?

A. Yes.

Q. On what part of the train did you ride?

A. I rode in the business car just ahead of the way car which was on there on account of the 11-car fruit shipment [fol. 3078] from California to Chicago and I was checking the riding action.

Q. When you speak of the way car, do you mean the car usually called the caboose?

A. The way car or caboose as we term it.

Q. Have you ridden generally at the rear end or near the rear end of freight trains?

A. I have on occasions where I wished to observe the action.

Q. What is your purpose in riding at the rear end of these freight trains?

A. Just to observe the performance and action where train handling was involved.

Q. In the course of the testimony here, reference has been made from time to time to a particular appliance or device attached to freight cars known as the draft gear. Are you familiar with that portion of the freight car?

A. I am.

Q. Have you ever made studies or tests relating to draft gears?

A. Yes, sir, rather extensive tests.

Q. Will you please state in general what is the purpose and function of the draft gear?

A. The draft gear at the tender of a locomotive and at both ends of cars is placed there with the idea of providing [fol. 3079] a flexible cushioning connection between the various units of your train to protect against shocks and make a yielding energy-controlled unit between the cars of the train.

Q. Is the draft gear connected to the coupler?

A. Yes, sir.

Q. Does the draft gear serve any purpose in absorbing shocks?

A. It does.

Q. Does it serve any purpose in the starting of the trains?

A. It does, in that it provides a flexible means that you don't have to start your entire train at once, you start it in increments.

Q. You start it one car at a time, so to speak?

A. Essentially that, taking slack in your train to start a little at a time and get your whole train rolling, which runs easier after rolling than the initial start.

Q. Are you a member of any committee or committees of railroad employees or officers having to do with the determination or maintenance of standards for draft gears?

A. I am.

Q. Will you state the name of that committee?

A. I am a member of a coupler and draft gear committee [fol. 3080] of the Association of American Railways and also a member of the subcommittee on draft gears of that same association.

Q. What is the nature of your work in that particular connection?

A. The idea is to supervise tests of draft gears for certificates of approval and check draft gears from time to time as one of the functions of the American Railway Association to see that they are maintained according to specifications.

Q. Did you study merely the experimental types of draft gears as invented from time to time or those which are supplied for application to freight cars?

A. The Association through its committee members studies the perfected models of draft gears rather than the experimental.

Q. When you say the Association, you mean that you yourself do that?

A. As a member of the committee and sub-committee.

Q. Then your work is not so much the purpose of development as to test what someone else has developed?

A. To see that it is suitable for the purpose intended.

[fol. 3081] Q. Have you participated in any tests of draft gears?

A. I have, yes, sir.

Q. Do those include laboratory tests?

A. Laboratory and car impact which may be considered laboratory also.

Q. Do they include as well field tests or reviews of performance in actual service?

A. They do to a limited extent.

Q. Will you state just what is done in these laboratory tests, I mean very briefly, what sort of implement you use in testing a draft gear?

A. That is rather a large subject and is a little difficult.

Q. Do you have a method of testing a draft gear in the laboratory by means of a heavy hammer?

A. Two methods are used, one is termed "static loading" under a testing machine where you can apply 400, 600 thousand pounds to close the draft gear. The other is the dynamic test which is under the hammer. We have in the Association laboratory equipment really three hammers, one is a two thousand pound or 2,240 pound hammer which is used on axles and rail; then a 9,000 pound hammer, I am referring to the falling weight, a 9,000 pound hammer that was used up to about 1928 or 1929 for the test of [fol. 3082] draft gears and now the 27,000 pound ham-

mer that has become standard for that same purpose. The reason, I believe, may be evident, the 2,000 pound hammer would have to drop considerably further and strike at a much higher relative velocity than the 9,000, so years ago, before the war, before 1918 a 9,000 pound hammer was used which of course limited the drop to quite an extent and then in order to get down to the mass comparable with the weight of a car the still heavier hammer was decided upon, which was built for use at Purdue University, the American Railway Association laboratories, where it is now serving its purpose to test dynamically draft gears, spring nests, spring snubbers, and equipment that is subject to a shock or quick action. The slow testing machines like the Riehle or Olsen or Emery Tatnall are still used for slow loading to get your curve or performance under a slower load.

Q. When you speak of slow loading machines, is that a means of applying continuous pressure by hydraulic or other means?

A. Hydraulic or screw means.

Q. Rather than the sudden application of pressure such as developed by the drop of the hammer?

[fol. 3083] A. The hammer develops its force by gravity. The tests are started by raising the hammer just in contact with the draft gear and tripping it just letting the weight drop upon the draft gear. Then it is raised half an inch, then an inch, then an inch and a half, small increments to determine the behavior under successively increased dynamic load upon the draft gear.

Q. I take it that the dynamic load, as you speak of it, increases with the height of the drop?

A. It does.

Q. And you can obtain in the same way an increasing slow load by increasing the pressure with the slow loading machine?

A. You can; while they are comparable they are not always identical.

Q. You spoke also of car impact. Is that a particular method of test?

A. That is a method that was developed by the U. S. R. A., United States Railway Administration.

Q. You have participated in such car-impact tests, have you?

A. I have, yes sir.

Q. How is the car-impact test undertaken?

A. The ends of two cars are equipped, the buffing ends are equipped with a draft gear that is desired to be tested. [fol. 3084] One car is stationary, the other car is pulled up an incline of known percentage of grade and tripped at a certain point which will give it a certain impact speed of, say, one mile, one and a half miles, two miles per hour successively higher, the intent of it being to determine at what car impact a draft gear will go solid, close entirely.

Q. Is the car which is hauled up the incline allowed to roll down the incline and strike against the other car?

A. It is allowed to go down the incline to get its speed and then travels on level track so that it is supposed to be at a constant speed and impacts on level track, and a chronograph is used, if I recall my setup rightly, about a 30-inch movement that is rotated at a constant speed from which you can measure the fraction of a second or the number of seconds that it takes for one draft gear to close and for the mate to close and for the two to open. You can from that plot each car as it does its own drawing, it is not done manually, it has to be adjusted of course by operators but it gives you a diagram or picture or how one car slows down and the other car speeds up.

Q. And the reaction of the draft gear to the impact?

[fol. 3085] A. That is the intent of it.

Q. You spoke of the Association of American Railroads' laboratory. Is that at Purdue University?

A. That is at Purdue University.

Q. Have you participated in tests at other laboratories?

A. I have, yes, sir.

Q. Do the manufacturers of draft gears maintain laboratories for the testing of their products?

A. They do.

Q. Have you tested draft gears at the manufacturers' laboratories as well as at Purdue?

A. I have at several different ones.

The Court: We will take our morning recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows.)

The Court: You may proceed.

Mr. Mason:

Q. Mr. Bohnstengel, you spoke of this laboratory at Purdue as being the Association laboratory. Do I under-

stand that the Association of American Railroads built and equipped that laboratory?

A. They did, yes, sir.

[fol. 3086] Q. Is it open to the use of the university and the university students in the mechanical department there?

A. It is rather a commercial laboratory where manufacturers pay to get their various devices or equipment that needs such tests subjected to official tests. The students can visit there and examine it, but they do not use it for student work.

Q. They use it more for the purpose of observation I take it?

A. If they come at all yes, sir.

Q. I take it that you test other things than draft gears there?

A. It is built primarily as a draft-gear laboratory but they do test spring snubbers and car springs.

Q. What is the purpose of these various tests you have described as employed in connection with draft gears?

A. Should I elaborate a little on that? Go back into the development from 1918?

Q. I intend to ask you about that later. Do you use these tests to determine whether draft gears in commercial service or proposed for commercial service meet certain specifications?

[fol. 3087] A. That is the intent of the tests, to see that they meet the American Railway Association specifications.

Q. Those specifications have to do with the strength and resistance to shock or stress, do they, as well as the size and character of material?

A. Durability and so forth of the equipment.

Q. You spoke of the drop test or the hammer test. Is that comparable to the action of a pile driver hitting on top of a pile?

A. Very much. The pile driver, however, some of them add steam pressure to the gravity action of their hammer while this depends entirely on gravity and is a fixed quantity for any one location.

Q. You spoke of the 27,000-pound hammer as in use there. What drop with a 27,000-pound hammer is the maximum that you use in connection with the present standard types of draft gear?

A. A draft gear to meet specifications must at least withstand 18,000 foot-pounds of energy, which would be the weight, 27,000-pound weight, divided into that many foot-pounds or inch-pounds which, I believe, gives you a figure of approximately six inches.

Q. You spoke of the minimum being 18,000 foot-pounds [fol. 3088] of energy applied at the end of the draft gear?

A. At the end of the draft gear.

Q. What is 18,000 foot-pounds of energy equivalent to in pounds per square inch?

A. Not in pounds per square inch, it would be total load.

Q. Well, total load?

A. Total load on the draft gear would be equivalent from three to five hundred thousand pounds.

Q. You spoke of a car-impact test. Do you use a loaded car for that test?

A. Fully loaded car, 70-ton car as I recall was used in our work; that would be 210,000 pounds on rail.

Q. What type of car would that be?

A. They were gondola cars loaded with iron pigs or pig iron, whichever way you want to word it.

Q. Is the car impact test in any respect similar to the actual movement of cars against each other in switching operations or shunting?

A. It would be very similar to hump-yard switching and comparable to picking cars and letting them couple into each other.

Q. You speak of hump-yard switching. You mean where [fol. 3089] cars are moved to different tracks in the yard by means of gravity?

A. Yes, sir.

Q. We have been discussing the draft gear. I want to ask you if there is any distinction between the draft gear and the appliance sometimes called the "drawbar"?

A. Those two terms are used interchangeably to a certain extent.

Q. Are they properly interchangeable or are they really distinct?

A. That would be difficult to answer.

Q. Will you state what the drawbar is usually thought of as consisting?

A. The drawbar or the draft rigging usually consists of the items, coupler, follower plates, knuckle, yoke, and draft gear.

Q. Then the draft rigging is the proper term for the entire assembly of drawbar and draft gear, is it?

A. I think that is more inclusive than to say the coupler or one of the items.

Q. The coupler and the draft gear are two separate things, aren't they?

A. The coupler and drawbar are used more or less [fol. 3090] interchangeably but never include the draft gear.

Q. What is the draft gear itself as distinguished from the drawbar? Is that merely the mechanism to which the drawbar is attached?

A. It is the flexible mechanism in the draft gear proper.

Q. Have you an exhibit in the form of a series of three drawings which will show the draft gear, drawbar, coupler, and so forth?

A. Yes, sir.

Q. The exhibit is in one sheet with three different drawings on it entitled, "Comparative Position of Couplers under Maximum Draft Gear Travel, Normal Buff and Pull." Have you that drawing before you?

A. Yes, sir.

Q. Was this prepared at your direction?

A. Yes, sir.

Q. Have you reviewed the drawing?

A. I have, yes, sir.

Q. I understand that it represents a particular type of draft gear, according to its title, known as the "National M-17" and "M-17-A" draft gear?

A. It does, yes, sir.

Mr. Mason: May this be marked as defendant's exhibit [fol. 3091] next in order?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 210 for identification.

Mr. Mason:

Q. Are you familiar with National M-17-A and National M-17 draft gear?

A. I am, yes, sir.

Q. Have you seen that draft gear both in actual use as well as represented by model?

A. I have.

Q. Have you made studies of the drawings representing the draft gear?

A. Yes, sir.

Q. And of the draft gear itself?

A. I have.

Q. Have you compared the drawings before you with the draft gear or drawings of that draft gear to determine whether it is correct?

A. It is essentially correct.

Q. Do these drawings represent the National M-17-A draft gear with certain attachments in various positions as indicated?

A. It does.

Q. Are the dimensions and the names of the various parts correctly shown?

A. They are.

[fol. 3092] Q. Are you also familiar with the model which is on the table before you which bears at least in one place a statement that it is a model of the National M-17 draft gear?

A. It is, about a quarter-size.

Q. Does the model also represent in all essential features the National M-17-A draft gear?

A. It does.

Q. What is the approximate scale of the drawing as compared to the size of the National M-17-A draft gear?

A. It is just a little under one-sixth size. Four inches is equivalent here to twenty-four and five-eighths.

Q. This drawing illustrates only one particular type of draft gear, does it not?

A. It does, yes, sir.

Q. Do friction draft gears in general operate according to the same principles which are indicated by the drawings on exhibit No. 210 for identification?

A. The same basic principles, yes, sir.

Q. Is the National M-17 draft gear and the M-17-A draft gear now in use upon freight cars according to your own observation?

A. It is, yes, sir.

[fol. 3093] Q. How long has it been in use?

A. To my knowledge, since about 1925.

Q. Would this drawing illustrate the operation of other types of draft gears so far as essential dimensions and length of travel are concerned?

A. It would, yes, sir.

Q. Are the dimensions and lengths of travel as indicated by the exhibit in accordance with A. A. R. standards?

A. They are.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: I was wondering what you meant, Mr. Bohnsteagel, when you said the drawing here is essentially correct, using the term "essentially"?

Mr. Mason: I don't think that was his answer.

A. I did say "essentially" but what I had in mind was that it is not detailed as to dimensions. It is to scale and is entirely correct in that respect, but not dimensioned in detail. That is the thought I had in mind.

Mr. Strouss: That is all.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 210.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 210.")

[fol. 3094] Q. Now, will you refer to exhibit No. 210, and particularly to the top drawing entitled "Normal Position." What is the relationship of the couplers to each other in the normal position?

A. The pulling and buffing faces are entirely free.

Q. When you speak of "buffing," do you mean pushing, equivalent to or for the purpose of pushing?

A. Yes, sir.

Q. And pulling, of course, is the opposite of buffing, I take it.

A. Yes, sir.

Q. I take it that the representation at the extreme left of the drawing indicates the coupler of an adjoining car?

A. It does.

Q. And then you have, commencing at that point, which is marked "coupler," an arrow showing the coupler of the car to which the draft gear is attached?

A. Yes, sir.

Q. In the first position you have the couplers in a condition where they are free of either buffing or pulling contacts?

A. Yes, sir, they are running free.

Q. In that position could the pin be lifted in either [fol. 3095] coupler?

A. Yes, sir.

Q. Without any change in the relative position of the cars?

A. Yes, sir.

Q. In what position is the draft gear in the first drawing, "normal position."

A. It fills the draft-gear pocket and the yoke and is not compressed beyond its own initial compression.

Q. Is the front end of the draft gear in contact with any particular part of the mechanism, and, if so, in what way?

A. The front end is in contact with the follower and the follower is in contact with the front end of the yoke and the butt end of the coupler.

Q. Now, is the back of the draft gear in contact with any particular portion of the draft rigging?

A. I should have added on that first question, the follower is in contact with the front draft lugs of the car, the rear end of the draft gear is in contact with the rear draft lugs of the car and with the rear end of the coupler yoke.

Q. And what is the relative positions of the coupler horn and the striking casting?

[fol. 3096] A. There is a space of three inches or over three inches in this drawing between the horn and the striking casting.

Q. When you refer to the coupler horn, just what part of the coupler do you mean?

A. That is a raised portion on the coupler bar that was put there in early car construction to contact the striking casting and help take the buff load on the car.

Q. What is the striking casting; is that a part of the end of the car?

A. That is part of the end sill or frame construction of the freight car.

Q. What does the striking casting consist of, is it wood or metal?

A. It is a steel beam or steel channel, often with a special casting on it to give added strength in the newer constructions.

Q. In normal operation, does the coupler horn ever contact the striking casting?

A. It is not intended to.

Q. What prevents the coupler horn from striking or contacting the striking casting?

A. The draft gear going solid on its own housing.

Mr. Mason: I wonder if counsel would object if we place [fol. 3097] the model before the Judge. It might be easier to follow.

Mr. Strouss: No, not at all.

Mr. Mason: In this normal position, is there any compression of the springs of the draft gear?

A. Only the intial compression of possibly a half inch or more, three-quarters of an inch, that the manufacturer builds into these draft gears to give initial compression resistance. It amounts to possibly five, ten or fifteen thousand pounds on the draft gear.

Q. There are certain friction members indicated by the drawing. Are the friction members in contact in the normal position?

A. They are; yes, sir.

Q. Going to the second drawing, or the center drawing called "Buff Position," what is the relative position of the couplers there?

A. The buffing faces are in contact, with seven-eighths of an inch of opening between the pulling faces; the draft gear is compressed its full travel, two and three-quarter inches, and fully contacts the buffing lugs on the car frame.

Q. Are those buffing lugs at the rear of the draft pocket?

A. They are; yes, sir.

[fol. 3098] Q. And known and identified in the upper drawing as the rear draft lug?

A. Yes, sir.

Q. And has the front end of the draft gear moved from the position indicated in the normal position drawing?

A. It has.

Q. In what direction, and for what distance?

A. Backward two and three-quarters inches.

Q. Has the coupler horn moved?

A. It has.

Q. The coupler horn of the car on which the draft gear under study is attached?

A. It has.

Q. Moved in which direction?

A. Also backward.

Q. How far?

A. Two and three-quarters inches, or within one-fourth inch of the line indicating the striking casting.

Q. Now, what is this seven-eighths of an inch of separation between the knuckles of the couplers called; what is that seven-eighths of an inch?

A. That is free-slack.

Q. What is this two and three-quarter inches of travel [fol. 3099] of the draft gear called?

A. That is controlled slack or controlled resistance.

Q. Is this two and three-quarter inches the maximum travel of the draft gear which can be obtained by maximum shock?

A. Except by deforming members beyond the designed travel.

Q. Well, without any deformity of the draft gear, is the two and three-quarters inches the total travel?

A. It is; that is the nominal travel.

Q. How much compressing or buffing shock is required for the National M-17-A in order to produce that total travel?

A. It will require 18,000 foot-pounds, which would be equivalent to a couple of loaded cars striking at four to five miles per hour.

Q. You spoke previously of three to five hundred thousand pounds?

A. That would be the static load or slow load that would have to be put on to do that.

Q. In the buff position, are the springs compressed?

A. They are.

Q. To what extent?

[fol. 3100] A. To within, just within being solid upon each other. The design requires that they must not go solid on each other, but must go solid on the housing, or a solid member of the draft gear.

Q. Are the friction members of the draft gear in contact?

A. They are.

Q. To what extent?

A. To the extent of resisting the three to five hundred thousand pound push that is being put on that.

Q. Now, going to the lower drawing, the one entitled "Pull Position," in what position are the couplers shown there?

A. The pulling faces are in contact with a seven-eighths inch space between the buffing faces.

Q. Is that the same seven-eighths of an inch that you designated previously as the free slack at the coupler faces?

A. It is.

Q. What has happened to the coupler horn with relation to the striking casting?

A. That is pulled away from the striking casting two and three-quarter inches over the three inches of its normal position, or five and three-quarters inches out.

[fol. 3101] Q. And is this pull position representative of the position which would be found where a locomotive is coupled to, and exerts a pull on a car?

A. That is an extreme position. A locomotive couldn't ordinarily exert that much pull; three hundred to five hundred thousand pounds.

Q. If the car were anchored and the locomotive were pulling, you would get something approximating this pull position, would you?

A. You would get half or a third of that possibly.

Q. Now, in the drawings marked "Pull Position," what is the position of the front of the draft gear? Is it the same in the normal position at the top of the sheet?

A. The first, the wedge part and follower are the same, they are contacting the pulling lug of the underframe, but the yoke and coupler butt have pulled away from the follower, and your force is exerted on the tail end of the yoke against the bottom of the draft gear.

Q. Is the draft gear itself in compression in the same manner as in the center drawing?

A. Absolutely. The only difference is that in the center drawing you are pushing on the head against the rear draft lugs, on the bottom drawing you are pushing against [fol. 3102] the front draft lugs.

Q. Do I understand, then, that whether you have extreme buff or extreme pull position, the draft gear is compressed in either event?

A. It is.

Q. Is that the normal functioning of every type of draft gear?

A. Every type of draft gear. They are never in tension, they are always in compression, either from the head backward or from the tail forward.

Q. Are the friction members in the same position with respect to each other in the pull position as in the buff position?

A. They are.

Q. And does the two and three-quarters' inches shown here represent the maximum amount of travel according to the specification and standard?

A. It does.

Q. Now, are draft gears in actual practice, particularly of the type represented on this drawing, are they ever lubricated, that is, intentionally lubricated?

A. There is one type built with lubrication.

Q. I mean, the M-17?

A. In the M-17, they are always in dry friction?

Q. Is there any type other than the one you have men-
[fol. 3103] tioned which is subject to lubrication?

A. Not intentionally, that I recall.

Q. Suppose that oil were to be spilled on a friction draft gear such as the M-17-A, would that rob the gear of any of its essential qualities?

A. It would reduce its resistance from a combined friction and spring to merely the value that the springs have in resisting compression.

The Court: But they are not intended to be oiled in any way?

A. Not the friction draft gears, with that one exception that I mentioned, the Edgewater, which is a ring-spring gear, and to avoid wear they are lubricated. The earliest one wasn't oiled either, but they got better work out of it by putting in a lubricated friction and spring.

The Court: The witness has indicated a time or two that he wanted to illustrate all this, and I suggest that off the record, because it wouldn't make much sense, that he do that now. Will you explain the model to us?

(Thereupon the witness explained the workings of the model draft gear to Court and counsel off the record.)

The Court: I think that illustrates it.

Mr. Mason: Mr. Bohnstengel, have you seen the National
[fol. 3104] M-17 and National M-17-A in actual service?

A. I have, yes, sir.

Q. Have you seen it applied to Southern Pacific cars?

A. I have.

Q. To Pacific Fruit Express Company cars?

A. Yes, sir.

Q. Santa Fe cars?

A. Yes, sir.

Q. Have you seen the various other types of friction draft gears now in use?

A. I have, yes, sir.

Q. And seen them applied also?

A. To various cars.

Q. Including Southern Pacific and P. F. E. cars?

A. Yes, sir.

The Court: Is there any particular difference in the coupler on the froight car, for instance, and on your passenger cars?

A. From Type E and D, from here (indicating) ahead, no. But from here back it may have a longer shank, may have a 60 or 70-inch coupler shank and fastened with a tail-pin instead of a key to your car, the reason being that on a passenger car you have the vestibule, you see, to get out under to the head end of the car, you need more coupler [fol. 3105] length and still put your draft gear back in the solid underframe of your car.

[fol. 3106] Mr. Mason: The coupler from the coupler horn forward is the same or substantially so?

A. Excepting tight lock. Tight lock has some gathering features that are not present in freight-car arrangement.

Q. You spoke in your reference to exhibit No. 210 of two and three-quarter inches as the travel of the draft gear in either direction. Is the same specification followed on other standard friction draft gears?

A. It is, yes, sir.

Q. Do they observe actually any lesser measurement than two and three-quarter inches or is that the standard?

A. Not less than two and one-half nor more than two and three-quarters, two and five-eighths is a pretty good average.

Q. You have spoken so far in your testimony largely of the friction-type draft gear. I take it that the National M-17-A represents the friction type draft gear?

A. It does.

Q. And that appears from the exhibit to be a combination of friction and springs?

A. It is.

Q. Do the springs themselves come into the picture and [fol. 3107] play a part in the operation as well as the friction members?

A. They do.

Q. Is there another type of draft gear heretofore in use other than the friction and spring or the friction draft gear represented here?

A. There is.

Q. Will you describe it?

A. The tandem spring was extensively in use before friction draft gears were developed.

Q. What was the earliest type of draft gear used in freight-car operation? Have you made any study of the history of draft-gear evolution?

A. There was none in the earlier years. It was simply connected to the car body and pulled on the car body, the resiliency of the car body was used as a means of cushioning.

Q. You mean the coupler was attached directly to the car?

A. Yes, or to draft rods passing under the car.

Q. What was the next development after it became necessary to provide some means of fastening the coupler to the car? Was there a spring used?

A. A spring was used, either a single, twin, or tandem.

Q. Is the tandem draft gear a gear still in use at [fol. 3108] times??

A. Yes, sir.

Q. About how much travel is there in a tandem spring draft gear ear to your observation?

A. Two to two and one-quarter inches.

Q. Is the friction draft gear a development from the tandem spring draft gear?

A. It supersedes the simple spring arrangement to get greater capacity.

Q. In the tandem spring draft gear as compared to the [illegible] pounds, which you mentioned as the force required for complete closure of the friction gear, how much force is required to develop the two to two and one-quarter inches of travel?

A. From sixty to sixty-five thousand pounds, but may I add that in some types of gears which are used on pas-

senger cars and that we use on locomotive tenders we still maintain for inch and one-half and for inch and three-quarters that tandem spring characteristic and have a combination of spring and friction as differentiated from simple friction or tandem spring.

Q. That is only on passegner cars and locomotives, is it?

A. We also have some of those on way cars as an easier cushioning device.

[fol. 3109] Q. Why is it necessary to have a draft gear on a freight car instead of having the coupler bolted directly to the underbody of the car?

A. You need a yielding resistance to protect equipment and also to guard against shocks.

Q. Does the draft gear play any function in absorbing shocks?

A. It does.

Q. Does it play any function in permitting easier starting of the train?

A. It does.

Q. Will you describe just how it functions in that respect.

A. The draft gear will move or yield under a load that the locomotive can put on that draft column in the so-called "taking slack" operation, and then start with a lesser pull than it would if you had to start the dead body of the train itself.

Q. Is this seven-eighths of an inch of free slack a part of the construction for the necessary functioning of the train in starting?

A. It is.

Q. What does that serve?

A. It serves as a yielding play or movement in making turn-outs, negotiating curves, and over bumps and through [fol. 3110] dips to avoid knuckle and coupler strain.

Q. Is there any other motion in the draft rigging other than the two and three-quarter inches of draft gear travel, and the seventh-eighths of an inch at the coupler faces which is developed in actual operation?

A. There is.

Q. How is it developed?

A. Due to wear and upset parts.

Q. You mean actual distortion or breakage?

A. No, the continuous bumping of the end of your coupler would shorten it to a certain extent, a thirty-second or sixteenth of an inch or so, and your draft gear key illus-

trated in the drawing, the coupler yoke key will show a certain amount of wear where it is contacting and pulling the load, and gradually develop a little extra free slack.

Q. How much can be developed before the draft rigging has to be replaced?

A. The sum total, I believe, that the Association permits is one and one-half inches all told.

Q. Including the seven-eighths?

A. Exclusive of that seven-eighths per car end, but I don't recall ever seeing that much develop in any cars I have inspected.

The Court: We will take our noon recess at this time.

(Thereupon the court stood at recess until two o'clock this day.)

[fol. 3111] January 28, 1941, Two o'clock P.M.

The witness Walter Bohnstengel was recalled to the stand, and proceedings were resumed as follows:

The Court: You may proceed.

Mr. Mason: Mr. Bohnstengel, do all gears now in use; by that, I mean particularly friction draft gears of the type indicated by your exhibit 210 meet substantially the same standards as to capacity to absorb compression or shock?

A. They do.

Q. And what is the standard which they have to meet?

A. It is the specifications of the manual of Association of American Railways.

Q. Well, pounds of force applied to the gear to produce compression; what is the minimum amount of force?

A. Expressed in foot pounds, 18,000 foot pounds, or the equivalent of three to five hundred thousand pounds of push.

Q. You speak of three to five hundred thousand pounds of push. Is that the same character of pounds that are used in measuring the tractive effort of a locomotive?

[fol. 3112] A. The same designation, same values.

Q. Suppose we have a locomotive with tractive effort of 124,000 pounds coupled to a car equipped with a gear such as the M-17; does that mean that the locomotive can

pull only 124,000 pounds at the coupler to attempt to close the first draft gear?

A. That is all it can on slow steady load; that doesn't include impact.

Q. I am speaking of pull.

A. You are correct there.

Q. When pull is applied or impact is applied upon a draft gear, a certain amount of energy is required in order to apply that impact or pull, is it not?

A. Yes, sir.

Q. What becomes of that energy in so far as the draft gear is concerned?

A. The compression of the springs through distance against resistance and heat.

Q. You speak of heat. Is some of that energy passed off as heat by the draft gear?

A. A certain amount depending on how much is put in there.

Q. Where is the heat developed, and where is it dissipated?

A. Between the friction surfaces and radiated to the [fol. 3113] atmosphere.

Q. Then the function of the friction members is to transfer the energy of the striking or pulling, in so far as the draft gear is concerned, into heat which is dissipated into the air?

A. Yes, that would be the interpretation.

Q. Is it possible by the tests which you have mentioned, to develop the amount of compression for which a draft gear is built and the amount of its capacity?

A. That is one of the purposes of the test.

Q. Is it possible to measure the amount of compression as to capacity accurately or precisely?

A. Fairly so.

Q. Within what limits expressed in percentage?

A. It ought to be within ten per cent or less.

Q. Would it be as close as five per cent?

A. Probably as close as that, depending on how slowly you go to it, to repeat your operation.

Q. Have you, on the Santa Fe, made any tests of draft gears in actual operation upon particular cars?

A. We have, yes, sir.

Q. Will you describe the test that you have in mind?

A. In 1927, after some tests that we had made of draft [fol. 3114] gears, a joint test sponsored by the New York Central, the Santa Fe, the Milwaukee and the Nickle Plate Railroads, we built 150 70-ton gondola cars for sulphur service, hauling sulphur between Galveston and the mines, and as these cars operate in one particular service and in a restricted territory, it was decided to put six different kinds of draft gears, 25-car sets each, on these 150 cars. At that time we put in Cardwell Miner, National M-17, Edgewater, Waugh-Gould, and Westinghouse, and these cars were inspected to start with, at the end of three months, then six months, and then a year, two-year periods, with the idea of observing the action of the draft gear and the behavior, anything that could be seen from it, and measurements as to slack development, to get an idea of which would be the most desirable draft gear of the groups that were then available and considered satisfactory for freight service.

[fol. 3115] Q. Are some or all of these 150 gondola cars still in service?

A. They are, yes.

Q. Have you made further inspections of that equipment during the past two years?

A. The last inspection that I started on was early in December of last year. I didn't follow it through, I had an assistant follow it through and haven't had time to analyze the figures.

Q. Did you endeavor by that experiment or test to develop the capacities for wear and the endurance of the draft gears as well as their characteristics in service?

A. Observation to notice the performance as indicated by its action on the coupler.

Q. From your experience, Mr. Bohastengel, is it possible in actual operation to develop full compression or full extension of a draft gear?

A. Not simultaneously. You can develop one or the other with suitable conditions, but in actual service conditions you wouldn't have a condition that would develop from one extreme to the other.

Q. Would the maximum travel be developed from normal to, let's say, full buff position in an ordinary operation?

A. That would be possible, yes.

[fol. 3116] Q. Will you give us an example?

A. A train moving and setting the air on the locomotive, the train would push into a full buff of gears throughout part of the train at least.

Q. Suppose that you make a switching coupling between locomotive and car or between two cars, let's say, at a speed of four or five miles an hour, will that develop a full buff?

A. That will probably develop a full buff and also a reprimand for doing it.

Q. That would be rather a high-speed coupling, would it?

A. I would consider it so, yes, sir. There is no objection to moving four to five miles up to the place you are going to make the coupling, but to make it at four or five miles is rather severe.

Q. Will that severe coupling develop full travel from full extension to full compression?

A. It will develop it from normal to full compression.

Q. From normal to full buff, it is under compression at either of the extremes?

A. It might do this, when you make that kind of a coupling, it might kick the one or two cars ahead hard enough to jerk and break the knuckle. It might go in with a double [fol. 3117] action of compression and jerk, but they would be successive.

Q. You speak of breaking the knuckle. I take it that the various parts of the draft rigging are built to a certain standard of resistance to force, is that correct?

A. They are, yes, sir.

Q. What is the standard resistance to force of the coupler head apart from the knuckle, disregarding the knuckle for the moment, what is the breaking point there?

A. It is usually considered six hundred thousand or over.

Q. What is the breaking point of the coupler shank?

A. That would be as a unit from knuckle to shank because you would have to put a high elastic or especially strong knuckle in to develop the full strength of your coupler.

Q. Have the draft lugs in the gear pocket any standard of resistance to breakage or distortion?

A. They try to exceed the strength of the coupler or knuckle or yoke so that the removable member will fail before those elements will fail.

Q. As to the draft gear itself, as you said, it will go solid after a million pounds more or less?

A. Something of that nature.

[fol. 3148] Q. What is the breakage point?

A. The members being under compression at all times will begin to shorten at seven or eight hundred thousand or maybe a million pounds and your specifications allow only a certain amount of shortening, based on a certain number of over solid drops.

Q. The knuckle itself, is that built to a particular breaking point?

A. The older knuckles were in the neighborhood of 350,000 to 400,000 pounds. Newer type D, which has been in service for many years are usually thought of as about 500,000 pounds and the type E possibly around 525,000 pounds.

Q. Matching all these together, the knuckle appears to be the weakest member of the entire chain of connections collectively known as the draft rigging?

A. That is the intention, that is the easiest member to replace.

Q. Is it, so to speak, the fuse?

A. Just exactly, that would be the electrical designation of it; the part that would yield with the least amount of injury to equipment.

Q. When a train is made up and is traveling on the line, how much of the movement of the draft gear will be de-

[fol. 3149] veloped in ordinary operations?

A. That depends on your grade and the speed at which you are going. If you are starting and developing full locomotive tractive effort, 75,000 or 100,000 pounds, you will probably develop one-third or half travel of the draft gear from neutral to the full position. If you get a jerk in there, you may get a little more.

Q. Would that occur throughout a train of one hundred or one hundred twenty-five cars?

A. That would occur at the head end; the tail end would follow with less effort.

Q. Would this travel that you speak of in the draft gear be in addition to the seven-eighths of an inch of what you call "free slack" at the coupler facing?

A. It would; yes. By way of explanation there, I might point out one thing, that seven-eighths of an inch of so-called "free slack" in your knuckle, when you round

a curve or turn-out you have nothing. It is utilized to permit an angling of your coupler and it would disappear. If you didn't have it there, your train would naturally put it there and strain your equipment, so design has put it there to start with.

Q. Would it be possible by the application of a steady [fol. 3120] pull of a locomotive of a train which was being started and moved to develop the entire two and three-quarter inches of travel from normal to pull position, which is indicated by the lowest of the three drawings on exhibit No. 210?

A. It would be in the head end of the train on a number of cars but not on the rear of the train.

Q. You say it would be possible to develop the full travel by applying 124,000 pounds of tractive effort to the front car?

A. Not by 124,000, it would take more than that either in pull or in impact.

Q. I spoke of a steady pull.

A. I didn't understand it. I missed the "steady"; I understood "pull."

Q. In your experience, taking into consideration both the free slack at the coupler faces and the controlled resistance in the draft gears, what is the approximate amount of the movement per car of the train which would be developed in service conditions in the ordinary freight train expressed in inches?

A. A little over six inches.

Q. Will that be the average amount of motion including both free slack and controlled resistance?

A. That has been my experience.

[fol. 3121] Q. Have you conducted tests or measurements for the purpose of arriving at that figure?

A. We have.

Q. How do you get at that figure of six inches plus apart from any experiments or any trains that you have seen operating? Can you point out the factors on the drawing, exhibit No. 210?

A. If you are operating your train on some pull, you will extend part of that two and three-quarters inches at the head end of the train and very little of it past the middle or rear end of the train because your draft gears normally have five, ten, to fifteen thousand pounds initial compres-

sion, or it would take a pull of that much to even start them moving. If you were to set the brakes suddenly and could realize a complete compression from them throughout the train, you could only realize the two and three-quarters inches maximum plus your seven-eighths, or just a little over three inches per car end or a little over six inches per car throughout the train. You couldn't be fully extended throughout the train and then get full compression throughout the entire train. That is not a physical possibility in train operation.

[fol. 3122] The Court: Are you making any allowance in that computation for the play that you testified to this morning that would occur after the parts had been in use for some time of one-and-a-half inches?

A. That one and one-half inches, your Honor, part of it, assume that a half inch of it would develop in the gear pocket where you normally have two and three-quarters inches of engagement, and you develop one-half inch of free play in that gear pocket, that would restrict your controlled movement to two and one-quarter inches, it would take care of most of it, but not quite all of it. My figure, to answer your question without the illustration, it would take care of most of that inch-and-a-half allowable free slack.

Mr. Mason: And another portion of that inch-and-a-half is simply additional wear at the coupler faces over and above the seven-eighths' inches, isn't it?

A. No, that inch-and-a-half is from the coupler horn back.

Q. Now, do draft gears operate in one manner to absorb or reduce shocks which may arise in the movement of the train?

A. That is one of their functions.

[fol. 3123] Q. In what way do they operate to that end?

A. They cushion and gradually hold back as far as they can an impact that is coming toward closing them, instead of having a buff with a high shock, they cushion it the same as you would with your hand.

Q. Do the draft gears in actual operation tend to increase or reduce shocks at the rear end of freight trains?

A. They tend to reduce them.

Q. Suppose that because of features of operation, such as the movement of a train over a slight hogback or hump

or slight sag in the lines, there is a difference in speed as between adjacent cars or cars in different parts of the train, do the draft gears tend to absorb those differences in speed?

A. Yes, sir, they do, they iron it out and even it up.

Q. Does the draft gear function generally in any respect like the net of a trapeze performer?

A. That would be one way of thinking of it, it yields and then comes back to be in position to yield again.

Q. We have before us on the table here and in the drawing the reduced size of draft gears you testified pre- [fol. 3124] viously. What does the National M-17-A Draft gear actually weigh?

A. About 400 pounds. I would have to check my figure on that. I don't recall. I made tabulations some time ago, but I didn't try to commit them to memory.

Q. I show you a tabulation which appears to be in your handwriting and ask you if you will show that to Mr. Strouss, although it is your handwriting.

A. The weight in pounds of the National M-17, the second one with one follower, 441 pounds. The follower weighs 71 pounds, so it would be 370 pounds for this much of the draft gear, and the follower 71 pounds, 441 pounds.

Q. Now, what are the foot-pounds of capacity that that draft gear has?

A. On the official test, the average is 20,700 foot-pounds.

Q. What is that equivalent to in pounds of the same character as are used in measuring tractive effort?

A. That would be about 495,000 pounds.

Q. Is that draft gear generally typical as to weight and capacity in foot-pounds or any other measurement that you have recited?

[fol. 3125] A. The lowest weight that I have recorded is 333 pounds, and the highest weight 520 pounds for a draft gear for one car end, not both draft gears.

Q. There is a draft gear, of course, at each end of every freight car?

A. Yes, sir.

Q. Are there draft gears of higher capacity than the National M-17-A?

A. There are draft gears of higher capacities, and there are individual draft gears of the M-17 type that will, as they get a truer friction surface, develop higher capacity.

Q. But the capacity you spoke of, 495,000 pounds, is representative of the class?

A. It is representative; it may be a little more or less; it must be at least 18,000 or 440,000 pounds, something of that magnitude.

Q. You say 18,000?

A. 18,000 foot pounds.

Q. Just for the sake of the record, Mr. Bohnstengel, will you describe what you mean by a foot-pound? Do I understand that that is the force developed by the movement of a pound one foot vertically?

A. The way foot-pounds are figured in draft gear tests is to raise a hammer, let us say, the old 9000 pounds one [fol. 3126] foot, and that would be 9000-foot pounds, or if it drops two feet it develops 18,000 foot-pounds potentially at the instant that it strikes.

Q. I understand that that is complicated by the fact that where gravity is the impelling force the force increases with the square of the distance, doesn't it? Isn't there some such formula as that?

A. Yes, energy varies as the square of the impact speed, doesn't it; isn't that the relation?

Q. I remember some formula which would indicate that the energy of dropping 9000 pounds two feet would be greater at the point of impact than the energy of dropping 18,000 pounds one foot, because of the difference in the length of travel. 18,000 pounds dropped one foot would be 18,000 foot-pounds, but that doesn't work indefinitely; if you were to stretch it out to 300 pounds dropped thirty feet, you would get more than 9000 pounds dropped one foot?

A. By way of explanation there, a car coupling at two miles per hour has an impact force of four, the square of two; or four; at three miles per hour, the impact value, or the destruction value is nine. It varies as the square [fol. 3127] of your impact speed.

Q. Now, getting to the dropping of a weight, the law of gravity leads to the conclusion that the greater the distance of drop, the greater the speed at the point of impact; isn't that right?

A. I think that is right.

Q. And by that same formula, the force is equal the mass times the square of velocity?

A. Mass times velocity squared.

Q. A lesser weight from a greater height would lead to more force at the point of impact than to drop a greater weight a less height, even though the product of height times weight would be the same in both cases?

A. You are quizzing me on mathematics that I haven't thought of for some time, your Honor.

Q. I will abandon the question. Why did you go from a 9000-pound hammer to the 27000-pound hammer?

A. Because of the great surface disturbance and heat created by impact, which would not be as representative as a lower drop which just had the foot-pounds available.

Q. Which, in other words, represented merely the application of the weight without the force of the drop, is that correct?

[fol. 3128] A. Yes; in other words, if you take a small hand hammer and hit a heavy object at a high speed all you do is to disturb the surface. If you take a massive weight and just drop it at a small height but enough to be greater than that would resist, it would put an actual bend in it. You could hit all day with a small hammer and, surface-peck the thing. By the way, that 9000, I understand, was an accident too. They had a ten thousand weight on their first hammer, where I can't tell you, but they were going to use the 10,000 pound weight to do their dropping and they didn't have enough motive power to lift it; so they took off a thousand pounds to fit the job to the conditions that existed.

Mr. Mason: I think that is all. Thank you, Mr. Bolinstengel.

Cross-examination.

By Mr. Strouss:

Q. I had intended to ask you the question Mr. Mason asked you about the effect of speed, what effect it would have as to increasing the force of the impact. That law of physics was mentioned, mass times velocity squared is the force that applies not only in the case of gravity but any [fol. 3129] time where there is speed applied, Mr. Bolinstengel, mass applied to force, isn't that true?

A. I believe it does. Now, you see, with the 9000-pound hammer, we went up in one-inch increments, with the

27000-pound hammer they go up in half-inch increments, or quarter-inch increments.

Q. But, using an illustration other than the application of the force by gravity, using the locomotive that Mr. Mason referred to.

A. Yes.

Q. Having a tractive effort of 124,000 pounds, of course, the force with which the pull or impact the force pulled at the time of pull or impact would depend upon the speed as well as the tractive effort of the locomotive, isn't that true?

A. You could run into it, you could take slack and then run and you have your equation of tractive effort, it wouldn't hold at all.

Q. Well, your mass by velocity squared——

A. Well, you are developing kinetic energy.

Q. Would the formula of mass times velocity squared apply?

A. It would apply in that case.

Q. The same way with a car, the mass of a car, the pull or impact would depend upon the speed with which it is moving?

[fol. 3130] A. Yes, it is proportional to the mass and the velocity squared, if I remember, the impact.

Q. I just wonder if you would agree with this statement, Mr. Bohnstengel: "Draft gears in fair to good condition are not pushed in for pulled out, they are either driven in or jerked out, both implying a severe shock." Do you agree with that statement?

Mr. Mason: May I ask what document you are reading from, Mr. Strouss?

Mr. Strouss: I am reading from the air-brake rules and regulations of the Southern Pacific Company.

A. As a regular operating condition?

Q. Yes.

A. You don't get that at a truly slow speed, you have to have something more than a run-in or a push; there has to be some kinetic energy there, rather than just slow moving.

Mr. Strouss: Or, as used here, driven in or jerked out.

A. Driven in or jerked out.

Mr. Strouss: That is all.

Redirect examination.

By Mr. Booth:

Q. Take an automobile weighing a thousand pounds and [fol. 3131] running into a stone wall at the rate of five miles an hour, a speed of five miles an hour, does it make any difference whether that automobile travels twenty feet or twenty miles at five miles an hour as to the impact?

A. If, at the instant of impact, it is going five miles an hour, that is the thing that counts. How long it was in getting that speed wouldn't be a factor, it is just what it is doing at the instant of the impact.

Q. If one car runs into a stationary car at the rate of five miles an hour, it doesn't make any difference how far that car has run?

A. No, it is the rate at which it strikes.

Mr. Booth: That is all.

Mr. Strouss: That is again the application of that formula?

A. Yes, MV Square.

Mr. Strouss: That is all.

The Court: There is one question the Court would like to ask. This exhibit 210, of course, I take it, purports to show a single draft rigging complete with the coupler on the left here, which, I take it, is attached to the other car?

A. Yes, sir.

Q. Now, in making your computation as to the slack or [fol. 3132] play, if I may use those terms, I have forgotten what you used, between the two cars, are you taking into consideration the play in the draft-gearing at the end of the car where the coupling is made?

A. There shouldn't be much play in the draft gearing itself in the pocket.

Mr. Mason: I think what his Honor meant was, did you take into account your six plus inches per car in the train, the play in the draft gear at the end of each car, plus whatever play there may be in the couplers, is that what you had in mind?

A. That is what I tried to do when I was adding two and three-quarters for the one and two and three-quarters for the other, that is five and a-half, plus your seven-eighths,

is six and three-eighths, plus some free slack between six and seven inches, that is what I had in mind from a neutral to a fully compressed condition.

The Court: Then, in any given train length if you would multiply the number of cars by six inches plus, you would arrive at the total possible slack in that train?

A. The slack that you would ordinarily be able to develop by tying down an end and pushing in and pulling out. Now, you could run in real hard, tie down with a couple [fol. 3133] of locomotives at the end and get a lot of impact; you could increase that, but what you could develop ordinarily under normal operating or handling conditions, that is what I tried to show. You see, potentially you have four times this two and three-quarters plus the seven-eighths before you would start breaking anything, but you can realize of that only a little over six inches per pair of cars or per car. Do I make myself clear there?

The Court: Yes.

[fol. 3134] Mr. Mason: You spoke of slack in answer to the Court's question. Do you have in mind the two components of that slack that you described before, controlled resistance in the draft gear and the free motion of the couplers?

A. I was using the Judge's broader term as it is occasionally used in operating, slack, whether it is controlled or free.

The Court: Do I understand you in normal operations the weak point in this connection is the knuckle?

A. That is the intention of car construction because all you need to do is to pull the pin and put in a new one, while if you break a coupler your car is disabled and has to go to the repair track, or if you break a yoke your car is disabled.

The Court: In normal operations, would it ever occur that this draft gear would be pulled out? By that I mean that your break would occur there?

A. The possibility would be that these lugs designated as front draft lugs, that that bunch of rivets could be sheared. If they had less than the 500,000 pounds strength, you might pull coupler, yoke, draft gear, and all out. In other words, you would get the whole insides out of the [fol. 3135] car.

The Court: Does that occur in normal operation?

A. The cars are at present built or riveted strongly enough so that there is a good safety factor for the yoke or the knuckle. It is rather expensive to get that part when a lesser thing would be better to come out.

Mr. Mason:

Q. Mr. Strouss asked you in referring to page 12 of the Southern Pacific's air brake rules and regulations whether you agreed with that statement as to draft gears, that they are either driven in or jerked out. Do you necessarily mean in your agreeing with that statement that they will be either driven in or jerked out to the full extent of the two and three-quarters inches of travel indicated by exhibit No. 210?

A. The answer that I had in mind, Mr. Mason, was that we seldom slowly push in or slowly pull out a draft gear. In other words, you may get the first one but by the time you reach the second or third one you are moving to a certain extent and you get that much of an impact drive or impact jerk. It doesn't necessarily mean that it will come all the way. It may come halfway or two-thirds of the way [fol. 3136] or get the next car started without coming at all.

The Court: What happens to your draft gear, if anything, we will say with a head-on collision? Does it have any injurious effect to your draft gear rigging?

A. With a head-on collision?

Q. Or rear-end either; I take it the effect would be the same?

A. I would look for coupler shank shortening, your coupler shank should begin to shorten at about 600,000 to 650,000 pounds. You would absorb a little of your work and energy in shortening that. You would compress your car underframe; you might shear off some of the lugs, depending on how heavy the shock or uncushioned the shock would be. You might shorten a draft gear housing one-eighth or one-sixteenth or three-sixteenths of an inch. You could stretch the yoke to a certain extent or bend the key in a little bit where it pushes on the key or if it reaches that far. There would be several places of give and then it would tend to spring back again. Your car frame I think is built for about 800,000 pounds push before it starts to

yield and that would mean you would have some elastic compression of that which would spring back when your force was taken off.

[fol. 3137] Q. I believe you testified that so far as draft springs themselves were concerned that they were so cushioned and protected that they couldn't be broken?

A. The specifications require that they be so designed in length and spacing that the gear should go solid on its housing rather than solid on the springs with just the thought that you expressed that they should stay operative. If you would put the springs solid first, as some defective draft gear might in older times, you would tend to break the coil springs and would have an inoperative draft gear as the result.

Q. I notice that this exhibit refers to M-17, M-17-A and M-17-A (Certified). Do those cover essentially the same type of draft gear rigging but the later numbers having some slight improvement, or what does that indicate?

A. The M-17 draft gear was the designation under which the National Malleable and Steel Castings Company marketed a gear of essentially these dimensions, sizes, and parts. Then after a few years' service they found that these brass pads in the wedge were battering down or beating out, due to lack of lubrication, so they put in graphite plugs in there and changed the angle of the wedge [fol. 3138] two degrees from thirty to thirty-two, as I recall, and improved the wear by case hardening the stem from 400 Brinell to 700 Brinell hardness and left the wedges at 400 and gave that gear a new designation, M-17-A, under which designation it was tested and approved according to the specifications of the Association of American Railways. Then a few years later they obtained permission from the American Railway Association to take some of the older gears that had been sold or had been manufactured and might not have been sold but were on hand, several thousands of gears, and replaced parts in those gears to make them the equivalent of the M-17-A as far as their tests show, which they designated as the M-17-A (Certified) gear. Your M-17-A (Certified) would have a date prior to the time that they got their certificate of approval, it would have a casting date.

Q. But the basic principles in all three are the same?

A. If they would set the three out here, unless you knew the details of difference, you probably wouldn't be able to

recognize or distinguish one from the other, they would look essentially the same. They may have had several thousand draft gears on hand which couldn't be marketed [fol. 3139] as a certified or approved gear.

Mr. Mason:

Q. They couldn't be marketed as M-17-A unless they were fixed up?

A. Unless they were conditioned to be the equivalent of them.

Q. Did you make an inspection of the P.F.E. yard here in Tucson to see whether the National M-17 or M-17-A gear was applied?

A. I did, yes, sir.

Q. Do you remember how many cars you examined?

A. I think I examined about 244 car ends.

Q. How many National M-17-A's did you find in percentage?

A. Approximately 20 per cent, a little over 20 per cent were M-17-A's, without knowing whether it was M-17 or M-17-A, but the M-17 National gear.

The Court: You stated that these gears known as M-17 have been in use since the year 1925?

A. That is when the earliest service applications were made as far as I can find out. I rode back of some of them around 1925, as I recall, or late in 1925, in locomotive tenders.

Q. Do I understand that this particular type of draft gear designated on this exhibit No. 210 is considered the latest word in draft gears in railroading?

[fol. 3140] A. One of a group, not picked out as an individual but picked out as one of a group of a dozen draft gears.

Q. Do these other draft gears have the same basic principles or in what respects do they differ from the one shown here?

A. The Miner draft gear instead of using a stem with your friction segments around it, uses a barrel with friction shoes in it and a wedge and drives out; it uses a spring. I made some sketches just for my own information on that. Waugh Gould of which there are a good many in service use a pair of half-wedges and flat curved springs in between them to give the friction action. The Edgewater, which is

an approved gear, uses rings about one and one-half inches thick and nine inches in diameter, an inside ring and outside ring of corresponding taper and they force probably a pile twenty inches high, which would be in the neighborhood of twelve or fourteen rings, and they push them together, which when they go solid they go solid on each other. The Waugh-Gould 410 has put the springs on the outside and put the wedges in between. The Peerless, the Westinghouse, they use a barrel with a wedge to drive shoes out into the barrel and keep from pushing it in and a spring, [fol. 3141] of course, inside the barrel to keep the whole system tight, and the Cardwell, which if you have ever looked under a freight car is the one that has two broad springs on each side of the draft gear. They keep tension on some wedging elements which straddle some triangular shoes but it is all a principle of either barrel or stem and wedge and shoe, spring controlled, so that you get a component of your spring action translated into friction to give you the desired capacity which in the old A.R.A. tandem spring would be from sixty to sixty-five thousand pounds, as I stated this morning, and in this will be from three hundred to five hundred thousand pounds with less tendency to recoil.

Q. Then do I understand that the mechanical division of the A.A.R. of which you are a member approves of all the different types you have been describing here just now?

A. As shown in the Code of Rules, yes, sir.

Mr. Mason: One other question; you spoke of observing on the P.F.E.'s that you inspected some 20 per cent of National M-17's or M-17-A's. Were the other 80 per cent all friction and spring draft gears?

A. On the P.F.E.'s I saw no spring draft gears. I saw [fol. 3142] one Bradford rocker type, which is a spring and lever combination. I saw some Edgewater ring springs, some Waugh-Gould's as I just described, some Miner.

Q. Were they all friction draft gears?

A. They were all friction draft gears, yes, sir.

Mr. Mason: That is all.

The Court: We will take our afternoon recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows.)

Mr. Mason: I take it that Mr. Bohnstengel is excused.
Mr. Strouss: Yes.
(Witness excused.)

B. S. Sines was recalled for further

Direct examination (continued).

By Mr. Mason:

Q. Mr. Sines, have you a statement before you in one sheet entitled, "Number of Passenger Trains of Different Lengths between El Paso, Texas, and Tucumcari, New Mexico, Year 1939"?
[fol. 3143] A. I have.

Mr. Mason: May we have this statement marked "Defendant's Exhibit No. 211"?
The Court: It may be marked for identification.
The Clerk: Defendant's exhibit No. 211 for identification.

Mr. Mason:

Q. From what sources was this exhibit prepared?
A. These were made from the passenger conductors' wheel reports for the territory El Paso-Tucumcari.
Q. Was it prepared under your direction?
A. It was.
Q. Has it been compared against the original sources?
A. Yes.
Q. Will you refer to the previous exhibits and state whether or not this exhibit is in any sense a companion?
A. It is companion to exhibit No. 188 previously introduced and completes the showing for the entire passenger operations from Los Angeles to Tucumcari, New Mexico. Exhibit No. 188 covers the territory Los Angeles-El Paso and this one goes on from El Paso to Tucumcari.
[fol. 3144] Q. This is really then a supplement to exhibit No. 188?
A. That is right.
Q. And for the same purpose?
A. Yes.

Mr. Mason: Have you any questions, Mr. Strouss?
Mr. Strouss: No; I have no questions.

Mr. Mason:

Q. Did you state whether the exhibit is true and correct?

A. It is.

Mr. Mason: We offer exhibit No. 211 in evidence.

Mr. Strouss: I object to it as irrelevant and immaterial.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 211.")

Mr. Mason:

Q. Is there any figure on this exhibit, Mr. Sines, that you wish to call particularly to the Court's attention?

A. Yes, the figures in the last line showing that during the year 1939 we had occasion to run between El Paso and Tucumcari 52 trains with a consist of over 14 cars.

[fol. 3145] Q. Will you take up now a statement in one sheet entitled, "Tucson and Salt Lake Divisions, Locomotive Assignment as of November 30, 1940"?

A. Yes.

Mr. Mason: May we have this exhibit marked No. 212 for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 212 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 212?

A. It was prepared under my direction and checked by me.

Q. From what sources?

A. From report furnished each month by the motive power department showing what the assignment of locomotives has been for the previous month, or, rather, for the month ending with the day the report was issued. You will notice the title says, "Locomotive Assignment as of November 30, 1940." The assignment for that month is for the month of November.

Q. Have you the report for November 30th, 1940, available here?

A. I have.

The Court: This exhibit includes both freight and passenger locomotives, Mr. Sines?

[fol. 3146] A. That is right.

Mr. Mason:

Q. Have you shown the segregation of freight and passenger locomotives for each division as to types?

A. I have.

Q. Is the exhibit true and correct according to the underlying documents?

A. Yes.

Q. Will you furnish that to Mr. Strauss if he wishes it?

A. All right.

Q. When you speak of the Numbers (Not Continuous), does that mean the numbers of the locomotives assigned that fall within the range of numbers as shown?

A. That is right.

Q. Those are simply the locomotive numbers stenciled on the sides of the individual engines, are they?

A. That is all.

Q. They don't have anything to do with the engines other than as a means of identification?

A. That is right.

Q. Has the exhibit been compared?

A. Yes.

Q. Will you say whether it is true and correct?

[fol. 3147] A. It is.

The Court: Isn't it true in numbering those engines, for instance, you wouldn't put a four thousand number on a Mogul, would you?

A. No, those numbers are assigned at the time the locomotive was originally put into service or manufactured and that series of numbers stays with that locomotive until the end of the locomotive's life or until the end of the life of that particular type of locomotive.

The Court: That was my understanding.

A. Yes, sir.

Mr. Mason:

Q. For example, you can always tell that a 3600-class locomotive is in the F type?

A. Yes.

Q. And a 3700 class likewise is a particular series of the F type?

A. That is right.

Q. You can always tell that a 4300-class locomotive is a Mountain type?

A. That is right.

Q. Is that indicated to some extent by this exhibit?

A. Yes; in speaking of engines, railroad employees use all three methods shown in columns B, C, and D to identify [fol. 3148] locomotives or types. They will speak of them as "F's," as "2-10-2's," or as "3700's" and they all mean the same thing.

Q. Even sometimes they personalize the locomotive by calling it "the 3720," don't they?

A. That is right.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: We offer the exhibit as defendant's exhibit No. 212.

Mr. Strouss: I object to that part of the exhibit relating to the Salt Lake division as irrelevant and immaterial.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 212.")

Mr. Mason:

Q. Mr. Sines, the record is not so far I think entirely clear as to the tractive effort of these Articulated-Consolidation locomotives in the 4000 series, which you show in line 12 here. Can you tell from the locomotive books what the tractive effort of that series of locomotives is?

A. Yes, the tractive effort is 90,940 pounds. This is the locomotive book I have here in my hand that you mentioned [fol. 3149] last week, but I didn't happen to have it with me at the time.

Q. What is the tractive effort of the 5000-class locomotives shown in line 15?

A. From the same book, 84,200 pounds.

Mr. Mason: I think the record shows it but I want to be sure.

Q. Is there any other showing on exhibit No. 212 to which you wish to direct attention?

A. With the exception of the Articulated Consolidation engines, the assignments on both divisions are much alike. The passenger power is much the same. The principal passenger engines on both divisions are the Mountain type 1, 3, 4, and 5. We use F-4's and one F-5 on the Tucson division. We use F-4's on both divisions and one F-5 on the Tucson division.

Q. I take it that these Moguls and Ten Wheelers are in use in branch line or other similar service on the two divisions?

A. Yes, branch line and local service.

Q. Have you a statement before you in one sheet entitled, "Lengths and Capacities of Main Line Sidings in Arizona, Yuma-Arizona State Line to Arizona-New Mexico State Line Via Gila and Bowie, Year 1912"?

A. I have.

[fol. 3150] Mr. Mason: May we have this statement marked "Defendant's Exhibit No. 213"?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 213, for identification.

Mr. Mason:

Q. Did you prepare or cause to be prepared exhibit No. 213 for identification?

A. I did.

Q. And the sources are as shown at the foot of the exhibit?

A. That is right.

Q. Did you insert any information as to the length or anything else shown in columns B and C?

A. Yes, clear length is taken from the Tucson division timetable and the capacity in column C was computed by myself.

Q. You show the bases of the computations, do you, on the exhibit?

A. That is right, in the lower righthand corner.

The Court: I thought the testimony the other day was that the cars had a length of 46 feet?

A. They do now, but this is in 1912 and that length of 44 feet is from our engineering department's records on the basis they were using at that time.

[fol. 3151] Q. But the length now is 46 feet?

A. Yes, the average length of car used in computing siding capacity.

Mr. Mason:

Q. Now as to the locomotive length of 80 feet, is that considerably shorter than present-day main line locomotives?

A. Yes, our main line locomotives now are from 100 to 126 feet in length.

Q. I take it by this exhibit you are attempting to present the situation as it existed in 1912 with reference to 1912 equipment?

A. That is right, to show the situation that existed in 1912 when the Arizona 70-car limit law was passed.

Q. You show the situation as of December 22nd, 1912, by timetable No. 71. Was there any substantial change during the year 1912 of which you are aware according to the records?

A. I don't know. I have the file of all the Tucson division timetables and I didn't examine them particularly to see if anything in particular had occurred in 1912.

Q. Subject to examination of the prior timetables, Mr. Sine, is it fair to assume that this represents the condition as of the beginning of 1912 as well as at the end?

[fol. 3152] A. Yes, railroad plants don't change overnight or in the space of a few months; they are the gradual development of a number of years and within any shorter period of years a statement of this kind probably reflects a condition that existed over a twelve-month period.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Do you have the underlying sources in connection with this exhibit available for examination if necessary?

A. Yes, I have the Tucson division timetables, including timetable No. 71, right here with me.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 213.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 213.")

Mr. Mason:

Q. Mr. Sines, I should like to ask you about some of these sidings. You show, for example, at Mohawk a capacity of 99 cars. Is that all on one siding?

A. No, the information that I took from time-table No. 71 is shown in column B and was expressed in "length of [fol. 3153] sidings, within clearance (feet)." I have duplicated those figures exactly in column B. The timetable does not indicate whether there was one or more tracks at Mohawk at the time the timetable was printed, but there are two tracks at Mohawk now of somewhat similar length and my conclusion was that there were two tracks at Mohawk at the time this timetable was printed because there would be no particular reason for changing the layout at Mohawk by taking up one track.

Q. Or by converting two sidings into one long siding?

A. That is right.

Q. Does the same situation obtain at Aztec where you show 101 cars?

A. Yes, that prevails at Aztec and at other stations where more than 70 cars were shown, say, in the neighborhood of 100 to 125 cars, as, for instance, at Sentinel, there was a yard at Ivalon, the third station from the top on the lefthand side. There are and probably were several tracks at Casa Grande, Red Rock, and then passing over to the Rio Grande division, with which territory I am more familiar than the territory west of Tucson.

Q. You speak of the Rio Grande division as it existed as one time to Tucson?

[fol. 3154] A. That is right. There are and were two tracks at Vail, Pantano, Mescal, Dragoon, Cochise, Willcox, and San Simon.

Q. What about Raso, is that a single siding?

A. I skipped that because I am not sure whether there is one long siding or two there.

Q. Is this district east of Tucson part of the district which you had under your jurisdiction as assistant engineer of the Rio Grande division?

A. I worked on the Rio Grande division in this particular territory for eight years. This was part of the territory I worked in for eight years.

Q. Have you a statement before you in one sheet, Mr. Sines, entitled, "Main Line Freight Trains of Various Lengths Operated between Yuma, Arizona, and El Paso, Texas, Via Gila, Arizona, and Lordsburg, New Mexico, and Via Douglas, Arizona, over South Line during June and August, 1938, Actual Operations Compared with Redispatched"?

A. I have.

Mr. Mason: May we have this statement marked exhibit No. 214?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 214 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 214, Mr. Sines?

[fol. 3155]? A. It was prepared under my direction and supervision and I have checked it.

Q. What was the source from which it was prepared?

A. The actual train sheets for the months of June and August, 1938, for the information shown on the lefthand side of the sheet under the caption "Actual" and the redispatch sheets for the months of June and August, 1938, for that portion of the sheet under the caption "Redispatch."

Q. Did you also use the white work sheets A concerning which you have testified?

A. Yes, we worked a two-way check on this exhibit by means of the white work sheets A because they also show train lengths.

Q. When you say "we," you mean yourself and your assistants?

A. Yes, the rest of the train limit party that did the statistical work.

Q. Has the exhibit been compared and checked against these underlying sources?

A. It has.

Q. Are these the same actual and redispatch sheets which have been furnished previously to Mr. Strouss?

[fol. 3156] A. Yes.

Q. And the white work sheets A, have they been furnished to him?

A. They have.

Q. Referring to the actual column here, the exhibit purports to show a grouping of trains according to their length in cars in columns A, B, and C. What train length, or, rather, at what point in the course of the progress of the train across the division is the train taken for the purpose of determining into which classification it falls?

A. This classification is according to the highest number of cars handled at any one time.

Q. I take it if a train had 49 or less cars at any one time it would fall into the classification in column A?

A. Yes, fifty and less.

Q. Is the count taken by examining the story of the train as it is written on the train sheets?

A. Yes.

Q. There are certain computations showing totals and percentages. Are those capable of being made and checked from the face of the sheet itself?

A. That is right. We have used a system of cross-addition and footings so that the computations are auto-
[fol. 3157] matically checked by arriving at the same total at the lower righthand side of the block in each instance.

Q. Will you explain how that is? Do you, for example, in connection with the actual between Yuma and El Paso show a certain total number of trains in column J opposite the words, "Grand Total"?

A. That is right.

Q. Is that total capable of being checked by the subtotals above?

A. That is right.

Q. And also by the column totals to the left?

A. That is right.

Q. And the same would apply to the totals shown in column T?

A. Yes, sir.

Q. Taking everything that appears in the subtotal footings above or the columns to the left as far as the double line?

A. That is right.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: This is a summarization or recapitulation of the information appearing on exhibit No. 198 and other
[fol. 3158] white sheets similar to that covering the redispatch during the two periods and on the territory indicated?

A. That is right, with this additional explanation, that in all cases you will not be able to check the length of the trains off the white sheets because in a few cases the train reached its maximum length between initial terminal and final terminal and exhibit No. 198 simply shows the length of the train leaving the terminal and arriving at the terminal.

Mr. Strouss: That is true of the other white sheets of which this is typical?

A. Yes.

Mr. Mason:

Q. Then it is necessary in this connection to go to the dispatchers' train sheets for a complete check, is it?

A. Yes.

Mr. Strouss: You meant of the actual trains?

A. Of the actual trains for those on the left-hand side of the sheet and the redispatch on the righthand side.

Mr. Strouss: In other words, you would have to go to the train sheets for the redispatch in order to get that information as to redispatched trains?

A. That is right.

[fol. 3159] Mr. Mason:

Q. I take it that arises because some few of these trains may have picked up cars after leaving initial terminal and dropped them before arriving at final terminal?

A. That is right; not many trains do that, but a few.

Q. Is there any previous exhibit showing a train count according to maximum train length to which this exhibit corresponds?

A. I made one for the territory from Sparks to Ogden.

Q. Do you have in mind exhibit No. 186?

A. Yes.

[fol. 3160] Q. Is the train count undertaken here along the same lines and following the same classifications?

A. That is right.

Q. Now, I take it that the results of the entire showing are as indicated by the recapitulation at the foot where you compare actual operations with redispatched operations?

A. You have to do that in two parts. The recapitulations appear for the line Yuma to El Paso via Gila and Bowie

In the upper part of the sheet, and in the lower part of the sheet the recapitulations afford a comparison for the line Tucson to El Paso via Douglas.

Q. This doesn't relate in any respect to the Phoenix line, does it?

A. No, and on this exhibit I didn't attempt to throw the south line operation in with the north line operation to get a grand total.

Q. The Tucson-El Paso via Douglas is entirely separate from the upper part of the sheet so far as totals are concerned?

A. That is right. The reason for that was that the south line operation was affected relatively very little by the redispatch study. We ran the same number of trains in [fol. 3161] the actual as will be observed by reading the last figure in column J as we did on the redispatch, as will be shown by reading the last figure in column T.

Mr. Strouss: Why wasn't the Phoenix line shown?

A. Well, during June and August, it didn't offer any opportunity for redispatching or consolidating of trains, you might say, whatsoever.

The Court: In other words, Mr. Sines, on that particular line, even if the Arizona Train Limit law had not been in force and effect, you would not have been operating any trains over 70 cars in length?

A. It didn't appear so, for the months of June and August, 1938. You note we did make the redispatching study for December, 1938, where we showed quite a change.

Mr. Mason: Have you a subsequent exhibit to cover that?

A. That is right, that is another study that was listed on one of my——

Q. It is listed on Exhibit 197, I think, or 196.

The Court: Mr. Sines, in connection with actual operations, under Exhibit No. 214, it would indicate that the defendant here had studiously lived up to the Arizona [fol. 3162] Train Limit law during those two periods?

A. Yes, sir.

Q. There were two instances where the train had to be broken down at the state line in order to comply, or I should say four instances?

A. That is right, but let me make this clear. It was not necessarily at the state line, it was somewhere east of the state line. We had a record of the trains leaving Lordsburg and for the purposes of this exhibit we did not attempt to show just where those cars had been set out before the trains reached the state line.

Mr. Strouss: Or whether they were destined to the point where they were set out?

A. No, we didn't determine that either.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit No. 214.

Mr. Strouss: We make the same objection to this exhibit as was made to Exhibit 198, particularly to the part of this exhibit covering the redispatch.

The Court: Well, the Court is going to overrule the objection, and admit it in evidence.

(Thereupon the document referred to was received in [fol. 3163] evidence and marked "Defendant's Exhibit No. 214.")

Mr. Mason: Mr. Sines, in your discussion prior to the offer of the exhibit, you said that you operated the same number of trains over the El Paso-Douglas-Tucson line in the redispatch study as were operated in actual operations?

A. Yes.

Q. But, apparently, according to the exhibit, the train lengths were considerably changed in redispatching?

A. That is right. Whereas actually only two trains exceeded 70 cars, our redispatch shows that 51 trains would have exceeded the 70-car limit, or 17.23 per cent.

Q. How did you reach this result of operating 49 more trains with more than 70 cars? Did you operate more traffic over the south line?

A. That is right, we took empty cars off the north line and ran them through Douglas. With one train a day in each direction between Tucson and Douglas, and between Douglas and El Paso, there was still available on the redispatching study, and it was true in actual operations too, although we didn't have an opportunity to avail ourselves of it, there was still available additional engine capacity to haul more tonnage, so we took the empty cars, [fol. 3164] some of the empty cars off the north line, thereby

lightening the burden on the north line and sent them down through Douglas without increasing the train-miles or the train-mile expense doing it, except to the extent that you might burn a little bit more fuel because of the increased distance.

Q. Was this movement of empties predominantly westbound, particularly in June, over the south line?

A. Yes, that is shown in the Tucson-Douglas block, where on the redispatch westbound we operated sixteen trains of over 70 cars.

Q. And the same number between Douglas and El Paso apparently?

A. That is right.

Q. Were you present in the court room, Mr. Sines, when the dispatchers spoke of the unbalance of trains and consequently of locomotives at intermediate points, such as Gila and Lordsburg?

A. Yes.

Q. Does your exhibit indicate from the record of the actual operation, an overbalance in one direction or another of trains between Yuma, and Gila, for example?

A. It does.

[fol. 3165] Q. Will you point to the figures?

A. In the first block, Yuma to Gila, the total in column J indicates 228 trains east and 251 trains west.

Q. What happened to that unbalance of 23 trains in the month of June, 1938, on the redispatch?

A. On the redispatch we were able to redistribute the business so that there were 165 trains east and 164 trains west.

Q. Are similar figures available for each of the other blocks to indicate an unbalance in actual operation, and a partial balancing or approximate balancing in redispatching?

A. That is right, and that is true. As far as Lordsburg, from Lordsburg to El Paso it appears that a balance of 216 east and 219 west, and actual between 182 east and 189 west, an excess of three became an excess of seven. Just why that was, I don't recall.

Q. Now, referring again to the first block of the exhibit, the June movement between Yuma and Gila, the 228 trains eastward, and 251 trains westward, Mr. Sines, what was done to provide locomotives and crews for the other 23 trains?

A. Locomotives were double-headed, and train crews were deadheaded in the opposite direction to provide loco-
[fol. 3166] motives and crews to handle the excess cars.

Q. Does that mean, then, that you would have to move 23 locomotives approximately from Yuma to Gila without load?

A. Yes, sir.

Q. And 23 train crews deadheading?

A. That is right.

Q. But performing no service?

A. That is right.

Q. Would the same or substantially the same result be true as to each of the other cases in column J, where an unbalance is shown?

A. Yes.

Q. Again referring to the block between Yuma and Gila, and the same appears to be the case as to the block between Gila and Tucson, and Tucson and Lordsburg in the redispatching study, Mr. Sines, I notice that your eastward trains did not in any instance exceed 120 cars, and that the greater number of them fell in the block between 91 and 100 cars, whereas your westward trains in June, of course, fell in large number in the block between 121 and 130 cars. What is the explanation for the different preponderance of train lengths eastward and westward be-
[fol. 3167] tween Yuma and Gila during June when the actual number of the redispatched trains was almost the same?

A. There was an excess of westbound empties in June. In other words, we had more empty cars moving westbound than there were loaded cars moving eastbound, and not having any restriction placed on the maximum number of cars we could handle, we took care of this excess empty westbound movement by putting more cars in the westbound trains than in the eastbound.

Q. Do I understand that these are only empties moving westbound, or does that include loads as well as empties?

A. It also includes loads.

Q. Your unbalance is as between cars both loaded and empty in one direction over the other?

A. Yes, that is right. I spoke of the excess empties westbound because it is the empty cars that show the greatest amount of fluctuation.

Q. It is the empty movement that contributes largely to the unbalance?

A. That is right.

Q. And referring to these other blocks, Gila-Tucson and Tucson-Lordsburg, and Lordsburg-El Paso, would the same explanation apply?

A. Yes.

[fol. 3168] Q. Have you any other feature of the exhibit that has not been mentioned?

A. Yes. In the territory Lordsburg to El Paso, we see evidences of the efforts of Chief Dispatcher Herrell to make two trains out of three trains at Lordsburg in the eastward operation, and, also, it is apparent that there has been splitting up of long trains at Lordsburg in westward operation. He had for the two months shown, June and August, 14 plus 15 plus 156 plus 23, or 208 of the 678 trains over seventy cars. There is a comparison that you spoke about before the exhibit was introduced, between 186 and Exhibit 214, and the quickest comparison is to be made in the percentage of trains over 70 cars. Between Sparks, Nevada, and Carlin, Nevada, we had 72.4 trains over 70 cars, between Carlin, Nevada and the Nevada-Utah line we had 88.41 trains over 70 cars, and between the Nevada-Utah line and Ogden, Utah, we had 85.86 trains over 70 cars. On our redispatching study for the months of June and August, 1938, we had 80.06 trains over 70 cars for the line Yuma to El Paso, expressed in percentages.

Q. Mr. Sines, will you refer to a chart in one sheet bearing a rather long title, "Relative Train Length, California, [fol. 3169] Arizona, New Mexico, Texas, Through and Local Freight Trains," and so forth, based on redispatching study of June and August, 1938?

A. Yes.

Q. Did you prepare this exhibit or cause it to be prepared?

A. I had it prepared.

Mr. Mason: May we have this marked "Defendant's Exhibit No. 215 for identification"?

The Clerk: Defendant's Exhibit No. 215 for identification.

Mr. Mason: From what sources was this prepared?

A. This was prepared from the actual and redispatch train sheets for the months of June and August, 1938.

Q. Now, as to the district west of Yuma, did you use those sources?

A. No, that information was taken from a statement furnished by the auditor of equipment service accounts.

Q. How was the information prepared?

A. The territories included there are the freight runs between Indio and Yuma and between the Imperial Valley and Yuma, so that the average number of cars per train [fol. 3170] is the average of the trains entering Yuma from the west and departing from Yuma to the west.

Q. Is this average a composite average of trains over both those lines which converge just west of Yuma?

A. Yes.

Q. Is it based upon the conductor's wheel reports?

A. It is, and it is determined by compiling the car-miles and then dividing by the train-miles to get the average number of cars per train-mile.

Q. This figure west of Yuma represents the number of cars per train from the aspect of the trains arriving at Yuma from the west, from as far west as Indio or the Imperial Valley?

A. Yes, sir.

Q. What do the averages for the lines styled "Actual Operation" represent as shown here?

A. They represent the average length of trains arriving at the terminals indicated for the territory Yuma to Gila, for instance, in an eastward direction, at the bottom of the sheet, the trains arriving at Gila in actual operation averaged 64.3 cars; whereas, the trains arriving at Gila on the redispatched operation——

Q. The exhibit has not been offered. But these aver- [fol. 3171] ages are the average number of cars in the train, exclusive of caboose, is that correct?

A. Yes, this is exclusive of caboose.

Q. Entering the particular terminal indicated by the vertical line; is that correct?

A. That is correct.

Q. And all of the information as to the districts east of Yuma is taken from the actual and redispatch train sheets and the white work sheets A?

A. Yes.

Q. Has the exhibit been checked against the underlying sources?

A. It has.

Q. And as to the records shown in compiling the average west of Yuma, are those records available?

A. I have the statements furnished by the auditor of equipment service accounts, and I can get the conductors' wheel reports for that territory, if they should be required.

Mr. Mason: Will you need that, Mr. Strouss, for the territory west of Yuma?

Mr. Strouss: The conductors' wheel reports? No. West of where?

The Witness: Yuma.

[fol. 3172] Mr. Mason: The California portion of the sheet.

Mr. Strouss: No.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No, I have no questions.

Mr. Mason: I don't think you have explained, Mr. Sines, but do I understand that the top half of the chart above the line across the exhibit, which is designated by the zero, represents the average length, actual or redispatched, as the case may be, of westward trains?

A. That is right.

Q. Is that entirely separate from the showing on the lower half of the chart representing the lengths of the eastward trains?

A. That is right.

Q. What is the purpose or significance of the cross-hatching?

A. By means of the area that is cross-hatched on this chart, we have visual evidence of the effect of the Arizona Train Limit law in limiting the length of freight trains.

Mr. Mason: We offer the exhibit in evidence as defendant's Exhibit No. 215.

Mr. Strouss: The same objection as to the previous ex-[fol. 3173] hibit.

The Court: The objection is overruled. It may be admitted in evidence.

(Thereupon the document referred to was received in evidence and marked, "Defendant's Exhibit No. 215.")

Mr. Mason: Now, Mr. Sines, do I understand from the exhibit that the average length of trains entering Lords-

burg, rather entering El Paso from the west over the Lordsburg-El Paso line, is at present 68 cars?

A. Yes.

Q. And that the average length westward entering Lordsburg is 65.2 cars?

A. That is right.

Q. I notice also that you show in actual operation between Yuma and Lordsburg average lengths of 63, 64, and 65 cars, approximately, in the various districts?

A. Yes, sir.

Q. Although the law permits 70 cars. Will you explain why the average as computed by you in actual operation does not attain more closely to 70 cars?

A. There are two reasons, there are two very important reasons. The first one is that it is not always possible to [fol. 3174] put 70 cars in every train, the traffic simply isn't there. That is particularly true with the last train leaving Yuma at the end of the day's business, at the end of the day's business as it is received from California, and furthermore,——

Q. Mr. Sines, you say that the number of cars in the day's business at Yuma will not be an exact multiple of 70, is that the idea?

A. That is the idea.

Q. Why can't you leave those 40 or 50 cars which may be the odd cars and wait until you have an exact multiple of 70?

A. Because those cars with perishables in them are moving on schedule and are due in Chicago or some other eastern destination on a certain day, and cannot be left over at Yuma for any length of time. The local trains also have difficulty, probably very seldom, if ever, reach 70 cars in length. Those are the trains that pick up and set out and do local work along the road. We don't have any assigned locals in this territory, but occasionally trains will run each day doing more local work than others; a train leaving Yuma, knowing that he is going to pick up cars at Wellton, will leave Yuma with enough space under seventy [fol. 3175] to permit him to pick up to 70 cars at Wellton, then if he sets out some cars short of Gila he will have to run into Gila with a consist of less than 70 cars. The result of that operation is that the average length of the train for the entire run from Yuma to Gila may be considerably

less than 70 cars. This applies, of course, to all districts between Yuma and Lordsburg, and Yuma to Rodeo. The other important factor is the length of sidings as they exist today in Arizona. Originally, as shown by the exhibit which I have just introduced, Exhibit 213, we had a complement of sidings which were capable of, with few exceptions, of holding trains consisting of 70 cars and engine and caboose, but the engines and the cars got longer and the result is that today we cannot crowd 70 cars into all of these sidings. On the other hand that does not limit us necessarily to operating only 66 cars in both directions, we can still operate up to 70 cars in one direction on trains and run short siding clearance length trains in the other direction to permit these trains to pass. Another consideration is that it is not always necessary that all of the trains in the same direction be of 70 cars. By timing the departures from terminals, it is possible to run trains of [fol. 3176] up to 70 cars in each direction within the same twenty-four hour period. This can be done also by taking advantage of the few long sidings which we do have today in Arizona. The result of all of this is that instead of having an average more closely approaching seventy cars, we get down to the averages shown on my exhibit 215, but when it comes to seventy cars, the Southern Pacific Company has never felt justified in spending the hundreds of thousands of dollars that would be necessary to give them a complete line all the way across Arizona of sidings which would be capable of holding more than seventy cars.

The Court: This hearing will be recessed until tomorrow morning at ten o'clock.

(Thereupon the court stood at recess until January 29, 1941, at ten o'clock, A.M.)

[fol. 3177] January 29, 1941, ten o'clock A. M.

Proceedings were resumed at this time as follows:

Mr. Mason: Your Honor, Mr. Masson is here and has some further additional information in the shape of exhibits which were suggested at the time of his prior appearance, and if there is no objection I would like to inter-

rupt the course of Mr. Sines' testimony to put Mr. Masson on for that purpose and for any additional questions which Mr. Strouss may have.

The Court: If there is no objection, that may be done.

L. J. Masson was recalled to the stand and testified further as follows:

Redirect examination.

By Mr. Mason:

Q. Mr. Masson, at page 2317 of the transcript, with reference to Exhibit 166, it was suggested by Mr. Strouss that you give more of the detail of the cars and tonnage for the System and for the three states, Arizona, New Mexico and Nevada, in accordance with the major sub- [fol. 3178] divisions which the commissions recognize in the annual reports rendered to them. I will ask you now if you have prepared from the annual report of the company to the Interstate Commerce Commission for the year ended December 31, 1939, a showing of schedule 541, revenue freight carried during the year, showing the total of tons and cars by commodities and by classifications of commodities?

A. Yes. This exhibit is a photostatic copy of schedule 541 as it appears in the annual report to the Commission, except as to the heading, "Southern Pacific Company, Pacific Lines," and the legend which appears at the upper righthand corner.

Q. This is an exhibit of four sheets, the first sheet showing a photographic reproduction of printing "541. Revenue Freight Carried During the Year."

A. Yes, sir.

Mr. Mason: May we have this exhibit marked No. 216?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 216 for identification.

Mr. Mason: Now, is Exhibit 216 an exact photographic reproduction of these particular pages of the annual re- [fol. 3179] port which are identified by number from 512 to 519?

A. Yes, except as I have stated.

Q. The identifying material at the top of the sheet has been added by typewriting before photographing?

A. Yes.

A. And being a photograph, it is an exact reproduction except as to size?

A. Yes.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: We offer it as defendant's Exhibit No. 216.

Mr. Strouss: No objection.

The Court: It may be admitted.

(Thereupon, the document referred to was received in evidence and marked "Defendant's Exhibit No. 216.")

Mr. Mason: In connection with the same subject matter, Mr. Masson, have you an exhibit in two sheets bearing the style in typewriting, "Southern Pacific Company, Pacific Lines, State of Arizona," and then showing on the first sheet schedule 941, revenue freight carried during the year?

[fol. 3180] A. Yes.

Mr. Mason: May we have this exhibit marked No. 217?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 217 for identification.

Mr. Mason: Is this exhibit a photograph of pages 908, 909, 910, and 911 of the annual report for the year 1939, rendered to the Corporation Commission of the State of Arizona?

A. This is a typed transcript of the figures as they appear in the report to the Corporation Commission of Arizona on a form that corresponds to Schedule 941, which was subsequently photostated.

Q. Then these figures appearing here in typewriting, apart from the printed matter which appears in the photostat, are a typewritten transcript of figures rendered to that commission?

A. Yes.

Q. Why did you prepare this in typewriting?

A. Because our office copies are in manuscript.

Q. Has this exhibit been checked against the office copy of the annual report?

A. Yes.

Q. Will you state whether it is true and correct?

[fol. 3181] A. To the best of my knowledge and belief it is, yes, sir.

Q. Do I understand that this contains the information for the State of Arizona corresponding substantially to the information for the System as reported to the Interstate Commerce Commission, and shown on Exhibit 216?

A. Yes, sir.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: We offer the exhibit as defendant's Exhibit No. 217.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 217.")

[fol. 3182] Mr. Mason:

Q. Mr. Masson, have you prepared an exhibit similar to No. 217 from the annual report rendered to the state commission of New Mexico for the year 1939?

A. Yes, sir.

Q. Was this exhibit prepared in the same way?

A. It was prepared in the same way, the figures that appear in the schedule of the report to the state corporation of the state of New Mexico for the year 1939.

Mr. Mason: May we have this statement marked No. 218 for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 218 for identification.

Mr. Mason:

Q. I take it that exhibit No. 218 is in exactly the same form as exhibit No. 217 but relates to the state of New Mexico?

A. That is true.

Q. Has it been compared?

A. Yes, sir, and it is correct to the best of my knowledge and belief.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 218.

Mr. Strouss: No objection.

The Court: It may be admitted.

[fol. 3183] (The document referred to was received in evidence and marked "Defendant's Exhibit No. 218.")

Mr. Mason:

Q. Have you a similar exhibit in two sheets relating to the state of Nevada and purporting to be a reproduction of pages 908 to 911, inclusive, of the annual report to the Nevada Public Service Commission?

A. Yes, sir.

Mr. Mason: May we have this marked "Defendant's Exhibit No. 219"?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 219 for identification.

Mr. Mason:

Q. Was exhibit No. 219 for identification prepared in the same way as the preceding exhibits Nos. 217 and 218?

A. Yes, sir.

Q. Has it been compared?

A. Yes, sir, and it is correct to the best of my knowledge and belief.

Q. It relates to the same subject matter but as set forth in the report to the Nevada Commission?

A. As set forth in the report to the Public Service Commission of Nevada for the year 1939.

Q. Are these forms of reports as rendered to the states [fol. 3184] insofar as concern schedule 941 identical or substantially so?

A. Yes, they are identical.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 219.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 219.")

Mr. Mason:

Q. Mr. Masson, in connection with your exhibit No. 173, at page 2290 of the transcript, you stated as to item 18 there were no amortization charges included in the item. I will ask you if you have made a subsequent investigation to determine whether any such charges have been included in that item for any of the years represented on exhibit No. 173?

A. At the time of my answer I had before me the figures for 1939, in which year there were no amortization charges, but I overlooked the fact that there are charges for amortization of discount on funded debt in all of the years 1925 to 1938, inclusive.

[fol. 3185] Mr. Mason: May we have the understanding that the statement in the record at page 2290 may be considered corrected accordingly?

Mr. Strouss: Yes.

The Court: It is so ordered.

Mr. Mason:

Q. There was one other matter to which inquiry was made in connection with your exhibit No. 162. You were asked to give some breakdown of the mileage, I believe?

A. Mr. Strouss asked for a breakdown of the mileage for 1939, as I recall it, as between main line and branches on exhibit No. 162. That breakdown is as follows: main line, 5,129 miles; branch lines, 3,430 miles, which comes to the total of 8,559 miles as shown in the exhibit. That, I believe, completes all of the data you asked for.

Mr. Strouss: Yes, I believe so.

Mr. Mason: Have you any questions of Mr. Masson?

Mr. Strouss: No, I have nothing further to ask him.

Mr. Mason: Do you wish Mr. Masson to return at a later date for cross-examination?

Mr. Strouss: I don't believe so. I have gone over his testimony and I don't know of anything I wish to ask him about further.

[fol. 3186] Mr. Mason: Unless you find something, we will consider Mr. Masson is excused?

Mr. Strouss: Yes.

The Court: You may step aside.

(Witness excused.)

B. S. Sines resumed the witness stand for further

Direct examination.

By Mr. Mason:

Q. Mr. Sines, have you before you an exhibit consisting of a chart of a single sheet entitled, "Southern Pacific Company, Yuma, Arizona, to El Paso, Texas, June 18th, 1938, Train Movements"?

A. I have.

Mr. Mason: Your Honor, we ask that this chart be marked "Defendant's Exhibit No. 220" for identification.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 220 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 220 for identification or supervise its preparation?

A. It was prepared under my direction and I supervised it.

[fol. 3187] Q. The chart appears to be divided into two portions and I will ask you if the two are separate and distinct charts?

A. They are.

Q. Addressing yourself to the chart at the left side of the sheet which is headed "Actual," from what source was that prepared?

A. That was prepared from the actual train sheets reflecting the movement of trains on June 18, 1938, between Yuma, Arizona, and El Paso, Texas.

Q. Were the conductors' time returns and delay reports used in connection with the preparation of the chart?

A. They were.

Q. Is the showing on the chart headed "Actual" restricted to a particular route between Yuma and El Paso?

A. Yes, to the route via Gila and Bowie.

Q. From what source was the portion of the chart headed "Redispatched" prepared?

A. From the redispatched train sheets for the same date.

Q. Were the conductors' delay reports employed in connection with its preparation?

A. Only indirectly insofar as the conductors' delay reports were used to govern the movement of the redispatched [fol. 3188] trains, as I have previously described.

Q. The date referred to is June 18, 1938. Has that date any particular significance?

A. That is the day of maximum traffic during the month of June, 1938, between Yuma and El Paso.

Q. You mean maximum traffic with respect to train movement?

A. With respect to the number of trains operated.

Q. Would that also be the maximum number of cars moved between the points?

A. That would be a fair guess, although I didn't check the cars handled.

Q. Was that also the day on which the largest number of redispatched trains were operated or did you check as to that?

A. No, the check refers to the movement that occurred actually on June 18th.

Q. Going to the detail of the charts themselves, and referring for this purpose to the actual chart, I take it that the two charts are in a sense counterparts of each other?

A. They are; they are made out to the same time and distance scales.

Q. What is the significance of the figures under the word [fol. 3189] "Actual" and immediately at the top of the actual chart?

A. They represent the twenty-four hours of the day, June 18th, starting with twelve midnight and ending with twelve midnight.

Q. Are the hours plotted to scale horizontally across the chart?

A. They are.

Q. That is to say, the width of the chart is divided into twenty-four equal spaces?

A. Twenty-four equal spaces, yes.

Q. Those are the hours as designated by the figures A.M. and P.M., I take it?

A. Right.

Q. Proceeding down the chart and without reference first of all to the angling lines, what do the horizontal lines along the chart indicate?

A. They represent the station locations according to the names indicated at the left and right-hand sides of the chart.

[fol. 3190] Q. Are the distances between stations according to scale?

A. Yes, according to the miles between the stations.

Q. It appears, for example, that between Granite Spur and Ligurta is a considerably less space than between Ligurta and Wellton. Is that in accordance with the mileage between those points?

A. It is.

Q. Now, you show certain points or certain lines on the chart somewhat heavier than others. For example, I notice a heavy line at Gila and also a larger size of lettering used in designating Gila. Was there any particular reason for that?

A. Yes, we indicated the terminals with a heavier line and with larger sized printing.

Q. Then that particular designation applies also to Tucson, and Lordsburg, does it?

A. That is right.

Q. What is the significance of the cross-hatching that appears for example, between Yuma and East Yard, between Dome and Wellton, and between Stockham and Mescal?

A. The cross-hatching indicates the location of double track.

[fol. 3191] Q. Where there is no cross-hatching, what is the character of the operation?

A. Single track.

Q. I notice that in the double-track territory, between Stockham and Mescal, that the names of the stations on the lefthand side of the chart are not in all cases the same as the names of stations on the righthand side of the chart. Why is that?

A. That is because the location of the stations on the two tracks do not always coincide in the mileage distances from some given point, and is brought about because of the divergence of the tracks.

Q. Is that the district between Tucson and Mescal where the eastward and westward tracks are not on the same grade at all points?

A. Yes, and as I recall the distance, by the eastbound track is a mile or two longer than by the westbound track.

That difference in mileage is accounted for by shrinking or expanding the westbound track each time to conform to the eastbound mileage schedule. It would be impossible to draw the map, to draw this chart, and have exact scales in each direction, so we assumed that the eastbound scale is the governing scale.

Q. Does that have any substantial effect upon the chart [fol. 3192] itself?

A. It has very little effect; well, none at all on the information that the chart portrays.

Q. Now, what is the significance of the black lines which move across the chart, extend across the chart in a more or less diagonal fashion?

A. Those lines represent the progress of individual trains according to the time and distance scales upon which the charts are laid out.

Q. And are those trains identified in any manner on the charts?

A. Yes; those trains are identified with sufficient frequency so that a train may be traced from its first appearance on the chart to its final appearance on the chart.

Q. I notice that some of these lines sloping from the left to the right as one goes down the chart; that, practically all of them cross other lines from the left to the right as one goes up the chart. What do those intersections indicate?

A. If those intersections occur on single track, it means that the trains have met and passed in opposite directions.

Q. Do you indicate the meets by some particular method on the chart?

A. Yes, we drew circles around those meets in order the [fol. 3193] more easily to identify and count them.

Q. Now, if the lines intersect in a double track section, what does that mean?

A. Well, that means that the trains met, but that there was no interference between the trains, being on double track.

Q. They simply went by each other on opposite tracks?

A. Yes.

Q. I notice, also, that a sloped line changes its course frequently, that these sloping lines may come to the line indicating a station and then there will be a bend or elbow in the line?

A. Yes.

Q. The line, that is to say, extends to the right along the station line instead of continuing its course. What does that indicate?

A. It indicates that the train has stopped at that station for one reason or another, and the length of the elbow measured on the time scale indicates the length of time that the train was at the station.

Q. It appears that some of these circles which you have stated indicated meets have figures such as a 2 or 3 opposite them. What do those indicate?

A. When figures occur alongside of the circles it indicates [fol. 3194] the number of meets that have occurred between trains, for instance, a train in one direction may go into the siding and be passed by two trains running in the opposite direction. In that event we counted that as two meets, and the figure "2" alongside is also to assist in identifying and counting the meets.

Q. Now, some of these lines which you state indicated progress of trains are solid and others are dashed. What is the significance of that?

A. The long dash indicates passenger trains running on this particular day.

Q. Are they identified by their numbers?

A. They are.

Q. And what do the dotted lines indicate?

A. The dotted lines indicate movement of helpers and light engines without trains.

Q. Now, lines which start on the lefthand side of the chart and slope to the right and downward indicate movement in what direction?

A. Eastward, generally from Yuma toward El Paso.

Q. How do you indicate westward movement?

A. By a line beginning at the lower left and progressing toward the upper right.

Q. Suppose that a train at midnight is at or near an [fol. 3195] intermediate station between Yuma and El Paso such as Gila, for example, how do you indicate that? Where does its line start?

A. If it be the midnight between June 17th and 18th, the line will start at that station and the further progress of the train will then be indicated by the manner in which the line is drawn. If it be the midnight between June 18th and 19th, the train is shown passing off of the chart at the

particular location, or near the particular location that it happened to be at midnight.

Q. Now, has this exhibit been checked against the dispatchers' train sheets and the time returns and daily reports?

A. Several times.

Q. Was the chart showing the movement of redispatched trains prepared in the same way and along the same lines as the chart depicting actual movements?

A. Yes, sir.

Q. The description which you have given of the chart as to actual applies likewise to the redispatched?

A. That is right.

Q. Now, I notice at the foot of the sheet there is a tabula- [fol. 3196] tion as well as a legend. Where do you get those figures?

A. Those figures can be checked by making a count of the particular items indicated directly above.

Q. That is, you can count the number of actual trains by just counting the number of lines eastward or westward, can you?

A. Yes.

Q. The same way as to the redispatch?

A. Yes.

Q. And you can find the number of meets by taking the number of circles and figures of meets shown on the chart and adding them up?

A. That is right. That explanation is true as to meets and passes, but a further explanation should be made with respect to the count for the number of trains. In making that count, we found it was necessary to establish an arbitrary rule and we counted those trains which left any terminal within the 24-hour period. Fractional trains that started at midnight at some intermediate station, we did not count.

Q. Unless they left a terminal during the twenty-four hours?

A. That is right.

[fol. 3197] Q. Then a train which came on the chart, let us say, at Wellton at or near midnight and went only to Yuma before going off the chart, would not be counted as a train?

A. No.

Q. But if it left Gila at or near midnight and went on to Yuma, it would be counted?

A. Yes.

Q. And the same way, if a train came on the chart moving eastward at a point between Lordsburg and El Paso, it wouldn't be counted as a train because it didn't leave Lordsburg within the 24 hours?

A. That is right.

Q. I notice that some of these circles, according to the legend at the foot of the chart, instead of being in solid line are in dashed line.

A. Yes.

Q. What does that signify?

A. That signifies a pass.

Q. How do you define a pass as distinguished from a meet?

A. A pass occurs when a train overtakes a train going in the same direction and passes it, goes by the preceding train.

Q. Does that happen, for example, when a passenger [fol. 3198] train overtakes a freight train in the same direction on single track and runs around the freight train?

A. That is right. That can happen on both single and double track.

Q. Meets normally occur only in single-track territory?

A. Yes, sir.

Q. Whereas, passes may occur in either?

A. Both single and double line track.

The Court: Mr. Sines, referring to that exhibit under the actual operations, see if I follow the chart: take for instance the progress of the train designated C-4-13 in the upper lefthand corner. Now, that train left Yuma near midnight of June 17th-18th, and proceeded on its eastward course, but only reached during that 24-hour period the division point at Lordsburg, when we lose track of it; is that correct?

A. That is correct, although apparently that is C-413 leaving Lordsburg at approximately 11:30 and passing off the chart between Elmoris and Lisbon. You will notice that the preceding train leaving Lordsburg is CY412 and west of Lordsburg the preceding train was also CY412.

The Court: Now, taking a passenger train, for instance [fol. 3199] No. 6, that left Yuma between four and five

A. M., it reached El Paso, Texas, at eight P. M. that evening?

A. That is right.

Mr. Mason: What is the purpose of the charts shown here, on Exhibit 220 for identification?

A. There are two primary purposes. The first is to give visual evidence of the difference in operation between operations under the 70-car limit, the actual, and under unrestricted operation, the redispatch. Just by a glance of the eye it is possible to obtain an appreciation of the reduction in the number of trains possible with an unrestricted operation. The second purpose is to demonstrate the reduction in interference occurring as a result of the reduction in the number of trains operated. The second purpose is largely the reason for the tabulation appearing at the bottom of the sheet where the number of trains and the number of meets and passes establish a relationship which I develop later to make an estimate of what would occur during the year 1938 under an unrestricted operation.

Mr. Mason: Have you any questions on this exhibit, Mr. Strouss, at this time?

Mr. Strouss: No; not at this time.

[fol. 3200] Mr. Mason: Your Honor, there are certain other explanations that could be made with profit on the exhibit, but would involve some of its details. I prefer to ask them after the exhibit has been received in evidence, if it is received. I offer the exhibit in evidence as Defendant's Exhibit No. 220.

Mr. Strouss: The same objections to this exhibit as were made to Exhibits 198 and 214 and 215, particularly as to the redispatch part of the exhibit.

The Court: The objection is overruled. It may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 220.")

[fol. 3201] By Mr. Mason:

Q. Mr. Sines, I wish you would take some particular train on the exhibit and indicate its progress. Take, for example, C-413 in actual operation. That train apparently left Yuma somewhat before midnight of June 17th; you first see it at East Yard, is that correct?

A. That is right. That train probably left Yuma about eleven-thirty or sometime around eleven-thirty and, arriving at East Yard at the end of the double track, it met a westbound train DF-3627, meaning "dead freight with engine 3627." We counted that as a meet because inspection of the train sheet and conductor's delay report indicated that the progress of 413 had been delayed a little by the DF-3627 leaving the single track and going on the double track.

Q. Does that mean that C-413 waited at the end of double track for the other to clear?

A. Yes. 413 then progressed to Araby and went into the siding to meet passenger train 43; went to Fortuna and went into the siding to meet train No. 5. He then proceeded to Gael and the little jog to the right is an inspection stop. He then proceeded to Mohawk and went by dead freight 3625, which had gone into the siding at Mohawk. C-413 was not delayed by that meet. C-413 then proceeded [fol. 3202] to Stanwix where C-413 went into the siding and trains SSW First and Second 17 consolidated with GBW-16 passed, followed immediately by SSW Third 17. C-413 departed from Stanwix after SSW Third 17 had gone by and doubled from Lava to Sentinel. The double is indicated by the jog to the right and by the amount of time consumed by the train in going from Stanwix to Sentinel. At Sentinel he met DF-3321 which was waiting for him but which did not delay C-413 and then went to Tart on where he met DF-3612, again not being delayed by DF-3612. He had another meet with DF-3638 at Smurr. There was no delay to C-413 at Smurr either. Then approaching Gila the conductor's delay report showed that the train had flagged a block into Gila and that is the reason for the slow progress being indicated by the less steep slope of the line beginning halfway between Smurr and Gila.

Q. You say he flagged a block, what do you mean?

A. It means that approaching Gila yard he found the block signals at "Stop," and sent a flagman ahead to walk in advance of the engine and flag the train into the station at Gila.

Q. He had to wait, did he, before he could pass the block with the signal in "Stop" position?

[fol. 3203] A. Yes, the flagman has to go out there a safe distance ahead, I think it is something like half a mile or a mile that the flagman has to go out ahead of the train

in order to properly protect his train. C-413 arrived at Gila at approximately 6:15. He was in Gila about thirty-five minutes, departing at 6:50 and proceeded to Estrella. At Gila he picked up a helper, the helper being cut off at Estrella and returning to Gila. The return of the helper from Estrella to Gila is indicated by the short dashed line leaving Estrella almost immediately after the departure of train C-413. C-413 progressed to Mobile and went into the siding to permit passenger train No. 6 to pass him. He then went to Enid where DF-3660 was already in the siding, having met passenger train No. 6. C-413 went past Enid without delay and progressed to Maricopa where there is a stop indicated, that is a water stop as I remember, or he might have been there for switching. He then progressed to Casa Grande where he met DF-3636 without being delayed and progressed to Picacho where there was a delay for one reason or another which I don't remember. He went on to Rillito where he stopped again for five or ten minutes and then progressed to Cortaro where he met DF-3615 without being delayed inasmuch as DF-3615 had [fol. 3204] gone into the siding. He then progressed to Tucson, arriving at Tucson at approximately 12:35. As he was entering the Tucson yard and between the end of double track at Stockham and the yard at Tucson he met DF-3617 departing from Tucson. C-413 departed from Tucson at approximately 1:40—I want to explain that these times are approximate as I read them off this scale.

Q. They are actually shown, I take it, on the train sheets and the time returns and delay reports?

A. Yes, that is right. He went to Mescal without stopping. He stopped at Mescal probably for an inspection, went to Chaniso where he met DF-5021, DF-5021 having taken siding, and then C-413 went to Benson where he met two passenger trains, first 43 and second 43; C-413 taking the siding. Leaving Benson he went into the siding at Curvo for merchandise train 5026 and also took siding at Sibyl for SSW First 18 and GBW-17. Then he went to Dragoon and took siding for SSW Second 18 and apparently waited there also for DF-5037. There is no indication on this chart as having had a helper from Tucson to Dragoon, but I would say that he did have one because [fol. 3205] he had a helper between San Simon and Steins.

Q. If he had a helper, it is possible that the helper engine may have been attached as a double-header to one of the westward returning trains?

A. Yes, that would have occurred at Dragoon and the presence of the helper would not have been disclosed.

Q. Because it would not be a separate movement?

A. That is right.

Mr. Strouss: I think the testimony of what probably was there should be stricken.

The Court: Yes, it may be stricken.

By Mr. Mason:

Q. In any event, whether or not a helper was used will be revealed by the train sheets?

A. That is right.

Q. And the movement of the helper, if it was double-headed, is likewise indicated by the train sheets?

A. That is right. He progressed to Willcox where a delay of five or ten minutes is indicated and then went to Bowie where he was delayed ten minutes and also met DF-3742. At San Simon he stopped for a helper and went to Steins where the helper was cut off, the return of the helper being indicated by the short dashed line, and then [fol. 3206] progressed to Pyra where he met DF-5014 without being delayed and reached Lordsburg at approximately 10:45. He departed from Lordsburg about 11:35 and passes off the chart between Ulmoris and Lisbon at midnight.

Q. You point out in the progress of this train various places at which he took siding either for passenger trains or for freight trains. When a train goes into a siding to wait for a passenger train or another freight train which it is to meet or which is to pass it, who throws the switch which permits it to enter the siding?

A. The head brakeman of the train entering the siding.

Q. When the train pulls out of the station after the meet or pass has been accomplished, is the switch again lined up for the main line?

A. Yes, by the rear brakeman of the train leaving the siding.

Q. After a train has taken siding and while it is waiting, is the switch which it has used to enter that siding lined up for the main line?

A. Yes, the rear brakeman of the train taking siding does that also.

Q. When the train leaves the siding to return to the main [fol. 3207] line, does the head brakeman throw the switch for it?

A. That is right.

Q. Can these switches be thrown by these brakemen while they remain on the train or must they get off the train for that purpose?

A. They have to get off the trains to do that.

Q. Do they get off the trains while the trains are moving?

A. Yes.

Q. And climb on the trains again after the trains have started?

A. That is right.

Q. With reference to the actual chart again, I notice that some of these lines, for example, the line indicating the movement of train No. 901 at the top of the chart extends only from Wellton to Yuma. What does that indicate?

A. 901 is the Phoenix line local coming on to the Yuma-Gila line at Wellton and moving from Wellton into Yuma on the Yuma-Gila line.

Q. I notice that there are certain lines down toward the center of the chart which appear to begin at Picacho and extend only between Picacho and Tucson or from Picacho eastward. Is there a similar explanation in their case?

A. Yes, those are the trains operating between Tucson [fol. 3208] and Phoenix which use the line from Picacho into Tucson.

Q. For example, passenger train No. 2 apparently has no progress west of Picacho on the chart but is shown as extending from Picacho eastward?

A. That is right.

The Court: We will take our morning recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows.)

Mr. Mason:

Q. Mr. Sines, I will ask you whether the incidental delays which occurred to individual trains in actual operation are indicated on the diagram of the actual showing here,

for example, those due to flagging of blocks or engine failure or whatever may have happened?

A. That is right.

Q. Are those incidental delays indicated on the redispatched chart as having been assigned to a particular train or group of trains about the same time and in the same locality?

A. They are.

Q. That is the method pursued by you throughout the redispatch?

A. That is right.

Q. This is a sample of the method pursued throughout [fol. 3209] the redispatch?

A. Exactly.

Q. I take it also that, generally speaking, the freight trains operated on the redispatch side of the chart had more cars per train than those on the actual side?

A. That is right.

Q. And the length of those trains is shown by the underlying documents, the train sheets and the white work sheets A which have been furnished to Mr. Strouss and are now in his possession?

A. That is right.

Q. Is it possible from this chart to count the number of trains in the district, for example, between Yuma and Gila?

A. Yes.

Q. Have you made that count?

A. Yes, I have.

Q. How many trains are shown on the actual here as operated between Yuma and Gila in both directions during the twenty-four-hour period?

A. Counting them in the same manner that we counted them for the tabulation at the bottom, we have ten trains eastbound.

Q. Are you counting freight trains only?

A. No, I counted passenger trains also, thirteen trains [fol. 3210] westbound in the actual operation. I should make this observation, too. A moment ago I mentioned that we made an arbitrary rule to follow in counting these trains and I described how we confined that count to trains only leaving terminals between midnight and midnight. With respect to these trains that operated to Phoenix and which appear at Wellton and again at Picacho and which

operated through Douglas and which appear at Mescal and Anapra, we eliminated those trains also; so that we have in our count only those trains operated on the main line between Yuma and El Paso via Bowie and Gila and departing from terminals between midnight and midnight. The count that I just made between Yuma and Gila was made in that manner.

Q. And does not include the trains between Yuma and Wellton at all if they operated only that distance?

A. No.

Q. I take it that your total includes passenger trains as well as freight trains both on the exhibit itself and as stated by you for the Yuma-Gila district?

A. Yes.

Q. Counted in the same manner?

[fol. 3211] A. Yes.

Q. How many meets and passes were made in actual operation between Yuma and Gila?

A. In actual operation I make it forty-three meets and passes between Yuma but not including meets indicated at Gila.

Q. That is giving to each meet or pass its value as indicated by the adjoining figure or the value of one if no figure is shown?

A. Yes.

[fol. 3212] Q. Now, will you count the number of trains operated between Yuma and Gila as shown by the redispatch chart?

A. Eight trains eastward. Seven trains westward.

Q. And how many meets and passes between Yuma and Gila in redispatched operations?

A. Eighteen.

Q. Counted in the same manner?

A. Yes. I would like to check this at my leisure and would like to correct the record if I have made any errors.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss, before we pass to the next one?

Mr. Strouss: Not at this time.

Mr. Mason: Mr. Sines, I will ask you to refer to an exhibit in two sheets, entitled "Year 1938, Yuma, Arizona,

to El Paso, Texas, via Gila and Lordsburg, Estimated Number of Meets and Passes Eliminated by Long Train Operation."

A. Yes.

Mr. Mason: May this exhibit be marked Exhibit 221 for identification.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 221 for identifica-
[fol. 3213] tion.

Mr. Mason: Did you prepare Exhibit No. 221 for identification, Mr. Sines?

A. It was prepared under my direction and I have checked it, and it is correct.

Q. Now, from what sources did you take the information shown on the first sheet in the block headed "Actual?"

A. That is taken from the actual train sheets and the count of trains in columns A and B is made in the same manner as the count which I have previously described with Exhibit 220.

Q. And where do you get the figures in column D under the heading "Actual?"

A. That comes from the sheet 2 of this exhibit and are figures read off of the chart.

Q. Then, in order to get the showing on sheet 1, you first must go to the showing on sheet 2, is that correct?

A. Yes.

Q. Will you then explain what you have done on sheet 2?

A. Yes. The first thing we did was to make a count of trains and meets and passes in a manner exactly similar to that which I have just described in connection with Exhibit
[fol. 3214] 220 for the days indicated on the chart, those days being August 17, August first, June first, June second, June twenty-third, June fourteenth and June eighteenth, 1938. The number of trains operated those days are indicated at the top of sheet 2, and the number of meets and passes are shown alongside.

Q. Is this based upon the actual trains operated?

A. Yes, that count is from the actual train sheets in all instances, rather, that data is taken from the actual train sheet in all instances.

Q. Do I understand then you took the actual train sheet for the dates in 1938 which are indicated on sheet 2 and counted from the train sheets the number of trains in ac-

cordance with the method that you used and explained on Exhibit 220?

A. Yes.

Q. And also counted the number of meets and passes made by these trains in the district between Yuma and El Paso via Gila and Lordsburg?

A. Yes.

Q. And then plotted the points indicated by the dates to scale on this scale, is that correct?

A. That is right.

Q. Now, what does the figure at the top of sheet 2 "41" [fol. 3215] indicate? Is that the number of trains on August first?

A. That is August 17th, directly above the point August 17th.

Q. And that is plotted according to the scale at the foot of the sheet, is it?

A. Yes.

Q. Then what does the figure "74" indicate?

A. The number of meets and passes which occurred on August 17th.

Q. As represented by the actual train sheets?

A. Yes.

Q. That is plotted according to scale on the righthand side of the sheet?

A. That is right.

Q. Then, each of these other figures or pair of figures at the top of the sheet may be read down to its corresponding date, is that correct, to a plotted point?

A. That is right.

Q. Then, having plotted these points on a scale of this kind, what was the next step?

A. We then computed the probable path of a line drawn through or near those points and determined the equation of the line which is indicated in the block in the middle of the chart.

Q. Is the plotting of the equation of the line, having given [fol. 3216] a sufficient number of points to determine its course, a common and ordinary problem in analytical geometry?

A. Yes, sir.

Q. And is that the problem which you undertook to solve here?

A. That is right.

Q. And did you obtain the equation which would obtain the course of this line?

A. That is right, the equation.

Q. Will you read the equation, please?

A. The equation indicated in the center of the chart reading "M equals 0.042946 T to the 1.925 power," where M equals the number of meets and there should be added "and passes", and T equals the number of trains.

Q. Now, what use can you make of this curve as determining the number of meets and passes which will occur on the district between Yuma and El Paso via Gila and Lordsburg?

A. By means of this curve and given the number of trains operated on any particular day, it is possible to determine quite accurately in the average aspect the number of meets and passes which will probably occur.

Q. Now, what use did you make of the curve and the [fol. 3217] equation on sheet 2 then in plotting and making the showing on sheet 1?

A. We then proceeded to count the number of freight and passenger trains which had actually been operated between Yuma and El Paso on the first and fifteenth day of each of the twelve months of 1938. The results of that count are shown in columns A, B and C.

Q. And then how did you compute the figures in column D?

A. Then, taking the total shown in column C we go into the chart on sheet 2 and above the number of trains indicated in column C we find the point where the line crosses that number of trains and then go to the right to read the probable number of meets and passes.

Q. For example, to get the figure for January first, you plot the point at which the total number of trains falls on the scale of number of trains?

A. Yes.

Q. And then read the point at which the curve for the number of trains corresponds with that shown for January first across the scale of the number of meets and passes?

A. Yes, sir.

[fol. 3218] Q. Did you do that for each of the other 23 days shown for 1938 on sheet 1?

A. We did.

Q. How do you get the figure shown in column E for each of these days?

A. Column E is the figure in column A reduced by the percentage indicated at the head of the column.

Q. Where do you get the percentage indicated at the head of the column?

A. That comes from the block at the foot of the sheet and is derived from the number of trains actually operated and the number of trains operated on the redispatch in those four territories for the month of June and August, 1938. There is a blank showing for the exhibit, and I rearranged the order of my exhibits the other day, and I now find that the exhibit indicated is going to follow Exhibit 221 instead of preceding Exhibit 221.

Q. Your exhibit No. 214 contains the showing as to some of these districts?

A. It does as far as Lordsburg, but for the territory Lordsburg to El Paso Exhibit 214 includes several short El Paso Strauss turnaround trains which I didn't use in making this percentage computation.

[fol. 3219] Q. Are those the El Paso-Strauss turnarounds mentioned in the testimony of Mr. Herrell?

A. Yes. Some were operated in actual performance, but we operated more on redispatch.

Q. Well, I take it that the total figures in the lower block on Exhibit 221 for identification, may also be checked against the train sheets?

A. That is right.

Q. And the white work sheets A?

A. Yes.

Q. And the exhibit which you speak of which is to be introduced following Exhibit 221 for identification is likewise predicated upon the train sheets and white work sheets A?

A. That is right.

Q. You derive a ratio between the actual train and the redispatched train as shown by the actual train sheets and the redispatched train sheets for the entire territory covered, did you?

A. Yes.

Q. And that is the ratio of percentage which you used in obtaining the figure in column E?

A. That is right.

Q. Now, did you make any similar reduction in obtaining the total of redispatched passenger train, column F?

[fol. 3220] A. No, they were left the same. This percentage reduction applies to freight trains only.

Q. If there were any fewer trains operated, fewer passenger trains operated under this redispatching study, that has not been carried into this showing?

A. That has not been taken account of here.

Q. Now, to obtain the figures in column H, did you follow the same process as in obtaining the figures in column D?

A. That is right.

Q. By the use of the curve on the second sheet?

A. That is right.

Q. Now, as to the recapitulation, is that simply an addition of the figures appearing in the columns above?

A. Yes.

Q. Plus the multiplication to expand the showing for the annual bases?

A. Yes.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: Yes. Mr. Sines, how did you determine the days that you used on page 2?

A. Those were selected to give us as big a range as possible by which to locate the course of the line. It wouldn't [fol. 3221] have done, for instance, to select days which would give a group of points immediately in the middle of the chart. We took a peak day, the peak day of 1938, June 18th, then went to August, which we know is the lightest month of 1938, and picked one of the lightest days in August, which is August first, in order to get a point way down on the curve.

Q. Now, then, column A on sheet 1, how did you arrive at that figure?

A. That is a count of freight trains from the actual train sheets made in the same way that we made the count of trains for the date as shown on sheet 2 of this exhibit, and also, as I have described in connection with Exhibit 229.

Q. Well, in other words, this is an actual count of trains operated on the day indicated, counting a train for each division through which it passes?

A. Yes.

Q. Then, passenger trains in column B, that would be the same?

A. The same.

Q. Now, then, column D is the application of the formula that you arrive at on page 2 to the totals shown under column C?

[fol. 3222] A. That is right.

Q. To arrive at what you denote as the probable meets and passes?

A. Yes.

Q. Now, the figure shown in column E, how did you arrive at that? I didn't quite understand that.

A. Well, by the tabulation at the foot of the sheet, I determined that the ratio of actual trains to redispatched trains was as 100 per cent is to 72.30 per cent, actual against redispatch, and that is again in its average aspect because we have June and August in there, so I applied that 72.3 against the count which I had previously made in column A.

Q. And by that arrived at the figures shown in column E., That would again be the probable number of freight trains operating in the redispatch?

A. Yes, that is right. Excuse me now. As the probable number of trains that would have been operated had we conducted a redispatching study on every one of those days.

Q. Now, the passenger trains, there is no change from the actual, is there?

A. No.

[fol. 3223] Q. Then column G is the total?

A. Yes.

Q. And column H, using that total in your formula, you arrive at what you term the probable number of meets and passes on redispatch?

A. Yes.

The Court: Your redispatching study didn't cover, though, all of the year 1938?

Mr. Strouss: No, June and August, wasn't it?

A. No, our redispatching study just covered two months of 1938, June and August.

The Court: Pardon me, then where do you arrive at these figures out here in the redispatch columns E and F for the ten months not covered by your redispatching study?

A. By applying the ratio of percentage there, 72.3. In the beginning, when I first described this redispatching

study, I said that we have chosen the months of June and August, 1938, because June is a peak month and August is the month of lightest traffic, and the results from that selection would reasonably give us a cross-section of operations for the year 1938. Now this 72.3 is taken from that, is taken from the maximum and minimum months, and I have applied it against the entire year.

[fol. 3234] Mr. Mason: 72.3 represents the number of trains operated during the two months of June and August on the redispatching study assigning a value of 100 to the number of trains actually operated during the months of June and August, does it?

A. That is right.

Q. So that, taking June and August as a cross-section of the year, you may fairly assume that the entire year's trains will be reduced in the same proportion?

A. Yes.

Q. Is that what you have done here?

A. That is right.

Mr. Mason: Have you any other questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Has the Court any other questions?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as Exhibit No. 221.

Mr. Strouss: The same objection as to the previous exhibits, as irrelevant and immaterial, calls for the conclusion of the witness, assumes facts not in evidence and purely speculative.

Mr. Mason: As to the assumption of facts not in evidence, [fol. 3225] I take it, your objection is not because the exhibit has not yet been introduced, because the train sheets, the actual and redispatch, and the white work sheets A, really form the foundation of the computation as to the number of trains, and those are in your possession, but as to the exhibit, that will be introduced.

Mr. Strouss: No.

The Court: Well, I will hear you on that, Mr. Mason. I am inclined to think the objection is good to this particular exhibit.

Mr. Mason: Your Honor, I think if the exhibit is understood, that the objection is no more tenable than the objection made to prior exhibits.

The Court: I might shorten this up—I don't know that you need to take this in the record unless you want to. It seems to me that we are rather building an inference upon an inference here.

Mr. Mason: I don't think it goes to that end. We are applying a mathematical formula to facts which we know. First of all, the formula itself is derived from the actual operations, and does not depend to any extent nor in any degree upon any redispatched operations; the formula is simply the derivation from the plotting of points which [fol. 3226] relate entirely to actual operations. Mr. Sines, as he explained in his testimony, selected altogether nine dates during the months of August and June of 1938, counted the trains operated on those dates, and from the actual train sheets counted the number of meets and passes which were made by those trains; then plotted those points on a chart, and then from the location of those points was ably, by the use of rather common mathematical process, to determine a curve which would pass through those points or so close to them as to indicate that it was the curve upon which those points would be located. Then, having located that curve and determined its equation, we proceed to the redispatching study. Now, the redispatching study shows for the two months which are representative of the year, the actual number of trains operated and the number of trains necessary to be operated to carry the same traffic without the restriction.

The Court: It seems to me, Mr. Mason, that that is the weakness in your link here.

Mr. Mason: Well, if the redispatching study is admissible or, let us say, for example, and I don't think there is any question about it, that Exhibit 220 is admissible as [fol. 3227] showing how trains did operate and how trains would be operated or were operated on the redispatching study by the same dispatchers, and it seems to us there can be no question as to that, then it is equally proper to take the work of those dispatcher as showing the number of trains actually operated during the entire two months' period and the reduction of those trains which would be accomplished, reduction in their number, I mean, which would be accomplished by operating free of the restriction. That is to say, that you can find out if you were operating 27.7 per cent less trains—that is not exactly the figure—but you would operate 72 trains, let us say, where before

you had operated 100 trains. The redispatching study shows that just as concretely as it makes the showing on the exhibit 220, which indicates that during the days there were operated 89 trains and under the redispatched operations there would have been operated 68 trains. Now, if we show during those two months we operated 100 trains and under the redispatched we would have operated 72, then taking those two months as representative of the year, we can expand that showing for the entire year and say that for the year, because the two months are representative, 72 trains would have been operated under long-train operation as compared to 100 trains operated under short-train operation, or, as the exhibit shows, as the train sheets show, 2,968 trains were operated during the two months actually, and without the law 2146 would have been operated. If the showing for the two months is representative of the years shown, it is representative for the purpose of obtaining a comparison of the number of trains to be operated during the entire year; and then it is only necessary to indicate the number of trains which would have been operated for each day, because the same ratio by and large will hold for the year, and every day of the year. It may be that more than the 72 trains operated would have been run on January first, but it is equally likely that the variation from 72 per cent would iron out when you take 24 days, or, especially, when you take the entire year. The purpose of the exhibit is not to show, necessarily, that exactly this number of meets and passes would have taken place either actually or with the lesser number of trains, but substantially what the proportion and the reduction would be. We know that the reduction would occur in accordance with the equation. The only thing necessary to do is to associate it with a series of days in order to obtain [fol. 3229] a cross-section of the year. This undertakes to show 24 days of the entire year. I can't see that it is building inference on inference, it is rather using a cross section of the year for the purpose of obtaining a result. We agree that it is possible that with the redispatched operation there would be more than 1,711 meets and passes for the 24 days, or more than that number expanded by 15.2 per cent for the entire year, and it might well be less, but it will vary very little from that figure, and certainly the relationship as between actual operation and redispatching operation is going to persist, because the mathematical formula used is

unquestionable. There cannot be any dispute as to that. Another mathematician of equal or greater competency than Mr. Sines would arrive at the same result, would arrive at the same curve, and would solve it in the same way, and the equation is not in any sense a speculation.

Mr. Strouss: I think the Court has stated my position entirely. Mr. Mason has shown the soundness of the objection. His whole argument is an argument of "ifs." This is purely a speculative proposition, taking trains which are shown by the actual and having two months of operation, [fol. 3230] then from that build up the year, assuming first the number of trains will be run in the redispatch, then having assumed that they assume that the meets and passes would occur; it is an assumption all the way through, and on top of that, of course, in order to build up through the year, they have to assume that the operating conditions would be the same all year around. If there was ever a case of evidence that is speculative, this is it.

Mr. Mason: In a sense, the redispatching study is predicated, of course, upon the assumption of a condition which, as we know, does not exist. It is predicated on the assumption that the law is inoperative and set aside.

The Court: So far as your redispatching study is concerned, the Court has ruled with the defendant. In that, the Court felt that you laid the proper foundation; you showed by experienced, skilled men who have spent months in these operations, and after all these various factors had been taken into consideration in these assumed operations, and in order to permit you to make the comparison the Court admitted in evidence the redispatching studies. But now, it seems to me, and I am not finding fault with the exhibit on account of a mathematical calculation involving [fol. 3231] the well-known principles of mathematics, even though it gets up into the higher realm, into trigonometry to do it, but, as Mr. Strouss has stated, it seems to me it is predicated upon too many "ifs" and too many different assumptions to make it of very much value. It seems to me it is highly speculative. The Court will sustain the objection to it.

Mr. Mason: I take it that the objection was principally because of the showing as expanded to the year by the application of the same ratio.

The Court: I think that is one of your weakest points.

Mr. Mason: That is probably the only point of the objection; there hasn't seemed to be any serious question, I don't think there has been any serious question by Mr. Strouss that the two months are representative of the year. We can show the ratio, of course, that the two months' traffic bears to the entire year. The point is this, a study of this kind could be made and restricted, if you will, to the two months, June and August, 1938, and escape the principal ground upon which the objection was made.

The Court: We will cross that bridge when we get to it.

Mr. Mason: We might make that study because I think [fol. 3232] it would be informative. There is no way of disputing the fact that with an increasing number of trains, meets and passes will increase and they will increase out of proportion. No one questions that seriously, I don't Mr. Strouss does. Again I suggest also that Sheet 2 of this exhibit which contains the derivation of the formula and which is based upon actual observations, observations of the actual operations and not in any sense upon the redispatch, is not open to the objection made and might well be received even though the conclusions on the first sheet are subject to the objection.

The Court: Well, of course, the exhibit was offered as a whole.

Mr. Mason: That is correct.

Mr. Strouss: I can't see where there would be any materiality to the second sheet.

The Court: The second sheet forms the basis for the data contained on the first sheet.

Mr. Mason: I take it that the second sheet in and of itself would still show, and I think it is very material to the case because the more meets and passes the more interference, and as our answer alleges, the more meets and passes the more hazards because men getting on and off trains to open [fol. 3233] and close switches must run to catch up with their train and must run ahead of the train.

The Court: There is nothing before the Court, Mr. Mason. It is so near the noon hour, we will take our noon recess at this time.

(Thereupon, at twelve o'clock M. the court stood at recess until two o'clock P. M. this day.)

[fol. 3234] 2 P.M., January 29, 1941.

All parties being present as heretofore noted, proceedings were resumed as follows:

B. S. Sixes resumed the witness stand.

The Court: You may proceed.

Mr. Mason:

Q. Mr. Sines, have you before you a chart in one sheet entitled, "Yuma, Arizona-El Paso, Texas, Via Gila and Lordsburg, Locomotive Requirements for Long Train Operation, June 16th to 20th, 1938"?

A. I have.

Mr. Mason: May this be marked exhibit No. 222 for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 222 for identification.

Mr. Mason:

Q. From what source was this exhibit prepared?

A. This was taken from the redispatch train sheets.

Q. For what period?

A. For the period June 16th to June 20th, 1938.

Q. Why did you take that period?

A. That is the maximum five-day traffic period during [fol. 3235] June, 1938.

Q. What is the purpose of exhibit No. 222?

A. The purpose is to determine the minimum number of locomotives which will be required to fulfill the locomotive requirements developed by the redispatching study.

Q. Is it to obtain the figure of the minimum number of locomotives of the type contemplated for the redispatching study required to handle the maximum day's or maximum volume of traffic during the redispatching period.

A. Yes.

Q. Did you prior to the start of the actual work of redispatching have any discussion at your conferences with respect to locomotive requirements?

A. Yes.

Q. Did you reach any conclusion as to the probable number of locomotives which would be required to carry out the plan as then contemplated?

A. Yes, as a result of those discussions I estimated we would require thirty AC-8 locomotives to fulfill the requirements for the road locomotives. That was based upon actual performance of 1938 when we were running eight or nine trains in each direction daily, and I estimated [fol. 3236] that removal of the restriction of the 70-car limit law would permit us to reduce the movement of eight or nine trains to approximately six trains per day in each direction.

Q. Over each subdivision?

A. Yes, and then considering the distance from the terminals through which those locomotives would operate it was apparent we would need about five times those six locomotives in order to man the service and that gave me the total of thirty.

Mr. Booth: You said "ave times six locomotives." You mean five times the six trains, don't you?

A. That is right.

Mr. Mason:

Q. Was the study represented by exhibit No. 222 undertaken after the redispatching study was completed?

A. Yes.

Q. What were you undertaking to ascertain by this study?

A. What the absolute minimum requirement would be under that thirty. When I started the redispatching party of dispatchers that worked at Los Angeles at the beginning of the study, I gave them instructions relative to thirty AC-8 locomotives.

Q. Did you tell them they would have thirty AC-8 loco- [fol. 3237] motives in the pool for the main freight line between Yuma and El Paso?

A. That is the number I was figuring on tentatively although I expected to reduce that a little bit, but I did not want them to take the time and effort to redispatch the locomotives for the entire sixty days. I intended to take the train redispatching for the maximum period such as this, the five days between June 16th and June 20th, and assign locomotives to the trains as the requirements ap-

peared during that peak period after their redispatching study was completed.

Q. Could you by a study of the peak period determine the number of locomotives required for any other day during the period?

A. Do you mean for any other day other than the peak period?

Q. Perhaps I should reframe the question. Would the determination of the minimum number required for the peak period of traffic also constitute a determination of the number required for any other day during the two months' period studied?

A. Yes, if we found that a certain number of locomotives were able to move the trains during the peak period, surely that same number of locomotives would move a lesser number of trains.

[fol. 3238] Q. In your redispatching study, how did you contemplate that the locomotives assigned as train locomotives would be operated, that is, into and out of terminals and with respect to time at terminals?

A. For the purposes of this chart I figured that the locomotives would operate on the first-in-first-out basis and provided in all instances that there would be standby locomotives to man the services. It was possible to do that, I say in all instances with the exception of very short periods which will appear later and to which I will call attention. When I say first in and first out, I mean taking a terminal like El Paso where there would be several locomotives in the terminal at any time, that the locomotive that had been in there the longest or that had come in first would go out first.

Q. Did you contemplate any servicing at El Paso?

A. Yes, El Paso would be the point where the major repairs would be performed and would generally be the point where engines would be blown down and washed.

Q. Would they receive such servicing as necessary at Yuma or Tucson?

[fol. 3239] A. Yes, that same washing service would and could be performed at Tucson and Yuma also.

Q. Are you familiar with the requirements for periodical inspection of locomotives?

A. Yes, in addition to the washing which is given a locomotive after a certain number of miles has been covered

it is necessary that the engine also be given a Federal inspection at least once every thirty days.

Q. Does that take some time?

A. The engine should be out of service a minimum of twelve or fourteen hours.

Q. That is from the time it is received at the roundhouse until it leaves the roundhouse to go in service again?

A. From the time it comes into the terminal until the time it can go out again.

Q. Did your plan contemplate sufficient time at El Paso or some other terminal for the purposes of Federal inspection?

A. That is right.

Q. Is that Federal inspection performed by company employees, do you know?

A. Yes, it is performed by company employees.

Q. And a record is made of it, is it?

A. Yes.

[fol. 3240] Q. Now, will you explain just how this chart, Exhibit No. 222, is drawn? Does it purport, for example, to show the movement of locomotives?

A. It shows movement of trains and the assignment of locomotives to those trains.

Q. Is it somewhat similar to the chart which has been received in evidence as Exhibit No. 220?

A. Yes; exhibit No. 220 shows the train movements for June 18, 1938, and this chart also includes the train movements for June 18, 1938.

Q. You don't show any stops at intermediate points here?

A. No, the lines are drawn continuously from terminal to terminal except in the case of unusual occurrence, such as engine failures, and we had two during this five day period.

Q. Now, you show types of locomotives by different indications, do you?

A. Yes, both by indication and by engine type numbers written on the lines which represent the engines.

Q. Is there a particular designation for the AC type locomotive, for example?

A. The AC type locomotives is a continuous full line without any number designation at all. That is indicated by the legend in the middle of the sheet at the bottom.

[fol. 3241] Q. And what do the numbers or lettering, various phrases and numbers alongside the lines, indicate?

A. They indicate the designation of the trains to which these engines are assigned.

Q. Now, taking this solid line, I notice there is a somewhat heavier line which starts at the lefthand side of the sheet. What does that indicate?

A. I took two lines, one of them starting at the lefthand side of the sheet, and caused it to be drawn somewhat heavier than the rest of the lines merely to make it convenient to follow with the eye should we care to describe the history of that particular locomotive.

Q. Does the heavier line indicate anything more than any of the other solid lines?

A. No.

Q. It is simply for ease in following?

A. That is all.

The Court: Then you mean, Mr. Sines, that on this exhibit, taking one of your heavy lines for instance, would illustrate the movement of that particular locomotive during the five days in question?

[fol. 3242] A. That is right. I brought that heavy line up to the middle of June, 18th, and then an engine failure occurred there causing us to swap engines and trains, so I simply picked up another engine at Tucson, which was the first one ready to go, and followed that across the chart.

The Court: Well, I believe that the other day, in response to a question from Mr. Strouss, that you stated in your redispatching study that you didn't give numbers to the locomotives used, you had a pool from which you drew but no specific numbers were assigned?

A. That is right.

Q. Now, on this exhibit is a specific number assigned to the locomotive?

A. No, I still haven't assigned any specific number to the locomotive, neither do the dispatchers.

Q. But, even if a specific number is not assigned, the heavy line that we have just referred to does designate definitely a locomotive and its movements during the period covered by this exhibit?

A. Yes, with the explanation in the middle of the chart, I jumped from one engine to another.

Mr. Mason: Now, Mr. Sines, referring to this heavy [fol. 3243] line, I notice that it starts out at Lordsburg and is level; that is, it has no slope one way or the other for a considerable period. What does that indicate?

A. It means it is standing in Lordsburg awaiting service.

Q. From midnight until a later hour?

A. Yes, sir.

Q. Is this a chart of hours on the lefthand side of this chart?

A. Yes, that is a chart showing the hours, it shows a 24-hour period.

Q. The chart up and down indicates the district Yuma to El Paso?

A. Yes.

Q. According to scale?

A. Well, it is a pretty good scale.

Q. What happened to this heavy-line locomotive at 3:15 or 3:30 A. M. Thursday, June 16th?

A. He was put on a train and went to El Paso.

Q. Does the line indicate when he went to El Paso?

A. Yes, the time can be read approximately.

Q. Then the line, I notice, crosses perpendicular to the long axis of the chart down toward the foot of the chart; what does that mean?

[fol. 3244] A. That goes to the foot of the line of engines that are awaiting service.

Q. He is the last in, is he?

A. He is the last in, yes.

Q. All these lines above are engines in earlier, is that right?

A. That is right.

Q. Now, the line goes along parallel to the central axis of the chart. What does that mean?

A. That he stays in El Paso almost twenty-four hours.

Q. Does he stay in El Paso until he becomes first out?

A. That is right.

Q. How do you find out that he became first out?

A. Well, as trains leave El Paso subsequent to his arrival at El Paso, those engines that were there ahead of him are assigned to trains successively until he stands first out and he catches a train at the time indicated.

Q. Now, these lines at which these angling lines strike the line representing El Paso, represents arrivals or de-

partures of trains as the case may be, as shown by the redispatch train sheets?

[fol. 3245] A. Yes.

Q. Then your level black line at El Paso then returns to the El Paso station line at a point approximately ten A. M. on Friday, June 17th?

A. That is right.

Q. Then what happens?

A. He goes west on S. S. W. third 17.

Q. Does this angling line from El Paso to Lordsburg indicate that he is enroute during that period?

A. Yes.

Q. Then the time that the angling line strikes the station line to Lordsburg indicates his arrival at Lordsburg?

A. That is right.

Q. Then what happens?

A. Well, there is an engine available and ready for service at Lordsburg when he gets there, so they take him off to be serviced and the engine that is ready takes his train out.

Q. What happens to the locomotive represented by the heavy line?

A. He stays at Lordsburg for about four hours.

Q. Is that what you call "dropping back?"

A. Yes.

Q. And what is the effect of dropping locomotives back [fol. 3246] in that fashion?

A. That means that you have to provide more locomotives than where those engines run through.

Q. Does it mean that you generally have a locomotive available at the drop-back intermediate terminal?

A. Yes.

Q. Now, you show this same locomotive as staying at Lordsburg then until about five-thirty?

A. That is correct?

Q. Then what happens?

A. He catches a drag west going to Tucson.

Q. Now, between five-thirty, apparently, and about seven-forty-five, there is no locomotive at Lordsburg at all, is there?

A. That is right.

Q. Do I understand that where there is a locomotive line parallel with a station line, that indicates a locomotive stands at that terminal?

A. Yes, sir.

Q. If there is more than one such line, there is more than one such locomotive?

A. Yes, you can count them and that will give you the number of locomotives standing at the terminal.

Q. Do you show the progress of your locomotive with [fol. 3247] the heavy line westward toward Tucson?

A. Yes, he got as far as Benson where he was delayed for about forty minutes, and then went to Mescal where he became involved in an engine failure of another train.

Q. When was that; what time of the day?

A. About three A. M.

Q. On June 18th?

A. Yes.

Q. Now, do you show that occurrence in your chart of the movements of redispatched trains on June 18th on Exhibit 222?

A. That is right, that is on the redispatch chart on Exhibit 220.

Q. 220, yes.

A. It is also on the actual chart.

Q. There was an engine failure on the actual at Mescal, was there?

A. Yes.

Q. Shown on the chart on Exhibit 220?

A. That is right.

Q. And reproduced on the redispatch at Mescal at the same time?

A. That is right. Then we came along to determine what the locomotive requirements would be for this period, and [fol. 3248] we worked our way through that locomotive failure also.

Q. And the way you worked it through is indicated on the chart, Exhibit 222?

A. Yes, sir.

The Court: Well, was that particular locomotive withdrawn from service then during the balance of this period, June 19th to 20th?

A. Now, the locomotive failure occurred to an engine which was on Y308-309 going east, and when our engine

that we started originally at Lordsburg got to Mescal, they took that engine off the westbound drag and put it on the eastbound train, Y308-309. A helper then took our westbound drag into Tucson, and that is indicated by the dash line with the figures 5,000 under it. The locomotive which failed on Y308-309 is shown standing at Mescal until 2:10 P. M. when another drag train came along west, picked him up and pulled him into Tucson, and there is a notation there which says, "To shop," meaning that this particular engine on the redispatch went into the shop, and thereupon, for the rest of this two-and-a-half day period on this chart and also for the rest of the month we considered that that engine was out of service because that is what actually happened, the engine which failed at Mescal on June 18th [fol. 3249] at 3:00 A. M. didn't show up for service any more during June, 1938, it was in the shop at Tucson.

[fol. 3250] Mr. Mason:

Q. You mean you reproduced in the redispatch what actually occurred to the locomotive that actually failed early in the morning of June 18, 1938?

A. That is right.

Q. In order to trace the further course of the locomotive, did you pick up another AC locomotive which was standing ready for service at Tucson?

A. I might have turned back on Y-308-309 to follow the particular engine I started out with but I wanted to go over to Gila and Yuma for purposes of demonstration and illustration so I jumped up to the engine which was first out at Tucson and picked him up about 5:15. You will notice the horizontal line becomes heavy directly beneath the word "Ajo."

Q. That is another AC locomotive which you can trace from somewhere else?

A. Yes.

Q. You have only made it heavy here in order to bring it to the west of Tucson?

A. That is right.

Q. What does that locomotive do for the next few hours after you picked him up?

A. He has been at Tucson since a little before eleven P. M. the day before and he stays at Tucson until a little [fol. 3251] after eleven A. M. the next morning, when he goes out on the drag train leaving Tucson about 11:20 A. M.

Q. Where does he go?

A. He goes to Gila, drops back at Gila, catches the second train out of Gila after his arrival at Gila, and goes to Yuma. He is at Yuma five hours, catches the Colton fruit block back to Gila, drops back at Gila, catches the Y-316-317 to Tucson. He is at Tucson five hours, goes back on the GBW to Gila. He is at Gila only an hour and a half when he returns to Tucson and this time he stays at Tucson approximately nine hours before taking a train west.

Q. How can you tell that a locomotive is first out at a particular terminal?

A. By the mechanics of drawing this chart.

Q. When there are no lines between the station lines and the locomotive's own line drawn parallel to the station line?

A. Yes, that is the thing that determines whether he is first out or not.

Q. I notice at Tucson you show a number of dashed or dotted lines. What do those indicate?

A. Those indicate helper locomotives assigned to the Tucson-Dragoon territory.

[fol. 3252] Q. When those locomotives are standing still at Tucson, how is that indicated?

A. The line continues horizontally to the right.

Q. And when those locomotives are in active helper service handling or assisting trains, how is that indicated?

A. They are drawn along closely parallel to the train which they are assisting.

Q. Do you show them also returning light from the cut-off point back to Tucson?

A. Yes, they return light to Tucson in some instances and they are also shown coupling in with westbound trains at both Dragoon and Benson.

Q. I take it that the chart is entirely a time chart and does not attempt to show distances traveled by the locomotives but rather the time that they were engaged in particular services or waiting, is that correct?

A. Time is the essential element but you could compute miles off of this if you had the timetable in one hand and the chart in the other.

Q. You could figure out the locomotive miles made?

A. Yes.

Q. Could you also figure the hours enroute between ter-[fol. 3253] minals as contrasted with the hours spent in terminals awaiting service?

A. Yes.

Q. You show at the top of the chart immediately under the title the figure "27" for midnight June 17-June 18 and the figure "26" for midnight June 18-19. Are there other figures on the chart which correspond to those?

A. There are.

Q. What do they mean?

A. That is the count of the AC-8 locomotives made over twenty-four hours to indicate the number of AC-8 locomotives on that chart. The difference to which you called attention which occurs on June 18th with 27 in the morning and 26 at night is due to the fact that one of our AC locomotives has gone to the shop at Tucson and he stayed in the shop. As I have indicated heretofore, this count is also a verification of the accuracy of the chart. We start out at midnight, June 15th, June 16th, with 27 AC locomotives, that is, you can actually count them, 27 locomotives on that midnight line. Then the next midnight we can still count 27 locomotives, we get the same thing the following night and so on across the chart. In other words, [fol. 3254] we haven't picked up but we haven't lost any locomotives.

Q. You called attention to the showing of engine failure at Mesyal on the morning of June 18. Is there a showing of another engine failure on the chart on another day?

A. Yes, on June 19th in actual operation there was an engine failure at Cambray at approximately three A. M. to the engine pulling Colton block 413. We reproduced that on our redispatch train sheet and of course provided for it on this exhibit No. 222.

Q. How did you take care of C-413 and bring it to El Paso? Does the exhibit show?

A. Yes, on our redispatch operation the chief dispatcher Herrell allowed enough time for the train crew at Cambray to notify the dispatcher's office at El Paso that their engine had failed and to permit the office at El Paso to call a new engine crew and get a new engine ready and get it started west to Cambray. Its departure at El Paso is indicated about 4:30 and its movement thence to Cambray is indicated by the line with the word "light" above it. That engine got over to Cambray and about thirty minutes later towed

the dead engine and train C-413 into El Paso. That was not a serious failure, however; the engine returned to [fol. 3255] service. As I remember, that was just an air pipe that broke on that engine.

Q. You duplicated on the redispatch operation the actual failure including the actual disability that occurred to an engine in actual practice at Cambray at that time?

A. Yes. I should qualify that to this extent; I determined that it was an air pipe that broke but just when that engine went back into service at El Paso, I didn't check that.

Q. Would it be possible to make a chart of the actual engine movements from the actual train sheets during the period June 16th to June 20th, 1938, for the territory covered by exhibit No. 222 for identification?

A. Yes.

Q. Would it resemble this chart somewhat in the same manner, for example, as the actual and redispatch charts on exhibit No. 220?

A. It would look very much like it only it would have more lines on it just as the actual chart on exhibit No. 220 has more lines.

Q. I take it this showing covers only freight train locomotives and the helper locomotives used to handle those freight trains?

A. Yes.

[fol. 3256] Q. There is nothing here with reference to passenger trains or passenger locomotives?

A. No.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has your Honor any questions?

The Court: No.

Mr. Mason: We offer exhibit No. 222 in evidence.

Mr. Strouss: The same objection as made to the previous exhibits.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 222.")

Mr. Mason:

Q. Will you explain again, Mr. Sines, just how you got the actual number of AC-8 locomotives required for the maximum or heaviest day?

A. The requirement developed by this chart applies for each day of the five-day period and not only for the maximum day; but the five-day period does include our maximum day, therefore, we know that the assignment that we have here will take care of any other situation that might [fol. 3257] arise in 1938. By providing sufficient lay-over time at El Paso, Tucson, and Yuma to service and wash these engines and by providing sufficient time at Gila and Lordsburg for servicing and by having standby engines at all these terminals with the exception of the short periods, some of which we have indicated here, we determine that 27 AC-8 locomotives will have been required for the first two and one-half days and that thereafter we could have gotten along with 26 locomotives. The actual determination itself is made simply by counting the number of locomotives in service at any one time.

Q. Including those standing by at terminals?

A. Yes.

Q. And the number of locomotives in service can be determined simply by counting the number of solid lines you cross at any hour?

A. That is right. I have counted them at midnight, but that count could have been made at any other hour during the day.

Q. Does the chart show how many locomotives were standing by available at any of these terminals at any particular hour that you want to select?

A. Yes.

Q. Simply by counting the number of parallel lines? [fol. 3258] A. That is right.

Q. Were you able by means of this chart to determine the number of helper locomotives required for the purposes of the redispatching study?

A. As to that I verified the judgment of the chief dispatchers who themselves figured on the number of locomotives they would require at Gila and Estrella and San Simon and Steins. You will recall in their testimony they said that they put engines and helper crews in service as needed. Mr. Baker provided for two 5000's and one 3700 engine at Gila and two 5000's at San Simon, and when we drew this chart it appeared that Mr. Baker's helper assignments were adequate. At Tucson I determined the helper locomotives from the assignments which had been made to individual trains as they were operated

out of Tucson on the redispatching study and those locomotives bear the same relationship to the making of this assignment as do the locomotives operating out of Yuma and El Paso.

Q. Does the chart show the use of train locomotives other than the A6' class where such locomotives were used?

A. Yes, on the redispatching study, dispatcher Baker figured he would have an assignment of 3600's, those are [fol. 3259] the light 2-10-2's, operating between Yuma and Tucson to handle trains known as the Ajo drags and the TXM's. Occasionally those trains were heavier than what a 3600 would handle, however, and it was necessary to put a 4100 on the Ajo drags and the TXM's. When the redispatching train sheet indicated that dispatcher Baker had done that, we reproduced his selection on this chart. The 3600's are indicated by the dashed line. One of them is shown leaving Yuma at 6:30 P. M., and prior to 6:30 P. M. at Yuma two of them are shown standing at Yuma awaiting service.

The Court: Mr. Sines, is the ore from the mines at Yuma hauled to the smelter at Douglas, or what is the nature of that load?

A. Those are concentrates and come from Ajo, coming into our main line at Gila, not Yuma. The concentrates are handled on trains from Gila into Tucson and go to Douglas.

Mr. Mason:

Q. Have you another statement in one sheet entitled, "Locomotive Assignment, Weight and Investment, Yuma, Arizona, to El Paso, Texas"?

A. Yes.

Mr. Mason: May this statement be marked "Defendant's Exhibit No. 223" for identification?

The Court: It may be marked.

[fol. 3260] The Clerk: Defendant's exhibit No. 223 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 223?

A. I prepared a considerable part of it, it was done under my supervision. I have checked it and it is correct.

Q. From what sources did you prepare it?

A. The information under the "Actual" is taken from the mechanical department's report of locomotive assignments as of June 30th, 1938, and also from an inspection of the actual train sheets to determine the locomotives which were in service, that is, I checked the mechanical department's locomotive assignments to see that the locomotives were actually in operation between Yuma and El Paso. The information shown under the "Redispatch" comes from the exhibit previously introduced, No. 222, with an allowance of 10 per cent for shopping, and finally I made a check between the actual and the redispatch based upon the reduction in the amount of service that would be required by the redispatched assignments.

Q. When you say an increase of 10 per cent to allow for shopping, you mean you allowed more locomotives than are shown for road service on exhibit No. 222?

[fol. 3261] A. Yes.

Q. Where does that appear? In what line and what column of exhibit No. 223 for identification?

A. In line 6, column D, the number there is larger by 10 per cent than the requirement which I indicated on the previous exhibit, No. 222.

Q. Did you assign helpers as indicated by the redispatched train sheets?

A. Yes.

Q. Are they included in your column D for redispatched assignments?

A. They are, and they may be checked against exhibit No. 222 directly with respect to the Gila-Estrella helper district and the San Simon-Steins helper district. The Tucson-Dragoon helper district assignment on exhibit No. 223 is larger by three units than the requirement indicated on exhibit No. 222. This was because at other times of the month of June dispatcher Baker used engines other than what had been used during the five-day period.

Q. Having gotten the figures in columns C and D in the manner that you have explained, how did you get the figures in the recapitulation, lines 9 and following? Was that entirely by computation?

A. Yes, average light weight of locomotive and tender [fol. 3262] comes from averages I made from mechanical department's record of weight of these locomotives.

Q. Those are based upon the actual records of the mechanical department, are they?

A. Yes, and the actual assignment, column G, is a recapitulation as indicated by a check of the total; column H is a multiplication of the weight in column F by the number of units in column G. The same process is followed with respect to columns I and J. Lines 17, 18, and 19 are derived from information shown in line 16 and also the price per pound indicated in the note at the bottom of the exhibit.

Q. Where did you get that figure of the price of an AC-8 locomotive as shown in the note at the bottom of the exhibit?

A. That was an estmiate which was furnished to me by the mechanical department and it was testified to by Mr. F. E. Russell when he was here at the beginning of the trial.

Q. Is that the figure testified to by Mr. Russell on the first day of the trial?

A. Yes, sir.

Q. I take it that the computation of the price per pound is simply a division?

A. That is all.

[fol. 3263] Q. Have you checked these computations?

A. Yes.

Q. Have you checked the information in the upper block of the exhibit against the actual and redispatch train sheets in the preceding exhibits to determine its correctness?

A. I have.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has the Court any questions?

The Court: This exhibit shows, then, by the use of this heavy equipment or consolidated locomotives that in your redispatch you are able to decrease by twenty-one the number of locomotives necessary?

A. That is right.

Q. And there is an actual increase in the locomotive weight as shown in line 18?

A. Yes.

Q. And then your computation down on line 19 would indicate that your capital investment to provide these

heavier locomotives would run into the last figure shown on line 19?

A. That is right.

Mr. Mason: We offer the exhibit in evidence as defend-
[fol. 3264] ant's exhibit No. 223.

Mr. Strouss: Same objection as made to defendant's exhibit No. 221.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 223.")

[fol. 3265] Mr. Mason: Now, Mr. Sines, have you any method of checking the correctness of your computation as to the number of locomotives required for the redispatch operation?

A. Yes; for June 1938, the actual locomotive miles compiled as a part of our redispatch study for the territory Yuma to El Paso was 312,931, and for the same month of June the redispatched locomotive-miles were 214,018. This means that there was a reduction of 31.5 per cent in locomotive mileage during the month of June, actual against redispatched. The locomotives assigned to the main line between Yuma and Tucson were 69 in number, that is, 74 less the five shown between Tucson and El Paso on the south line.

Q. You say between Tucson and El Paso, you mean between Yuma and El Paso via the north line?

A. Yes, that is right, via Gila and Bowie,—will reduce the 69 by the 31.5 per cent, and we find that 47 locomotives would be required if the locomotive requirements descended in the same proportion that the locomotive-miles go down. I have actually provided 48 locomotives for that same territory on the redispatch operation, 48 being the difference between 53 and five on the south line.

[fol. 3266] Q. You have made no reduction in the number of locomotives required for the south line?

A. No, the number of trains operated were the same each day, actual and redispatched.

Q. You haven't calculated the locomotive-miles on the south line in the computation you have made in the relationship there?

A. No.

The Court: We will take our mid-afternoon recess.

(Thereupon, a short recess was taken, after which the witness B. S. Sines was recalled to the stand, and proceedings were resumed as follows:)

The Court: You may proceed.

Mr. Mason: Mr. Strouss, Mr. Sines asked me to say that he has the 1938 locomotive assignment which was used in connection with Exhibit No. 223.

Mr. Strouss: That is the one I had yesterday.

The Witness: That was November, 1940. This is the one that was used to provide part of the information on Exhibit 223.

Mr. Strouss: I think I will enjoy myself looking at the lines rather than at the figures.

Mr. Mason: Mr. Sines, have you before you an exhibit in one sheet entitled, "Tucson and Rio Grande Divisions Through Freight—Pool Service Additional Cabooses and [fol. 3267] Caboose Investment Required by Arizona Train Limit Law."

A. I have.

Mr. Mason: May we have this statement marked No. 224 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 224, for identification.

Mr. Mason: Did you prepare this exhibit, Mr. Sines?

A. It was prepared under my direction. I have checked it and it is correct.

Q. Now, from what source did you take the information shown, let us say, in column D, for these various districts?

A. That comes from the white-work sheets A, the recapitulations, which show the train miles operated in those districts for the month of June.

Q. Do you get the column G figure from the same source?

A. Yes.

Q. Where do you get the figure in column E?

A. Column E comes from a record entitled "Car Dispatcher's Record of Trainmen," also known as Form 7080.

Q. Now, how can you determine from the record of train- [fol. 3268] men the cabooses in service on a particular district?

A. Each time a crew departs and leaves a terminal, a record is made of it on this form showing the names of members of the crew and the caboose used at time of departure or arrival, and also identification of train upon which the caboose was operated. By examining the crew record for a month and counting the numb.. of cabooses that appeared thereon, it was possible to determine the total number of cabooses assigned.

Q. Generally speaking, is each assigned crew also provided with an assigned caboose?

A. Yes.

Q. Now what provision, if any, do you make for extra crews or spare cabooses, if any are required? Does your book show those too?

A. Yes, when extra crews are called, the book shows the departure of those crews and the caboose number that they used on the train.

Q. Did you from examination determine the actual number of the separate individual cabooses that were used in June on the Yuma-Gila district, for example?

A. Yes, sir.

Q. And the same way for each of the other districts?

[fol. 3269] A. That is right.

Q. Was the same process followed in August?

A. Yes.

The Court: Is a freight conductor assigned a specific caboose which he uses whenever he is on the run?

A. If he is in regular assigned service, he does have a regularly assigned caboose. That caboose stays with him sometimes for long periods.

Q. Is that true with an engineer with his locomotive?

A. No, sir; an engineer may have a succession of different engines on each run.

Mr. Mason: Now, how do you obtain the figures in column F?

A. That is the result of a mathematical computation, dividing the train-miles in column D by the number of assigned cabooses in column E, and produces the average miles per month per assigned caboose.

Q. Now, then, the figure in column G is obtained from the redispatch train sheets through the white work sheets?

A. That is right.

Q. Then, how do you proceed from that point of the ex-
[fol. 3270] hibit?

A. Using the same average number of miles per month per caboose, we determine what the caboose requirements would be for a reduced number of train miles. That is done by dividing the figures in column G by the average monthly miles in column H to produce the figure in column I. That didn't always come out even, but the next highest full number was used in putting the result in column I.

Q. In disposing of fractions then, you took the next highest whole number if you didn't have an approximate exact division, is that correct?

A. Yes.

Q. I take it that the figures in line 5 are simple additions?

A. That is right.

Q. And the division of column G by column H is for the purpose of checking the figure shown as the total in column I?

A. Yes.

Q. Did you follow the same process as to August?

A. Yes.

Q. Why did you work out the August requirements having the June requirements worked out?

A. Well, to demonstrate that there will be a reduction in
[fol. 3271] requirements in both August and June.

The Court: How do you account, Mr. Sines, for the fact that there would be such a difference between the month of June and August there as to make the saving in cabooses twenty-one for the one month, and for the other only ten?

A. The total train-miles in each month is considerably different. For instance, in line 5, we see 262,000 train-miles, for June, whereas in line 11 there are only 153,000 train-miles. Now, reducing each one of those by the same percentage will mean that the reduction for the smaller number will be smaller than the reduction for the larger number.

The Court: In other words, the business in June was far in excess of what it was in August?

A. Yes, there was 70 per cent more business in June than in August, basing that on train-miles operated.

Mr. Mason: How do you arrive at the figure of unit cost of a caboose?

A. That was the recorded cost of the last steel cabooses which we had manufactured when this exhibit was prepared.

The Court: When you say "steel caboose" you mean steel underframe?

[fol. 3272] A. No, sir, all steel construction.

Mr. Mason: Is that the type of caboose now being purchased or built by the company?

A. Yes.

Q. From what source do you take that cost figure?

A. From records of the mechanical department.

Q. I take it that in getting the final figure in line 13, you simply multiply?

A. That is right. May I add a little something to this with respect to the question a moment ago why I had shown both August and June. I wanted to be sure and to demonstrate that after I had reduced the 21 cabooses in June, leaving 56, that that number would not be smaller than the net figure left after I had reduced my August assignment.

Q. In other words, you wanted to make sure that your June assignment would still cover your August requirements?

A. Yes.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No, not at present.

Mr. Mason: Has the Court any further questions?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as defend-
[fol. 3273] ant's Exhibit No. 224.

Mr. Strouss: The same objection as to Exhibit 221 for identification.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked, "Defendant's Exhibit 224.")

Mr. Mason: Have you before you, Mr. Sines, a statement in one sheet entitled "Yuma, Arizona-El Paso, Texas, Summary of Investment Charges and Annual Charges Incident to Adoption of Long Train Operation?"

A. I have.

Mr. Mason: May we have this statement marked Exhibit 225 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 225 for identification.

Mr. Mason: Did you cause this exhibit No. 225 to be prepared, Mr. Sines?

A. Yes, I prepared some of it, and have checked it and it is correct.

Q. Are the figures shown hereon taken from preceding exhibits?

A. That is right.

Q. What is the source of the figures shown in column A [fol. 3274] for siding extensions, is that Mr. Herbert's exhibit?

A. Mr. Herbert's exhibit. I guess I could have saved some time by indexing these. Exhibit 202 shows $685,985 total increased investment in sidings.

Q. Now, where do you get the roundhouse and shop facilities, the figure in column A, is that Exhibit 205?

A. Exhibit 205 shows an increase of $453,832 in roundhouse and shop facilities.

Q. And the locomotive investment is from one of your own exhibits recently received?

A. That is right. That is from——

Q. 223?

A. Yes.

Q. And the caboose investment decrease is from exhibit 224?

A. That is right.

Q. What is the purpose of the showing in columns B and C?

A. To convert these investment figures into annual charges by applying interest and maintenance and depreciation rates.

Q. Now, first as to the item of interest, columns B and C, you show a particular figure in column B as the interest [fol. 3275] rate. Where do you get that figure?

A. Well, four per cent is a percentage rate which is a judgment figure of what we can do in getting new money nowadays, and it is on the conservative side, inasmuch as our last bond issue in 1936 was at the rate of three and three-quarters per cent, and money which we are getting on equipment trusts is at a much lower rate of interest than that.

Q. Locomotive and caboose investment would be on an equipment trust basis?

A. Yes.

Q. Now, have we any current obligations on which the interest rate is less than four per cent, well, for example, the R. F. C. borrowings?

A. Yes, just what it is I don't know, but I checked these interest rates before I used the four per cent and I know it is less than four.

Q. When you say "conservative" you mean this is a higher rate than the cost of money has been to the company for purposes of this kind in recent years?

A. Yes.

Q. If a higher rate were used here, would that increase the annual charge?

[fol. 3276] A. Yes, sir.

Q. Now, what is the source of the figures shown in column D, as the maintenance cost for sidings?

A. That is a judgment and experience figure which I draw from my own experience in the maintenance department, and which provides at the rate of ten cents per track-foot, a maintenance charge of $528 per track-mile. That $528 per track-mile compares favorably with branch line maintenance charges of $250, $300, and $400 per track mile, where I have had occasion to make studies to determine the maintenance charge per mile or per track-foot.

Q. Will you say whether or not, based upon your experience in the maintenance department, ten cents per track-foot for siding is an ample allowance or a mere average allowance?

A. Fully adequate.

Q. Now, what about the depreciation rate or maintenance rate in per cent shown in column D for the roundhouse and shop facilities?

A. That is the result of a study which was made by the valuation department at my request, and is based upon an analysis of investment and maintenance charges to account [fol. 3277] 235. The title of account 235 is "Shops and Engine Houses." The maintenance rate for the caboose investment is a figure derived from the 1938 annual report. (Addressing Mr. Strouss) I think you have the 1938 annual report.

Mr. Strouss: To the I. C. C.

A. Yes.

Mr. Mason: This figure is taken out of the 1938 annual report, is it?

A. Yes, it is a computed figure, dividing the cost of repairing our freight-car equipment, including cabooses, by the total investment in that equipment. We don't have any repair rate per caboose-mile, so I developed this percentage rate from the figures that I have described.

Q. Cabooses are maintained and repaired in the same facilities and in much the same way as freight boxcars, are they?

A. Yes.

Q. Now, where do you get the depreciation figures in columns F and G?

A. Well, the locomotive investment depreciation figure is the rate which we are charging, and shows in schedule 284 of our annual report to the Interstate Commerce Commission, as does also the figure of 3, the depreciation rate [fol. 3278] for caboose investment, in which I use the depreciation rate for freight car equipment. Again, we don't have a caboose investment depreciation rate.

Q. They are grouped with the other freight-train rolling equipment, are they?

A. Yes, in our reports to the Interstate Commerce Commission.

The Court: Well, Mr. Sines, I find difficulty in reconciling your Exhibit 225 with reference to the caboose item with your Exhibit 224. Now, on Exhibit 224 you conclude that there is an additional caboose investment required, $71,694, which item is carried forward into column A, your total investment here, but throughout on this line of caboose investment you have indicated a decrease.

A. That is right. That is probably due to my selection of words in describing the items on 224. My total says "additional cabooses and caboose investment required by Arizona Train Limit Law." Putting the reverse on that means an investment which would be saved if the law were set aside.

Mr. Mason: Do you mean that the exhibit No. 224 shows, in so far as the figure at the bottom is concerned, that is a $71,000 plus investment, which would be unnecessary and [fol. 3279] would be saved if long train operation according to your contemplated plan were followed?

A. Yes.

Q. Whereas, in the case of locomotives there would be an additional investment of $284,000 to carry out the long train operation?

A. That is right.

Q. So, one of these is a credit charge against the debit charge of the other?

A. That is right.

Q. Whichever side of the picture you chose to look at?

A. Yes, and I reversed this procedure here without thinking where it might lead to.

Mr. Mason: Does that make it clear to your Honor?

The Court: Yes.

Mr. Mason: Now, in this computation here, have you taken the reduced caboose investment as a credit against the added investment required for the other items?

A. I have. The total is the net figure. The total in the last line is in each case a net figure of the sum of the first three figures in the column minus the caboose investment figure.

Q. Do you undertake by exhibit 225 for identification to [fol. 3280] show what the annual increased charges would be incident to the changes in investment required if the law were set aside and the company were to operate as contemplated by the redispatching study?

A. Exactly.

Q. And this amount indicated as the net annual increase in charges would be an offset against whatever money the company might save as operating charges or otherwise, if it operated long trains according to the plan that you have outlined?

A. Yes.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Has the Court any questions?

The Court: I think not.

Mr. Mason: We offer the exhibit as No. 225.

Mr. Strouss: The same objection as to the previous exhibit.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 225.")

Mr. Mason: Have you a statement before you, Mr. Sines, in two sheets entitled, "Redispatch Study—Operating Sta-
[fol. 3281] tistics, Yuma, Arizona, to El Paso, Texas, Excluding Phoenix Line for Period June and August, 1930?"

A. I have.

Mr. Mason: May we have this statement marked No. 226 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 226 for identification.

Mr. Mason: Did you prepare Exhibit No. 226, Mr. Sines?

A. It was prepared under my direction. I have checked it, and it is correct.

Q. I take it that it has been checked several times?

A. That is right.

Q. From what sources?

A. From the white work sheets A.

Q. Does that go back to the original and redispatch train sheets?

A. Yes, the white work sheets are recapitulations of the actual and redispatch train sheets.

Q. What is the grouping of districts; what is the purpose of that?

A. To analyze the results of the redispatching study for for the territory, Yuma to El Paso via Gila and Bowie, set-
[fol. 3282] ting those results up by individual freight train districts, then to show the results on the south line between El Paso and Tucson via Douglas, show the total on the south line, bring the total north and south lines together, show what the changes are in percentages, and, finally, to expand the changes to an annual basis.

[fol. 3283] Q. I take it that the designation "North Line" as used here means the main freight line via Gila and Lordsburg?

A. That is right.

Q. And the term "South Line" as we have been using it throughout these proceedings is the line via Douglas?

A. Right.

Q. You show on the face of sheet No. 1, particularly in columns E and F certain note references, and F note one of those is carried in other columns. Are those explained on the second sheet?

A. Yes, the second sheet contains those note references and also the derivation of the percentage used in the subdivision XIII at the bottom of sheet No. 1.

Q. The ratio shown in subdivison XIII of the exhibit is derived by taking the actual operations for the two months and the actual operations for the year and comparing them?

A. Yes.

Q. And is used solely for the purpose of indicating what the redispatching study develops for two months carried to an annual basis?

A. That is right.

Q. It does not enter into the computations otherwise [fol. 3284] on the sheet, does it?

A. No.

Q. In obtaining these figures of number of trains, are these by an actual train count?

A. That is right.

Q. And the train-miles are likewise from an actual count of the figures for each train as they appear on the white work sheets A?

A. Yes.

Q. What about the other locomotive-miles?

A. For every train-mile there must be at least one locomotive-mile, but in addition to that one locomotive-mile per train mile there will be helper-miles, helpers returning light, light engine movements, double-header engine movements, which go to make up the total locomotive mileage in any district. You will see by checking that the figures in column D are the sums of the figures in the preceding two columns.

Q. When you speak of "saving for period," do you mean just the two months, June and August, 1938?

A. That is right.

Q. Are those, generally speaking, the differences between the actual figures and the redispatch figures?

[fol. 3285] A. They are.

Q. When you get over to the number of cars, have you made an actual car count of the cars handled on the actual trains and the cars handled on the redispatched trains?

A. Yes, those are the cars accounted for on the actual and redispatch studies and consist of the count made of the trains entering the terminals. For instance, the first count

is made of trains entering Gila. Some point had to be chosen to make the count, and we arbitrarily selected the arriving terminal.

Q. That would be of eastward trains, I take it?

A. Yes.

Q. Westward you would count the trains as they entered what terminal?

A. Yuma?

Q. Between Yuma and Gila?

A. That is right.

Q. Referring to column E, how did you get at the number of cars, is that an accurate count of the cars as they were handled?

A. That is the number of cars that entered Gila eastward and Yuma westward added together.

Q. You explain by reference to note No. 1 on sheet No. 2 just what this difference between the cars handled amounts [fol. 3286] to and how it came about?

A. Yes.

Q. How do you arrive at the figure in column F? Is that a division in column E by the corresponding figure in column A?

A. It is.

Q. Except, of course, as to the saving for the period?

A. Yes, that has to be a difference.

Q. Is the same process gone through with in blocks 1, 2, 3, and 4 that you have indicated for block 1 in these last few questions?

A. That is right.

Q. Going to block 5, will you explain the "turnaround trains"?

A. In actual operation during June and August there were a number of turnaround trains operated which are indicated in column A, but on the redispatch operation there were a large number operated. Turnaround trains operated from El Paso to Strauss usually with an even one hundred cars. They set those cars out at Strauss and return with a light engine and caboose to El Paso. In counting the number of turnaround trains, the movement west was counted as one train and the movement east was counted as one train, so that a roundtrip of this turnaround train was [fol. 3287] counted as two trains in column A, but in column E we only have deliveries being made at Strauss on the westward leg of each of these trips and in order not to lead

to any misconception, when we computed the average in column F we didn't take the sum of westward trains and the sum of eastward trains, one train of 100 cars and the other of no cars and get an average of fifty, but we have shown the number handled on the westbound leg of the trip.

Q. Does this El Paso-Strauss turnaround operation enter into the averages that are shown under the heading in block 6, "Cars per Train," column F?

A. No, and their absence is indicated by note No. 6 on sheet No. 2 which says, "Average cars per train computed, omitting El Paso-Strauss turnaround trains and cars handled by those trains."

Q. Going to the South Line block, blocks VII, VIII, and IX, Mr. Sines, you show, for example, that there were more cars handled in redispatch than there were in actual operation, is that correct?

A. Yes, we took trains off the North Line, we took empty cars off the North Line and sent them through Douglas both eastward and westward.

[fol. 3288] The Court: The same explanation applies to this as to what you have already testified heretofore?

A. Yes, sir.

Mr. Mason:

Q. This is simply a grouping in one place showing operating statistics derived from the redispatched train sheets and white work sheets A?

A. That is right.

Q. Is the entire exhibit brought to one total in block XI.

A. Yes.

Q. And that again is explained as to the totals and averages in column F by note No. 11?

A. That is right.

Q. These percentages in block XII, are those computations from the figures immediately preceding in block XI?

A. Yes, and are capable of check from the face of the exhibit.

Q. I wish you would go to the block on sheet No. 2 of the exhibit, "Derivation of Ratio." How did you determine the gross ton-miles for the months of June and August?

A. That is from information regularly compiled by our accounting department in connection with statistics that [fol. 3289] appear on form 521. 521 is not broken up into

these particular districts, however, so I went back of the form 521 in that regard but they are figures regularly compiled.

Q. These are figures from the same sources as form the basis for the forms 521?

A. Yes.

Q. Are they kept by months?

A. Yes.

Q. They are computed for those districts, I take it, from the conductors' wheel reports?

A. Those are the basic records, yes.

Q. Of course, the same source would give you the figures for the entire year 1938?

A. Yes, sir.

Q. What does the percentage figure at the foot of the block, "Derivation of Ratio," represent?

A. That represents the percentage that the business handled during June and August bears to the total business handled during the year 1938.

The Court: Those are actual figures?

A. Yes, sir.

Mr. Mason:

Q. This is business actually handled and moved over the line in the year 1938 for the two months referred to?

[fol. 3290] A. That is right.

Q. What use do you make of that ratio that you thus developed?

A. I expend the results obtained during June and August, 1938, to indicate what the figures would be on an annual basis.

Q. That is somewhat similar to multiplying the two months' figure by six to get a twelve-month figure except you have used a different multiplier?

A. We have done that, one sixth would be 16.67 per cent and it happened that in 1938 the business for those two months was 17.89.

Q. Is this the same method of expanding to an annual basis that has been used in the previous redispatch studies in the first Arizona case and the Nevada Train Limit case?

A. Yes, the first Arizona case had three months and they expanded their three months to an annual basis; the Nevada case had two months and we expanded those two months

to an annual basis. This study has two months, and I hereby expand those two months to an annual basis.

Q. Would you say, Mr. Sines, basing your answer upon your experience in connection with this and the prior Nevada case and other cases and matters in which you have [fol. 3291] made studies and your general experience in the Bureau of Transportation Research, whether this expansion of a cross-section of a year to an annual basis by this method represents a fair method of arriving at the total for the year?

A. It does.

Mr. Strouss: I object to that as calling for a conclusion.

Mr. Mason: I based it upon his experience, your Honor, and I think he is fully qualified in that respect.

Mr. Strouss: Whether he has used a fair method or not, I think is objectionable.

The Court: The objection will be sustained.

Mr. Strouss: I move the answer be stricken.

The Court: It may be stricken.

Mr. Mason: I take it that the objection being sustained the question and answer are of no significance in the record. Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Has your Honor any questions?

The Court: No.

Mr. Mason: We offer the exhibit as defendant's exhibit No. 226.

Mr. Strouss: The same objection as made to exhibit No. [fol. 3292] 221 for identification.

The Court: I will hear you on one phase of that. It seems to me that the Court to be consistent with the ruling made on exhibit No. 221 that possibly the last block, block XIII, might be objectionable. However, there may be a distinction there between the principle governing the two exhibits and I will hear you on it. I am going to overrule the objection as to the first twelve blocks of the exhibit.

Mr. Mason: Your Honor, I think perhaps some distinction can be observed between the two. The showing on exhibit No. 221 for identification was simply taken by months for two days of each month for a twenty-four-day showing and then expanded to an annual basis after being averaged. Here, the two months, it has been testified, are the high and low months of the year, and they have been testified to

without objection to be representative months of the entire years. In order to obtain an annual figure which will have some significance, and I may say that it doesn't make a great deal of difference except for the purpose of obtaining some fairly accurate result whether you take a multiplier of six or a multiplier represented by one hundred divided by 17.89 or what multiplier you wish to take, but there must [fol. 3293] be some multiplier taken to expand two months' showing to indicate an annual result. Now, it seems to us, and the witness testified that he had taken the gross ton-miles, which, of course, represent the total tonnage hauled over the district during the two months and during the twelve months. It is certainly reasonable and certainly fair to assume that if in the two months' period studied approximately 18 per cent of the year's business was handled, then the number of actual trains operated in the course of a year would be in the proportion of eighteen to one hundred, or rather, one hundred to eighteen, approximately, and that in the same way if the business was handled in the redispatch study for those two months in 2,498 trains, in the course of a year the figure representing the total business handled would be approximately five and one-half times as much, or would take about five and one-half times as many trains. We suggest there is no other method, short of taking some multiplier, by which a cross-section of a year's business can be expanded, so as to represent the total for a year, other than this method here. It does not necessarily mean that you have to take the gross ton-miles. Perhaps the train-miles for the year would have been an equally [fol. 3294] satisfactory figure, and probably would not have produced a greatly different result. Perhaps the total car-miles, or some other figure between a two months' period and twelve months' period on some other basis, could have been used. It would have been perhaps sufficient to multiply the result of six, except that we know the business is not exactly constant and this exhibit shows it; but there must be some method short of studying the entire twelve months and redispatching it to get a figure for the twelve months which will be sufficiently accurate for the purposes of this case. The objection, in short, does not go to the admissibility of the testimony, but rather goes to the weight which is to be given, having in mind this particular method of expanding the showing for the two months so as to represent the showing for the twelve months.

Mr. Booth: I should like to be heard just a moment, your Honor.

The Court: You may proceed, Mr. Booth.

Mr. Booth: I think we should approach the reception of evidence of this kind with a somewhat realistic view as to how the testimony is being applied. If this were a suit against the state of Arizona for damages for enforcement [fol. 3295] of the Train Limit Law, it is obvious it would be much different and a more definite type of evidence would be required than has been presented by this exhibit and the other companion exhibits. If this were an action upon an insurance policy to recover damages, the same would likewise be true. But this evidence is addressed to the issue as to whether this law burdens interstate commerce being carried on by this defendant and is responsive to the allegations in the answer that it does burden and burdens it substantially. Now it make- no difference for the purposes of this case whether our annual burden is two hundred thousand or five hundred thousand or a million dollars. The only thing we are required to show under any of the decisions with which I have any acquaintance is that the damage be actual and that it be substantial. I think no one could listen to the testimony in this case or even contemplate the case without hearing any testimony, without being convinced that there could be a substantial saving to this company by the operation of trains free from the restrictions of the law. Everyone knows that it costs a certain amount per train-mile depending on the type of power used, the amount of fuel consumed, wages paid, and all that sort of thing to run a train one mile and everyone [fol. 3296] must know and certainly the evidence in this case has already fully developed that the defendant in this case could run a substantially less number of trains in the state of Arizona to transact its business that is originated here, delivered here, and moves across the state if it were not for the restriction of this law. To come back to my first proposition, I think we should approach the reception of evidence of this kind from a realistic standpoint. The defendant is trying to prove that its operations are substantially burdened by this law in that at a large expense it is necessary for it to run a substantially greater number of trains day in and day out than it would otherwise run if it were not for this law. As I said before, we are not held down to a meticulous showing of any definite amount per

year; for we are not asking for judgment in any amount; but are simply presenting evidence which in the last analysis the Court must draw the conclusion whether or not the defendant is substantially burdened by the enactment of this law. The production of these figures, as Mr. Mason very well said, could have been on a train-mile basis. That was one method used in one of these cases. It could have been on a car-mile basis. It might have been on almost any [fol. 3297] basis, but no matter what basis was used, if you consider what might be done, as has already been abundantly shown, if this law were lifted, no matter what basis was used, some substantial saving would have been effected and it is for the purpose of proving substantiality rather than any definite amount that this evidence is offered.

Mr. Strouss: That is sort of an invitation to me to argue the evidence before it is in, but I refuse. What Mr. Booth has said is true, of course, on the question of whether the cost is substantial or not or that they would be required to prove a definite amount, but we have in the last two exhibits a situation where this one just offered, by taking two months and multiplying by a ratio would develop that two months' so-called "savings" into a year's savings. Then, on the other side, we have the picture of their idea of the investment which would be an added cost by reason of long-train operation, one to offset the other. Now there may come a situation here where this investment cost and the claimed savings would be rather close together and there would be considerable question whether there would be a substantial saving or not. There is hardly anything [fol. 3298] upon which to determine whether there is a substantial saving or substantial burden by reason of additional costs.

The Court: You have this situation with reference to this exhibit, as I understand Mr. Sines' testimony, that the percentage of 17.89 is an actual percentage based—I am not speaking now of the redispatch operations—but it is based upon the percentage of the actual operations for the months of June and August as compared with the total operations for the year.

Mr. Strouss: That is true, but it does of necessity have to assume that operating conditions, in order to have the same relative savings as claimed here, there would have to be an assumption of operating conditions, availability of

traffic, and all of the other things that would go to the redispatch trains in some of those other ten months as the two months here.

The Court: Well, the Court is of the opinion there is a distinction between the two exhibits, and might say I am wholly satisfied in my own mind as to the ruling made on exhibit No. 221. I will overrule the objection and let the exhibit in evidence. We will take a recess at this time until tomorrow morning at ten o'clock.

[fol. 3299] (The document referred to was received in evidence and marked "Defendant's Exhibit No. 226.")

(Thereupon the court stood at recess until ten A. M., Thursday, January 30, 1941.)

[fol. 3300] January 30, 1941, ten o'clock A. M.

Proceedings were resumed at this time as follows:

B. S. Sines was recalled to the stand, and testified further as follows:

Direct examination (Continued).

By Mr. Mason:

Q. Mr. Sines, will you take up next a statement in six sheets entitled "Arrival Time at El Paso, Texas, of Fruit Blocks and Manifest Sections, Actual Operation Compared With Redispatch Operation, With No restriction and Using AC Power and Long Sidings. Months of June and August, 1938?"

A. Yes.

Mr. Mason: May that be marked Exhibit 227 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 227 for identification.

Mr. Mason: Was this exhibit prepared under your supervision, Mr. Sines?

A. It was. I have checked it, and it is correct.

[fol. 3301] Q. From what sources was the exhibit prepared?

A. From the actual and the redispatch train sheets.

Q. Now, I take it that the first sheet is merely a summary of the detail showing on the second and succeeding sheets down to and including the sixth, isn't that right?

A. Yes.

Q. Will you then go to the second sheet and explain the examples shown there, or a few of them?

A. Well, the dates of arrival at El Paso are indicated in column A; the identification of the train is indicated in column B; and the arrival time at El Paso is indicated in column C. Columns B and C relate to the actual performance; then column D indicates the identification of the redispatch train.

Q. Is that the corresponding train shown in column B?

A. Yes.

Q. These are rather perishable blocks than trains, are they?

A. That is right. Then column C indicates the arrival time at El Paso of the redispatched train, and columns F, G and H are computations, or observations made as a result of the comparison of columns C and E. For instance, in [fol. 3302] the first line the redispatched train arrived in El Paso in advance of the time that the actual train arrived by the amount indicated in column F. The second and third trains arrived at El Paso at the times indicated in column C, but on the redispatch the perishable blocks Y257 and Y258 arrived at El Paso as one train at the time indicated in column E. The comparison between arrival times then of the two trains actual against the one train redispatched is shown in column F; the first train arriving somewhat in advance of the second train resulted in the differences as shown in column F.

Q. Do I understand that in the redispatch where you show these parentheses following the block identification, that two blocks which moved in separate trains in actual operation moved in one train in the redispatched operation as they arrived at El Paso?

A. Yes, the parentheses indicate when that occurs.

Q. And where you have a single arrival time at El Paso of two blocks indicated by parentheses that aga indicates

that the blocks were consolidated into a single train for the [fol. 3303] purposes of the operation into El Paso?

A. That is right.

The Court; Were any of these operations over the south line through Douglas?

A. No, sir. I have been discussing those blocks which arrived in El Paso in advance of actual performance. Column G contains instances when the redispatched trains arrived in El Paso later than in actual performance, and column H indicates instances when the redispatched and actual trains arrived at El Paso at the same time, and when that occurs the word "same" is used.

Mr. Mason: Then, in obtaining the summary on the first sheet, did you first of all count from the actual train sheets the number of trains which were moved?

A. Yes.

Q. With perishable or manifest sections in them?

A. That is right.

Q. And likewise count the number of redispatched trains which carried the same perishable or manifest sections?

A. That is right.

Q. Those are the figures appearing in lines 1 and 2 in each of the blocks June and August, 1938, in the sum[fol. 3304]mary?

A. Yes. The amount of consolidation that was performed is evident from the difference in figures in lines 1 and 2.

The Court: What do you mean by "Ice House Arrival" on these sheets?

A. The trains arriving at El Paso in June usually went to the ice house where the trains received servicing, which is located about two miles west of the Union Station in El Paso.

Q. And you used that point as the point of destination for the purposes of this study?

A. Yes, and the point of comparison; but in August the ice house was not operated, and arrival time of the trains was taken in the yard at El Paso. In that case the time of arrival is taken from the train sheets for August where it is shown down in the yard. The time of arrival at the ice house in June is taken from the conductor's delay reports.

[fol. 3305] Mr. Mason:

Q. In each case where you make comparisons of arrival times between actual and redispatch, are you comparing arrivals at the same point in El Paso whether ice house or yard office?

A. Yes.

Q. As to line 4 and its subdivisions in each of the blocks on the summary sheet, sheet No. 1, is that a summarization of the information which appears in columns F, G, and H?

A. Yes, that is a count, just an item count of the items indicated in those columns.

Q. Is line 5 and sublines A and B worked out the same way by aggregating the totals of advance or later times, as the case may be?

A. That is right.

Q. How did you arrive at the information on line 6?

A. That is a mathematical computation, dividing the figure in line 5A by the figure in line 4B.

Q. And the same process as to line 7?

A. Yes, that is the division of 5B by 4C.

Q. Do all of these times which are shown in line C and E check against the dispatchers' train sheets or the time returns and delay reports, as the case may be?

A. Yes.

[fol. 3306] Q. How do you obtain the time of arrival at the ice house at El Paso of redispatched trains for which there were no time returns and delay reports?

A. That was a part of the redispatching operation. The dispatcher performing that work set the actual train performance against the redispatch train performance.

Q. He moved these particular redispatched trains which in actual operation had been moved to the ice house before going to the yard and he also moved the redispatched trains with the same blocks in them to the ice house?

A. Yes.

Q. And took his time of arrival at the ice house?

A. That is right.

Q. Are there any particular details of sheets two to six, inclusive, which have not been already referred to which require further explanation? I notice, for example, on sheet No. 3 you show a double cross-reference there. Is

that the same engine failure on the 19th which was referred to in your exhibit No. 222?

A. Yes.

Q. Has the exhibit been compared and checked through [fol. 3307] out?

A. Yes.

Q. Will you say whether or not it is a true and correct representation of the underlying sources?

A. It is.

Q. Have the computations all been checked?

A. Yes, I did that checking myself.

Q. Will you state the purpose of the exhibit?

A. To demonstrate the result of removal of interference in permitting arrivals at El Paso on the redispatch operations in advance of arrivals at El Paso on actual operations.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss:

Q. This time of arrival at the ice house, was the same time allowed the redispatched train in the yard movement as the actual train took or was there a redispatched movement of the train after it arrived in the yard?

A. The ice house is at the west end of the yard, there is no yard movement involved in this.

Mr. Strouss: I was wondering why you use in some instances the yard arrival and in other instances the arrival at the ice house?

A. Depending on whether the actual train went to the [fol. 3308] ice house or to the yard. We sent our redispatched train to the ice house or to the yard according to what had happened in actual performance.

Mr. Strouss: If the arrival shown here is not at the ice house, that means that the train never went to the ice house?

A. Yes.

Mr. Mason: Perhaps you should explain it a little more fully, Mr. Sines.

Q. Is the ice house on the direct line from the west as trains move toward the center of El Paso?

A. Yes.

Q. And a short distance east of the bridges across the Rio Grande River?

A. That is right.

Q. Is it a fact that trains may go either direct to the ice house as they come to El Paso or by-pass the ice house and go to the yard?

A. That is right.

Q. If they go to the ice house direct, they go to the yard later, is that correct?

A. Yes, sir.

The Court:

Q. Mr. Sines, referring to your cover page of exhibit [fol. 3309] No. 227, particularly to line 3 of June operations and line 3 of August operations, I take it from those figures that in your redispatching study it is possible to combine blocks?

A. What has happened there is indicated on the following sheets by the word "Part" and comes about because at Yuma it is necessary to cut blocks in two or more parts sometimes in order to comply with the 70-car limit. On our redispatch operation it was necessary to cut those blocks in parts less frequently. We could take a train as it arrived from California and dispatch it east without cutting a block in two.

The Court: You might clarify the mind of the Court if you would define the term "block." I recall distinctly the testimony with reference to the Phoenix block and the Yuma block and the Colton block, but what I am concerned with now is what constitutes a block as applied to your actual train operation.

A. Blocks originate for our purposes on this southern route at Colton, California, and again at Yuma. Block numbers are given to the train loads of P. F. E. cars departing from Colton and at that time one block number is assigned to all P. F. E. cars in that particular train. [fol. 3310] Thereafter the cars that left Colton on that train are kept track of and traced by means of that block number no matter how many times the block may be broken up.

The Court: I believe that answers the question.

A. The same thing applies to trains that come from the valley into Yuma.

Mr. Mason:

Q. You mean from the Imperial Valley?

A. Yes.

Q. You stated that blocks originate at Colton and Yuma. Your exhibit No. 227 for identification shows also an "A" block. Do you recall the testimony regarding the block from the Salt River Valley?

A. That is right.

Q. They originate at Phoenix, do they not?

A. That is right.

Q. And come into this picture at Tucson?

A. That is right.

Q. Have you an example on sheet No. 2 of the Yuma or Y block being broken up in actual operation on June 9th?

A. The first one indicated by the word "Part" is an example.

Q. Does that indicate that part of Y-276 went with Y-275?

[fol. 3311] A. Yes.

Q. And the other part with Y-277?

A. That is right.

Q. Whereas in redispatch operation the Y-276 was not broken up at all?

A. Yes. A moment ago I said sometimes it was necessary to break them up to comply with the law but there is an instance, the first one, of where in order to fill the train out to 70 cars it was necessary to cut the block in half, to cut 276 in half. That filled Y-275 out to near 70 cars, but then the part of Y-276 that was left over went forward with Y-277, filling that train up.

Mr. Booth:

Q. What happened on the redispatch on that block?

A. That block was not broken up on the redispatch but went forward intact with block Y-277.

The Court: The term "block" is only used as applied to perishable products?

A. That is right.

Q. And all of the cars containing perishables that are made up into one train at these points that you have heretofore indicated constitute a block?

A. Yes, sir.

[fol. 3312] Q. And is given a specific number so that any car of perishables from that original train carries that number on through to its destination?

A. That is right.

[fol. 3313] Mr. Mason: Mr. Sines, does the breaking up of these blocks into parts in order to move on separate trains, as you indicated, involve additional switching at Yuma or any other point where the break-up may occur?

A. Yes, that requires more switching than would otherwise be necessary.

Mr. Mason: Are there any further questions from the Court?

The Court: No.

Mr. Mason: We offer the exhibit No. 227 for identification in evidence.

Mr. Strouss: The same objection as to Exhibit 221, it is immaterial, calls for the conclusion of the witness, purely speculative.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 227.")

Mr. Mason: Have you an exhibit before you now, Mr. Sines, bearing the title "Arrival Time at Yuma, Arizona, of 'SSW' and 'GBW' Westward Manifest trains—Actual Operation Compared with Redispatched Operation, With No Restriction and Using AC Power and Long Sidings, Months of June and August, 1938."

[fol. 3314] A. I have.

Q. Being in four sheets?

A. Yes.

Q. Did you prepare this exhibit or cause it to be prepared?

A. It was prepared under my direction and supervision.

Q. And from what sources was it prepared?

A. From the actual and redispatched train sheets.

Q. Were the conductors' time returns and daily reports used?

A. Not in this exhibit, because we have the arrivals at Yuma indicated in all instances on the train sheets.

Q. Was this exhibit prepared in the same manner and along the same lines as Exhibit No. 227?

A. Yes.

Q. And, I take it that this relates to the westward movement of identified or scheduled trains in the same manner as No. 227 relates to the eastward movement?

A. That is right.

Q. There are no ice-house or other arrivals except at the destination or the yard office at Yuma involved here? Are there?

[fol. 3315] A. That is all.

Q. I take it that the first sheet is a summary sheet of the same type as the first sheet of exhibit 227 and that the details are shown on sheets 2, 3 and 4?

A. Yes.

Q. Will you go to sheet 2 and take an example on that sheet and explain just what was done.

A. The arrival time of the first train is shown in column C and the date of arrival is shown in column A. The identification of the train is shown in column B; the same identification appears in column D, and the arrival of the redispatched train is indicated in column E. The actual and redispatched trains arrived at Yuma at the same time, which fact is indicated by the word "same" in column H. On that same day the GBW arrived at Yuma on the actual and redispatched at different times, and the result of that comparison is given in column G. In column F, the fourth train, we have an example of a train arriving at Yuma at different times on actual and redispatched, with the redispatched arrival in advance of the actual arrival. Consolidations on this exhibit are indicated again as they were on the previous exhibit, 227, and the computations were [fol. 3316] performed in exactly the same manner as the previous exhibit 227.

Q. The totals and averages in lines 5, 6 and 7 are worked from the proper columns of sheets 2, 3 and 4 in the same way?

A. Yes.

Q. Will you state the purpose of this exhibit?

A. The purpose of this exhibit is to indicate what the removal of the interference of the Arizona Seventy-Car Limit Law would permit in the way of early arrivals at Yuma to westbound manifest trains.

Q. Has the exhibit been compared and checked against the underlying sources?

A. It has.

Q. Will you say whether or not it is true and correct?
A. Yes.

Mr. Mason: Have you any questions?
Mr. Strauss: No.
Mr. Mason: Has the Court any questions?
The Court: No.
Mr. Mason: We offer the exhibit in evidence as No. 228.
Mr. Strauss: The same objections as to the previous exhibit.
[fol. 3317] The Court: I will overrule the objection. It may be admitted.

(Thereupon the document referred to was received in evidence and marked "Defendant's Exhibit No. 228.")

The Court: Now, Mr. Sines, do you have any perishables going west? I mean under these operations in June and August?

A. No, I don't suppose we have a western perishable movement of any volume at all.

Q. You use the expression "blocks" here. Now, in your westward movement, I thought I understood you, that that only applied to the perishables?

A. Well, I suppose that that is because the word "blocks" is shorter than using the term "manifest section."

Q. Well, then the term "block" is not exclusively applied in railroading to the perishables?

A. Well, about 99 per cent of the time it is, your Honor. They have the same significance, however, both the word "block" and "manifest section" in that it involves a group of cars as to which particular attention is being paid regarding schedule performance and keeping track of the progress of the cars in those blocks or sections.

The Court: Well, now, if you had a train load of empty refrigerator cars going west, would you term that a block [fol. 3318] or a manifest?

A. That would be neither a block nor a manifest, that would just be a drag. The PFE Company just keeps track of the movement of their loaded cars in blocks.

The Court: You may proceed.

Mr. Mason: Generally speaking, Mr. Sines, blocks and manifest sections which are treated on exhibit 228 are the

loads moving west under schedule in the manifest trains, are they not?

A. That is right.

Q. This does not undertake to treat of the movement of westbound empties?

A. No.

Q. As such?

A. No.

Q. I will ask you to refer, if you will, please, to a statement in one sheet entitled "Redispatch Study Wage Data?"

A. Yes.

Q. "Yuma, Arizona to El Paso, Texas for Period June and August, 1938."

A. Yes.

Mr. Mason: May we have this statement marked defendant's Exhibit 229 for identification?

The Court: It may be marked.

[fol. 3319] The Clerk: Defendant's Exhibit 229.

Mr. Mason: Did you prepare or supervise the preparation of this exhibit, Mr. Sines?

A. I supervised the preparation of the exhibit and assisted in a large part of it.

Q. From what sources was it prepared?

A. The information in columns A, B, and F was taken from the white work sheets A, and the information in columns C, D, E and G, G, H, I, was taken from the white work sheets A, information shown in columns J, K, L are computations of the figures in columns C, D, E, and G, H, I.

Q. Now, those lines which are identified severally throughout the exhibit as saving for a period, or increase for a period, are those computations subtractions from the lines immediately above them?

A. Yes.

Q. Now, getting at the basic and variable wages actually paid to trainmen and enginemen, I take it those were from the white work sheet A entries explained by Mr. Garverick?

A. That is right.

Q. Which in turn were taken from the time returns and delay reports rendered by the conductors or engineers?

[fol. 3320] A. Yes.

Q. As to the basic wages for the redispatched trains for trainmen and enginemen, those again were entered on the white work sheets A, were they?

A. Yes, the basic wages.

Q. How did you arrive at the variable wages so called here?

A. The variable wages were treated as lump sums and are computations based upon the percentage reduction and train-miles actual against redispatched, with the exception of certain continuing items which we knew would continue at the same volume without relation to length of trains, such items as station switching at Gila, which is done by road crews, and station switching at Lordsburg, which is done by road crews, and which is not affected one way or the other by length of trains, were continued at the same level; but other items involving overtime, initial switching, terminal switching, and held-away-from-home terminal time, were reduced in the ratio of the train-mile reduction.

Q. Those items vary with the amount of the train-service performed measured in train-miles?

A. Yes, with the opportunities for their accumulation. [fol. 3321] Then, I take it, referring to the Yuma-Gila block, that the amount of variable wages shown for trainmen for the redispatched represents the relationship of the redispatched train-miles to the actual train-miles, and bears the same proportion to the variable wages for the actual operation as the redispatched train-miles do to the actual train-miles, subject to the explanation that you made as to the continuing level of the amounts paid for station switching at Gila?

A. That is right, and Lordsburg.

Q. Well, Lordsburg wouldn't be involved in the Yuma-Gila block?

A. That is right.

Q. And the same explanation would apply to the reduction of variable wages for enginemen from the figures shown for the actual and the figures shown for the redispatched?

A. Yes, and there the computation is based on locomotive-miles.

Q. In the case of enginemen, the computations are based on locomotive miles?

A. Yes.

Q. As shown in column F?

A. Yes.

[fol. 3322] Mr. Mason

Q. Now as to the figures in block VI, total North Line, are those simply the additions of the figures appearing above for each of the separate blocks?

A. That is right.

Q. These totals of basic variable and total in columns J, K, and L, are those cross-totals as well as vertical totals?

A. Yes, sir.

Q. Do you bring the total showing for both North and South lines together?

A. In block XI.

Q. That represents in block XI the totals for the actual and the redispatch operations for both lines and the differences between the two in the line identified as "Saving for period"?

A. That is right.

Q. What operation is undertaken in obtaining the figures in block XII?

A. We expanded the two months' showing to an annual basis using the ratio indicated, whose derivation is shown in the block at the bottom of the sheet.

Q. That is, you obtained the figure for the year by comparing the total traffic in gross ton-miles for the two months with the total traffic in gross ton-miles for the year?

[fol. 3323] A. Yes.

Q. I think you have explained these figures before in connection with the previous exhibit, No. 226. Are these the same figures which appear in the block on the second page of exhibit No. 226?

A. They are.

Q. Are these the same figures of trains, train-miles, and total locomotive-miles which appear on that exhibit?

A. Yes.

Q. How do you arrive at the figure shown in line 13?

A. During 1938 the combined railroad retirement and unemployment insurance tax rate was 5.75 per cent, but those percentages apply to salary payments only up to $300 per

month. Over that there was no tax so we investigated a considerable number of payments to trainmen and enginemen—I just forget how large a volume of figures we worked with—and developed that for trainmen the combined retirement and unemployment insurance tax was 5.65 per cent instead of 5.75, the one-tenth of one per cent difference being due to the fact that some of those trainmen received more than $300 per month.

Q. And the excess over $300 per month was exempt from [fol. 3324] tax in this case?

A. That is right. A similar computation was made for enginemen and there were more enginemen getting over $300 a month than trainmen so it brought that percentage down to 5.44.

Q. Do I understand that the application so far as conductors and trainmen are concerned of 5.75 per cent on the total compensation up to $300 in any one month is equivalent to the application of 5.65 on the total compensation including that above $300 a month?

A. That is right.

Q. That is how you got this figure?

A. Yes.

Q. A similar explanation would be correct as to the 5.44 percentage figure for enginemen?

A. Yes. Then we applied those percentages in columns E and I and added them to the saving figure in block XII to produce the grand total saving in line 14.

Q. Are all of the figures of wage payments shown on the exhibit down to and including block XII exclusive of these Federal taxes?

A. They are, because they are not shown nor computed on the time returns and delay reports. That is done after the timekeeping is done on the paycheck and it is done in [fol. 3325] lump sum computation just as it is on this exhibit here.

Q. Does the company pay this tax to the Federal government or to the railroad retirement board as a lump sum payment on its entire payroll exclusive of compensation of over $300 per month to any one person?

A. I am sorry, I don't know just how we handle that after we get past the timekeeping stage.

Q. Will you say whether or not it is a Federal payroll tax paid by the company?

A. Yes, it is.

Q. And is in addition to the wage payments and not deducted from them?

A. That is right.

Q. Do you know and, if so, will you state whether there is in addition a deduction from the wage payments made for account of each employee and paid directly to the Federal government?

A. That is right, each employee makes a contribution to those funds also.

Q. To the retirement fund but I think not to the unemployment fund?

A. You are right.

Q. That is not included in this account at all?

A. No.

[fol. 3326] Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: Not at present.

Mr. Mason: Has the exhibit been carefully checked, Mr. Sines, with the underlying sources?

A. It has.

Q. Have the computations been carefully checked?

A. They have.

Q. I take it that line 12, column L, represents the amount of monetary payments of wages to employees which would be saved on the annual basis as computed here and that the figure in line 14, column L, represents the total of payments for account of wages and payroll taxes on those wages which would be saved by the company under the circumstances contemplated by this exhibit?

A. That is right, yes.

Mr. Mason: Has the Court any questions?

The Court: No questions.

Mr. Mason: We offer it in evidence as defendant's exhibit No. 229.

Mr. Strouss: The same objections as to the previous exhibits.

The Court: Objections overruled, it may be admitted.

(The document referred to was received in evidence and [fol. 3327] marked "Defendant's Exhibit No. 229.")

The Court: Mr. Sines, for the moment referring to that same exhibit, in column A, if I recall the previous testimony,

you are taking a train from Yuma to El Paso through the four divisions or districts indicated, which would be classed as four trains rather than one train?

A. That is right.

The Court: We will take our morning recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows:)

Mr. Mason:

Q. Mr. Sines, have you a statement in one sheet entitled, "Los Angeles, California, to El Paso, Texas, Passenger Redispatch Study for the Year 1938," etc.?

A. Yes.

Mr. Mason: May we have this exhibit marked as "Defendant's Exhibit No. 230" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 230 for identification.

Mr. Mason:

Q. Did you prepare this exhibit, Mr. Sines?

A. Yes.

Q. From what sources?

[fol. 3328] A. From the white work sheets A which were used to make the passenger redispatch studies for the year 1938.

Q. Does this cover the entire year 1938?

A. It does.

Q. What does this reflect as to passenger train operations during the year 1938?

A. It indicates the additional and extra passenger train service which we determined was brought about by observance of the Arizona 14-car limit law.

Q. Contrasting the passenger train redispatch study with the freight redispatching study, why is it you are able to make the study of the entire year according to the appearance of the exhibit comparatively much more simply and easier than in the case of the freight redispatching study?

A. In the case of a passenger redispatching study it is much easier to indicate what would have been done if the 14-car limit law had not been operative. For instance, take the simplest example, a train comes to Yuma with 15 cars none of which can be set out but which must move forward

on the schedule of that train. It is then necessary to provide a second or extra section to handle that one car to its destination if it be in Arizona or across the state to Lordsburg if it be east of Arizona. It is very easy to say if there had not been a 14-car limit that train could have gone through Arizona handling 15 cars and we could point our figure accurately and exactly at that extra section and say "That is the train which would have been eliminated," but with a freight redispatching study where a day's business is handled in fleets of trains, fleets of six, seven, eight, or nine trains per day, all of those trains observing the 70-car limit and their redispatching that business in a fewer number of trains, it is impossible to point your figure at any one train and say "This is the train that would have been eliminated." All you can do is say that the actual operation amounted to nine trains and the redispatch operation amounted to six or seven trains, and there would have been saved two or three trains; and you get at the difference by subtraction instead of by actual determination.

The Court: You don't mean to infer from that that in actual operations where you might bring 15 cars to Yuma from Los Angeles that you would actually run a separate section of that train across the state with only one car?

A. Yes.

[fol. 3330] Q. That is actually done?

A. Yes, sir.

Mr. Mason:

Q. In actual practice, Mr. Sims, if you had 15 cars, would you run two sections of eight and seven or something like that instead of fourteen and one?

A. In the year 1938 I have known where both occurrences happened. We handled one car in our extra section and fourteen cars in the regular section. The reason for that is you cannot take one Pullman car and take it away from the diner because you have to feed your passengers. You cannot take an observation car off a train very well because you have advertised to the passengers that they are going to have an observation car to use, so you will take a head-end car with mail or express that has to move on that schedule or that has the passengers' baggage and other equipment in it and you make a train out of that head-end car. On a short trip where they don't need a diner you might run

a two car train with a passenger car and a buffer. In that event it means you are subjecting yourself to the additional expense of hauling that additional buffer car.

Q. Referring to exhibit No. 230 for identification, will you take some of these examples and explain just what you have [fol. 3331] done here?

A. All of these examples are listings of the second and extra sections of the trains identified in column A which were determined by means of our study would be necessary to run.

Q. Taking the first example, was there an extra section of train No. 2 operated from Yuma to El Paso via Phoenix and Bowie?

A. There was.

Q. Which made the number of train-miles shown?

A. Yes.

Q. By your study with the dispatchers' actual train sheets and the white work sheets, you determined that that train extra section could have been eliminated?

A. Yes, because of the increased number of cars which would have been handled from Tucson east to Lordsburg, we would have provided a helper for that larger train out of Tucson and incurred the additional expense indicated in column F in order to eliminate the necessity for an extra train the entire distance across the state.

Q. In other words, the locomotive-miles in column F identified with the letter "O" are light and helper miles which would have been run on the consolidated train which were [fol. 3332] not run on the two separate trains within the 14-car limit?

A. That is right.

Q. And are an offset against any saving of locomotive-miles that would have been made by running one instead of two trains?

A. That is right.

Q. Do you get the total in column G by subtracting the figure in column F of the line representing train No. 2 from the total locomotive-miles shown in column E for that particular train?

A. That is right.

Q. And the same way as to the second one?

A. Yes, occasionally, or it is more often than occasionally, in running these additional or extra sections we run one more train in one direction or one more train than we have

scheduled as an everyday occurrence in one direction than we do in the other direction and that means that we have to balance passenger engines and the engine crews and the passenger train crews in the same manner as we have described for freight operations in order to get them over to the point where they will be required for service or return them to their home terminals after they have completed their service. In that event, by eliminating this extra section we have also eliminated the necessity for paying these crews [fol. 3333] for the dead-head movement in the case of the train crews and the double-head movement in the case of the engine crews and we will also eliminate the locomotive mileage in both directions even though the train itself only sees service in one direction. The additional locomotive-miles over and above the locomotive-miles during which time the locomotives are handling the train are indicated in column F also.

The Court: Do I understand you to say in your normal operations now there is an unbalance of both power and men due to the fact there is a greater movement in one direction of passengers than there is in the other?

A. Did you say "normal"?

The Court: Yes.

A. No, the normal situation is that we have four passenger trains in each direction through Arizona each day.

The Court: What did you mean when you referred to an unbalance?

A. When we run one additional train in one direction, we then have five passenger trains in one direction and four passenger trains in the other direction.

The Court: And that is what creates the unbalance?

[fol. 3334] A. These additional and extra sections caused by the Arizona 14 car limit law.

Mr. Mason:

Q. You mean where an extra section of a train is run because you have fifteen or sixteen cars in one direction and only fourteen in the other on some particular day or pair of days?

A. Yes, under the circumstances I have described.

Q. And the circumstances studied in exhibit No. 230?

A. Yes.

The Court:

Q. However, if it happens that on that same day in the opposite direction you also had a long train, there wouldn't exist this unbalance that you mention?

A. Not necessarily, that is right.

[fol. 3335] Mr. Mason: If your eastward long train happens to be moving over the south line, and the westbound long train happens to be moving over the north line, you would have a double unbalance, wouldn't you, Mr. Sines?

A. That is right.

The Court: We are now getting into the theoretical.

The Witness: No, you are talking about actual conditions that we have to meet every day, and it also depends, to some extent, upon seasons. During the Christmas season we will have long trains or extra sections running in both directions which will cancel out.

The Court: With your passenger trains, Mr. Sines, running from Yuma to El Paso, do you count that as one train, or do you count it as you do your freight train, one train for each division or district through which it operates?

A. I didn't attempt to define that, your Honor. I just said that that happened so many times.

The Court: Well, I undersand that this exhibit doesn't refer to it, but I am asking you now, in the other exhibits let us say that may be in evidence here, how was it designated, the passenger trains, or do we have any such?

[fol. 3336] Mr. Mason: We have such an exhibit; yes, the exhibit No. 220 has a train count on it.

The Witness: There are no passenger trains on there, are there, 220? Yes, you are right, and in that event the passenger trains on exhibit 220 have been counted once on each freight district.

Mr. Mason: In the same manner as the freight trains were counted?

A. Yes, but as far as any passenger studies are concerned, I have not identified them as trains by any kind of an arbitrary count.

Q. I should like to have you, on exhibit 230, explain this offset of 150 motor-car-miles. How does that come about?

A. That is indicated by the note alongside of the item at the bottom of the sheet and was brought about by elimination on our redispatch of a section which operated through Phoenix, but which had some Phoenix passengers on it.

Q. You say operated through Phoenix?

A. Yes. When we took the train off through Phoenix, it meant that the equipment went through Gila. In order to get those passengers up to Phoenix we said, "We will run a motor car down to Picacho to pick them up and take them to Phoenix."

Q. And that accounts for the 75 miles of motor car oper- [fol. 3337] ation light from Phoenix to Picacho, and loaded from Picacho to Phoenix?

A. Yes, sir.

Q. Mr. Sines, as I recall it, your passenger operations as distinguished from your freight operations, that your 1938 redispatching study as well as the actual operations for the passenger cover the entire year, whereas for the freight it only covered the months of June and August?

A. That is right.

Mr. Strouss: I didn't understand where that motor car operation appeared in there.

A. The note at the bottom, and it doesn't appear in any of the totals above there.

Mr. Mason: Have you any other comments on this exhibit, Mr. Sines, prior to its offer?

A. No.

Mr. Mason: Have you any further questions, Mr. Strouss?

Mr. Strouss: I was trying to see where this is different from Exhibit 199.

Q. Exhibit 199 would include this, but in addition, other interferences?

A. Yes, sir. This information on 230 is an operating statistics exhibit to develop the quantities necessary to make an estimate of the money which could have been [fol. 3338] saved, but the other exhibit that you speak of, No. 199, is an interference exhibit.

Q. Now, what is this item, "Indio Helper Service?"

A. When the two trains, 43 and 5, operate through Tucson westbound, either one of those trains would have more than fourteen cars west of Tucson or either one of them would pick up west of Tucson so as to increase their consist over fourteen cars if it were permissible. It is the practice to take the cars off one train and put them on the other train if the second train has available space under the fourteen car limit to permit it. We reroute the cars and reassign the cars to the other train. This may mean that both trains will leave Tucson with fourteen cars and that they will go through to Yuma with fourteen cars. Now, operating west from Yuma to Los Angeles, it is our practice to furnish helper service for passenger trains of over ten or eleven cars——

Mr. Mason: Between what points westward?

A. Between Indio or Garnet and the top of the hill at Cabazon.

Q. Banning?

A. Banning.

[fol. 3339] Q. Is that the Beaumont grade?

A. Yes.

The Court: Is that to enable them to maintain their schedule?

A. Yes.

Q. The locomotive could pull the train but not maintain its schedule, or is that a matter of contract with the brotherhoods?

A. Oh, no; I don't know whether they could get up there with fourteen cars or not, but it assists in maintaining schedule, yes. We don't reswitch those trains at Yuma because of the time and inconvenience that would be necessary, but let both those fourteen-car trains go over to the bottom of the helper grade, and then it means that both those trains will have to have a helper to assist them up the hill. Now, if it had been possible originally at Tucson to permit one train to go out with ten or eleven cars and the other train to go out with fifteen or sixteen cars, only one train would have required the helper, and the other train could have gone single. We had several instances in 1938 where both trains, under the circumstances I have de-

scribed, required helpers but where reconsisting the trains made it possible to eliminate the helper on the second train, [fol. 3340] and we have accounted for that on this exhibit.

Mr. Strouss: No more questions.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit 230.

Mr. Strouss: The same objection as to the previous exhibits.

The Court: The objection will be overruled. It may be admitted in evidence.

(Thereupon the document referred to was received in evidence and marked "Defendant's Exhibit No. 230.")

Mr. Mason: Have you before you, Mr. Sines, an exhibit in one sheet entitled "Los Angeles, California, to El Paso, Texas, Saving in Passenger Train Service and Costs Account Discontinuance of Fourteen Car Limit on Passenger Trains in Arizona, Year, 1938?"

A. I have.

Mr. Mason: May this be marked Exhibit 231?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 231 for identification.

Mr. Mason: From what sources was this exhibit prepared, Mr. Sines?

A. This was prepared from information shown on Exhibit 230 as to train and locomotive-mile savings and I [fol. 3341] have applied against those mileage the costs shown in our form 521 for passenger service for the year 1938, as to items in 3D, 3E, and 3F, the items of fuel, enginemen's wages and trainmen's wages is taken directly from the reports regularly made as the result of the operation of those trains. A special computation was made with respect to the fuel item to separate the fuel consumed by the engine as contrasted with the fuel consumed by the trailing load.

Q. And are all these computations either taken directly from the reports of the wages or, as the case may be, from form 521?

A. Yes.

Q. The figures I notice for fuel and so forth, particularly for fuel, rather, between Los Angeles and Yuma are

different than those between Yuma and El Paso. Is that because of a difference in the figures reported in form 521?

A. Did you say the fuel?

Q. Yes.

A. Well, that is because I had the fuel separated by the Fuel Bureau at Yuma to give me the fuel consumed by trains west of Yuma and the fuel consumed by trains east of Yuma and then after I made the split of fuel between [fol. 3342] locomotive and trailing load, the fuel consumed per locomotive-mile was greater west of Yuma than it was east of Yuma.

Q. Then that accounts for the difference in unit cost between the districts west of Yuma and east of Yuma?

A. That is right.

Q. Now, this is entirely addressed to the train or locomotive miles saved rather than in comparison with the total operated and the total which would have been operated?

A. That is right. An explanation should be made with respect to the cost of gasoline motor car operation, the expense figure indicated there in line 8 comes from a statistical statement prepared by our accounting department covering the cost of operation of motor cars similar in form and substance to the form 521. I have a copy of that motor car statement here, which I can give Mr. Stronss.

Q. This is simply a unit cost developed in the same fashion as the unit costs which are developed on form 521?

A. Yes.

Q. And all of these unit cost figures relate to the forms 521 for the year 1938, do they?

[fol. 3343] A. Those which I have mentioned, except 3A, 3B and 3C, which are direct segregations.

Q. Has the exhibit been compared against these underlying sources to determine its correctness?

A. Yes.

Q. Are there any other computations other than those which appear on the face of the exhibit which you have not already explained?

A. Well, yes. There is especial consideration given to the out-of-pocket cost feature from this viewpoint: The cost of fuel, enginemen and trainmen items is charged out at 100 per cent of its value, engine house is charged at 43 per cent of the unit cost figure shown on form 521, other locomotive supplies are charged at 100 per cent, and locomotive repairs are charged at 80 per cent. The reasons for

reducing the engine house and locomotive repairs to percentages less than one hundred is that in eliminating occasional operation such as this, the expense of supervisory forces and some of the labor expense will continue even though the locomotive-miles themselves be reduced. We won't cut down our foreman's expense, for instance, in the roundhouse because we don't operate a particular passenger train.

Q. The same way as to locomotive repairs, there will be [fol. 3344] some stand-by expense which will not be eliminated even though the locomotive-miles are eliminated, occasionally eliminated as you say?

A. That is right, and the percentages that I have mentioned are percentages that we have developed in the Bureau of Transportation Research and which I have used for a number of years.

Q. By charging these expenses at a percentage figure rather than a total of 100 per cent, do you reduce the amount indicated as a saving or do you increase it?

A. I reduce it.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: Yes. I am not quite certain that I understand that 3A, 3B and 3C. 3B and 3C, if I understand you correctly, you have taken the actual figures of wages paid out, actual wages paid out?

A. Yes, to the men manning the particular trains which we say would be eliminated.

Q. Now, in 3A, Fuel, you didn't use the unit cost which you have set up in your form 521?

A. No, we went to our Fuel Bureau and had them give us the amount of the fuel consumed by every one of these particular extra sections.

[fol. 3345] Q. On the particular engines used on those operations.

A. Yes, and that gave us the fuel for the movement of the locomotive and cars. Now, most of these cars would go ahead anyway regardless of the fact that we cut the train off, so, in effect, all that we do is to eliminate the operation of the locomotive and these buffer cars that I speak of, so I made this computation to split the fuel as between locomotives and cars and that is the resulting unit figure that I have shown on the exhibit.

Mr. Mason: That represents the fuel required to move the locomotive apart from the cars?

A. Yes.

Q. You figures that you only saved the locomotive-miles and not the car-miles?

A. That is right.

Mr. Strouss: In other words, in the actual train, if these cars had remained in that train there would have been additional fuel in order to move those cars in the actual train?

A. That is right.

Q. And you have made an allowance here for what that additional fuel would have been in the actual operation, and this then would bring it down to what you consider the [fol. 3346] fuel necessary to move the locomotive alone?

A. That is right.

Mr. Strouss: That is all.

Mr. Mason: We offer the exhibit in evidence as defendant's Exhibit No. 231.

Mr. Strouss: The same objection as to the previous exhibits.

The Court: The objection is overruled. It may be admitted in evidence.

(Thereupon, the document referred to was received in evidence and marked "Defendant's Exhibit No. 231.")

Mr. Mason: Have you a statement before you, Mr. Sines, entitled "Passenger Redispatch Study—Year 1938, Los Angeles, California, to El Paso, Texas, Extra-Territorial Effect of Arizona Train Limit Law between Los Angeles, California, and Yuma, Arizona, and Arizona-New Mexico State Line and El Paso, Texas?"

A. Yes.

Mr. Mason: May we have this statement marked Exhibit 232?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 232 for identification.

Mr. Mason: Did you prepare this exhibit, Mr. Sines?

[fol. 3347] A. I did.

Q. And from what sources?

A: The sources are indicated in the—source blanks are indicated in the body of the exhibit, the information is all taken from the preceding two exhibits, 230 and 231.

Q. You have a blank under block one of this exhibit. What figure should be filled in there?

A. Exhibit 231.

Q. And in the other blanks, what would that be, 230 and 231?

A. Yes.

The Court: At the bottom?

Mr. Mason: At the bottom under the asterisk what would that be?

A. 231.

The Court: You are asking that the exhibits filed with the clerk, that the numbers be inserted that you indicate?

Mr. Mason: Yes.

Q. Now, I take it that the figures under paragraph one are taken directly from the preceding exhibit?

A. Yes.

Q. How do you arrive at the figures in paragraph 2?

[fol. 3348] A. We computed the train-miles indicated on exhibit 230 from the Arizona-New Mexico state line to the end of the train runs shown on the exhibit. For instance, train No. 1 on exhibit 230 operated from El Paso, Texas, to Yuma, Arizona, via Bowie and Phoenix. From El Paso to the Arizona-New Mexico state line would be 171 miles, and that would be included in the figure on exhibit 232 as extra-territorial train-miles.

Q. Was the same detailed computation undertaken in connection with every other item on exhibit 230?

A. That is right.

Q. To obtain the additional train-miles?

A. That is right.

Q. There were no additional light or helper locomotive-miles?

A. Well, I did that from the train-mile basis because these light locomotive-miles don't always match up with the train-miles that are operated, so I stayed with the train-mile basis.

Q. Now, in pricing out these saved train-miles, you show by the asterisk, where are those figures?

A. Those figures come from line 3G, column C, where we find $9,397 as the saving in the territory Yuma, Arizona, to El Paso, Texas, and in line 1 we find 12,712 train-miles [fol. 3349] saved between Yuma, Arizona, and El Paso, Texas.

Q. And you obtain an average figure per train-mile for each train-mile saved?

A. That is right.

Q. And then apply that average figure to the extra-territorial miles that are saved?

A. That is right.

Q. Then I take it that line 3 is simply the addition of the three figures appearing directly above the total?

A. Yes, sir.

Q. Have the computations on the exhibit been checked?

A. They have.

Q. Is the exhibit true and correct as a reflection of the underlying sources?

A. It is.

Mr. Mason: Has the Court any questions?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as defendant's Exhibit No. 232.

Mr. Strouss: The same objection as to the preceding exhibit.

The Court: The objection is overruled. It may be admitted.

[fol. 3350] (The document referred to was received in evidence and marked "Defendant's Exhibit No. 232.")

Mr. Mason: Take up the exhibit in a single sheet entitled "Redispatch Study—Operating Statistics, Tucson—Phoenix Month of December, 1938."

A. Yes.

Mr. Mason: May we have this statement marked No. 233 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 233 for identification.

Mr. Mason: Did you prepare this exhibit, Mr. Sines, or supervise its preparation?

A. I supervised its preparation.

Q. From what sources was it prepared?

A. This was taken from the white work sheets A upon which Chief Dispatcher Cassady of the Tucson Division performed the redispatching study for the month of December, 1938, between Tucson and Phoenix.

Q. Were the original train sheets used in this connection?

A. Yes, the original train sheets were used to determine the actual handling.

Q. Were there any redispatch train sheets compared? [fol. 3351] A. No.

Q. Will you explain why not?

A. The reason for that is that there was one, or at the most two trains per day involved in each direction, and their operation could be indicated with enough detail on the white work sheets A to satisfy the requirements of the redispatching study.

Q. Is this an actual count from the train sheets and the work sheets of the statistics which are shown in columns A to E, inclusive?

A. That is right.

Q. I take it that the computation of cars per train is computed from the exhibit?

A. Yes.

The Court: This exhibit has to do wholly with freight operations?

A. Yes.

Mr. Mason: And this is the separate redispatching study or the result of the separate redispatching study of the Phoenix-Tucson line which Mr. Cassady mentioned in his testimony?

A. That is right.

Q. Will you explain why the month of December was taken, whereas in the other 1938 redispatching study June and August were taken?

A. June and August were the months chosen for the line [fol. 3352] Yuma to El Paso because those are the months which would best measure the maximum and minimum volumes of traffic passing through Arizona from California to eastern destinations, and from eastern destinations to California, and with the exception of December and one or two other months of the year, a very small percentage of

that through business gets up onto the Phoenix line. There are only operated on that line one local train in each direction each day, but during December and one or two other months of the year there is a perishable season in the Phoenix territory and two trains per day are operated out of that territory and sometimes three.

Q. Then did you select the month of December because that represents a heavier month on the Phoenix line?

A. That was the peak month for 1938 on the Phoenix line.

Q. Did the redispatching study indicate and, if so, will you state whether the 70-car limitation operated in any sense as a restriction upon operations during the month of December, 1938?

A. It did operate as a restriction in that it caused us to operate more trains, more train-miles and locomotive-miles than would otherwise have been necessary.

[fol. 3353] Q. Your exhibit No. 233, then, presents the result of that study, of that particular peak month on the Phoenix line?

A. That is right.

Q. Have you undertaken to evaluate this saving beyond presenting merely the amount of the train-miles and locomotive-miles that would be saved by non-observance of the law?

A. No, I have not.

Q. Do I understand that the train sheets and the white work sheets A for the month of December, 1938, have also been supplied to Mr. Strouss?

A. No, they haven't but they have been made available, and are subject to his call at any moment.

Mr. Mason: That was our understanding previously that they would be available upon your call, Mr. Strouss.

Mr. Strouss: Yes.

Mr. Mason: Have you any questions on Exhibit 233, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Has the Court any questions on No. 233?

The Court: No.

[fol. 3354] Mr. Mason: We offer the exhibit in evidence as defendant's Exhibit No. 233.

Mr. Strouss: The same objections.

The Court: The same ruling. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 233.")

Mr. Mason: There is a feature of Exhibit 233 which you might explain, Mr. Sines. I notice the reference to the Phoenix Roustabout Service. Apparently, in the redispatching handling, there was an increase in the number of trains. How did that come about? What is the Phoenix Roustabout handling on the redispatched that didn't exist in the actual?

A. In making the consolidation of trains at Phoenix, that is, letting one train do the work that two had done to handle cars from Phoenix to Tucson, it was necessary to eliminate from local work on our redispatched long train between Phoenix and Tucson at stations immediately east of Phoenix, so we had to provide for a Phoenix roustabout to do that local work in the immediate vicinity of Phoenix. That would be quite a saving, however, because the roustabout, as indicated here, would only operate for 61 miles; [fol. 3355] whereas the train eliminated had operated about 120 miles from Phoenix to Tucson.

The Court: Where do you get that 61 miles the roustabout train would operate?

A. Dividing the 254 by 4.

[fol. 3356] Mr. Mason:

Q. You had four trains and you got a total of 254 train-miles?

A. Yes.

Q. A little more than 61, I think, four into 254?

A. All right, 63.

Q. Do you have anything further on exhibit No. 233?

A. No, sir.

Q. I think you have previously spoken of redispatching studies relating to the period in 1940, month of April of that year, when trains were operated on the Tucson division or in the state of Arizona to a certain extent without regard to the 70 car limitation?

A. That is right.

Q. Have you an exhibit showing the result of the redispatching of what may be called for convenience "1940 Long Train Period"?

A. I have.

Q. When I refer to the 1940 long train period, it will be understood that it means the period between April 4th and April 30th, inclusive, 1940?

A. Yes.

Q. First of all, the redispatching study which compares the actual operation of long trains during that period, of [fol. 3357] all trains during that period, with the operations as they would have taken place if the 70-car restriction had been fully observed. Have you an exhibit of that type before you?

A. Yes, sir.

The Court: In other words, we are now about to consider the reverse of what we have been considering up to date?

A. Exactly, we want to determine how much we saved during those twenty-seven days.

Mr. Mason:

Q. This is a case, to carry out the Court's suggestion a little further, this is a case of making short ones out of long ones where heretofore we have been making long ones out of short ones?

A. That is right. This is an exact duplicate of what we did in our Nevada Train Limit study.

Q. I want to refer to your exhibit No. 196. Is the subject matter which we are now approaching with your next exhibit associated with item No. 5 of exhibit No. 196?

A. Yes.

Q. Will you state the title of the exhibit which has just been distributed?

A. "Main Line Freight Trains of Various Lengths Operated between Yuma, Arizona, and El Paso, Texas, via [fol. 3358] Gila, Arizona, and Lordsburg, New Mexico, and via Douglas, Arizona, over South Line during Period April 4th to April 30th, 1940, inclusive, Actual Operation Compared with Redispatched Operation, Observing 70-Car Restriction and Using Present Power and Short Sidings."

The Court: You are waiving any right that this might incriminate the defendant in this case?

A. I am leaving that to counsel.

Mr. Mason: We understand that this is not a criminal prosecution, Judge; we believe it is preferable here to show

the facts. I imagine that the fact of the operation of these trains is not unknown to the Attorney General's office, but for reasons of its own the Attorney General's office chose to refer to only two trains in the complaint.

Q. Did you prepare or supervise the preparation of this exhibit, Mr. Sines?

A. It was done under my supervision and direction.

Mr. Mason: This exhibit, by the way, should be marked No. 234 for identification, if your Honor please?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 234 for identification.

[fol. 3359] Mr. Mason:

Q. From what sources was this exhibit prepared?

A. This was taken from the actual train sheets and the redispatched train sheets supplemented by information taken from the conductors' wheel reports and the conductors' time returns and delay reports.

Q. Has it been compared against the underlying sources which you just mentioned?

A. It has.

Q. Does this exhibit correspond to any exhibit previously presented in connection with the 1938 redispatching study?

A. Yes, it is a counterpart of exhibit No. 214.

Q. This, I take it, is simply a train count by train lengths of the trains as they were operated and as they would have been operated if the 70-car restriction had been complied with?

A. That is right.

The Court: Exhibit No. 214 covered the months of June and August, whereas this exhibit only covers the twenty-six or twenty-seven day period?

A. That is right.

Mr. Mason:

Q. Was this exhibit prepared in exactly the same manner as exhibit No. 214?

A. It was.

[fol. 3360] Q. And from the corresponding sources relating to the long train period of 1940?

A. Exactly.

The Court: There is this distinction though, is there not, between these exhibit No. 214 and No. 234; in fact as I recall it, your entire redispatching study and all of the exhibits that have been offered in connection therewith have been on the assumption that you had suitable sidings and suitable power to operate those redispatched trains?

A. That is right.

The Court: Whereas with exhibit No. 234, the sidings were as they actually exist and I believe you heretofore testified that the length of the period was such that you didn't feel justified in shifting the heavier power onto this line?

A. That is right.

Mr. Mason:

Q. In order to carry the distinction further, Mr. Sines, this is a comparison of operations as they were conducted without regard to the 70-car law but with the power and the sidings which were available in April of 1940?

A. That is right.

Q. As contrasted with operations as they would have been conducted if the law had been observed with the same power [fol. 3361] and the same sidings?

A. That is right.

Q. So that the only difference in the operating conditions as between actual and redispatched is the disregard of the 70-car law?

A. Yes.

Q. Is the exhibit true and correct as a reflection of the underlying sources?

A. It is.

Q. Have the computations been checked?

A. They have.

Q. I take it that the totals are as shown for each of these separate blocks or additions of the figures immediately above?

A. Yes.

Q. You haven't undertaken to present any showing of savings or increased operations, as the case may be, as achieved by the operation?

A. No, this is simply a train length exhibit, although savings are indicated in the totals where comparison may be made between the number of trains actually operated

and the number of trains that would have been operated had the law been observed as shown in the redispatch.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

[fol. 3362]. Mr. Strouss: No questions.

Mr. Mason: Has the Court any further questions?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 234.

Mr. Strouss: The same objections particularly as to the redispatch.

The Court: The objections are overruled, it may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 234.")

The Court: The court will be at recess until two o'clock P. M.

(Thereupon the court stood at recess until two o'clock P. M., this day.)

[fol. 3363] January 30, 1941, two o'clock P. M.

The witness B. S. Sixes, was recalled to the stand, and proceedings were resumed as follows:

The Court: You may proceed.

Mr. Mason: Your Honor, the question was asked Mr. Sines as to the difference between the freight redispatching study and the passenger redispatching study, particularly as to the determination of the trains eliminated, and because his answer seemed at the time incomplete, we have had it written up to determine whether it read as we thought it read. I would like to have that answer made more complete. I think in your answer this morning, Mr. Sines, as it has been recorded, you said that "with a freight redispatching study where a day's business is handled by fleets of trains, fleets of six, seven, eight or nine trains per day, all of those trains observing the 70-car limit and then redispatching that business in a fewer number of trains, it is impossible to point your finger at any one train and say, 'This is the train that would have been eliminated.' All you can do is say that the actual operation amounted to

nine trains, and the redispatch operation amounted to six or seven trains, and there would have been saved two or [fol. 3364] three trains; and you get at the difference by subtraction instead of by actual determination." And there the quotation ends. Now, do you mean that you don't make an actual determination in the freight redispatching study, or simply that you don't make an actual determination of any specific or individual train to be eliminated?

A. The latter is my contention, that we don't determine the specific individual train eliminated.

The Court: Well, the Court so understood it.

Mr. Mason: Whereas, in the passenger redispatching studies, you eliminated an actual and specific train?

A. Yes.

Q. Now, refer to your exhibit 234 again. I think that you said, prior to the noon recess, that it was possible by reference to the exhibit to determine what the additional operation would have been if the law had been observed even though the precise figures of additional train operation in the sense of train-miles may not appear on the exhibit?

A. Yes.

Q. Can you point to the showing on the exhibit which you had in mind?

A. The total for the territory, Yuma to Gila indicates [fol. 3365] 377 trains actually operated and on the redispatch 399 trains, an increase of 22 trains in that particular district. The grand total, trains between Yuma and El Paso, indicates 1,550 trains actually operated as compared with 1,614 trains which would have been operated according to our redispatching study, an increase of 114 trains.

Q. Now, I notice that between Yuma and Gila there were actually operated eastward 175 trains, and westward 202. Does that indicate an unbalance of trains?

A. Yes, there were 27 more trains operated westbound than eastbound, which would have required the double-heading of locomotives and deadheading of train crews in the opposite direction to balance the power and crews.

Q. That was in actual service, was it?

A. Yes.

Q. Now, was that an actual requirement rather than a potential requirement?

A. That was an actual requirement.

Q. Now, what do we find on the redispatching study as to the unbalance?

A. On the redispatching study under the 70-car restriction, we go further out of balance, we find that there were [fol. 3366] 47 more trains westward than eastward.

Q. Does a similar condition appear in some of the other districts?

A. Yes, Gila to Tucson, actually there were 24 more trains westward than eastward, and on the redispatch there were 44 more trains westward than eastward. Similar differences prevail between Tucson and Lordsburg, but between Lordsburg and El Paso there was no change indicated as a result of the redispatching study.

Q. There was substantially the same operation, generally speaking, between Lordsburg and El Paso in the redispatch as in the actual, was there?

A. That is right.

Q. The figures, of course, here would indicate precisely what the differences were?

A. Yes, sir.

The Court: Then, Mr. Sines, in your recapitulation of your redispatch in the territory from Yuma to El Paso, the 107 trains of over seventy cars, all of those operated between Lordsburg and El Paso paying due respect to the Arizona law in the redispatched operation?

A. That is right. That can be quickly checked.

The Court: I see that can.

[fol. 3367] Mr. Mason: Have you any other comments on exhibit No. 234?

A. No, I don't think so.

Q. Have you before you a chart in one sheet entitled, "Relative Train Lengths, Arizona, California, New Mexico, Texas, Through and Local Freight Trains Operating Via Yuma, Gila, Tucson, Lordsburg, and El Paso, Based on Redispatching Study of April, 1940, Observing 70-Car Restriction and Using Present Power and Short Sidings"?

A. Yes.

Mr. Mason: May this be marked "Defendant's Exhibit No. 235" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 235 for identification.

Mr. Mason:

Q. Is this likewise based on the redispatching study, item No. 5 of your exhibit No. 196?

A. It is.

Q. And prepared under your direction?

A. Yes.

Q. What is the source of the figures shown on the exhibit?

A. Data abstracted from the actual and redispatched train sheets.

[fol. 3368] Q. As to the territory west of Yuma, is that one especially prepared in the office of the auditor of equipment service accounts?

A. Yes, for the 27 day period, April 4th to April 30th, 1940.

Q. Did you consolidate the trains entering Yuma from the west so as to include those coming from the Imperial Valley direct as well as those coming from Indio via Niland?

A. That is correct. There are shown hereon trains entering Yuma from the west and trains departing Yuma to the west.

Q. Is this exhibit a counterpart of exhibit No. 215?

A. Yes.

Q. This exhibit is a showing similar in its general aspects to exhibit No. 215, is it?

A. Yes.

Q. Has it been checked against the underlying sources?

A. It has.

Q. Will you state whether it is true and correct?

A. It is true and correct.

Mr. Mason: Have you any questions, Mr. Strouss?

[fol. 3369] Mr. Strouss: No questions.

Mr. Mason: Has the Court any questions?

The Court: No.

Mr. Mason: We offer the exhibit as defendant's exhibit No. 235.

Mr. Strouss: Same objections.

The Court: Objections overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 235.").

Mr. Mason:

Q. Mr. Sines, I notice from exhibit No. 235 that the cross-hatching appears only or practically only in connection with

the westward operation. There is apparently very little difference between the average actual trains and the average redispatched shorter trains for the eastward operation. Will you explain why that is?

A. Because the preponderance of traffic during April, 1940, was westward and we brought the westward train operation more nearly into balance with the eastward operation by lengthening our westward trains. We did run a few long trains eastward but not to the same extent that we did in the opposite direction.

Q. Was it necessary in the 1940 long train operation to [fol. 3370] observe siding clearance, generally speaking, one way or the other?

A. Yes, that was a further handicap that had its reflection in the results of that long train operation in April, 1940. We still had to observe siding clearance generally with the trains in one direction and on top of that we couldn't add appreciably to the length of our eastward trains with the power that we had available at that time.

Q. By referring to the preceding exhibit, I notice that between Yuma and Gila there were 77 westward trains having 71 or more cars but only 12 eastward trains. Is that condition reflected on the Yuma-Gila district as it appears on exhibit No. 235?

A. Yes.

Q. Do I understand you to say that is because of an unbalance of traffic as measured in car-miles westward?

A. Yes.

Q. As against the eastward traffic?

A. Yes.

The Court: Mr. Sines, referring back for the moment to exhibit No. 234, I notice in the upper block the operations from Yuma to El Paso over your northern route there was an actual saving in your long train operation as against [fol. 3371] your redispatched when you complied with the Arizona law of some 64 trains, whereas in the lower block, your southern route, apparently you ran exactly the same number of trains in your actual operations where you paid no attention to the restrictions of the Arizona law as you did in your redispatch?

A. That is right.

Q. Will you explain that? How you would affect the saving in one instance and not in the other, I mean a saving in the number of trains?

A. Yes. The situation on the South Line via Douglas was the same in 1940 as it was in 1938, we were running one train a day in each direction and——

Mr. Mason (Interrupting): You mean one through train in each direction, I take it?

A. It has a connection at Douglas, but it is not a through train. They do local work down there.

Mr. Mason:

Q. What I had in mind was exclusive of the Douglas-Bisbee service?

A. Yes. We couldn't cut any trains out on the South Line by consolidation or elimination. We always have to run the one train.

The Court:

Q. If you only had one train a day each way, that would be two trains operated daily and you have two districts so [fol. 3372] you would have double that, that would be four, and four times the twenty-six days that you operated would be 104, whereas you actually operated 176 trains so that there was more than one a day each way during that 27-day period on the average?

A. All right, let's look at Douglas-El Paso. We have 29 trains east and 28 trains west as compared with the 27-day period.

The Court: I possibly overlooked the Douglas-Bisbee Junction operation where you actually had 48 trains there; that was included in the total of 176?

A. That is right.

The Court: That may account for it.

A. That helps to account for it, but between Douglas and El Paso they apparently ran one train in one direction and two trains in the other direction over the one train per day and we exceeded that a little bit between Tucson and Douglas. Just what the occasion for that was I don't know, but the big difference was that it should have included the Douglas-Bisbee Junction turnaround and which are put in here because during the long train operating period we ran

nine of those Douglas-Bisbee Junction trains over 70 cars in length as is indicated in columns C and E. They fit into [fol. 3373] a through train operation occasionally, too, and this is the use we made of them in our 1938 redispatch. They handle empty ore cars from Cakmet, a station near Douglas, west to Bisbee Junction, and they have a little excess capacity on the locomotive; and on the redispatching operation in 1938 we had them handle some empty cars west from Douglas to Bisbee Junction where those empty cars would be set out and picked up by this one train a day west operating between Douglas and Tucson. The maximum grade west from Douglas occurs between Douglas and Bisbee Junction, and the Douglas-Bisbee Junction turnaround train thus assisted one local train west in handling the tonnage over the most difficult part of the trip.

Mr. Mason:

Q. Going to exhibit No. 235, Mr. Sines, does the fact that the saving was substantially all on the westward movement as indicated here reflect the opportunity or lack of opportunity for long train operation imposed by the siding lengths?

A. Yes, there are two factors governing the length of the eastward trains, one of them was siding length and one of them was capacity of present power.

Q. In this case the eastward trains in a practical sense, [fol. 3374] because of the long westward trains, could not exceed siding length in the same territory, is that correct?

A. Yes.

Q. With the present siding lengths even if the Train Limit law were disregarded, would it in a practical sense be a one-way operation in one way or the other so far as exceeding the 70-car limitation was concerned?

A. You might say that was the general situation although yesterday or the day before I did mention cases where by timing the departure of trains from terminals it is possible to exceed the siding length with trains in each direction, but that is not a regular and general operation.

Q. Would a condition of this kind, as indicated by exhibit No. 235, obtain in greater or less degree throughout the year if the law were disregarded?

A. It would obtain to this extent the year round first in one direction and then in the other direction depending upon the surges and the movement of traffic.

Q. Wherever the unbalance happened to be?
A. Yes.

The Court:

Q. Mr. Sines, to put this another way, your entire re-
[fol. 3375] dispatch study on all of the exhibits that have been admitted in evidence disclosing the effects of it is based upon a Utopian condition, that is, if all of the sidings were extended and if we had big power here is what we could do. You are not able, when you were turned loose for 27 days, to make anywhere near as good a showing on your actual operation without restriction of the law as you were able to show on your redispatching study which, as I put it, was somewhat of a Utopian situation?

A. That is true. You will remember that one of my very first exhibits was a siding extension program and then we followed that shortly with my assignment of power.

The Court: When I say "Utopian," I don't mean to infer that that condition could not—that is, a favorable condition could not be realized with the necessary outlay of money to improve the rights of way and so forth.

Mr. Mason:

Q. Mr. Sines, would there be any practical benefit of extending the sidings if the law is to be observed?
A. No.

The Court:

Q. In other words, you get along very nicely as it is?
[fol. 3376] A. Yes, sir.

Q. And have been getting along with the sidings of the present length these many years?

A. Always with the shackles of the law around us, we manage to get along, yes. Our present plant is adequate to handle the business the way we have to handle it.

Mr. Booth: The law gave us all we were doing then but froze us at that point.

The Court: I think I see the situation.

Mr. Mason:

Q. Again, Mr. Sines, you have shown what the cost would be both from the capital standpoint and on the annual basis

as opposed to the gross saving which would be achieved if the law were disregarded with the implements at hand to disregard it, have you?

A. Up until now I have only given you an indication of what the savings would be as regards train-miles. I haven't got to the money stage yet, but I hope to soon.

Q. Except as to the wages?

A. Yes.

Q. Let's return to exhibit No. 235. This shows what the saving could be with the present far from ideal conditions?

A. That is right.

[fol. 3377] Q. And is in a sense an example of the saving which was achieved, is it not?

A. Exactly.

Mr. Strouss: I think I am going to have to object to that as leading.

The Court: Yes, the last question was leading; objection sustained.

A. There is one other comparison I would like to make between exhibit No. 234 and exhibit No. 235, if I may. Looking at the figures in the total, columns H and P, for the Yuma-Gila territory, it is apparent that eastward the redispatching operations show we would have had to run only one more train if we had observed the law eastward and we would have had to run 21 more trains westward if we had observed the law. That, in large measure, is the reason for the close proximity of the lines on exhibit No. 235 in the eastward operation. There is only a difference of one train in the Yuma-Gila district eastbound, one train in the Gila-Tucson district eastbound, one train from Tucson to Lordsburg eastward. The greatest difference, or practically the entire difference, occurs in westward operations, which is shown by the separation of the lines on exhibit No. 235 on the westward block.

[fol. 3378] The Court: You have already testified that the April traffic covered by the period that you were operating without the restriction of the Arizona law, that the bulk of that was westward?

A. Yes, sir, I would rather say the preponderance was westward.

[fol. 3379] Mr. Mason: Mr. Sines, looking at exhibit No. 235, will you say whether or not this represents graphically a saving which might reasonably be achieved forthwith if the restrictions of the law were lifted or discarded?

A. Yes.

Q. Would any additional capital outlay be involved in achieving this particular saving?

A. None at all. There is another twist that you don't see there unless your attention is called to it particularly. Between Lordsburg and El Paso redispatched trains were longer than the actual trains westward because in actual operation, we did take a few cars off the north line and sent them down through Douglas, a very few. On the redispatched operation they returned on their normal route on the north line.

The Court: And this exhibit 235 doesn't cover the operations on the south line at all?

A. No.

Q. Whereas, Exhibit 234 shows both?

A. Yes, sir.

Mr. Mason: Is there anything further on Exhibit 235, Mr. Sines?

A. No.

Q. Have you before you a statement in two sheets en- [fol. 3380] titled "Redispatch Study—Operating Statistics, Yuma, Arizona, to El Paso, Texas, for period April 4th to April 30th, 1940, Actual Operation Compared with Redispatched Operation, Observing Seventy Car Restriction and Using Present Power and Short Sidings."

A. I have.

Mr. Mason: May we have this statement marked "Exhibit 236," your Honor?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 236 for identification.

Mr. Mason: Was this exhibit prepared by you or under your supervision, Mr. Sines?

A. It was prepared under my direction and supervision.

Q. From what sources?

A. From the totals on the white work sheets A; and back of the white work sheets A, of course, are the actual and redispatch train sheets.

Q. You call a portion of this exhibit, a block of the exhibit refers to the north line. Is that the line via Gila and Lordsburg?

A. Once again that means the line by Gila and Lordsburg.

Q. You show separately the statistics for that line and the [fol. 3381] south line, do you?

A. Yes.

Q. How did you arrive at the—perhaps I should ask you first, does this exhibit correspond to No. 226?

A. Yes.

Q. Was it prepared along the same lines?

A. It was.

Q. I take it that all of the notations which are shown by numbers in parentheses are explained in full on the second sheet?

A. That is right.

Q. Are there any differences between this exhibit and Exhibit 226, as to method of compilation which require explanation?

A. No.

Q. Now, you show in each block, the separate blocks being identified by Roman numerals, the notation "Increase for Period." Does that mean the increase in the number of the various items shown in columns A to F, inclusive, for the period April 4th to April 30th, inclusive, 1940?

A. Yes, as indicated in the title.

Q. Has the exhibit been checked?

A. It has.

Q. And the totals, are those correctly computed?

[fol. 3382] A. Yes.

Q. What is the purpose of the exhibit?

A. To show the results of the redispatch study in these operating statistics, and also to develop figures upon which to base estimates of costs.

Q. Now, Mr. Sines, I think that in your oral testimony with reference to exhibit 234, you stated that there were 114 more trains operating in redispatched operations than were actually operated. If I read your exhibit correctly, the difference is the difference between 1,550 and 1,614, the figures appearing on exhibit 234, and that difference would be 64?

A. That is right, my 114 was in error.

Q. Does that same computation appear in actual figures in the total for the north line for the number of trains in the first column of exhibit 236 for identification?

A. It does.

Q. Is there any additional explanation you desire to make with reference to the notes on the second sheet?

A. No, only to call attention to them and to the fact that they are explanations of the numbers appearing on the face of the first sheet.

Q. Are they largely or entirely for the purpose of ac- [fol. 3383] counting for the difference between the number of cars actually moved and the number of cars moved on the redispatch study?

A. That is right.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has the Court any questions?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as Exhibit No. 236.

Mr. Strouss: The same objection as to the previous exhibit.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 236.")

Mr. Strouss: Do you have the 521 and 1232's for 1940?

A. Yes.

Mr. Strouss: I would like to have copies of those.

The Witness: All right.

Mr. Mason: Forms 521 and 1232 for 1940?

Mr. Strouss: Yes.

Mr. Mason: Is that all complete now?

The Witness: Yes, that is available.

[fol. 3384] Q. Mr. Sines, did you as a result of and in connection with the redispatching study of April, 1940, prepare an exhibit reflecting the arrival times at El Paso, Texas, of fruit blocks and manifest sections moving during that period?

A. Yes, sir.

Q. Similar in form to your exhibit 227?

A. Yes.

Q. Will you state its title, please?

A. "Arrival time at El Paso, Texas, of Fruit Blocks and Manifest Sections, Actual Operation Compared with Redispatch Operation, Observing Seventy Car Restriction and Using Present Power and Short Sidings, April 4th to May First, Inclusive, 1940."

Q. From what sources was this exhibit prepared?

A. From the actual and the redispatch train sheets.

Mr. Mason: May this be marked Exhibit 237, your Honor?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 237 for identification.

Mr. Mason: Has it been compared with the actual and redispatch train sheets?

A. It has.

[fol. 3385] Q. And I take it that the computations which are shown in the second, third, fourth and fifth sheets in columns G and H are your own computations?

A. That is right.

Q. Is it substantially identical in form to Exhibit 227?

A. Yes.

The Court: Mr. Sines, you haven't added an extra day on us here? All your previous exhibits referred to the period April 4th to April 30th, and this goes from April 4th to May first.

A. Well, I would explain that by saying that one of the trains that left Lordsburg on April 30th arrived at El Paso 5 A. M. May first.

The Court: Was that the reason for including the May first date?

A. Yes, that is shown on sheet 5.

Q. And that was the only reason?

A. Yes.

Mr. Mason: I should have said, Do the explanations made in connection with Exhibit 227 likewise apply with reference to Exhibit 237?

A. They do.

Q. Is the exhibit true and correct to the best of your knowledge and belief?

A. It is.

[fol. 3386] Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: You didn't have any difference in this one with respect to arriving at the yard and arriving at the ice house?

A. No, in April 1940, the ice house was not operated.

The Court: This covers the north line and has nothing to do with the south line?

A. That is right. I might say that none of our perishable trains operate over the south line in normal operation; they all go through Lordsburg.

Q. Is that because you can make quicker time that way?

A. Yes, and because the north line is a cheaper route to operate than the south line.

Q. What is the difference in the operating time between Tucson and El Paso, say, over your north line and over your south line?

A. That is largely a matter of train interference and distance. It is 30 miles longer through Douglas than it is over the north line, and it depends on the number of trains which you have to meet. My answer a moment ago when I said yes, it is a quicker route, was not an exactly correct answer, there are so many other factors involved in that besides just dispatching speed.

[fol. 3387] Mr. Mason: It is thirty miles shorter, that contributes some difference in the cost and time?

A. That is right.

Q. Then with the refrigerator cars there is two cents per car-mile each way?

A. That is right.

Q. You might explain to the Judge what it costs the company.

A. We pay the Pacific Fruit Express Company, and any other railroad in the United States pays the Pacific Fruit Express Company two cents a mile for the use of that car whether the car be loaded or empty.

The Court: And if the car were not moved you wouldn't have to pay anything for that day?

A. No, sir.

Q. Whereas, with these other connecting carriers where their cars are on your line you pay a dollar a day?

A. That is right.

Mr. Mason: Now, the difference is that refrigerator equipment is paid for on the mile basis and ordinary boxcar equipment is paid for on the day basis?

A. That is right.

Q. Now, the difference between moving seventy refrig- [fol. 3388] erator cars to El Paso by Lordsburg and moving seventy refrigerator cars to El Paso by Douglas is sixty cents a car, is it not?

A. That is right.

Q. Or $42 for a seventy-car train?

A. That is right.

Q. Is that one reason for moving trains over the shorter route?

A. That is one of the reasons.

Q. And the expense of hauling a train thirty miles further?

A. Yes.

Q. Independent of the car rental feature?

A. Yes.

Mr. Mason: I offer Exhibit 237 in evidence.

Mr. Strouss: The same objection as to the previous exhibit.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 237.")

Mr. Mason: Will you take up an exhibit in three sheets entitled "Arrival Time at Yuma, Arizona, of 'SSW' and 'GBW' Westward Manifest Trains, Actual Operation Compared with Redispatched Operation, Observing Seventy Car [fol. 3389] Restriction and Using Present Power and Short Sidings."

A. Yes.

Mr. Mason: May that exhibit be marked Exhibit 238, your Honor?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 238 for identification.

Mr. Mason: Does this exhibit correspond to your exhibit 228, Mr. Sines?

A. It does.

Q. What is the source of the information shown on the exhibit?

A. The actual and redispatch train sheets.

Q. Is the information shown here abstracted directly from the actual and redispatch train sheets?

A. It is.

Q. The computations in columns F and G are computations appearing from the figures in the preceding columns, are they?

A. Yes.

Q. Has the exhibit been checked to determine whether it is true and correct?

A. It has.

Q. Will you say whether or not it is true and correct?

[fol. 3390] A. It is.

Q. I take it that its purpose is the same as the preceding exhibits of the same form?

A. Yes.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has your Honor any questions?

The Court: No.

Mr. Mason: We offer the exhibit as Exhibit No. 238.

Mr. Strouss: The same objection.

The Court: The objection is overruled. It may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 238.")

Mr. Mason: Have you an exhibit in one sheet entitled "Redispatch Study Wage Data Yuma, Arizona, to El Paso, Texas, for Period April 4th to April 30th, 1940?"

A. I have.

Q. And this exhibit again compares the redispatched with actual operation, observing the seventy-car restriction and using present power and short sidings?

A. That is right.

Mr. Mason: May this exhibit be marked Exhibit No. 239, [fol. 3391] if your Honor please?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 239 for identification.

Mr. Mason: From what source was it prepared, Mr. Sines?

A. From the white work sheets A.

Q. What other exhibit, if any, preceding does this exhibit resemble?

A. This exhibit resembles Exhibit 229.

Q. Was it prepared in the same way?

A. It was.

Q. This, I take it, is the converse or opposite, so to speak, of 229 in that this shows an increased expense by reason of the redispatched operation rather than a reduction?

A. That is right.

The Court: Mr. Sines, referring back to exhibits 237 and 238 for a moment, I am not certain that I get the import of the data contained under 5A on the front page of each exhibit. Now, do I understand that with your redispatch trains, that they actually make better time and arrive in advance of those that I will term long trains to the extent shown there in that exhibit?

A. Yes.

[fol. 3392] Q. In other words, the longer train slowed up operations?

A. Yes, because of the handicap of short sidings.

Mr. Strouss: Now, that last, I move it be stricken.

The Court: Yes, it was volunteered and it may be stricken.

Mr. Mason: Now, Mr. Sines, in actual operation eastward, as represented on No. 237, were there any substantial number of long trains operated?

A. In eastward operations, there were twelve long trains operated between Yuma and Gila, sixteen between Gila and Tucson, seven between Tucson and Lordsburg.

Q. And that is out of a total of something like 1,172 trains, isn't it?

A. That is right.

Q. So there was no substantial long-train operation eastward which might have resulted in long trains arriving to any extent later than short trains would have arrived?

Mr. Strouss: I object to that as leading.

Mr. Mason: I will withdraw the question.

Q. I think you had explained that Exhibit 239 was prepared along the same lines and in the same manner as [fol. 3393] Exhibit No. 229?

A. That is right.

Q. Have you checked the exhibit against the underlying sources, Mr. Sines?

A. I have.

Q. Now, as to the variable items in columns B and H, I think you have explained how that item was calculated in connection with Exhibit 229. I will ask you if you followed the same methods here.

A. That is right. The variable item in this instance is increased in the same proportion as the increase in train miles for trainmen and locomotive-miles for enginemen.

Q. And in computing the railroad retirement and unemployment insurance tax, does that represent moneys paid by the company as and for that particular type of tax based upon the wages?

A. Yes; sir.

Q. Is it computed only against the difference between the actual and the redispatched wage items?

A. That is all.

Q. Where do you obtain this 5.94 per cent?

A. In 1938, the company's proportion of those two taxes totaled five and three-quarters per cent, but in 1940 it had advanced to 6.0 per cent.

Q. But you show here 5.94. Is that because of the elimi- [fol. 3394] nation of a portion of the wage payments from the incidence of the tax?

A. Yes, those salaries totaling more than $300 a month.

Q. Then, this is the actual money tax paid for trainmen's wages applied against the total amount paid them as wages and a ratio thus derived rather than taking the flat six per cent?

A. That is right.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Has your Honor any questions before the exhibit is offered?

The Court: No.

Mr. Mason: We offer the exhibit as defendant's Exhibit 239.

Mr. Strouss: The same objection as to the previous exhibit.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 239.")

Mr. Mason: Mr. Sines, have you made any attempt to expand the figure of the wage decrease, or, rather, increase, as indicated so as to arrive at an annual figure for 1940.

[fol. 3395] A. No, I have not.

Q. This $3,832.32 simply represents, according to the exhibits whatever wage savings plus tax there may have been in 27 days?

A. That is right.

The Court: Mr. Sines, referring now to Exhibit 229 as well as to Exhibit 239, I notice, first on the exhibit 229 that in your redispatching study, the cost of the items shown on this exhibit actually increased on the south line to the tune of $558.93?

A. Yes.

Q. And on your corresponding exhibit 239, you were able to show a decrease for the period over the south line of $8.84?

A. That is right.

Q. Now, forgetting the south line for a moment, your real economy or saving for the period June and August, 1938, as shown by exhibit 229, was $48,000 plus for the two months. Dividing that by two would give you approximately $24000 a month average saving?

A. That is right.

Q. That was under the ideal conditions heretofore testi-

[fol. 3396] fied to with long sidings and the heavy power?

A. That is right.

Q. As opposed to that, under your redispatching study of the period April 5th to 30th, shown by Exhibit 239, you were only actually able to make a saving where you operated without the restriction of the Arizona law of the sum of $5,000 plus, or less than a fourth of the estimated savings under your ideal conditions?

A. That is right.

Mr. Mason: Mr. Sines, the items mentioned in the Court's question relate only to wage savings on the north line?

A. Yes.

The Court: And it only covered, I appreciate a 27-day period as against a full month on the other.

Mr. Mason: What is the basic reason why the saving in April as indicated by Exhibit 239, omitting the small item of tax, would be $5,518 as indicated by the exhibit, whereas it would be, as suggested by the Court, approximately $24,000 per month, as shown by Exhibit 229?

A. The whole answer is found in column B of each exhibit. Under ideal conditions we can save $114,240 train [fol. 3397] miles in two months, or 57,000 in one month, according to Exhibit 229, but on exhibit 239 we were able to save 8,733 train-miles, and when we say "ideal conditions" we have in mind the extended sidings and larger power.

Q. Are these ideal conditions in any sense impracticable or out of reason?

A. No, they are found on every other part of our main line on this railroad, with the exception of the territory in Arizona.

Q. Now, you say that the difference is found in the difference in train-mile saving. What is it that prevented a train-mile saving, if one was prevented, in April of 1940, but which permitted a more substantial train-mile saving, if one was permitted, by the redispatching study of 1938; what physical condition is it, or other condition?

A. The length of sidings and power.

Q. And what is it that prevents those sidings from being extended today? Is there anything to prevent them from being extended?

A. No, we can extend them as shown by my siding extension program if there is any reason to extend them.

The Court: We will take our afternoon recess.

(Thereupon, a short recess was taken, after which the witness was recalled to the stand, and proceedings were resumed as follows:)

[fol. 3398] Mr. Mason: I don't believe exhibit No. 239 has been offered.

The Court: It was admitted.

Mr. Mason:

Q. Mr. Sines, have you reviewed the forms 521 for 1940 to determine the percentage relationship between the traffic

handled in April of that year as measured in gross ton-miles on the Tucson division and the traffic handled in the entire year?

A. I have.

Q. What percentage of the total traffic of the Tucson division measured in gross ton-miles was handled during the month of April, 1940?

A. During the entire month of April there was handled 8.65 per cent of the total year's business.

Q. What would one-twelfth of the year be?

A. 8.33 per cent. During the twenty-seven days of April, figuring that on the basis of twenty-seven thirtieths of the 8.65, there was handled 7.78 per cent.

Q. Mr. Sines, will you turn to an exhibit in one sheet bearing title, "Main Line Freight Trains of Various Lengths Operated between Yuma, Arizona, and El Paso, Texas, Via Gila, Arizona, and Lordsburg, New Mexico, and Via Douglas, Arizona, over South Line during Period [fol. 3399] April 4th to April 30th, 1940, Inclusive, Actual Operation Compared with Redispatched Operation with no Restriction and Using AC Power and Long Sidings"?

A. Yes.

Q. Have you that exhibit before you?

A. I have.

Q. What is the basis of this exhibit?

A. The basis of this exhibit is a redispatched study to determine what the results would have been during the 27-day period of April had we been able to operate with long sidings and with larger power.

Q. The series of exhibits just concluded ending with exhibit No. 239 had to do with making long trains into short ones, had it?

A. Yes, sir.

Q. And the first redispatching study of 1938 had to do with making Arizona-size trains, 70 cars or less, into long trains with AC power and long sidings?

A. Yes.

Q. What is this redispatching study?

A. This takes the long trains of the 27-day period, April 4th to 30th, and makes longer trains out of them assuming that we have longer sidings and larger power.

[fol. 3400] Q. Do you contemplate for the purposes of this study the same siding extensions and same types of

locomotives as were contemplated for the 1938 redispatching study?

A. Yes, sir.

Q. What underlying documents did you employ in preparing the exhibit before you?

A. This exhibit was prepared from the actual and redispatched train sheets.

Mr. Mason: May we have this statement marked as "Defendant's Exhibit No. 240" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 240 for identification.

Mr. Mason:

Q. Does it resemble any of the preceding exhibits, Mr. Sines?

A. Yes, we have two exhibits like this, one of them is No. 234 and the other is No. 214.

Q. I take it this is simply a train count from the actual and redispatch train sheets?

A. That is right.

Q. Does the actual showing on this exhibit reproduce the showing of actual — which is on exhibit No. 234?

A. It does.

[fol. 3401] Q. Has the exhibit been checked against the underlying sources?

A. It has.

Q. Will you say whether or not the exhibit is correct insofar as it reflects those underlying sources?

A. It is correct.

Q. Now as to the computations, have they been checked?

A. They have.

Q. Will you say whether or not they are correct?

A. They are.

Q. I take it this exhibit has a purpose similar to that previously stated by you for exhibit Nos. 214 and 234?

A. Yes, sir.

Mr. Mason: Have you any questions on exhibit No. 240, Mr. Strouss?

Mr. Strouss: No questions at present.

Mr. Mason: Has the Court?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 240.

Mr. Strouss: The same objections as to the previous exhibits.

[fol. 3402] The Court: Objections overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 240.")

Mr. Mason:

Q. If I read the exhibit correctly, there was practically no change made in the South Line operations as between the actual and redispatch operations during the period covered by exhibit No. 240?

A. That is right.

Q. The only change, or at least the only change of any account, is in the making of the trains actually operated into still longer trains on the basis of AC power and longer sidings?

A. Yes.

The Court: Then the real gist of this is expressed in the recapitulation there that under your actual long train operations during this period you had 25 plus per cent of trains with over 70 cars, whereas under your ideal conditions you stepped that up to 76 per cent?

A. That is right.

Mr. Mason:

Q. Mr. Sines, have you any other comments on exhibit No. 240?

A. No, but right along the line of the judge's last question I would like to call attention to exhibit No. 214, re- [fol. 3403] capitulation of the redispatch, indicating that in June and August, 1938, we showed 80 per cent of trains over 70 cars.

The Court: How do you reconcile the difference in percentage there?

A. I was wondering how I was going to volunteer the thought that that is a pretty good comparison.

Mr. Mason:

Q. Will you turn to a chart in one sheet entitled, "Relative Train Lengths, California, Arizona, New Mexico,

Texas, Through and Local Freight trains operating via Yuma, Gila, Tucson, Lordsburg, and El Paso, Excluding Strauss Turn-around Trains, Based on Redispatching Study of April, 1940, with No 70-Car Restriction and Using All Power and Long Sidings"?

A. Yes.

Mr. Mason: May we have this marked "Defendant's Exhibit No. 241" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 241 for identification.

Mr. Mason:

Q. By the way, Mr. Sines, exhibit No. 240 and exhibit No. 241 for identification are related to the redispatching study which is identified as item No. 6 on your exhibit No. [fol. 3404] 196, are they not?

A. Yes.

Q. Does this exhibit resemble exhibits Nos. 215 and 235?

A. Yes.

Q. Prepared in the same manner?

A. Exactly.

Q. From the same sources or similar sources to these exhibits?

A. Yes.

Q. Has the exhibit been compared against these underlying sources to determine its correctness?

A. It has.

Q. In order that the record may be complete, will you state what is the principal underlying source for the information shown for the territory east of Yuma?

A. Statistics from the actual and redispatched train sheets.

Q. Is the exhibit true and correct?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has the Court?

The Court: No.

[fol. 3405] Mr. Mason: We offer the exhibit as defendant's exhibit No. 241.

Mr. Strouss: The same objections as to the previous exhibits.

The Court: Overrule the objections, it may be admitted.

(The document referred t was received in evidence and marked "Defendant's Exhibit No. 241.")

Mr. Mason:

Q. Mr. Sines, I will ask you first to take your exhibit No. 241 and your exhibit No. 215. Exhibit No. 215 shows that in the redispatch operation you were able to obtain during June and August, 1938, train lengths east of Yuma running between 85.2 cars per train and 89.1 cars per train, whereas the showing on exhibit No. 241 ranges from 76.7 cars per train up to 83.2?

A. That is right.

Q. How do you explain that difference?

A. In April we were in a different perishable season than we were in June, 1938, or in June of any year. In June, 1938, we were receiving very long trains from the Imperial Valley. We didn't have those trains in April and the result was that the trains redispatched east from Yuma did not attain quite as great a length as they did during June, 1938.

[fol. 3406] Q. Is that difference illustrated by the figure of actual average train length in the district of eastward trains in the territory west of Yuma?

A. That is right.

Q. There is also some difference between the westward average train lengths in the territory east of Yuma. You show on exhibit No. 215 an average train length very close to 93 cars throughout the territory from El Paso to Yuma; whereas in the 1940 redispatch the train length varies down from 92.8 to 84.6?

A. That is right.

The Court: In that connection, Mr. Sines, I notice from exhibit No. 241 that your train lengths under this redispatching study of April, 1940, you get progressively longer trains the further east you get clear into El Paso, and as compared to your California actual operations during that same period which were under no law restriction you only had 81.5 as against 92.8 over in your Rio Grande division. In other words, you are getting progressively longer trains as you go eastward.

Mr. Mason: I think your Honor is referring to a westward movement.

The Court: I guess I am incorrect there.

[fol. 3407] Mr. Mason: While your Honor's question does refer to the westward movement, I would like to ask the witness if there is any particular explanation to be made there?

A. The same tendency is evident in exhibit No. 215 and I don't find any ready explanation for that except it is the result of the entire railroad operation where trains east must balance or should nearly balance with the trains west.

Mr. Mason:

Q. You mean as to number or length?

A. As to number.

The Court: Could that be explained by the fact that some of those cars are dropped off into Arizona local traffic?

A. No.

Q. Shipments consigned to Arizona?

A. I wouldn't think Arizona local traffic would affect this very much in April. There is a considerable difference in the length of trains westbound from Yuma comparing June and August, 1938, against April of 1940. That, again, is due to the fact that in June, 1938, we were running long trains into the Imperial Valley as well as out of the Valley, whereas in April, 1940, we were not running those particular trains and a large part of the operation west of Yuma [fol. 3408] was confined to the line Yuma to Indio.

Mr. Mason:

Q. Mr. Sines, will you take exhibit No. 241 and also exhibit No. 235. Have you exhibit No. 235 before you?

A. Yes.

Q. I will ask you whether it is possible with those two exhibits to determine or to visualize, let us say, the differences between redispatched operation using AC power and long sidings in April, 1940, and operations in complete compliance with the Arizona law?

A. Yes.

Q. How is that done?

A. It would be possible to superimpose exhibit No. 235 over exhibit No. 241 so that the line 68.7 between Yuma

and Gila would lie directly on the line 68.7 between Yuma and Gila and you would then find that the redispatch short operation of 62.7 cars would compare with the redispatch long train operation of 84.6 cars and the hatched portion of the chart would extend down to the 62.7 line.

Q. Would it be possible simply to draw in the lines representing the redispatched short train operation on exhibit No. 235 in their proper places on exhibit No. 241 in order to obtain the complete picture?

[fol. 3409] A. That is right.

Q. In other words, the two charts can be combined so as to give the full difference such as is indicated by exhibit No. 215?

A. That is right.

Q. Will you turn, please, to a statement in two sheets entitled, "Redispatch Study, Operating Statistics, Yuma, Arizona, to El Paso, Texas, for Period April 4th to April 30th, 1940, Actual Operation Compared with Redispatched Operation, with No Restriction and Using AC Power and Long Sidings"?

A. Yes.

Mr. Mason: May this exhibit be marked No. 242 for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 242 for identification.

Mr. Mason:

Q. Did you prepare or supervise the preparation of exhibit No. 242?

A. I did.

Q. From what sources was it prepared?

A. From the white work sheets A which were compiled from the actual and redispatched train sheets.

[fol. 3410] Q. You show here a segregation by freight train districts, does that correspond to segregations on previous exhibits similar in form to this?

A. That is right.

Q. Will you identify those previous exhibits?

A. Exhibit No. 226 is the corresponding exhibit for the June and August, 1938, redispatch, and exhibit No. 236 is the corresponding exhibit for the April 4th to 30th redispatch using present power and short sidings.

Q. Was this prepared in exactly the same way as exhibit No. 226 and No. 236?

A. Yes, sir.

Q. You show an average number of cars per train in column F for each of the districts. Are those the average lengths counting the trains in both directions?

A. Yes.

Q. Whereas the average train lengths shown on exhibit No. 241, for example, are computed separately as to eastward and westward trains?

A. That is right.

Q. One other item, in column F you show cars per train, whereas in other columns there appears to be a difference styled, "Decrease for period," and in column F that desig-
[fol. 3411] nation doesn't appear to apply. Will you explain that?

A. Apparently there was an oversight in the preparation of this exhibit. The "I" indicating increase at the bottom of the sheet would apply or should have been placed in front of each one of those differences.

Q. That is where the figure for the redispatch is greater than the figure for the actual?

A. Yes.

Q. Here I see no substantial difference as to the South Line. Was the South Line redispatched in this particular item No. 6 of exhibit No. 196?

A. No, we didn't perform any redispatch study but we included the statistics on here in order to give us a showing which would be comparable to the other two showings.

Q. The South Line statistics are included on each of the other showings corresponding to exhibit No. 242?

A. Yes.

Q. Has this exhibit been compared to determine whether it is correct?

A. It has.

Q. Have the computations and additions, subtractions, and multiplications been checked?

A. They have.

[fol. 3412] Q. Will you say whether or not it is true and correct?

A. It is.

Q. I take it that its purpose is as already explained in connection with the exhibit No. 226 and No. 236?

A. Yes.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has your Honor?

The Court: No questions.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 242.

Mr. Strouss: Same objections.

The Court: Objections overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 242.")

The Court:

Q. Mr. Sines, for the record will you indicate on this exhibit No. 242 just where the figure "I" indicating increase should appear in column F and I will ask the clerk to make the proper notation on his copy as I will on mine.

A. In the line entitled "Decrease for period" in the following subdivisions indicate with the Roman numerals [fol. 3413] I, II——

The Court: That will be opposite 17.2?

A. Yes.

The Court: All right, go ahead.

A. In subdivision II, 19.4; in subdivision III, 20.9; in IV, 15.3; in VI, 18.3; in V also because there were no Strauss turnarounds in actual performance whereas we ran some on the redispatch so that is an outright increase opposite the 88.1.

The Court: Any on the South Line?

A. No, but in the final summary in subdivision XI, opposite 16.2.

Mr. Mason:

Q. Will you take up now a statement in four sheets entitled, "Arrival Time at El Paso, Texas, of Fruit Blocks and Manifest Sections, April 4th to May 1st, Inclusive, 1940," and also headed "Redispatched AC Power." I take it this also contemplates the use of longer sidings?

A. That is right.

Mr. Mason: May we have this exhibit marked "Defendant's Exhibit No. 243" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 243 for identification.

Mr. Mason:

Q. Did you prepare or cause to be prepared defendant's [fol. 3414] exhibit No. 243?

A. I did.

Q. From what sources?

A. From the actual and redispatched train sheets.

Q. Is this exhibit similar in form to the preceding exhibit showing arrivals at El Paso?

A. It is.

Q. No. 237 and No. 227 particularly?

A. That is right.

Q. Will you say whether or not it was prepared in the same manner?

A. It was.

Q. I take it that the computations or showings of hours and minutes in columns F and G on sheets Nos. 2, 3, and 4 are predicated upon the times shown in columns C and E?

A. That is right.

Q. Then you summarize that entire showing on sheets Nos. 2, 3, and 4 in the block on the first sheet?

A. Right.

Q. Were there any operations of trains either actual or redispatched at El Paso into the ice house tracks as against operations into the train yard?

[fol. 3415] A. No.

Q. What is the point of arrival of these trains actual and redispatched at El Paso?

A. Octavia Street yard.

Q. Has the exhibit been checked against the underlying sources?

A. It has.

Q. Will you say whether or not it is true and correct?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Your Honor?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 243.

Mr. Strouss: The same objections as to the preceding exhibits.

The Court: Objections overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 243.")

The Court:

Q. Mr. Sines, referring to this exhibit No. 243, I notice that your long train operations under ideal conditions that [fol. 3416] you get those trains into their destinations in advance of the actual operations the greater portion of the time?

A. That is right.

Q. Whereas in the previous exhibits in response to the question from the Court I believe you admitted that the so-called "long train operation" slowed it up due as you said then to your short sidings?

A. That is right.

Q. Now, with this exhibit you have your ideal conditions of long sidings and heavier power you make better time apparently, at least it is so reflected in this exhibit?

A. That is right.

Mr. Mason:

Q. Mr. Sines, is it possible by comparing exhibit No. 243 with exhibit No. 237 to have some comparison of the number of trains actually operated, the number of trains which would have been operated if the law had been completely observed and the number of trains which would have been operated if the long sidings and heavier power had been available?

A. Yes.

Q. Where do you find that comparison?

A. On exhibit No. 237 in line 3 redispatch we find 185 [fol. 3417] which is the number of trains which would have been operated had we complied with the provisions of the law.

Q. Is that correct or is it in line 2, number of trains arriving El Paso?

The Court: Possibly the witness didn't understand the question.

Mr. Mason: I referred not to the number of blocks but to the number of trains.

A. That is right. The answer to that is you cannot tell by looking at exhibit No. 237 what the difference in trains was eastward. I don't know that that is responsive to your question.

Mr. Mason: You can tell by looking at No. 237 and No. 243, can you not, the number of trains in which the traffic was carried which actually arrived at El Paso as compared with the number of trains in which the traffic was carried which arrived at El Paso on either of the redispatch studies?

A. Yes, you can.

Q. That is shown on the face of the exhibit, is it not?

A. Yes, there were 165 trains that actually arrived at El Paso on both studies. There were 165 trains that ar-
[fol. 3418] rived at El Paso on the first redispatch study and there were 132 trains arriving El Paso on the second redispatch study.

Q. Will you say whether or not this lesser number of trains arriving at El Paso on the second redispatch study reflects a lesser number of trains operated in the territory west of Lordsburg?

A. Yes, in the second redispatch study the operation was a through, continuous operation.

Q. I take it by reference to exhibit No. 234 you can compare the number of eastbound trains operated during the long train period of April, 1940, in the territory between Yuma and Lordsburg which handled this eastbound traffic?

A. That is right.

Q. Mr. Sines, referring again to line 2 of the summary on exhibit No. 243, does the lesser number of trains arriving El Paso as shown there reflect a lesser number of interferences with the movement of those trains over the line betwen Yuma and El Paso?

Mr. Strouss: I object to that as calling for a conclusion. The exhibits are in here which speak for themselves.

The Court: Yes, the objection is sustained.

Mr. Mason: Perhaps what I asked for was in a sense elementary, Mr. Sines.

[fol. 3419] Q. As reflecting or indicating the effect of trains upon number of interferences, suppose we have a dis-

trict such as the district between Yuma and Gila or between Douglas and El Paso where there is only one freight train in each direction per day, how many meets will there be?

A. One.

Q. At most?

A. Yes.

Q. Suppose that the number is increased so there are two trains in opposite directions during the same period and they all have to meet, how many meets will there be?

A. Four.

Q. If the number is again increased to three in each direction, how many will there be?

A. Nine.

Mr. Strouss: That depends on whether they are running during the same period of time.

Mr. Mason: That is part of the assumption, that they are running during the same period of time.

A. That is right.

Q. Of course, meets could be avoided by running all of the eastward trains at night and all of the westward trains in the daytime?

[fol. 3420] A. Yes.

Q. If you could operate in that way?

A. Yes.

Q. Could you operate in that way?

A. Not practically.

Q. If you were to take a longer district, for example, as between Yuma and Lordsburg, you couldn't possibly get all your trains in one direction over the line before all the westward trains had to start or all the westward trains over the line before the eastward trains had to start, could you?

A. No.

Q. Will you say whether or not it is the general rule that a multiplication or an increase of the trains in opposing directions produces a disproportionate increase in the number of meets roughly equivalent to the square or product of the trains in the opposing directions?

A. That is the relationship, yes.

Q. Referring again to exhibit No. 243, would the lesser number of trains arriving at El Paso on the redispatch as indicated on the face of the exhibit as compared with

the number of trains actually arriving betoken more or less interference by reason of meets and passes?

[fol. 3421] Mr. Strouss: Your Honor, we have had exhibits in here as to meets and passes; they have one up there on the board now.

The Court: I will overrule the objection, he may answer.

A. Yes, it does.

Mr. Mason:

Q. More or less?

A. More.

Q. Will you turn now to a statement in three sheets bearing title, "Arrival Time at Yuma, Arizona, of 'SSW' and 'GBW' Westward Manifest Trains, Actual Operation Compared with Redispatched Operation, with No Restriction and Using AC Power and Long Sidings"?

A. Yes.

Mr. Mason: May we have this marked "Defendant's Exhibit No. 244" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 244 for identification.

[fol. 3422] Mr. Mason: Did you prepare Exhibit No. 244, Mr. Sines?

A. It was prepared under my direction and supervision.

Q. From what sources?

A. From actual and redispatch train sheets.

Q. Does this exhibit correspond in general to exhibits Nos. 238 and 228?

A. It does.

Q. Did you follow the same methods?

A. Exactly.

Q. And make the computations in the same manner as already explained in connection with exhibits Nos. 238 and 228?

A. Yes, sir.

Q. Is the exhibit true and correct, to the best of your knowledge?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Any questions by the Court?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as No. 244.

Mr. Strouss: The same objection.

The Court: The same ruling. It may be admitted.

[fol. 3423] (The document referred to was recived in evidence and marked "Defendant's Exhibit No. 244.")

Mr. Mason: Will you turn to an exhibit in one sheet entitled "Redispatch Study Wage Data, Yuma, Arizona, to El Paso, Texas, for Period April 4th to April 30th, 1940. Actual Operation Compared with Redispatched Operation, with No Restriction and Using AC Power and Long Sidings."

A. Yes.

Mr. Mason: May we have this statement marked No. 245?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 245 for identification.

Mr. Mason: Did you prepare Exhibit No. 245 for identification, Mr. Sines?

A. It was prepared under my direction and supervision.

Q. Did you check it against the underlying sources?

A. I did.

Q. What are those sources?

A. The white work sheets A.

Q. Was this prepared from the entries on the white work sheets A of wage statistics in the same manner as Nos. 239 and 229?

[fol. 3424] A. Yes.

Q. You have used the same method indicating the totals and in applying the railroad retirement and unemployment insurance tax rates, as shown in line 12?

A. That is right.

Q. Will you explain just what was done in obtaining the variable items in columns D and H for the redispatched lines on the exhibit?

A. The variable amounts in the actual operations were reduced by the proportion of reduction of train-miles, first setting aside certain constant items and then adding those constant items back, such as switching at Gila and Lordsburg.

Q. Now, as to the enginemen's variable wages, did you use the locomotive-miles ratio?

A. Yes.

Q. Is the exhibit true and correct, according to the best of your knowledge and belief?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: We offer the exhibit in evidence as No. 245.

Mr. Strouss: The same objection.

The Court: The objection is overruled. It may be ad-
[fol. 3425] mitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 245.")

The Court: I notice the net result of this exhibit No. 245, Mr. Sines, is to increase the savings on wages as compared to Exhibit No. 239 by approximately three or four times?

A. That is right, and they are additive in this way, by adding the two together we get the difference between short train operation under the law and long-train operation with long sidings and big power for that 27-day period.

Mr. Mason: Now, going back to Exhibit 239, Mr. Sines, do I understand that the figure of $128,092 shown in the summary block 10 of the exhibit is the amount of wages, exclusive of tax, which would have been paid if the law had been fully observed?

A. Yes.

Q. And the amount of $103,508.99 in block 11 on exhibit No. 245 is the amount which would have been paid as wages, exclusive of tax, if long sidings and AC power had been used, and the law had not been observed?

A. That is right.

Q. It appears that the figure of $122,582.60 representing
[fol. 3426] actual wage payments is common to both exhibits?

A. That is right.

Q. To use a figure of speech, is that the center point from which you figure each way to the other results?

A. That is right, that is a good illustration.

Q. Is that what you had in mind when you said the figures were additive?

A. Yes.

Q. Is there any other feature of exhibit 245 to which you wish to draw attention?

A. Only to call attention to a computation which the Judge had me make in connection with exhibit 239 in order to refer back to exhibit 229. Half of the saving for the period in column L on exhibit 229 was $24,000, representing one month's savings, and here, in April, 1940, by adding these two figures together, we get something over $25,000, an exactly comparable item, short train operation compared with long train operation.

Q. And have you, Mr. Sines, an exhibit bearing the title "Statistics in Connection With Passenger Trains Exceeding Fourteen Cars in Length Operated During March and April, 1940?"

A. I have.

[fol. 3427] Mr. Mason: May this be marked 246 for identification, if your Honor please.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 246 for identification.

Mr. Mason: Did you prepare exhibit 246, Mr. Sines?

A. It was prepared under my direction and supervision. I have checked it and it is correct.

Q. From what sources was it prepared?

A. From the train sheets for March and April, 1940, supplemented by a review of the passenger conductor's wheel reports for the same period.

Q. I take it that Exhibit 246 for identification does not relate to any redispatching study concerning which you have just been testifying?

A. None whatsoever.

Q. It is based entirely on train sheets as supplemented by the passenger wheel reports?

A. Right.

Q. Now, precisely what have you done on this exhibit?

A. I have indicated the trains which operated in excess of fourteen cars within the boundaries of the state of Arizona during the months of March and April; I have com- [fol. 3428] puted the train miles that those trains negotiated and the car-miles accumulated during the time and only the time that their consist exceeded fourteen cars.

Q. If a train operated in the State of Arizona as for example No. 2, for only a portion of the distance across the

state, and for the balance of the distance across the state had fourteen or less cars, do you show any statistics with relation to the latter operation; that is, for the operation of fourteen cars or less?

A. No.

Q. And this includes only statistics of operation of passenger trains having fifteen or more cars for the period while they had that many cars?

A. Yes.

The Court: What actual period is covered here by this exhibit; from what date in March to what date in April?

A. I don't know what those are. I would have to look at our records to tell; I don't have it here available.

Mr. Mason: Approximately the 5th of March to the 27th of April?

The Witness: I seem to remember the 5th of March in connection with the passenger train that was testified to, [fol. 3429] and that was the first long train that was operated in Arizona.

The Court: And the passenger operations continued up until the 27th day of April, when you stopped your long freight train operations?

A. I can't answer that.

Mr. Mason: Now, how do you compute the train-miles shown here, Mr. Sines?

A. Well, just from the timetable distances between the stations between which the trains operated with over fourteen cars.

Q. The number of times that the operation was undertaken is shown in column C, headed "Times"?

A. That is right.

The Court: Mr. Sines, for your information and that of counsel, the complaint in this case, the second cause of action, indicates that the date was March second rather than March fifth.

The Witness: That was the first train, I know that.

Mr. Mason: Now, how do you obtain the car-miles shown here?

A. By examining the consists or the conductors' wheel reports, we determine the number of cars in excess of four-

teen cars and multiply those by the train miles negotiated, thus producing the car-miles.

[fol. 3430] Q. Now, do these car-miles in column E represent only the car-miles made by trains during the time that their consist exceeded 14 cars?

A. Exactly.

The Court: The other normal operations are not included in this exhibit?

A. No. For instance, look at the second item under Train 44. It says, "Yuma to Phoenix," and "Tucson to Arizona-New Mexico State Line." For that part of the train's operation between Phoenix and Tucson, neither the train-miles nor car-miles were computed, nor do they appear on this exhibit, because at that time the train had fourteen or less cars.

The Court: But this exhibit does cover all passenger operations in excess of fourteen cars to the train anywhere within the state of Arizona, both including the Phoenix line and the south line by Douglas?

A. That is right.

Mr. Mason: Now, suppose a train contained fifteen cars, Mr. Sines, and operated from Tucson to Phoenix, 121 miles, would the number of car-miles accumulated as shown here be fifteen times 121?

A. Yes.

[fol. 3431] Q. Not merely the excess over fourteen?

A. No.

Q. Mr. Sines, do you recall whether there was during the period covered by this exhibit one occasion where two trains, neither of them exceeding fourteen cars, were consolidated into a single train by reason of an engine failure?

A. That did happen, and account of that occurrence is not taken on this exhibit.

Q. Where did the engine failure occur, if you recall?

A. At Dock, Arizona, on a westward passenger train.

Q. And what happened then?

A. The train was consolidated with an immediately preceding or following passenger train and taken into Phoenix, a distance of approximately forty miles.

Q. Was that a case of engine failure between terminals?

A. Yes.

Mr. Mason: Your Honor will recall that the law exempts engine failures between terminals from the operation of the statute.

Q. You didn't take that into account in this showing here at all?

[fol. 3432] A. No.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: Yes.

Q. In the first item there is 435 train-miles and 6,646 car-miles. That would indicate a train of fifteen cars with 121 car-miles in addition. Would that mean that there had been a car put on that train at Phoenix perhaps, and brought to Tucson, and then dropped, making sixteen cars for that distance?

A. Yes, that would be a pretty good guess, Mr. Strouss.

Mr. Strouss: That is all.

Mr. Mason: Has your Honor any questions?

The Court: No questions.

Mr. Mason: We offer the exhibit in evidence as Exhibit 246.

Mr. Strouss: The same objection.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 246.")

Mr. Mason: That concludes the exhibits, your Honor that we now have ready for introduction by Mr. Sines. We have [fol. 3433] a number of other exhibits in preparation for introduction by him, and except for the distance between here and San Francisco in connection with the reproduction, we would have them here today, but I doubt if we can have them before Tuesday.

The Court: You suggest then, Mr. Mason, that we recess until next Tuesday morning?

Mr. Mason: Yes, sir. I think that that would be in the interest of expedition and would enable us to have our exhibits in the proper form at that time.

The Court: You have no objection, Mr. Strouss?

Mr. Strouss: No, that is agreeable.

The Court: I understand from you that you still will be able to complete your defense by the end of our court session next week?

Mr. Mason: We expect to close our case in chief barring some unusual developments by Friday night of next week, starting on Tuesday morning; subject, of course, to the cross-examination which opposing counsel has suggested that he defer, and any redirect that we may have.

The Court: Then the hearing, the trial of this matter will be recessed until Tuesday morning, February 4th, 1941.

[fol. 3434] February 4, 1941, ten o'clock A. M.

Proceedings were resumed at this time as follows:

The Court: Whenever you are ready, you may proceed.

Mr. Mason: We will have to interrupt the course of Mr. Sines' testimony for a moment, to put on a witness who is here from San Francisco with one exhibit. I will call Mr. Barker.

LESLIE E. BARKER was called as a witness on behalf of the defendant and, being first duly sworn, testified as follows:

Direct examination:

By Mr. Mason:

Q. Please state your name and residence to the reporter, Mr. Barker.

A. Leslie E. Barker; Oakland, California.

Q. Where are your headquarters, Mr. Barker?

A. 65 Market Street, San Francisco.

Q. What is your position with the Southern Pacific Company?

A. I am office manager for the general superintendent of motive power.

Q. Are you in the headquarters of the motive power and [fol. 3435] mechanical department at San Francisco?

A. Yes, sir.

Q. You say general superintendent of motive power. You mean of the Southern Pacific Company?

A. Of the Southern Pacific Company, yes, sir.

Q. In your position as office manager, are you familiar with the records maintained in the motive power department?

A. Yes, sir.

Q. Will you describe the character of the records maintained in the motive power department with respect to the freight cars owned by Southern Pacific Company?

A. Well, we maintain a physical record of freight cars which shows the specifications of the cars and any changes that might be made in them after they had been placed in service.

Q. Are those records maintained by classes of cars distinguishing boxcars from stockcars, gondola cars, tank cars, and so forth?

A. Yes, sir.

Q. Is there an individual record for each car, according to its number and identification?

A. Yes, sir.

Q. Now, suppose that a car is taken to the shop and some actual change is made in the appliances on the car, [fol. 3436] as, for example, in the wheels, brake installation or draft gears; do you maintain a record of such changes?

A. We maintain a record of any physical change in the car. In other words, changing the type of the apparatus on the car. Where it is repaired in kind, and turned out the same way as it came in, we don't record that in our office.

Q. From what source do you obtain your information as to these physical changes, if any?

A. It is reported to us by the shop that does the work.

Q. Are those reports made to your office in the regular and ordinary course of business?

A. Yes, sir.

Q. Then what do you do with those reports; do you make entries from them?

A. We make entries from those of repairs into the permanent record describing the equipment.

Q. Have you before you a statement in one sheet entitled "Southern Pacific Company, Pacific Lines, Freight Cars Equipped with Friction Draft Gear, January 1, 1941?"

A. Yes, sir.

Mr. Mason: May this statement be marked, your Honor, defendant's Exhibit 247 for identification?

[fol. 3437] The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 247.

Mr. Mason: Did you prepare Defendant's Exhibit No. 247 for identification, Mr. Barker?

A. It was prepared under my supervision.

Q. Was it prepared in the office of the general superintendent of motive power?

A. Yes, sir.

Q. From what sources was it prepared?

A. Well, it was prepared from our permanent records describing the freight-car equipment.

Q. Have you those permanent records in so far as they were used in obtaining these figures upon this exhibit in Tucson with you?

A. Yes, sir.

Q. Are they available for the use of Mr. Strouss if he wishes?

A. Yes, sir; there is part of them here in the court room.

Q. You have part of them in the court room?

A. Yes, sir.

Q. And the balance of them are where?

A. In the office——

Q. Across the street?

A. Yes, at 90 Church Street.

Q. I take it that the information shown in column 1 of [fol. 3438] the exhibit is simply a description by types of the various classes of freight-car equipment, is that it?

A. Yes.

Q. Where do you get the information contained in column 2? What does that indicate?

A. It is right out of these books here, that is, the number of cars owned. In other words, it is the physical record of freight equipment. When any new cars are purchased we enter them in the books, and when the cars are destroyed or otherwise disposed of, sold, or taken out of service, they are written out of the books. The books are balanced every month as to our total ownership of cars.

Q. Where do you get the information in column 3? Is that from the same sources?

A. That is entered in the books here under the description of the car of any change that might have been made in it.

Q. Do you make an individual check of the record on each car?

A. They make a count from the books of the cars.

Q. As to column 4, is that your own computation?

[fol. 3439] A. Yes, that is percentage.

Q. I take it that the totals are simply the addition of figures appearing above?

A. That is right.

Q. I notice also that the exhibit shows a substantial number of cars, as interchange cars, and then there is a somewhat smaller number appearing "Cars Confined to Home Lines." Are these interchange cars those which move in service beyond the Southern Pacific Lines?

A. Yes, they are cars that were in general service, may be loaded at any point.

Q. As to cars confined to home lines, what particularly is their distinction?

A. The distinction there, these logging cars are used, the majority of them, up in Oregon in the lumber districts. They run on these little branch lines, they don't get off our line.

Q. Are they restricted to branch-line logging service?

A. I couldn't say whether they are restricted to that service or not, but I know they don't get off our line; caboose cars that are used by our crews, they don't get off our line; the narrow-guage line, that is a little narrow guage up in Nevada, they don't get off our line.

[fol. 3440] Q. Has the exhibit been checked against the underlying sources to determine its correctness?

A. Yes, sir, it has been carefully checked.

Q. Will you say whether or not it is true and correct?

A. To the best of my knowledge and belief it is true and correct.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has your Honor?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 247.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 247.")

The Court: Mr. Barker, do I understand from your testimony that all of these cars shown in column 3 which purport to be equipped with the friction draft gear are equipped with any particular type of gear, for instance, M-17, or does it vary in different types?

A. They are equipped with any of the recognized types of friction draft gear.

[fol. 3441] Q. And no distinction is made on your records as to what particular type?

A. There might be a few cases where the distinction doesn't show but ordinarily the distinction is made and shows whether it is a Cardwell or Miner or whatever it might be. It is written right in here when the cars are bought and will show the type.

Q. These are equipped with standard draft gears?

A. Yes, sir, you can glance through these books and see them if you like.

Mr. Mason: That is all the questions I have.

Mr. Stronss: You haven't made any distinction on this exhibit, have you?

A. No, because they just asked for friction draft gears and that it what it is.

Mr. Stronss: I have no further questions.

(Witness excused.)

Mr. Mason: We will recall Mr. Sines.

[fol. 3442] B. S. Sines resumed the witness stand for further

Direct examination (continued).

By Mr. Mason:

Q. Mr. Sines, I want to call your attention first to exhibit No. 237. On the front page of exhibit No. 237, the first sheet, summary sheet, it is indicated that forty of the redispatched blocks made a better arrival time at El Paso than the actual blocks, this being the operation during the long train period of April, 1940, when certain trains were operated without regard to the 70-car restriction. I will ask you whether you made an investigation of the record of the actual operation of these particular forty blocks and

what your investigation shows as to the schedule performance?

A. I have made such an investigation and the investigation is based upon the departure time from Tucson, Phoenix, Yuma, and Colton, the points where those particular blocks originate and from which the perishable schedules are computed. In other words, on each one of those forty blocks I went back to the departure from the originating terminal and computed the schedule in due time across to El Paso.

[fol. 3443] Q. What did you find as to schedule performance of the actual blocks?

A. I find as to the actual blocks that they all arrived at El Paso, Texas, ahead of their due time except for five blocks.

Q. This was an actual operation with trains in excess of 70 cars, as the case might be?

A. Yes, during that time we were running long trains.

Q. What as to the five which did not arrive in accordance with schedules?

A. One of them was five minutes late at El Paso; it arrived at 9:25 and it was due at 9:20 P. M. Another one was fifteen minutes late; it was due at 11:30 A. M. and it arrived at 11:45. A third one was fifteen minutes late, due in El Paso at 11:30 and arriving at 11:45 A. M. The fourth one was an hour and thirty minutes late, due at 11:30 A. M. and arriving at 1 P. M. The fifth was two hours and forty minutes late, due at 11:45 A. M. and arriving at 2:25 P. M.

Q. As to the redispatched operation, where these same blocks were operated, and all other trains at the same time were operated, having in mind the 70-car restriction, did you investigate to determine whether these five late arriv-

[fol. 3444] als on schedules made arrival on schedule when they were redispatched?

A. I did.

Q. What was the result of that investigation?

A. The three which were five minutes, fifteen minutes, and fifteen minutes late at El Paso arrived at El Paso ahead of schedule on our short train redispatch. The other two which were considerably later than that failed to arrive at El Paso on schedule on the short train redispatch in the same manner that they failed to arrive there in actual

operation. The last two that I speak of did make somewhat better performance into El Paso, amounting in one case to forty minutes and in the second case to thirty minutes, due to a change in the opposition and interference and operating conditions surrounding the movement of the trains on the redispatch as compared with what had happened in actual operation.

Q. Will you turn to exhibit No. 241?

A. There is one other point I would like to add.

Q. Have you any further explanations to make in connection with exhibit No. 237?

A. We are talking about forty fruit blocks that arrived at El Paso on our short train redispatch in advance of their [fol. 3445] actual time, during which time we were running long trains. Of those forty trains, we had the following number of trains exceeding 70 cars at some time in their operation between Yuma and El Paso—nine trains.

Q. Nine trains of the forty actually had more than 70 cars during the operation between Yuma and El Paso?

A. Yes, the others whose performance was somewhat less favorable on the short train redispatch than on the long train operation were short trains also, that is, they were shorter than 70 cars.

Mr. Mason: Will you read that last answer, please?

(The last answer was read by the reporter.)

The Witness: Short trains in actual performance as well as in redispatch performance.

Mr. Mason:

Q. Their performance actually was somewhat worse than the redispatch performance?

A. Yes.

Q. Then I understand the situation is depicted on exhibit No. 237 correctly?

A. Yes.

Q. And not as you have just stated?

A. Yes.

Q. Is that all you have in connection with exhibit No. 237 [fol. 3446] at this time?

A. That is all.

Q. Will you turn to exhibit No. 241. At pages 3406 and 3407 of the transcript your attention was called by the

Court to the fact that the exhibit shows progressively longer trains in the territory affected by the Arizona law as one moves eastward from Yuma toward El Paso, the Court's question having particularly to do with the showing in the upper or westward block of the exhibit and of course relating to the showing of the redispatch operation. Have you made an investigation to determine just what factor, if any, may have contributed to the difference in the lengths of the redispatched trains particularly eastward and westward of Tucson?

A. I have.

Q. Will you make such explanation as your investigation has enabled you to make?

A. I would like to discuss exhibit No. 241 from the standpoint of a comparison with exhibit No. 215 to show just what happened at Tucson and Gila with respect to westbound operation. In June and August, 1938, there was a slight increase in the number of cars per train westbound at Gila, the average cars per train on the redispatch in- [fol. 3447] creasing from 92.8 to 93.0. There was a slight decrease at Tucson, the average cars per train falling from 93.2 to 92.8. On exhibit No. 241, however, there was a continuing decline in the length of trains at Tucson and Gila. At Tucson the decrease was 2.1 cars and at Gila, 4.7 cars. Upon investigation I found that the principal difference between 1938 and April, 1940, was a slag hauling job that the railroad was engaged in in 1940, during which time we were hauling a considerable number of cars of slag from Douglas, Arizona, to the west end of the Tucson division for ballast purposes. These cars of slag are somewhat heavier than ordinary westbound tonnage, ordinary westbound cars, and resulted in shorter trains being operated out of Tucson. Then when we got to Gila the cars continued through and we set out and emptied them between Gila and Yuma and the cars never got into Yuma. They were later picked up and moved again eastbound into Gila and on into Tucson. The average cars per train shown on both exhibits No. 215 and No. 241 are on the basis of a count made of cars in trains coming into the terminals. These cars having been set out east of Yuma didn't give us an opportunity to include them in our average cars per train. [fol. 3448] Q. Between Gila and Yuma?

A. Between Gila and Yuma.

Q. Because that would be based upon the count as you entered Yuma?

A. Yes. On the other hand, going eastward, the lower part of exhibit No. 241, the cars would be counted into Gila and they would be counted again coming into Tucson.

Q. They would not be counted going out of Tucson eastward?

A. No.

[fol. 3449] Q. Does that account for the difference between the eastward trains into Tucson and the eastward trains out of Tucson to any extent on Exhibit 241?

A. That would influence that difference a little bit, but there is still another reason to assign for that as to 1938 and 1940.

Q. I want to make it clear. This ballast movement in April, 1940, was entirely company material moving for ballasting the right-of-way of the railroad?

A. Yes.

Q. What is the reason for this falling off of 83.2 cars into Tucson and 77.7 cars into Lordsburg, as shown in the lower block, or eastward movement, on Exhibit 241?

A. There again I would like to discuss that from a standpoint of comparison of Exhibit 215. Exhibit 215 indicates that eastward there was an increase in the number of cars per train from Tucson for June and August, 1938, whereas, as Exhibit 241 indicates, there was a decrease in April, 1940, on our redispatch. Both tendencies are shown, although they are not so marked in actual operation. In 1938, and again in 1940, the reason for the change is due to a change in operating conditions with respect to A [fol. 3450] blocks. Those are the perishable blocks originating in the Phoenix territory. In 1938, the A blocks coming into Tucson arrived at such a time that it was possible to consolidate them with T. X. M. Tucson manifest, with cars off the Tucson manifest train at Tucson, and build up the train east of Tucson. In 1940, however, the A blocks were arriving in advance of the T. X. M. trains, or vice versa, the T. X. M. trains were arriving late from California, and it wasn't possible to make that consolidation, and the trains containing A blocks went east of Tucson with relatively light loads and a relatively small number of cars, which would have the effect of pulling down the average cars per train between Tucson and Lordsburg.

Q. Does that conclude your answer on those two exhibits?

A. Yes.

Q. Have you an exhibit in one sheet entitled "Total Road Mileage as of December 31, 1939, and Freight Train Car-Miles and Revenue Passenger-Miles Operated During Year 1939, Class One Railroads of United States and of Certain Railroads Concerning Which Individual Witnesses Have heretofore Testified on the Subject of Operating Costs"?

[fol. 3451] A. I have.

Mr. Mason: May we have this statement marked No. 248 for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 248 for identification.

Mr. Mason: How was this exhibit prepared, Sines?

A. This exhibit was prepared from an inspection of the transcript of the record in this case, from an inspection of the exhibits already introduced, and by abstracting figures from preliminary abstract of the I. C. C. statistics of railways for the year 1939.

Q. I take it that the columns A, B, and C are simply transcript references, are they?

A. That is right.

Q. And column D indicates the subject matter or the particular railroad concerning which the witness named in column A testified?

A. That is right.

Q. Now, as to column E, is that also a figure taken from Exhibits or testimony already of record?

A. That is from the exhibit listed in column F.

[fol. 3452] Q. In the corresponding line?

A. Yes.

Q. Now, are these figures in column G taken directly from the Interstate Commerce Commission's published abstract?

A. Yes.

Q. Is that a copy of the same publication referred to in the testimony of Dr. Parmalee?

A. That is right.

Mr. Mason: I think it has already been furnished to Mr. Strouss. If not, it is available.

The Witness: We have an abstract available for his use, yes.

Q. Are the figures in column I likewise taken from the abstract?

A. That is right. The page references in column H apply to both columns G and I.

Q. Do those figures appear, the figures of freight train-miles and passenger train-miles, both appear on those pages?

A. Yes.

Q. Are there any computations on the exhibit other than those which are identified in lines 19 and 20?

A. No.

Q. Will you say whether or not the exhibit has been [fol. 3453] checked and, as to the computations, whether they have been checked?

A. It has been checked and is correct.

Q. And will you state the purpose of the exhibit?

A. To indicate the representation which has been made, the scope of the representation which has been made by the witnesses from foreign lines in this case, and which is found in the percentages in columns E, G, and I, line 20.

The Court: In other words, Mr. Sines, from this exhibit it would appear that there has been produced here witnesses from these sixteen lines other than the Southern Pacific?

A. Including the Southern Pacific.

The Court: I think there are sixteen besides that.

The Witness: Excuse me.

The Court: That represents better than half of the railroad mileage of the United States?

A. Yes.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Has your Honor any further questions?

The Court: No.

[fol. 3454] Mr. Mason: We offer the exhibit in evidence as No. 248.

Mr. Strouss: We have the same objection as made to the original exhibits shown in column F, with the same reasons, without restating them.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 248.")

Mr. Mason: I take it, Mr. Strouss, that your objection is as to relevancy and materiality and not as to competency?

Mr. Strouss: I am not raising any question of competency, so far as failure to produce records is concerned.

The Court: This exhibit, in effect, is a summary of the testimony already introduced in this case?

Mr. Mason: Yes; and, as the witness explained, to indicate whether or not our showing as to the railroads of the United States is comprehensive or otherwise.

Q. Have you before you, Mr. Sines, a statement in four sheets entitled, "Southern Pacific Company, Pacific Lines, Comparisons between Tucson Division, Pacific Lines, and Salt Lake Division, Showing Trends in Freight Train [fol. 3455] and Locomotive Loading, and Effect on Fuel Consumption?"

A. I have.

Mr. Mason: May this statement be marked No. 249, your Honor?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 249 for identification.

Mr. Mason: Did you prepare Exhibit No. 249, Mr. Sines?

A. I did.

Q. From what sources?

A. From forms 521 and 522.

The Court: Do I understand that those are reports submitted to the I. C. C.?

A. No, they are forms regularly compiled in the course of business by the Southern Pacific Company for the guidance of its operating officers and executives, and the figures that are included in forms 521 and 522 are later included in reports to the Interstate Commerce Commission in forms OS-A and in the annual reports. It all fits into the scheme of building up our final figures.

Mr. Mason: Are the forms 521 and 522 regularly prepared in the accounting department?

A. Yes.

[fol. 3456] Q. And from what general sources are they prepared?

A. From the documents of original entry coming into the accounting department, such as the conductors' wheel reports, the conductors' time return and delay reports covering wages, the reports on movement of trains and locomotives from the chief dispatchers' offices, the reports on material and supplies and prices coming from the mechanical and maintenance departments and the time reports from those same departments; and any other basic documents that represent expenditures of money, either for material or supplies, find their way into the figures compiled for forms 521 and 522.

Q. Do the forms 521 confine themselves to cost figures, or do they include also statistics of performance in the shape of locomotive-miles, car-miles, train-miles, and the like?

A. They include cost figures and the statistics which you have mentioned. The cost figures are those figures bearing directly on operation of freight and passenger trains, the direct expenses associated with the cost of performing transportation service.

Q. Does the form 521 bear a particular title?

A. It does and I have looked at it a thousand times, [fol. 3457] but I cannot tell you what it is.

Q. And the Form 522 which you mentioned, was that a predecessor carrying much the same information?

A. That was a predecessor of form 521.

Q. You have used the forms 522 and 521 previously in the preparation of other exhibits which have been offered and received?

A. Oh, yes.

Q. Will you explain what sheet 1 of exhibit 249 undertakes to show?

A. Sheet 1 is a summary of percentage figures which are developed on the succeeding three sheets.

Q. I will ask you to refer back to exhibit No. 179, introduced by Mr. Herbert?

A. Yes.

Q. Is your exhibit 249 for identfication prepared in somewhat the same manner as exhibit 179?

A. In exactly the same manner.

Q. Does it include the same or any additional statistics?

A. Mr. Herbert's exhibit 179 includes those operating costs which are shown on form 521, and which are identified as direct costs and he works with the total of those direct costs. My exhibit singles out the fuel item, per [fol. 3458] forms a similar analysis for fuel consumption.

Q. You don't undertake here to show cost?

A. No.

Q. What are you undertaking to show by Exhibit 249?

A. I am showing the percentage decrease in pounds of fuel per 1000 gross ton-miles.

Q. Your exhibit 249, then, is associated entirely with fuel consumption as related to performance?

A. Yes.

Q. Now, will you go to Sheet No. 2 and I will ask you first whether the figures in the lines for the several years shown in column A, those figures which appear in columns B to J, inclusive, are taken directly from the forms 522 and 521?

A. The figures in columns B to F are taken from forms 521 and 522, and columns G to J are computed, but the figure in column G and H may be found on form 522 and 521 also. In other words, I have checked the form 521 and 522 with respect to those items.

Q. You say column G represents the computations? Is that a division of other figures on the exhibit?

A. Yes, that is a division of the figures in column D by the figures in column B.

[fol. 3459] Q. How do you get the figures in column H? What computation do you make?

A. By dividing column E by column B.

Q. And the figures in Column I?

A. Dividing column E by column C.

Q. And finally the figures in column J, how were they obtained?

A. By converting net tons of fuel in column F into pounds of fuel and dividing by column E.

Q. Then there has to be an adjustment of the decimal point, I think, because this is a figure for a thousand gross ton-miles.

A. That is right.

Q. Now, having the figures above the lines, which horizontally cross the exhibit below the year 1939, what is the next step?

A. The next step was to group the years 1924-1925, 1928-1929, 1930-1931, 1938 and 1939 group the basic figures in columns B to F, the additions for which are shown on the exhibit or appear on the exhibit in the same columns and compute new averages in columns G to J.

Q. Was that done for each of the two-year periods that are shown with the words "Total"?

A. Yes.

Q. Then you show certain percentage changes. Are [fol. 3460] they computed?

A. Then the percentage changes in columns G to J are computed, comparing the first two-year period 1924-1925 with the second two-year period 1928-1929.

Q. Why did you with the Tucson division make a break in 1929 this way.

A. In July, 1930, the limits of the Tucson division were changed and the eastern end of the Tucson division was extended from a point immediately east of Tucson to Lordsburg. The period 1924-1929 therefore embraces a period during which the aspects of the Tucson division remained the same for the entire six years.

Q. Do the 1924 figures take into account the lines which were added in 1924?

A. Yes. The merger of the Arizona Eastern and the Southern Pacific occurred in the fall of 1924, but when our accounting department compiled figures for the year 1925, they restated the year 1924 on the 1925 basis, so that comparisons which they were then making between 1924 and 1925 would be on a comparable basis.

Q. In 1930 you say the change in the Tucson limits took place in the middle of the year?

A. Yes.

[fol. 3461] Q. Are the figures for 1930 restated in the same manner on the 1931 basis?

A. Then in 1931 the 1930 figures were restated so the years 1930, 1931 and subsequent years would be on a comparable basis with respect to the limits of the Tucson division.

Q. In the last line where you say "Total Per Cent Change," how do you get the total percentage?

A. By adding the percentages appearing above, that is, the percentage change for the period 1924-1929, plus the change for 1930 to 1939.

[fol. 3462] Q. Did you treat a decrease as having a minus sign for the purpose of that addition?

A. Yes.

Q. So that these additions are additions in the algebraic sense?

A. That is right.

Q. Going to sheet No. 3, will you state whether or not you followed a similar process there?

A. I did.

Q. Did you likewise follow a similar process on sheet No. 4?

A. That is right.

Q. Has the exhibit been checked and compared against the underlying sources?

A. It has.

Q. Have the computations been checked?

A. They have.

Q. Returning to the first sheet of the exhibit, as I read the exhibit the showing in column A on the first sheet is merely a repetition of what appears in the total line on sheet No. 2; is that correct? The final total line on sheet No. 2?

A. That is right, in column G on sheet No. 2.

Q. Columns G, H, I, and J, I think, are all repeated, are they not, in column A on sheet No. 1?

[fol. 3463] A. That is right.

Q. What is the purpose of exhibit No. 249?

A. The purpose is to establish a comparison in fuel consumption on the Tucson division, Pacific lines, and the Salt Lake division and to show trends in freight train and locomotive loading and their effect on the said fuel consumption.

Q. Does this exhibit afford a foundation for a further portion of your showing?

A. It does.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has your Honor any questions?

The Court: No questions.

Mr. Mason: We offer the exhibit in evidence.

Mr. Strouss: We make the same objection as previously made in the running objection as irrelevant and immaterial and calling for a conclusion and particularly to that part of the exhibit referring to the Pacific lines and the Salt Lake division.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 249.")

[fol. 3464] The Court: We will take our morning recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows.)

Mr. Mason:

Q. Mr. Sines, have you before you a statement in one sheet entitled, "Yuma, Arizona, to Lordsburg, New Mexico, Fuel Consumption Comparisons and Estimated Economy Resulting from Adoption of Long Train Operation"?

A. I have.

Mr. Mason: May we have this statement marked "Defendant's Exhibit No. 250" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 250 for identification.

Mr. Mason:

Q. Did you prepare this exhibit No. 250?

A. I did.

Q. From what sources did you obtain the information shown in columns A, B, and C, lines 1, 2, 3, and 4?

A. Those figures are reproductions from the summary appearing on sheet No. 1 of the exhibit previously introduced, No. 249.

Q. Where did you obtain the figure in line 1, column D? [fol. 3465] A. That comes from summaries produced from our recapitulation sheets covering the June and August redispatch studies and shows what the result of long train operation would be in increasing the cars per train expressed as a percentage.

Q. Is that figure in column D, line 1, a comparison between the average train lengths of the actual and redispatched trains for June and August of 1938?

A. Yes, for the territory Yuma to Lordsburg.

Q. Will you refer back to exhibit No. 226, please?

A. I have it.

Q. Is there any way that the figure in column D, line 1, could be checked against exhibit No. 226, or, if that is not the correct exhibit, some other exhibit to obtain the figure?

A. No, that computation cannot be made directly, but taking the figures shown on exhibit No. 226 and making corrections for the number of cars, for the less number of cars handled on the redispatch than on the actual, the average cars per train for the territory Yuma to Lordsburg can be computed for both actual and redispatch and then the percentage change can be derived therefrom.

Q. That is, the basic figures from which this computation [fol. 3466] can be made are of record on exhibit No. 226, are they?

A. That is right.

Q. Where did you obtain the figure in line 2, column D, on exhibit No. 250 for identification?

A. There is one more feature that should be explained in connection with the figures in line 1, column D.

Q. Will you explain that, please?

A. That is that the percentages in column D refer to the Tucson division. I previously said the territory Yuma to Lordsburg, and it is the territory Yuma to Lordsburg insofar as our redispatching study is concerned, but the change in the average cars per train is the reflection that the redispatch study in the territory Yuma to Lordsburg has on the Tucson division average cars per train for June and August.

Mr. Strouss: You mean by that, including Phoenix?

A. Yes, the entire Tucson division.

Mr. Mason:

Q. Does the figure in line 2, column D, also relate to the entire Tucson division?

A. Yes.

Q. From what sources do you obtain that figure?

[fol. 3467] A. The actual performance for June and August, 1938, comes from the form 521. We then modify the form 521 figures by the changes brought about by our redispatch study and determine what the percentage change would have been actual performance compared with the

result after the changes of the redispatch study had been accounted for.

Q. I take it you have gross ton-miles between Yuma and Lordsburg as shown on sheet No. 2 of your exhibit No. 226?

A. Yes.

Q. Do you include in making the computation which leads to this figure the gross ton-miles made on the other parts of the division?

A. Yes, this is the entire Tucson division.

Q. How do you arrive at the figures in column D, line 3?

A. They are also the actual performance figures for the Tucson division for the months of June and August, 1938, modified by the reduction in locomotive-miles brought about by the redispatching study.

Q. Does this figure represent the comparison between actual and redispatch performance with those factors taken into account?

A. It does, it establishes the percentage relationship be- [fol. 3468] tween actual performance and the performance as it would have been had the long train operation prevailed.

Q. Will you explain how you derive the figure in line 4, column D?

A. The figure in line 4 is a judgment figure, taking into consideration the following factors: between 1924-1925 and 1938-39, the Tucson division increase in gross ton-miles per locomotive-mile was 3.96 per cent; on the Pacific lines it was 20.87 per cent; and on the Salt Lake division it was 36.57 per cent as indicated on this exhibit and on the previous exhibit No. 249. At the same time the improvements in fuel consumption were as shown by the percentages in line 4, comparing the combined period 1924-25 with the combination period 1938-39. We see, therefore, that the improvement on the Tucson division resulted in a decrease in fuel consumption of 12 per cent with an increase in locomotive loading of 3.96 per cent.

Q. Those figures are already of record on exhibit No. 249, are they?

A. That is right.

Q. And simply reproduced here as to columns A, B, and C?

A. Yes; ordinarily I don't like to read figures off the face [fol. 3469] of an exhibit, but I must explain the reasoning that led to the choice of the figure in column D, line 4. At

the same time the percentage improvement in fuel consumption on the Pacific lines was a decrease of 22 per cent accompanying an increase in locomotive loading of 20.87 per cent; while on the Salt Lake division there was an improvement in fuel economy of 26 per cent accompanying an increase in locomotive loading of 36 per cent. We make the redispatch study for June and August of 1938 and on top of the previous economy which had been achieved on the Tucson division we are able to superimpose the economy which will result by increasing the locomotive load.

Q. Then do I understand that line 3, column D, indicates the increase in locomotive load incident to the redispatch?

A. Yes, and whereas a difference of 17 per cent between Tucson division and Pacific lines found in line 3, columns A, B, produced a difference in fuel economy of, roughly, 10 per cent as between Tucson division and Pacific lines, and whereas a difference in locomotive loading of, roughly, 33 per cent as between Tucson division and Salt Lake division produced a fuel economy of 13.4 per cent as between Tucson division and Salt Lake division in column D, line 4, I [fol. 3470] indicate a conservative figure of 10 per cent which would follow the increase in locomotive loading as determined from the redispatch study.

Q. Now as to column E, line 1, column E, the figure shown there, where is that derived?

A. I will have to look at a work sheet to be positive of a figure which I have used and would like to take time to do that. The figure in column E, line 1, is derived by taking twenty-seven thirtieths or nine-tenths of the car-miles produced during April, 1940, and modifying those car-miles by the changes resulting from the April, 1940, redispatch study.

Q. Does this also relate to the performance on the Tucson division for the month of April, 1940, as affected by the redispatch long trains of that period into short ones?

A. That is right.

The Court:

Q. Mr. Sines, is there any relationship between the percentage shown on line 4 of column D and the percentage shown on the same line, column A?

A. There is this kind of a relationship; between 1924-25 and 1938-39 the improvement in fuel performance on the

[fol. 3471] Tucson division is as shown, 12.6 per cent. That has come about because of changes largely in the motive power used on the Tucson division, the appliances and the equipment furnished to those locomotives and the fact that the locomotives themselves now in recent years are bigger, larger, heavier, more efficient locomotives than they were in 1924 and 1925. That same improvement has taken place every place else on the Southern Pacific, our entire locomotive inventory has felt that same change. In addition to that 12.6 per cent on the Tucson division, there is still available another economy resulting from increase in train loading. The increase in train loading we measured, or the possible increase in train loading we measured with the redispatch study. We could still further increase the train load on the Tucson division by the percentage shown in column D, line 3, if it were not for the 70-car law. We have been able to increase the percentage loading on the Pacific lines by 20.87 per cent. We have been able to increase it on the Salt Lake division by 36 per cent. Therefore, I say in addition to the 12.6 per cent already achieved on the Tucson division we can still go out and for the purposes of my study claim at least the percentage improvement in [fol. 3472] column D, line 4, as the result of the increased trainloading still possible if the law were set aside.

Mr. Mason: Is it possible by a straight mathematical computation to obtain a figure in place of the figure which you do show in column D, line 4?

A. No, there is no mathematical computation like two times three are six which will produce that figure in column D, line 4. It is a judgment figure, taking into consideration the factors I have been talking about.

The Court: In effect your statement is that added to the 12.6 decrease in pounds of fuel consumption here there could be added an additional 10 per cent shown in column D on the same line?

A. Exactly.

Q. You have indicated your view of the relationship between those two figures that the Court asked you about. Is there even a more direct relationship between the other percentage figures shown on the same line in columns E, F and G?

A. Having established the figure in column D, line 4, I made the other figures in columns E, F, and G consistent.

In column V we have all the figures in column E representing the result of our first 1940 redispatch study when we [fol. 3473] made short trains out of long trains which had been operated during the period April 4th to 30th. That would result in a decrease in the locomotive loading and a comparable increase in fuel consumption. If a decrease in train loading in column D of 34.5 per cent——

Mr. Mason: (Interrupting) That is an increase I think, isn't it, in column D?

A. Right. If an increase in train loading of 34.5 per cent in column D, line 3, resulted in the figure in column D, line 4, then the decrease in train loading of the amount shown in column E, line 3, would produce the percentage shown in column E, line 4, just as a matter of proportion between the figures in line 3, columns D and E. In other words, one is about one-seventh of the other.

The Court: Do I take it from this exhibit on the Tucson division only oil-burning locomotives are used?

A. Yes.

Mr. Mason:

Q. Is that likewise true in the main as to the balance of the showing on the exhibit?

A. Well, the title of item 4 is, "Percent decrease in pounds of fuel per thousand gross ton-miles," and the ex- [fol. 3474] pression, "pounds of fuel per thousand gross ton-miles," is an item reported on the form 521 and I think that is also on form OS-A which we report to the Interstate Commerce Commission. The Southern Pacific and a few of the railroads in the western territory are oil burners. We convert that fuel oil to coal on ratios established by each one of the carriers themselves. It is not a constant ratio between all of the railroads, and we have continued to report oil as coal in order that all railroads in the United States might be talking in the same terms. The ratio is four barrels of oil equal one ton of coal.

Q. That is so far as our operations are concerned?

A. So far as our operations are concerned. It may be different on other railroads and it is different on some of the other railroads.

Q. I want to ask you this, Mr. Sines, if you had followed out the exact percentage decreases in fuel consumption per

thousand gross ton-miles which are indicated in columns B and C and applied the relationships between the figures in line 4 and the figures in line 3 in columns B and C in deriving the figure in line 4, column D, would you obtain a greater or less figure than you show in column D?

[fol. 3475] A. If I had depended on straight arithmetic, that would have been a larger figure.

Q. How much larger?

A. It would have been 11.2 per cent instead of 10 per cent.

[fol. 3476] Q. I take it, that in arriving at the figures in columns F and G, you followed the same process as you have described for column D?

A. That is right.

Q. Now, to refer to line 5.

A. Yes.

Q. Column H. Is that figure taken from actual records?

A. Yes, that is from the form 521.

Q. And line 6, column H?

A. Wait a minute, form 521 with respect to June and August, 1938, and twenty-seven thirtieths or nine tenths of the fuel consumed for April, 1930, for the figures in columns I, J and K, line 5.

Q. Now, in line 6, where do you get that price?

A. That is the charge-out price which the accounting department has used from month to month and year to year, a statement for which I have here with me.

Q. And that varies, does it, from month to month?

A. Yes.

Q. This figure in column H is the charge-out price, is it, for those two months?

A. That is the average for the two months, yes.

[fol. 3477] The Court: In other words, from an examination of the exhibit, on this particular line it would indicate that your oil was costing you more in 1938 than it was in 1940?

A. That is right.

Mr. Mason: Now, as to line 7, is that a computation?

A. That is a multiplication of the figures in the preceding two lines 5 and 6.

Q. Line 8, where is that taken from?

A. From the figures in the columns above in line 4.

Q. The corresponding figures in column D, E, F and G in line 4?

A. That is right.

Q. As to line 9, is that a computation again?

A. The application of the percentages in line 8 to the cost of fuel oil consumed, in line 7.

The Court: Is a barrel of oil measured in gallons or pounds?

A. Gallons.

Q. How many gallons in a barrel?

A. 42.

Mr. Mason: What is the purpose of exhibit 250 for identification, Mr. Sines?

A. To develop the fuel economy expressed in money in [fol. 3478] 9, columns H, I, J and K, for use in exhibits to follow, to develop the result of adoption of long-train operation.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has your Honor any further questions?

The Court: No.

Mr. Mason: Have the computations on the exhibit been checked, Mr. Sines?

A. They have.

Q. Will you say whether or not, from the mathematical standpoint, the exhibit is true and correct?

A. It is.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 250.

Mr. Strouss: Objected to as irrelevant and immaterial, calling for a conclusion——

The Court: The objection is overruled. It may be admitted.

Mr. Strouss: —and purely speculative.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 250.")

Mr. Mason: Now, Mr. Sines, will you refer, please, to a statement in one sheet entitled "Lordsburg, New Mexico, [fol. 3479] to El Paso, Texas, Fuel Consumption Comparisons, and Estimated Economies Resulting From Adoption of Long Train Operation?"

A. I have it.

Mr. Mason: May this statement be marked 251, if your Honor please?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 251 for identification.

Mr. Mason: Did you prepare this exhibit, Mr. Sines.

A. I did.

Q. I take it that the block "Total Percentage Change for Two Periods" which appears as columns A, B and C, is likewise a reproduction on the first sheet of exhibit 249?

A. That is right.

Q. Now, as to column D, will you explain how the percentage figures in lines 1, 2, and 3 in that column are obtained?

A. Yes. Whereas the previous exhibit 250 dealt with the Tucson division, main and branch lines, this particular exhibit deals with the main line only, Lordsburg, New Mexico to El Paso, Texas, which is a part of the Rio Grande Division, and which I have set aside from the rest of the Rio [fol. 3480] Grande division operations. From our accounting department, I secured figures of car-miles and train-miles in the territory between Lordsburg and El Paso; I modified those figures by the results of our redispatching study as to cars handled and train-miles operated, and determined what the percentage relationship would be between actual performance and redispatched performance.

Q. In number of cars per train?

A. In number of cars per train.

Q. Did you make the same calculation as to gross ton-miles per train-mile?

A. That is right.

The Court: Why weren't the branch lines included in this territory, what I am getting at, Mr. Sines, would this particular exhibit be comparable to the other division territory where branch lines were included if the branch lines were not included in this territory?

A. At best, the branch line operation represents a very small percentage of any division's operation, and has little effect on the ultimate result. The reason that I took the Tucson division in its entirety for the previous exhibit was that the exhibit 249, which is the basis for these fuel computations, had to be made on a division basis including

[fol. 3481] both the main and branch lines, that is the only way those figures are available.

The Court: Now, if that is true in the Tucson division, why isn't it equally true in the Rio Grande division?

A. Now, to the extent that long-train operation has occurred on the Pacific lines and on the Salt Lake division, the improvements that have resulted in operating costs and fuel consumption on the Pacific lines and on the Salt Lake division are kept at a lower level than they would be if you had to consider the main lines only, on a somewhat lower level. I said just a minute ago that the effect of branch-line operations doesn't mean very much anyway. When we come over to the territory between Lordsburg and El Paso, if I modify main-line operation by a percentage which has been determined somewhere else for main and branch, I produce a less economy in the territory between Lordsburg and El Paso, and it results in showing up the long-train operation in a less favorable light than if I were to take the results of main-line operation only. Further than that, there is no particular branch-line operation for the Rio Grande division that I could assign to the territory Lordsburg to El Paso in any kind of a proportion or re-[fol. 3482] lationship.

Mr. Strouss: There is a very substantial difference in the ratio of branch line operations in the two states however, isn't there?

Mr. Mason: Which two states do you have in mind?

Mr. Strouss: I mean the Tucson division and the Rio Grande.

A. I would hesitate to answer that offhand, Mr. Strouss. I am thinking about a long branch line operation we have on the Rio Grande from Tucumcari to Dawson, which exceeds anything you have here in Arizona so far as branch line operations are concerned.

Q. Your forms 521, would they show the relation?

A. Yes.

Q. They show the branch lines on the two divisions?

A. That is right.

Mr. Mason: As to this particular column 19, Mr. Sines, you are considering, as I understand, only that part of the Rio Grande division which is between Lordsburg and El Paso?

A. Yes.

Q. Is that the only portion as to which there was any substantial modification of train lengths as a result of the [fol. 3483] redispatching study?

A. That is right.

Q. Do I understand that the figures in lines 1, 2 and 3 are the changes in that particular district only as a result of the redispatching study?

A. Yes.

Q. Expressed in percentage relationship of actual to redispatch?

A. That is right.

Q. Now, how do you arrive at the figure in line 4, column D; is that by the same process as explained in connection with the corresponding figure on exhibit No. 250?

A. Yes. The ten per cent in column D, exhibit 250, is the result of an increase in locomotive loading of 34.5 per cent, or roughly thirty-five per cent. By means of the relationship between the figure in column D, line 3, and the 35 per cent, I have modified the ten per cent to produce the figure in column D, line 4, of exhibit 251 for identification.

Q. Then the figures shown here in column D, lines 3 and 4, to express your answer in another way, if I may, are substantially in the same proportion as the figures in column [fol. 3484] D, lines 3 and 4, on exhibit 250?

A. Yes.

Q. Going to columns F and G, will you explain whether or not those computations are of the same character as already explained for column D?

A. They are.

Q. Now, as to the lower block of the exhibit, where do you obtain the figures in line 5?

A. As to column H, I secured that figure from the fuel bureau of our accounting department. They furnished me the fuel consumption between Lordsburg and El Paso in fuel oil. They also furnished me the figure in line 8, column H, in tons of coal, because we do have some coal operation of freight trains between Lordsburg and El Paso.

Q. Were the figures in columns J and K secured from the same source?

A. Yes, and I used there twenty-seven thirtieths or nine-tenths of the figures reported for the month.

Q. What about these prices, first of all, the figure in line 6, that is the same figure as presented on exhibit 250?

A. Yes.

Q. And the coal price, where do you get that?

A. Also from our Fuel Bureau of the accounting depart-
[fol. 3485] ment.

Q. Is that the charge-out price of coal as recorded for the particular periods in question?

A. That is right.

Q. Now, I take it that line 11 is simply a total of the money amounts immediately preceding in lines 7 and 8?

A. Yes.

Q. How do you obtain the figures in line 13?

A. The application of the percentages in line 12 to the money amounts in line 11.

Q. Will you say, Mr. Sines, whether or not, generally speaking, No. 251 for identification corresponds in its construction and in the sources used in its preparation to exhibit 250?

A. It does.

Q. It is simply a separate computation because it relates to the line between Lordsburg and El Paso then?

A. Yes.

Mr. Mason: Have you any other questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Has your Honor any further questions?

The Court: No.

[fol. 3486] Mr. Mason: We offer the exhibit in evidence as Exhibit No. 251.

Mr. Strouss: The same objections.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 251.")

Mr. Mason: Have you before you, Mr. Sines, an exhibit in one sheet entitled "Summary of Annual Savings and Annual Increased Costs in Freight and Passenger Service between Los Angeles, California, and El Paso, Texas," and so forth?

A. Yes, sir.

Mr. Mason: May we have this exhibit marked No. 252 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 252 for identification.

Mr. Mason: Did you prepare Exhibit No. 252, Mr. Sines?

A. I did.

Q. I notice that in the first block of the sheet there is a blank opposite the words "Exhibit Number" following the word "Wages," is that to be filled in?

A. Yes, exhibit No. 229.

[fol. 3487] Q. And again in the next line, "Fuel, Yuma-Lordsburg"; what figure is to be filled in there?

A. 250.

Q. And the next line, "Fuel, Lordsburg-El Paso"?

A. 251.

Q. Are the figures on this exhibit taken directly from other exhibits?

A. They are.

Q. By the way, there is one more blank that I haven't called attention to, line 2, "Passenger Service," exhibit what?

A. 231.

Q. These totals, how are they arrived at?

A. By adding the figures directly above.

Q. Then the figure under freight service identified as a saving for the year, how did you arrive at that?

A. Expanding the figure, total savings for the period in column A by the ratio 17.89 to 100 per cent, which has been developed in previous exhibits, particularly exhibit 229.

Q. Now, on exhibit 226, and I think on 229 as well, you have at the conclusion of the exhibit, it happens to be in line 12 in both exhibits, block 12, expanded a figure for two months to an annual figure by dividing by 17.89?

[fol. 3488] A. Yes.

Q. Have you done the same thing here in this figure which appears in column B of exhibit 252 for identification?

A. Exactly the same.

Q. Now, this figure in line 3, is that the addition of the preceding figures?

A. It is.

Q. And in line 4?

A. It is taken from exhibit 225.

Q. And what does line 5 represent with reference to figures on the exhibit; is it a difference or addition, or what?

A. It is a difference of the figures in lines 3 and 4.

Q. Obtained from subtracting the smaller from the larger?

A. Yes.

The Court: Mr. Sines, this particular exhibit is merely a summary of other figures taken from the exhibits that you have indicated, that are already in evidence?

A. That is right.

Mr. Mason: I take it then, Mr. Sines, the purpose is to bring to one place the figures which may be found in other [fol. 3489] exhibits?

A. Yes, and, as you say there, it occurs to me that you will not find the figure in column A, line 1, wages, on exhibit 229, but you will be able to compute it from the figures on 229. There is an involvement there of the unemployment and pension percentages that the company is paying, which have to be computed separately against trainmen's and enginemen's wages in order to produce the figures shown on Exhibit 252. The data is all available, however, on 229.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit No. 252.

Mr. Strouss: The same objections as heretofore made to exhibits 250 and 251.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 252.")

The Court: We will take our noon recess at this time.

(Thereupon the Court stood at recess until two o'clock P. M. this day.)

[fol. 3490] 2 P. M., February 4, 1941.

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed.

B. S. Sixes resumed the witness stand.

Mr. Mason: Your Honor, Mr. Strouss has asked for the forms 521 for the system and the several divisions for the months and the entire year 1940 and I now have those

documents here. It is quite a bulky set of documents and I will now deliver to Mr. Strouss the 1940 forms 521 I have mentioned; that is, for each division and for the system by months and for the month of December, showing the cumulative totals for the entire year. In addition to that the forms 1232 for the divisions and for the system for the same period are available although not in the courtroom at present and will be made available to Mr. Strouss at the close of the proceedings this afternoon.

Mr. Strouss: Very well.

Mr. Mason:

Q. Had you finished entirely with your explanation of exhibit No. 252, Mr. Sines?

A. Yes.

Q. Have you a statement in one sheet bearing the title, [fol. 3491] "Redispatch Study, June and August, 1938, Extra-territorial Effect of Arizona Train Limit Law between Arizona-New Mexico State Line and El Paso, Texas"?

A. I have.

Mr. Mason: May that be marked No. 253, your Honor?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 253 for identification.

Mr. Mason:

Q. Mr. Sines, on the face of exhibit No. 253 for identification in the footnote there appears a blank space. Will you state what number should be inserted there?

A. 252.

Mr. Mason: May we have that insertion made on the record copy?

The Court: Yes, it may be made.

Mr. Mason: While we are speaking of insertions, may the record copy of exhibit No. 252 bear the insertions which were recited by the witness in his testimony?

The Court: Yes, exhibit No. 252 may show those insertions.

Mr. Mason:

Q. Will you state the sources from which exhibit No. 253 was prepared, Mr. Sines?

[fol. 3492] A. The figures appearing in section No. 1, columns A and B, come from computations made with respect to the actual and redispatch trains for June and August, 1938, and can be made from working papers which I have in my possession.

Q. Are they taken in the first instance from the actual and redispatch train sheets?

A. Yes.

Q. Dividing the train-miles at the state boundary?

A. That is right.

The Court: Does this cover both freight and passenger or only freight?

A. This refers to freight only.

Mr. Mason:

Q. Now as to line 2, is that taken from the train sheets or the white work sheets A?

A. That is taken from the actual and redispatch train sheets originally and appears in my work papers also.

Q. And column C and column D appear to require no explanation in view of the headlines. Did you perform those operations of subtraction and division which are indicated there?

A. Yes, I performed the operations indicated. I might say that the difference between this exhibit and exhibit No. 226 is that exhibit No. 226 is a recapitulation of all of [fol. 3493] the operations from Yuma to El Paso, whereas on exhibit No. 253 we have simply drawn the line at the state line and have accumulated the train-miles east of the Arizona-New Mexico state line. The processes are the same.

Q. The figures in line 3 are totals except as to the per cent figure in column D?

A. Yes.

Q. How do you arrive at the figure in line 4?

A. By expanding the figure in line 3, column C, by the ratio of 17.89 to 100.

Q. Will you explain a little more fully than the exhibit shows how you arrive at the figure in line 5?

A. The footnote indicates the source of the money which entered into the computation producing the figure with the asterisk. The train-miles in the note are taken from preceding exhibits, the first one being exhibit No. 226. Dividing the money, $329,394, by the train-miles saved, produces the average saving per train-mile. That average saving per train mile is therefore made up of the same elements entering into the total saving of $329,394 and reference to exhibit No. 252 will indicate that those elements are wages and fuel saved plus the passenger service saving [fol. 3494] divided by the total freight train miles saving.

Q. Do you consider the offset of the added facilities?

A. With the deduction of the investment cost for siding extensions and locomotive and caboose investment.

Q. Then is the figure in line 5 a multiplication of the .5158 that you obtained by division?

A. Yes, the figure in line 5 is the multiplication.

Q. I will ask you if this figure of train-miles eliminated at the bottom of exhibit No. 253 is the same figure which appears in column B, block XIII, on exhibit No. 226?

A. Yes.

Q. Have those computations been checked?

A. They have.

Q. Insofar as they are computations, will you say whether or not they are true and correct?

A. They are true and correct.

Q. What is the purpose of exhibit No. 253?

A. To establish the amount of saving which can be effected east of the Arizona-New Mexico state line in a round figure by adoption of the long train program.

Q. Does this purport to be a saving accomplished en- [fol. 3495] tirely outside of the state of Arizona?

A. Yes.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: Yes. Exhibit No. 252 purports to be annual saving between Los Angeles and El Paso. This is between the Arizona-New Mexico line and El Paso. Is that part of the same thing?

A. The saving on No. 253 is included within the saving on No. 252, yes, but I have made that separation or cleavage at the state line by this method of computation.

Mr. Mason: I think what Mr. Strouss has in mind and I think you have answered, although I will ask you the question in another form. Does the total of $329,394 which you show as a net annual saving on exhibit No. 252 include whatever amount might be saved between the state line and El Paso as indicated by exhibit No. 253 for identification?

A. Yes.

Mr. Mason: Has your Honor any questions?

The Court: In the case of exhibit No. 252, that evidently purports to cover both freight and passenger service whereas you have stated that exhibit No. 253 is exclusively freight.

A. The average takes the whole problem into considera-
[fol. 3496] tion and there is involved a couple of thousand dollars over in California also.

Mr. Mason:

Q. You haven't got those two thousand dollars here on exhibit No. 253, have you?

A. No, it is in No. 252.

Q. I think what his Honor has in mind is this, are these train-miles saving in line 4, column C, associated entirely with freight train operation, are those freight train miles or passenger train miles?

A. That figure is freight train solely.

Mr. Mason: Does that answer your Honor's question? We offer the exhibit in evidence as defendant's exhibit No. 253.

Mr. Strouss: The same objection as to the two previous exhibits.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 253.")

[fol. 3497] Mr. Mason: Have you a statement before you, Mr. Sines, entitled "Locomotive Repair Cost Data For Use in Redispatch Studies?"

A. I have.

Mr. Mason: May this statement be marked defendant's No. 254 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 254 for identification.

Mr. Mason: Did you prepare this exhibit?

A. I did.

Q. From what sources?

A. From a record regularly maintained by the mechanical department, Form No. 4395-A, the total of which is "Record of Locomotive Mileage Shopping and Repairs."

Q. Is that a record regularly and continuously kept in the office of the general superintendent of motive power?

A. It is.

Q. Are you familiar with the manner in which it is kept?

A. Yes.

Q. In what manner did you prepare this exhibit from that record?

A. Well, I should explain the record a little more in [fol. 3498] detail.

Q. Is the record kept according to types and numbers of locomotives?

A. According to types and individual numbers of locomotives, yes.

Q. And what statistics as to individual types and numbers of locomotives does the record show?

A. Since 1932 this form has shown the expense of making shop repairs and the mileage which those locomotives operate, the mileage being accumulated monthly from records furnished by the auditor of equipment service accounts, the repair expenses being furnished by the auditor of disbursements.

The Court: In column A there, you are referring to types rather than to individual locomotives?

A. That is right.

Mr. Mason: Did the record to which you refer in the motive power department show the mileage prior to 1932 by years?

A. Yes.

Q. And by individual locomotives?

A. Yes, sir.

Q. Did it also show the shop repairs by individual locomotives?

A. It did.

Q. Did it show any other class of repairs?

[fol. 3499] A. It showed the running repairs, they were accumulated prior to 1932.

Q. Have running repairs since 1932 been shown by types or classes of individual locomotives?

A. No.

Q. Do you on this exhibit show running repairs, or do you show the shop repairs only?

A. This exhibit is confined to shop repairs only.

Q. Is there any other classification of the repairs other than the shop repairs or running repairs?

A. Not in connection with form 4395-A, and all of the repairs made to locomotives can be classed either as shop repairs or running repairs.

Q. The two terms are not synonymous then?

A. No; the distinction between the two is that when a locomotive is repaired, if it is out of service more than five days, it is a shop repair, if it is less than five days, it is a running repair.

Q. But the repair in each instance is done in the shop?

A. It can be done in the shop or it can be done in the roundhouse or on the road; as to running repairs, they can be made practically anywhere. Shop repairs have to be [fol. 3500] made in the shop.

Q. But if the repair is of such a nature that it can be completed within five days, then it is a running repair?

A. Yes.

Mr. Mason: And in that case, it would not appear in any figures on exhibit No. 254?

A. No.

Q. Now, having the record in its details as you have indicated, Mr. Sines, how did you go about the preparation of this exhibit; are there any further steps to be explained?

A. Yes. I went to the record and selected the first fifteen locomotives on the list of equipment, in each one of these nominal classifications that had been in service continuously for the ten-year period 1930 to 1939 inclusive. I used that method of selection with all except the F-5 locomotives, and as to those I examined the service record of all of our F-5 locomotives and selected the first fifteen which had not been in mountain service.

Q. By "mountain service" you mean service on the Sacramento Division or the Los Angeles Division between [fol. 3501] Los Angeles and Bakersfield, the San Joaquin Division?

A. That is true as to the Sacramento division from Roseville over the mountain to Sparks, from Roseville north to Eugene over the Cascade Mountains. The F-5 locomotives used between Bakersfield and Los Angeles also see service north of Los Angeles and west of Los Angeles, and it was not possible to exclude them in all instances.

Q. Then, having selected 15 of each of these locomotives, what was your next step?

A. I determined the average weight of the locomotives from records in our mechanical department, and then proceeded to abstract the information in columns C and D from a form that I have previously mentioned, 4395-A, and finally determined the figure in column E by dividing the figures in column D by the figures in column C.

Q. Now, when you speak of the net weight of the locomotive in tons, what weight do you include?

A. That is the light weight without fuel or water.

Q. Does that include only the weight on the drivers?

A. No, that is the entire locomotive and tender.

Q. This figure then will not necessarily agree with the [fol. 3502] figures shown in exhibit 5 or exhibit 6 introduced by Mr. Russell?

A. No, there again we had to select individual locomotives, and the record of their weights and the record of the tender weights and make an average of the combination of locomotive and tender. There is a few hundred pounds' difference as between individual locomotives even of the same type.

Q. Exhibits 5 and 6 purport to show weight on drivers. Is that an entirely different figure from the net weight?

A. Yes, the weight on drivers is always considerably less than the total weight of the locomotive.

The Court: That would be true because the tender weight is not included in weight on drivers?

A. The tender weight, also the weight on engine trucks which are the small wheels at the front of the engine, and the trailer truck, which are the small wheels under the cab of the engine, that weight is not included in weight on drivers.

Mr. Mason: Has the exhibit been compared against its underlying sources, Mr. Sines?

A. Yes, sir.

Q. Have you any or all of the documents from which it [fol. 3503] was prepared available or can they be made available?

A. I have all of the forms 4395-A with me in Tucson, and they can be made available to Mr. Strouss with the exception of the three books which are being used currently to post our record from day to day, which is a continuous operation in the mechanical department, and I left those books in San Francisco with the understanding that they can be sent down here on a moment's notice. The rest of them are here.

Mr. Mason: If you wish them, we can make them available.

Mr. Strouss: I don't think I want them.

Mr. Mason: Will you state whether or not the exhibit is true and correct according to these sources?

A. It is.

Q. And the computations have been checked?

A. They have.

Q. Are they correct, so far as you know?

A. Yes.

Q. Will you state the purpose of the exhibit?

A. The purpose is to establish unit costs for shop repairs for locomotives to be used on subsequent exhibits.

Q. Now, Mr. Sines, have you in your prior exhibits in- [fol. 3504] dicating the potential saving, I am referring particularly to exhibits 252 and 253, made any showing of the increased or reduced expense, whichever the case might be, that would be involved if long-train operation were conducted in place of the restricted operation under the seventy-car law in so far as locomotive repairs are concerned?

A. No.

Q. And they are first treated with, then, I take it, in connection with your exhibit 254?

A. Yes, this is the first place they make their appearance.

The Court: A few moments ago, you mentioned the locomotives used on your mountain divisions. I take it that

the cost of repair is greater on such locomotives than it would be on those operated elsewhere?

A. Yes.

Mr. Mason: Have you made a study of that situation, Mr. Sines, with a view to developing the difference in repair costs as to locomotives predominantly used in mountain service and those used predominantly in valley service?

A. I have.

Mr. Mason: Have you any questions on Exhibit 254, Mr. [fol. 3505] Strouss?

Mr. Strouss: Do I understand column B is an average taken from 15 locomotives of each type?

A. Yes.

Q. Did you obtain the figures under columns C and D; are they averages also?

A. No, they are not averages. They are the total quantities, Mr. Strouss, for the entire fifteen locomotives. The fifteen Moguls in line 1, accumulated the mileage in column C, and there was spent on those fifteen locomotives the money in column D for the ten-year period, 1930 to 1939.

The Court: In other words, those are actual figures?

A. Yes.

Q. Taken from the records of the fifteen locomotives of each type that you selected?

A. Yes.

Mr. Strouss: These are the locomotives from the Pacific Lines as a whole and not from any particular division?

A. Yes, they were chosen from the Pacific Lines as a whole, but I purposely excluded those F-5 locomotives which had operated between Roseville and Sparks, and Roseville and Eugene.

[fol. 3506] Mr. Strouss: It doesn't purport to show shop repairs, for example, on the Tucson division solely?

A. No.

Mr. Mason: Are these types of locomotives which have in the past or are now being used on the Tucson division?

A. Each of those locomotives in lines 2 to 7 are in service today on the Tucson division. I don't know whether we have any of those small ones.

Q. You mean the Moguls?

A. The Moguls.

Q. I think there is a preceding exhibit which shows the Moguls assigned here, but I don't know whether it was the Six to Nine class or whether it was some other class.

A. I am quite sure I would be safe in saying it is representative of all those types that are in service today on the Tucson division.

Mr. Strouss: But it is not limited to the types of locomotives in service on the Tucson division?

A. No; it would be impossible to do that for any great period because these locomotives see service all over our system from time to time and year to year. We transfer [fol. 3507] the power all over.

The Court: Mr. Sines, referring to Mr. Russell's Exhibit No. 5, no reference is made here to the type which you designate here on lines 5 and 6 on exhibit 254 as F-1 and F-5, is there?

A. Yes, the 2-10-2 small is the F-1. Refer to the tabulation on exhibit 5.

The Court: Oh, I see.

The Witness: And the 2-10-2 large is the F-5, or includes the F-5.

The Court: I see. That is clear to me now.

Mr. Mason: Has your Honor any other questions on Exhibit 254?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as Exhibit No. 254.

Mr. Strouss: The same objection.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 254.")

Mr. Mason: Now, Mr. Sines, do you have in addition to the showing on Exhibit No. 254 of these types of locomotives, any statistics as to the mileage, shop repairs and average shop repair costs per mile for the locomotive of the AC-6 class?

[fol. 3508] A. I have. Fifteen locomotives chosen in the manner I have described for the ten-year period from 1930

to 1939 accumulated a mileage of 6,513,481. That figure might now be written at the foot of column C, Exhibit 254; and for the same ten-year period those fifteen locomotives accumulated a shop repair expense of $1,521,554.76. The average weight of an AC-6 locomotive and tender is three hundred and fifty tons. The shop repair cost per mile for these AC-6's, dividing the 1,500,000 by the 6,500,000 miles is 23.36 cents. That figure could be written in column E.

[fol. 3509] Q. What is the character of the service in the territory where these AC-6's, these fifteen, were principally in use during the ten-year period 1930 to 1939?

A. These fifteen AC-6's, in fact all of the AC-6's that are in service, have been in service in mountain territory, Roseville to Sparks and Roseville to Eugene.

Q. Have you an exhibit in one sheet bearing title, "Redispatch Study, Locomotive Repairs, Yuma, Arizona, to El Paso, Texas; for Period April 4th to April 30th, 1940, Actual Operation Compared with Redispatched Operation Observing 70 Car Restriction and Using Present Power and Short Sidings"?

A. I have.

Mr. Mason: May we have that exhibit marked as Exhibit No. 255" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 255 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 255 for identification?

A. I did.

Q. From what sources was it prepared?

A. The figures in columns A and D were taken from the actual and redispatch train sheets and compilations made [fol. 3510] therefrom and the figures in columns B and E come from the previous exhibit No. 254. The figures in columns C and F are results of multiplying the figures in column A by the figures in column B, and the figures in column D by the figures in column E. There are certain types of locomotives appearing on exhibit No. 255 which are not found on exhibit No. 254. I refer to the type in line 5 and in line 4. They are passenger locomotives principally which were used in freight service occasionally in 1940 and which were used in our redispatched operations also for 1940, but for which I did not compute locomotive repairs

according to the method in exhibit No. 254 because there I attempted to confine that study to freight locomotives entirely. It would have been possible for me to compute the locomotive repairs for those two passenger types of locomotives because the figures are available, but because of the fact that the operation is somewhat different any repair expense computed for a passenger locomotive would hardly be applicable if you used that same locomotive in freight service. Therefore, in assigning a unit of repair cost in columns B and E for those two types, I took the repair cost of the next heaviest freight locomotive, the F-1 in [fol. 3511] line 6, and used that.

Q. Is the E-1 referred to in line 6 approximately the same weight over all as the Pacific and Mountain types in lines 4 and 5?

A. It is a little bit heavier than the Mountain type. The Pacific type is the lightest of the three classes.

Q. What effect, if any, results from the use of a unit cost repair figure for a heavier type in connection with these two passenger type locomotives?

A. The effect on the results of this exhibit would not be appreciable because almost the same quantities are involved on the actual and the redispatch operations. In other words, they cancel out except for the difference in column C, line 5, and column F, line 5.

Q. The difference between column C, line 5, and column F, line 5, is apparently less than nine dollars?

A. That is right.

Q. There is no other effect of including these two with these repair rates which you have shown?

A. No.

Q. There are certain computations otherwise on the exhibit than those multiplications. Will you indicate those [fol. 3512] computations?

A. The columns are footed as indicated and the difference between the total in column F and the total in column C appears in line 10 with the total increase for period.

Q. Do you undertake to show by this exhibit No. 255 for identification any item of cost other than the item of shop repairs?

A. That refers to shop repairs only.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has your Honor?

The Court: No questions.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 255.

Mr. Strouss: The same objection as to the preceding exhibits.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 255.")

Mr. Strouss: Mr. Sines, during that period did you have a record of the actual repair costs, do your records show what the actual repairs cost on the Tucson division during that period?

[fol. 3513] A. No, you cannot allocate locomotive repairs to any one division. We have a record for the system, it is the second exhibit from now.

Mr. Strouss: I will wait.

Mr. Mason:

Q. Mr. Sines, I think you stated just before the exhibit was received that this relates only to shop repairs and you have already explained that there are in addition running repairs?

A. That is right.

Q. Is there a system record kept of the total amount of money spent for locomotive repairs, including shop and running repairs?

A. Yes, that goes into our report to the Interstate Commerce Commission, account No. 308.

Q. Is that kept by types?

A. No.

Q. Is there any record presently kept of the total of running repairs by types?

A. No.

Q. Have you made any investigation to determine how much of the total locomotive repair bill during the past several years is included in the totals of shop repairs?

A. Yes.

Mr. Mason: I will defer that question for just a moment. [fol. 3514] I will ask you to turn to an exhibit in one sheet entitled, "Redispatch Study, Summary of Increased Costs, Yuma, Arizona, to El Paso, Texas, for Period April 4th

to April 30th, 1940, Actual Operation Compared with Redispatched Operation Observing 70-Car Restrictions and Using Present Power and Short Sidings"?

A. Yes.

Mr. Mason: May that exhibit be marked "Exhibit No. 256" for identification?

The Clerk: It may be marked.

The Clerk: Defendant's exhibit No. 256 for identification.

Mr. Mason:

Q. Did you prepare this exhibit, Mr. Sines, or cause it to be prepared?

A. I did.

Q. You have certain blanks shown on the exhibit. Will you indicate how those are to be filled?

A. Yes, the first blank should be exhibit No. 236. The next blank opposite "Wages" should have exhibit No. 239 inserted; the third blank opposite "Fuel" should have exhibit No. 250 inserted; the last blank should have exhibit No. 255 inserted.

The Court: Then this exhibit is merely a recompilation of the statistics heretofore admitted in evidence in the exhibits [fol. 3515] you have indicated?

A. That is right.

Mr. Mason:

Q. You simply bring them together in one place and add them for a total, is that the idea, Mr. Sines?

A. Yes.

Q. Is the exhibit true and correct in accordance with the exhibits previously received?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has your Honor?

The Court: No questions.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 256.

Mr. Strouss: The same objection as to the preceding exhibits.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 256.")

Mr. Mason:

Q. Mr. Sines, referring to my discussion of shop repairs and running repairs in their relation to the total, I will ask you to refer to a statement in a single sheet en- [fol. 3516] titled, "Relation between Locomotive Shop Repair Costs, Running Repair Costs, and Total Costs." Have you that statement before you?

A. I have.

Mr. Mason: May this statement be marked "Defendant's exhibit No. 257" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 257 for identification.

Mr. Mason:

Q. Did you prepare this exhibit or supervise its preparation?

A. I supervised its preparation.

Q. From what sources was this taken?

A. The total repairs are taken from report to the Interstate Commerce Commission, account No. 308. The shop repairs were secured from the mechanical department which keeps records of the shop repairs in the manner I have previously described in connection with form 4395-A. Having accumulated all the shop repairs, the running repairs are the difference between total repairs and shop repairs.

Q. Then you obtain column B by what process?

A. Deduction or subtraction.

Q. What figures do you subtract?

A. The figures in column A from the figures in column C. [fol. 3517] Q. How do you obtain column D?

A. That is a division of the figures in column A by the figures in column C.

Q. That represents the ratio of A to C, does it?

A. Yes.

Q. How do you obtain the figures in the total block at the foot of the sheet?

A. By dividing the figures in column A by the figures in column C.

Q. I notice there are variations from year to year in the ratios as expressed in column D?

A. That is right.

Q. How are those accounted for?

A. The effect of the economies which were introduced during the depression years when we deferred as much of the heavy work as possible and ran the mileage on the locomotives which were then available and didn't repair them for several months and sometimes even years until the necessity arose for putting them back in service.

The Court: Chickens coming home to roost?

A. That is the reason for the sharp increase between 1933 and 1934.

Mr. Mason:

Q. Are these higher ratios of shop repairs in more recent [fol. 3518] years the performance of those deferred repairs that you spoke of?

A. That and a change in policy with respect to performing shop and running repairs, changes in operations which occur over any ten-year period.

Q. Do I understand that the figure marked "Average" in the right is a straight mathematical average of the figures above or is it a computed figure based upon the three columns preceding?

A. It is a computation based upon the three columns preceding.

Q. What is the purpose of exhibit No. 257?

A. The purpose of exhibit No. 257 is to give a key to the total locomotive repair expense, a part of which has been treated with in connection with exhibit No. 256, No. 255, and No. 254. We could allocate locomotive repairs only as to the shop repair portion of them, but there is in addition to that the cost of running repairs.

Q. Has the exhibit been checked to determine its correctness?

A. Yes.

Q. Have the computations been checked?

A. They have.

Q. Will you say whether or not it is true and correct and in accordance with the underlying sources?

[fol. 3519] A. It is.

Q. Are the annual reports showing the figures in column C either heretofore made available or now available for the use of opposing counsel?

A. Yes, we have them here and they are available at any time.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has your Honor?

The Court: No questions.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 257.

Mr. Strouss: The same objection as to the preceding exhibits.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 257.")

Mr. Mason:

Q. Mr. Sines, will you pass to a statement in a single sheet entitled, "Redispatch Study, Summary of Savings, Yuma, Arizona, to El Paso, Texas, for Period April 4th to April 30th, 1940, Actual Operation Compared with Redispatched Operation, with No Restriction and Using AC Power and Long Sidings"?

[fol. 3520] A. Yes.

Q. I notice that this exhibit has certain blanks. Are those to be filled in?

A. That is right.

Q. What figure should be shown in the first line where it says "Freight service, exhibit No. —"?

A. Exhibit No. 242. In the second blank opposite "Wages" insert the number 245; in the third blank for "Yuma-Lordsburg" insert the figure 250; and in the fourth blank, exhibit No. 251.

Q. Do I understand that this is simply a summary much the same as exhibit No. 256?

A. It is.

Q. And simply brings to one place figures which appear on exhibits already of record?

A. Yes.

Q. Has the addition indicated hereon been checked?

A. It has.

Q. Will you say whether or not the exhibit is true and correct?

A. It is.

Mr. Mason: Your Honor, I overlooked having the exhibit marked. I ask that it be marked as "Exhibit No. 258" and [fol. 3521] subject to any questions of counsel or your Honor that it be received in evidence with that number?

The Court: It may be marked for identification.

The Clerk: Defendant's exhibit No. 258 for identification.

Mr. Strouss: I have no questions but I have the same objections as to the preceding exhibits.

The Court: Objections overruled and it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 258")

Mr. Mason:

Q. Mr. Sines, I notice that exhibit No. 256 includes an item for locomotive repairs, whereas there is no such item shown on exhibit No. 258. Will you explain that?

A. The AC-8 locomotives which we used in our redispatch with no restriction and long sidings were built in 1939 and have only seen service since the closing months of 1939. They haven't been in service long enough to establish a repair cost which could be used in this case.

Q. Does the AC-8 locomotive resemble any other locomotive now in service?

A. Yes, the AC-8 locomotive is almost an exact duplicate of the AC-6 to which I have previously testified in connec- [fol. 3522] tion with exhibit No. 254 as to design, tractive effort, the only considerable difference being in total weight, which is 376 tons, as compared with the weight of the AC-6 of 350 tons.

Q. Where is that difference in weight principally found in the two locomotives?

A. In the tender.

Q. You spoke of experience with the AC-6's and I think in your testimony indicated a repair rate for shop repairs. Is that repair rate related to the service in which they have principally been assigned?

A. Yes, that is the way it has to be accumulated, from the service that the engine has seen.

Q. You have also stated that you have made a study to determine the difference in the repair rate accumulated by

locomotives in mountain service as contrasted with those in predominately valley service. Just what did your study in that connection consist of?

A. I examined the entire locomotive inventory of the Southern Pacific to find, if I could, a particular type of engine which had had types in operation in mountain territory and in valley territory simultaneously for any con- [fol. 3523] siderable period and I found that I could make a selection of F-5 locomotives that answered that particular need. I found fifteen locomotives which had not operated in the territory between Roseville and Sparks and Roseville and Eugene to any considerable extent during the whole ten years from 1930 to 1939, and then I also found eight locomotives which had spent most of that ten years in that same territory and I found that those that had operated in the less arduous territory accumulated a repair expense 11.56 per cent less than the locomotives——

Mr. Strouss: (Interrupting) I want to object to this as immaterial and incompetent.

The Court: What is the purpose of it, Mr. Mason?

Mr. Mason: Your Honor, it is along the lines as indicated by your question, that is, to develop that the repair rate for locomotives in valley service has been proved by experience to be less than for similar types in mountain service and to develop that the repair rate for AC-6's in valley service or any service other than in these particular arduous mountain districts would similarly be lower if they were used in valley service. They have not been so used according to the testimony of the witness. That would give us [fol. 3524] an index of the repair rate of the AC-8's because the AC-6's and AC-8's are, as the witness has stated and as Mr. McDonald stated when he was on the stand, substantially the same locomotive having precisely the same characteristics.

Mr. Strouss: It would certainly be pretty remote in determining any costs in Arizona where the witness has testified we have no record of locomotive repairs in this division.

The Court: Yes, I will sustain the objection.

Mr. Mason:

Q. Have you some further explanation in connection with exhibit No. 258, Mr. Sines?

A. I wish to point out that the saving of $28,278 which occurred as a result of the redispatch study from April 4th

to April 30th when we redispatched the long trains which had actually been run into still longer trains is to be added to the figure on exhibit No. 256, $9,331, and which indicates the saving that was actually made when we ran long trains, but under the restriction of short sidings and present power, so that adding those two together there is available just from the items considered on those exhibits themselves, $37,500 in savings in the twenty-seven-day period, April 4th to April 30th, 1940.

Q. Does that figure represent the difference between, re-
[fol. 3525] stricted operation on the one hand and operation with AC power and longer sidings on the other?

A. It does.

Q. For those particular items?

A. Yes.

The Court: We will take our afternoon recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows.)

[fol. 3526] The Court: You may proceed.

Mr. Mason: Mr. Sines, will you take up a statement in a single sheet entitled, "Redispatch Study, April 4th-30th, 1940, Actual Operation Compared With Redispatched Operation, with No Restriction and Using AC Power and Long Sidings, Extraterritorial Effect of Arizona Train Limit Law Between Arizona-New Mexico State Line and El Paso, Texas?"

A. Yes.

Q. Did you prepare the exhibit?

A. Yes.

Q. Will you describe how it was prepared, and from what sources?

A. The mileages in columns A and B were taken originally from the actual and redispatch train sheets, and then from work sheets which I have segregating the train-miles east of the Arizona-New Mexico state line. The train-mile saving, column C, is a substraction, as indicated, of B from A; per cent savings in column D are obtained by dividing the figures in column C by A.

Mr. Mason: By the way, before the witness goes any further, I think I neglected to ask to have this marked. May it be marked Exhibit 259 for identification?

[fol. 3527] The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 259 for identification.

The Court: The blank space in the column below there as to exhibit number, what should that be, Mr. Sines?

A. 258.

The Court: That may be filled in on the original.

Mr. Mason: Now, Mr. Sines, having obtained the figure in line 3, column C, did you go to another exhibit for a multiplier to obtain the figure in column 4?

A. Yes, that came from Exhibit 258, as indicated by the note.

Q. And will you say whether or not the computations on the exhibit are correct?

A. They are.

Q. Has the exhibit been checked against the underlying sources?

A. It has.

Q. Now, I will ask you if this figure in column 4, and the showing on the exhibit in general, is in addition to what is shown on Exhibit 258, or is it a part of what is shown on Exhibit 258?

A. It is a part of the figures on Exhibit 258.

[fol. 3528] Q. And I take it, it is the part which relates to the operation between the Arizona-New Mexico state line and El Paso?

A. Yes.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Has your Honor any questions?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as Defendant's exhibit No. 259.

Mr. Strouss: The same objection as to the preceding exhibits.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 259.")

Mr. Mason: Mr. Sines, does this exhibit resemble a preceding exhibit in which you have presented a summary of extra-territorial effect?

A. Exhibit No. 253, which covered the extra-territorial effect, determined by the redispatching study of June and August, 1938.

Q. Did you undertake to show any extra-territorial effect in so far as the redispatching study of April, 1940, was concerned, using present power and short sidings?

[fol. 3529] A. No.

Q. Then this exhibit resembles only Exhibit 253 in so far as it relates to the extra-territorial effect?

A. That is right.

The Court: In that connection, Mr. Sines, I notice that all of these exhibits which the defendant is offering to illustrate the extra-territorial effect has to do with the territory east of the Arizona-New Mexico line and from there to El Paso?

A. Yes.

Q. And I take it, that by their absence of any exhibits, that the extra-territorial effect west is somewhat inconsequential?

A. West of Yuma?

Q. Yes.

A. Yes, inconsequential.

Mr. Mason: That is in so far as freight service is concerned?

A. Yes.

Q. Have you a showing of extra-territorial effect not measured in money necessarily as to passenger service west of Yuma?

A. Yes, the effect on the passenger service is shown quite clearly——

Q. Isn't that the 33-page exhibit, Mr. Sines, that was [fol. 3530] received some time ago?

A. On the exhibit you mention, which is exhibit No. 199, and also on exhibit No. 232. On Exhibit 232 we develop the extra-territorial effect in money as a result of the redispatching study which we make for the entire year 1938.

Q. As relating to passenger service only?

A. That is right.

Q. I take it, then, that in answer to his Honor's question, as to the inconsequential effect of the law west of Yuma, you had in mind freight-train operations?

A. Yes.

Q. Mr. Siner, what circumstance is there that tends to minimize any extra-territorial effect which the law might have west of Yuma in so far as the Southern Pacific Company is concerned, in connection with freight-train operation?

A. The fact that the freight terminal is located at Yuma, Arizona, immediately adjacent to the state line, which is the middle of the Colorado river.

Q. Do you know and, if so, will you state whether freight trains not conforming to the 70-car restriction operate into and out of Yuma?

A. I know that they do.

Q. Do you know whether or not that operation has been [fol. 3531] substantial and continuous for the past several years?

A. It has.

Q. Now, would it be possible to operate these trains from California or from Arizona into California in length greater than the law permits originating them exactly at the state line or halting them exactly at the state line?

Mr. Strouss: I object to that as immaterial, calling for an opinion based on facts not in evidence.

The Court: Objection sustained.

Mr. Mason: I think the facts are in evidence that the line is in the middle of the Colorado river, and I don't think that it is based on facts not in evidence, and I think the witness is well qualified to state whether such an operation would be possible.

Mr. Strouss: It is not such an operation that has ever been prohibited. The evidence is that that operation is permitted; in other words, that you do operate these long trains in and out of that terminal.

Mr. Mason: Now, do I understand that the counsel for the State will agree that the law does not prohibit the opera- [fol. 3532] tion of trains into and out of the Yuma terminal in length exceeding seventy cars?

The Court: Is that what you are driving at, Mr. Mason?

Mr. Mason: I was driving at this point, that the extra-territorial effect west of Yuma obviously, I think it is obvious, it is to me, is overcome only because the Southern Pacific Company has not been compelled to observe the restrictions of the seventy-car law in bringing its Los

Angeles division trains into Yuma or originating its Los Angeles division trains at Yuma.

The Court: Even though that involved a short-train operation in the State of Arizona?

Mr. Mason: It involved a long-train operation in the state of Arizona. It involves operating trains in excess of seventy cars from the line at the middle of the bridge, as the witness testified, for some distance at least into the state of Arizona. I take it, whether it be one foot, 100 yards or 1000 yards, it is in an operation within the state of Arizona, and it is in defiance of the seventy-car law or by sufferance. Now, which is it, Mr. Strouss?

Mr. Strouss: You can figure it out.

Mr. Mason: Why does the State object to our showing on [fol. 3533] this matter unless the State is prepared to take some stand in this matter?

Mr. Strouss: The witness has testified; I am taking the witness's word for what the past operation has been, that they have operated long-trains in there and used that terminal for long-train operation. Now, if there is any speculative testimony here as to what it would be if there was a different operation in there——

Mr. Mason: That is not what I asked the witness. I asked the witness if it was possible from a practical standpoint to originate these trains at the middle of the bridge or stop them at the middle of the bridge.

The Court: Perhaps it wasn't clear.

Mr. Mason: I will ask you, Mr. Sines, is it possible to originate trains for the Los Angeles division at the middle of the bridge over the Colorado river west of Yuma?

A. No, it is a physical impossibility to have a 125-car train exactly at that state line.

Q. To originate there?

A. Yes.

Q. Is it a physical possibility to make the middle of the bridge over the river west of Yuma an arriving terminal for trains from the Los Angeles division, and by that I mean [fol. 3534] trains not conforming to the seventy-car restriction.

Mr. Strouss: I still don't see the materiality of this.

The Court: I will overrule the objection.

A. No, it wouldn't be physically possible to pull a 125-car train up to the state line, and make any kind of delivery without having a long-train operation in Arizona.

The Court: And, as a matter of fact, all of the tracks that are necessary at a division point are located in the state of Arizona at Yuma?

A. Exactly.

Mr. Booth: A literal and technical compliance with the law would compel us to build a terminal on the California side of the Colorado river, would it not?

A. Yes.

Mr. Strouss: I object to that. That is calling for a conclusion.

Mr. Mason: Can you make up and break up trains without an appropriate trackage upon which to do it?

A. No.

Mr. Strouss: You can run them short to the next terminal, can't you?

[fol. 3535] Mr. Mason: I ask that that statement be carefully recorded, because that is a concession by the State that the law has necessarily extraterritorial effect, you can run short trains into your next terminal into the next state, which compels you to conform to the Arizona law in your New Mexico or California operations.

Q. You heard the statement of counsel, did you, Mr. Sines?

A. Yes, sir.

Q. Do you agree with it?

A. That is one way.

Q. That is one way to meet the requirements of the law?

A. That is the way we have been meeting it east of the Arizona-New Mexico state line for about twenty years.

Q. Now, Mr. Sines, your redispatching study for June and August, 1938, related to those months, in 1938 and to the conditions which prevailed during those months, did it not?

A. Yes.

Q. Will you say whether or not the factors which either governed or permitted operations as they took place in 1938 and as you contemplated them for the purpose of the redis- [fol. 3536] patching study are in general still in existence

and operative upon the territory to which the redispatching study of 1938 relates.

Mr. Strouss: Now, what factors are you talking about? That is a pretty indefinite question. I would like to know what the witness is about to testify to so I can at least have a chance to make an objection.

Mr. Mason: All right, Mr. Strouss. We will particularize them.

Q. Mr. Sines, in 1940 and 1941, is the line in the same place as in 1938?

A. Yes.

Q. Are the sidings the same?

A. Yes.

Q. Is the general character of the traffic substantially the same as in 1938?

A. Yes.

Q. Is the volume of traffic in 1940 and so far in 1941 heavier or lighter than in 1938?

A. The volume is considerably heavier in 1940 and 1941 than it was in 1938.

Q. Then comparing 1938 and 1940 or 1941, would the opportunity for savings such as are indicated by your redispatching study be greater in 1940 than in 1938, or less?

[fol. 3537] Mr. Strouss: That is objected to as calling for a conclusion, speculative.

The Court: The objection is overruled. You may answer.

A. The opportunities would be greater.

Mr. Mason: And why is that?

A. Because the volume of traffic is greater, the number of short trains required to handle that traffic is greater, the opportunities to cut down the train-miles and locomotive-miles are greater.

Mr. Strouss: My objection goes to this.

The Court: Yes.

The Witness: The amount of wages is greater in 1940 than it was in 1938, and the amount of fuel consumed was greater in 1940 than in 1938. All of the elements entering into a cost study of this kind are greater in volume and quantity in 1940 than in 1938.

Mr. Mason: Referring to a comparison of conditions in 1940 and 1938, were the wage levels of the employees whose wages were considered in your 1938 redispatching study the same in 1940 as in 1938?

A. The same.

Q. Were the same general types of locomotives used?

[fol. 3538] A. There has been a change in the assignment on the west end of the Tucson division. We are now using F-4's and 5's more extensively, that is, in 1940 we were using F-4's and 5's more extensively than we were in 1938.

Q. Other than where there has been a change, are the locomotives in use in 1940 and in 1938 all of the F type?

A. Yes, F-1's in 1938 and F-4's and 5's in 1940, although locomotives of both types were used in both years.

Q. Will you refer to other factors which had to do with the redispatch, and state what conditions were the same and what conditions were different, if any?

A. Well, we were operating under the same set-up as to perishable schedules generally, although there has been an advance in the arrival time in Chicago, which was amended just within recent months, which has meant a speeding up in the operation between Yuma and El Paso. That didn't have effect however in April, 1940. We always had the Arizona 70-car law in 1938 as well as in 1940.

Q. That condition has not changed?

[fol. 3539] A. No, and that was the principal item that remained unchanged.

Q. There has been no change in the number of men required or used in crews, has there?

A. No, the Arizona full crew law was operative both years.

Q. There has been no change in the limits of the division?

A. No, that remained the same.

Q. Has there been any change in the location of division terminals?

A. No.

Q. Has there been any change in the location or extent of the helper territories?

A. No.

Mr. Strouss: What about your branch lines?

Mr. Mason: Whether or not there has been any change in branch lines?

Q. Does the branch-line operation have anything to do with the redispatching study?

A. No.

Q. Did it have any effect upon the opportunity of operating long trains upon the main line?

A. None.

Mr. Strouss: Would you mind—I would like to know that for my own information, whether there has been any [fol. 3540] change in the branch lines?

A. Mr. Masson's exhibit, detailing branch-line abandonments will show you what has happened up to recent date.

Mr. Mason: It is my impression there has been very little if any change. There is a history of branch-line abandonment for Arizona in the record.

Q. Mr. Sines, on exhibit 259 and as well upon exhibit 253, you show in a unit cost per train-mile saving in the one case of .596 dollars, or 59.6 cents, and in the other 51.58 cents. I will ask you whether that is relatively high or relatively low as a train-mile cost in your experience?

Mr. Strouss: Relative to what?

Mr. Mason: Well, what is the average cost per train-mile for the group of expenses which you stated and which you have mentioned in your testimony previously as showing the direct cost?

A. For the year 1938 the direct costs on the Tucson division, as shown by the Form 521, per train-mile were $1.285.

Mr. Booth: That is freight train-mile?

A. Yes, freight train-mile.

Mr. Mason: What items of expense does that include?

Mr. Strouss: What year is that?

[fol. 3541] A. That is 1938. That includes fuel, enginemen, trainmen, engine house, other locomotive supplies, train supplies and expenses, and does not include locomotive repairs.

Mr. Strouss: Now, is that main line and branch line both?

A. That is the total for main line and branch.

Mr. Mason: Have you any figure for main line only, cost per freight train-mile?

A. No, that figure has not been compiled since 1932.

Mr. Strouss: May I ask, do you have records showing the costs segregated as to the line through Phoenix?

A. No, we don't have.

Q. Not as to trains run or net tons per train or any of those items?

A. We have statistics, Mr. Strouss, but no costs by statistics.

Q. Operating statistics?

A. Yes.

Q. Segregated as to that particular part of the road?

A. Yes.

Q. I wonder if I could get those statistics?

A. You will find them on form 1232 for the territory [fol. 3542] Wellton to Picacho, or it may be Yuma to Tucson by Phoenix.

Q. That only gives gross ton-miles, locomotive-miles and train-miles.

A. That is right.

Q. But not net tons per train?

A. No. Gross tons per train can be computed and gross tons per locomotive.

Q. But not net tons per train, that is what I was trying to get.

A. No.

Q. You have no statistics on that?

A. We don't have in any of the forms we have furnished you or any of the reports we have published. They may be available in the accounting department work papers, I can't answer as to that.

Mr. Strouss: Pardon me for interrupting.

[fol. 3543] Mr. Mason: You say that you obtained cost exclusive of locomotive repairs for main and branch line freight train miles for 1938 in excess of a dollar, did you, or what was the figure?

A. $1.28½.

Q. Whereas you show here for the year 1938, $0.5158. Does your showing on exhibits Nos. 253 or 259 omit some items which you have stated enter into the direct cost?

A. Yes.

Q. Which ones?

A. Such items as engine house, other locomotive supplies, train supplies and expenses. There are included fuel, enginemen's and trainmen's wages.

Q. Is anything included for repairs on exhibit No. 253?
A. No.
Q. Or No. 259?
A. No.

Mr. Mason: Mr. Strouss, I think we had some discussion off the record as to the appearance of chief dispatcher J. A. Day of Los Angeles division whose testimony, if offered, would have served as a foundation for the passenger redispatch study and the exhibits offered by Mr. Sines relating to the passenger redispatch study, and I think at that time [fol. 3544] you indicated you were willing to agree that he need not be called, that it could be stipulated that the necessary foundation had been laid and Mr. Sines might testify as if his testimony had preceded this.

Mr. Strouss: That is right.

Mr. Mason: His testimony insofar as concerns the redispatching study of the passenger trains during the year 1938 would, I understand, be along the same lines as Mr. Baker and Mr. Herrell and Mr. Cassady?

Mr. Strouss: Yes, I think he only had to do with the passenger redispatching study.

The Witness: That is right.

Mr. Mason: With that understanding he was not called to testify.

Mr. Strouss: That is right.

Mr. Mason: I would like to have that understanding in the record and also express my appreciation of your not having required us to call him. In addition to the forms 521 we now have the forms 1232 that you asked for earlier this afternoon. We have two additional exhibits for Mr. Sines, but they are not quite ready.

The Witness: That is right.

Mr. Mason: I would like at this time to withdraw him [fol. 3545] with the privilege of recalling him the first thing in the morning.

The Witness: That depends on our mail plane connections from San Francisco.

The Court: It will not interfere with your cross-examination of this witness if he is withdrawn?

Mr. Strouss: No.

The Court: Very well, you may step aside, Mr. Sines.

(Witness temporarily excused.)

E. S. FEWTRELL was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Booth:

Q. Will you state your name and residence to the reporter?

A. E. S. Fewtrell, Berkeley, California.

Q. What position do you hold with the Southern Pacific Company?

A. Chief clerk to the auditor of equipment service accounts.

Q. How long have you occupied that position?

[fol. 3546] A. Fourteen years.

Q. What is the function of the auditor of equipment service accounts office?

A. Records are kept of movement of all cars and locomotives and all operating statistics of train operation are compiled there.

Q. Does the office of the auditor of equipment service accounts use the conductors' wheel reports in accumulating statistics?

A. The wheel reports are one of the basic and most important records that are used there.

Q. Of course you are thoroughly familiar with what they are and how they are used?

A. Yes, sir.

Q. Does your office make up the statistics of freight train miles and freight car miles monthly as a basis for the reports of the company to the various state commissions and to the Interstate Commerce Commission?

A. Yes, some are made weekly.

Q. Will you state the number of freight train miles and freight train car miles, respectively, in the state of Arizona of the Southern Pacific Company for the month of April, 1940?

A. The total made by all trains, train miles, was 237,018; freight train car miles was 13,173,540.

[fol. 3547] Q. Was a special study of the conductors' wheel reports for that month insofar as it related to freight train operation within the state of Arizona made under your direction for the purpose of ascertaining how many trains

of 70 cars and less were run and how many trains of over 70 cars were run in accumulating the 237,018 freight train miles you have mentioned?

A. It was.

Q. That was made of the wheel reports, was it not?

A. Yes.

Mr. Booth: I will state to counsel we have those wheel reports if he cares to examine them.

Mr. Mason: They are a part of the documents used in connection with the April, 1940, redispatch study.

Mr. Strouss: I don't want them.

Mr. Booth: I don't think they would be very much nourishment for anyone.

Q. Will you state the number of freight train miles of trains of 70 cars and less during that month?

A. Freight train miles, 199,761.

Q. How many freight train car miles did those trains of 70 cars and less accumulate?

[fol. 3548] A. 9,993,262.

Q. How many freight train miles were accumulated by trains of over 70 cars?

A. 37,257.

Q. And how many freight train car miles did they accumulate?

A. 3,180,278.

Q. To make the record complete, although it can be done without the witness testifying to it, what is the statistical average of cars per freight train of a train of 70 cars and less obtained by dividing those freight train miles into freight train car miles?

A. 50.03.

Q. And of trains of over 70 cars?

A. 85.36.

Q. And the grand average of all trains?

A. 55.58.

Mr. Booth: No further questions.

Mr. Strouss: No questions.

Mr. Booth: May the witness be excused?

The Court: Yes, he may be excused.

(Witness excused.)

The Court: It is so near the closing hour, if counsel desires to adjourn until morning, we will be at recess until ten o'clock tomorrow morning.

(Thereupon the court stood at recess until 10 A. M., February 5, 1941.)

[fol. 3549] February 5, 1941, ten o'clock A. M.

Proceedings were resumed at this time as follows:

Mr. Booth: If the Court please, at the conclusion of yesterday's session, Mr. Fewtrell was the last witness on the stand, and we find in checking over the work sheets that one figure he gave, namely, the figure at the top of page 3548 of the transcript showing the number of freight car-miles in the trains of seventy cars and less operated during the month of April, 1940, in the state of Arizona was incorrect. I would like to call him to the witness stand to ask him to correct it. It will necessitate a change in three figures that he gave yesterday.

The Court: All right.

E. S. Fewtrell was recalled to the stand, and testified further as follows:

Direct examination (Continued).

By Mr. Booth:

Q. Mr. Fewtrell, on page 3547 of the transcript, at the bottom of the page, I asked you the question, "How many freight train car-miles did those trains of seventy cars and [fol. 3550] less accumulate?" And your answer, line 1, page 3548, was "9,993,262." Now, do you desire to make a correction in that figure?

A. Yes, sir.

Q. Well, what is the correction?

A. The corrected figure is 10,533,262. The average cars per train is 52.73.

Q. And the grand average of cars per train?

A. The freight train car-miles for all trains was 13,713,540. Average cars per train, 57.86.

Q. There was no change in the figures of the trains of over seventy cars?

A. No, sir.

Mr. Booth: I will ask, if the Court please, that the reporter copy this table in the transcript so that we will have it all in one place.

Mr. Strouss: That is perfectly agreeable.

The Court: The reporter may copy it into the record.

(The table referred to reads as follows:)

[fol. 3551] "FREIGHT TRAIN AND FREIGHT TRAIN CAR MILES

STATE OF ARIZONA

April, 1940

	Freight Train Miles	Freight Train Car Miles	Average Cars Per Train
Trains of 70 cars and less	199,761	10,533,262	52.73
Trains of over 70 cars	37,257	3,180,278	85.36
Total	237,018	13,713,540	57.86"

Mr. Booth: We will call Mr. John J. Sullivan.

[fol. 3552] JOHN J. SULLIVAN was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Booth:

Q. Your name is John J. Sullivan?

A. That is correct.

Q. Your residence is what?

A. San Francisco, California.

Q. What official position do you have with the Southern Pacific Company?

A. I am assistant manager of personnel with headquarters at San Francisco.

Q. What, in a general way, are the duties of the personnel department of which you are assistant manager?

A. The general duties are the matter of employee labor relationships and the negotiation of working agreements with the various crafts, but along with those duties I have been assigned numerous special duties.

Q. When did you first enter the service of the Southern Pacific Company?

A. April 26, 1904.

Q. Will you briefly state the respective services in which [fol. 3553] you have been engaged for the Southern Pacific Company since that time and where they occurred, on what divisions, and for what lengths of time approximately?

A. I originally entered the service on April 26, 1904, as a yard clerk at Lordsburg, New Mexico, then on the Tucson division. Two months later I was transferred to Tucson. Between April 26, 1904, and February 28, 1913, I was employed as a yard clerk at Lordsburg and Tucson, as a clerk and timekeeper, train master's clerk, division accountant, chief clerk to assistant superintendent, chief clerk to the division engineer, and assistant chief clerk to the superintendent of the Tucson division at Tucson. From March 1, 1913, to December 31, 1915, I was a student in general railroad operation on various operating divisions and the general office departments at San Francisco.

Q. Right there, what did the company do in respect to this student course it had at that time?

A. At that time it was the policy to select certain employees, generally graduates of colleges, to train them for subordinate officer positions. Ordinarily the course extended over a period of three and a half or four years and embraced services in the various operating departments, [fol. 3554] for instance, as a student section foreman, student yardman, brakeman, fireman, working in the division shops and general shops with machinists and boiler-makers, in the various statistical departments of the general office including the freight accounts, disbursement accounts, and equipment service accounts; service with various officers; a period in the freight traffic department on the compilation of tariffs and the quotation of rates to the public; service in the general manager's office, in the statistical department, and, finally, as a student assistant train master on one of the operating divisions.

Q. Will you proceed with your duties from January 1, 1916?

A. From January 1, 1916, to July 24, 1917, I was a special inspector and accident and statistical clerk in the office of the vice-president and general manager at San Francisco; from July 25, 1917, to February 28, 1918, I was detailed from the Southern Pacific Company as a general

agent of the American Railway Association, council of national defense, at Camp Cody, Deming, New Mexico.

Q. Having to do with what?

A. The movement of supplies and the concentration of [fol. 3555] troops at Camp Cody. From March 1, 1918, to October 7, 1919, I was in the United States Army as a first lieutenant and captain of engineers, serving in France from June 7, 1918, to September 15, 1919, as assistant superintendent and division superintendent of railway transportation service. October 8, 1919, to February 29, 1920, I was a Southern Pacific Railroad representative on the San Francisco terminal car service committee of the United States Railroad Administration. From March 1, 1920, to July 15, 1920, I was supervisor of transportation of the northern district, which comprised the territory from San Francisco north to Portland and east to Ogden, Utah, with headquarters at San Francisco; from July 16, 1920, to July 22, 1920, I was train master of the Stockton division with headquarters at Tracy, California; from July 23, 1920, to November 30, 1922, I was train master of the Tucson division with headquarters at Yuma, Arizona; from December 1, 1922, to July 31, 1923, I was terminal train master of the Los Angeles terminal; from August 1, 1923, to June 30, 1934, I was train master and assistant superintendent of the Shasta division and the Shasta district of the Sacramento division after consolidation with headquarters at Dunsmuir, California; from July 1, 1934, to [fol. 3556] September 30, 1935, I was special representative of the general manager at San Francisco; from October 1, 1935, to February 28, 1938, I was assistant superintendent of the Salt Lake division with headquarters at Ogden, Utah; from March 1, 1938, to March 31, 1939, I was assistant superintendent of the western division with headquarters at Stockton, California; from April 1, 1939, to October 31, 1939, I was assistant to the general manager with headquarters at San Francisco; on November 1, 1939, I was appointed to my present position, that of assistant manager of personnel.

Q. Now, as accident and statistical clerk in the office of the vice-president and general manager during the period from January 1, 1916, to July 24, 1917, was it a part of your duties to be familiar with the system of reporting railway accidents of various kinds to the Interstate Com-

merce Commission with the classification of those accidents and all matters connected therewith?

A. It was.

Q. In your various capacities as assistant superintendent of the Shasta division and the Salt Lake division, was it a part of your duties to, and did you, familiarize yourself with the same requirements and documents I have mentioned?

[fol. 3557] A. It was my duty.

Q. Have you done any special work, any special assignment, in connection with the preparation and presentation of statistical summaries based either on the published statistical reports of the Interstate Commerce Commission or on the form T's, which we will explain presently, filed with that Commission?

A. I have, I prepared such statistical showings from which I testified in the so-called "first Arizona Train Limit case," the Nevada Train Limit case, and have prepared similar tables for presentation at the trial of this suit.

[fol. 3558] Mr. Booth: Did you on behalf of the Association of American Railroads prepare and present a series of statistical tables bearing on the results of operation of railroads of the United States from the safety standpoint at the hearings before the House Committee on interstate and foreign commerce in the spring of 1938 on Senate Bill No. 69, the so-called Train Limit Bill?

A. I did.

Q. Did you prepare the series of tables, statistical tables bearing on relative safety of operation by years, by districts, and so on, which are referred to in the findings of the Court in the Nevada Train Limit case adopted by the Court in its opinion?

A. I did.

Q. How long have you been engaged in the preparation, in special preparation for testimony in this case?

A. Approximately seven months.

Q. Practically all of your working time?

A. Yes, sir.

Q. You have been here in Tucson since the trial of the case opened?

A. I have.

Mr. Strouss: If the Court please, his testimony as to [fol. 3559] what the Nevada court based its findings on is a conclusion. I move that it be stricken.

Mr. Booth: The figures are referred to in the findings at great length.

The Court: It may be stricken. I don't see that that is material.

Mr. Booth: Have you prepared a photographic copy of seventeen sheets of the rules of the Interstate Commerce Commission governing monthly reports of railway accidents effected January 1, 1922?

A. I have prepared a seventeen-sheet photostatic copy, but it consists of more than the seventeen sheets of the rules of the Interstate Commerce Commission.

Q. Of what does it consist?

A. It is a photostatic copy of the title page and the rules governing the monthly report of railway accidents, commencing at page 11 and continuing to page 36 of the printed rules and regulations of the Interstate Commerce Commission covering the reporting of accidents.

Mr. Booth: We ask that this be marked for identification.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 260 for identifica- [fol. 3560] tion.

Mr. Booth: I will state, your Honor, that the entire book from which this is taken is in evidence. It was introduced, I think, as Exhibit No. 9, as a part of exhibit No. 9, but in the interest of brevity in the record, we thought we would take what we considered the material parts and put them in this more convenient form.

Q. Did the Interstate Commerce Commission require reports of railway accidents prior to the adoption of these rules?

A. It did. This particular set of rules is referred to as the 1922 revision.

Q. And took effect when?

A. On January 1, 1922.

Q. Have you access to the copies of all reports made by the Southern Pacific Company under these rules and kept in its offices?

A. I have; those copies that have been retained.

Q. The copies that were retained?

A. Yes, sir.

Mr. Booth: I will offer Defendant's Exhibit No. 260 for identification in evidence.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and [fol. 3561] marked "Defendant's Exhibit No. 260.")

Mr. Booth: Will you describe, briefly, for the record the general groups of reportable accidents required by the Interstate Commerce Commission to be reported by railroads under its jurisdiction?

A. On page 14 of the rules, which is sheet 3 of exhibit 260, it will be found that railway accidents are grouped under three classes—train accidents, train service accidents, and non-train accidents. Train accidents cover accidents with or without casualties arising in connection with the operation or movement of trains, locomotives or cars that result in damage to equipment or other railway property in excess of $150, including the cost of clearing the wrecks. Train service accidents cover only fatalities or injuries to persons where damage to the equipment or property does not exceed $150. Train service accidents include all fatalities, and it includes injuries to employees where disability exceeds three days, and injuries to all other persons except employees where the disability exceeds one day. The group of non-train accidents are those that in no way are involved in the operation of trains, cars, or locomotives, and include the group that are found in the operation of shops, [fol. 3562] stations, and other non-train facilities of the railroads.

Q. Now, when you use the word "casualties" in these statistics, you mean both deaths and injuries in the case of an employee resulting in absence from service over three days?

A. That is correct.

Q. In the case of a passenger exceeding one day?

A. That is correct. The term "casualty" includes fatalities as well as reportable injuries.

Q. For the sake of illustration, suppose there is a derailment of train which results in damage to equipment of $100 and in no deaths or personal injuries, that would not be reportable under these rules?

A. That would not be a reportable accident.

Q. If it results in damage to equipment of $150 or more, but no casualties, including deaths, it would be reportable as what?

A. No, the damage must exceed $150, damage of even $150 would not be reportable.

Mr. Booth: Amend the question to read that way.

A. It would be reportable as a train accident.

Q. And if there was a death or casualty resulting from the accident you have just mentioned, it would still be [fol. 3563] reportable as a train accident, would it?

A. That is correct.

Q. Now, let us suppose that in this derailment that resulted in damage of equipment of $150 or less, there was the death of or injury to some person, how would that be reported?

A. That would be reported under the rules as a train service accident.

Q. What about the death of a trespasser?

A. That would be reported as a train service accident. The fatalities or injuries to all persons regardless of their occupation or other relationship is reportable under the rules, the only distinction in the rules being this: An injury to an employee is not reportable unless disability exceeds three days. All other persons except employees are reportable if the disability exceeds one day.

Q. Now, is there anything else to which you desire to call attention in this exhibit No. 260?

The Court: Well, Mr. Sullivan, if there was no damage whatever to any railroad property, but there was an injury to an employee, say, or even a trespasser, that would be listed under train service accidents?

[fol. 3564] A. That is correct. As to the fatalities, I might invite attention to this: A person receiving injury from which death results in less than 24 hours is reported, and required to be reported by the rules of the Commission as a person killed; if the death results subsequently to the expiration of twenty-four hours, under the rules of the Commission the person is reported as one injured and as a subsequent fatality.

Mr. Booth: Does the Commission in its rules break these groups of accidents down into a number of sub-classifications?

A. I does. There is a very extensive sub-division of the causes and sub-causes of both train accidents and train-service accidents.

Q. Is that in the book of rules itself, which has been introduced here as part of exhibit No. 9?

A. It is.

Q. Does the Commission annually publish a statistical report and summary, including its comments of the accidents reported for the preceding calendar year?

A. It does.

Q. You have just handed me accident bulletin 107, summary and analysis of accidents on steam railways in the United States subject to the Interstate Commerce Act, [fol. 3565] Calendar Year 1938. Is that the latest publication of this character which is available?

A. It is.

Q. The Commission has not yet released its annual accident bulletin for 1939?

A. It has not, so far as I know.

Mr. Booth: You are familiar with this, of course, Mr. Strauss?

Mr. Strauss: Yes.

Mr. Booth: I would like to show it to the Court.

Q. Does the Bureau of Safety of the Interstate Commerce Commission itself investigate railroad accidents throughout the United States?

A. It does.

Q. Generally speaking, in what cases does it conduct an investigation?

A. The more serious collisions and derailments, and collisions with motor vehicles where employees or passengers or other persons on the train are killed or receive serious injury.

Q. Almost always the accident is one in which one or more deaths have occurred as a result of the accident; is that correct?

A. Generally that is true, but they don't investigate all [fol. 3566] of them.

Q. Does the Commission issue quarterly summaries of the results of those investigations?

A. It does.

Q. Have you with you available for the inspection of counsel a file of the annual statistical reports of the Inter-

state Commerce Commission similar to report 107 for the year 1923 to the year 1938, inclusive?

A. I have.

Q. You have just handed me a pamphlet entitled "Interstate Commerce Commission, Bureau of Safety, Summary of Accident Investigation Reports, No. 79, January, February and March, 1939." For how long a period have you a file here in Tucson and available to the inspection and use of counsel of these summaries of accident investigation reports?

A. From the year 1927 to the year 1939, inclusive.

[fol. 3567] Mr. Booth: I have just handed his Honor for his inspection and not as an exhibit the quarterly summaries just referred to.

Q. Have you prepared an exhibit, Mr. Sullivan, consisting of six pages giving copies of certain forms filed with the Interstate Commerce Commission and required to be filed with them by railroads?

A. I have.

Mr. Booth: We ask that this be marked for identification as "Defendant's Exhibit No. 261."

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 261 for identification.

Mr. Booth:

Q. What is the first page of this exhibit, Mr. Sullivan?

A. It is an extract from the rules of the Interstate Commerce Commission which appear on pages 22 and 23 of the printed rules, paragraphs 15 to 19, inclusive.

Q. Dealing with what?

A. Dealing with the forms and arrangement of the monthly reports of accidents to the Interstate Commerce Commission.

Q. What is the second page of this exhibit No. 261 for identification?

A. Page 2 is the yellow form identified by the Interstate [fol. 3568] Commerce Commission and on the form itself as form V. The form is the verification of the other forms and is included as a part of the monthly report. It includes, in Section A, report of summary of all non-train casualties to employees on duty that are reportable; also

includes the oath of the authorized officer of the carrier who submits the report to the Interstate Commerce Commission.

Q. What is the third page?

A. The third page is the form T report on which is reported all reportable train and train service accidents.

Q. These form T reports when accumulated at the end of the month are attached to form V and sent to the Interstate Commerce Commission, is that correct?

A. They are arranged in accordance with rules, all of the form T reports covering train accidents being assembled first and immediately following the sheet 1 or the verification report, then followed by all form T's covering the train service accidents and each of these particular groups are further arranged according to the particular group according to the type of train accident or the type of train service accident reported.

[fol. 3569] Q. Do the records of the Southern Pacific Company show since the adoption of the 1923 rules it has followed the mechanics of reporting as you have described them?

A. Yes.

Q. What is the fourth page?

A. The fourth page is the so-called "supplementary form T" covering additional information required in connection with accidents at public highway grade crossings and became effective January 1, 1937, the blank form on page 4 of this exhibit being the 1939 revision, there having been some changes year after year in this particular form.

Q. Prior to 1937, when a train collided with a vehicle at a public grade crossing and a casualty resulted or damage resulted to the train in excess of $150, was that reported to the Interstate Commerce Commission?

A. Yes, it was reported on form T and is still reported on form T. There is no change in the mechanics of reporting that particular type of accident.

Q. There are highway grade crossing statistics in the published reports of the Commission back as far as, we will say, 1923?

[fol. 3570] A. That is correct.

Q. In fact you have used those in making up an exhibit which will be offered later?

A. I have.

Q. What is the fifth page of this exhibit No. 261?

A. The fifth page is known as form R and it is a report required by the Interstate Commerce Commission in connection with any reportable train accident due to a failure of any kind in a rail. In other words, that form is supplementary to any form T that may be made of any train accident that was due to a rail failure.

Q. You spoke a little while ago of subsequent fatalities. Is that form of report covered on page 6 of this exhibit?

A. It is.

Q. Does the Southern Pacific Company retain in its files and have you had access to the filed copies of these reports as they have been filed from time to time since January 1, 1923?

A. I have had access to them at different times during the past years, but the office filed copies of form T reports are not retained permanently or, I should say, indefinitely, but I have had access to certified photostatic copies that were [fol. 3571] obtained from the Interstate Commerce Commission for the years 1923 to 1935, inclusive, and I have the retained office filed copies of the form T reports as far back as 1929, either 1929 or 1930.

Mr. Booth: We offer exhibit No. 261 for identification in evidence.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 261.")

Mr. Booth:

Q. There have been referred to in connection with the testimony of other witnesses the Interstate Commerce Commission statistics on railways in the United States for the years 1923 to 1939, inclusive. Are you familiar with those statistics?

A. I think you mean 1938.

Q. 1938, yes.

A. I am quite familiar with that statistical publication.

Q. Have you prepared a series of exhibits which, for convenience, we will call the "national exhibits" dealing with various phases of casualties on the Class I railroads of the United States from the years 1923 to 1938, inclusive?

[fol. 3572] A. Yes, both casualties and train accidents.

Mr. Booth: I have handed the clerk an exhibit in one sheet entitled "Casualties to All Classes of Employes on Duty Sustained in Train and Train-Service Accidents, Class I Railroads of the United States, Reflected by Statistics of the Interstate Commerce Commission, Years 1923 to 1938, Inclusive," which we ask to have marked "Defendant's Exhibit No. 262" for identification.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 262 for identification.

Mr. Booth:

Q. From what sources was this exhibit prepared?

A. The information in columns B and C representing total car-miles and total train-miles was obtained from the Statistics of Railways of the United States, the complete reference being shown at the foot of the exhibit. Columns D, E, F, and G appear in the Interstate Commerce Commission Annual Accident Bulletins, the reference being shown at the foot of the page of exhibit No. 262.

Q. Those are all official publications of the Interstate Commerce Commission?

A. They are.

Q. The computed figures in this exhibit were made by [fol. 3573] you?

A. They were. Items 7, 14, 19 to 23, inclusive, are also calculations made by me.

Mr. Strouss: Will you repeat that, please?

A. Items or lines 7, 14, 29 to 23, inclusive, are also calculations made by me.

Mr. Booth:

Q. Is this exhibit true and correct?

A. It is.

Q. Does it not only include employees engaged directly in the operation of trains and locomotives but also includes other employees, injury cases?

A. It does if they receive their injury in train or train-service accidents.

Q. Will you give some illustrations of other employees that it includes?

A. It includes car inspectors and car repairers working around train yards where the movement of trains, loco-

motives, or cars is involved; it includes employees of the maintenance of way department, bridge and building department, signal department working on the track and structures, or that type of employees who may be traveling to and from their headquarters to point of work on track vehicles such as velocipedes, hand cars, motor cars, or similar travel of those employees from one point of work to [fol. 3574] another point of work during their tour of duty where they may have received injury through the operation of locomotives or trains; clerical employees, such as yard clerks out in the yards who are required to take the numbers of cars in trains where they may have received injury by the operation of trains or locomotives or moving cars; it includes the entire group of employees both on and off the train who may receive injury or suffer death through the operation of trains, locomotives, or cars.

Q. It does not include the so-called "nontrain" class of accidents?

A. It does not.

Q. In calculating the rates in the four columns headed "Casualty Rate Per," what bases have you used?

A. In column I, I have used the rate based on a million car-miles which is a recognized measurement of the occurrence of casualties to the movement of a given amount of traffic; in column J, a million train-miles; column K, a million locomotive-miles; column L, a million man-hours, which is a recognized basis of measurement of the occurrence or exposure of employees to injury.

Q. In the case of many employees covered by this ex- [fol. 3575] hibit, there would be no car-miles, train-miles, or locomotive-miles that could be made applicable to them, is that correct?

A. That is partially true. No car-miles or train-miles are accumulated in connection with, for instance, yard or terminal operation, but locomotive-miles are accumulated.

Q. What employees would be included in the computation on the basis of man-hours that would not be included if you had confined the study to locomotive-miles, car-miles, and train-miles, just in general?

A. Generally, any reportable train or train-service accident that might occur in a terminal yard, there would be no train-miles or car-miles against which the occurrence of the casualty could be related; but man-hours are calculated

and maintained for all classes of employees and locomotive-miles are calculated and maintained for yard operations. That was my object in showing the four bases so that the complete picture would be shown based on all of the recognized bases of measuring the occurrence of casualties.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: Yes. When you said that these columns I, J, K, and L are on recognized bases of calculation, are [fol. 3576] those your own calculations or are those figures taken from the accident bulletins?

A. No, they were calculated by me. The basic figures as to the absolute number of casualties are from the accident bulletins and I calculated the various rates.

Mr. Strouss: That is all the figures in either of those columns?

A. That is true.

Mr. Booth: This can be checked on the face of the exhibit?

A. Yes, they can be checked mathematically and you may find the casualty rates based on man-hours and locomotive-miles in some of the tables of the accident bulletins.

The Court: Then I take it that the Interstate Commerce Commission does not promulgate a casualty rate as you figured it in these columns?

A. Yes, they do, your Honor, they calculate casualty rates based on million man-hours but many of their tables include in that rate the non-train accidents.

The Court: You have made the segregation?

A. I have made the segregation so it would eliminate the non-train accidents and only show the casualty rates for [fol. 3577] train and train-service accidents which are the only type involved in train or locomotive operation. I may state that this is only a series of exhibits prepared in somewhat similar form, and as I shall offer the exhibits they will break down to the various class of employees.

By Mr. Booth:

Q. This is the first of the series?

A. That is correct.

Mr. Booth: If neither counsel nor the Court has any further questions, I will offer the exhibit in evidence.

Mr. Strouss: No further questions.
The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 262."

Mr. Booth: I ask that this second national exhibit be marked "Defendant's Exhibit No. 263" for identification.
The Court: It may be marked.
The Clerk: Defendant's exhibit No. 263 for identification.

By Mr. Booth:

Q. Before we pass to it, I would like to ask the witness to describe what this exhibit No. 262 shows in the progressive movement in the average casualty rates on all Class I railroads of the United States from the year 1923 to 1938, [fol. 3578] inclusive?

A. In the first place, I prepared the showing not only as to individual years but in order to show a proper cross-section of cycles of years; I have prepared it so that in addition to the years a comparison may be made with two six-year cycles and a four-year cycle, the first period being from 1923 to 1928; the next period, six years, 1929 to 1934; and the next period being from 1935 to 1938. This will permit not only of a comparison and examination of the trend of casualty rates year by year but it also permits a comparison of a recent consecutive period of years with preceding periods of years. On lines 7, 14, and 19, average casualty rates have been calculated in columns I, J, K, and L. These are not averages of averages, but a calculated average based on the information shown on line or item 7 in columns B, C, D, and E, representing the car-miles, train-miles, locomotive-miles, and man-hours and the casualties reported in column H. With that information shown, it is not difficult to calculate the percentage of decrease in the casualty rates which are shown as lines or items 21, 22, and 23. For instance, on line 21 under column I it will be observed that the casualty rate for the period 1929-1934 [fol. 3579] compared with the earlier six-year period, 1923-1928, has decreased 57.74 per cent. Likewise, the average for the last four years shown compared with the immediately preceding period, 1929-1934, has decreased 27.37 per cent, and on line 23 the casualty rate, or the average casualty rate for the four years, 1935-1938, compared with

the earliest six-year period has decreased 69.39 per cent. In a similar manner, the corresponding decrease may be found in the casualty rate based on train-miles shown in column J, locomotive-miles shown in column K, and on a man-hour basis shown in column L.

[fol. 3580] Mr. Booth: Putting the illustration another way, the average for the four years ending in 1938, which is shown by line 19, column I, would mean that an average of 31.23 casualties occurred in those four years to the movement of one car one hundred million miles or one hundred cars a million miles, is that correct?

A. That is correct.

Q. And those four years an average of 8.77 casualties occurred in the movement of the average train for a million miles?

A. That is correct, that is shown in column J.

Q. And on a man-hour basis that the average casualty rate was 3.18 casualties in one million man-hours?

A. That is correct.

The Court: Mr. Sullivan, how were these casualties reported prior to the year 1923?

A. They were reported in the same manner and on the same basis except that additional subdivisions of the so-called Code Causes were made. In other words, apparently, after the experience of a number of years, the Interstate Commerce Commission decided that there should be further segregation as to specific causes of casualties, both train and train service.

[fol. 3581] The Court: That is when they adopted these 1922 rules?

A. That is true, but I know of my own knowledge that the same type of accident on the same disability basis was reported to the Interstate Commerce Commission in the year 1916 when I was handling that matter in the general manager's office.

The Court: May I ask, will subsequent exhibits cover the period prior to 1922?

The Witness: Prior to 1923?

The Court: 1923, I mean.

A. No, they will not. They all begin at 1923.

Mr. Booth: Would the fact that you have taken four years in the block represented by line 19, and six years in each

of the other blocks represented by lines 7 to 14 in your opinion impair the validity of the comparison between the blocks?

A. No, because you can select any period of consecutive years you want for comparative purposes.

The Court: We will take our morning recess at this time.

(Thereupon a short recess was taken, after which the witness was recalled to the stand, and proceedings were resumed as follows:)

[fol. 3582] The Court: You may proceed.

Mr. Booth: Mr. Sullivan, speaking of the three days' or more disability, more than three-day disability of an employee to make the case a reportable accident, there is another limitation besides that, is there not?

A. Yes, the rules provide that the accident is reportable if the disability in excess of three days occurs within the ten days immediately following the occurrence of the accident. In other words, there must be more than 72 hours' disability within the 240 hours immediately following the occurrence of the accident.

The Court: Mr. Sullivan, is there a time limit within which the individual must die in order to be counted as killed?

A. Yes, the person injured must die within 24 hours after the occurrence of the accident to be counted in the statistics as a person killed. If death occurs after 24 hours the statistics show it as a person injured, but it is reported as a subsequent fatality.

Mr. Booth: Are those both shown on sheet 11 of your exhibit No. 260, those requirements you have just testified to?

A. On sheet 11 of Exhibit 260, which is a reproduction of [fol. 3583] page 30 of the rules at the top, this reference is shown: "Killed. Any person killed in an accident at the time of its occurrence, or so seriously injured as to die within 24 hours thereafter, should be reported as killed. Note: See Section 19 for instructions relative to injuries that subsequently result in death." Section 19 appears on sheet 8 of exhibit No. 260 and is a reproduction of page 23 of the Rules. It states: "Form F (Subsequent fatalities). If, as the result of an injury, a person dies more than 24

hours after the occurrence of the accident, the casualty should be reported on a Form T as an injury, with full details as required by the provisions of the form, and in addition, a memorandum of the death should be given on Form F in accordance with the requirements of that form. This additional report is to be made in connection with the report for the month in which the accident occurred, if practicable; otherwise it should separately accompany the first monthly report filed after the death has come to the knowledge of the carrier. A single Form F may contain reports of more than one such fatality, provided all persons included therein were injured during the same month. A. [fol. 3584] Form F is not required in relation to a non-train accident."

The Court: Well, Mr. Sullivan, assuming that a person was injured in train operations and actually didn't die for two or three years later, but there was a connection between the injury and subsequent death, would you still report it on Form F?

A. Yes, sir, if the death was directly due to the original injury. I have no knowledge of any cases where as much as two years have expired, but I do know of Form F's having been prepared at least a year after the occurrence of the accident.

Q. But the Commission prescribes no time limitation on it?

A. No, sir.

Mr. Booth: The requirement as to the reporting of employees and other persons injured in reportable accidents is shown in the second column on sheet 11 of exhibit No. 260, a reproduction of page 30 of the Rules, is that correct?

A. That is correct.

Q. Now, turning to Exhibit 263 for identification, was this exhibit made from the same sources as Exhibit 262?

A. It was.

Q. And does it show the same information as is shown [fol. 3585] on Exhibit 262, except that it is limited to a smaller number of classes of employees?

A. It is limited to a certain class of employees and there is some limitation in the casualty rate shown on the exhibit.

Q. The limitation is expressed in the title as being "casualties to road trainmen and enginemen on duty; all classes

of service, sustained in train and train-service accidents," is that correct?

A. That is correct.

Q. That would include casualties to road freight, road passenger and work-train service, would it not?

A. That is correct.

Q. What does the term "road train-men and enginemen" include?

A. Road trainmen and enginemen includes conductors, brakemen, flagmen, baggagemen, engineers and firemen.

Q. Engaged in passenger, freight, or work-train service?

A. That is right.

Q. Is there any classification of employees known as a helper which this would include?

A. On some railroads, not very many any more, they [fol. 3586] have what they call a helper to a fireman. If an injury should occur to a fireman's helper, that would be included.

Q. Do we have anything of that sort?

A. Not on our railroad.

Q. Does this include train baggagemen on passenger trains?

A. It does.

Q. Does it include hostlers at terminals taking care of engines, taking them to and from the roundhouse?

A. No.

Q. Now, column D is headed "Man-Hours worked by Road Trainmen." Does that include enginemen as well as trainmen?

A. It does. The Interstate Commerce Commission throughout, where they refer to trainmen, includes conductors and brakemen as well as engineers and firemen. In other words, column D includes all of the man-hours for all of the classes of employees shown in the title of the exhibit.

Q. Or the footnote?

A. Or in the footnote.

Mr. Strauss: What did you mean by "throughout," the Interstate Commerce Commission "throughout" when they say "trainmen"?

[fol. 3587] A. When they refer simply to the term "trainmen," referring to accident bulletin No. 107 for the year 1938, page 107, second column, this reference is made: "The

term trainmen in this bulletin includes engineers and motormen, firemen and helpers, conductors, brakemen and flagmen engaged in passenger, freight, yard, or work-service, also train baggagemen, but not hostlers." A similar reference appears in every accident bulletin from 1923 to 1938 inclusive.

Mr. Booth: Do the same explanations that you gave with respect to the construction and computations in exhibit 262 apply to exhibit 263?

A. Yes.

Q. In other words, it is identical with 262 except for the limited number of employees that it covers as compared with exhibit No. 262?

A. And the bases of measurement, and one basis of measuring the casualty rate.

Q. Are locomotive-miles excluded from 263?

A. It is.

Q. Why?

A. Because all of the classes as shown in the title of the exhibit and the footnote, any casualties may relate either to train-miles or man-hours, the basis of measuring exposure to injury, or car-miles, the measurement of casual- [fol. 3588] ties to the movement of a given amount of traffic, so there was no necessity of showing locomotive-miles in this exhibit, because yard trainmen and yard enginemen are not included in Exhibit 263.

Mr. Booth: Any questions, Mr. Strouss.

Mr. Strouss: No questions.

Mr. Booth: We offer the exhibit as defendant's Exhibit 263.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 263.")

Mr. Booth: Have you any comments on this exhibit other than what you have said about it already and about the preceding exhibit?

A. Nothing except that I would like to direct attention to the trend, to the downward trend of casualty rates as shown in columns H, I and J from 1923 to 1938, and the figures on lines 21, 22, and 23 in the respective columns H, I and J, which shows the percent of decrease in the casualty rates.

comparing the four-year period, 1935-1938, with the average rate in the period immediately preceding it and with the earliest period shown on the exhibit. For instance, line 23 [fol. 3589] shows a decrease in column H of the casualty rate measured on a car-mile basis of 68.03 per cent, comparing the latest period shown with the earliest period shown on the exhibit, and similarly for the column I and column J. You will note that the trend shows a casualty rate of 73.52 casualties per million car-miles in column H for 1923, whereas, in 1938 it was only a fifth of that or 14.57 casualties per million car-miles.

Q. Have you prepared a third exhibit in this national series entitled "Casualties to Road Freight Trainmen and Enginemen on Duty Sustained in Train and Train Service Accidents, Class 1 Railroads of the United States, Reflected by Statistics of the Interstate Commerce Commission, Years 1923 to 1938, Inclusive"?

A. I have.

Mr. Booth: We ask that that be marked Exhibit 264 for Identification.

The Court: It may be so marked.

The Clerk: Defendant's Exhibit No. 264 for identification.

Mr. Booth: Are the sources of this exhibit shown in the footnotes?

A. They are.

Q. Are they the same sources as those from which Ex- [fol. 3590] hibit 263 was prepared?

A. Yes, sir.

Q. And is the exhibit arranged identically in all respects as the arrangement of Exhibit 263?

A. Yes, sir.

Q. What further limitation of classes of trainmen and enginemen on duty is contained in this exhibit 264 for identification?

A. 264 is confined to road freight trainmen and enginemen on duty.

Q. Does that include passenger?

A. It doesn't include passenger.

Q. And work trains?

A. Yes, it includes work trains because road freight trainmen and enginemen man work trains.

Q. Were the computations in this exhibit and the preceding exhibit made by yourself?

A. They were.

Q. I think I neglected to ask you whether all of the others and also whether this exhibit is true and correct, to the best of your knowledge and belief?

A. This and those are.

Q. These exhibits are your personal work, not made by someone else?

A. They are my personal work.

[fol. 3591] Mr. Booth: Any questions, Mr. Strouss, on 264?

Mr. Strouss: No questions.

Mr. Booth: We offer this in evidence.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 264.")

Mr. Booth: Have you any comments to make on this exhibit, Mr. Sullivan?

A. I want to call attention to the downward trend on each of the bases of measurement or the casualty rates shown in H, I and J from the years 1923 to 1938, also the percentage comparisons made and shown on lines 21, 22 and 23 under the respective casualty rate columns. For instance, in column H for the year 1923, the casualty rate applying to road freight trainmen and enginemen on duty was 70.6 casualties per million car-miles, and it had decreased to 13.56 casualties per million car-miles in 1938.

Q. In one hundred million car-miles?

A. A hundred million car-miles.

Q. The decrease by blocks would be from 50.68 in the first six years to 22.01 in the second six years to 16.09, all per one [fol. 3592] hundred million car-miles in the last four years?

A. That is correct.

Q. Is there any statistical advantage of comparing the statistics of this character by blocks rather than by individual years?

A. Yes.

Q. Would it tend to iron out any inequalities of individual years?

A. Yes, because casualties have no regularity in their occurrence, and in order to get a true picture it is necessary

to take a period of three, four, five or six years, and strike an average in order to find a true trend of experience.

Q. Have you prepared another in this series of national exhibits which still further limits the employees covered by the exhibit?

A. Yes.

Mr. Booth: We have handed the clerk one sheet entitled "Casualties to Road Freight Conductors, Brakemen and Flagmen on Duty Sustained in Train and Train Service Accidents, Class 1 Railroads of the United States, Reflected by Statistics of the Interstate Commerce Commission, Years 1923 to 1938, Inclusive." I ask that it be marked Exhibit 265 for identification.

The Court: It may be marked.

The Clerk: Defendant's 265 for identification.

[fol. 3593] Mr. Booth: Are the sources of this exhibit correctly shown in the source notes?

A. They are.

Q. Was this exhibit, like the others, prepared personally by yourself?

A. It was.

Q. Do you believe it is true and correct?

A. Yes, sir.

Q. You made the computations yourself?

A. Yes, sir.

Q. And abstracted the figures from the reports yourself?

A. That is correct.

Q. In what respect and only in what respect does this exhibit differ from the preceding exhibit No. 264?

A. Exhibit No. 265 does not include road enginemen; that is, road engineers or firemen or firemen helpers, if there were any, and it is confined solely to road freight conductors, brakemen, and flagmen, as indicated in the title.

The Court: Just a further breakdown of the previous exhibit?

A. That is correct, your Honor.

Mr. Booth: Have you any questions, Mr. Strouss?

[fol. 3594] Mr. Strouss: No questions.

Mr. Booth: We offer this in evidence as defendant's exhibit No. 265.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 265.")

Mr. Booth:

Q. Have you any comments to make on this, Mr. Sullivan?

A. The same comments apply equally to this exhibit as to the previous one. The casualty rate on the three bases, the downward trend from 1923 to 1938, and the comparisons on the average for the various groups of years as shown on items or lines 21, 22, and 23.

The Court: This exhibit would indicate, would it not, Mr. Sullivan, that your casualty rate on the conductors, brakemen, and flagmen as shown by exhibit No. 265 is slightly less on a percentage basis than where you group larger classifications together? For instance, the previous exhibits Nos. 263 and 264 and also No. 262, down in column H, lines 21 to 23, would indicate that these percentages on this exhibit No. 265 are slightly lower than the other larger groups?

A. The casualty rates become lower in each succeeding [fol. 3595] exhibit because certain classes of employees are eliminated. It does not necessarily mean there is any difference in the casualty rate as applying to a particular group. For instance, if we should go further with exhibit No. 265 and eliminate the brakemen and flagmen, the casualty rate would be lower for the conductors because the casualties in each case are related to the same basic measuring stick; in other words, the same train-miles, the same car-miles. So, finally, if you would only have left one particular group, the casualty rate for that group would be much lower than the total of all employees included in the original group.

The Court: Because your measuring stick is the same for all?

A. That is correct.

Mr. Booth:

Q. The table in all of these exhibits headed "Comparison of Average Casualty Rates" is the table of percentages of decrease and not percentages of rates, is it not?

A. It is a percentage of decrease based on the casualty rates for the respective groups of years.

Q. But not the casualty rates themselves?

A. That is right.

Q. Those casualty rates are shown in the columns pre-
[fol. 3596] ceding?

A. That is right. In other words, from line 1 to 20 in every case that is the casualty rate. Lines 21 to 23 are percentages comparing the casualty rates in the periods with other periods.

Q. Have you prepared a further exhibit headed, "Casualties to Road Freight Conductors, Brakemen and Flagmen, Train-Service Accidents Caused by Sudden Stop, Start, Lurch or Jerk of Locomotive, Car or Train, All Railroads of the United States"?

A. I have.

Mr. Booth: We ask that this — marked "Exhibit No. 266" for identification.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 266 for identification.

Mr. Booth:

Q. Under the rules of the Commission on the reporting of accidents, will you call attention in the record to the code cause known as "sudden stop, start, lurch or jerk of locomotive, car or train"?

A. In the rules which appear in exhibit No. 9 from pages 37 to 52, inclusive, under the rules governing monthly reports of railway accidents to the Interstate Commerce Commission, the Commission has assigned code of causes for
[fol. 3597] train accidents and train-service accidents. These code causes are used in the annual accident bulletins in preparing their various statistical tables. Under "train-service accidents" on page 51 of the rules, appears Code Cause 7007 which covers casualties resulting from sudden stopping, starting, lurch, or jerk of locomotive, car, or train not elsewhere provided for.

Q. Will you indicate to the reporter what portion of that you have just stated should be included in quotation marks as a quotation from the rules?

A. All that I have just read beginning with "7007" and ending with the word "for" of the phrase "not elsewhere provided for." The following should be quoted, "7008,

sudden application of brakes, improper handling of air." "7009, sudden application of brakes, air hose bursting, parting or otherwise defective." "7010, sudden application of brakes, other defective air brake equipment."

Q. Which of those code causes you have just read into the record are covered by this exhibit No. 266 for identification?

A. 7007, 7008, 7009, and 7010, as shown at the foot of the exhibit.

[fol. 3598] Mr. Booth: Your Honor, we have filed this with the reporter in blueprint form and will ask permission if the exhibit is received to substitute a planograph copy.

The Court: You may have permission to do that.

Mr. Booth:

Q. What classes of employees does this exhibit include?

A. Road freight conductors, brakemen, and flagmen.

Q. On trains of all lengths?

A. Yes, sir.

Q. Is any segregation made by the Interstate Commerce Commission as to trains of different lengths?

A. No segregation is made by the Commission.

Q. I mean in its statistical reports?

A. No, they make no segregation.

Q. That is true of all of its reports on which these tables are based?

A. That is correct.

Q. But the form T reports show, do they not, or should show in each case the length of a frieght train in which an accident occurred which is reported on that report?

A. Yes, the form T carries a space for showing the number of cars in a train.

[fol. 3599] Q. If you have access to the form T reports, you can ascertain the number of cars in the train at the time of the accident as reported by the company?

A. That is right, by reference to item 18-B on form T report.

Q. But you say the Commission itself does not classify trains into lengths at all?

A. It does not in their statistics.

Q. Is that true of passenger as well as freight trains?

A. Yes, sir.

Q. Is there any way from the statistics published by the Interstate Commerce Commission in its annual accident bulletins to determine what proportion of any particular class of train or train-service accidents occurring on road freight trains fell into this arbitrary division of more than 70 cars or 70 cars or less?

A. Will you read that, please?

(The question was read by the reporter.)

A. It is not possible.

Q. Is there any discussion in any of those annual accident bulletins of freight train lengths?

A. I have never seen any.

Q. I am speaking of the annual bulletin, you have read [fol. 3600] all of them, have you not?

A. I have read them all. I have never seen any such reference.

Q. Referring to this exhibit No. 266, columns B and C, which relate to car-miles and train-miles as shown in the headings, are taken from the sources shown in the footnotes?

A. That is correct.

Q. Columns D, E, and F are taken from the sources shown in the footnotes?

A. D and E are; F are additions made by me.

Q. Columns G and H and lines 7, 14, 19, 20, 21, 22, and 23 are calculations made by yourself?

A. That is correct.

Q. And are true and correct to the best of your knowledge and belief?

A. They are.

Mr. Booth: Have you any questions, Mr. Strouss?

Mr. Strouss: The code classification where an accident falls under the code classification is determined from the form T report, isn't that true?

A. Yes, the Interstate Commerce Commission, Bureau of Statistics, based their statistics on an examination of the form T reports submitted by the carriers.

[fol. 3601] Mr. Strouss: And the form T report is based upon the employees' information furnished to officials of the company who prepare the form T report?

A. The information on the form T in most cases is the information furnished by the employee himself, providing it is correct.

Mr. Strouss: What do you mean by that? If an employee who was involved in an accident makes a report, the official making the form T report to the Interstate Commerce Commission reserves the right to determine whether that employee's report was correct?

A. All reports to the Interstate Commerce Commission are made after investigation of the facts because the Interstate Commerce Commission rules require that the management submit the reports under oath and it is their duty under the law and the rules to see that the reports reflect the facts.

Mr. Strouss: As they determine them?

A. Yes.

Mr. Strouss: There are, of course, forms required to be executed and filed by the employee involved in the accident?

A. Yes, the rules require the preparation of accident re-[fol. 3602] ports covering all accidents.

Mr. Strouss: What is that form?

A. It is employee's report of accident, the form blank has been changed over a period of years. If I am not mistaken, it is 2611.

Mr. Strouss: The Code Causes 7007, 7008, 7009, and 7010 are your personal selection of the code classification which cover this particular subject and that no other code classifications do cover it?

A. It is my selection, but I have had the benefit of the assistance and suggestions of the employees who offer statistics of this character. They have felt that these were the controlling causes so it is not altogether my judgment but it is my opinion that these correctly include all of the so-called "sudden stop, start, lurch, or jerk of locomotive or train."

Mr. Booth:

Q. That is in train service?

A. In train-service accidents. As I explained before, these are train-service accidents. There is no comparable code cause prescribed by the Interstate Commerce Commission for train accidents of this type.

Mr. Strouss: That is all.

Mr. Booth: We offer this exhibit in evidence as defendant's exhibit No. 266.

[fol. 3603] Mr. Strouss: I object to it as incompetent, irrelevant, and immaterial, based upon matters not in evidence and upon conclusions and not the best evidence.

The Court: The objection is overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 266.")

Mr. Booth:

Q. Have you prepared an exhibit entitled, "Casualties to Passengers on Trains in Train and Train-Service Accidents, Class I Railroads of the United States, Reflected by Statistics of the Interstate Commerce Commission for the Years 1923 to 1938, Inclusive"?

A. I have.

Mr. Booth: We ask that that be marked "Exhibit No. 267" for identification.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 267 for identification.

The Court: Before you go into that, the Court wants to ask a few questions on exhibit No. 266 in the light of Mr. Strouss' objection. Do I understand, Mr. Sullivan, that this particular exhibit, particularly referring to columns D and E, that you exercised your own judgment in selecting what [fol. 3604] accidents fell into those classifications or were these figures obtained from the reports to the Interstate Commerce Commission?

A. The figures are included in the statistics of the Interstate Commerce Commission under those particular code causes and including only the statistics applying to road freight conductors, brakemen, and flagmen. The exhibit was prepared and introduced in anticipation of the contention that is always made in support of a limitation of freight cars in trains, that the trains of certain lengths, in this case of over 70 cars——

The Court: (Interrupting) I am not so concerned with the purpose of it. My question has to do with the accuracy of the classifications.

A. The figures are correct and are not my selection of any particular figures in these code causes. They are all of the

casualties shown by the Interstate Commerce Commission in their statistics under those particular code causes which they have prescribed and shown for road freight conductors, brakemen, and flagmen.

The Court: What did you mean when you said a moment ago in answer to a question from Mr. Strouss that you had had the benefit and opinion of—did I understand you to say employees?

[fol. 3605] A. I have listened to them testify in these train limit law suits and they offer in support of their contention the casualties occurring under these particular code causes.

The Court: We will cross that bridge when we get to it, but what I am concerned with now is what discretion did you attempt to exercise in the matter of selecting from the various types of accidents to road freight conductors, brakemen, and flagmen the figures shown here in these columns, D and E?

Mr. Strouss: May I interrupt just a minute, one thing that might help the Court, in my asking questions and I think in response to questions from Mr. Booth, you have referred to code causes which I don't think have been explained to the Court.

Mr. Booth: It was explained in the record. Does your Honor have the bulletin before you?

The Court: Yes.

Mr. Booth:

Q. Mr. Sullivan, will you take the Interstate Commerce Commission bulletin for 1938 and refer to the page?

A. On page 58 of the accident bulletin under the title, "Table No. 80, Miscellaneous Train Service Accidents not Elsewhere Classified," will be found certain code causes at [fol. 3606] the extreme left of the page.

The Court: What do you mean by "code causes"?

A. Code causes are code numbers that have been assigned by the Interstate Commerce Commission under their rules and in their statistics for the purpose of showing and classifying and separating the figures which would represent the cause of an injury.

The Court: That is shown on that page 58 by all of those numbers on the left giving the various types of causes of injuries sustained?

A. That is correct. You may go back further, this is a general breakdown of all the casualties. The breakdown of

train-service accidents begins on page 47. This is simply one group.

Mr. Mason: Isn't this the case, if an accident as indicated by the form T is shown to be due to sudden stopping, starting, lurch, or jerk of locomotive, car, or train not elsewhere provided for, it is assigned code number 7007?

A. Yes, but it would be assigned to code 7007 by the Interstate Commerce Commission, not by the carrier.

Mr. Mason: And it is listed or included under the number which appears opposite Code Cause 7007 under table No. 80 [fol. 3607], on pages 58 and 59 of the accident bulletin for 1938 and corresponding tables and pages for earlier issues of the accident bulletin:

A. That is correct.

Q. Similarly, as to 7008, 7009, and 7010?

A. That is right and under the particular class of employees that is shown at the top of the column, and for the purpose of this exhibit under road service, freight conductors in two columns showing the killed and injured, and brakemen and flagmen in the two following columns.

The Court: What I am getting at, might accountants differ in their views as to which one of these particular lines should or should not be included in this exhibit?

A. The title of the exhibit shows the casualties in train-service accidents resulting from sudden stop, start, lurch, or jerk of locomotive, car, or train, and all a statistician or anyone else familiar with this type of statistics need do is to start from the beginning of the train-service accidents code causes and select those that clearly indicate that the casualty was a result of a sudden stop, start, lurch, or jerk, and you will find that 7007 to 7010 include that particular type of accident.

[fol. 3608] The Court: Possibly I would follow you a little easier if you would take the year 1938 for which bulletin No. 107 was issued and substantiate the figures you have shown on this exhibit No. 266 as to that particular line?

A. Exhibit No. 266 are the figures combining Code Causes 7007 to 7010 as indicated at the foot of the exhibit. If the Court will please refer under freight service to conductors and then to column, brakemen and flagmen, if you make an addition of those killed you will find that the total is two. If you add the eight sets of figures, four appearing under conductors and four appearing under brakemen and flag-

men, it will equal the total, 316, shown for 1938 in column E of the exhibit.

The Court: We are now only concerned with conductors and brakemen?

A. In freight service, yes, sir.

The Court: I believe I follow you.

Mr. Mason: In order to make it clear, Mr. Sullivan, all you have done is to aggregate the figures for road freight conductors, brakemen, and flagmen as killed or injured as they appear in those four lines for each of the code causes for those particular years?

A. That is correct.

The Court: We will take our noon recess at this time.

[fol. 3609] February 5, 1941, two o'clock P. M.

The witness, JOHN J. SULLIVAN, was recalled to the stand, and proceedings were resumed as follows:

Mr. Booth: Mr. Sullivan, when we adjourned this morning, Exhibit 267 had been offered for identification. I am wondering whether you had completed your description of the exhibit, passenger exhibit. I think not.

A. I don't think anything was——

Q. Are the sources of this exhibit shown in the source notes at the foot of the exhibit?

A. They are.

Q. And those sources are exclusively official statistics published by the I. C. C. in the volumes there shown in the source notes?

A. For the columns indicated, that is correct.

Q. Column B shows the number of revenue passengers carried by thousands?

A. That is correct?

Q. That is, the first figure would have three ciphers added to it to be approximately correct?

A. That is correct?

Q. And the second figure shows the number of revenue passengers carried one mile by thousands.

A. That is correct?

Q. And those figures to be correct within a thousand [fol. 3610] would have to have three ciphers added to them?

A. That is correct?

Q. Now, the train accidents and train service accidents in columns D, E, F, G, H, and I are taken from the sources shown in the footnotes?

A. Columns D and E and G and H are, and columns F and I are totals made by me.

Q. Those are additions?

A. Yes, sir.

Q. And the columns J, K and L are additions made by yourself?

A. That is correct?

Q. Columns M and N and lines 7, 14, 19, 20, 21 and 22 are computations made by you?

A. That is correct?

Q. They are merely mathematical calculations that can be checked from the face of the exhibit?

A. Yes, sir.

Q. Were the figures shown in the exhibit which were abstracted from the I. C. C. reports correctly abstracted therefrom?

A. Yes, sir.

Q. Are the computations made true and correct, to the best of your knowledge and belief?

A. They are.

[fol. 3611] Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Booth: Your Honor, we offer the exhibit in evidence as Defendant's Exhibit No. 267.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 267.")

Mr. Booth: Now, in respect to the length of time of disability, how do the casualties shown in this exhibit where they did not result in death differ from those shown in the preceding exhibits in so far as they dealt with employees?

A. Well, as indicated in the note at the foot of the exhibit, an injury to a passenger is reportable if the injury is sufficient to incapacitate the injured person from following his

customary vocation or mode of living for a period of more than one day. In the case of employees, the injury is not reportable unless it disables the employee for more than three days within the ten days immediately following the occurrence of the accident.

Q. Under the reporting rules of the Commission, how are deaths to passengers handled in reporting the accident?

[fol. 3612] A. In the same manner as the deaths to any person. If death results within twenty-four hours after the occurrence of the accident, it is reported in the statistics as a person killed. If death results after the expiration of twenty-four hours, it is reported as a person injured and a report made of the subsequent fatality.

Q. You have shown the casualty rates by two methods, per million passengers carried and per hundred million passenger-miles. Have you any observations you desire to make as to that?

A. Yes, million passengers carried represents the absolute number regardless of the distance that the individual passengers may have travelled. In order to give an idea as to the occurrence of accidents and the exposure to injury, generally, casualties are measured against the miles travelled by the passenger which is shown in column C, and the rate is shown in column N. I would like to direct attention to the average casualty rate per passenger carried shown in column M for the four years 1935-1938, which is 4.86 per million passengers carried. That is equivalent to saying that there were less than five passengers killed and injured for every million who travelled. Related to the distance they travelled, the average casualty rate of 10.51 per one [fol. 3613] hundred million passenger-miles, it can be stated in another way, that there was only one casualty for every nine and a half million miles travelled by passengers.

[fol. 3614] Mr. Booth:

Q. The decrease rates, I take it, are self-explanatory?

A. Yes, on lines 20, 21, and 22.

Q. The bottom block contains six percentages of decrease and are not rates per number of passengers or rates per miles traveled?

A. That is correct, except one of the six items is an increase figure, in column M. There are five decreases and one increase, in column M.

The Court: Is there any particular explanation to account for that one increase in that period?

A. There are some factors. It will be noted in 1938, in column D, there was a heavier figure of fatalities in train accidents but, generally, there is not much of a fluctuation and any slight increase is very noticeable on account of the very low casualty rate.

Mr. Booth:

Q. It is only by projecting the occurrence of casualties into the million passengers carried or the hundred million passenger-miles that you get any substantial rate?

A. That is true. Any change in the absolute number affects the average casualty rate when it is related to such a large figure.

The Court: On this classification of train accidents and train-service accidents, you followed the Interstate Com-
[fol. 3615] merce Commission regulations as shown by the exhibits you have already offered on that?

A. That is true, and these figures are taken from the statistics of the Interstate Commerce Commission where they segregate these particular accidents under the group, train accidents and train-service accidents. In fact, the figures in their absolute can be checked by comparing them with Table No. 55. In other words, this is simply a summary for sixteen years of the information reported each year by the Interstate Commerce Commission in Table No. 55.

Mr. Booth:

Q. Have you prepared another of the series of national exhibits entitled, "Casualties in Highway Grade Crossing Accidents in Which Automobiles Were Involved, All Steam Railways, Reflected by Statistics of the Interstate Commerce Commission"?

A. I have.

Mr. Booth: We ask that that be marked "Exhibit No. 268" for identification.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 268 for identification.

Mr. Booth:

Q. Does this cover the same sixteen-year period as the [fol. 3616] other exhibits?

A. It does.

Q. From what source are the figures derived in this exhibit other than the computations?

A. The source is indicated at the foot of the exhibit, column B from the Statistics of Railways, Interstate Commerce Commission; columns C, D, and E from Interstate Commerce Commission Accident Bulletins, Table No. 13, for the various years; columns F, G, and H, and the figures shown in lines 7, 14, 19, and 20, and the average comparisons in the table at the foot of the exhibit are computations by myself.

Q. For what reason do all of these national exhibits stop with the year 1938?

A. The Interstate Commerce Commission has not as yet distributed the 1939 issue, at least it hasn't been placed in my hands.

Q. Did you make arrangements to have it sent you by air mail as soon as it was issued?

A. Yes, I have an order at Washington to have it transmitted by air mail as soon as it is distributed by the Interstate Commerce Commission.

The Court: Are they customarily two years behind with that?

A. They are later this year than they have been here- [fol. 3617] tofore. They are customarily almost a year behind. Ordinarily, in previous years I have received the bulletin in November or December in the year following that for which it was prepared. In that connection I may state also if we had the accident bulletin showing the number of casualties it would hardly be possible to compute the casualty rates because the blue book, Statistics of Railways, from which I obtain all the other data usually is not distributed until about March or April and the only other source from which the figures could be obtained would be through the preliminary abstracts.

Mr. Booth:

Q. What was the purpose of preparing and offering this exhibit?

A. The occurrence of grade-crossing accidents involving the operation of trains is a very serious problem confronting the public and the railroads as can be readily seen from the columns D and E, where during this sixteen-year period over twenty-six thousand people were killed; even the four-year period from 1935 to 1938 there were 5,875 killed and when it is almost common knowledge that persons injured in automobile accidents receive very severe and serious injury the figure in column E is also quite impressive, where during the same sixteen-year period almost eighty-one [fol. 3618] thousand people were injured or a total of 107,273 were killed and injured for that period. The four latest years shown, 1935 to 1938, shows there were 23,658 persons killed and injured and by referring to column G where the casualty rate has been calculated on a train-mile basis it will be noted that the rate is somewhat constant.

Mr. Strouss: I don't think this exhibit has been admitted, has it?

The Court: No, I think not.

Mr. Booth: Have you any questions on this? I beg your pardon.

Mr. Strouss: No, I have no questions.

Mr. Booth: Any questions, your Honor?

The Court: No.

Mr. Booth: We offer the exhibit in evidence.

Mr. Strouss: I have no objection.

The Court: It may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 268.")

Mr. Booth: I would like to have the witness' explanation stand if there is no objection.

Mr. Strouss: All right.

Mr. Booth:

Q. You spoke of the rate being somewhat constant in column G?

A. Yes, I invited attention to the fact by examining the [fol. 3619] figures in column G that the casualty rate on a train-mile basis shows it has remained somewhat constant. There are slight fluctuations and those fluctuations can more readily be observed by examining the block at the foot of the exhibit in the same column in comparison of average

casualty rates, which shows there is a direct relationship to the operation of trains.

The Court: Taking the year 1938, Mr. Sullivan, it would indicate by reference to the previous exhibit, No. 267, there was considerably less than half the casualties to passengers on trains as what there were casualties to occupants of automobiles at grade crossings during that year?

A. That is correct, the figure in No. 268 shows 5,090 whereas the figure on exhibit No. 267 is 2,335.

The Court: I am wondering why you limited your statistics here in exhibit No. 268 to automobile accidents in grade crossings rather than including all accidents at grade crossings whether it happened to be a pedestrian or a vehicle pulled by horses?

A. Your Honor, this was simply an abstract from a similar table that is prepared by the Interstate Commerce Commission and it is possible from the same table to show [fol. 3620] all casualties regardless of whether they are occupants of automobiles or other vehicles, except that all of the other types is not a very impressive figure. I will say 90 per cent or more accidents occurring at grade crossings involve the occupants of motor vehicles.

The Court: The other is negligible?

A. That is true.

Mr. Booth:

Q. Is it true that you can relate these figures to the number of automobile registrations and there is no way of relating the figures to pedestrians or horse-drawn vehicles?

A. You couldn't relate the casualties to the automobile registrations but they could be related to the million train-miles and possibly I could prepare an exhibit showing that particular study. It would not affect the casualty rate on a train-mile basis very much, but it would increase it because there would be some additional persons included in the total casualties.

Q. Will you refer to the table by number which you just described in your answer to the Court?

A. Table No. 13 in the accident bulletin.

Q. Will you state whether the Interstate Commerce Commission has commented on this subject of its statistics relating to grade crossing accidents in the same bulletin in [fol. 3621] the table was published?

A. Yes, it regularly comments and make observations of the figures reflected by their statistics in the bulletin for the year 1938, Accident Bulletin No. 107, page 11, in the first column.

Q. Will you read that, please?

A. (Reading) "The percentage of reduction in grade-crossing fatalities in 1938 corresponds with that in motor vehicle experience generally. There was a reduction of 19.09 percent in highway grade-crossing fatalities and an estimated reduction of 19.28 percent in motor vehicle deaths.

"Accidents at rail-highway crossings involving motor vehicles were responsible for 4.10 percent of all motor vehicle deaths in 1938.

"There was a decrease in 1938 compared with 1937 of 27.67 percent in the cases where the motor vehicle ran into the side of the train and a reduction of 20.52 percent in the number of cases where the motor vehicle was struck by the train.

"In collision of motor busses and trains, 12 accidents caused 34 fatalities and 73 injuries. School busses were involved in 4 of these accidents which resulted in 28 deaths and 26 injuries.

"In 1938, 53.06 percent of the motor vehicle accidents at [fol. 3622] grade crossings occurred during daylight. The hour of greatest frequency was between 5 and 6 p. m., though it was but slightly higher than in the other hours between 3 and 7 p. m. In a segregation of night accidents according to hour of occurrence, the hour of greatest frequency was between 11 p. m. and 12 midnight. Saturday was the day of greatest frequency. Winter is the season of highest accident frequency at grade crossings. In 1938, 35.58 percent of the total number occurred in November, December, and January, with a peak in December.

"In proportion to the total number of crossing accidents in 1938, the number in which motor trucks were involved declined somewhat under 1937 while those in which passenger automobiles were involved increased slightly in 1938.

"More freight trains were involved in collisions with motor vehicles in 1938 than passenger trains. Freight trains were involved in 45.19 percent, passenger trains in 43.19 percent, and switch and work trains in the remainder. The frequency rate per million locomotive- and motor train-

miles in 1938 was 2.73 for freight trains and 3.24 for passenger trains.

"Out of a total of 1,450 night accidents, 352 or 24.28 per-
[fol. 3623] cent occurred at crossings at which flood, street or other lights had been especially installed to illuminate the crossing.

"Forty-eight percent of all accidents involving motor vehicles occurred at city crossings and 50 percent at rural crossings. Crossings in communities with a population exceeding 2,500 were classed as city crossings.

"Sixty percent of the accidents involving freight trains and motor vehicles occurred at train speeds of less than 20 miles per hour. In 10 percent of the cases, the train was standing. Approximately 34 percent of the accidents involving passenger trains occurred at train speeds ranging from 10 to 29 miles per hour. Seventy-five percent of the accidents involving switching movements occurred at speeds under 10 miles per hour. In 13 percent of these, the train was not in motion."

Q. There is another quotation, I believe, on page 10 of the same bulletin in which the Commission further analyzes these statistics?

A. In the first column at page 10 under the caption, "Highway Grade-Crossing Accidents," it reads:

"Total accidents at public highway grade crossings in
[fol. 3624] 1938 constituted 33.7 percent of the fatalities in all railway accidents and 14.7 percent of all nonfatal injuries. In accidents involving train operation, they accounted for 35.4 percent of all the fatalities and 25.9 percent of the injuries reported by carriers.

"In 1938, 1,517 persons were killed and 4,018 injured in accidents at highway grade crossings. This was a reduction of 358 fatalities and 1,118 injuries under 1937. Automobiles were involved in 88 percent of the accidents at grade crossings in 1938. As may be noted in table 50, 1,198 out of a total of 3,437 accidents that caused casualties at highway grade crossings in 1938 occurred at crossings protected by gates, watchmen, or the various types of signals which indicate the approach of a train. Two thousand, two hundred and thirty-nine accidents occurred at crossings not having the protection described above. Added significance would be given these figures if a record of the proportion of the traffic using these crossings were available.

"As in the case of railway accidents in general, there is a close relation between the number of grade-crossing accidents and volume of traffic. This relation may be noted in [fol. 3625] the table which follows, wherein train-miles are used to express volume of rail traffic, and automobile registration and gasoline consumption to indicate the highway hazard. Although it is recognized that the number of automobiles which pass over railway crossings is not necessarily in proportion to the number registered, it is the best available measure in the absence of an actual count of the number of automobiles that cross railways in a year. As may be observed from table 13, the accident rate whether based on train-miles, automobile registrations, or gasoline consumption is less in 1938 than in the preceding year and in most instances below that shown in the other years covered in the table."

[fol. 3626] Mr. Booth: Just in that connection 1938 was the lowest year; the total number of train-miles as shown by this exhibit, of the four years in the last block, is it not?

A. Yes, it is the lowest since 1933.

Q. Mr. Sullivan, have you prepared another national exhibit in three sheets headed "Train Accidents and Resultant Casualties, All Railroads of the United States, Reflected by Statistics of the Interstate Commerce Commission, Years 1923 to 1938, Inclusive?"

A. I have.

Mr. Booth: We ask that that be marked Exhibit 269 for identification.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 269 for identification.

Mr. Booth: Are the sources from which this exhibit was prepared, are all the sources from which this exhibit was prepared shown in the source note on the first page of the exhibit?

A. They are.

Q. Those are the same statistics of railways and the same accident bulletins to which you have been referring?

A. That is correct.

[fol. 3627] Q. You have already defined the meaning of the word "train accidents" within the meaning of the reporting rules of the Commission?

A. Yes, sir.

Q. Into how many classes are those train accidents grouped?

A. Five general classes.

Q. Five general classes, by the Commission itself?

A. Yes, sir.

Q. What are those general classes?

A. Collisions, derailments, locomotive boiler accidents, other locomotive accidents, and miscellaneous train accidents.

Q. Now, what does sheet 1 of the exhibit show in columns, taking up all the columns, what does the first column B show?

A. Column B shows the total car-miles in thousands. Column C shows the total train-miles in thousands.

The Court: This covers both freight and passenger operations?

A. All classes of service, yes, sir.

Mr. Booth: And all railroads in the United States as distinct from all Class 1 railroads?

A. That is right. And column D includes the total lo-
[fol. 3628] comotive-miles in thousands, columns E, F, G, H, and I show the absolute number of each of the different types of accidents as shown by the statistics of the Commission for each of the years 1923 to 1938, the lines 7, 14, and 19 being additions and calculations by myself, as is column J, showing the total of all of the types of train accidents. The statistics not only show the total number of train accidents, but it also shows the number of such train accidents in which casualties occur, and that information is shown in column K of the exhibit, and as to those train accidents in which casualties occur, I have shown in columns L, M and N the casualties to train and engine-men on duty in such accidents.

Q. Those again, with the exception of the additions, are exact copies of the figures in the I. C. C. bulletins from which they were taken?

A. That is correct.

Q. You didn't have enough room on page 1, I take it, to complete this. And what is the explanation as to page 2?

A. Collisions are further subdivided on pages 14 to 16, inclusive, of the rules into nine separate subdivisions, or classes, and the most important of this and the group in

which most of the accidents occur are the rear-end and [fol. 3629] head-on collisions, and these figures representing that particular type of collisions are shown in column B, which is the number of rear-end, and column C the number of head-on, D being simply an addition of the two, and are shown on sheet 2 of this exhibit. Likewise, in columns E and F, the casualties of trainmen and enginemen on duty in rear-end and head-on collisions are shown in their absolute number.

Q. Those figures again are copies of the entries of the I. C. C. reports?

A. That is true as indicated in the source reference at the foot of the exhibit.

Q. Did you complete page 2?

A. Train accidents, as I have stated before, are further separated into groups, which, as to defects or failures of equipment generally involve derailments. The Interstate Commerce Commission in classifying accidents as to defects and or failures of equipment have a number of predetermined groups, one being locomotives and tenders, defects or failures in trucks, defects and failures of wheels and axles, defects and failures in power brakes, which includes the airbrake apparatus, defects and failures of hand-[fol. 3630] brakes, of couplers, of draft rigging, and car bodies, and other parts of the cars, and the figures shown by the Interstate Commerce Commission in their accident bulletins for these various groups have been transferred to this exhibit and shown in columns H to O inclusive, on sheet 2 under the caption "Train Accidents Due to Defects in or Failures of Equipment." In columns Q and R, the figures shown by the Interstate Commerce Commission bulletins cover trainmen and enginemen on duty injured in these accidents has been shown. Column P for the total number of accidents and column S for the total number of casualties are additions by me.

Q. And those are two columns which are related in that exhibit; in other words, the total number of casualties to trainmen and enginemen on duty in the last block on the right applies to column P, does it?

A. Column P. It will be noted that both the number representing the number of accidents and the number representing the casualties appear under the caption headed

"Train Accidents Due to Defects in or Failures of Equipment."

Q. Now, take sheet 3.

A. Sheet 3 is simply the calculations of casualty rates, [fol. 3631] all of which were computations by myself, using the basic figures in columns B, C and D on page 1 of the exhibit, and the other columns as to the absolute number of accidents and the absolute number of casualties shown under the various captions on pages 1 and 2 of the exhibit.

Q. Is this exhibit true and correct, to the best of your knowledge and belief?

A. It is.

Q. It represents your personal work, does it?

A. It does.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Booth: We offer the exhibit in evidence.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 269.")

The Court: Now, Mr. Sullivan, if I understand it, if there was a mere failure of the locomotive or failure of any of the equipment that did not cause an accident, why, then those failures would not be reflected in any way in the statistics shown in this exhibit?

A. If the failure, regardless of its character, caused damage to the equipment or railway property exceeding $150, [fol. 3632] it would be reported as an accident.

Q. Under that, it would not?

A. It would not.

Mr. Booth: Are the percentages of improvement, or decrease, as you term it, shown on this exhibit, and if so, where?

A. It is shown on sheet 3 on items 20, 21, and 22, and according to the index at the extreme bottom of the exhibit. In other words, as was true of other exhibits which have been introduced in this case, they are all decreases, the decrease in the average accident or casualty rate for the indicated group of years is compared with another, and the percentage of decrease of such casualty rates is shown on the appropriate line.

Q. Now, on the first page you show in column J total number of train accidents in these five general groups, in column K you show the total number of those accidents which resulted in casualties. Do you desire to make any observation regarding that?

A. Yes. An impression might prevail that every train accident causes an injury to someone. By comparing the figures shown in column K with the figures shown in column J, it will be observed that only a small percentage of the train accidents that occur result in personal injury.

[fol. 3633] Q. That would be an even smaller percentage than accidents to trainmen and enginemen?

A. Well, somewhat smaller, yes, because this showing includes injuries to all persons, and there have been any number of the 2,084, for instance, shown at the foot of the page, which did not result in injury to trainmen or enginemen on duty.

Q. Well, injuries to trespassers caused by an accident which resulted in damage of more than $150 to equipment, would be in this group?

A. In this particular showing, it would be.

Q. Is there any indication in the report of the Commission, say of 1938, as to what proportion of the total number of injuries were injuries to trespassers and what to trainmen?

A. Well, it cannot be determined from this exhibit, but you can determine the number of accidents to all classes of persons by examining the statistics.

Q. This includes freight trains, passenger trains, work trains, and mixed trains, does it?

A. And yard accidents. It includes all train accidents in all of the groups that are reportable under the rules of the Commission.

[fol. 3634] Mr. Booth: I will pass to another exhibit if there are no questions. Have you prepared an exhibit consisting of 26 sheets entitled "Tabulation of Data Shown in Summaries of Accident Investigation Reports, Interstate Commerce Commission, Bureau of Safety, In So Far as It Relates to Accidents Involving Road Freight Trains, Including Mixed Trains Handling Freight Cars, Years 1928 to 1939?"

A. I have.

Q. Have you with you and available to counsel the quarterly reports of the Interstate Commerce Commission containing the investigations made by the Bureau of Safety of Accidents on the railroads of the United States?

A. I have.

Mr. Booth: I would like to ask to have this marked as Exhibit 270.

The Court: It may be so marked.

The Clerk: Defendant's Exhibit No. 270 for identification.

Mr. Booth: Now, calling your attention to sheet 3 of this exhibit, does that sheet contain a copy of the Act of Congress under which the reports of accidents are required by the Commission and under which it investigates accidents.

[fol. 3635] A. Yes, sir, it is quoted in full in the first two columns on page 3 of the exhibit.

Q. I take it that the underlining there is your work for emphasis, and does not represent an italicised or otherwise conspicuous part of the Act of printing?

A. That is correct, that underlining is my own.

Q. These quarterly reports, a sample of which has already been exhibited and the rest of which you have here, are those the reports made of investigations conducted under section 3 of the Act as shown on page 3 of this proposed exhibit?

A. They are.

Q. Have you personally examined each of those quarterly reports, and each page thereof, for the years 1928 to 1938, inclusive, as the basis for the information abstracted on this report?

A. I have.

Q. And is the information shown on this report exclusively taken from those quarterly reports?

A. It is, as far as the narrative and the information is concerned.

Q. Now, turning to page four of the proposed exhibit, is that typical of the other pages that follow?

[fol. 3636] A. It is.

Q. Column 1 contains a number of four-digit numbers. What do they represent?

A. It is shown for reference, and it represents the investigation number assigned by the Interstate Commerce

Commission Bureau of Safety to their report of the investigation of the specific accident.

The Court: It is merely their docket number?

A. That is right. Each accident investigated is numbered consecutively by the Interstate Commerce Commission Bureau of Safety.

Mr. Booth: And Columns 3 and 4 show what?

A. Shows the persons killed and the persons injured in the accident, as reported by the investigation report.

Q. What does the expression "Number of accidents" mean at the head of Column 2?

A. Simply means that one accident is investigated and it was placed there merely for convenience of tabulating; it could have been omitted.

Q. Do these bulletins show in each case the lengths of the various trains, freight trains involved in the accidents?

A. In every case it shows the full identification of trains; [fol. 3637] and the number of cars that the trains consisted of.

Q. And were you able, from that source and that source alone, to prepare the information contained in columns 5 to 13 inclusive?

A. Yes, sir.

Q. Columns 14 to 17, inclusive, are merely a mathematical calculation from what precedes?

A. That is correct.

Q. Now, taking up the first section of the page, which I will have to identify a little more specifically, it is headed "I"—Roman numeral I, "Negligence of Employes," and following that you have thirty-five descriptions; on this one page you have thirty-five descriptions. Are those descriptions your version of the report of the Commission, or are they taken bodily from the findings of the Commission as to the cause of the accidents?

A. That is the literal language used in the report of the Bureau of Safety in assigning the cause of the accident. No part of the language used by the Commission has been altered by me in any way, and I may state that as to listing these train accidents under the various causes, for instance, Item I, "Negligence of Employes, (A) Train Orders," this conforms to the classification and subdivi- [fol. 3638] sions used by the Interstate Commerce Commission themselves, as shown in the rules, covering the monthly

reports of railway accidents under train accidents, pages 38 to 46, inclusive.

Q. Of the rules governing accidents, which are part of exhibit 9?

A. Yes, sir.

Q. Now, going back to pages 1 and 2 of the proposed exhibit, what are those pages?

A. Pages 1 to 4, tabulations and calculations made by me, based on the information which is summarized following supporting sheets under the various heads. Each accident bulletin indicates the date for which it was rendered, there is an index that shows the number of accidents investigated, the text of the various accident investigation reports indicate the kind of train involved and the character of accident, the persons killed and injured, the length of the train and the cause assigned, and from that information in the bulletin the various blocks, four items to a block for each year, has been transcribed on sheets 1 and 2 for the years 1928 to 1939, inclusive.

Q. Sheet 2, the bottom block of sheet 2, and headed "Causes of Accidents," and so forth, is what?

[fol. 3639] A. Sheet 2 is the summary showing the number of accidents under the general subdivisions used by the Interstate Commerce Commission, negligence of employes, defects in or failures of equipment, defects in or improper maintenance of way structures, and miscellaneous causes, and for those items, in columns 1 to 17 in the lower block has been shown a summary for the entire study covered by the exhibit.

Q. That can be checked mathematically with the succeeding pages?

A. It can.

Q. You took all accidents for the years covered by this exhibit in which a road freight train was involved, including mixed trains handling freight cars?

A. That is correct.

Q. Didn't leave any out?

A. I did not.

Q. And you didn't select any particular type or types of accidents?

A. I did not.

Q. Was there any element of your own personal judgment or opinion involved in arriving at the information shown here as to cause of the accident?

A. None at all. The only part in the preparation where [fol. 3640] my judgment was used was the manner in which it should be reflected.

Q. The mechanical arrangement?

A. The mechanical arrangement of the information.

Q. Can this statement and each and every item on the study of the proposed exhibit 270 be checked with the underlying reports which you have here in the court room?

A. It can.

Q. Are you satisfied that it is true and correct?

A. Yes, sir.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No questions.

The Court: Well, Mr. Sullivan, referring to page 2 there, in column 3, that says that the grand total number of all accidents, of accidents of all kinds of trains investigated was 1002. That doesn't necessarily mean that there weren't more than 1002 accidents, but it merely means that 1002 is the number of accidents that the Interstate Commerce Commission investigated.

A. That is true. I know by comparing this figure with the figures shown in the other statistical reports that there [fol. 3641] were other train accidents that the Interstate Commerce Commission Bureau of Safety did not investigate. This simply represents the number that were investigated by the Commission.

Mr. Booth: Will you state to the Court whether during the period covered by this exhibit there was any form of telegraphic report required by the Commission of certain classes of accidents preceding and independent of the submission of the Form T or any other form?

A. Yes, by reference to sheet 3 of the exhibit, at the extreme right or in the third column is copied a copy of the order of the Interstate Commerce Commission issued on December 8, 1928, which requires that carriers report by telegram "any collision or derailment upon the railroad operated by such common carrier resulting in the death or serious injury of one or more persons, including any collision with a motor vehicle at a grade crossing resulting in the death or serious injury of any passenger, employee or other person riding on the train involved in such collision." Invariably the Bureau of Safety investigates any train accident wherein death results to a passenger, and

in many cases where there is serious injury, and they investigate a majority of the train accidents involving [fol. 3642] freight trains where death to persons results, and in some cases where death does not result.

The Court: Well, then it is the major accidents that are investigated, and the minor ones that are not investigated?

A. That is it, the more important accidents with the serious results or questionable cause are investigated by the Interstate Commerce Commission through the medium of their own inspectors.

Mr. Strouss: Mr. Sullivan, I notice at the bottom of page 2, you show the total number of trains, classifying them as to trains of seventy cars and less and trains of over seventy cars, showing then the percentage that were over seventy cars and those under. Now, that percentage, I take it, is the percentage of the accidents?

A. No, the percentage of the number of trains.

Q. Trains in the accidents investigated?

A. Yes, because in one accident there may be two freight trains involved, for instance, a collision.

Q. I mean the trains, that is, the percentage of the number of trains in the accidents investigated?

A. As to lengths, that is correct.

[fol. 3643] Q. Of course, it doesn't in any way show, nor do any records of the I. C. C. show, the related number of short and long trains operated during that period?

A. No, there is no information of that kind available.

Mr. Strouss: That is all.

Mr. Booth: We offer the exhibit in evidence.

Mr. Strouss: I don't see its materiality, but I am not going to object to it.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 270.")

Mr. Booth: We tender the underlying documents to you for your examination at your convenience.

Mr. Strouss: Yes, I would like to have them.

Mr. Booth: Is there in any of the investigation reports upon which this exhibit was founded any statement or indication in any manner that the length of the train was responsible for any of the accidents investigated?

Mr. Strouss: I object to that.

Mr. Booth: That is the only way I know to prove a negative.

The Court: I will overrule the objection; he may answer Yes or No.

[fol. 3644] A. I have examined and read every report for the period covered by the exhibit, and in no case did the Interstate Commerce Commission state that the accident could have been or might have been avoided, or that the length of the train in any way was involved.

Mr. Booth: May we take our recess now, your Honor?

The Court: Yes, we will take our recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows:)

[fol. 3645] Mr. Booth:

Q. Mr. Sullivan, just before recess I asked you the following question which was objected to and the objection overruled: Is there in any of the investigation reports upon which this exhibit was founded any statement or indication in any manner that the length of the train was responsible for any of the accidents investigated? And your answer was, "I have examined and read every report for the period covered by the exhibit, and in no case did the Interstate Commerce Commission state that the accident could have been or might have been avoided or that the length of the train in any way was involved."

A. That it might have been avoided if the train had consisted of a lesser number of cars, or any reference that the length of train had anything to do with the accident.

Q. In connection with this exhibit No. 270, taking the block at the bottom of page No. 2, of the freight trains involved in the investigation as covered by this exhibit, how many were 70 cars or less?

A. 574 or 78.8 per cent.

Q. How many over 70 cars?

A. 154 or 21.2 per cent. Of course, you understand that is for the full twelve-year period.

[fol. 3646] Q. Of the total number, how many trains were 40 cars or less?

A. 344 or 47 per cent.

Q. What percentage of these accidents was found by the Commission to have resulted from the negligence of employees?

A. 62.2 per cent.

Q. And from defects in or failures of equipment?

A. 14.1 per cent.

Q. And from defects in or improper maintenance of way and structures?

A. 5.9 per cent.

Q. From miscellaneous causes?

A. 17.8 per cent.

Q. Can those causes be further broken down progressively by years for the use of anything in this exhibit, and, if so, what?

A. Each period covered by the exhibit shown on sheet No. 1 and No. 2, a similar breakdown to the table at the bottom can be made as to the cause of the accident and the proportion of the various train lengths involved.

Q. That is a matter of analysis that I don't think I want to burden the record with at this time. Have you prepared another exhibit similar to the one just admitted as exhibit [fol. 3647] No. 270 and relating to passenger trains for the years 1934 to 1939, inclusive?

A. I have.

Mr. Booth: I hand the reporter an exhibit consisting of thirteen sheets and will ask that the exhibit be marked No. 271 for identification.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 271 for identification.

Mr. Booth:

Q. Was this exhibit prepared exclusively from the same quarterly reports used in the preparation of exhibit No. 270?

A. It was.

Q. But the period is a lesser period?

A. Yes, sir.

Q. How long did it take you, working time, to prepare this exhibit?

A. About twenty working days. I had already reviewed the reports in the preparation of the other exhibits and

had marked the investigation report references that involved only passenger trains.

Q. To what is this proposed exhibit No. 271 confined?

A. It is confined to all accidents investigated by the [fol. 3648] Bureau of Safety in which passenger trains were involved.

Q. Whether it was one passenger train or two passenger trains?

A. Or a passenger train and a freight train, any accident where the operation of the passenger train was involved in the accident.

Q. And this like the other, No. 270, covers all railroads in the United States or only Class I railroads?

A. It covers any accident investigated by the Bureau of Safety and they have jurisdiction over all railroads.

Q. Are the statements "Causes of Accidents" subject to the same explanation exactly as the explanation you gave of those statements in exhibit No. 270?

A. Exactly the same.

Q. No element of personal judgment or choice of words on your part?

A. No, sir.

Q. Nothing was resorted to in the preparation of this exhibit except the quarterly reports for the years 1934 to 1939, inclusive?

A. That is correct. There is some difference in the summary of causes of accidents investigated between the [fol. 3649] exhibit No. 271 for identification and exhibit No. 270 in that I have made a segregation of the accidents classified as "Collisions with Vehicles at Grade Crossings" on account of there being such a large percentage involved and that is an additional cause that has been separated from the miscellaneous.

Q. In exhibit No. 270 that was embraced in the miscellaneous causes?

A. Yes, because there was not a very large number of freight train accidents involving automobiles or grade crossing accidents investigated by the Commission.

Q. Are the computations made in this exhibit true and correct?

A. Yes, sir.

Q. And the result of your own personal work?

A. Yes, sir.

Q. Is the exhibit itself true and correct to the best of your belief?

A. It is.

Q. And the same accident bulletins for the years 1934 to 1939, inclusive, that in part underlie exhibit No. 270 underlie this?

A. Not the accident bulletins but the quarterly summaries.

[fol. 3650] Mr. Booth: I mean the quarterly summaries. Any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Booth: Your Honor?

The Court: No.

Mr. Booth: We offer this in evidence as defendant's exhibit No. 271.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 271.")

Mr. Booth:

Q. How many occurrences were investigated which went into this table?

A. Involving passenger trains, a total of 232 accidents out of a total of 520 of all accidents investigated.

Q. What percentage of those did you find due to negligence of employees?

A. 48.3 per cent, that is, negligence of employees as described by the Interstate Commerce Commission, Bureau of Safety.

Q. What were found by the Bureau of Safety to be due to defects in or failure of equipment?

A. 3 per cent.

Q. To defects in or improper maintenance of way?

[fol. 3651] A. 9.1 per cent.

Q. To collisions with vehicles at grade crossings.

A. 18.1 per cent.

Q. And to miscellaneous?

A. 21.5 per cent.

Q. Was the length of the passenger train, or the trains if there was more than one, stated in each case in the report which formed the basis of this tabulation?

A. Yes, it was.

Q. You have tabulated here the number of trains of 14 cars or less and their percentage and the number over 14 cars and their percentage. Will you give those figures, please?

A. Of the total number of trains involved, which was 267, of the 232 accidents investigated for the six years, 261 trains consisted of 14 cars and less or 97.8 per cent and 6 trains consisted of over 14 cars or 2.2 per cent.

Q. Are the details of the accidents involving those six trains shown in the first sheet?

A. Yes, I have briefly narrated the character of the accidents for the six trains consisting of more than 14 cars, but the detail of the cause and the other data as given [fol. 3652] by the Interstate Commerce Commission may be found on the appropriate page opposite the Interstate Commerce Commission investigation number that I have shown opposite the item on sheet No. 1.

Q. These six statements under the heading, "Brief Description," on page No. 1 are simply literal transcripts of what appeared by the same investigation number in the following pages, is that correct?

A. Yes, except more information is included in a sentence, where on the following pages it is tabulated.

Mr. Strouss: May I ask a question. An accident investigated by the Commission which involved a freight train fouling on passenger tracks derailing a passenger train, would that be included in this?

A. Yes, it would, if the passenger train was derailed, it would be in there.

Mr. Strouss: Under what heading would that appear?

A. It would depend upon the cause. If it was employee negligence, it would likely be on page 4, "Failure to identify opposing trains or to clear superior trains," or it might be under item 5, "Overrunning scheduled meeting point or [fol. 3653] failure to clear switch at meeting or passing points." It would depend upon the cause assigned by the Bureau of Safety of the Interstate Commerce Commission as to where it might be shown.

Mr. Strouss: Thank you.

Mr. Booth:

Q. Is there any accident that occurred in Arizona shown on this exhibit?

A. Yes.

Q. Where?

A. On sheet No. 11, item 30, opposite investigation 2371, was an Arizona accident.

Q. Has the Commission during this period investigated any other accidents to passenger trains and placed the results of its investigations in its quarterly bulletins than those shown in this exhibit? In other words, have you included in the exhibit all passenger trains investigated by the Bureau of Safety during the period covered by the exhibit?

A. They are all included for the years 1934 to 1939, inclusive.

The Court: Was this Arizona accident shown on sheet No. 11 on the Southern Pacific lines or on the Santa Fe?

A. It was on the Santa Fe.

Mr. Booth:

Q. There were 232 occurrences investigated or what you [fol. 3654] call "accidents," were there?

A. Involving passenger trains, that is correct.

Q. And those involved a larger number of passenger trains than 232, did they not? In other words, in some of those occurrences there was more than one passenger train?

A. Of the 232 occurrences, it involved a total of 261 passenger trains.

Q. In any of these investigations, did the Interstate Commerce Commission state or in any way intimate or did the Bureau of Safety of the Interstate Commerce Commission intimate in any way that the length of the passenger train in any way contributed to the accident?

Mr. Strouss: Again I make my objection, that is irrelevant and incompetent.

The Court: Objection overruled.

A. No.

Mr. Booth:

Q. Have you, independent of this exhibit, in the courtroom with you investigation report No. 1718 of the Interstate Commerce Commission related to the derailment of passenger train at Dome, Arizona, on August 5, 1931? Do you have that report with you?

A. Yes, that is in quarterly report No. 49 for the period [fol. 3655] July to September, 1931.

Q. Referring solely to that report, what were the circumstances of that accident as found by the Bureau of Safety?

Mr. Strouss: If he is asking the witness to give his conclusions, I object to that.

Mr. Booth: This was an extra train of about three cars. We have the train sheets here and the train sheets will show that the Arizona law made it necessary to run this train. It was run on ahead and was a very light train, and if was wrecked and the men were killed directly chargeable to the law is our contention.

Mr. Strouss: If they want to put the whole report in, that is all right.

The Court: You mean the particular docket number 2371?

Mr. Booth: We will have the report copied and put that in. I will defer this until then.

Mr. Mason: I think the record should be clear here; we were not talking about the Coconino accident on the Santa Fe, that is 2371. We were talking about an accident which is not on exhibit No. 271. It occurred prior to the period studied by that exhibit.

Mr. Strouss: It occurred in 1931, didn't I understand [fol. 3656] you to say?

The Court: There were two accidents, Mr. Strouss, the Santa Fe accident and the accident occurring in 1931. The one Mr. Booth was interrogating about occurred in August, 1931, on the Southern Pacific.

Mr. Booth: The one I referred to is investigation report 1718, an accident occurring on August 5, 1931, which is not shown on this exhibit at all and which occurred on the Southern Pacific near Dome, Arizona.

Mr. Mason: The Coconino accident is referred to particularly on sheet No. 13 of exhibit No. 271 as having occurred on the Santa Fe on July 27, 1939.

Mr. Booth:

Q. Have you prepared an exhibit headed, "Casualties to All Classes of Employes on Duty, All Classes of Service, Sustained in Train and Train Service Accidents, Reflected by Statistics of the Interstate Commerce Commission,

Years 1923-1938, Inclusive," for the Southern Pacific Company (Pacific Lines)?

A. I have.

Mr. Booth: We ask that that be marked "Exhibit No. 272" for identification.

The Court: It may be marked.

[fol. 3657] The Clerk: Defendant's exhibit No. 272 for identification.

Mr. Booth:

Q. From what source or sources was this exhibit prepared?

A. From the Interstate Commerce Commission Annual Accident Bulletins.

The Court: Do I understand you have completed your showing on the national picture and are starting now on the accident reports of the Southern Pacific Company?

Mr. Booth: I think we have unless there is some exhibit that hasn't reached here yet. Is that correct, Mr. Sullivan, are there any other national exhibits?

A. I think it is complete.

Mr. Booth:

Q. What does column B show on this exhibit No. 272 for identification?

A. It shows the total locomotive-miles in thousands as shown in the annual accident bulletins of the Interstate Commerce Commission.

Q. And columns C and D?

A. The killed and injured as shown in the accident bulletins for each of the years.

Q. And columns E and F are merely mathematical calculations from the preceding columns, are they?

A. That is correct.

[fol. 3658] Q. Lines 7, 14, 19, 20, 21 and 22 are your computations, are they?

A. They are.

Q. And the three bottom lines, 20, 21, and 22, show the decreases as described in those lines?

A. Except one item; 21 is an increase.

Q. Yes, I overlooked that. There was an increase in the period from 1935 to 1938 as compared with the period from 1929 to 1934?

A. That is correct, an increase of about one casualty or a little less.

The Court: This exhibit No. 272, Mr. Sullivan, is comparable to exhibit No. 262 showing the national picture?

A. It is.

Mr. Booth:

Q. Is there anything in the figures on the face of the exhibit that might be pointed to as accounting for a portion, at least, of the increase just referred to?

A. Yes.

Q. What is it?

A. The higher casualty rate of 9.67 in the year 1937 accompanied a very heavy increase in business compared with the two preceding years of the same block and it was the heaviest business reflected by locomotive-miles since 1929. [fol. 3659] Heavy increases in business have a tendency to increase the number of casualties in a more rapid rate than the business increase.

Q. Because of the greater number of men employed?

A. The greater number of men and an increased number of new men taken into the service, and with an increase in locomotive-miles or business there is always an increase in yard and terminal switching service out of proportion to the increase in traffic.

Mr. Booth: Any questions on this exhibit, Mr. Strouss?

Mr. Strouss: No questions.

The Court: Mr. Sullivan, I notice on exhibit No. 262 that you computed your casualty rates on car-miles, train-miles, locomotive-miles, and man-hours, whereas on this exhibit the computation apparently is on locomotive-miles?

A. It could have been calculated on the other basis, but as I explained before when you take all classes of employees on duty, it includes classes of service where train-miles or car-miles are not involved, they are not accumulated, and I believe I explained my reason on exhibit No. 262 for showing all of the various bases, not that they were appropriate [fol. 3660] in all cases but to give as complete a picture of the national showing as could be reflected. Now, the train-miles and car-miles and man-hours can be calculated for exhibit No. 272, but as to individual railroads in the Interstate Commerce Commission statistics they do not make all

of the various segregations as they do for the railroads as a whole; so we are limited in our ability to draw off statistics by classes where we only use the accident bulletins themselves.

The Court: Do I understand that the Interstate Commerce Commission uses the locomotive-miles as their unit of computing these?

A. Locomotive-miles and man-hours, those two, but they make frequent reference to train-miles and other statistics in comparisons.

Mr. Booth:

Q. That is where they are considering all employees?

A. That is true.

Q. Train service and non-train service?

A. I may explain the reason for not using the man-hours or the other bases of measurement for a system showing. There are so many varied factors entering into it that rather discolor the comparisons. Various states have different full crew laws. A considerable mileage of the South-[fol. 3661] ern Pacific is in California and all of the casualty comparisons, either one state with another or even a system showing is distorted by the provisions of the California law.

Mr. Booth: We offer this exhibit in evidence as defendant's exhibit No. 272.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 272.")

[fol. 3662] Mr. Booth: Have you prepared an exhibit showing casualties to trainmen on duty, all classes of service, sustained in train and train-service accidents reflected by statistics of the Interstate Commerce Commission, years 1923 to 1938, inclusive, Southern Pacific Company, Pacific Lines?

A. I have.

Mr. Booth: We ask that that be marked No. 273 for identification.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 273 for identification.

Mr. Booth: Is this a companion to the preceding exhibit, No. 272?

A. Yes, with a limitation to certain class of employees.

Q. Is that limitation shown in the footnotes to the exhibit?

A. It is.

Q. And is the definition of trainmen as used in this exhibit shown in the first footnote on the face of the exhibit?

A. It is.

The Court: Does the word "trainmen" as used here, include the engineer as well?

A. It does, engineers and firemen.

[fol. 3663] Q. Is this exhibit comparable to No. 263?

A. It is.

Mr. Booth: Now, in this exhibit you have used in addition to locomotive-miles, man-hours and car-miles?

A. That is correct.

Q. Although this is a companion to Exhibit 272. Why did you use the three bases in this exhibit and only one in the other?

A. As I explained before, the other exhibit includes all classes of employees, as I explained in connection with the national exhibit, includes employees who have no connection whatever with the operation of the train, but who are subjected to the hazard of injury of the trains, for instance, car inspectors and car repairers who may be working in the train yard, the yard clerk, car checkers, maintenance of way department, B and B department, and signal department, who work on the track and structures and who are subject to injury through the operations of locomotives and trains, and in this exhibit 273 for identification, I have shown the locomotive-miles and the man-hours worked and the car-miles, so that it will present a picture both from the standpoint of exposure to injury measured by locomotive-miles [fol. 3664] and man-hours and the relation of the occurrence of casualties to the movement of a given amount of traffic measured on a car-mile basis.

Q. This includes among the term "trainmen" passenger trainmen as well as freight yard or work service trainmen?

A. That is correct.

Q. These are the employees included in these exhibits whose services accumulate car-miles in this exhibit?

A. And locomotive-miles also, it includes a class of employees, yard trainmen or yardmen and yard enginemen,

a service which does not accumulate train-miles or car-miles. That is the reason I have included the column in this exhibit "locomotive-miles".

Q. And also the reason you put in man-hours?

A. That is correct.

Q. The sources of this exhibit are fully stated on the face of it?

A. Yes, sir.

Q. You made the computations yourself?

A. I have.

Q. And is the exhibit true and correct to the best of your knowledge and belief?

A. It is.

Mr. Booth: Any questions, Mr. Strouss?

[fol. 3665] Mr. Strouss: No questions.

Mr. Booth: We offer it in evidence as Exhibit No. 273.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 273.")

The Court: Mr. Sullivan, I notice that by referring to exhibit No. 272 and also 273, and comparing the comparable national exhibits of 262 and 263, that, for instance, on the exhibit 272, first, that your Southern Pacific, Pacific Lines, shown would indicate in the first two blocks of years, 1923 to 1928, and 1929 to 1934, that you had a higher average than what the national picture shows?

A. That is correct.

Q. And the same thing is true as to exhibit 273, comparing it with No. 263, at least on a man-hour basis, whereas, in the last block, the four years 1935 to 1938, on both exhibits the Southern Pacific showing is superior to that of the national, that is, you have a lower rate there?

The Witness: Your Honor, what exhibits were you comparing, 272 with——

The Court: 272 with 262, and 273 with 263. To restate [fol. 3666] that a little more condensed, if I have correctly interpreted your exhibits, for the first two blocks of years your total casualties on the average were in excess of the national picture, but the last four years the average of the Southern Pacific is less than the national picture.

A. Your Honor, Exhibit 273 cannot be compared properly with No. 263, because 273 includes all trainmen on duty, whereas Exhibit 263 is confined to road trainmen and enginemen.

Q. But I understood you to say that the two exhibits were comparable.

A. I must have misunderstood the reference. It is not possible to make an exhibit for the Southern Pacific using as a basis the accident bulletins of the Interstate Commerce Commission, for the reason that no segregation is made in the accident bulletin as between trainmen of the various groups for individual railroads, so I was in error when I stated that Exhibit 273 was comparable to exhibit 263.

Mr. Mason: You mean it is not possible to make an exhibit like No. 263 for the Southern Pacific?

A. That is correct.

The Court: Then may I ask you if Exhibit 272 is compar-
[fol. 3667] able to No. 262?

A. It is as to the basic data and the casualty rate on a locomotive-mile basis.

Mr. Mason: Now, Mr. Sullivan, does exhibit No. 273 include more employees than are included in No. 263? By that, I mean more classes of employees, or fewer?

A. What exhibit?

Q. 273.

A. I think the Court asked about Exhibit 272 and No. 262.

Q. You have explained that. I will ask you this, exhibit 273, if I understand you correctly, includes train and engine employees on duty in both road service and yard service?

A. That is correct.

Q. And Exhibit 263 includes train and engine employees on duty in road service but not in yard service?

A. That is correct.

Q. And that is the only reason why the two exhibits are not comparable?

A. That is correct.

Q. So that if the casualty rates on exhibit No. 273 are less per hundred million locomotive-miles, man-hours, or
[fol. 3668] car-miles, than those exhibited on 263, that is in spite of the fact that a greater class of employees is stated?

A. That is correct, in 273.

Mr. Booth: I am not sure whether I offered this exhibit 273.

The Clerk: It was admitted.

Mr. Booth: Mr. Sullivan, referring to this exhibit 274——

The Court: You haven't got to 274 yet.

Mr. Booth: Referring to this exhibit 273, casualties to trainmen on duty, you show in here the number of man-hours worked by the trainmen on duty, and in connection with the last exhibit you spoke of the influence of the increased traffic in 1937. Now, column E in this exhibit is expressed in thousands of man-hours, is it not?

A. Column C.

Q. Column C, yes. 21,519,000 man-hours worked in 1937, is that correct?

A. That is right.

Q. As compared with 19,214,000 in 1936, the preceding year; and with 17,855,000 in 1938?

A. That is right.

Q. Does that show the additional employment of men that you referred to in connection with the preceding exhibit, increase in the man-hours?

[fol. 3669] A. Well, it is reflected partly, but this represents the actual man-hours worked.

Q. Well, does this show the increased traffic also in column D of 1937 over preceding years?

A. Yes. Column D reflects the traffic in car-miles by thousands.

Q. And it shows that a larger number of car-miles were run in 1937 than was run in any year since 1929?

A. That is correct.

The Court: Hence, on a percentage basis there naturally would be more accidents, is that true?

A. Yes, any increase in traffic exposes more men to injury, but experience shows that accidents increase at a faster rate than the increase in the amount or the volume of traffic.

Mr. Booth: Can that be developed by plotting curves on some of these exhibits you have introduced here?

A. Well, partially so, but it isn't so true always with an individual railroad, but over a cycle of years, and taking the experience of railroads generally, that is what it shows, and that is what the Interstate Commerce Commission has found.

[fol. 3670] Mr. Booth: We have come to the end of our Pacific System exhibits.

The Court: The court will be at recess until ten o'clock tomorrow morning.

(Thereupon, the court stood at recess until February 6, 1941, at ten o'clock A. M.)

[fol. 3671] February 6, 1941, ten o'clock A. M.

Proceedings were resumed at this time as follows:

The Court: You may proceed.

JOHN J. SULLIVAN was recalled to the stand and testified further as follows:

Direct examination (Continued).

By Mr. Booth:

Q. Mr. Sullivan, have you prepared an exhibit entitled "Southern Pacific Company, Pacific Lines. Detail of Casualties to all Classes of Employes on Duty, Sustained in Train and Train-Service Accidents, Road Freight Train Operation, Reportable to the Interstate Commerce Commission, Years 1923 to 1939, Inclusive, State of Arizona?"

A. I have.

Mr. Booth: Consisting of twelve sheets. We ask that this be marked No. 274 for identification.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 274 for identification.

Mr. Booth: For the years 1923 to 1935, inclusive, calendar [fol. 3672] years, from what source was this exhibit prepared?

A. From the photostatic copies of the original form T reports filed with the Interstate Commerce Commission certified to over the signature of the secretary of the Interstate Commerce Commission and the seal of the Commission.

Q. Those were procured by you for use in the Nevada Train Limit case, were they?

A. They were.

Q. Have you those certified copies here in Tucson?

A. I have.

Q. Are they available to counsel?

A. They are.

Q. For the years 1936 to 1939, inclusive, from what source was this exhibit exclusively prepared?

A. From the office files of the true carbon copies of the form T's prepared by the Southern Pacific Company for the Interstate Commerce Commission.

Q. Have you those office copies here with you?

A. I have.

Q. Will you explain the exhibits by columns on the first page, all of the columns being identical on the other pages? In the first place, it is arranged by years, is it not?

[fol. 3673] A. It is.

Q. And the items are all numbered consecutively?

A. They are.

Q. Now, please explain the columns?

A. The exhibit consists of a brief analysis in tabular form showing the date of the accident in which the casualty occurred, the location of the accident, the class prescribed by the Interstate Commere Commission for classifying the accident, the identification of the train by train number, the number of cars in the train, the speed in miles per hour, the name and occupation of the person injured, and the disability, either actual or estimated, as the case may be.

Q. As stated in the form T?

A. As stated, in most cases, in the form T; and a brief description of the accident, all of the information being shown on the form T either in tabular form or in the narrative. The accidents generally appear in chronological order, that is, for each year they appear throughout the year as they occurred, and the same operation is extended throughout the entire twelve sheets of the exhibit.

Q. I notice that the title of this exhibit says "Reportable [fol. 3674] to the Interstate Commerce Commission." Did you make an independent examination of certain company records to determine whether these form T's actually embrace all of the accidents for that period?

A. I did for the period from 1923 to 1935, inclusive.

Q. What did you examine?

A. I examined the certified copies of the form T reports, the records of the general claim agent, whose responsibility it was to receive reports and make settlements in connection

with personal injuries, and admission records and treatment records of the general hospital department.

Q. What do you mean by "general hospital admission records?"

A. When an injured employee or one who is ill is admitted to the general hospital of the company, or treatment for illness or injury is made to an employee, a report is maintained in the general hospital department of such injuries.

Q. To the best of your knowledge and belief, is this exhibit true and correct as to what it purports to be?

A. Yes, but in connection with the questions that I was just asked pertaining to the detail list of casualties in the [fol. 3675] state of Arizona covered by Exhibit 274 for identification, there were no casualties reportable that were not reported to the Interstate Commerce Commission.

Q. This is confined to all classes of employees on duty sustained in train and train-service accidents?

A. In road freight train operation.

Q. In road freight train operation?

A. That is correct.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: Do you know whether the reports were made to the Arizona Corporation Commission on these same accidents?

A. I don't know of my own knowledge; but I do know that for some of the early years, copies of the original reports could not be found in the office of the Corporation Commission in 1929, but at that time carbon copies of the records were available, and we found that the reports had been made to the Corporation Commission.

Q. The practice now is to make the same reports, same type of report to the Arizona Corporation Commission as is made to the I. C. C.?

A. That is correct, and on the same basis.

Q. Do you know how long that practice has prevailed?

[fol. 3676] A. I don't know how much earlier, but I know that the practice was in effect in 1916.

Q. Their forms did vary, however, for a while?

A. They did; they were not uniform, I don't recall the year, but it has been a number of years ago, the Corporation Commission adopted as their rules the rules of the In-

terstate Commerce Commission for the reporting of train and train-service accidents.

The Court: This exhibit covers any casualties to those who work on the tracks, such as section hands?

A. Yes, if road freight train operation was responsible for the injury.

Q. I notice also that a special officer is listed here in one of the exhibits, or one of the sheets.

A. That is correct, your Honor, and likewise if reference is made to item 28 on the first sheet, you will find reference to a water service foreman. All classes of employees on duty, regardless of their occupation, are shown on this exhibit, if the injury was received incidental to the operation of a road freight train.

Mr. Booth: Does this include accidents in yards while [fol. 3677] a road freight train was being made up or broken up?

A. No, that is not considered under the rules road freight train operation.

Q. But if an accident occurs while a road freight train is coming into the yard, and before it is turned over to the yard crew for handling, that accident would be in here?

A. If the train is still in charge of the road crew, it would be reported.

Q. And similarly, after a train is made up in the yard, and is taken charge of by the engineer, conductor and the other members of the crew, and the accident occurs either while the train is standing still or getting under way, that would be reported?

A. If the employee was on duty in connection with it.

Q. That would be included in this exhibit?

A. It would.

Mr. Booth: We offer this in evidence as defendant's Exhibit No. 274.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred was received in evidence and marked "Defendant's Exhibit No. 274.")

[fol. 3678] Mr. Booth:

Q. Mr. Sullivan, have you prepared an exhibit consisting of seven sheets similar to exhibit No. 274, identical in title with the exception that it relates to the state of Nevada?

A. I have.

Mr. Booth: May we have this marked for identification as No. 275?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 275 for identification.

Mr. Booth:

Q. Of how many items does this exhibit consist?

A. 275.

Q. Are the items numbered consecutively on the lefthand margin from 1 to 275, inclusive?

A. They are, beginning with No. 1 on the first sheet.

Q. Opposite what items and in column No. 9 are found the letters "(N. R.)" in capital letters and brackets and please give the page of the exhibit and the number of the item?

A. On sheet No. 3 of the sheet, item 122; sheet No. 4, item 141.

Q. That covers injury to two persons, does it not?

A. It does. Item 142, item 164; sheet No. 5, item 176, [fol. 3679] item 178, item 188, item 190, item 198.

Q. You have given nine items with two injuries in item 141, or ten injuries altogether?

A. That is correct.

Q. What do the letters "N. R." stand for in this exhibit?

A. As indicated in the legend of the sheets, each was a casualty that was properly reportable under the rules, but was not reported on form T to the Interstate Commerce Commission.

Q. Did you make the same check of records in the superintendent's office, hospital department, and the claims attorney's department in the course of preparing for the trial of the Nevada Train Limit case that you did as to Arizona as you have described?

A. I did.

Q. Were these items developed by you, these items that were not reported in the course of that check?

A. They were.

Q. Did you prepare exhibits in the Nevada Train Limit case making a showing of reportable casualties in Nevada for the years 1923 to 1935, inclusive?

A. Yes, there were two series of exhibits. The first ex-
[fol. 3680] hibits were for the years 1923 to 1934, and later the figures for the year 1935 had become available and the previous exhibits were brought up to date to include the year 1935.

Q. Were these items shown as not reported, in this exhibit, finally included in the exhibits in the Nevada Train Limit case?

A. They were finally.

Q. As to the items in this exhibit No. 275 for identification which are not marked with the letters "N. R.", from what source is the information taken?

A. For the years 1923 to 1935, inclusive, from the certified photostatic copies of the original reports made to the Interstate Commerce Commission as I have previously described.

Q. That is, you had available at that time certified copies of both Arizona and Nevada of the form T reports?

A. Before the exhibit was finally completed.

Q. From what source were the items in this exhibit taken as to the items not marked with "N. R." from January 1, 1936, to December 31, 1939?

A. When the fact that these reportable accidents——

Mr. Booth (Interrupting): I don't think you got my
[fol. 3681] question.

The Court: Read the question.

(The question was read by the reporter.)

A. From the true carbon copies of the office files of the original form T's made by the Southern Pacific Company to the Interstate Commerce Commission.

Mr. Booth:

Q. Have you here in Tucson at our office across the street from the courthouse the certified copies you have referred to?

A. I have.

Q. Have you the office copies, the record copies of the form T's from January 1, 1936, to December 31, 1939?

A. I have.

Q. Is this exhibit true and correct to the best of your knowledge and belief?

A. It is.

Mr. Booth: I will state to the Court that we haven't here in the courtroom or in Tucson any supporting documents for these items marked "N. R." We were in this position in regard to those, we couldn't very well produce an exhibit before the court and call it an exhibit of reported accidents when the records in the Nevada case show very clearly there were nine accidents and ten casualties that [fol. 3682] were not reported to the Commission. It is my understanding that in all probability the files in the superintendent's office showing those accidents have been destroyed. The law requires them to be kept for only three years, and storage space is a considerable item in the division office. I am pretty sure that enough of the claims department files are in existence to identify these accidents and perhaps give a description of them, and it may be that the hospital department records are in existence, although that I doubt. I will undertake to bring those here, whatever we can find, if the superintendent's files haven't been destroyed; and I will have those here as to the nine accidents when we resume after a brief recess.

Mr. Strouss: I don't think you need to do that, Mr. Booth, unless I should ask for them. I would like to look the exhibit over before I say I would not want those records, but now my anticipation is that I would not require you to bring them, but I would like to look the exhibit over first.

The Court:

Q. Mr. Sullivan, why weren't these accidents reported?

A. I don't know, sir. It may be inadvertence; but of my own knowledge I do not know why they were not reported. [fol. 3683] I had no jurisdiction or responsibility in Nevada at the time these accidents occurred and were not reported; I was working on another part of the system.

Q. There is no such occurrence here in the exhibit affecting the state of Arizona?

A. No, sir, not a single one.

Q. I notice these last two exhibits cover the years 1923 to 1939, inclusive, whereas your national showing only brought it up to and including the year 1938?

A. As to the Southern Pacific, all basic data and records are available for 1939 and, as I explained yesterday, the statistical accident bulletin for the year 1939 has not yet been distributed by the Interstate Commerce Commission.

Q. Another thing, in the case of exhibit No. 274 which covers the casualties in the state of Arizona, I understand that is all of the casualties occurring within the physical boundaries of the state and is not limited to the Tucson division?

A. It includes not all of the casualties; but it includes all casualties to employees on duty within the physical boundaries of the state of Arizona involving road freight train operation only.

[fol. 3684] Q. Those things that it purports to show?

A. That is correct.

Q. Is the same thing true of exhibit No. 275, it doesn't cover the Salt Lake division but it actually covers the casualties occurring in freight train operation within the physical boundaries of the state of Nevada?

A. That is correct.

Mr. Booth:

Q. These are special studies not found in any published statistics, are they?

A. It is a special study and not found in any statistical showing of any kind.

The Court: In the ordinary course of events, I presume you would keep track of these accidents by divisions, would you not?

A. That is true.

Q. This is a special study to compile these particular exhibits?

A. That is correct.

Mr. Booth:

Q. For what length of time can you estimate were you at work on these two exhibits, including your work in the Nevada case and your work in preparation for this case?

A. It would be hard to say for the particular exhibits, but in preparation for the Nevada case all of the statistical showing and some operating testimony I was at work for a [fol. 3685] year. In preparation for the trial of this case, about seven months.

The Court: I understood the question had reference to the length of time it took you to make this particular study in connection with these exhibits?

A. I couldn't determine or state the amount of time for this particular study, because it was all interrelated, and a number of exhibits have their foundation in this particular detailed list.

Mr. Strouss: I don't see where that has any relevancy anyway.

Mr. Booth: It has this relevancy, we didn't go to the trouble and expense of making a system showing as elaborate as this. This explains the reason why we made the system showing by Interstate Commerce Commission statistics, and made this showing by states.

Mr. Strouss: There is one part of the testimony before this exhibit is offered that I want to move to strike and that is as to these nonreported casualties having been admitted in evidence in Nevada. That is hardly competent or relevant testimony before this court.

Mr. Booth: I made that as a statement to the court. If [fol. 3686] it is evidence, it may go out.

The Court: It may be stricken because this case must stand on its own bottom and not on what may have occurred in Nevada.

Mr. Booth: I was explaining our quandary in preparing this exhibit.

Q. Mr. Sullivan, in 1935 was a checking system put into effect in the general manager's office to obviate the occurrence or recurrence of failure to report reportable casualties?

A. It was.

Q. Of what did that consist and is it in effect now?

A. Accidents are reported to the general manager by telegraph, and in those cases where injuries occur a copy of the telegraphic report is passed to an organization known as the "Central Timekeeping Bureau." That accident report is kept in what is termed "suspense" and checked to see whether or not time is lost by the employee shown on the report and if loss of time is indicated it serves as an index for reporting the accident in the event it might have been overlooked. It is used as a checking basis only.

Q. Has that system been in effect since 1935?

A. It was placed in effect in 1935.

[fol. 3687] Q. And has been in effect since?

A. I don't know; I presume that it has.

The Court:

Q. Mr. Sullivan, with reference to both those last two exhibits introduced this morning, I notice there is no summary in connection with it. Does the report itself, is it possible to summarize the data therein contained?

A. Summaries will be offered in exhibits later.

Mr. Booth: We offer this exhibit in evidence as defendant's exhibit No. 275.

Mr. Strouss: I object to it as irrelevant and immaterial.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 275.")

[fol. 3688] Mr. Booth: Mr. Sullivan, did the certified copies of the form T's for Arizona and Nevada for the years 1923 to 1935, inclusive, to which you have referred in connection with the two preceding exhibits, and which you have here in Tucson, include all reported accidents to all classes of employees on duty in all classes of service?

A. Yes.

Q. And have you examined, and have you with you here in Tucson, the office copies to which you have referred, of all form T's for the calendar years 1936 to 1939, inclusive, for all classes of employees on duty in all classes of service in the states of Nevada and Arizona?

A. I have.

Q. Have you prepared an exhibit in one sheet entitled "Comparison of Casualties to all Classes of Employes on Duty, all Classes of Service, Sustained in Trains and Train-Service Accidents, Reportable to the Interstate Commerce Commission for the years 1923 to 1939, Inclusive, Southern Pacific Lines, States of Nevada and Arizona?"

A. I have.

Mr. Booth: We ask that that be marked No. 276 for identification.

[fol. 3689] The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 276 for identification.

Mr. Booth: Will you please describe this exhibit, Mr. Sullivan?

A. The exhibit is arranged to show the information by years from 1923 to 1939, inclusive, subdivided into cycles of years, the two early periods six and six years respectively, and the last cycle a five-year period, 1935 to 1939. The source of the figures of total locomotive miles, thousands, for Nevada, is the annual report of the Southern Pacific Company to the Public Service Commission of Nevada, Column C, showing the same information for Arizona, is from annual reports of the Southern Pacific Company to the Arizona Corporation Commission. The data shown in columns D to G, representing the employes on duty killed and injured in Nevada and Arizona, are from the form T reports which I have previously referred to. Columns H and I, showing the total casualties, and columns J and K, showing the casualty rate on a locomotive-mile basis, as well as the figures in items or lines 7, 14, and 20 to 26, inclusive, are computations by me. The exhibit as to casualties to all classes of employees on duty includes all classes of service, including freight, passenger and [fol. 3690] yard.

Q. I see you have put on here a table showing the main track mileage. Is that table correct in accordance with what it purports to state?

A. It is. It represents the main track mileage, both main line and branch, as described in the block at the foot of the exhibit for both Arizona and Nevada.

Q. You have a footnote here opposite the star, "Includes 13 killed and 12 injured in derailment of streamliner City of San Francisco at Harney, Nevada, August 12, 1939, caused by malicious tampering with the track." Now, have you with you here the quarterly report of the I. C. C. Bureau of Investigation finding that that accident was caused by malicious tampering with track?

A. I haven't the quarterly summary, but I have a copy of the individual report.

Q. By the way, how many cars did that train have?

A. I also have the quarterly bulletin, I beg your pardon; and I have the individual report also. It was a fourteen-car train.

Q. Streamlined?

A. Yes.

Q. Steam or Diesel power?

[fol. 3691] A. Diesel powered.

Mr. Booth: Have you any questions, Mr. Strouss, on this exhibit?

Mr. Strouss: These locomotive-miles, of course, includes helper locomotives and light locomotives?

A. It includes all locomotive-miles, Mr. Strouss, including yard locomotive-miles, light and freight, as well as passenger train.

Mr. Booth: The exhibit includes yard accidents?

A. That is correct.

Mr. Booth: We offer the exhibit in evidence.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 276.")

Mr. Booth: Mr. Sullivan, have you prepared an exhibit in the same form as exhibit No. 276, but showing merely a comparison of casualties to all classes of employees on duty, road freight train operation, Southern Pacific Lines, states of Nevada and Arizona?

A. The exhibit is similar but it shows different basic data and the casualty rate on additional bases, but it is confined solely to a showing for the states of Nevada and [fol. 3692] Arizona.

Q. I omitted to ask you with reference to Exhibit No. 276 whether that exhibit includes the nine non-reported accidents and ten casualties which were testified to in connection with the list of accidents in Nevada?

A. It does.

Q. Does this exhibit No. 277 for identification include those?

A. It does.

Q. Will you please describe the exhibit, the sources from which it is derived?

A. The exhibit is prepared the same as the one immediately preceding it, showing the figures by years and cycles of years, the basic data. Freight train miles and freight train car-miles for Nevada in columns B and D were obtained from the annual reports of the Southern Pacific Company to the Nevada Public Service Commission; columns C and E for Arizona from the annual reports of the

Southern Pacific Company to the Arizona Corporation Commission; the figures in columns F, G, H, and I from the form T reports, as previously described, and for the state of Nevada the ten casualties which were not reported but which are detailed on Exhibit No. 275; the figures in columns J and K indicating the total casualties, and columns [fol. 3693] L and M, showing the casualty rate on train-mile basis, and N and O, the casualty rate on a car-mile basis; and the figures in items or lines 7, 14, and 20 to 26, inclusive, are computations by myself. I may state that I have used the freight train-mile basis and the car-mile basis, the train-miles basis being a measurement of the exposure to injury, and the car-mile basis a measurement of casualties against the movement of a given amount of traffic.

Q. Is this exhibit true and correct, to the best of your knowledge and belief?

A. It is.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: This exhibit, I note, has on the bottom, "Comparison of main track mileage operated as of December 31, 1939." Of course, that mileage is not the same as was operated in 1923, for example?

A. No, that is correct. In fact, it changes from year to year.

Q. In 1923, in Arizona, neither the E. P. & S. W. Lines, nor the Arizona Eastern had been added to the Southern Pacific Company's operations at that time, had they?

[fol. 3694] A. They had not.

The Court: Well, this last exhibit has to do with the freight train operations and is a further break-down of 276. In other words, the casualties shown there in 276 are included in this exhibit 277?

A. That is correct as to road freight train operations. In other words, we have eliminated in exhibit 277 the casualties that might have occurred in other classes of service other than road freight train operation.

Mr. Booth: We offer this in evidence as defendant's Exhibit No. 277.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence, and marked "Defendant's Exhibit 277.")

Mr. Booth: Have you prepared an exhibit in one sheet showing the casualties to all classes of employees on duty in road freight train operation sustained in train and train-service accidents reportable to the Interstate Commerce Commission, classified as to causes and classes of employees for the years 1923 to 1935, inclusive, for the states [fol. 3695] of Nevada and Arizona?

A. I have.

Mr. Booth: We ask that this be marked for identification as defendant's Exhibit 278.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 278 for identification.

Mr. Booth: To which of your exhibits is this a supplement?

A. No. 277.

Q. Should No. 277 be inserted in the fourth line in the title to the exhibit?

A. It should.

Mr. Booth: May the Clerk make that insertion?

The Court: Yes, it may be inserted.

Mr. Booth: Now, will you explain this exhibit, Mr. Sullivan?

A. In the submission of form T's by the carrier to the Interstate Commerce Commission, the rules require that the class of train accident or train-service accident be incorporated in the proper place on the form. As I have previously described, train accidents are subdivided into five general classes, train-service accidents in ten subdivisions.

Q. Major subdivisions?

[fol. 3696] A. Well, they are subdivisions. Train service accident is really the major subdivision, and these ten subclasses are subdivisions of train service accidents. For instance, an accident occurring to employees while coupling or uncoupling locomotives or cars, is shown as I. C. C. class S-a, likewise coupling or uncoupling air-hose, S-b, operating locomotives, S-c, operating handbrakes, S-d, and so on. The casualties included on exhibit 277 have been

classified on exhibit 278 for identification, both as to the class of accidents and the class of employees, columns C to F, showing the injuries reportable to conductors, brakemen and flagmen; columns G to J to engineers and firemen; columns K to N to all other classes of employees other than conductors, brakemen, flagmen, engineers and firemen, and columns O to R, inclusive, show the total for all employees. These casualties are grouped into cycles of years for the same period as indicated on exhibit 277 and a grand total has been computed in item or line 16 to show for the various three periods, six years, six years, and five years, respectively, and a grand total, the total number of casualties, both killed and injured, occurring in those years for each of the described classes of employees. It is a break-
[fol. 3697] down of exhibit 277 by causes and classes of employees.

Q. What does "locomotive boiler (B)" include in the way of accidents?

A. That would include any casualties resulting from the explosion of a locomotive boiler.

Q. And the next item 4, "other locomotive (L)"?

A. That would include any other defect or failure in a locomotive where the damage to the equipment or the company property exceeded $150 and employees had been injured in that type of accident, such as the failures of rods, wheels or tires, locomotive axles, or any other appurtenances of the locomotive itself.

Q. Suppose an employee had been injured to the extent of losing more than 72 hours' time and the damage did not amount to $150, but was due to some part of the locomotive breaking, would that be shown on here?

A. If it was either the engineer or fireman operating the locomotive, it would be shown in item 8, "operating locomotives."

Q. Is this exhibit true and correct, to the best of your knowledge and belief?

A. It is.

Mr. Booth: Any questions, Mr. Strouss?

[fol. 3698] Mr. Strouss: No questions.

Mr. Booth: Your Honor?

The Court: No.

Mr. Booth: We offer this in evidence as defendant's exhibit No. 278.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 278.")

Mr. Booth: According to this exhibit, there has been no locomotive boiler explosion causing a casualty in either of these states?

A. That is correct.

Q. During the period covered by this exhibit?

The Court: That would be such an occurrence as happened in Denver in the last two weeks on the D. & R. G.?

A. It would be, your Honor, if the press reports are correct.

Mr. Booth: What class of accidents would this item 13 cover, "Accidents at Highway Grade Crossings?"

A. That would include injuries to employees in a grade crossing accident on account of the operation of a locomo-
[fol. 3699] tive, or train, or car colliding with a vehicle or striking a pedestrian where a derailment did not occur, and where there was damage less than $150 to the company property or equipment. If a derailment or other train accident occurred where damage to railroad property or equipment exceeded $150, it would be reported in item 5, miscellaneous train accidents.

Q. Now, let us turn back to defendant's Exhibit 274, item 10, "J. Breseno, track walker, 13 days' disability," would that be shown on this exhibit 278? I mean, would it be included in it, and, if so, in what subdivision?

A. That would be reported in item 14 of exhibit 278, "struck or run over by cars or locomotives," or, depending upon the circumstances, it may be included in item 15. That particular casualty is reported in item 14.

Q. On sheet 4 of this exhibit 274 you have item 140, "J. Chavez, track laborer, struck by train, ten days' disability." Now, from that description can you tell in what item the accident would fall in No. 278?

A. Item 14, S-i, struck or run over by cars or locomotives; and it would be shown under the column "All other employees," column N, the accident having occurred in
[fol. 3700] Arizona.

Q. Would this table include an employee dead-heading in a caboose on his way to an assignment for service?

A. No, because an employee deadheading is not considered on duty.

The Court: He is being paid, isn't he?

A. Yes, but the Interstate Commerce Commission classes employees traveling but not on duty even though under pay as employees off duty.

Q. Is that included in their classification of "time paid for but not worked?"

A. Yes, sir. I may describe that further. If the deadheaded employee is traveling on a passenger train, under the rules of the Commission he would not be classified as an employee either on duty or off duty, but as a passenger.

The Court: Then, would he receive any protection if he was injured?

A. You mean from the standpoint of compensation?

Q. Yes.

A. I think he would. That is out of my department, but I think they do.

Mr. Booth: Suppose I was injured coming down here to Tucson, would I be classified as a passenger?

[fol. 3701] A. Yes, sir.

The Court: We will take our morning recess.

(Thereupon, a short recess was taken, after which the witness was recalled to the stand, and proceedings were resumed as follows:)

[fol. 3702] Mr. Booth: Mr. Sullivan, have you prepared an exhibit in one sheet that is a further breakdown of exhibit No. 277 and relates to road freight conductors, brakemen, and flagmen on duty exclusive of engineers and firemen?

A. I have.

Mr. Booth: We ask that that be marked as "Defendant's Exhibit No. 279"?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 279 for identification.

Mr. Booth:

Q. This exhibit is in the same form and from the same sources and on the same basis as exhibit No. 277, is it not?

A. That is correct.

Q. What employees included in exhibit No. 277 are excluded from this exhibit?

A. All classes of employees are excluded except road freight conductors, brakemen, and flagmen on duty.

Q. The term "flagmen" is applied to the rear brakemen where it is used without any qualification, isn't it?

A. Yes, that is a term used by the Interstate Commerce Commission in their classification of employees, but the [fol. 3703] flagman is one of the brakemen on the freight train crew.

Q. Referred to by that term, I believe, in the Arizona full-crew law, is it not?

A. Yes, sir.

Q. Will you describe this exhibit, please?

A. The exhibit is prepared in exactly the same form as exhibit No. 278. The basic figures in columns B to E are the same freight train-miles and freight train car-miles. Columns F, G, H, and I are the casualties to road freight conductors, brakemen, and flagmen on duty only but which are included also in the preceding exhibit No. 277. Like the other exhibits, columns J to O, inclusive, and the figures in lines 7, 14, and 20 to 26, inclusive, are calculations by myself.

Q. These casualty rates are estimated on the basis of per million train-miles and per hundred million car-miles.

A. Not estimated, but calculated on the basis of per million train-miles and per hundred million car-miles. As I previously explained, train-miles to show the relative exposure to injury, the car-mile basis to indicate the occurrence of casualties in the movement of a given amount of traffic.

The Court: Mr. Sullivan, from these various exhibits it would appear that as compared with the engineers and [fol. 3704] firemen the conductors, brakemen, and flagmen have a more hazardous occupation?

A. There are more injuries, that is true. Of course, there is an explanation that may be seen by an examination of exhibit No. 278. Engineers and firemen, except in unusual cases, are not required to couple or uncouple locomotives or cars or air hose or steam hose or safety chains. In the performance of their duties, they are always on the moving

locomotive, they are not required to get on and off a moving locomotive. They are not required to operate hand brakes and rarely are required to operate switches unless they are on a light engine, and it is seldom while they are on duty that they are exposed to the other type of injury, being struck or run over by locomotives or cars. As to engineers and firemen they are exposed to one type of accident that only one member of the train crew is exposed to and that is collisions and the collisions and derailments resulting from striking vehicles at grade crossings.

Mr. Strouss: That does not include all collisions, does it, as classified by the Interstate Commerce Commission?

A. Yes, if they were injured, they would be included be-
[fol. 3705] cause this exhibit includes both train and train-service accidents.

Q. When you say "collisions" that includes collisions between cars that may be switched or collisions of that sort as well as collisions between engines?

A. That is true, but head-on collisions invariably involve one or more locomotives and the engineer and fireman on those locomotives.

Q. Of course the trainman would be exposed if he were on cars that collided in switching?

A. Yes, and the trainmen are exposed to the rear-end collisions.

Mr. Booth: We offer this in evidence.

Mr. Strouss: I object to it as irrelevant and immaterial.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 279.")

Mr. Booth:

Q. Following that thought a little further regarding the relative exposure to hazard of engineers and firemen as contrasted with the conductors and brakemen, there is only one engineer and he is matched by one conductor, is that correct?

[fol. 3706] A. That is correct.

Q. And one fireman, you could match him off with the head brakeman?

A. That is correct.

Q. There is always at least one more brakeman and sometimes, or usually, more than one?

A. For the purpose of this exhibit, there are at least two, both in Arizona and Nevada.

Q. So that that would have to be taken into consideration?

A. Yes, there are more road conductors, brakemen, and flagmen exposed to injury than there are engineers and firemen.

Q. You are familiar with the operating rules of the Southern Pacific Company as they have existed during your period of service, are you not?

A. Yes, sir.

Q. You have been train master on this division and assistant superintendent on the divisions you mentioned in your testimony?

A. Yes.

Q. Inspector of transportation and so on?

A. Yes.

Q. What do our rules require and what is the practice where a train takes a siding for another train to meet or pass it with respect to the brakeman getting on and off the [fol. 3707] train that takes the siding?

A. It is required that someone throw the switch for the train to enter the siding and if it is a train on which a train crew is employed it is the duty of a member of the train crew to get off the train and throw the switch. Leaving the siding, the switch must be thrown back for the main line and the member of the train crew must board the train before it proceeds from that station.

Q. Under our operating rules and practices, when the train approaching a siding intending to take that siding for the purpose of allowing another train to meet or pass it, does the head brakeman usually throw the switch?

A. Yes, that is the invariable practice.

Q. Who closes the switch as the train leaves the siding?

A. A member of the train crew, usually the rear brakeman but occasionally the conductor.

Q. Does the rear brakeman have to close the entering switch after the train has gone into the siding?

A. Yes.

Q. And open the leaving switch as the train departs?

[fol. 3708] A. No, the head brakeman usually opens the leaving switch when the train departs and usually the rear

brakeman closes the switch after the train has left the siding.

The Court: That necessitates bringing the train to a stop or practically so?

A. Practically so but not always. It depends upon the conditions generally. Pulling out of a siding, it is the invariable practice for the engineer to control the movement of the train at such a slow speed that the brakeman is able to get off, throw the switch, and run and catch the caboose.

Mr. Strouss: If the Court please, I move that be stricken, "invariable practice." That is a conclusion which the witness certainly couldn't know as to what every engineer does.

Mr. Booth:

Q. Is it the practice as you have observed it?

A. It has been the practice as I have observed it and I have ridden in the caboose of a great many freight trains.

The Court: The expression, "invariable practice," may be stricken.

Mr. Booth:

Q. Are there any comments you desire to make on this exhibit No. 279?

[fol. 3709] A. The exhibit has been prepared in such a way that the casualty rates both on a train-miles basis and on a car-mile basis may be readily compared, one state with the other. It has also been prepared in such a way that the trend represented by the various casualty rates may be followed from the earlier years to the latest and through the intermediate years, and also the average casualty rates for the indicated periods of years may be compared one with another and the trend indicated by the rates may be followed from one group of years to the others. In the block represented by lines 22 to 26, inclusive, the percentage figures indicate the decrease in the casualty rates, one period with another, for each of the states and on both a train-mile basis and a car-mile basis. The exhibit itself shows, for instance, referring to column N for Nevada, that the casualty rate on a car-mile basis which represents, of course, injuries to road freight conductors,

brakemen, and flagmen, that the rate was 39.34, whereas in 1939 it had decreased to 4.86. Likewise, in Arizona the rate in 1923, while it was lower than Nevada, it has decreased to 10.51 in 1939, but in that year the rate is still over twice as much in Arizona than in Nevada. For the total seven-[fol. 3710] teen years, it will also be noted that the average casualty rate in Arizona is almost twice that in Nevada. The same comparison may be run through in the casualty rate on a train-mile basis or for any year or cycle of years that are shown and calculated.

The Court: It is true, however, that there is a fourth more mileage in Arizona than there is in Nevada, approximately?

A. The main track mileage over which practically all freight train miles are operated is relatively the same. There are 808.29 main track miles on the main line in Arizona and 819.82 in Nevada. But even if there was a difference, that is compensated for on the basis against which the casualties are measured. Regardless of the mileage, if you had no freight train miles operating, there wouldn't be any employees and there wouldn't be any casualties; for it is only in the movement of freight trains and the movement of freight train cars that we produce the casualties to road freight conductors, brakemen, and flagmen on duty.

Mr. Booth:

Q. I notice in the first block, that is the block of 1923 to 1928, inclusive, the average for those six years on a train-mile basis is 11.44 casualties per million train-miles [fol. 3711] in Nevada and 15.07 in Arizona?

A. That is correct.

Q. Can you give the approximate figures of the statistical length of freight trains in those two states for those six years arrived at by dividing the car-miles by the train-miles?

A. It can be calculated. In Nevada for the six years, 1923 to 1928, the statistical average would be about 58 cars and Arizona, 52.

Q. Take the approximate statistical average for the years 1935 to 1939, inclusive?

A. In Nevada, 77 cars plus, slightly over 77 cars; and Arizona, slightly over 55.

Q. All those figures you gave include the caboose, do they not?

A. Yes, that is simply calculated by dividing the freight train car-miles by the freight train miles.

Q. Have you any added comments on this exhibit?

A. No, sir.

Mr. Strouss:

Q. This includes all operations in either state?

A. It includes all freight train operations.

Q. That would be branch and main line?

A. That is correct.

Q. What about yard?

[fol. 3712] A. No, it does not include yard. Road switching, where it is in charge of the road freight train crew is included in this showing.

Q. That is the way road switching is classified as distinguished from yard, isn't it, the road crew does the switching?

A. They do the switching where a yard engine is not employed.

Q. That would be classified as road switching? I ask that because of the former showing of the distinction on the records of the company as between road switching and yard switching.

A. I don't quite understand your question.

Q. If locomotive-miles in road switching were shown for a division, that would mean the switching was done by the train crew rather than the yard crew?

A. There are no locomotive-miles on these exhibits.

Q. I am asking as to the distinction between road switching and yard switching?

A. Independent of this exhibit?

Q. Yes.

A. That is true. There is a calculation made of switching and that is classified in the Interstate Commerce Com-[fol. 3713] mission rules as road switching. That is included in the locomotive-miles classification.

Q. That type of road switching would be included here, because it would be done by the train crew?

Mr. Mason: I take it you mean if casualties occur, such casualties are included here?

Mr. Strouss: In the train-miles.

The Witness: No, there are no train-miles or car-miles accumulated by switching.

Mr. Strouss: Not even road switching?

A. No, sir.

Mr. Booth: Only locomotive-miles?

A. That is correct.

Q. Have you prepared an exhibit, Mr. Sullivan, making a breakdown of exhibit No. 279 to show the comparison between the states of Nevada and Arizona for the same period of casualties caused from sudden stopping, starting, lurch, and jerk of train?

A. I have.

Mr. Booth: We ask that that be marked "Defendant's Exhibit No. 280"?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 280 for identification.

[fol. 3714] Mr. Booth:

Q. Upon what is this exhibit based?

A. The exhibit is based, as in the case of the previous exhibits, on reports of casualties made by the Southern Pacific Company to the Interstate Commerce Commission with the exception that it also includes for the state of Nevada any of the casualties which were not reported and which were caused from sudden stopping, starting, lurch, and jerk of train.

Q. Insofar as casualties are concerned, this is based on exhibits Nos. 274 and 275 which list the casualties in those two states, is that correct?

A. Yes, reference to that will be found there, and references made on exhibits Nos. 274 and 275 to that particular class of casualty by an index reference that is shown at the foot of the sheets on exhibits Nos. 274 and 275, the reference being shown in column No. 3.

The Court: Mr. Sullivan, these casualties caused from sudden stopping, starting, lurch, and jerk of train, do they fall into any particular classification shown on your exhibit No. 278?

A. They could fall under item 2 or item 5 for train accidents. Item 15, which covers the train-service accidents, [fol. 3715] and in each case on exhibits Nos. 274 and 275

they may be traced through the class of Interstate Commerce Commission accidents under column No. 3, which is preceded by the index indicating that the casualty was caused from sudden stopping, starting, lurch, or jerk of train. For instance, item 3 in exhibit No. 275 shows an injury to a brakeman on a 50-car train due to the engineer applying brakes in an emergency to avoid running over the derail. It will be noted that the Interstate Commerce Commission class for that particular accident is S-j. That would be included in that group of miscellaneous train-service accidents covered by exhibit No. 278. Likewise, item 8 shows an Interstate Commerce Commission class M-b in which a brakeman was injured. That is included in item 5, miscellaneous train accidents, on exhibit No. 278 and likewise throughout. In other words, the index of the class of accident is shown in each case on exhibits Nos. 274 and 275 in column No. 3.

[fol. 3716] Mr. Booth: Now, does this exhibit 280 for identification include those accidents, and only those accidents that are identified by the cross mark or number mark in column 3 of exhibits 274 and 275?

A. Yes, that is correct.

Q. Will you describe the exhibit briefly, please?

A. As to the form and the basic data as to freight train-miles and freight train car-miles it is the same as exhibit No. 279; likewise, it only includes the same class of employees, road freight conductors, brakemen and flagmen on duty, but it is confined to the casualties caused by the causes indicated in the title of the exhibit. Columns J to O, inclusive, and in lines or items 7, 14, and 20 to 26 inclusive, are calculations by myself.

Q. Is this exhibit true and correct, to the best of your knowledge and belief?

A. It is.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Booth: We offer it in evidence as defendant's Exhibit 280.

Mr. Strouss: Objected to as irrelevant and immaterial. [fol. 3717.] My objection, if the Court please, I want to say, on these exhibits, is going particularly to the Nevada part of it.

The Court: I so understood it. The objection is overruled. It may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 280.")

The Witness: I want to invite attention to the figures in columns D and E, which apply equally to the companion exhibits, which is confined to road freight trains and the road freight conductors, brakemen and flagmen, that for the 17 years and for the intermediate cycles of years the traffic measured in the freight train car-miles shown in column D and E is practically the same, in Nevada it being slightly more, the 17 years, two billion two hundred twenty-six million, seven hundred sixty thousand, and in Arizona two billion, one hundred twenty-seven million, five hundred fifty-four thousand.

The Court: Your long train operations in Nevada are clearly disclosed by those columns B, C, D and E, in that, as you have just pointed out, your freight train car-miles were more in the state of Nevada than they were in Arizona during the entire period, whereas the train-miles were [fol. 3718] very substantially less in Nevada than they were in Arizona?

A. That is correct.

Mr. Booth: Does that finish your statement, Mr. Sullivan?

A. Yes.

The Court: Isn't it true, Mr. Sullivan, that this is the first exhibit, that I have observed, at least, that shows more casualties in the state of Nevada than in the state of Arizona during the period in question?

A. That is true, but possibly at this point I could invite the Court to refer to exhibit 275, and by an examination of that exhibit it will be found that of the 114 casualties occurring in Nevada, 24 of them occurred on trains of seventy cars and less, 90 on trains of over seventy cars, so, if you should take the casualties shown in columns J and K, in exhibit 280, it will be found that there were 92 in the two states on trains of seventy cars or more, and 124 on trains of seventy cars or less.

Mr. Booth: Is there any Arizona casualty included in this table that happened on a train of more than seventy cars?

A. Yes, in 1937, there were two casualties on a train of [fol. 3719] over seventy cars.

Q. A train at Yuma?

Mr. Strouss: That was just one accident, however, two casualties in one accident.

A. Yes, two casualties in one accident at Yuma on October 21, 1937.

The Court: Was that coming into the Yuma yards from California?

A. Yes, sir.

Q. It was not a long-train operation between Yuma and Tucson?

A. It was not.

Mr. Strouss: Your exhibit doesn't show the number of short trains and number of long trains operated over the period, does it, Mr. Sullivan?

A. No, it does not.

The Court: Well, Mr. Sullivan, from your study of casualties, is there a higher or lower percentage on the main line or on the branch lines, or are they kept separately?

A. They are not kept separately, but that can be determined by an examination of exhibits 274 and 275, which gives the location.

The Court: I might state my purpose in asking that question. Your total mileage in the two states on main [fol. 3720] lines are very closely the same, but if you include your branch lines, then the total mileage in the state of Arizona is a fourth more than it is in the state of Nevada, and I was just wondering whether proportionately there was a larger or lesser percentage of accidents, casualties, on your branch lines than on your main lines?

A. Well, on account of the extent of operation, there is bound to be a considerably fewer casualties on branch lines.

The Court: Based on train-miles or car-miles, either way you want to put it?

A. On any basis, that is true. Attempting to relate casualties to road mileage would be an imperfect basis of comparison. Frequently, on a branch line the service might be mixed train service or it could be local freight service. In any case, whether it is Arizona or Nevada, or branch line or main line, the statistics show that the casualties

are infrequent. Now, considering your branch line operation where possibly there might only be, well, 2500 train-miles in a month, if one casualty should occur on that branch and there had been no casualties over a period, on any basis of measurement the figure would be distorted because it is not truly representative of a big operation as repre- [fol. 3721] sented by the extensive train and car-miles shown on the exhibit; and it is not possible from the statistics that are reported to the Commissions to make a showing on branch or main lines. They are reported all in a lump as we would say, for the entire operation according to the class of service.

The Court: In other words, what you are stating is, in effect, advising the Court that the only fair basis is on a train-mile or on a car-mile basis rather than the track mileage?

A. That is correct, and I have never seen any statistics or anyone attempt to relate the occurrence of either accidents or casualties to road mileage without some reference to the basic statistics, either locomotive-miles, train-miles, car-miles, or, as is used for all classes of accidents, the man-hours.

The Court: Well, of course, that would be true when you came to a percentage proposition as shown, for instance, on exhibit 280, in columns L to O inclusive, but if you went over into the columns as to the actual number of accidents, like columns F to K, inclusive, then in a state where you have twice the mileage, we will say, that you had in another [fol. 3722] state, you would expect, naturally, more accidents; assuming that the traffic was about the same, would you not?

A. You might have them in the aggregate, but that is the reason you level it off or flatten it by using a common basis of measurement to relate one to the other. I think it is elementary that if you would have twice as many train-miles in a state, regardless of the mileage over which it might have been operated, while it doesn't always hold that it would be so, you would expect twice as many casualties because there would be twice as many employees exposed to injury.

Mr. Mason: Mr. Sullivan, is it correct that the train-miles measure the opportunity of exposure to casualty?

A. Yes.

Q. And car-miles represent a measure of the traffic moved against which to measure casualties?

A. That is correct.

Q. And mileage of road operated considered apart——

Mr. Strouss: I think we are getting much too leading here.

Mr. Mason: I will reframe this question.

Q. Will you say whether or not mileage of road operated, [fol. 3723] independent of the traffic moved over it, affords a measure of opportunity for accident?

A. It does not afford a measure of opportunity. It merely provides, at best, a description of that portion of the line which may have accumulated a certain number of train-miles and car-miles.

Q. Now, referring particularly to Arizona and Nevada operations, will you say whether or not there is any substantial operation of trains of more than 70 cars on any of Nevada's branch lines?

A. There is no operation of trains of over seventy cars on Nevada branch lines.

Q. Is there on any of Arizona's branch lines any operation of trains approaching seventy cars in length?

A. Not that I know of.

Q. Are you particularly familiar with Nevada operations during the period to which your exhibits relate?

A. Yes, I am familiar with operations in Nevada.

Q. And to some extent with operations in Arizona, particularly the branch lines?

A. Yes.

Mr. Booth: Mr. Sullivan, have you prepared an exhibit showing fatalities, subsequent fatalities or amputation of [fol. 3724] limbs, road freight conductors, brakemen and flagmen, train and train-service accidents in Nevada and Arizona, during the period covered by the preceding exhibits?

A. I have.

Mr. Booth: We ask that this be marked defendant's Exhibit 281 for identification.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 281 for identification.

Mr. Booth: Is this a particular listing of accidents which already appear in preceding exhibits?

A. Yes, they may be found by reference to exhibits 274 and 275 for the states of Nevada and Arizona.

Q. And identified by the dates in column A?

A. That is correct, or by the identity of the person shown in column H.

Q. Did any of these nine accidents and ten casualties that were not reported in Nevada result in a subsequent fatality or amputation of limb?

A. No.

Q. So this statement is based entirely on Form T reports of the Southern Pacific Company to the Interstate Commerce Commission?

[fol. 3725] A. That is correct.

Mr. Booth: Or reports of subsequent fatalities. Any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Booth: Your Honor?

The Court: No.

Mr. Booth: We offer this in evidence as defendant's Exhibit No. 281.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 281.")

Mr. Booth: Have you prepared an exhibit, Mr. Sullivan, showing a comparison of the three years, 1923 to 1925, inclusive, with the three years, 1937 to 1939, inclusive, the operation of road freight trains in the State of Nevada.

A. I have.

Mr. Booth: We ask that this be marked No. 282 for identification.

The Court: It may be marked.

Mr. Booth: Will you describe this exhibit, please, and the sources from which you obtained it?

A. The source data is the same as I have invited attention [fol. 3726] to for the preceding exhibits. As to the casualties shown in columns F, G, H and I, and the total of them shown in column J, they are included in the Nevada figures, columns F, H and J, on exhibit 277 for the years 1923, 1924, and 1925, the earliest three years, and years 1937, 1938 and

1939; the latest three years. The statistical average of cars per train computed from dividing the train-miles into the freight train car-miles shows the average length of trains for those periods, which indicates that the period from 1923 to 1925 was a relatively short-train period of operation. The years 1937-1939 shows that it was a period of long-train operation. It therefore provides a comparison in exactly the same territory, which was the state of Nevada, of long train operation with a period of short train operation. The casualty rates have been computed on a locomotive-mile and freight train-mile, and the freight train car-mile basis, the figures in columns B, C, and D, having been abstracted from the annual reports of the Southern Pacific Company to the Nevada Public Service Commission for the years shown.

The Court: Which exhibit are you referring to, Mr. Sullivan?

[fol. 3727] A. Exhibit 282 for identification.

Mr. Booth: Is this exhibit true and correct, to the best of your knowledge and belief?

A. It is.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Booth: Any questions, your Honor?

The Court: No.

Mr. Booth: We offer this exhibit in evidence as Defendant's Exhibit No. 282.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: Objection overruled. It may be admitted.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 282.")

The Court: The court will be at recess until two o'clock.

(Thereupon, the court stood at recess until February 6, 1941, at two o'clock P. M.)

[fol. 3728] 2 P. M., February 6, 1941.

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed.

Mr. Booth: I will ask Mr. Mason to continue the examination, if the Court please.

The Court: There is no objection to that, I take it?

Mr. Strouss: No objection.

JOHN J. SULLIVAN resumed the witness stand.

Mr. Mason:

Q. Mr. Sullivan, referring back to your exhibit No. 282, I don't think any mention was made of these footnotes which appear below the block of figures. I will ask you if these footnotes are substantially the same as the narrative in connection with these accidents as it appears on your exhibit No. 275?

A. They are.

Q. Where do you get this figure shown with the plus sign, "includes 96 freight conductors, brakemen, and flagmen," is that by reference to exhibit No. 275 in the aggregation of figures shown thereon?

A. That is correct, likewise the minus sign.

[fol. 3729] Q. The "28 freight conductors, brakemen, and flagmen"?

A. That is correct.

Q. You speak of a ratio in the body of the exhibit. First of all, in column E, how do you obtain that ratio?

A. That ratio is obtained by dividing train length of the last period, the three years 1937 to 1939, by the figure representing the average train length for the earlier period, 1923 to 1925.

Q. Then, this is a ratio of the larger figure to the smaller and not of the earlier figure to the later?

A. That is right.

Q. When you come to columns K, L, and M, are those the ratio of the larger figure to the smaller?

A. That is right.

Q. And not of the later period to the earlier?

A. That is correct.

Q. Will you say whether or not these ratios should be read as counterbalancing each other rather than side by side?

A. They should be read independently for each column.

Q. I mean the ratio, for example, in column E and the [fol. 3730] ratio in column K, one of those is a ratio of the later period against an earlier, and the other is a ratio of the earlier period against a later, isn't it?

A. Possibly I had better explain what the figure represents. The train length in the later period, 1937-1939, was 1.48 longer than during the short train period, almost one and a half greater. The casualty rate for the earlier or short train period, based on locomotive-miles, was 2.82 times as great as it was in the long train period of 1937-1939; and the train-mile casualty rate for the early short train period was 2.88 times the casualty rate of the long train period; and on a freight-car-mile basis the casualty rate was 4.27 higher or greater in the short train period than it was in the long train period. In other words, there were 4.27 times as many casualties in the short train period, measured on a car-mile basis, than there were in the long train period of 1937-1939.

Q. Are these averages of cars per train inclusive or exclusive of caboose?

A. They are inclusive of caboose.

Q. If I understand you correctly, and I am undertaking to summarize for my own information, you show by column E that trains in the earlier period were two-thirds as long, [fol. 3731] on the average, and by column M that accidents were four times as frequent in proportion to car-miles, is that correct?

A. That is correct.

Q. Will you take up a statement in two sheets entitled, "Casualties to All Classes of Employes Off Duty, Road Freight Train Operation, Sustained in Train and Train Service Accidents Reportable to the Interstate Commerce Commission, Years 1923 to 1939, Inclusive, State of Arizona"?

A. That is correct.

Q. Was this exhibit prepared by you?

A. It was.

Mr. Mason: May we have this marked "Defendant's Exhibit No. 283" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 283 for identification.

Mr. Mason:

Q. I take it you have already explained the source showing of freight train miles and freight train car-miles and that that source is the same as on preceding exhibits where these figures are shown?

A. That is correct.

Q. What is the source of the casualty showing?

[fol. 3732] A. The same source as the casualty figures in the preceding exhibits, the certified copies of the photostatic copies, form T, made by the Southern Pacific Company for the Interstate Commerce Commission for the years 1923 to 1935, inclusive, and for 1936 to 1939 true carbon copies of the original form T's made by the Southern Pacific Company to the Interstate Commerce Commission.

Q. You show in column J of the first sheet of the exhibit the grand total of all the casualties to which the exhibit relates. Do you show the detail of those casualties on sheet No. 2?

A. I have.

Q. Is the showing on sheet No. 2 a correct excerpt of what appears on the individual form T's covering these particular occurrences?

A. It is.

Q. I take it that the calculations are your own calculations on the face of the exhibit?

A. That is correct.

Q. And are capable of check?

A. Yes, sir.

Q. Will you say whether or not the computations on the exhibit are true and correct?

A. They are.

Q. I will ask you if these casualties indicated on exhibit [fol. 3733] No. 283 for identification are those incident to freight train operation in Arizona sustained by employees but in addition to those which are shown on exhibit No. 274?

A. They are in addition, the ones shown on No. 274 only include employees on duty.

Q. And in this exhibit you undertake to show those to employees not on duty but still classed as employees?

A. That is correct?

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Has your Honor any questions?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 283.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 283.")

[fol. 3734] The Court: Well, these casualties were reported to the Interstate Commerce Commission?

A. They were.

Q. The regulations so require?

A. It requires the reporting of injuries to all persons regardless of their classification or occupation, but it requires by a symbol to indicate on the report whether the employee is on duty or if it is an employee off duty; so I prepared the exhibits on the same basis that is followed by the Interstate Commerce Commission, employees on duty and employees off duty.

The Court: Now, Mr. Sullivan, an employee of the Southern Pacific who was not engaged in any duties for the railroad, he would not be classed or would not be listed under this exhibit here; what I am getting at is, suppose that after working hours he suffers an injury like any other individual might, the company doesn't keep any record of that?

A. If he was injured through the operation of a train, and depending on the circumstances, he would be classified as a trespasser if he had no right to be where he was; he would be classified as a non-trespasser if he had a right to be where he was when struck. If a conductor of the Southern Pacific Company off duty was crossing a street cross-[fol. 3735] ing, where he had a right to be, and was struck by a train, car, or locomotive, the injury would be reported under the rules of the Commission on form T and he would be classified as a non-trespasser; but every injury, every fatality, resulting, must be reported even though the person injured may have been a trespasser.

Mr. Mason: I think what his Honor had in mind was whether all injuries to employees off duty were reported, and I think you made it clear. I will ask you if you have undertaken to show here only those injuries incident to the operation of freight trains on the railroad? You wouldn't report an injury to an employee suffered in an automobile accident far from the right-of-way, would you?

A. No. I might explain by a detail. Item 3, sheet 2 of exhibit 283 shows an injury to Conductor W. W. Pettis. He had just completed his trip, he was off duty and his pay

had stopped, but while crossing over between trains on the way to the office, considering the conditions under which he had to cross, he had a lawful right to be there, and while crossing between the cars his hands slipped and he fell. The rules of the Commission require in cases of that [fol. 3736] kind that the injury be reported as an employee off duty rather than as a trespasser or as a non-trespasser.

Mr. Mason: Has your Honor any further questions?

The Court: No, no further questions.

Mr. Mason: Will you take up next, Mr. Sullivan, a statement in two sheets bearing the title, "Casualties to All Classes of Employes off Duty, Road Freight Train Operation, Sustained in Train and Train Service Accidents, Reportable to the Interstate Commerce Commission, Years 1923 to 1939, Inclusive, State of Nevada?"

A. I have prepared such an exhibit.

Mr. Mason: May we have this marked as No. 284 for identification.

The Court: It may be marked for identification.

The Clerk: Defendant's Exhibit No. 284 for identification.

Mr. Mason: From what sources was this exhibit prepared, Mr. Sullivan?

A. From the same sources as the preceding exhibits, photostatic copies, certified photostatic copies of form T's for the year 1923 to 1935, inclusive, and true carbon copies of the office copies of the original form T's made by the Company to the Interstate Commerce Commission.

[fol. 3737] Q. Now, does this exhibit relating to Nevada include any accidents reportable to the Interstate Commerce Commission but which for any reasons were not so reported?

A. It does not.

Q. Will you say whether or not the showing on this exhibit is similar in form to that made on Exhibit 283?

A. It is. It is a companion exhibit.

Q. In column J you show a grand total of all casualties. Do you show the details of such casualties on sheet No. 2?

A. Yes.

Q. Are these details a true and correct representation of what is set forth on the form T reports?

A. They are.

Mr. Mason: Have you any questions, Mr. Strouss?
Mr. Strouss: No.
Mr. Mason: Your Honor?
The Court: No.

Mr. Mason: Is the exhibit true and correct in so far as it concerns computations, Mr. Sullivan?
A. It is.

Mr. Mason: We offer the exhibit in evidence as No. 284.
[fol. 3738] Mr. Strouss: Objected to as irrelevant and immaterial.
The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 284.")

Mr. Mason: Mr. Sullivan, will you please take up a statement in a single sheet entitled, "Casualties to persons Carried Under Contract (Livestock Caretakers, Banana Messengers, etc.), Road Freight Trains, Sustained in Train and Train Service Accidents, Reportable to the Interstate Commerce Commission, for the Years 1923 to 1939, Inclusive, Southern Pacific Company in States of Nevada and Arizona." Have you that statement before you?
A. I have.

Mr. Mason: Your Honor, may this be marked No. 285 for identification?
The Court: It may be marked.
The Clerk: Defendant's Exhibit No. 285 for identification.

Mr. Mason: Did you prepare No. 285, Mr. Sullivan?
A. I did.
[fol. 3739] Q. Will you state the sources?
A. The sources are the same as for the preceding exhibits, the photostatic certified copies of the form T reports for the State of Arizona and the State of Nevada for the years 1923 to 1935, inclusive, and true carbon copies of the office copies of the original form T's made by the company to the Interstate Commerce Commission.
Q. Have you examined the counterpart copies of the form T's since and including the year 1936 for any casualties of the type indicated by the exhibit?
A. Yes.

Q. Will you say whether or not there were any casualties of that type in either state since the first of January, 1936, to and including the end of 1939?

A. The only casualties reportable are the ones shown on exhibit 285 for the State of Nevada and the State of Arizona. There have been no accidents of that type in Nevada since 1925 or in Arizona since 1934.

Q. Will you say whether or not the showing upon the exhibit is a true and correct representation of what appears in the original documents to which you have referred?

A. It is.

[fol. 3740] The Court: Do I understand that it is customary for the railroads, for instance, with a livestock shipper to permit him to send one man along to care for the cattle and that you haul him free and return him to his point of embarkment, that is where he left from?

A. That is true; there are one or more caretakers that may travel with the stock, depending upon the number of carloads in the shipment, the number being regulated by rule and tariff; and it is optional with the shipper whether he will have a caretaker or not. Upon his arrival at destination he is returned to his point of origin if he desires to return there.

Q. And this exhibit would cover injuries to such people?

A. It will while on the freight train, and if the livestock caretaker returning after accompanying a shipment of stock is traveling on a passenger train and should be injured, he would be classified as a passenger and not as a person traveling under contract.

Q. He is really a non-revenue passenger?

A. That is right.

Mr. Mason: There was even some dispute as to that, your Honor, because perhaps the money for his transporta-
[fol. 3741] tion is part of the money for the transportation of the livestock.

Q. Now, Mr. Sullivan, I take it that exhibit 285 for identification relates to only those casualties which may have been suffered by persons such as livestock caretakers while riding on freight trains within these two states?

A. That is correct.

Q. Is the classification shown in the title "Persons Carried Under Contract" a classification employed by the

Interstate Commerce Commission in its rules relating to the reporting of railway accidents?

A. It is.

Q. Do they prescribe therein which classes or subclasses of persons shall be regarded as carried under contract?

A. Yes, all persons who have a legal right to be on the train, but who are not employees, are classified by the Interstate Commerce Commission as persons carried under contract. That applies not only to freight trains, but to certain classes of individuals who travel on passenger trains.

Q. As applied to freight trains, who are the principal classes of persons carried under contract?

A. Livestock caretakers, banana messengers, attendants [fol. 3742] in charge of emigrant movables.

Q. Messengers in charge of live poultry cars?

A. Messengers in charge of live poultry; in some cases representatives of fruit-growing associations, who are permitted to ride to accompany test shipments of perishable freight, well, depending upon conditions. The field is somewhat large.

Mr. Booth: Mr. Sullivan, a trainman's term for a caretaker in charge of emigrant moveables is "Zulu," isn't it?

A. I think that is the term generally used.

Mr. Mason: Any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Has your Honor any questions?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit No. 285.

Mr. Strouss: I object to the part relating to Nevada as irrelevant and immaterial.

The Court: The objection will be overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 285.")

Mr. Mason: Mr. Sullivan, in connection with persons [fol. 3743] carried under contract on freight trains, what is the extent, the minimum extent of the disability which renders an accident reportable?

A. Any disability beyond one day.

Q. Do the rules require the reporting of all accidents even though not necessarily directly connected with the operation of the train?

A. Yes, if the injury is sustained in connection with the operation of the train.

Q. I notice here you have one accident in the State of Arizona, item No. 4, where a livestock caretaker was kicked by a steer while inside of the car?

A. Well, that is reportable under the rules, the accident occurred while the individual was on the freight train.

The Court: If the steer had kicked him while loading him, you wouldn't have reported it?

A. If it was on the company premises, that would be reported as a non-train accident to a non-trespasser.

Mr. Mason: Mr. Sullivan, I will ask you to take up next, if you will, please, a statement in one sheet bearing the title "Derailments Caused by Defects in or Failures of Freight Car Equipment, Road Freight Trains, Including [fol. 3744] Mixed, Reportable to the Interstate Commerce Commission, Years 1923 to 1939, Inclusive, State of Arizona." Is that before you?

A. Yes, sir.

Mr. Mason: May we have the statement marked Defendant's Exhibit No. 286 for identification.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 286 for identification.

[fol. 3745] Mr. Mason:

Q. Did you prepare this exhibit or cause it to be prepared?

A. I prepared the exhibit.

Q. I take it as to columns A, B, and C the sources are as previously explained by you?

A. That is correct.

Q. From what sources did you draw the information in columns D and E?

A. From the form T reports, the same sources as the reports that casualties are made to the Interstate Commerce Commission.

Q. Do the form T reports show in connection with the

accidents causing damage to equipment the amount of the damage to equipment?

A. It does.

Q. I will ask you whether or not the accidents shown here are largely or entirely of the class known as "train accidents"?

A. They are the train accidents, that type of accident involving damage to equipment, track, and structures, including the cost of clearing wrecks exceeding $150 for each accident.

Q. Here I take it you have included only that particular class of train accidents which may be referred to as "derailments"?

A. That is right, that is one of the primary classifications [fol. 3746] by the Interstate Commerce Commission.

Q. Does your form T report show again whether a derailment is due to a defect in or failure of equipment as contrasted with defect in or failure of the roadbed or track structures?

A. Item 17 and item 26 on form T require that a narrative description of the cause be given and the Interstate Commerce Commission Class No. 8 indicates also that it is due to a certain cause, different symbols being required for derailments due to defects or failures of equipment or from other causes.

Q. I take it this is confined not only to a particular class of train accident known as "derailment" but to those which are caused by defect in or failure of equipment?

A. Freight car equipment, yes.

Q. This does not include any defect in or failure of the locomotive?

A. It does not.

Q. Or of the track?

A. It does not.

Q. Or any derailment which may have been due to failure or negligence of employees?

A. Not as classified by the Interstate Commerce Com- [fol. 3747] mission, but negligence could be involved but nevertheless it is classified by the Interstate Commerce Commission as a defect or failure of the equipment.

Q. When I speak of negligence of employees, if there were a derailment due to excessive speed or failure to close a derail, that wouldn't be shown here?

A. It would not.

The Court: Does some part of the train actually have to leave the rails to constitute a derailment?

A. Yes, sir.

Q. Even if only one car on the train was derailed, it would constitute a derailment?

A. That is correct, or if even one wheel of the car was derailed that would classify it as a derailment.

Q. This exhibit merely purports to show those derailments which were caused by defective freight car equipment?

A. Or failure of some part of the equipment which might not have been defective, that is correct.

Mr. Mason:

Q. Mr. Sullivan, I notice in the title beside the words, [fol. 3748] "Description or Nature of Defect or Failure," you have also the words, "And I. C. C. Cause Code Numbers." You explained yesterday the system of code number used by the Interstate Commerce Commission in its accident bulletins relating to particular classes of train-service accidents. Does the Commission use code numbers with relation to the causes and classification of causes of train accidents as well?

A. It does.

Q. Are you using those same numbers here for the purposes of this exhibit?

A. I have. I have shown the code causes so that in case anyone desired to analyze the exhibit they could determine what kind of defect is reportable under the various heads.

Q. Referring to column D and to line 3, how do you arrive at the figure in column D?

A. I tabulated the number of accidents classified as derailments involving freight car equipment that occurred in the state of Arizona for the year 1925. The aggregate of that particular class was nine and opposite was shown the total damage in those nine accidents.

Q. This particularly refers to failures of trucks. Did you add up the number of truck failures to get the nine? [fol. 3749] A. Yes, and the related causes, trucks and arch-bars and parts of the trucks and arch-bars.

Q. How did you get the figure in column E, line 3, is that by addition of the separate figures appearing on the several form T reports?

A. That is correct.

Q. Corresponding to the nine numbers?

A. That is right.

Q. Did you follow the same process as to the figures in each column and in each line other than those which appear to be totaled?

A. I did.

Q. Going over to columns R and S, are those the addition of what appears in the preceding columns?

A. It is.

Q. The computations in column T and U, are those simply rates?

A. They are calculated rates, in relating the total number of accidents shown in column R against the freight train miles shown in column B for the result shown in column T and against the freight train car-miles in column C for the rate that is shown in column U.

The Court: Mr. Sullivan, it appears from this exhibit [fol. 3750] there are 105 accidents or derailments, I take it, caused by the defects or failures in equipment. Does it necessarily follow there were any casualties in connection with these derailments?

A. The footnote will indicate the only reportable casualties by an index figure, the letter "(a)" in column D on line 3 indicates that in one of those accidents an engineer was killed; on line 5 in column L, one accident in which a telegraph lineman was killed. There were no other casualties in those 105 reportable derailments.

Mr. Mason:

Q. The only casualties were these two fatalities and there were no personal injuries involved in these derailments?

A. That is correct.

Q. Will you say whether or not the exhibit is true and correct as reflecting the underlying sources?

A. It is.

Q. Have the computations been checked?

A. They have.

Q. Are they true and correct?

A. They are.

Q. One other question as to the face of the exhibit, you show in line 22 certain rates, are those the calculations of [fol. 3751] the number of accidents for the entire period

related to the total number of car-miles for the entire period?

A. They are.

Q. And are capable of check against the figures in line 21?

A. They are. The accident rate based on one hundred million car-miles figured on car-miles because the defect in every case is associated with an individual car rather than the train.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has your Honor any questions?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 286.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 286.")

Mr. Mason:

Q. Will you please refer to a statement in a single sheet bearing a title similar to that on exhibit No. 286 but relating to the state of Nevada. Have you that exhibit before you?

A. I have.

Mr. Mason: May this statement be marked as "Defend-
[fol. 3752] ant's Exhibit No. 287"?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 287 for identification.

Mr. Mason:

Q. Will you state whether this exhibit was prepared in the same manner and along the same lines as exhibit No. 286?

A. Exactly in the same manner as the preceding exhibit.

Q. And the rates have been calculated and are placed in corresponding lines and columns, have they?

A. They have. There is a difference; I want to call attention to the block at the foot of the exhibit that does not appear on the exhibit No. 286.

Q. I was going to ask you about that. Have you undertaken by the block bearing the identification, "Summary of Derailments Shown Above," to classify the accidents by

the type or character and the portion of the equipment which failed and by train length as between 70 cars and less and over 70 cars?

A. I have.

Q. Has the exhibit been compared against the underlying sources?

[fol. 3753] A. It has.

Q. Have the computations been checked?

A. They have.

Q. Will you say whether or not it is true and correct?

A. It is.

Q. Do I understand that you are likewise showing here the casualties by way of death or injury which may have been incurred by employees in connection with these derailments?

A. I have, by reference to line 16 in column F an index letter "(a)" is shown which indicates that one of the trainmen was injured in one of the accidents shown.

Q. You also show a reference in 1934, line 13, to "(b)"?

A. That indicates that in that accident two trainmen were injured.

Q. I will ask you whether these casualties shown on exhibit No. 286 just received and also on No. 287 for identification are included in the lists of personal injuries to train and enginemen in the states of Nevada and Arizona which have been received as exhibits Nos. 274 and 275?

A. I will have to check, but my recollection is that the engineer who was killed was not on a road freight train [fol. 3754] but was on another train and was killed when the derailment occurred.

Mr. Mason: Have you any questions on exhibit No. 287, Mr. Strouss?

Mr. Strouss: This also includes cost of clearing wrecks, does it, Mr. Sullivan?

A. It does, yes. I didn't complete my answer. On item (b) the telegraph lineman killed is shown as item 190 on sheet No. 5 of exhibit No. 274. I have a footnote, Mr. Strouss, at the bottom of exhibit No. 286 which indicates what is included in the term "damage." Damage includes "damage to equipment, track and structures, and cost of clearing wrecks."

Mr. Strouss: But it would only include cost of clearing wrecks where the wreck was caused by derailment as a result of defect or failure in freight car equipment?

A. Yes, only the accidents that are included in this particular exhibit.

Mr. Mason: We offer exhibit No. 287 in evidence.

Mr. Strouss: Same objection.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and [fol. 3755] marked "Defendant's Exhibit No. 287.")

Mr. Mason:

Q. Mr. Sullivan, I will ask you to refer, if you will, to sheet No. 6 of exhibit No. 275 and to item 218. Is that the same accident which is referred to by your footnote "(a)" on your exhibit No. 287?

A. Yes, that is the one.

Q. Will you refer to item 224 on sheet No. 6 of exhibit No. 275. Is that the same accident which is referred to in footnote "(b)" on exhibit No. 287?

A. That is the accident.

Q. Have you before you a statement in one sheet entitled "Comparison of the Total Derailments Caused by Defects in or Failure of Freight Car Equipment Shown in Exhibit No. — for State of Nevada, and Exhibit No. — for State of Arizona, Years 1923 to 1939, Inclusive"?

A. I have.

Q. I take it that these blanks should be filled in by reference to preceding exhibits. Will you indicate the numbers?

A. The first blank on the second line of the title should show exhibit No. 287 for the state of Nevada and exhibit No. 286 for the state of Arizona.

[fol. 3756] Mr. Mason: May we have the statement just referred to marked for identification as "Exhibit No. 288"?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 288 for identification.

Mr. Mason:

Q. Will you say whether exhibit No. 288 is a compilation of the information appearing on the last two exhibits, Nos. 286 and 287?

A. It is. The block at the foot of the exhibit indicates where the figures in the various columns have been obtained.

Q. I take it this is simply a gathering together in one

place of the information shown in separate columns on the preceding exhibits?

A. That is correct.

Q. Are there any additional computations on this exhibit?

A. Yes.

Q. Will you indicate in which columns they appear?

A. In columns L and M and P and Q the total damage on account of the derailment shown on the exhibits referred to has been related to a million train mile basis and one hundred million car mile basis, respectively, so that the com-
[fol. 3757] plete showing will show in corresponding columns the accident rate and the damage per accident rate on a train mile and on a car-mile basis.

Q. In line 7 you show certain averages under the rate columns, J to M and N to Q, inclusive. Are those averages of the total money, total train-miles, and total car-miles over the period?

A. They are.

Q. So that this is not an average of averages but an actual over-all average rate?

A. It is an actual over-all average rate.

Q. Would the same be true as to lines 14 and 20?

A. Exactly.

Q. And line 21?

A. Yes, sir.

Q. Have these computations been checked?

A. They have.

Q. Will you say whether or not the exhibit is true and correct insofar as it reflects the underlying sources or the computations to which you have referred?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

[fol. 3758] Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 288.

Mr. Strouss: The same objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 288.")

Mr. Mason:

Q. Mr. Sullivan, I will ask you to take up a statement in twelve sheets entitled, "Detail of Train Accidents, Road

Freight Train Operation Reported to the Interstate Commerce Commission, Years 1923 to 1935, Inclusive, State of Arizona."

A. I would like to request that that title be corrected, where it shows the years "1923 to 1935" it should be "1923 to 1939."

Mr. Mason: May we have the title read in the last line, "Years 1923 to 1939, Inclusive"?

The Court: It may be corrected.

Mr. Mason: May we have this statement marked for identification as "Defendant's Exhibit No. 289"?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 289 for identification.

Mr. Mason:

Q. Mr. Sullivan, did you prepare this exhibit?

A. I assisted in its preparation and checked the entire [fol. 3759] exhibit.

Q. Was it prepared under your direction and supervision?

A. It was.

Q. From what sources?

A. From the four T reports, the same sources as the preceding exhibits.

Q. Was this exhibit prepared in the same manner as exhibit No. 274?

A. It has gone further than No. 274. This is a detail of all train accidents and No. 274 includes some injuries that are included in No. 289 for identification.

Q. I understand that, but my question was, was it prepared in the same manner as exhibit No. 274?

A. Yes.

Q. I understand that the difference between the two exhibits is that exhibit No. 289 for identification relates to train accidents in road freight train operation whereas exhibit No. 274 relates to casualties to employees on duty sustained in either train or train-service accidents?

A. That is correct.

Q. Would it follow then, Mr. Sullivan, there is some duplication as between the exhibits?

A. As to the personal injuries, yes.

[fol. 3760] Q. Where there were personal injuries involved in train accidents, that accident will be shown in exhibit No. 274, will it?

A. If it was an employee on duty.

Q. And would, of course, also be shown in exhibit No. 289 if that exhibit is correct?

A. That is true.

The Court: But there might be a train accident reported on this exhibit No. 289 without any resulting casualty?

A. That is correct. In fact practically all of them are of that type.

Mr. Mason:

Q. Will the accidents shown on exhibit No. 289 for identification, if they were derailments resulting from defects in or failures of car equipment, be included in the showing on exhibits Nos. 286 and 288?

A. They will.

Q. I take it this is simply a presentation of the train accidents by detail and in sequence?

A. For road freight train operation, that is correct.

Q. Will you say whether or not the information shown hereon corresponds to that which appears on the original sources, the form T reports to which you referred?

[fol. 3761] A. It does.

Q. Has the exhibit been carefully checked for that purpose?

A. It has.

Q. Are there any computations or calculations of your own in connection with the exhibit?

A. No.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has your Honor any questions?

The Court: No questions.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 289.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 289.")

The Court: For an accident to have been reported and to appear on this exhibit No. 289, there must have been damage in excess of $150?

A. That is correct.

Mr. Mason:

Q. Do you undertake by this exhibit to show all reportable train accidents whether accompanied by casualties or not which occurred in road freight train operation during the [fol. 3762] period referred to?

A. I have, that is correct. That includes derailments, collisions, locomotive accidents, and miscellaneous train accidents.

Q. Have you any other comment on the exhibit, Mr. Sullivan?

A. No.

Q. Will you take up a statement in nine sheets bearing the title, "Detail of Train Accidents, Road Freight Train Operation, Reported to the Interstate Commerce Commission, Years 1923 to 1939, Inclusive, State of Nevada"?

A. I have the exhibit.

Mr. Mason: May we have this statement marked "Defendant's Exhibit No. 290" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 290 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 290, Mr. Sullivan?

A. I did.

Q. From the form T reports or the certified copies thereof or retained copies thereof as you have previously mentioned?

A. Yes, sir.

Q. Will you say whether or not this exhibit No. 290 cor- [fol. 3763] responds to exhibit No. 289 except that it relates to the state of Nevada?

A. It does.

Q. Is it a true and correct representation of the information appearing upon the underlying documents?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has your Honor any questions on the exhibit?

The Court: No questions.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 290.

Mr. Strouss: The same objection as to the previous exhibits on the state of Nevada.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 290.")

Mr. Mason: May we take our recess at this time, your Honor?

The Court: Yes, we will take our recess now.

(Thereupon a short recess was taken after which proceedings were resumed as follows.)

[fol. 3764] The Court: You may proceed.

Mr. Mason: Mr. Sullivan, I will ask you to refer, please, to a statement in four sheets entitled "Casualties to All Classes of Persons, Except Trespassers, Sustained in Train and Train Service Accidents While On, Employed On, or Getting On or Off Passenger Trains, Reportable to the Interstate Commerce Commission, Years 1923 to 1939, Inclusive; Southern Pacific Company Lines in State of Nevada." Have you that statement before you?

A. I have.

Mr. Mason: May we have the statement marked Exhibit No. 291 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 291 for identification.

Mr. Mason: Mr. Sullivan, as I look at the exhibit, the first sheet is a summary sheet of details which are shown on the succeeding sheets, is that correct?

A. That is correct.

Q. And the first sheet also contains certain calculations predicated upon the statistics which appear on the first sheet, is that right?

A. That is correct.

[fol. 3765] Q. Now, will you state from what sources you obtained the figures shown in columns B, C, and D?

A. The basic figures in column B represented the number of revenue passengers carried, column C, revenue passengers one mile in thousands, and passenger train-miles in thousands were abstracted from the annual report of the

Southern Pacific Company to the Nevada Public Service Commission.

Q. Are those directly copies from those annual reports for those several years which are referred to on the exhibit?

A. Yes, sir.

Q. Now, I take it that the figures shown in columns E to P inclusive, are the aggregation of the figures representing the individual accidents shown on the succeeding sheets?

A. That is correct.

Q. As to columns Q and R, what are those?

A. They are the total of the preceding columns of the killed and injured, respectively.

Q. Now, in columns S, T, and U, have you calculated the casualty rate for the passengers separately?

A. I have.

Q. And in column V, the casualty rate for employees on the train-mile basis?

[fol. 3766] A. I have.

Q. And in column W, to persons other than passengers or employees classed as non-trespassers.

A. I have.

Q. And finally the casualty rate for all persons in column X?

A. I have.

Q. Are these calculations true and correct?

A. They are.

Q. And are the figures upon which the calculations are predicated likewise true and correct?

A. They are.

Q. Now, going to sheet 2, I will ask you whether the explanation of sheets 2, 3 and 4, is similar? What do you undertake to show on these sheets?

A. They are the details abstracted from the Form T reports of the Southern Pacific to the Interstate Commerce Commission.

Q. And are these a correct summary of the details as they appear upon the form T reports?

A. They are.

Q. Are there any of the accidents which are referred to on Exhibit No. 291 for identification which were reportable but not reported?

A. No.

[fol. 3767] Q. Did you make an examination to determine whether there were any accidents involving passenger trains that might not have been reported although reportable?

A. I made such an investigation, and found none.

The Court: I see one of these accidents was caused by a dog biting the baggageman.

Mr. Mason: Mr. Sullivan, is an accident of that kind nevertheless reportable, if it occurs during the operation of the passenger train?

A. Yes, it is reportable.

Mr. Mason: Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Your Honor? We offer the exhibit in evidence as Exhibit No. 291.

Mr. Strouss: The same objection.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 291.")

Mr. Mason: Now, Mr. Sullivan, is there any detail of the operation or any detail of the showing, rather, as it relates to the year 1939 which deserves particular mention other [fol. 3768] than mention which has been made on the exhibit

A. Yes. I would like to invite attention to sheet 4, item 51, wherein reference is made to a derailment of No. 101, which is a streamliner consisting of fourteen cars, in which a number of passengers and employees were killed and injured, which was due to malicious tampering with the track, and has a tendency to otherwise distort a statistical showing of this kind, which is readily apparent when reference is made to the casualty rates for the year 1939 as well as the five-year period shown on line 20 for the years 1935 to 1939.

The Court: Were the parties responsible for this ever apprehended and prosecuted?

A. No, sir.

Mr. Mason: Do you know and, if so, will you state, Mr. Sullivan, whether efforts are still being continued to run

down the person or persons responsible for the Harney wreck?

A. Yes, I know of my own knowledge that such effort is being made.

Q. Is there a substantial reward offered by the company for their apprehension?

A. Yes, sir.

Q. Do you know how much?

[fol. 3769] A. I don't recall; it seems to me it is $10,000. And I may state that while the cause is given in column 1, train derailment due to malicious tampering with the track, that was an accident investigated by the Bureau of Safety of the Interstate Commerce Commission, and that was the cause assigned by that body for the accident.

Q. You have reference now to the report of the investigation as published by the Interstate Commerce Commission?

A. Yes.

Q. Bureau of Safety?

A. And I have that report in a separate bound copy in my office across the street.

Q. Mr. Sullivan, you were assistant superintendent on the lines in Nevada for several years, were you not?

A. I was.

Q. You were inspector of transportation in the territory including the lines in Nevada for some time, too, were you not?

A. For a short time in 1920.

Q. Now, I would like to have you refer, if you will, please, to sheets 3 and 4 of your exhibit. I noticed that on sheet three, for example, the first item, No. 23, you refer to train [fol. 3770] No. 28. Do you remember the name designation of train No. 28?

A. The Overland Limited.

Q. And what is the name designation of train No. 21?

A. The Pacific Limited.

Q. Of train No. 9?

A. Fast Mail.

Q. Of No. 22 when that is shown in 1932?

A. I don't recall the designation, it seems to me that was known as the Reno Local.

Q. Now, going to sheet 4, you show a train designation there of No. 14.

A. Pacific Limited.

Q. No. 30, was that the Challenger or Advance Overland Limited?

A. I don't believe it had a designation, but it was operated as an advance overland limited, later changed to 88.

Q. Is No. 27 a companion to No. 28?

A. It is.

Q. You show also 87.

A. That is the Challenger.

Q. And finally 101, the train which was derailed at Harney?

A. That is known as the Streamliner City of San Francisco, a Diesel-operated train.

[fol. 3771] Q. Mr. Sullivan, during your experience as assistant superintendent on the Salt Lake division, will you say whether or not the operation of passenger trains of more than 14 cars was usual or unusual?

A. It was a common practice.

Q. Have you before you, Mr. Sullivan, a statement in ten sheets bearing the title on the first sheet, "Casualties to all Classes of Persons Except Trespassers Sustained in Train and Train Service Accidents While on, Employed on or Getting on or off Passenger Trains, Reportable to the Interstate Commerce Commission, Years 1923 to 1939, Inclusive, Southern Pacific Company Lines, State of Arizona."

A. I have that exhibit before me.

Mr. Mason: May we have the exhibit marked as No. 292 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 292 for identification.

Mr. Mason: Did you prepare Exhibit 292, Mr. Sullivan?

A. I did.

Q. I take it, the sources are as shown in the footnotes on Sheet No. 1?

A. That is correct.

[fol. 3772] Q. Did you make the calculations of the rates indicated in columns S to X, inclusive?

A. I did.

Q. Will you state whether or not this exhibit has been prepared along the same lines and in substantially the

same form as to sheets 1 and 3 to 10, inclusive, as exhibit 291?

A. It has.

Q. Now, going to sheet No. 2—before we do that we will go to sheet No. 3. What do you undertake to show on sheets 3 to 10 inclusive?

A. Show a brief narrative, showing the date of the occurrence, the location, and other information that is shown on the carrier's form T of all accidents and personal injuries sustained by persons other than trespassers while on, employed on, or getting on or off pasenger trains in the state of Arizona.

Q. I take it, then, that sheets 3 to 10, inclusive, are a summary of the details of each of these accidents as such details appear in the form T reports?

A. That is correct.

Q. And you have simply shown them here in chronological order?

A. That is correct.

[fol. 3773] Q. By the way, I want to call your attention, Mr. Sullivan, to sheet 8. Will you refer to that sheet, and particularly to item 156. I take it that that accident is the one to be compared to the one where the person was bitten by a dog?

A. I think that is the one.

Q. Now, will you refer to sheet 2, Mr. Sullivan and explain what you have undertaken to do on that sheet?

A. As will be noted from Exhibit No. 291, casualty rates have been calculated relating to passengers, to employees, and to other passengers, and similar calculations on exactly the same basis on Exhibit 292 cover similar information for the State of Arizona. I have then on sheet 2 of Exhibit 292 made a comparison of the casualty rates for the same cycles of years, six years, 1923 to 1928, six years, 1929-1934, and five years, 1935 to 1939, as well as for the entire seventeen-year period, Arizona with Nevada, and then I have pointed out following an index reading "Ratio, Arizona Rates to Nevada Rates," to show the relationship of those rates to each other. In every case the casualty rate for all classes and for all periods is higher in Arizona than in Nevada except——

[fol. 3774] Mr. Strouss: Just a minute——

Mr. Mason: I don't think you should testify as to what the exhibit shows. You have made these computations, and

the computations, I take it, are explained by the wording on the face of the exhibit.

Q. Now, have you taken into account in the computations for the third block representing the period 1935 to 1939, inclusive, the casualties occurring in the Harney derailment?

A. They are included.

Q. Are they included, likewise, in the grand total?

A. They are.

Q. Have these computations been checked against the underlying sources?

A. They have.

Q. Has the exhibit itself been checked against the form T reports or other underlying sources to determine its correctness?

A. It has.

Q. Will you say whether or not it is true and correct?

A. It is.

Mr. Mason: We offer the exhibit in evidence as defendant's Exhibit No. 292.

[fol. 3775] Mr. Strouss: I object to the matter on page 2 relating to operations in Nevada as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 292.")

Mr. Mason: Now, Mr. Sullivan, I think that prior to the offer of the exhibit and its reception in evidence, you were about to comment upon the relationship between the casualty rates for the various classes of persons stated in Arizona and in Nevada, and the fact that the Arizona rates were higher or lower as the case might be. Will you continue with, or repeat that comment?

A. I called attention to the index identified as "Ratio, Arizona Rates to Nevada Rates," and in two instances "Ratio, Nevada Rates to Arizona Rates," in each of the four blocks; and I would like to invite attention that in every case except four, three of the items being in columns R, S, and T, in item No. 3 for the five years 1935-1939, and in column S, in item 4 for the 17-year period the casualty rate in Arizona is higher for every class than in Nevada,

the relationship one with the other being shown by the ratio [fol. 3776] figure in each column opposite the arrow.

Q. In each instance, as I read the exhibit, Mr. Sullivan, you have shown the ratio of the greater rate to the less rate however it might fall, have you?

A. That is right.

Q. Now, I would like to have you refer, if you will, to item 104 on sheet 6 of this exhibit. Do you know and, if so, will you state whether the accident referred to in item No. 104 was the subject of investigation by the Bureau of Safety of the Interstate Commerce Commission?

A. It was.

Q. And have you in the court room a copy, a printed copy of the published report of the Bureau of Safety?

A. I have.

Q. Will you identify it by its number and date, please?

A. The report appears at page 9 and continues to page 10 of the Interstate Commerce Commission Bureau of Safety Summary of Accident Investigation Reports No. 49, for the months of July, August, and September, 1931, the title page of the report bearing the seal of the Interstate Commerce Commission.

[fol. 3777] Q. This is a report, is it, bearing serial number 49, issued by the government printing office at Washington during the year 1932, according to the title page, is it?

A. That is correct.

Mr. Mason: Your Honor, I had intended to ask the witness to read from the report, but in order to save time and save the reporter, I will ask, with the consent of counsel and with your Honor's authority, that the reporter simply take the report and copy it into the record as if read.

Mr. Strouss: I have no objection to that. I would like to see it.

The Court: You say you have no objection, Mr. Strouss?

Mr. Strouss: No, I have no objection.

The Court: It may be copied in the record.

Mr. Mason: With the same effect as if the witness had read it?

The Court: Yes.

(The Summary of Accident Investigation Report referred to reads as follows:)

"Southern Pacific Co.

"Derailment of a passenger train near Dome, Ariz., on August 5, 1931, which resulted in the death of 2 employees and the injury of 12 passengers and 5 trespassers.

[fol. 3778] "This accident was caused by excessive speed on a sharp curve.

"In the vicinity of the point of accident this was a single-track line over which trains were operated by time-table, train orders, and an automatic block-signal system. The accident occurred near mile post 750 at a point approximately 3 miles west of Dome. Approaching this point from the west, the track was tangent, followed by a short curve to the left, a short tangent, and then a compound curve to the right 1,165 feet in length; this latter curve consisted of 270 feet of spiral, a 10 degree curve 456 feet in length, and then a six-degree curve for a distance of 289 feet, followed by 150 feet of spiral; the accident occurred on the six degree curve at a point 15 feet from its western end. The grade for eastbound trains was slightly ascending, being 0.04 per cent at the point of accident. On account of the rugged and mountainous country and the numerous sharp curves located on this section, the maximum speed for all trains in this vicinity was 30 miles per hour; the slow board at the western end of this restricted territory was located at a point 2.34 miles west of the point of accident.

[fol. 3779] "In the vicinity of the point of accident the track was on a fill 20 feet in height; it was laid with 130-pound rails, 39 feet in length, with 22 or 23 creosoted fir and gum ties to the rail length, fully tie-plated, double-spiked, and ballasted with crushed rock to a depth of 8 inches. The track was maintained in excellent condition.

"It was raining at the time of the accident, which occurred about 2:30 a. m.

"Eastbound passenger train first No. 104 consisted of two baggage cars and one coach, hauled by engine 3122. This train departed from Yuma at 1.55 a. m., according to the train sheet, 15 minutes late, and was approaching Dome when it was derailed while traveling at a speed estimated by a surviving member of the train crew to have been 30 miles per hour.

"Engine 3122 stopped on its left side down an embankment on the outside of the curve, with its head end 200 feet

beyond the initial point of derailment; it was badly damaged, with all the appurtenances torn off from the top as well as the left side of the engine. The tender also stopped on its left side behind the engine. The first car was headed down the embankment; the second car stopped on its right side to the right of the track and the last car stopped, leaning to the right at an angle of 45 degrees against [fol. 3780] the side of the cut. The employees killed were the engineman and fireman.

"The brakeman stated that before reaching the restricted-speed territory the train was traveling at a speed of 60 miles per hour and the conductor estimated the speed at 50 miles per hour. While neither of them was able to state that the brakes had been applied on passing through the restricted-speed territory until just prior to the derailment yet they did not think that the speed was excessive at the time of the accident. A thorough examination of the track and equipment, however, disclosed nothing that could have contributed to the cause of the accident. The only marks found on the track at the point of derailment were on the outside angle-bar bolts on the high rail, and on the ends of the ties leading down the embankment, indicating that the engine turned over from centrifugal force without first being derailed. This could have been accounted for only by excessive speed, which was consistent with the position in which the wreckage came to rest, and with the fact that the engine apparently landed on its back and then turned on its left side before coming to a stop [fol. 3781] down the embankment."

Mr. Strouss: That is not the complete report that was rendered, was it, Mr. Sullivan? This is just a summary of the report that is published here?

A. No, I don't understand that that is a summary report; I understand that that is the official report by the Bureau of Safety.

Q. Did I understand you to say you had a separate report from them?

A. On the Harney derailment.

Mr. Mason: Have you anything further on Exhibit No. 202, Mr. Sullivan?

A. Yes; on account of the reference having been made to the Harney derailment due to malicious tampering with

the track, I thought it only proper to call attention that a similar accident appears in Exhibit 292, that that particular type of accident wasn't associated entirely with Nevada.

Q. Will you state the item and the date sufficiently to identify the accident on Exhibit No. 292?

A. Item 21 on sheet 3 of Exhibit 292.

Q. How many fatalities were there in that?

A. A passenger fireman was killed, and a passenger engineer, and a passenger conductor, and five passengers [fol. 3782] were injured.

Q. Now, is that all that you had on 292, Mr. Sullivan?

A. That was all.

Q. Will you turn now to a statement in a single sheet entitled "Highway Grade Crossing Accidents in Which Automobiles Were involved, All Railroads, State of Arizona; Reflected by Statistics of the Interstate Commerce Commission and Those Which Occurred on Lines of Southern Pacific Company, Years 1923 to 1939, Inclusive?"

A. I have the exhibit.

Mr. Mason: May we have this marked "Defendant's Exhibit No. 293?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 293 for identification.

Mr. Mason: Did you prepare Exhibit No. 293, Mr. Sullivan?

A. I did.

Q. Are the sources indicated on the exhibit?

A. They are.

Q. Now, I notice that for the year 1923, you indicate by a footnote reference that the column B, number of accidents not reported. Was the accident bulletin incomplete in that [fol. 3783] respect for the year 1923?

A. Yes, the accident bulletin didn't show until 1924 the number of accidents.

Q. Did it show the number of casualties?

A. It did.

Q. And also the number of automobiles registered by states?

A. It did.

Q. Now, these calculations "casualties for state per 10,000 automobiles registered." were they made by yourself?

A. No, the information shown in columns G and H also appear in the accident bulletins.

Q. And in column I?

A. It is a calculation by myself.

Q. Simply an addition?

A. That is right.

Q. Column J, where is that taken from?

A. Taken from the same bulletin, Summary No. 24.

Q. Now, for the lines identified as Southern Pacific only or "S. P. Only," from what source did you obtain that?

A. From the form T reports of the Southern Pacific Company to the Interstate Commerce Commission.

[fol. 3784] Q. And this, as to the Southern Pacific, is an aggregation of the information appearing on the form T reports for the several years?

A. That is correct, just a tabulation of the number of casualties occurring.

Q. I notice that for the year 1939, you have only the showing for the Southern Pacific. Is that explained at the foot of the sheet?

A. Yes, the I. C. C. accident bulletin for the year 1939 has not yet been made available.

Q. Has the exhibit been checked against the underlying sources to determine its correctness?

A. It has.

Q. Will you say whether or not it is true and correct?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Your Honor?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit 293.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 293.")

[fol. 3785] Mr. Mason:

Q. Mr. Sullivan, have you a statement in a single sheet entitled, "Detail of Casualties to All Classes of Persons, Except Trespassers, Operation of Passenger Trains, South-

ern Pacific Company, State of Arizona, March and April, 1940"?

A. I have.

Mr. Mason: May this exhibit be marked No. 294 for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 294 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 294?

A. I did.

Q. Will you state the sources from which it was prepared?

A. It was prepared from the carbon copies of the original form T's made by the Southern Pacific Company to the Interstate Commerce Commission for the months of March and April, 1940.

Q. Why did you select the months of March and April, 1940, for this particular showing?

A. It was during the months of March and April, 1940, that the passenger trains in excess of 14 cars were operated in the state of Arizona.

Q. Is this showing confined so far as the dates are con- [fol. 3786] cerned to the dates between which the operation of passenger trains of more than 14 cars was carried on?

A. No, it is for the entire two months of March and April, 1940.

Q. In point of fact, did the operation of such long passenger trains start before March 16th?

A. I think the information is in evidence, but I don't recall the date. I know that it was during March and April.

Q. In any event, you have included all of the reportable passenger train casualties during the two months?

A. That is correct.

Q. Has the exhibit been compared?

A. It has.

Q. Will you say whether or not it is true and correct as reflecting the form T reports?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has your Honor any questions?

The Court: No questions.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 294.

[fol. 3787] The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 294.")

Mr. Mason:

Q. Mr. Sullivan, I notice in item No. 1 you show a casualty to a passenger on consolidated trains Nos. 5 and 43. Have you made any further investigation of the circumstances of that accident?

A. Nothing except what appeared on the form T report and an examination of the train sheet that No. 43 and No. 5 had been consolidated at Dock for movement to Phoenix on account of failure of engine No. 43 due to a broken oil line between the engine and tender on account of striking boulder on track between Olberg and Dock.

Q. Does the form T report indicate which train, whether on No. 5 or on No. 43, the passenger had been or was riding?

A. No, the report indicated that the carrier had no knowledge of the injury which was alleged.

Q. When did the injury or alleged injury first come to the notice of the carrier's employees?

A. I don't know of my own knowledge.

Q. Is it indicated by the form T report?

A. It is not. I simply call attention to item 2 on the same report.

[fol. 3788] Q. Did that take place on one of the consolidated trains?

A. On one of the consolidated trains on the same date where the claim was made that it was due to a sudden stop of the train between Olberg and Dock where train No. 43 struck a boulder.

Q. Was that striking of the boulder the cause of the engine failure?

A. Yes.

The Court: It was not the same woman passenger, though?

A. No, a different woman. I simply drew attention to that because both injuries are claimed or alleged.

Mr. Strouss: What do you mean by "alleged"? Is this what was reported to the Interstate Commerce Commission as actually happening?

A. I can explain because I have personal knowledge of cases of that kind. Frequently, weeks or a month after an occurrence some passenger will report to a representative of the carrier that he has been injured and that is the first information that the carrier has of the accident. The rules of the Commission require that such alleged or claimed injuries be reported.

Mr. Strouss: I think if there is going to be a suspicion [fol. 3789] thrown upon the form T reports here that they should bring in the underlying records.

Mr. Mason: I don't think there is any suspicion thrown on the form T reports. The form T report, as I understand it, and you will correct me if I am not correct, carries a report to the Commission that the passenger alleged the injury?

A. That is correct.

Q. The form T report carries a statement that the passenger alleges or claims the injury?

A. That is correct.

Mr. Strouss: If there was no claim of injury until some weeks after, these underlying records will show it. If that is what they are trying to get in here, by inference, I would like to have the records brought in.

Mr. Mason: We are only emphasizing what the form T reports emphasize, that the passenger has claimed the injury.

Mr. Strouss: I think the form T report itself will speak for itself on that.

Mr. Mason: The form T report is available if you desire to examine it as an underlying document. We haven't made any effort to keep you from examining that.

The Court: Well, counsel having asked for the under- [fol. 3790] lying records, they may be produced and given to him.

Mr. Mason: We are prepared to give him the form T reports. We haven't used the others, and I don't think that we are required to give the others.

The Court: As I understand your testimony, Mr. Sullivan, the reports to the Interstate Commerce Commission classify these injuries to passengers in two different ways, that if the passenger makes an immediate report of the injury to the conductor or some other employee of the car-

rier that is reported in one way and where a report comes in days or weeks later that is reported in a different column?

A. No, it is reported in exactly the same manner on the same form. If the company employees or officers have knowledge of the injury, it is reported as an injury. If the carrier has no knowledge and the passenger simply alleged the injury, the form T report is made and simply states that the person alleged the injury but it is reported in the same manner as if the carrier's employees had knowledge of it. I didn't use any of the underlying data for the preparation of this exhibit. Had I thought I would have been permitted to do so, rather than using the reports to the [fol. 3791] government, I could have examined the files and possibly given more information than is on the exhibit, but I relied solely and wholly on the form T reports.

Mr. Strouss: My objection is not what the form T reports themselves show, but it is trying to get an inference to these reports which I don't think is on the face of the report itself. If there is to be any such inference given, then the reports to the trainmen or claim of the passenger should be produced here to show just what the situation was.

Mr. Mason: Your Honor, if there is any attempt to cast inference against the form T report, it proceeds from the other side, not from us. We have simply called attention to the fact there were two accidents on the same day and on the same train.

Mr. Strouss: But the inference has been left, at least by a suggestion, that this type of claim is not made often until weeks or months afterward by a passenger and by that an inference is made that this may have been one of that type of accident, in some way the passenger is faking or whatever inference they are trying to draw from it. If there is an inference other than what the form T report [fol. 3792] shows, I think the underlying records should be produced.

The Court: That is true, but counsel denies there is any such inference on his part. That is the only place you disagree.

Mr. Mason: We are only showing here what the form T report shows. If Mr. Strouss thinks it would be a better showing, we can eliminate items Nos. 1 and 2 here.

Mr. Booth: When a superintendent puts the word "alleged" in a passenger report, it is a very clear indication that he believes it didn't happen.

Mr. Strouss: I expect in almost every instance from the company's standpoint they think it didn't happen, what the passenger alleges. It is probably not unusual.

Mr. Booth: Well, the conductor may be one of your witnesses later on, and you can ask him.

Mr. Mason: I think the exhibit was received in evidence. Mr. Sullivan has one or two additional exhibits.

Q. Have you before you a statement in one sheet entitled, "Detail of Train and Train Service Accidents, Road Freight Train Operation, Reportable to the Interstate Commerce Commission, Southern Pacific Company in State of Arizona, April, 1940"?

[fol. 3793] A. I have.

Mr. Mason: May we have this statement marked, your Honor, as "Defendant's Exhibit No. 295" for identification?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 295 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 295?

A. I did.

Q. From what sources?

A. From the form T reports of the Southern Pacific Company to the Interstate Commerce Commission, that is, carbon copies of the office files.

Q. I take it that the information shown in the lower block of the exhibit was prepared from that which was stated of record by Mr. Fewtrell?

A. That is correct.

Q. Your exhibit shows the month of April, 1940. Why did you select that period?

A. That was the month during which freight trains in excess of 70 cars were operated in the state of Arizona.

Q. The details shown in column K of the exhibit, are those taken directly from the form T's?

A. Yes, that is a brief narrative as it appears on the form T.

[fol. 3794] Q. Does that truly and correctly represent what is shown on the form T reports?

A. It does.

Q. Are the form T reports used in connection with exhibit No. 294, the preceding exhibit, as well as in connection with exhibit No. 295 for identification available for the use of opposing counsel?

A. They are.

Mr. Mason: May the record show, your Honor, that these are hereby tendered to opposing counsel for their examination?

The Court: The record may so show.

Mr. Strouss: Which are these?

Mr. Mason: The form T's used in connection with these exhibits Nos. 294 and 295. Have you any questions on the exhibit, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has your Honor?

The Court: No.

Mr. Mason: We offer the exhibit in evidence.

Mr. Strouss: No objection.

The Court: It may be received.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 295.")

Mr. Mason:

Q. Mr. Sullivan, as to item No. 5 of this exhibit, you show [fol. 3795] the number of cars in the train as 91. Does the form T report show that the train was moving with 91 cars in it at the time of the accident?

A. No, it shows it was not moving. It shows that the accident occurred while the caboose was being handled by the engine, as indicated in column K.

Q. Then the speed of eight miles per hour indicated in column F is the speed of the engine and caboose?

A. That is it.

Q. Are there any other comments on the exhibit, Mr. Sullivan?

A. The calculations can be readily made from the basic figures shown in the lower block. It will show that 37,257 train-miles and 3,180,278 freight train car-miles were operated in Arizona in April, 1940, without a reportable casualty on the trains consisting of more than 70 cars. Calculations can also be made relating to train accidents against the train-miles and car-miles. While a month only shows

a small number of accidents, it will be noted that a miscellaneous train accident, a collision, a locomotive accident, and four train-service accidents occurred during the month [fol. 3796] which related to previous exhibits which have been introduced for a year would indicate that it follows the trend, as the same type of accidents may be found throughout the year. The collision, as shown in item No. 7, involved a light engine and a 58-car freight train. I have no further comments to make on the exhibit.

Mr. Masqn: I think that is all for Mr. Sullivan at this time.

Mr. Booth: I would like to call another witness, your Honor?

The Court: You may step aside, Mr. Sullivan.

(Witness temporarily excused.)

E. C. Bruns was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Booth:

Q. Will you state your name and residence to the reporter, please?

A. E. C. Bruns, 250 25th Street, San Bernardino, California.

Q. What position do you hold with the Atchison, Topeka and Santa Fe Railway Company?

[fol. 3797] A. Claim adjuster.

Q. How long have you occupied that position?

A. Two periods, this last time since 1927. A former period from 1914 to 1916.

Q. Between 1916 and 1927, what was your occupation?

A. I worked in the Los Angeles office from 1916 until 1927 as senior personal injury clerk in charge of the records.

Q. Are you familiar with the system of reporting accidents as required by the Interstate Commerce Commission?

A. I am.

Q. And with the form T reports and other reports required by them in connection therewith?

A. Yes, sir.

Q. Has the Atchison, Topeka, and Santa Fe Railway Company regularly maintained since prior to 1923 office files containing the office copies of the reports filed by it with the Interstate Commerce Commission pursuant to the rules for reporting accidents as amended in 1921?

A. It has.

Q. Have you prepared an exhibit consisting of one sheet and headed, "Atchison, Topeka and Santa Fe Railway Company, Casualties to Road Freight Trainmen and En-[fol. 3798] ginemen on Duty While on or Getting on or Off Road Freight Trains (Through, Local and Mixed), Main Line Territory between Clovis, New Mexico, and Gallup, New Mexico, Compared with Main Line Territory between Gallup, New Mexico, and Needles, California, as Reported to the Interstate Commerce Commission—Years 1923 to 1939, Inclusive"?

A. I have.

Mr. Booth: We ask that this be marked for identification as "Defendant's Exhibit No. 296."

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 296 for identification.

Mr. Booth:

Q. I will ask you whether the figures in columns B, C, D, and E were taken from defendant's exhibit No. 140 introduced in evidence during the testimony of Mr. R. H. Weeks?

A. They are the same.

Q. Are the figures in columns X and Y computations made by you from those figures?

A. Yes, sir, they are.

Q. Made in what manner?

A. By dividing the freight train miles into freight car miles.

Q. Are the figures of averages in columns X and Y, lines [fol. 3799] 7, 14, and 20, averages of averages or are they averages of the added freight train miles and freight car miles for the respective periods?

A. They are the average of the grand-total of the seventeen years, not average of average.

The Court: That average of average might be quite misleading, might it not?

A. It might.

Mr. Booth: That is, the averages in line 7 are obtained by dividing the respective totals in line 7 into those shown in columns B, C, D, and E?

A: That is correct.

Q. And the same is true in line 14?

A. Line 14, 20, and 21.

Q. From what source were the figures in columns F to M, inclusive, taken?

A. F to M, inclusive, were obtained from the file copies of our form T reports as made to the Interstate Commerce Commission.

Q. Have you those file copies here in Tucson with you?

A. I have, yes, sir.

Q. Are they in the temporary office of defendant counsel at 90 Church Street, across the street from the courthouse here?

[fol. 3800] A. They are, yes, sir.

Q. Are they available for the examination of plaintiff's counsel?

A. They are.

Q. Are the figures in lines N, O, P, and Q additions made by yourself?

A. Yes, sir.

Q. Are they true and correct?

A. They are true and correct.

Q. Are the figures in R and S figures made by yourself?

A. Yes, sir, they are grand totals of the previous totals.

Q. Are the figures in columns T, U, V, and W made by yourself?

A. They are.

Q. They are capable of mathematical check on the face of the exhibit?

A. Yes, sir, they are just computations, divisions of casualties into train-miles and freight car-miles.

Q. Are all the figures shown on the face of this exhibit other than those testified to by Mr. Weeks true and correct to the best of your knowledge and belief?

A. They are.

[fol. 3801] Q. As to the detail of fatalities shown in the two blocks at the bottom of the page, one headed, "Clovis, New Mexico, to Gallup, New Mexico," and the other, "Gallup, New Mexico, to Needles, California," from what sources are those details taken?

A. Those details were taken from the form T's covering those particular accidents.

Q. They are not your conclusions but what are stated in the form T reports?

A. An abbreviated statement of what is contained on the form T in each instance.

Q. Are the distances between stations correctly stated in the four lines underneath the statement headed, "Main Line Mileage"?

A. They are.

Q. What is Clovis, New Mexico, in your operations, a freight terminal?

A. Yes, sir.

Q. Where crews change?

A. Yes, it is a freight terminal the same as Tucson is on your line here.

Q. What is Gallup, New Mexico?

A. That is a similar freight terminal.

Q. Is there an intermediate terminal between Clovis and Gallup?

[fol. 3802] A. There are two of them, one at Vaughn, New Mexico, and one at Belen, New Mexico, so that this area from Clovis to Belen covers three so-called "freight train districts."

Q. What is the situation between Gallup and Needles? Is Needles a freight terminal?

A. It is, and that area from Gallup to Needles comprises three freight train districts, Gallup to Winslow, Arizona; Winslow to Seligman; and Seligman to Needles.

Mr. Booth: Any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Booth: Your Honor, the Santa Fe line has been fully described, we think, by the Santa Fe witnesses, Mr. Mahoney, Mr. McDonald, Mr. Thomas and Mr. Blanchard, and we offer this exhibit in evidence.

Mr. Strouss: The same objections as heretofore made to exhibits from foreign roads.

The Court: The objections are overruled, it may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 296.")

Mr. Booth:

Q. In line 22, stating "Period 1935-1939 Compared with Period 1923-1928," opposite the word "Improvement," there is Clovis to Gallup freight train miles per casualty, [fol. 3803] column T, 94.65 per cent. Is that intended to represent the ratio of improvement between the two periods stated?

A. It is.

Q. And the same is true as to line U, Gallup to Needles, 88.03 per cent?

A. That is correct.

Q. All of those figures opposite the two words "Improvement" in columns T, U, V, and W are ratios, are they not?

A. That is right. They are ratios of improvement, one block of years as compared with the other, as stated.

Q. The frequency of casualties is shown on this exhibit by the number of freight train miles per casualty and the number of freight car miles per casualty, respectively?

A. That is correct.

Q. The figure of 97,946, being the first figure in column T, is arrived at by what method?

A. It is arrived at by dividing the total number of casualties for that year, 1923, into the freight train miles.

Q. In other words, it is arrived at by dividing the top figure in column R, 12, into the top figure in column B, 1,175,346?

A. That is correct.

[fol. 3804] Q. And the same is true of all the others?

A. The procedure is the same in all columns.

Mr. Booth: I think I tendered the use of these form T's to counsel, if not they are in the office here.

Mr. Strouss: Someone will be here during next week?

Mr. Booth: Yes.

Q. Now, going to the detail of fatalities. You show only the fatal accidents reported. You have no detail of any others on this exhibit?

A. No, just the fatal accidents are detailed.

Q. Between Clovis, New Mexico, and Gallup, New Mexico, according to this, the only fatalities on trains of over 70 cars in length were "a brakeman murdered by hobos

on 84-car train" and "an engineer and fireman killed on a 99-car train by a locomotive boiler explosion"?

A. That is all in trains of over 70 cars.

[fol. 3805] Q. That was a rather severe derailment, May 16, 1937, where 35 cars were derailed by striking a bull on a bridge. Do you know whether the owner of the bull presented a claim for that?

A. Not to my knowledge.

Mr. Strouss: Rather an odd place for the bull to be, on the bridge?

Mr. Booth: Are there any comments you desire to make on this exhibit?

A. I think they are pretty well explained, they explain themselves, the figures, I don't think there is any particular comment.

Q. Yes, there are one or two questions I want to ask you. Suppose a freight brakeman is getting off of a freight train for the purpose of throwing a switch, and he has let go of the handholds, he is on the ground but he has not recovered his balance yet, and he falls. Although he is not touching any part of the train, is that considered a getting-off casualty?

A. Yes, they are so calculated.

Q. Suppose a trainman is walking or running toward a train to board the train after leaving it for some purpose, is that included?

A. If he was running in an attempt to get on the train, it would be included, and was included.

[fol. 3806] The Court: I take it, Mr. Bruns, from this exhibit, that in the territory between Gallup and Needles, as shown in column H, not a single engineman was killed during the 17-year period?

A. That is correct.

Q. I thought you had a fatal accident at Joseph City. Was that a passenger engineer that was killed?

A. That was a passenger train, as I recall it, Your Honor, it went through a bridge.

The Court: Yes.

The Witness: That was a passenger train, I think No. 8.

The Court: This fatality occurring on January 7, 1929, at Holbrook, that was the Peterson case over which you had considerable litigation?

A. No, the Peterson case wasn't a fatality. He struck a water crane at Flagstaff. The trial was held at Holbrook, as I well remember it, I attended it. I don't recall the name without going back to my working data of that brakeman involved in the Holbrook accident. It could be determined very readily.

The Court: Peterson subsequently died.

The Witness: This Holbrook, your Honor, locates the point of accident, and I know that Mr. Peterson that you [fol. 3807] refer to was injured at Flagstaff, Arizona.

Mr. Booth: No further questions?

Mr. Strouss: I have no questions at this time. I want to look at the form T reports before I decide.

Mr. Booth: Will it be convenient, Mr. Strouss, for you to let Mr. Sines know whether you want Mr. Bruns back?

Mr. Strouss: Yes, I will be glad to do that. I will let Mr. Sines know.

Mr. Booth: We have no further witnesses this evening.

The Court: The court will be at recess until ten o'clock tomorrow morning.

(Thereupon, the court stood at recess until February 7, 1941, at ten o'clock A. M.):

[fol. 3808] February 7, 1941, ten o'clock A. M.

Proceedings were resumed at this time as follows:

The Court: You may proceed.

Mr. Mason: I will call Mr. Bays.

G. A. Bays was called as a witness on behalf of the defendant and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Mason:

Q. State your name.

A. G. A. Bays.

Q. Where do you reside, Mr. Bays?

A. 333 South Third Avenue, Tucson.

Q. What is your position with the Southern Pacific, Mr. Bays?

A. Assistant superintendent, Southern Pacific Company, headquarters, Tucson.

Q. Are you assistant superintendent of the Tucson division?

A. Yes, sir.

Q. What has been your experience in the Southern Pacific Company service, Mr. Bays?

A. I entered the service of the Southern Pacific Com- [fol. 3809] pany as a student brakeman in May, 1910 on the Western division, Oakland, California, and was promoted to conductor in May, 1913. At that time the divisions were split, and I was transferred from the Western division to what was known at that time as the Stockton division, and was then employed as conductor from May, 1913, to July, 1921. July, 1921, to October, 1921, assistant trainmaster; November, 1921, to June, 1922, conductor; July, 1922, to October, 1922, assistant trainmaster; November, 1922, to June, 1923, conductor; July, 1923, to November, 1923, assistant trainmaster; December, 1923, to June, 1924, conductor; July, 1924, to November, 1924, assistant trainmaster; November, 1924, to July, 1925, conductor; July, 1925, to November, 1925, assistant trainmaster; November, 1925, to July, 1926, conductor; July, 1926, to December, 1926, assistant trainmaster; January, 1927, to May, 1927, conductor; May, 1927, to August 13, 1928, assistant trainmaster. Then, on the 13th of August, 1928, I was promoted to trainmaster and transferred to the Tucson division, headquarters at Yuma, Arizona. I remained at Yuma, Arizona, as trainmaster from August 13, to June 30, 1932, as trainmaster.

Q. That was from August, 1928, to June, 1932, at Yuma? [fol. 3810] A. Yes, sir. During the depression I was transferred to Phoenix as terminal trainmaster, remained there from July 1, 1932, to September 30, 1933, and from October 1, 1933 to September 15, 1937, was trainmaster with headquarters at Phoenix, Arizona. On September 16, 1937, I was transferred to the Coast division as trainmaster, with headquarters at Watsonville Junction, remained there until January 31, 1938, and was promoted, transferred back to Tucson, Arizona.

Q. Promoted to assistant superintendent?

A. Assistant superintendent.

Q. And you have been here since?

A. Yes.

The Court: Gentlemen, before I overlook it, the fact is that today is a legal holiday, being Friday, February 7th, which is Arbor Day in Southern Arizona. In order that there may be no question as to the propriety of our proceedings, I wish that counsel would dictate into the record a stipulation that we may hold court today.

Mr. Strouss: I was wondering if it wouldn't be more proper after the proceedings are had and on the next court day to stipulate that the proceedings had today may become a part of the record as testimony properly and [fol. 3811] legally received.

The Court: That is satisfactory.

Mr. Mason: It is certainly entirely satisfactory to me; or it would be equally satisfactory to stipulate that today's proceedings may be regarded as taken in due form and order without regard to the fact that today is a legal holiday and as if the session had been held on a regular judicial day.

Mr. Strouss: That is agreeable to me.

The Court: Very well.

Mr. Mason: We can cover it both ways.

The Court: Proceed.

[fol. 3812] Mr. Mason: You were trainmaster of this division with headquarters at Yuma on August 4th and 5th, 1931?

A. Yes, sir.

Q. Were you in the courtroom yesterday when Mr. Sullivan testified and called attention to a derailment occurring at Dome on August 5, 1931, of train first No. 104 as shown in item 104 of Mr. Sullivan's exhibit No. 292?

A. Yes, sir.

Q. Are you familiar with the circumstances of the operation immediately preceding that accident as relating to the operation of that passenger train?

A. Yes.

Q. The showing on sheet No. 6 of exhibit No. 292 indicates that there was a train first No. 104. Have you examined the train sheets and will you say whether or not there was also a second No. 104 on that day?

A. Yes, sir, I have examined the train sheets and there was a first No. 104 and a second No. 104.

Q. How many cars were in second No. 104 leaving Yuma?

A. Second No. 104 leaving Yuma, consist 14 cars.

Q. Were there two sections to train No. 104 into Yuma [fol. 3813] from the west on that day?

A. No, sir, one section into Yuma.

Q. Did the train entering Yuma consist of more than 14 cars?

A. Yes, sir.

Q. Do you know and, if so, will you state why train No. 104 was broken up into two sections at Yuma?

A. It was necessary on August 5, 1931, to run two sections of No. 104 from Yuma on account of more than 14 cars to move, and in order to comply with the state law we ran the first section consisting of two head-end cars and a coach, three cars, and the second section, 14 cars.

Q. Were there at that time regularly assigned crews in passenger service?

A. Yes, sir.

Q. Was there a crew regularly assigned to handle train No. 104 out of Yuma eastward?

A. On this date the regular crew manned second No. 104.

Q. Where did you obtain the engine crew, the engineer and fireman for first No. 104?

A. From our extra list at Yuma, our enginemen's extra list which is known as "pool freight extra list" from the Phoenix district.

[fol. 3814] Q. Were the engineer and fireman handling first No. 104 regular passenger enginemen or extra freight enginemen?

A. They were extra freight and extra passenger men also.

Q. Why did you call an extra man from a freight pool to handle a passenger train movement?

A. Because this man that stood for this run was first out, and he was called in compliance with the working agreement.

Q. He stood for the work?

A. He stood for the work.

Mr. Mason: That is all.

Mr. Strouss: I have no questions, but I would like to have the train sheets.

Mr. Mason: Will you furnish Mr. Strouss with the train sheets?

The Court: It was the first section that was involved in the derailment?

A. Yes, sir, the first section.

Mr. Mason: Will you hand the train sheets for August 5, 1931, for the Yuma-Tucson-Gila district to Mr. Strouss and indicate if you will where the movement of first and second No. 104 is shown.

Mr. Strouss: After we reconvene, I may have some questions about that.

[fol. 3815] Mr. Mason: That is understood. Has your Honor any further questions?

The Court: No.

Mr. Mason: May Mr. Bays be excused for the time being?

The Court: Yes.

(Witness temporarily excused.)

W. P. Herbert was recalled as a witness in behalf of the defendant and having been previously sworn testified further as follows:

Direct examination (Continued).

By Mr. Mason:

Q. Mr. Herbert, at page 3061 of the reporter's transcript of your testimony while on the stand previously, you were asked by Mr. Strouss to verify certain figures excerpted by him from the forms 521 relating to operations on the Salt Lake and Tucson divisions?

A. Yes, costs per thousand gross ton-miles.

Q. Have you undertaken to verify those figures?

A. I have.

Q. Will you state whether there were any corrections in the figures recited to you by Mr. Strouss?

[fol. 3816] A. I found two to be corrected.

Q. The others were all correct?

A. Yes.

Q. Will you recite the correct figures, that is to say, the figures stated to you by Mr. Strouss which are incorrect and the corrected figures which should replace them?

A. The cost per thousand gross ton-miles on the Tucson division, main line only, as stated by Mr. Strouss for the

year 1927 was $0.454. As I checked it, it should be $0.504. For the same division, same cost, year 1925, in the record shows $0.582. I have checked it to be $0.578.

Q. Mr. Herbert, will you refer to exhibit No. 200, please?

A. Yes, sir.

Q. Have you made a study of the division records to determine which of the public crossings shown for the year 1938 were in towns and cities or within one mile of the entrance to the yard or siding on either side of the stations in such towns and cities, giving the total by number and the towns and cities where they are.

A. Yes, except that I checked the year 1939 which is the last year shown on my exhibit No. 200. Examination of the [fol. 3817] records of the Tucson division engineer's office reveals that at the following stations, namely, Yuma, Gila, Tempe, Benson, Willcox, Buckeye, Phoenix, Tucson, Chandler, Bowie, Casa Grande, Mesa, Cochise, Coolidge, and Douglas there was a total of 82 public road crossings. In addition to those eighty-two, there were two state highway crossings across the main track of the Southern Pacific in Arizona.

Q. Where were those?

A. One at Dragoon and one at Bowie at that time.

Q. Do you include in the 82 public road crossings that you have just recited a crossing at Mesa?

A. Yes.

Q. On highway 87.

A. Yes.

Q. And a crossing at Benson on highway 66?

A. Yes.

Q. I notice that you mention the station at Douglas. That involved an examination of the Rio Grande division record, did it not?

A. Yes, it did.

Q. Then, with the addition of these two at Dragoon and Bowie, there is a total of 84 crossings in all in the towns or immediately adjacent thereto out of the total shown for [fol. 3818] the year 1939, is that correct?

A. That is correct.

The Court: What is that total for the year?

Mr. Mason: As indicated by exhibit No. 200, at the end of the year 1939 it was 654.

Q. Have there been any of these 84 crossings eliminated or presently in process of elimination?

A. Yes, since 1939 up to the present time, three of the total of those 84 crossings have been eliminated or are in the process of elimination. The crossing of State Highway No. 66 at Bowie was eliminated by underpass; the crossing at Central Avenue in Phoenix was eliminated by underpass; and an underpass on State Highway No. 87 at Mesa, Arizona, is now under construction and the state highway crossing is now closed for traffic.

Q. Does your total of 84, or now 81, include any rural crossings or only those in towns?

A. Only those in towns mentioned and the state highway crossings that might be between those towns.

Q. You include state highway crossings?

A. Yes, State or Federal highway crossings. There happen to be no Federal highway crossings.

The Court: Mr. Herbert, what proceedings are necessary [fol. 3819] in order to establish a grade crossing? Can any individual at any point on the line demand that there be a crossing and the railroad fixes a crossing for him?

A. If they desire a public crossing, as I remember when I was here, they have to take it up with the State Corporation Commission, and the State Corporation Commission is the one that decides whether or not the crossing is necessary and if they find it to be necessary they order the crossing put in; as to private crossings, that, as I understand it, is just an agreement between the railroad and the party desiring the crossing. In the case of private crossings, they are covered as a rule by agreements.

The Court: You don't have the figures at hand that would show how many of these 654 crossings were private crossings and how many were public?

A. They are all public crossings.

[fol. 3820] Mr. Strouss: Those are determined by hearings before the Commission as to the public necessity and convenience?

A. Yes. There is one question the Court asked on my previous testimony, as to private crossings all having gates, whether it is fenced or not. There are cases where private crossings do not have gates, but they would still be considered private crossings and the parties entering into those agreements are responsible for the crossings.

Mr. Mason: Mr. Herbert, I show you an exhibit in a single sheet, consisting in part of a drawing or plan and in part of a tabulation, and bearing the title, "Estimated Cost of a Terminal at the Arizona-New Mexico State Line For the Reconsisting of Freight Trains." Did you participate in the making of the studies preparatory to this exhibit?

A. Yes.

Mr. Mason: May this be marked, if your Honor please, as defendant's exhibit next in order, No. 297?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 297 for identification.

Mr. Mason: Did you make a study of the track maps and [fol. 3821] station layout at the station of Cavot preliminary to the preparation of the chart and tabulation on Exhibit 297?

A. Yes, I did.

Q. Were you instructed so to do?

A. Yes.

Q. By whom?

A. By Mr. Sines.

Q. Are you familiar with the main line at or adjacent to Cavot?

A. Yes, I am.

Q. How did you acquire that familiarity?

A. Well, from my experience on the Tucson division, having worked on the ground at that point and in that vicinity for quite a few years, and a study of the records in the office of the division engineer at Tucson.

Q. Did you make any preliminary inspection of the track and the adjacent territory at Cavot for the purposes of this exhibit?

A. Yes, I made a special trip and study, on-the-ground study, for the purpose of this estimate.

Q. Now, will you say whether or not the actual track layout as indicated by your exhibit is your own plan or a plan which you were asked to consider and study from the standpoint of feasibility and cost?

[fol. 3822] A. Well, that plan was presented to me in its present form for me to ascertain the cost for such track construction.

Q. Now, what is the source of the information as to the mile-posts, grade and distances shown on the chart at the upper part of the exhibit?

A. It is from the company's track maps and profiles.

Q. What do the initials T. C. followed by degrees, minutes and seconds expressed in figures, indicate?

A. "T. C." represents total curvature.

Q. Are those figures taken from the track map?

A. Yes, they are.

Q. Is the station of Cayot immediately at the Arizona-New Mexico line?

A. It is, the Arizona-New Mexico line practically bisects the siding at Cayot.

Q. By the way, you show a dashed line at the siding of Cayot. Is that the present siding at that station?

A. Yes, it is.

Q. And the heavy line across the map is an outline of the main track, is it?

A. That is the main track.

[fol. 3823] Q. The light lines are what?

A. They are the necessary additional tracks and side-tracks.

Q. From what source did you obtain this figure of the grade which is indicated just below the map?

A. That is obtained from our detail profiles.

Q. This distance to Steins, what does the "E. SW" mean?

A. That means it is 1.73 miles from the east switch of this proposed layout to Steins, New Mexico.

Q. Would that be to the station at Steins?

A. Yes.

Q. And this figure of total curvature, state line to east switch, which you show, is that an aggregation of figures of total curvature indicated on the exhibit?

A. Yes, that is a summation of the total curvature shown for the curves shown between the Arizona-New Mexico State line and the east switch of this yard layout.

Q. Now, is that simply the total curvature of the main track, or is that the curvature of the main track considered by itself and then added to that the curvature of each of the switches as they are planned here?

[fol. 3824] A. No, that is just the total curvature of the main track alignment.

Q. Going to the lower part of the exhibit——

The Court: By the way, when was this estimate made, Mr. Herbert?

A. It was made in the last three or four weeks.

Mr. Mason: I will ask you to refer back to your exhibit 202. Did you follow the same methods in connection with the preparation of this tabulation and in the preparation of the figures which enter into the tabulation which was followed in preparing the figures on Exhibit 202?

A. Yes, I did.

Q. Where do you obtain your figures of the quantities, for example, the track feet of new sidings and of an additional track. Are those from scale measurements on the detail drawings?

A. Yes.

Q. The figures as to quantities of cut and fill? How did you determine those?

A. They are obtained from actual on-the-ground study.

Q. As to item 3, how did you obtain that figure?

A. That is also obtained from an on-the-ground study, and from our regular standard drawings of those culverts [fol. 3825] and the unit cost of their construction.

Q. As to item No. 6, did you take that from an on-the-ground study?

A. Yes, I counted the poles that would be necessary to be moved. Those, incidentally, are very heavy poles, heavy in the number of wires on the poles. They consist of about forty to fifty wires each.

Q. Now, you show in item 7, the cost of building a telegraph office. From what source do you take that figure, and the figure for the frame dwellings?

A. They are obtained from our standard drawings for such buildings and the cost that accrued from past construction of similar buildings.

The Court: Is there now a telegraph office at Cavot?

A. No, there is not. There is nothing there now except that one sidetrack and spur.

Mr. Mason: There is a concrete telephone booth there?

A. There is a concrete telephone booth there, yes.

Q. What is the source of the figures in line 4 of the estimate?

[fol. 3826] A. I obtained them from our signal engineer in San Francisco, having given him the layout plan and he in turn sent me the detail work necessary to be done and I

have examined those plans, and to my own knowledge they are correct.

Q. Have you yourself supervised the relocation of automatic block signals on this division?

A. Yes, I have.

Q. Is there any present water supply at Cavot?

A. No, there isn't.

Q. How did you obtain the figure in line 8?

A. That is an estimate of what it would cost if water was available. However, that might be problematical, whether they would find water for that money, and for that reason it might be understated. However, if water is obtained at any reasonable depth, it would cost about a thousand dollars to get it.

Q. Now, do I understand, Mr. Herbert, that as to the actual layout itself, you are not prepared to testify as to its details or the manner in which it would be used, but have simply made the study from a plan which was furnished to you?

A. That is right.

Q. In the same manner as in connection with Exhibit No. 202?

[fol. 3827] A. Yes, that is right.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Has your Honor any questions?

The Court: No.

Mr. Mason: I think that is all we have of Mr. Herbert at this time.

The Court: Mr. Herbert, if this plan were followed, does your company contemplate switching your division point from Lordsburg over to Cavot, or is this merely a proposed construction right at the state line where you might reconsist these trains?

A. Well, that might be better explained by another witness, but, as I understand it, it is just for reconsisting trains.

Mr. Mason: I propose to have Mr. Sines testify as to the operations which would be carried on, your Honor, and to offer the exhibit after he has testified in connection with it.

The Court: Any further questions of this witness?

Mr. Mason: No.

Mr. Strouss: I have none at this time.

Mr. Mason: He will return for cross-examination this [fol. 3828] afternoon. Will you take the stand, Mr. Sines?

B. S. Sines was recalled to the stand, and testified further as follows:

Direct examination (Continued).

By Mr. Mason:

Q. Mr. Sines, will you refer to defendant's exhibit No. 297 for identification?

A. Yes.

Q. Did you prepare the contemplated plan of trackage at or adjacent to Cavot which is indicated on that exhibit?

A. I did.

Q. Now, will you state, in the first place, the reason why this trackage would be located at the point indicated on the exhibit rather than at some point either east or west of that location?

A. The initial switch at the west end of the layout is placed immediately at the Arizona-New Mexico state line, and the layout then proceeds from that point easterly, the idea being to avoid exceeding the Arizona seventy-car law within the State of Arizona and at the same time to cut down the extraterritorial effect of the law to a mini- [fol. 3829] mum.

Q. Now, will you explain why the plan contemplates the sidings as proposed on the south side of the track, and, as well, why the sidings as proposed are contemplated on the north side?

A. Yes. There are three sidings on the south side of the track, consisting of a 125-car siding and 2 70-car sidings, in the order of their position from the main line toward the south. The 125-car siding is for the purpose of building up 70-car trains which would arrive from Arizona. The other two 70-car tracks would be for the purpose of receiving and holding 70-car trains while the 125-car train is in the process of being built up. At those times when it would be possible to consolidate three seventy-car trains into two 105-car trains, if those trains happened to be operated to

the maximum 70-car limit, it would be necessary to provide tracks to receive and accommodate three trains. It would take some time to assemble the three 70-car trains into two longer trains, and enough track must be provided to clear the main line while that operation was in progress.

Q. Do trains actually follow each other in present-day operation so closely as to require such storage or hold [fol. 3830] tracks to be made available?

A. Yes. A very good appreciation of that situation can be obtained from the chart which I have previously introduced of train movements on June 18, 1938, which exhibit is No. 220. On that day there would have been an opportunity to consolidate the three trains which actually arrived at Cavot at approximately 8:20, 8:30 and 9:10 A. M., and the operation would have been for the first seventy-car train to enter one of the seventy-car tracks, for the second seventy-car train to enter the 125-car track, and for the second train to pick up 35 cars from the first train, making a 105-car train, and leaving 35 cars on one of the 70-car sidings. While this operation was in progress, the third train would have arrived and would have gone in on the third track provided for its use also. Such consolidation occurs when the trains are grouped in groups of three, that is, when three trains are operating closely together. When they are scattered out, as they were earlier on that day, the opportunity for consolidation is less favorable.

The Court: What is the total distance from the state line eastward to the end of your proposed sidetracks on this Exhibit 297?

[fol. 3831] A. That would be approximately 200-car lengths or 9200 feet, or 1.74 miles. That would be the distance from the state line to the east switch of the westbound 125-car track. Operations westbound would present a somewhat different picture in that 125-car trains would approach the state line from Lordsburg and would there be faced with the necessity of setting out 55 cars, but during that operation it would be necessary to provide for the train to enter a siding and to provide for a second track upon which the 55 cars could be set out. That process would be repeated two or three times during the day until 70 cars or more had been built up, at which time a short 70-car train would be operated from Cavot into Arizona.

Mr. Strouss: I think I should have my objection in here. This exhibit has not been offered yet, and there is testimony here I want an objection to as irrelevant, immaterial and purely speculative.

The Court: Yes, it should be offered.

Mr. Mason: I intended to offer the exhibit after the witness had supported it by a study of the situation.

Mr. Strouss: For the purpose of the record I would like to move to strike this testimony.

The Court: The motion to strike will be denied.

[fol. 3832] Mr. Mason:

Q. Mr. Sines, have you made a careful study of the situation at Cavot and on the north line of the Tucson division for the purposes of the showing indicated on exhibit No. 297 for identification?

A. Yes, sir.

Q. Will you say whether or not from that study the trackage indicated on exhibit No. 297 for identification represents the trackage which would be required and necessary if reconsisting operations would be undertaken at Cavot in order to avoid extraterritorial effect of the Arizona Train Limit law?

A. It does.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 297.

Mr. Strouss: I object to it as incompetent, irrelevant, and immaterial, calling for conclusions and purely speculative.

The Court: Objection overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 297.")

Mr. Mason:

Q. Mr. Sines, I think you said the distance from the link to the east switch was 9,700 feet and, as I read the exhibit, it shows a milepost 1125 just west of the state [fol. 3833] line and milepost 1127 a short distance west of the east switch layout as planned here. Will you give the matter further consideration and say whether or not your previous estimate of 9,700 feet is correct or slightly short?

A. The 9,700 feet is short, obviously it is something over two miles in length. My statement that there were two hundred car lengths between sidings was inadequate in that I hadn't allowed for switches and cross-overs. The length is approximately 2.1 miles.

Q. Mr. Sines, from your experience as a railroad construction engineer and from your experience with railroad operations generally, will you say whether or not the territory at and immediately east of Cavot represents a satisfactory location for a terminal?

Mr. Strouss: That is objected to as irrelevant and immaterial and calling for a conclusion.

The Court: Overrule the objection, you may answer.

The Witness: Will you read the question, please?

(The question was read by the reporter.)

Mr. Mason:

Q. By that I mean, the territory immediately along the [fol. 3834] main line as presently located?

A. It does not represent a satisfactory location for a terminal.

Q. Why is that?

A. Because of the curvature and grade involved in the layout on exhibit No. 297. The principal consideration for the selection of this location was to locate a yard immediately east of the state line, but such a location would be impracticable both from an engineering and from an operating standpoint.

Q. Have you in mind the 1.4 per cent ascending eastward?

A. Yes, sir.

Q. What does a grade of that character involve insofar as switching operations are concerned?

A. It would be a very difficult switching operation. By comparison, the Tucson yard is laid out on a one per cent grade and whenever a train enters the Tucson yard our employees are instructed, and they do, because I have seen them, set the hand brakes on 15 cars on the downhill end of the train and 10 hand brakes on the uphill end of the train before the engine is disconnected.

Mr. Strouss: May the record show my objection to all of [fol. 3835] this?

The Court: Yes, it may show the objection and it is overruled.

The Witness (Continuing): On this much steeper grade we would probably insist on setting the hand brakes on every car that was left standing on the side tracks not connected to an engine.

Mr. Mason:

Q. Is Cavot in the center of the helper district?

A. It is at the easterly end of the helper district. There is a helper district from San Simon to Steins, a distance of 14 miles, and Cavot is 3 miles from Steins.

The Court: The summit is located at Steins?

A. Yes.

Mr. Mason:

Q. Does the matter of the helper service in connection with the trains made up or cut down at Cavot enter into the problem at all?

A. That would present another consideration which would have to be overcome and which would be taken care of by assigning another helper engine to the San Simon-Steins territory. I can explain what that operation would be if you think it desirable.

The Court: The Court does not think it is necessary, [fol. 3836] Mr. Sines.

Mr. Mason:

Q. How does the trackage as you have planned and shown it on exhibit No. 297 compare with the trackage as it now exists at Lordsburg?

A. We have a yard somewhat larger than this at Lordsburg where the trains are received and from which they depart and in addition to that train yard we have several thousand feet of additional track to take care of any overflow or additional storage space required. In comparison to the yard at Lordsburg, this yard is considerably smaller.

Q. How does the layout at Cavot compare with the layout of the yard at Yuma?

A. The same thing holds true with respect to Yuma. At Yuma there are eight or ten train tracks providing for the

making or breaking up of the trains in addition to which there is additional storage space.

Q. What station force would be contemplated at Cavot if reconsisting operations were undertaken?

A. We would have to have a telegraph operator on duty around the clock, that is, for the entire twenty-four hours to hand up orders to train crews and helper engines and in order to permit the operation at Cavot to be properly supervised.

[fol. 3837] Q. Would there be any necessity for a watchman?

A. Yes, occasion might arise where loaded cars would stand on these tracks for several hours and it would be necessary to provide watchman service, although whether that would require full twenty-four hours would depend upon our luck with what would happen at Cavot. If we were not bothered by pilferage, we might not have to provide a watchman all the time but undoubtedly there would be a watchman at Cavot some of the time.

Q. Would this additional trackage require any additional expense for maintenance?

A. Yes, the maintenance figure that we used for estimating the additional cost of our siding program in connection with the long train program was ten cents per foot per year. This layout provides for an additional 28,489 track feet at a cost of ten cents per foot, produces $2849.00 maintenance expense per year.

Q. What is the annual cost of the telegraphers?

A. The three telegraphers would cost $7,183.00 per year.

Q. Wages?

A. Wages.

Q. Have you computed the interest cost on the invest-

[fol. 3838] ment required to produce this layout?

A. The interest cost on the investment charged at the same 4 per cent which I have used in connection with my long train siding program computed against the $186,460 would be $7,458 per year.

Q. What does that make the total annual cost as you have computed it?

A. $17,490.

Q. I will ask you whether, predicating your answer upon your experience as heretofore related, the contemplated construction and expense at Cavot could in any way be

lessened or whether the layout and expense you have indicated represents the minimum for the purposes shown?

A. This represents a minimum for the purposes shown. I have referred to the 1.4 grade and the exhibit itself also indicates total curvature of 410 degrees. We undoubtedly would make some effort to lessen that grade by line changes and to cut down the curvature by other line changes, all of which would increase the total cost of the project.

Q. Your study does not include any expense of line change or curvature reduction or grade reduction?

A. No.

Q. You are simply taking the track as it is and building [fol. 3839] sidings alongside of it?

A. Parallel to the main line, yes.

Q. Mr. Sines, in your testimony on February 4 at page 3543 of the transcript, there was some discussion as to the relative expense items appearing on form 521 and the proportion of those expenses which had been included in the cost exhibit, showing the savings which would result or did result from long train operation?

A. Yes.

Q. I refer particularly to exhibit No. 253 which shows a figure of $.5158 per train-mile saved based upon the application of the total net saving on the 1938 redispatch to the total figure of train-miles eliminated?

A. That is right.

Q. I believe you testified that form 521 for the Tucson division for the year 1938 reflects an average cost per train-mile of $1.285?

A. Yes.

Q. What, if any, is the significance of the difference between the $0.5158 which you show on exhibit No. 253 as the average value per train-mile saved and the $1.285 which is shown on form 521 as the average cost per train-mile for the year 1938 on the Tucson division?

[fol. 3840] A. There is no particular significance in the difference in the size of those two figures in the abstract but in reviewing my testimony later I realized I hadn't completed my thought that I had in referring to form 521.

Q. Will you please explain the relationship further, then?

The Court: We will take our morning recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows.)

Mr. Mason:

Q. Mr. Sines, you were about to state the figures which the form 521 for December, 1938, shows for the Tucson division—I have that here if your Honor wants to look at them and follow the testimony.

The Court: All right.

A. The Tucson division form 521 for December, 1938, shows the following: fuel excluding line freight charges, 49.5 cent; enginemen, 23.7 cents; trainmen, 31.5 cents; engine house, 6.3 cents; other locomotive supplies, 5.0 cents; train supplies and expenses, 2.9 cents. Total, 118.9 cents or $1.189.

Q. That is the train-mile cost of the main and branch, is it?

[fol. 3841] A. Yes; if the freight line charges on fuel had been included, the cost per train-mile amounts to 1.285 cents. The reason for excluding line freight charges mentioned here is that this represents the cost to the Southern Pacific Company for fuel oil delivered to the Southern Pacific Company at such points as Yuma, Arizona, and Sparks, Nevada, by which means the Southern Pacific Company avoids paying the California sales tax on fuel oil to be used outside of the state of California. The oil companies pay the commercial freight charges and add those commercial freight charges to the California price of fuel thus offsetting the freight charges by an equal amount of revenue to the Southern Pacific Company and thus furnishing the reason for excluding such charges in the cost statement which I have just quoted.

Mr. Mason:

Q. Then the cost of fuel excluding line freight charges represents the net cost to the Southern Pacific Company?

A. Exactly.

Q. The freight charges being added in to the delivered price at Yuma and then subtracted in figuring the cost on the form 521?

A. On the form 521 it is figured both ways, the $1.285 includes the line freight charges and the note "A" appear-

[fol. 3842] ing on the face of the form 521 refers to a computation on the back of the sheet wherein the line freight charges are excluded and the net cost of the fuel is shown per train-mile.

Q. What items have you included in the cost statement which you have prepared in connection with the redispatching study?

A. I have included items for fuel, enginemen, and trainmen which for the year 1938 on the Tucson division represented a total of $1.047 or 88.2 per cent of the total, $1.189.

Q. As to train supplies and expenses, will you explain that item and why it is not included?

A. The item of train supplies and expenses which is Interstate Commerce Commission Account No. 402 is an item associated with inspecting, lubricating, cleaning, heating, icing, and watering cars and would not vary appreciably because of the adoption of long train operation inasmuch as the total number of cars handled will remain the same.

Q. You leave it out on both sides of the computation, do you?

A. I have.

Q. What as to engine house expenses and other locomotive supplies?

[fol. 3843] A. Engine house account No. 400 and other locomotive supplies which is a combined figure representing accounts Nos. 397, 398, and 399 and which in 1938 represented 9.5 per cent of the total.

Q. That is to say, engine house plus locomotive supplies jointly represent 9.5 per cent?

A. Yes.

Q. Proceed.

A. And are associated with caring for and preparing locomotives for service with water, lubricants, and other supplies for train locomotives and incidental labor and would not appreciably increase or decrease with train lengths because while the new locomotives would be somewhat larger there would be fewer of them and these expenses would probably remain at approximately the same level as those actually experienced in 1938.

Q. What other item other than the items of fuel, wages for enginemen and trainmen, and these last three items which you have been discussing, that is to say, engine house, other locomotive supplies and train supplies and

expenses, enters directly into the cost of train transportation?

A. The other direct expense is locomotive repairs, which item I covered in testimony in exhibits Nos. 254 and 255.

[fol. 3844] Q. Mr. Sines, have you made a study of the forms 521 insofar as they show the total number of freight train-miles and freight train car-miles made on branch lines and main line or branch lines and main line combined of the Salt Lake and Tucson divisions?

A. I have.

Mr. Mason: I may explain that this is in connection with your Honor's question yesterday as to mileage in the two states of Arizona and Nevada as a possible index of the opportunity for accident and casualty in the two states.

Q. I will ask Mr. Sines first whether the main and branch line train-miles and car-miles by states are immediately available?

A. No, they are not.

Q. Can they be made available by a comparatively short study?

A. They can, and I propose to have them in the course of a week.

Q. Can you give the main and branch line figures of train-miles and car-miles of the two divisions to indicate whether branch line train-miles or car-miles are substantial in proportion to the total for the divisions?

[fol. 3845] A. I have those figures for both the Salt Lake and Tucson divisions as reported on the forms 521, the operating statistics sheets.

Q. For what period?

A. For the year 1940.

Q. Will you give the figures and the percentage relationship?

A. Train-miles, main line, total, 2,451,653; branch line, 134,064.

The Court: Which division is this, Mr. Sines?

A. Salt Lake division.

The Court: Will you read those figures, Mr. Reporter?

(The last answer was read by the reporter.)

A. Total main and branch lines, 2,585,717; percentage of branch to total, 5.19. Car-miles, main line, 205,733,213;

branch line, 1,815,273; total main and branch, 207,548,486; percentage of branch to total, 0.88 or less than one per cent. Tucson division for the year 1940, freight train miles, main line, 2,493,497; branch, 175,379; total main and branch, 2,668,876; percentage of branch to total, 6.58. Car-miles, main line, 150,317,995; branch, 4,852,706; total main and branch, 155,170,701; percentage of branch to total, 3.12.

[fol. 3846] Mr. Mason: Mr. Sines, have you before you a statement in two sheets entitled "Yuma, Arizona, to El Paso, Texas, via Gila and Lordsburg, Estimated Number of Meets and Passes Eliminated by Long Train Operation, June and August, 1938; Expanded to Annual Basis"?

A. Yes.

Mr. Mason: May we have this statement marked defendant's exhibit No. 298 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 298 for identification.

Mr. Mason: Did you prepare or supervise the preparation of this exhibit, Mr. Sines?

A. I did.

Q. Will you refer first to sheet two of the exhibit and explain just what you have done in connection with that sheet?

A. The figures at the top of sheet two and directly above the dates indicated on the chart represent train counts and counts of meets and passes which were made off charts prepared for those particular dates in a manner similar to charts prepared for June 18, 1938, Exhibit No. 220.

Q. Were those charts prepared from the actual train sheets of those particular days?

[fol. 3847] A. They were.

Q. Now, in making the count of trains, did you count them in the same manner as they were counted on Exhibit 220?

A. I did.

Q. And did you count meets and passes in the same way?

A. I did.

Q. Then, what was your next step after finding the number of trains and the number of meets and passes on the various dates which are indicated?

A. Those points were plotted on the chart, sheet 2, in accordance with the scales at the bottom and right-hand

side of the chart, the number of trains being indicated at the bottom, and the number of meets and passes along the right side of the chart.

Q. I take it that each of these squares reading to the right, that is, these large squares reading from the right from the zero indicated at the foot of the sheet represents 20 and each very small square represents 2?

A. That is right.

Q. And is the same scale used in reading from zero at the foot of the chart up toward the top?

A. Yes.

[fol. 3848] Q. Then the points are plotted according to the number of trains and the number of meets and passes?

A. That is right.

Q. Then, having plotted the points, what was the next step?

A. To compute the path of a line most closely fitting the points which had been plotted according to a process of analytic geometry which gave us the equation of the line indicated on the exhibit, sheet 2.

Q. Is that a rather common and ordinary problem of plane analytic geometry?

A. It is.

Q. And did you obtain the line which is plotted as a solid curve line on the sheet in that manner?

A. I did.

Q. And solved for the equation?

A. I did.

Q. And what is that equation?

A. M equals 0.042946T to the 1.925 power where M equals the number of meets and T equals the number of trains. That should be "number of meets and passes."

Q. Now, given the number of trains on a particular day, [fol. 3849] can you by means of that formula or that equation obtain the number of meets and passes in the territory between Yuma and El Paso via Gila, Tucson and Lordsburg?

A. Yes, in the average aspect.

Q. Now, will you turn to Sheet 1 of the exhibit and, referring to column B, state from what source it is taken?

A. That is taken from a count of the trains actually operating in freight service in the territory between Yuma, Arizona, and El Paso, Texas.

Q. Is that taken from the actual train sheets?

A. Yes.

Q. And column C, what is that?

A. That indicates the number of passenger trains operating on the dates indicated.

Q. That is a train count made in the same way as you made the train count for exhibit No. 220?

A. Exactly.

Q. And what is column D?

A. The total of the preceding two columns.

Q. Did you follow the same process as to the columns collectively headed "Actual" for the entire period of 61 days, from June 1st to 30th, and August first to 31st, indicated here?

[fol. 3850] A. I did.

Q. Now, how did you obtain the figures in column E for each of these days?

A. That was read off the chart which is sheet 2 of this exhibit, by entering the chart, using the number of trains indicated in column D, ascending on the train line to the point where the train line intersected the curve on sheet 2 and then reading the number of meets and passes on the scale to the right opposite the point of intersection.

Q. Is that equivalent substantially to solving the equation which is shown on sheet two?

A. The same thing.

Q. Now, going to the part of the first sheet headed "Redispatched," where did you obtain the figures in column F?

A. From a count of the freight trains appearing on the redispatch train sheets for the months of June and August.

Q. Is that an actual count from the redispatch train sheets for the dates indicated?

A. Yes, sir.

Q. And for passenger trains, did you use the same source?

A. The same.

[fol. 3851] Q. And obtained the totals in column H the same way as in column D?

A. Yes.

Q. How did you obtain the figures in column I?

A. Those figures are read off of the chart, sheet 2, in a manner similar to the figures appearing in column E.

Q. And the figures at the foot of the sheet appearing with the word "total" to the left of the line, what are those?

A. Those are summations of the figures appearing in the columns immediately above.

Q. And the line headed "meets and passes eliminated by redispatch study," what is that?

A. That is the difference in the totals, appearing at the foot of columns E and I.

Q. You subtracted the total in column I from the total in column E?

A. Yes.

Q. How did you obtain the final figure in the lower righthand corner of the first sheet of the exhibit?

A. By expanding the different figures just described in the ratio of 17.89 to 100.

Q. That is the ratio of the gross ton-miles made on the district in question during June and August, 1938, as com-
[fol. 3852] pared to the gross ton-miles made on the district during the entire year 1938?

A. Yes, sir.

Q. As explained in connection with previous exhibits?

A. Yes, sir.

Q. Have these computations been checked?

A. They have.

Q. Are you as a mathematician prepared to state that the equation as shown on sheet 2 of the exhibit is the correct solution?

A. I am.

Q. And does the exhibit represent the application of ordinary mathematical principles to this particular problem?

A. Yes.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has your Honor any questions?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as Exhibit No. 298.

Mr. Strouss: Objected to as irrelevant and immaterial, purely speculative, and building an inference on an inference.

[fol. 3853] The Court: Just one question the Court wants to ask before ruling on it. It seems to the Court that the exhibit as now presented, which, of course, is another way of attempting to get into evidence the matter excluded under Exhibit 221, we do have now under the actual col-

umn a summary of the actual operations for the two months June and August, 1938, and also a summary of the redispatched trains during that same period. Now, while this other is not in evidence, I am going to refer to it. I notice, Mr. Sines, that on the exhibit 221, which was rejected, that using the mathematics there employed, that you arrived at a net decrease in the number of meets and passes for the year as being 15,337, whereas now you reach a total of 16,512. Can you reconcile those two figures?

A. Yes. The first figure of 15,000 plus was obtained by applying this formula against 24 individual days chosen for each month over the year 1938.

Q. That is, the first and the fifteenth?

A. Yes.

Q. Now, as a matter of fact, however, on exhibit 221, when you came to the matter of the redispatch, trains were not actually redispatched except during the months of [fol. 3854] June and August?

A. That is all.

Mr. Mason: You simply applied in getting the redispatched trains a constant factor of reduction in exhibit 221 for identification?

A. Yes.

Q. Whereas, in Exhibit 298 for identification you have used the actual redispatch?

A. Taken the results of the redispatching study for the 61 days, then expanded that to an annual basis.

The Court: Well, I am going to overrule the objection and admit it in evidence for what it is worth.

(The document referred to was received in evidence, and marked "Defendant's Exhibit No. 298.")

Mr. Mason: I suggest, your Honor, that even if the redispatch portion of the exhibit were entirely disregarded, we would still have the showing as between June and August actually, which would indicate how meets and passes can and do fluctuate as actual operations increase or decrease, because June was a month of heavy traffic and August a month of light traffic. We would still have a substantial comparison whether or not the redispatch columns are considered at all.

[fol. 3855] The Court: Well, it is somewhat speculative.

Mr. Strouss: I think that is putting it mildly.

The Court: I was sure you would agree with me.

Mr. Mason: Mr. Sines, have you prepared a statement in one sheet bearing the title, "Redispatch Study, June and August, 1938, Extraterritorial Effect of Arizona Train Limit Law Between Arizona-New Mexico State Line and El Paso, Texas."?

A. I have.

Mr. Mason: We ask that this statement be marked No. 299 for identification.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 299 for identification.

Mr. Mason: I wish you would refer, please, Mr. Sines, to Exhibit 253, and will you explain what change or difference, if any, there is between Exhibit 299 for identification and exhibit No. 253?

A. In Exhibit 253 the average cost per train-mile saved is based upon a figure appearing on Exhibit 252, which includes the saving of $397,515 per annum estimated to accrue to freight service and $10,884 estimated to accrue [fol. 3856] in passenger service should long-train operation be adopted. On exhibit 299 I have eliminated the $10,884 saving accruing to passenger service in computing the average saving per train-mile saved of 0.4988 dollars appearing at the bottom of exhibit 299.

Q. Now, in exhibit No. 299 for identification, you show the blank reference in the footnote at the bottom. Should that be filled in with reference to Exhibit 252?

A. 252, yes.

Q. As I understand you, all that you have done is to recompute the figure indicated on Exhibit 253, but eliminated all reference to the passenger train saving which is computed at $10,884 per year, as shown on exhibits 231 and 252?

A. That is right.

Q. So that the total figure on exhibit 299 for identification, as representing the monetary saving between the Arizona-New Mexico state line and El Paso, is based entirely upon freight train operations?

A. That is right.

The Court: That accounts for the difference between the total figures shown in line 5 of exhibit 253 of $78,293 as compared to the total shown in this exhibit 299 of [fol. 3857] $75,712?

A. Yes.

Q. It is that fractional percentage of 10,000 that would apply east of the Arizona-New Mexico line?

A. It is made up largely of that amount of passenger service east of the state line, but there was also a small amount of passenger service between Los Angeles and Yuma that became involved in the computation.

Mr. Mason: This merely eliminates entirely any distortion which might have occurred on that account?

A. Exactly.

Q. Has the exhibit been compared and checked, Mr. Sines?

A. It has.

Q. Are the computations correct, to the best of your knowledge and belief?

A. They are.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Has your Honor any questions?

The Court: No.

Mr. Mason: We offer it in evidence as defendant's Exhibit No. 299.

[fol. 3858] Mr. Strouss: It is objected to as wholly irrelevant and immaterial.

The Court: Overrule the objection. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 299.")

Mr. Mason: I think that closes our case, subject to cross-examination.

(Thereupon, the matter of the resumption of proceedings was discussed between Court and counsel off the record.)

The Court: Then, for the record, the Court will be at recess until February 17th at ten A. M., at which time the witnesses for the defendant required by the State for

cross-examination will be ordered to be present with whatever records may be necessary.

(Thereupon, the court stood at recess until Monday, February 17, 1941, at ten o'clock A. M.)

[fol. 3859] February 17, 1941, ten o'clock A. M.

Proceedings were resumed at this time as follows:

The Court: You may proceed, Mr. Strouss, with cross-examination of the defendant's witness.

Mr. Strouss: With respect to the cross-examination of Mr. Bruns, a witness from the Santa Fe, I told Mr. Sines during the last week that if we could stipulate to the putting in evidence of the timetables, the employees' timetables, covering divisions or territory covered by his testimony and the engine ratings over that territory, that it would not be necessary to bring him back, and we are going to do that. We have the timetables but not the engine ratings.

Mr. Mason: Albuquerque Division, No. 78, and the Arizona Division, No. 94, those two employees' timetables are already in evidence in connection with the testimony of Mr. Mahoney, but the Pecos——

Mr. Strouss: They are?

Mr. Mason: Yes, you remember when the New Mexico Division and these two divisions were put in evidence, but the Pecos Division, that table is not in evidence. However, if this has the engine ratings——

Mr. Strouss: It doesn't have the engine ratings.

[fol. 3860] Mr. Mason: I have asked Mr. Bruns to supply those engine ratings. They will probably be in our hands early this week; in any event, they will be supplied.

The Court: Do you want to offer these?

Mr. Strouss: Well, if the other two are in, there is no necessity of putting in——

Mr. Mason: Those are in.

Mr. Strouss: Then just the Pecos Division.

The Court: They may be admitted in evidence, the employees' timetable No. 68 of the Santa Fe, the Pecos Division.

(The document referred to was received in evidence and marked, "Plaintiff's Exhibit No. 300.")

W. H. KIRKBRIDE was recalled to the witness stand.

Mr. Strouss: I will ask that this be marked for identification.

The Clerk: Plaintiff's Exhibit No. 301 for identification.

Mr. Mason: May I see the exhibit?

(Mr. Strouss hands the exhibit to Mr. Mason.)

[fol. 3861] Cross-examination.

By Mr. Strouss:

Q. Mr. Kirkbride, I hand you plaintiff's Exhibit 301 for identification. That is a part of the profile map of the Southern Pacific Lines between Tucson and the New Mexico-Arizona line, is it not?

A. Yes, sir.

Q. That is a part of the records of the company, of the Southern Pacific Company?

A. It is.

Q. And truly portrays the matters set forth?

A. It does.

Mr. Strouss: We offer this in evidence.

The Court: Any objection?

Mr. Mason: I would like to ask the witness a question or two about it, to be sure I understand what it is.

Q. Mr. Kirkbride, the document you have had handed to you and which is marked for identification No. 301, is the profile of the line in the neighborhood of the stations of Curvo and Sibyl, is it, on the north line of the Tucson Division between Benson and Dragoon?

A. Yes, sir.

Q. In the vicinity of mile-post 1037 to 1041 approximately, [fol. 3862] is that correct?

A. That is correct.

Q. Now, does this show the condition of the line as it is today or as of what date?

A. It isn't necessarily correct with reference to the data that is shown on the lower portion of the profile; for instance, with reference to 90-pound rail and full tie-plated and rock ballast, that data is not necessarily correct, but the profile, the elevations and the mile-posts represent the railroad as constructed.

Mr. Strouss: And curves?

A. I don't know where these prints came from, that is, they may be old prints, not necessarily reflecting local line changes.

Mr. Strouss: Let me interrupt here just a minute. I asked for the profile of the lines of the Southern Pacific. If there is any contention they are changed, I ask for profiles up to date, and I ask to defer my cross-examination.

The Witness: These blueprint profiles are substantially correct, but they are not kept up for statistical purposes. As I have explained, with reference to the tie-plates and rock ballast and rail, we don't keep the data on these profiles, so that these profiles are relatively——

[fol. 3863] Mr. Strouss: (Interrupting) Well, I would ask of counsel, if there is going to be any contention that these are not up to date, if there is, I want them up to date.

Mr. Mason: Your Honor, as the witness has just explained, we don't undertake to keep the data of changes of rail or changes of ballast or track construction on these data. Now, as the witness has so explained, this does show the grades and other characteristics of the line in that respect, I assume substantially as of the present date, is that correct, Mr. Kirkbride?

A. Substantially so; but may I explain that in the laying of rail and in the ballasting we apply spirals to our curves and make slight alterations to the central angles and the degree of curvature. I may further explain that in the original construction of this railroad, some curves were laid without tapers, which may be explained as easement curves at the end of the main curve. Some of them were equipped with tapers. Our modern method of aligning curves is to apply spirals, and these spirals are always longer than the old original tapers and, furthermore, if a curve doesn't have in its original construction a taper, why, we apply a spiral to it.

[fol. 3864] Mr. Strouss:

Q. When you do that, don't you make a new profile map?
A. We keep records in our office, but I cannot say that this represents the latest record.

The Court: Where did that profile in your hand come from; what is it taken from?

A. It is one of many sheets that came out of my office but it does not necessarily reflect the changes that might have been made as I have just explained. It is basic construction profile, may I say that, that it is the basic construction profile.

Mr. Strouss: I would like to have produced any records where there have been any changes in the road bed, that is, the grades or curves, and I asked for those profiles and assumed that I had everything to date. That is what was given to me.

The Court: I take it it is understood, Mr. Strouss, that the data with reference to the weight of the rails and the ballast, you are not concerned with those?

Mr. Strouss: No, I am not concerned with them.

The Court: Mr. Kirkbride, do you have a profile map in your office that is up to date if this one before you is not correct?

A. We have the data, but I wouldn't say that all profiles [fol. 3865] of this character are right up to the date with reference to the exception I have just made.

Mr. Mason:

Q. Do those exceptions make any substantial change in the ruling or maximum grades indicated on the face of the profile?

A. Probably they do not. I am not advised as to just the questions you are going to ask, but I would say I don't think they are of substantial merit.

The Court: In other words, you would say that the ruling grade is correctly shown on the profile in your hands?

A. The ruling grade can be determined from the profile that we have. The ruling grade is not shown on this profile, but the grade lines and curves as this railroad was actually constructed are shown correctly on this profile.

Mr. Mason: I think to save any question that we can agree that the changes which would be accomplished in the course of re-laying rail would be so slight they would not affect any data of grade or line and this may be taken as indicating the grades and curves to within a very small percentage; isn't that correct, Mr. Kirkbride?

A. I think so.

[fol. 3866] Mr. Mason: With that understanding we will not offer any objection to the exhibit.

The Court: It may be admitted in evidence.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 301.")

Mr. Strouss:

Q. Mr. Kirkbride, will you take up exhibit No. 301 and explain the different symbols that appear on the face of the exhibit. In the upper lefthand corner appears a line which the figures, one degree 24 minutes L. What does that indicate?

A. That means that at that locality there is a one degree and 24 minutes curve to the left.

Q. A little further to the right appear the letters "CC"?

A. That is a compound point of a curve.

Q. Two degrees L would mean——

A. That means that the one degree and 24 minutes curve to the left changed to a two degree curve to the left.

Q. And the next curve is indicated by the heavy black line; is that correct?

A. Approximately so, yes, sir, but the exact stationing is more accurate. For instance, the end of that curve is shown as engineer's station 7 plus 78.0. To get the full stationing, [fol. 3867] you look lower down and find that the full stationing is 29,927 plus 78.0.

Q. Dropping down, the figures plus 1.372 on the slanting line, what does that indicate?

A. That means that the actual rise on that particular stretch of track which is around one degree and 24 minutes grade is 1.372 feet per hundred feet of distance, or, in other words, a 1.37 per cent grade.

Q. Going back to the top again at the end of the heavy line there, there is a space and then another heavy line. What does that space between the two heavy lines indicate?

A. I do not understand the question.

Q. The figures 7 plus 78 engineer's station?

A. I have just explained what 7 plus 78 means.

Q. That is your engineer's station?

A. Yes.

Q. Continuing to the right, the black line ends at that engineering station. Does the fact that there is no black line there indicate tangent track at that point?

A. Do you mean the black line or white line?

Q. I am sorry, I have been talking from the photograph copy. It would be the white line.

A. Do you refer to the question between this point and [fol. 3868] this point (indicating)?

Q. Yes, if you will indicate the figures.

A. Following along on the same line, you will note figures reading 1 plus 01.5 BC, that is the beginning of a six degree and 30 minutes curve to the right. The distance between previous station mentioned, namely, 7 plus 78.0 and one plus 01.5 BC, is tangent track.

Q. Do you know what the scale of this map is?

A. By referring to the lower portion of the sheet, you will note the first notation to be 30,008 and ten space further across the letters 90. That means we have advanced one thousand feet. Each small subdivision in the horizontal way being equal to one hundred feet. Now, vertically, five of the small spaces represent five feet.

Q. At the top again, in a circle appears the figure 1037?

A. That is the distance from San Francisco.

Q. Does that indicate a milepost there?

A. A milepost physically on the ground is designated by a sign on the nearest telegraph pole. The profile shows the exact milepost by the stationing.

Q. The center of the sheet, is that a continuation of the line as shown across the top; in other words, this sheet is in [fol. 3869] three parts, is it not?

A. For the purpose of keeping a certain stretch of profile within the limits of the sheet, we have the method of breaking the profile and dropping to a lower elevation on the profile, but of course the point being the same elevation as that above.

Q. The part in the center is the continuation of the line after you reach the upper righthand corner of the sheet?

A. I will answer your question this way, that that profile in the upper line terminated at a point called zero plus zero, elevation 3769.306. Now we drop down lower on the profile sheet and we start at the same identical point again and it is marked the same elevation, namely, 3769.306.

Q. The only difference being that you drop down lower on the sheet?

A. Drop down and started a new datum plan.

Q. The same would be true with the bottom part?

A. That is true.

The Court: What do the figures at the extreme top of the sheet represent, 183 and 184 and so on?

A. That is the number of the curve. In other words, just for the purposes of maintenance the roadmasters or the division engineers would refer to curve No. 184 and the next curve is curve No. 185, the zero point being usually [fol. 3870] at the commencement of the division.

The Court: Approximately what distance is covered by this particular profile, exhibit No. 301?

A. Nine thousand feet.

Q. You mean on just the one-third of it?

A. I referred to the length of the profile as representing nine thousand feet of track. Then, the central portion again represents nine thousand feet of track and the lower portion again represents nine thousand feet, so; all told, there is twenty-seven thousand feet of track represented.

Mr. Mason: Mr. Kirkbride, I notice right under the word "Curvo" in the center section of the exhibit there is a vertical black line and then apparently there is an interruption of the profile with approximately a thousand feet there, where the vertical black line appears under the word "Curvo." Does that mean there is a thousand feet of the drawing that is not used?

A. It becomes necessary to establish what we call "equations" and it will be noted that on the lefthand side of the vertical line there appears engineer's station 30,007 plus 42.10. That identical point is equal to 30,006 plus 38.5 in [fol. 3871] measuring the line eastward. There will be other equations shown, for instance, near milepost 1039, 30,049 plus 75.3 is equal to 30,049 plus 74.9. Going back to the question as to the vertical line below "Curvo," there is quite a difference, so it is necessary for the draftsman to advance to the next rectangle in order to start his station.

Mr. Mason: The total distance covered by the drawing can be approximated fairly well from the mileposts, can't it?

A. Yes, sir.

Q. And that would indicate it is something in excess of four miles and not quite five, as I read it?

A. That is correct.

The Court: Mr. Kirkbride, what does this jagged line represent in your middle section of the profile? You have

a straight line, that line being crossed at intervals by this other wavy line.

A. That jagged line with valleys and peaks is a profile of the natural ground along the center line of the track as originally surveyed. For instance, immediately above the word "Curvo" and just to the left of the numerals "5 plus 55.1" the jagged apexed line represents a cut approximately twenty feet in depth. Immediately eastward or to [fol. 3872] the right of 5 plus 55.1 the jagged line is below the grade line which we call "formation grade" and that fill is about fifteen feet in depth.

[fol. 3873] Mr. Strouss: Under the lines at the top left-hand corner, I neglected to ask you what the symbol "T. C. 24 degrees, 39 minutes" means.

A. The total curvature or central angle of the curve is 74 degrees, 39 minutes and [illegible] seconds.

Q. And the letters "E. C." at the end of the line mean end of curve?

A. That is correct.

Q. And where it has at the lefthand of the line "B. C." would mean beginning of curve?

A. Beginning of curve.

Mr. Strouss: Do you have any more questions?

Mr. Mason: Mr. Kirkbride, I take it that the natural peaks and valleys of the surface of the ground as it existed at the time the line was constructed are considerably exaggerated by reason of the nature of the drawing?

A. That is true.

Q. The vertical scale is out of proportion to the horizontal scale?

A. That is true.

Mr. Strouss: May these be marked for identification?

The Court: They may be marked.

The Clerk: Plaintiff's Exhibits 302 and 303 for identification.

[fol. 3874] Mr. Strouss: Mr. Kirkbride, I hand you plaintiff's Exhibit 302 for identification and ask you is that a part of the profile map of the Southern Pacific Company between Tucson and the New Mexico-Arizona line?

A. That is correct.

Q. It is a part of the records of your office?

A. It is.

Q. And portrays the territory near Irene?
A. It does.

Mr. Strouss: We offer this in evidence.

Mr. Mason: This is a part of the line between Tucson and Mescal, is it, Mr. Kirkbride?

Mr. Strouss: East of Mescal, isn't it?
A. Yes, sir.

The Court: Pardon me, I didn't get the answer. Between Tucson and Mescal or the other side of Mescal, is it?

A. It is west of Mescal.

Mr. Mason: And which line is this, the former Southern Pacific or former El Paso and Southwestern?

A. It is the former Southern Pacific.
Q. This is the eastbound line of the two?
A. It is.

Mr. Mason: No objection.
[fol. 3875] The Court: It may be admitted.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 302.")

The Court: Pardon me, Mr. Strouss, where is Curvo located?

A. Curvo is between Benson and Dragoon.

The Court: Go ahead.

Mr. Strouss: I hand you plaintiff's exhibit No. 303 for identification and ask you if this is also a part of the profile maps of the Southern Pacific Company lines between Tucson and the New Mexico-Arizona line?

A. It is.
Q. This is the portion of the line following immediately after the Curvo sheet, is it not?
A. It is.
Q. This is also a part of the records of your office?
A. It is.
Q. And correctly portrays the information that is there given?
A. It does.

Mr. Mason: In accordance with our understanding?

Mr. Strouss: Yes, in accordance with our understanding. I offer this in evidence.

[fol. 3876] Mr. Mason: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 303.")

Mr. Strouss: Now, if counsel will stipulate, we will substitute the photographic copies for the original.

Mr. Mason: Yes, I have no objection to the use of the photographic copy instead of the original.

The Court: The substitution then may be made.

Mr. Strouss: And the photographic copies marked as an exhibit in place of the original?

The Court: Yes.

Mr. Strouss: Mr. Kirkbride, in your direct examination you testified, page 2055, "Question: Are the lines in Arizona lines of continuous curvature or with considerable tangent track? Answer: Long tangents and flat curves are characteristic of the alignment." Then at page 2061, "Now, in respect to tangent track and curvature from the Nevada state line eastward, is the situation in Nevada and Utah substantially the same as you described in Arizona?" And you answered, "They are." Now, will you take the profile maps of the lines through Nevada and show me the [fol. 3877] territory there that is substantially the same as that at Curvo and at Sibyl and at Irene?

A: Where are the exhibits?

Q. Let me ask you first, withdrawing that question for a minute, you testified at page 2060, "There are long stretches of tangent track and flat curves ranging from nine degrees and 30 minutes to four degrees, with a few six-degree curves."

Mr. Mason: I think, by the way, that line 25 there, where it says, "nine degrees" should read "no degrees." That is the way I have noted here a correction to be made in the transcript at that point. Obviously, nine degrees wouldn't be correct in that respect, because the witness said, "Ranging from nine degrees and 30 minutes to four degrees, with a few six-degree curves."

Mr. Strouss: If that is the testimony——

Mr. Mason: I know that was improperly recorded there.

Mr. Strouss: I was about to ask the witness to point out to me any nine-degree curvature in Nevada.

Mr. Mason: Well, he said that the maximum was six degrees, so it couldn't have been nine.

[fol. 3878] The Court: Is this the testimony of Mr. Kirkbride?

Mr. Strouss: Yes.

The Court: His attention might be directed to that testimony, and ask him if it is correct or not.

Mr. Strouss: If that should be "none" we can correct it.

Q. Do you see what I am referring to at the bottom of the page there, Mr. Kirkbride?

A. That word "nine" is in error and should be "no" or "zero," more properly "zero degrees." I want to make myself plain, change the word "nine" to "zero."

The Court: Well, the correction may be made then on the original record.

Mr. Strouss: As a matter of fact, Mr. Kirkbride, there is only one curve as sharp as six degrees in Nevada, isn't that true?

A. There are six-degree curves.

Q. Curves? Or, is it a six-degree curve?

A. Well, I can't be positive of that. I think there are some six-degree curves, but I am referring to the properties generally. I am comparing the State of Nevada as a whole with the State of Arizona.

Q. You are not talking about main line then?

[fol. 3879] A. Yes, main line, but the subject has to do with the lines across Nevada, and in this case, Utah, and the lines across the state of Arizona.

Q. From the Utah-Nevada line to the California-Nevada line?

A. Yes, sir.

Q. And from the New Mexico-Arizona line to the California-Arizona line?

A. Yes, sir.

Q. And you say there is more than one six-degree curve?

A. Oh, well, I can't positively say that, but this statement is correct, "there are long stretches of tangent track and flat curves ranging from zero degrees and thirty minutes to four degrees, with a few six-degree curves." It is my recollection that there are a few six-degree curves.

The Court: You mean in the state of Nevada?

A. Yes, sir.

Mr. Strouss: I would like to have you, Mr. Kirkbride, if you will, during the recess at noon check the profile in Nevada and be prepared to testify after noon as to how many six-degree curves there are on that line. There are no curves in excess of six degrees in Nevada, are there?

[fol. 3880] A. I don't recall any.

Mr. Mason: I take it, you are referring now, Mr. Strouss, to the principal main line which enters the state of Nevada at Calvada and leaves the state east of Lucin?

Mr. Strouss: That is correct.

Mr. Mason: You have no reference to the Fernley line or any of the branches?

Mr. Strouss: No, I am not referring to the branches, I am speaking only of the main line between Sparks, well, it would be the California line west of Sparks and the Utah Nevada line near Lucin.

Q. Now, then, will you refer to the profile map of the main line across Nevada, and point out what territory in Nevada is comparable to the territory shown in exhibits Nos. 301, 302, and 303?

A. Well; I don't have the profiles available. For instance, the line over the Pequops between Wells and Montello is quite comparable to certain summits we have in Arizona. Now, if you refer exclusively to the degree of curves, then the curvature over these summits in Arizona, which are very limited in length, are sharper than the curves, for instance, in Nevada over the Pequops. The [fol. 3881] gradients and the cuts and fills, the character of the formation and ballast conditions and climatic conditions are almost the same.

Q. Could you take these profile maps and indicate the territory as shown on the profile maps?

Mr. Mason: Have you the Nevada profile maps?

Mr. Strouss: These are the Nevada profile maps.

Q. Would it take very long to do it? Or, if you prefer, you can do it during the noon hour.

A. We are covering a good many miles of track, and I think my last answer is responsive to your question, is it not?

Q. I would like to have you show on the profile maps, Mr. Kirkbride.

A. What do you mean by the word "comparable"?

Q. You testified that it was comparable.

A. I was dealing with all the phases of the problem of comparing two railroads. Now, if your word "comparable" deals only with curvature, eliminating all other factors of the railroad, why, I will answer that, of course, accordingly.

Q. Well, show me the territory comparable so far as grades and curves are concerned, and then any other territory that you had in mind when you testified that it was [fol. 3882] comparable to the territory indicated in these exhibits; also that which would be comparable to the territory between Mohawk and Estrella in Arizona. You are familiar with that territory. Or Sibyl and Dragoon. Now, if you will do that at noon.

A. Yes, sir.

Mr. Strouss: That is all I have then.

Mr. Mason: Is that all you will have of Mr. Kirkbride?

Mr. Strouss: Yes, until he has examined these.

Mr. Mason: Will you want to suspend the cross-examination for the time being?

Mr. Strouss: Yes.

The Court: We will take our mid-morning recess at this time.

(Thereupon, a short recess was taken, after which proceedings were resumed as follows:)

[fol. 3883] JOHN J. SULLIVAN resumed the witness stand for further examination as follows:

Cross-examination.

By Mr. Strouss:

Q. Mr. Sullivan, in testifying concerning exhibits Nos. 260 and 261 of reportable accidents where employees were concerned, you testified, I believe, that under the rules an accident must be reported where the employee is incapacitated from performing his ordinary work for a period of at least three days out of the first ten days following the accident?

A. More than three days.

Q. Yes, more than three days out of the first ten days.

A. That is correct.

Q. If an employee were to have a finger cut off but reported back to work at the end of the third day and was permitted to work, that would not be a reportable accident, would it?

A. It may and it may not be. If he was able with the amputated finger to perform all of the normal and regular duties of the position, it would not be reportable. If he was not able to perform all of his duties, although able to [fol. 3884] perform some of the duties, it would be reportable.

Q. I am thinking of an accident with respect to a shop man. Isn't it a fact that a short time ago in the shops in Tucson an employee did have a finger amputated and was back to work at the end of the third day and no report was made of the accident?

A. I know nothing about it. May I read from the Interstate Commerce Commission's Bureau of Statistics interpretation of rules governing monthly reports of railway accidents issued March, 1934, on that subject?

Q. Yes, go ahead, that is a part of your exhibit, isn't it?

A. No, it is not. I only have the one copy. It is entitled "Interstate Commerce Commission, Bureau of Statistics," over the seal of the Commission, dated March, 1934, "Interpretation of Rules Governing Monthly Reports of Railway Accidents, 1922 Revision." Interpreting under the caption, "Sufficient to incapacitate," the phrase, "sufficient to incapacitate," means "sufficient to prevent a person from doing his usual work by reason of possible future consequence or because of pain or limitation of function, [fol. 3885] whether such pain or limitation results from the injury, subsequent infection or from the bandaging or treatment. Thus the laceration of a finger might not in itself prevent a man from doing his usual work, but if the hand is bandaged in such a way as to prevent him from doing his usual work his injury should be considered sufficient to incapacitate him. In like manner, if the dressing of an otherwise minor injury to a dining car steward, waiter, ticket clerk or other employee who is required to meet the public makes it undesirable for him to do so, in opinion of the railway management it must be considered sufficient to incapacitate him. If a trivial injury develops infection suffi-

ciently severe to prevent performance of usual work, that injury must be regarded as sufficient to incapacitate." Following under the caption, "Performing his ordinary duties," reads, "the phrase 'performing his ordinary duties' is interpreted to mean performing fully and acceptably and without extra assistance all the duties customarily included in the regular assignment of the employee at the time of injury. For example, a brakeman or switchman must be able to walk, throw switches, get on and off cars and set brakes. A fireman must be able to fire an engine, take water, shake grates, etc. A track man must be [fol. 3886] able to walk, remain standing at work, use wrench, shovel, rake, etc. A carpenter must be able to stay on his feet, walk, set and drive nails, use hand saw and other tools in a workmanlike manner. A machinist must be able not only to operate his machines but to do the customary work in connection with the placing of the material in position on the machine and removing same. A person whose ordinary duties consist of manual work must have the reasonable use of his hands and feet. He must be able to turn out a customarily acceptable amount of work."

Q. Your exhibit No. 262 covers casualties to all classes of employees, train and train service accidents, Class I railroads?

A. All classes of employees on duty.

Q. That includes both passenger and freight operations?

A. That is correct.

Q. And all types of accidents?

A. All types of train and train service accidents. It does not include nontrain accidents.

Q. All types of train and train service accidents?

A. That is right.

Q. Whatever the cause?

[fol. 3887] A. That is correct.

Q. It includes all employees, service employees in all classes of service such as yards and shops or whatever the class of service as long as it was the result of a train or train service accident?

A. Yes. You said "shop." It is almost impossible to have a train or train service accident in the shops.

Q. A shop employee might be out some place where he would be subject to a train or train service accident?

A. He would be reportable in that case, that is correct.

Q. The exhibit merely shows the trend of improvement in the number of casualties, isn't that the purpose of the exhibit?

A. Yes, it shows the improvement in the trend to all employees on duty who suffered reportable injury in train and train service accidents.

Q. From any cause?

A. From any cause, yes.

Q. The figures in columns B, C, D, and E, those include motor train operation, do they not?

A. That is correct, because if an employee was injured in a motor train accident it would be reported under either column F or G.

[fol. 3888] Q. I notice you have broken your exhibit down into sixteen years from 1923 to 1938 into three periods—1923 to 1928, inclusive; 1929 to 1934, inclusive; and 1935 to 1938; the first two periods being six-year periods and the last period being a four-year period. If the years 1929 and 1930 were eliminated from the second period, there would be very little difference between the last two four-year periods, isn't that true?

A. I would have to calculate that, but there would be a difference because the casualty rate, for instance, on a car-mile basis in column I, shows the casualty rate of 37.29 casualties per million car-miles, that is considerably higher than the rate in any of the years 1935 to 1938. Likewise, the year 1932 is higher than any year 1935 to 1938. The years 1933 and 1934 are lower than 1936 and 1937 only.

Q. How did you happen to select the periods which you did?

A. It might not have been necessary to select any periods but I have studied accident and casualty statistics for many years and from that study I know that comparing one year with another is not always a satisfactory measuring stick. In my opinion the six-year cycle was a satisfactory [fol. 3889] basis, it couldn't be equally divided and when I prepared the exhibit I anticipated I would have the figures for 1939 available for this latest block and that would still give cycles of six, six, and five. I could have prepared it with fewer years in the cycles but I didn't consider it necessary.

Q. It is possible from your exhibit to make the comparison of the four-year periods between 1930 and 1938, two four-year periods?

A. The way the exhibit is prepared, the comparison can be made one year with any other or anyone by making their own calculations could prepare any cycle of years that they preferred.

Q. That would be merely a calculation from the exhibit?

A. That is correct.

Q. Exhibit No. 263 has the same purpose, to show the trend of improvement, and it is similar to exhibit No. 262 except that it is reduced to trainmen and enginemen on duty?

A. In road service; it excludes enginemen and so-called trainmen in yard service.

Q. Is that true? Casualty to trainmen and enginemen on duty, all classes of service?

A. In any class of service where you may have road [fol. 3890] trainmen, that would include both passenger and work.

Q. This is limited to road service?

A. It is limited to road trainmen and enginemen on duty as classified by the Interstate Commerce Commission.

Q. Let me understand, do you mean on duty in road service or would service in the yards be included?

A. If there are any railroads which have road trainmen and enginemen working in yards, it would be included because this is an exhibit not as to a particular service but as to a particular class of employees.

Q. This includes both passenger and freight operations?

A. It does.

Q. And it also includes motor train operation?

A. Yes.

Q. This exhibit again is divided into two six-year periods and the four-year period?

A. That is correct.

Q. It is also possible from this exhibit to determine how much improvement there has been since 1930 by mere calculation?

A. That is correct.

[fol. 3891] Q. Exhibit No. 264 is a further elimination and applies to freight service only?

A. Well, generally that statement is correct, Mr. Strouss, but it is confined to road freight train men and enginemen on duty. It is not an exhibit as to service but as to a particular class of employees and generally road freight train

men and enginemen are in freight train service, but generally the road freight train men and enginemen and work trains and on occasions road freight train men and enginemen might be injured in a passenger train accident, run over by a passenger train, for instance, that would be included in this exhibit.

Q. This does include work train operation?

A. It does.

Q. And motor train?

A. Yes.

Q. The two previous exhibits included work trains also?

A. Yes, sir.

Q. This exhibit is to show the trend so far as this class of employees is concerned?

A. That is correct.

Q. Again the comparison is the two six-year periods and the four-year period?

A. That is right, and the comparison is by years also. [fol. 3892] In other words, casualty rates and the absolute number killed and injured and the casualty rates appear for each of the years shown.

Q. It is also possible from this exhibit by mere calculation to determine the percentage of improvement from, say, any period in 1930?

A. That is correct.

Q. Exhibit No. 265 is similar except that it is reduced to a still smaller class, road freight conductors, brakemen and flagmen on duty?

A. Yes, this exhibit eliminates from the other exhibit any casualties to engineers, firemen, and firemen's helpers.

Q. This also includes motor trains and work trains?

A. No, this does not include motor trains if they were classified as passenger trains.

Q. Motor trains in freight service would be included?

A. That is correct, but it includes work trains.

[fol. 3893] Q. Comparing the percentage of improvement of this class of employees with all classes, as shown by Exhibit 266, it would appear that the percentage of improvement, so far as conductors, brakemen and flagmen on duty is concerned, is less than with the other classes of employees?

A. I believe you mention Exhibit 266.

Q. 262.

A. Do you have in mind any particular——

Q. Well, I notice in the period in line 23, you show for all classes of employees 69.39 per cent as against 64.94 per cent, conductors, brakemen——

The Court: What exhibits are you referring to, Mr. Strouss?

Mr. Strouss: 262 and 265.

Mr. Booth: Those are the three sets of figures in the lower righthand corner?

Mr. Strouss: Yes.

The Witness: What column are you referring to, Mr. Strouss, column H on 265 and I on 262?

Mr. Strouss: Yes.

A. Yes, there is a greater improvement in the rate shown on line 23 of Exhibit 262 than Exhibit 265.

Q. That would be true with respect to the percentage [fol. 3894] of improvement using train-miles as the basis?

A. Yes, that is correct.

Q. And man-hours as a basis?

A. That is correct. Of course, on both exhibits the percentage of improvement is in some cases relatively close but substantial.

Q. Now, the next exhibit, 266, still further reduces the previous exhibits, what is shown in the previous exhibits, 266, covering casualties to road freight conductors, brakemen and flagmen, train service accidents caused by sudden stop, start, lurch or jerk of locomotive, car or train. Now, at the bottom you indicate that these items are taken from code causes 7007, 7008, 7009, and 7016. Are those all of the code causes that would cover that type of accident, Mr. Sullivan?

A. No, as I believe I explained, it would not include possibly the same type of accident if it involved a train accident, that is, if an employee was injured in an accident where there was also damage to equipment or property of the carrier in excess of $150, but the Interstate Commerce Commission doesn't have that particular type of code causes under sudden stops, starts, lurch or jerk of locomotive, car or train.

[fol. 3895] Q. What about code cause No. 7000, which is the first code cause under table 80 of the accident bulletin, information not sufficient to classify?

A. I believe that is,—well, I don't believe—I can't recall ever having seen any accident reported under that par-

ticular code cause. I would say that there would be none included. In accident bulletin No. 107 under "Road Freight Service" there is shown one conductor killed and it shows one brakeman injured.

Q. Is that table 80, Mr. Sullivan?

A. That is table No. 80.

Q. Will you read just the heading of that table?

A. "Table No. 80, Miscellaneous Train Service Accidents Not Elsewhere Classifiable."

Q. Now, will you turn to table No. 77, code cause, what is the heading for that table?

A. "Train Service Accidents to Persons While Getting on or off Cars or Locomotives."

Q. Code cause 6736?

A. "Sudden Stopping, Starting, Lurch or Jerk of Locomotive, Car, or Train."

Q. Now, turn to table 74.

A. "Train Service Accidents to Employees While Op-
[101, 3896] erating Handbrakes."

Q. And code cause 6411?

A. "Sudden Stopping, Starting, Lurch or Jerk of Train or Car."

Q. Don't you think those code causes should have been included in making up your exhibit 266?

A. It could have been included, but this particular exhibit was to represent the trend in casualties from the code causes that I gave.

Q. Well, you didn't intend to cover all casualties then in train service accidents caused by sudden stop, start, lurch or jerk?

A. I don't, except those that were——

Q. Under those four code causes?

A. Yes, as the exhibit indicated.

Q. But any that were of the same type casualty, I mean any casualties resulting from the same type of accident which would appear under another code cause, you had no intention to include it?

A. I know from my own knowledge that they are not of the same type as the other four code causes. It was to show trends year after year for a particular type of accident. I could have gone on indefinitely and selected other types of accident to show trends. There wasn't any intention of leaving out any particular type of accident that

[fol. 3897] belonged to a certain group. For instance, the code cause under 74, code cause 6411, sudden stopping, starting, lurch or jerk of train or car, invariably those are switching accidents.

Q. They might occur on the road in road operations, might they not, Mr. Sullivan?

A. Yes, while the road train is standing still.

Q. Or when the road train is moving?

A. No.

Q. Isn't it sometimes on grade operations necessary to use hand-brakes, might possibly be necessary?

A. In all of my experience, I have never heard of an occasion where it was necessary to control a moving train by hand-brakes.

Q. Suppose that retainers were in use on grade operations, that would require the men to be out on top of the train, would it not?

A. Well, I thought I was talking about operating hand-brakes. Are we going to a new subject?

Q. I asked you whether that wouldn't be true?

A. That is true, but it has no connection with hand-brakes.

Q. There wouldn't be any use of hand-brakes where the pressure on the brake might be so low that the engineer would call for brakes, isn't that possible?

[fol. 3898] A. Possible, but highly improbable. In my twenty years' experience on the road, I never heard of a case where it was necessary for the engineer on a freight train to call for hand-brakes, and the brakemen set the brakes by hand in order to control it or stop.

Q. Now code cause No. 6736, accidents getting on or off locomotives, cars, or trains, sudden stops, starts, jerks, or lurch, that could certainly happen in road operations, couldn't it?

A. Yes, but not very often. Referring to accident bulletin No. 107 for December 31, 1938, taking all of the railroads of the United States, for the whole year there were only 13 casualties of that particular type. Five conductors were injured and eight brakemen were injured.

Q. Of course, when you say only thirteen, that is a relative figure, thirteen men injured is thirteen men injured, isn't it?

A. That is correct. Just like all these other causes that are shown on the exhibit, they are all unfortunate and regrettable and the railroads would like to eliminate them.

Q. And of course those thirteen from that particular cause, if included here would increase the total number, [fol. 3899] of course, that would be true, wouldn't it?

A. It wouldn't affect the trend.

Q. Well, you don't know if they are not included in your exhibit?

A. The exhibit, Mr. Strouss, just included those four particular code causes.

Q. Your exhibit then is merely a trend exhibit?

A. No, not altogether; it reflects the absolute number of casualties and the casualty rate year after year from 1923 to 1938 to those particular causes.

Q. That is, code causes 7007, 7008, 7009, and 7016?

A. That is correct. Now, you can get an example of the trend comparing it with the other figures, taking for instance the year 1923 under code cause 6736, which we have just been discussing, where there was a total of 13 injured in 1923, which is also shown on the exhibit. If we included 6736, it would show one killed and 49 injured against the thirteen injured for 1938.

Q. In this exhibit you have also made a division of periods into two sixes and a four-year period?

A. Yes, just the same as in the preceding exhibits.

[fol. 3900] Q. And, of course, from your exhibit it is possible by calculation to make comparison between different years?

A. That is correct.

Q. Now, Exhibit 267, this covers casualties to passengers on trains, train and train service accidents, class I railroads?

A. That is correct.

Q. And it is to show the trend with respect to such casualties?

A. Yes, both as to casualty rates and the casualties in the absolute number.

Q. So far as the last ten years is concerned, there isn't much improvement shown?

A. Well, of course, that is possible when you get a casualty rate down as low as reflected by this exhibit, comparing over a period of years.

Q. Well, that is a fact, isn't it, that there is not a great deal of improvement shown in the last ten years?

Mr. Booth: We submit that the figures speak for themselves.

A. I was about to say that the figures speak for themselves. As I explained on my direct testimony, there is one item that shows a slight increase, one period compared [fol. 3901] with the other, and there is another thing that must be taken into consideration, consider this exhibit with the others, and that is the reporting basis. Many injuries to passengers are reported because on a reporting basis of over one day would include a great many casualties under the injuries that wouldn't be reported if the basis was two, three, or on the same basis as employees, more than three days.

Mr. Strouss: That has been true over the whole period covered by your exhibit?

A. That is correct.

Q. Exhibit 268, this exhibit covers grade crossing accidents, casualties in highway grade crossing accidents where an automobile was involved, all steam railways?

A. That is correct.

Q. That is passenger and freight operations both?

A. Everything.

Q. Motor trains?

A. That is correct.

Q. This again is a trend exhibit?

A. It shows the casualty rates by years as well as the absolute numbers and the comparisons with the indicated [fol. 3902] periods, one with the other.

Q. This is upon the basis of number of automobiles registered and train-miles operated?

A. That is correct.

Q. No, isn't there another factor that really should be taken into consideration in that, Mr. Sullivan; that is the factor of number of crossings?

A. No, I don't think that is so important unless you entirely disregard the question of the number of vehicles using the crossing. In other words, you could have the same number of automobiles, using three crossings, the hazard would be just as great as though there was only one crosing. The real basis of measurement if the figure

could be obtained or was available, would be the train-miles, that is, the number of train units and the number of vehicles using all of the grade crossings.

Q. Of course, during this period covered by your exhibit, there have been a great many grade separations?

A. Yes, and a great number of grade crossings added.

Q. The grade separations, when they are constructed, are in practically every instance at points where the traffic is the heaviest?

[fol. 3903] A. I think that is one of the most important considerations when the grade crossing elimination is considered.

Q. So that, when there has been a separation of grade, it has been at points where the traffic has been the heaviest.

A. I wouldn't say the heaviest, but where it is heavy.

Q. Where it is heavy.

A. But not in all cases, because there are many crossings on the Southern Pacific lines with which I am familiar where the traffic is heavy, but no grade crossing elimination has yet occurred.

Q. But, during this period, and that has been taking place year by year over the period, there has been the elimination of crossings where there was heavy traffic?

A. That is true, but notwithstanding that, you will notice the fairly constant casualty rate based on a train-mile basis, which indicates very close relationship to the volume of traffic.

Q. Well, that of course is a factor, coming back to my question, that a great many crossings which at the beginning of the period existed where there was heavy traffic, have in the different years been eliminated by grade sepa-

[fol. 3904] rations? You can answer that yes or no.

A. I know that there have been a large number of grade separations, but notwithstanding that I will say——

Mr. Strouss: Let me have an answer to my question. You will have your opportunity to explain any of this on redirect.

The Witness: I beg your pardon, I thought I could answer the question in my own way as long as it was responsive.

Mr. Booth: Just read the question, Mr. Reporter.

(The question was read by the reporter.)

A. Yes, that is one of the factors.

Mr. Strouss: If you have any explanation, I am perfectly willing to listen to it.

A. I was just seeking information. I possibly was ignorant, but I thought I could answer the question in my own way.

The Court: Well, you need not argue over it. The witness has answered the question and said "Yes." Go ahead.

Mr. Strouss: Now, taking your exhibit 269, of course, again going back to 268, again you have used the six, six and four year periods for comparison.

A. That is correct.

[fol. 3905] Q. Now, in 269, this is the exhibit which shows the train accidents and resulting casualties relating them to specific causes

A. Yes; not altogether causes, but types and causes.

Q. This includes all railroads, does it not?

A. That is right.

Q. Includes terminal and switching railroads?

A. It does.

Q. It will also include all other railroads other than class one railroads

A. It does.

Q. Such as logging roads and narrow guages? Or what have you?

A. It would include any railroad that would be required to report their accidents to the Interstate Commerce Commission, and some industrial railroads are not required to report.

Q. But it does include all of that type that are required to report?

A. It includes all those that are required to report and which the Interstate Commerce Commission includes in, for instance, their table No. 63 of their bulletin 107 for 1938.

The Court: We will take a recess at this time until two o'clock.

(Thereupon the court stood at recess until two o'clock P. M. this day.)

[fol. 3906] 2 P. M., February 17, 1941

All parties being present, as heretofore noted, proceedings were resumed as follows:

Mr. Booth: If the Court please and counsel, we have received accident bulletin No. 108 of the Interstate Commerce Commission for the calendar year 1939.

The Court: That was the document you have been expecting momentarily that you referred to the other day?

Mr. Booth: Yes, your Honor. While it bears the imprint of the government printing office of 1940, evidently they didn't release it until the last few days. We have only one copy of it. This will necessitate the addition of 1939 to all of those national exhibits and the reworking of the percentage comparisons of the periods. It will result in the way we have the exhibits set up of two six-year periods and a five-year period. If it meets with the approval of the Court and counsel, I would like very much when we reconvene on the 25th of March to submit those tables to 1939, inclusive, and for any additional cross-examination counsel may desire, but it is physically impossible for us to do that this week.

Mr. Strouss: I realize that. I have no objection but I [fol. 3907] think I would rather have that done and substitute it for the existing exhibits if agreeable so we would not fill the record up.

The Court: Need there be any cross-examination?

Mr. Strouss: Probably not. I was going to suggest if you have this ready a little while ahead you might let me have copies before the 25th if they are prepared before and I would know whether there is anything I want to cross-examine on.

Mr. Booth: We can arrange that.

The Court: If counsel will stipulate, there may be substituted in this record for these various national exhibits that have to do with this safety angle of this case an exhibit which will bear the same number as those now in evidence but which will include the statistics for the year 1939.

Mr. Strouss: Yes.

Mr. Booth: There are some narrative findings in the first pages of Accident Bulletin No. 108 to which we may desire to call the attention of the court.

The Court: If that is to be done, the Court would suggest that might be done during this session, during this week.

Mr. Booth: I can do that tomorrow morning and you [fol. 3908] can cross-examine on this if you desire. It would not strictly be redirect examination.

The Court: That is true.

Mr. Strouss: Some of that went in out of the previous bulletin over my objection, not objecting too strenuously but I don't believe that that matter which appears in the front of the bulletin is properly a part of the record. It is put out by the Interstate Commerce Commission but there are conclusions there which I don't think personally are properly admissible in evidence.

The Court: There is probably some merit to your contention, Mr. Strouss. The Court admitted similar testimony heretofore, it seemed coming from the body that it did, the Interstate Commerce Commission, that it might have some probative value but we will cross that bridge when we get to it.

Mr. Strouss: Instead of having it read in, if what is desired can be written up, if it is not too much, so that objection could be made to it, but it doesn't make much difference I suppose.

The Court: You may proceed with the cross-examination.

[fol. 3909] JOHN J. SULLIVAN resumed the witness stand.

Mr. Strouss:

Q. Mr. Sullivan, this morning we were discussing exhibit No. 266 and Code Cause No. 6411, that is, accidents due to sudden stop, start, lurch, and jerks to employees operating hand brakes and I understood you to testify that those accidents occurred usually, if not practically always, in yard service?

A. No, I didn't say that I don't believe. I said during switching operation. In other words, if a road crew switching on the road, if some conductor or brakeman in road freight service should be injured while setting a hand brake due to one of the shock causes, sudden stop, start, lurch, or jerk, such as a cut of cars which the employee might be riding in setting the hand brake striking other cars or on a standing cut of cars setting a hand brake and he would be injured on account of the other moving cars

striking that one, that would be included under that code cause and that is what I termed a switching operation.

Q. Those accidents are divided into what might be called two principal heads in table No. 74, is that correct; that is, yard service and road service?

[fol. 3910] A. Yes, they are all separated by classes of service and classes of employees.

Q. In 1938 there appears to have been a total of 98 casualties, one killed and 97 injured?

A. That is correct.

Q. Of those, 37 were casualties to employees in road service, that is, 4 conductors were injured and 33 brakemen and flagmen?

A. In road freight service, that is right.

Q. In 1936 there appear to have been 130 such casualties, 6 killed and 124 injured?

A. What year?

Q. 1937.

A. I thought you said 1936.

Q. I guess I did, but I intended to say 1937.

A. Six killed and 124 injured.

Q. Of those, 51 were employees in road service, 10 conductors injured, 3 brakemen and flagmen killed, and 38 injured?

A. That is correct.

Q. Coming to exhibit No. 270, this exhibit is the tabulation of data which appear in the Interstate Commerce Commission summary of accident investigation reports?

A. That is correct.

Q. And insofar as such reports relate to accidents in-

[fol. 3911] volving freight trains, it covers all summaries of reports from 1928 to 1939?

A. That is correct.

Q. And with respect to passengers, from 1934 to 1939?

A. That is another exhibit.

Q. Yes, the next exhibit, No. 271?

A. That is correct.

Q. Your tabulation is such as to indicate the length of the trains?

A. Yes, in certain groups.

Q. And the casualties occurring?

A. That is correct. Are you just talking about exhibit No. 270 or both of them?

Q. 270.

A. The casualties are all grouped. In No. 271 there has been a separation made of the casualties by certain classes.

Q. Just No. 270 at the present time.

A. All right.

Q. At the bottom of sheet No. 2 you have a summary as to number and percentage of accidents?

A. That is correct.

Q. As occurring on trains of 70 cars or less and over 70. Nowhere in your exhibit have you shown or attempted to [fol. 3912] show the number of trains of 70 cars and less operated and those over 70 cars?

A. You mean the total number in the aggregate?

Q. Yes.

A. No, that information was not available.

Q. If a freight train wasn't in any manner involved in an accident, it is included in this exhibit, is that correct?

A. That is correct.

Q. On sheet No. 19 I notice an accident, item No. 2, automobile being driven upon crossing at grade directly in front of a passenger train which was approaching at high speed, Interstate Commerce Commission investigation No. 1622, number of accident, one, killed eleven, injured 131; number of freight trains involved as to various lengths in cars, exclusive of caboose, 40 and less, one, that is, one freight train of 40 and less involved. Are you familiar with that accident, Mr. Sullivan?

A. Without reference to the investigation report, I wouldn't say.

Q. I wish you would turn to it and check me and see if I am correct in summarizing the accident. An automobile drove on a crossing in front of a passenger train?

A. That is correct.

Q. The passenger train struck the automobile. The [fol. 3913] freight train involved was a motor freight train on a parallel track going in the opposite direction from the passenger train and its only relation to the accident was that after striking the automobile a coach or two of the passenger train sideswiped one or two cars of the freight train derailing them?

A. I think possibly the best way to answer the question would be to either have the entire report copied or let me read exactly what the Interstate Commerce Commission said.

Q. All right, go ahead and read it.

A. (Reading) "Chicago, North Shore & Milwaukee Railroad. A passenger train struck an automobile at a grade crossing near Kenosha, Wis., on February 23, 1930, resulting in the derailment of the passenger train as well as a freight train approaching in the opposite direction, and causing the death of 2 occupants of the automobile and 9 passengers, and the injury of 125 passengers, 4 employees on duty, 1 employee off duty, and 1 other person, all of the passenger train; 3 of the injured passengers subsequently died.

"This accident was caused by an automobile being driven upon a crossing at grade directly in front of a passenger [fol. 3914] train which was approaching at high speed.

"In the vicinity of the point of accident this was a double-track line over which trains were operated by time-table, train orders, and an automatic block-signal system. The accident occurred at a grade crossing north of Kenosha, Wis., where a highway known as the Burlington Road crossed the tracks at a right angle. Approaching the point of accident from the north, the track was tangent for more than one-half mile, this tangent continuing for a distance of about 1 mile beyond the crossing. The grade for southbound trains was 0.2 per cent descending at the point of accident. Approaching the crossing from the east on the Burlington Road, the highway was tangent for a distance of 625 feet; within 525 feet of this distance the road ascended 13 feet, and it was then level to the crossing, 100 feet distant, and for some distance beyond the crossing.

"There was a 2-story building located about 150 feet east of the railroad tracks and 75 feet north of the highway, and two smaller buildings were located north of this building. After a westbound motor vehicle had passed these buildings the driver had an unobstructed view toward the north for more than one-half mile; south of the highway, the [fol. 3915] view was unobstructed for approximately 700 feet.

"The crossing was protected by a warning signal of the wigwag type, located north of the highway and 9½ feet east of the center line of the northbound track. This signal consisted of a bell and a swinging banner with a red light in the center of the banner, which was visible on the highway for a distance of 700 feet east of the tracks. This signal was actuated by trains approaching from either

direction when they encountered the control circuit, which extended for a distance of 2,400 feet on each side of the crossing.

"The weather was clear at the time of the accident, which occurred at 10:45 p. m.

"The automobile involved was a Buick 5-passenger touring car, occupied by two men, and was moving westward on the highway over the crossing at a speed variously estimated to have been between 25 and 45 miles per hour when it was struck by southbound passenger train No. 436.

"Southbound passenger train No. 436 consisted of five motor cars, of steel construction. This train departed from Milwaukee, Wis., at 10 p. m., on time, passed Racine, Wis., at 10:36 p. m., one minute late, and was derailed when it [fol. 3916] struck an automobile at a grade crossing while traveling at a speed variously estimated by the members of its crew to have been between 35 and 60 miles per hour; the derailed equipment then sideswiped northbound extra 456, which was passing at the time.

"Northbound freight train extra 456 consisted of 1 empty car, 12 loaded cars, and a caboose, hauled by electric motor 456. This train passed Kenosha tower at 10:40 p. m., and was derailed while proceeding over the Burlington Road crossing at an estimated speed of 15 miles per hour.

"The automobile was thrown into the air and the engine block fell out under the first motor car of train No. 436, derailing this train to the left or east, sideswiping the first car in extra 456. Train No. 436 was then diverted to the west and came to rest in a wide ditch on the west side of the southbound track, with the first car at a point 546 feet from the crossing. The track was torn up for a distance of 273 feet and the rail from the southbound track curved around under the freight train on the northbound track, causing the derailment of the first seven cars of this train; these cars remained upright. The automobile was demolished.

"The investigation indicated that the automobile ap- [fol. 3917] proached the crossing at too high a rate of speed passed around another automobile standing just east of the crossing, and then started over the tracks. In all probability the driver of this car saw the freight train approaching from the south and thought he could clear the crossing before the freight train reached it, and apparently did not look toward the north to see if there was

a train approaching from that direction. While there were buildings located to the right of the highway, they were about 150 feet east of the tracks, and the view was unobstructed between these buildings and the tracks, with the result that a train could have been seen approaching from the north for a distance of at least one-half mile. The evidence also indicated that the wigwag signal was in operation and that at least one of the trains was whistling as it approached the crossing. The automobile standing at the crossing no doubt obstructed the view of the driver of the approaching car toward the north to some slight extent, but there was no reason why he could not have prevented the accident had he exercised any of the care required to be exercised when approaching a railroad crossing at grade."

[fol. 3918] Mr. Strouss: That is the accident which is referred to as item 2 on sheet 19 of Exhibit 270 as an accident occuring to a freight train of forty cars and less, showing eleven persons killed and 131 injured?

A. Yes, involving a freight train.

Q. And the freight train involved was the train drawn by the electric motor which was described in your report?

A. Yes, it was a freight train drawn by an electric locomotive.

Q. Now, these reports from which your exhibit is made, your exhibit is made from these volumes which you have handed to me entitled "Summary of Accident Investigation Reports," is that correct?

A. That is correct.

Q. These are summaries of reports made by the Director of Safety, are they not?

A. Yes, they have the title, "Interstate Commerce Commission, Bureau of Safety, Summary of Accident Investigation Reports."

Q. While you have that open, these are issued quarterly, are they not?

A. That is correct.

Q. Now, turn to the introductory paragraph of that quarterly issue and read the first paragraph.

[fol. 3919] A. Of any particular report?

Q. I think you will find it is the same in each report.

Q. I am reading from Quarterly Summary No. 43 for January, February and March, 1930, under the caption "Interstate Commerce Commision, Bureau of Safety.

"The following is a summary of reports made to the Interstate Commerce Commision by the Director of the Bureau of Safety covering accident investigations which were completed during the quarter ended March 31, 1930.

"The statements in these reports of the number of persons killed and injured in the accidents investigated are the figures obtained at the time of the investigation of the accidents."

Q. Was that "completed" or "undertaken"?

A. Well, this copy reads "were completed." Evidently they are not the same in all.

Q. Would you mind just checking to see if that statement doesn't appear substantially in those words in the beginning of each quarterly report?

A. I think it does. In the report for No. 61, it is the same and reads, "The following is a summary of reports made to the Interstate Commerce Commission by the Direc-
[fol. 3920] tor of the Bureau of Safety covering accident investigations which were completed during the quarter ended September 30, 1934." Now, on sheet 20 of Exhibit 270, item 72, "Heavy run-in of slack due to a sudden stop following a heavy service brake-pipe reduction, I. C. C. investigation No. 2310, number of accidents, 1, persons injured, 5," and the column as to the number of cars in train appears to be 81 to 90; is that correct?

A. That is correct.

Q. Now, will you turn to that. That is the summary of the report, is that correct, that I have just handed you? train appears to be 81 to 90; is that correct?

Mr. Strouss: I would like to have that. I don't think it is necessary to read it into the record. I would like to have it copied in.

Mr. Booth: We have no objection.

The Court. That portion of the report indicated may be copied into the record.

The Witness: It is investigation number 2310.

The Court: If you will hand it to me, Mr. Booth, when you are through with it, I will read it now, then it may be copied into the record.

Mr. Strouss: May this be marked for identification?

[fol. 3921] The Court: It may be marked.

The Clerk: Plaintiff's Exhibit No. 304 for identification.

(The following matter is copied into the record at this point in accordance with the directions of the Court:)

"Southern Pacific Company.

"Derailment of a freight train at Reno, Nev., on November 19, 1958, which resulted in the injury of five employees.

"This accident was caused by a heavy run-in of slack due to a sudden stop following a heavy service brake-pipe reduction.

"In the vicinity of the point of accident this was a double-track line over which trains were operated by time-table, train orders and an automatic block-signal system. The current of traffic was to the left. The accident occured on the westward track as the train was passing the pasenger station at Reno, located 3.3 miles west of Sparks.

"Chestnut Street extended practically north and South; it was located four city blocks or about 1,500 feet west of the station. Approaching Chestnut Street from the east the track was tangent more than 1 mile, and a considerable [fol. 3922] distance beyond. The grade westward was level a distance of more than 2,000 feet, then it was 0.84 percent ascending a distance of 2,428 feet to Chestnut Street and a distance of 522 feet west thereof. At Chestnut Street, a siding designated as No. 6 track paralleled the main tracks on the north; a track extending eastward from Chestnut Street and designated as the south team track paralleled the main tracks on the south, the switch leading thereto being located at Chestnut Street; this street was not open across the track, barriers being located along the property line on each side of the railroad. The space adjacent to the tracks in the vicinity of the barriers was used for public parking of automobiles.

"The track structure consisted of 100-pound rail, 39 feet in length, laid on an average of 22 treated ties to the rail length; it was fully tieplated, single-spiked, ballasted with about 8 inches of crushed stone and was well maintained.

"The engine involved in this accident burned oil; the cab was at the front end and the tender was coupled to the rear. The speed of trains was restricted to 20 miles per hour over various street crossings within the city limits of Reno.

"The weather was clear at the time of the accident, [fol. 3923] which occurred at 11:25 p.m.

"Extra 4165 West consisted of 86 empty refrigerator cars and a caboose, hauled by engine 4165, a 4-8-8-2 type with ET-8 brake equipment. This train left Sparks at 11:15 p.m., according to the train sheet, proceeded through Reno and while traveling at a speed variously estimated to have been from 10 to 28 miles per hour with the forward portion approaching Chestnut Street and on an ascending grade, the engineman made a heavy service reduction of the brake-pipe pressure to avoid striking an automobile which was fouling the track in the parking area near the barrier at Chestnut Street, resulting in the train stopping suddenly after moving approximately 300 feet. The automobile was backed away from the track by its driver just in time to avoid being struck.

"The caboose and six cars in the train, namely, the sixth, sixty-fifth, sixty-ninth, seventy-eighth, eightieth, and eighty-fourth cars were damaged. One pair of wheels on the fifty-sixth car was derailed and a slip-over of couplers occurred between the seventieth and seventy-first cars, which separated about 18 inches, both knuckles remaining closed and the air hose connected. The truck bolsters on [fol. 3924] the B-ends of the sixty-fifth, sixty-ninth and eightieth, and the cast steel truck bolsters on the A-end and B-end of the eighty-fourth car were broken. The caboose was considerably damaged and its furnishings were knocked loose and broken. The employees injured were the conductor and four brakemen, who were in the caboose.

"Before departure from Sparks a terminal test of the air brakes of Extra 4165 was made and they functioned properly. The control delay valve was set as required for freight service so that brake cylinder pressure on the engine and tender would not increase at as high a rate as on the cars. After passing over the principal street crossings of Reno, the engineman opened the throttle to some extent. The forward portion of the train was on the 0.84 percent ascending grade; the rear portion was on level track, with the slack stretched in the train of 85 empty cars, and the speed approaching Chestnut Street was variously estimated to have been between 10 and 28 miles per hour. When about four car lengths distant, the engineman saw an automobile standing afoul the track in the space adjacent to the south barrier at Chestnut Street. He immediately made a heavy service brake-pipe reduction, the first

[fol. 3925] reduction made on the trip, and the train stopped within a distance of about six car lengths. The engineman did not close the throttle until after the train had stopped.

"From the resultant damage it appeared that there was a heavy run-in of slack. Six cars and the caboose were damaged; truck bolsters were broken on four cars; one car was derailed and a slip-over of couplers occurred between the seventieth and seventy-first cars, these cars being separated about 18 inches but the air hose remained connected and the knuckles closed.

"According to the evidence members of the crew who were on the caboose felt only one shock at the time of the accident, ordinarily at least two shocks occurred when there was a run-in of slack. However, the conductor was of the opinion that there must have been a run-in of slack the full length of the train. No shock was felt on the engine; nevertheless the engineman thought there had been a heavy run-in of slack. The engineman said that he made a service reduction of about 20 pounds but thought the brakes somewhere on the rear of the train had gone into emergency. However, the road foreman of engines thought the unusually rough stop was caused by a heavy service reduction [fol. 3926] and said that the engineman apparently made the reduction in accordance with the rules but that had he made an emergency application instead of a heavy service application probably the slack action and damage would have been much less because the brakes would have applied much more rapidly throughout the train. Only nine cars in the train of 85 empty cars and caboose distributed between the thirteenth and seventy-second cars, inclusive, were equipped with the "AB" type brake."

Mr. Strouss: Mr. Sullivan, I hand you plaintiff's Exhibit 304 for identification, which appears to be a certified copy of the report of the Director of Safety covering the same accident at Reno, Nevada. Will you examine that and see if that is the same accident that was referred to in the summary Report?

A. Yes, that is the same accident.

Q. That is the accident which appears here as Item 72, sheet 20 of Exhibit 270?

A. Yes, and it is also Item 225 on Exhibit 290.

Mr. Strouss: We offer this certified copy of the Director of Safety's—I have another copy of that not certified.

[fol. 3927] Mr. Booth: No objection.

The Court: It may be admitted in evidence.

(The document referred to was received in evidence and marked, "Plaintiff's Exhibit No. 304.")

Mr. Strouss: Now, at page 3644 of the record, you testified in answer to a question by Mr. Booth appearing at page 3643, "Is there in any of the investigation reports upon which this exhibit was founded any statement or indication in any manner that the length of the train was responsible for any of the accidents investigated?" Your answer was, "I have examined and read every report for the period covered by the exhibit, and in no case did the Interstate Commerce Commission state that the accident could have been or might have been avoided, or that the length of the train in any way was involved." Now, in making that answer, Mr. Sullivan, did you have reference to the summary reports or the *the* reports of the Director himself?

A. I had in mind the reports of the summary, because I haven't seen all of the reports that might not have appeared in the summaries.

Q. I wish you would take Plaintiff's Exhibit 304 and read, beginning with the last paragraph on page 9?

A. Page 9, under the heading of "Discussion," investi-

[fol. 3928] gation 2310:

"According to the evidence members of the crew who were on the caboose felt only one shock at the time of the accident; ordinarily at least two shocks occur when there is a run-in of slack. However, the conductor was of the opinion that there must have been a run-in of slack the full length of the train. No shock was felt on the engine; nevertheless the engineman thought there had been a heavy run-in of slack. The engineman said that he made a service reduction of about 20 pounds but thought the brakes somewhere on the rear of the train had gone into emergency. However, the road foreman of engines thought the unusually rough stop was caused by a heavy service reduction and said that the engineman apparently made the reduction in accordance with the rules but that had he made an emergency application instead of a heavy service application probably the slack action and damage would have been much less because the brakes would apply much more rapidly throughout the train. Only nine cars in the train of 85

empty cars and caboose distributed between the thirteenth and seventy-second cars, inclusive, were equipped with the "AB" type brake. The question of serial action with [fol. 3929] older types of air brakes was discussed in the report of this Bureau of the accident on the Western Maryland Railway at Oldtown, Md., on February 9, 1937. In that accident only one car in a train of 162 empty cars and a caboose was equipped with an "AB" type air brake and coupler slip-overs occurred at two points. In that report, the following statement was made:

'Only one car in the train involved was equipped with an "AB" type air brake. The action of the air brake on both occasions illustrates the fact that under such conditions the serial action with older types of air brakes is not fast enough, on freight trains of considerable length, to prevent destructive slack action when an emergency application takes place. This accident emphasizes the urgent need for improved brakes and points to the necessity for expediting the progressive change to the new "AB" type of brake on freight cars.'

"Conclusions. This accident was caused by a heavy run-in of slack due to a sudden stop following a heavy service brake-pipe reduction. Respectfully submitted, W. J. Patterson, Director."

Q. Now, having read that statement, would you still say that in no case has the Interstate Commerce Commission [fol. 3930] or its Director of Safety stated that the accident might or could have been avoided or that the length of the train was in any way involved?

A. Yes, I would make the same statement.

Q. You would still say that there is nothing in this report to indicate that the length of the train was involved?

A. Absolutely.

Q. Going to Exhibit 271, Mr. Sullivan, this is a similar tabulation only it involves passenger trains and includes only the years 1934 to 1939, inclusive?

A. That is correct, and as I explained in my direct examination, on account of a large number of grade crossing accidents involved, an additional cause was inserted in the exhibit No. 271 that doesn't appear in 270.

Q. What do you mean by "grade crossing accidents"?

A. On exhibit 271 appears as one of the causes "Collisions with vehicles at grade crossings." That type of accident is included under miscellaneous in exhibit 270.

Q. And it is here under column V, I believe in exhibit 271.

[fol. 3931] A. In 271 it is under IV, four, Roman four.

Q. Now, this also has the summary at the bottom segregating as to trains of 70 cars and less, and over 70 cars?

A. No.

Q. I mean fourteen cars and less, and over fourteen?

A. That is correct. There is a distribution between the trains involved which had fourteen cars and less, and those over fourteen cars.

Q. Of course, again you haven't attempted to show the aggregate number of trains over the period of fourteen cars and less and over fourteen cars?

A. No, that information is not available.

Q. And that covers accidents from all causes, too, doesn't it?

A. Those accidents involving passenger trains which were investigated by the Interstate Commerce Commission regardless of the cause assigned.

Q. Now, Exhibit 272.

Mr. Mason: Mr. Strouss, before we leave Exhibit 271, in order that the record may be perfectly clear, you asked if collisions with vehicles at grade crossings was at column V, and the witness said column IV. Mr. Sullivan, will you [fol. 3932] look at your exhibit 271?

A. Possibly I misunderstood his question. I thought he was referring to the items and he was referring to the columns.

Q. It also appears in classification four, commencing on sheet eight of the exhibit?

A. That is correct.

Mr. Strouss: Exhibit 272, Casualties to all classes of employees on duty, all classes of service, train and train-service accidents, Southern Pacific Company, Pacific Lines. Now, this is reducing the exhibit 262 to the Pacific Lines.

A. Yes, they include the same types of accident and the same group of employees.

Q. By the way, when you refer to the Pacific Lines in your exhibits, you include of course both the Salt Lake division and the Tucson division as a part of the Pacific Lines?

A. Yes, those divisions are part, two of nine operating divisions comprising the Pacific Lines.

Q. When you are making a comparison with the Tucson division, you include that division in the Pacific Lines in making that comparison?

A. I don't think I made any comparison of the Tucson division with the Salt Lake division, but the lines in Arizona [fol. 3933] and the lines in Nevada which are a part of those divisions are also a part of the Pacific Lines.

Q. Now, this is, of course, exhibit 262 is an exhibit to show the trend in improvement in accidents causing casualties?

A. It has for its purpose to show the absolute number of accidents, the casualty rates by years and the trends, comparing groups or cycles of years with others.

Q. Now, this includes, in your locomotive miles here, you include work trains, motor trains, helpers, and light engines?

A. That is correct, and yard switching-miles.

Q. And your employees will include shop or yard or any employee who may be injured by a train or train service accident reportable to the Interstate Commerce Commission?

A. If he was on duty, that is correct.

Q. If he was on duty. This exhibit indicates that there was an increase in the average on the Pacific Lines the last four years over the previous?

A. That is correct.

Q. Now, the next exhibit is a similar exhibit eliminating [fol. 3934] all employees, however, except trainmen on duty?

A. That is correct, and the trainmen include that group as shown in the note at the foot of the exhibit.

Mr. Mason: That is 273.

Mr. Strouss: Yes, 273.

Q. And the locomotive-miles includes again switching, helper, light engines, motor trains, and work trains?

A. Freight and passenger, that is correct.

Q. Now, exhibit 274, this is a total of casualties to all classes of employees on duty sustained in train and train service accidents, road freight train operation, reportable to the Interstate Commerce Commission, 1923 to 1939, inclusive, in the State of Arizona?

A. That is correct.

Q. Your exhibit doesn't indicate it, but this only shows accidents which occurred on the Southern Pacific Company's Pacific Lines, isn't that correct?

A. That is correct. The caption of the exhibit is "Southern Pacific Company, Pacific Lines."

Q. That is what was intended by that caption?

A. That is what was intended.

Q. How about accidents that may have occurred on the E. P. and S. W. and the Arizona Eastern prior to the mer-

[fol. 3935] ger?

A. They were not part of the Southern Pacific Lines, were not reported by the Southern Pacific Lines, and are not included in this exhibit.

Q. Wouldn't be included until they were included and became part of the operative property of the Southern Pacific Company?

A. That is correct.

Q. Now, I notice at the bottom of the page a double cross, "Sudden stopping, starting, lurch or jerk of car, or train." In going through the exhibit, Mr. Sullivan, I found 92 of such accidents, 17 of which occurred on trains of 60 cars or less, and 75 on trains of over 60 cars, or better than 81 per cent of those accidents, according to your exhibit, occurred on trains of over 60 cars in length. Have you checked your exhibit to determine that?

A. I have not.

Q. And I found that 28 of the 92 occurred on trains of less than 65 cars and 64 on trains of 65 cars or more, practically 70 per cent on trains of 65 cars or more in length. You haven't checked to determine that?

A. No, I haven't made any calculation of that kind.

[fol. 3936] Q. On sheet 12, item 507. Do you have that?

A. Yes, I have that.

Q. An accident which occurred on July 30, 1939, at Arlington, train of 59 cars, Brakeman R. A. Green was injured and the description of the accident is, "Either thrown or fell down in caboose." That is not the description as given in the form T report, is it, Mr. Sullivan?

A. It should have been.

Q. Do you have a copy of that form T here?

A. I have it in the office.

Q. I wish you would check that and see if it doesn't show that he was found in the caboose and it wasn't known whether he was knocked down or fainted or what had happened to him. If you will make a note and check it.

A. If it said he either fainted or was knocked down, that is the interpretation I put on the form either thrown or

knocked down in the caboose without going into detail. This is just a brief narrative of the accident, but I will examine form T.

Q. And bring the form T over here. Now, exhibit 275, that is a similar exhibit for the state of Nevada, is it not, Mr. Sullivan?

A. That is correct.

[fol. 3937] Q. And again, as indicated at the bottom of the first sheet, you have indicated accidents which were caused by sudden stopping, starting, lurching or jerking of car or train by a double cross-bar?

A. That is correct.

Q. And like the exhibit 274, this covers all classes of employees in all service when on duty?

A. No, confined to road freight train operation.

Q. That is correct, road freight train operation, but all classes of employees on duty?

A. That is correct.

Q. Which would include yard and shops, if they were injured?

A. If injured by a road freight train, that is correct.

Q. Includes branch operation?

A. Yes.

Q. Both the exhibits 274 and 275 include branch operations?

A. That is correct.

Q. And the locomotive-miles here as in Exhibit 274 includes the principal locomotive-miles in the freight and passenger trains, helpers and light engines?

A. No, exhibits 274 and 275 make no reference to locomotive-miles whatever.

[fol. 3938] Mr. Strouss:

Q. In counting the number of accidents caused by sudden stops, starts, lurch, or jerk of the car or train shown on exhibit No. 275, state of Nevada, I found 92 such accidents as noted on your exhibit, 72 occurred on trains of over 70 cars and 20 on trains of 70 or less, or better than 78 per cent on trains of over 70 cars. Did you check your exhibit in that respect?

A. Are you talking about accidents or casualties?

Q. I am talking about accidents now.

A. No, I didn't make that kind of a count of the accidents but I did count the casualties.

Q. Ten of those accidents on trains of 70 cars or less occurred in the year 1923?

A. I presume they did because during 1923 twelve casualties involved trains of 70 cars and less.

Q. That was a period before you had entered into any agreement with the Western Pacific for paired track operation?

A. I don't recall the date of that agreement.

Q. My information is that it was in 1925; I would like to have you check on that and see. Of course a great deal of the double track which you now have in Nevada other [fol. 3939] than the paired track operation had not been constructed at that time?

A. I think they had some double track, I don't know how much has been constructed since 1923.

Q. It is a fact, too, isn't it, at that period they were having particular difficulty with the triple valves due to the weakness of the graduating springs and the gaskets which were then in use which were causing a leakage in the triple valve and causing undesired emergencies?

A. I wouldn't say it was causing leakage in the triple valves, but I do know during that period it was during the time of the difficulty experienced with undesired emergency on account of the light graduating springs.

Q. It was just shortly after that or about that time that that graduating spring was strengthened?

A. I wouldn't say shortly after.

Q. It was not later than 1926?

A. Changing out the light graduating spring was in progress during that time. It was in progress as late as 1928 and 1929 when I was located on the Shasta division.

Q. There was also a change in the gaskets which were causing the triple valves to stick?

A. I am unaware of that.

[fol. 3940] The Court: We will take our mid-afternoon recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows.)

The Court: You may proceed.

Mr. Strouss:

Q. Mr. Sullivan, in checking your exhibit No. 275 I further found that eliminating the year 1923 the sixteen-year

period following that there were 78 accidents of that type; 68 of which were on trains of over 70 cars and only 10 on trains of 70 cars or less, or 87 per cent of them on trains of over 70 cars; and in the last thirteen years there were 61 accidents, only 3 of which were on trains of 70 cars or less, or 96 per cent of those accidents were on trains of over 70 cars. You haven't checked that, have you?

A. No.

Q. Along that line I wish you would turn to the year 1929. My check of your exhibit shows from 1929 to 1938, inclusive, there were 41 accidents, all of which occurred on trains of over 70 cars. If you will check the year 1929, I think you will find 6 of that type of accident as indicated by you in that year. That is on sheet No. 5?

A. That is correct.

Q. All of those accidents occurred on trains of over 70 [fol. 3941] cars?

A. That is correct.

Q. In the next year, 1930, there were 7 such accidents, all of which occurred on trains of over 70 cars?

A. That is correct.

Q. In the next year there was one on a train of 79 cars?

A. That is correct.

Q. In the next year there were five, all on trains of over 70 cars?

A. That is correct.

Q. In the next year there were four, all on trains of over 70 cars?

A. That is correct.

Q. In the next year there were four, all on trains of over 70 cars?

A. That is correct.

Q. In 1935 there were three, all on trains of over 70 cars?

A. That is correct.

Q. In 1936 there were five, all on trains of over 70 cars?

A. That is correct.

Q. In 1937 there were four, all on trains of over 70 cars? [fol. 3942] A. That is correct.

Q. In 1938 there were two?

A. That is correct.

Q. Both on trains of over 70 cars?

A. That is correct.

Q. So that from 1929 to 1938, inclusive, every accident of that sort was on a train of 70 cars or more?

A. That is correct.

Q. In 1939 there were three accidents, one on a train of 104, one on a train of 79, and one on a train of 69 cars?

A. That is correct.

Q. Exhibit No. 256, this exhibit is a comparison of casualties to all classes of employees on duty, all classes of service, sustained in train and train service accidents in the states of Nevada and Arizona?

A. That is correct.

Q. This includes both freight and passenger train service?

A. Yes, all classes of service.

Q. Branch as well as main line?

A. That is correct.

Q. Locomotive-miles here are the miles operated by helper or principal engine on both freight and passenger [fol. 3943] helper and light motor trains and work trains?

A. Yes, sir.

Q. And employees include all employees, shop and yard, if they were injured by a train or train service accident?

A. That is correct.

Q. There aren't any motor trains in Nevada, are there, Mr. Sullivan?

A. No, there has been none there for several years.

Q. This includes the years 1923 to 1939, inclusive?

A. That is correct.

Q. The territory in the two divisions hasn't been the same during all of that period, has it?

A. This is not a division showing, it is a showing by the states but the railroad hasn't been the same.

Q. In Arizona the total main line in 1923 was around 300 to 400 miles, was it not?

A. I would have to check that. I know it is not the same as it is now because since that time the El Paso and Southwestern was purchased, the line through Phoenix was constructed, and the operation of the Arizona Eastern was [fol. 3944] absorbed by the Southern Pacific, so I know there was some difference.

Q. The Arizona Eastern included that Globe operation?

A. That is correct.

Q. I wish you would check and give us the mileage, main line and branch; I think it is about 390 main line and 155 branch, but I would like to be sure of it.

A. I will make that check, but I would like to make it clear that this exhibit has not attempted to show up any rates against road mileage and the identical locomotive-miles have been included where the same casualties are shown on the exhibit. In other words, I didn't include any locomotive-miles on any except the operated lines and likewise only the casualties occurring in the Southern Pacific operated lines in Arizona and Nevada for the respective years.

Q. I understand, but I would still like to have the territory involved shown.

A. I will obtain that.

Q. You don't know when the paired line operation began?

A. No, I will obtain that. I don't remember the exact year.

[fol. 3945] Q. This would also include switching operations, wouldn't it?

A. It would.

Q. Of course there is substantially more switching in Arizona than in Nevada?

A. Yes, because there is a direct relation between switching and the number of trains operated.

Q. There is considerably more traffic in the state of Arizona originates in the state of Arizona than in the state of Nevada, isn't there?

A. I think there is some difference, I don't know just what the figures are.

Q. That would have some effect upon switching also, wouldn't it?

A. It would have some but not as much as the other.

Q. You think that difference in traffic is small, that is, traffic originating in the two states?

A. No, I know from my own experience the more trains you have the more yard switching——

Q. (Interrupting:) I did not ask you that, I am asking you whether you know whether the difference in the traffic originating within the two states is substantial or not substantial?

A. I wouldn't want to say whether it is substantial or [fol. 3946] not substantial, I know there is a difference.

There is more traffic originated in Arizona than in Nevada because there is no perishable traffic originated in Nevada and perishable traffic is originated in the Yuma territory and the Salt River Valley.

Q. Of course that perishable traffic in the Salt River Valley requires the operation of so-called "turnaround" or gathering trains, doesn't it?

A. Yes, that is what we call road freight train operation.

Q. Which you wouldn't have in the state of Nevada?

A. That is correct. It is a type of local freight service.

Mr. Mason: I don't think you finished your answer, Mr. Sullivan, when you were interrupted.

Mr. Booth: It was not responsive to the question.

Mr. Strouss:

Q. Exhibit No. 277 is a similar exhibit except that the class of employees involved are employees on duty in road freight train operation?

A. That is correct.

Q. That would eliminate yard operations and switching [fol. 3947] except road switching?

A. And passenger train, that is correct.

Q. The locomotive-miles include the same items except passenger trains are not included?

A. Locomotive-miles are not included in exhibit No. 277.

Q. This again is an exhibit in which you show the trend of casualties in the two states, comparing the trend?

A. It shows the casualty rates by years and the trends as well.

Q. And of course covers the same periods as the previous exhibit?

A. That is correct.

Q. And so far as territory is concerned, what was said about exhibit No. 276 would apply to this exhibit also?

A. That is correct.

Q. Exhibit No. 278 is a tabulation of casualties to all classes of employees on duty, road freight train operation, train and train service accidents for the two states tabulated as to the cause and as to the employees involved?

A. That is correct. It is really a breakdown of exhibit No. 277.

Q. These causes shown in here are taken from the Inter-
[fol. 3948] state Commerce Commission designation of causes?

A. Yes, it conforms to the classifications used by the Interstate Commerce Commission.

Q. Cause No. 5, "Miscellaneous Train," that would take in a great many different types of accidents, wouldn't it? For example, cars that buckle in slack action accidents would come under miscellaneous train?

A. Yes, if no derailment of any of the cars resulted. Miscellaneous train also includes collisions at highway grade crossings where a derailment does not occur and where damage to equipment or property of the carrier exceeds $150.

Q. In the train service accidents that type of accident would appear under miscellaneous train service accidents. In other words, it would be an S-j designation?

A. Yes, where casualties occur, they are included under S-j if there was no damage exceeding $150 in the accident.

Q. No. 279 is similar to exhibit No. 277 except that it is limited to freight conductors, brakemen, and flagmen on duty?

A. That is correct.

Q. Other classes of employees are eliminated and pas-
[fol. 3949] senger train and yard switching and so forth are eliminated?

A. That is correct, except that if a road freight conductor or brakeman or flagman was on duty in connection with his own train and was injured by a yard engine he would be included in this exhibit because this is not an exhibit as to service but as to a particular class of employee.

Q. This includes branch line operation?

A. Yes.

Q. Of course what was said concerning exhibit No. 276 and the difference in territory during the period would apply here also?

A. That is correct.

Q. No. 280 is a similar exhibit except that it is further limited to the cause of the accident?

A. That is it, a certain particular type of accident.

Q. Accidents caused from sudden stop, start, lurch, and jerk of train, that is, a casualty to freight conductors, brakemen, and flagmen on duty?

A. That is correct.

Q. Of course if that accident at Arlington should appear from the form T not to have been caused by a sudden stop, start, lurch, or jerk of train then column K, 1939, would [fol. 3950] become three rather than four, wouldn't it?

A. Yes, if there is any error in the classification, but I am not aware that there was. That would still leave a higher casualty rate in Arizona than Nevada.

Q. Exhibit No. 281 simply shows cases where death has occurred either at the time of the accident or subsequent?

A. Yes, it shows narratively the occurrence of the serious accidents in the two states related in the aggregate, there being fifteen in Nevada.

Q. Of course an accident can be serious without resulting in death?

A. Well, any accident that causes death or the loss of limbs is the most serious accident occurring on the railroad.

Q. Isn't there a case shown in your exhibit No. 274 of a brakeman named Willoughby who was thrown from a train by a sudden stop, start, lurch, or jerk of the train and has been in the state hospital ever since?

A. Yes, sir, but the Arizona law didn't prevent it.

Q. That was in 1928?

A. That is correct.

Q. Wouldn't you call that a rather serious accident? [fol. 3951] A. I certainly do.

Mr. Mason: I think the inference is in the record from the questions of counsel that this exhibit No. 281 is confined to fatalities. Of course that is obviously not true from the face of the exhibit.

Mr. Strouss: Or amputation of limbs. That is all that is included, isn't it?

A. Yes, as the title of the exhibit indicates, "Fatalities, Subsequent Fatalities, or Amputation of Limbs."

Q. Is exhibit No. 282 somewhat of a summary of exhibit No. 281 for the state of Nevada?

A. It is a summary that may be checked and calculated from exhibits Nos. 277 and 279 and the details can be checked from exhibit No. 281.

Q. The exhibit pretty well explains itself, doesn't it?

A. I think it does, yes, sir.

Q. Exhibit No. 283, "Casualties to All Classes of Employees Off Duty; Road Freight Train Operation," I be-

lieve there is a total of six shown for the state of Arizona, 1923 to 1929?

A. That is correct.

Q. And, three of those were caused by a sudden stop, [fol. 3952] start, lurch, or jerk of train?

A. That is right, one on a 62-car train and two on 60-car trains and one of them occurred on the locomotive.

Q. Exhibit No. 284 is similar to exhibit No. 283 except it is for the state of Nevada?

A. That is correct.

Q. And there are nine accidents there?

A. That is correct.

Q. Five of which resulted from sudden stop, start, lurch, or jerk of train?

A. That is correct.

Q. Resulting in six casualties?

A. That is correct, and the last one occurring over twelve years ago?

Q. Two of them were on a 94-car train, two on a 55-car train, one on an 88-car train, and one on a 76-car train?

A. That is correct.

Q. Exhibit No. 285 gives the casualties to persons carried under contract. There seems to have been one in Nevada and eleven in Arizona during that seventeen-year period?

A. That is correct.

Q. Five of those in Arizona were due to sudden stop, start, lurch, or jerk of train occurring on 50, 58, 59, 68, and [fol. 3953] 70-car trains?

A. That is correct.

Q. Exhibit No. 286 and the next one have to do with derailments due to defects in or failures of freight car equipment?

A. That is correct.

Q. And there appear to have been 105 accidents with total damage of $201,577 in Arizona and 65 accidents with total damage of $100,141 in Nevada in the seventeen-year period?

A. That is correct.

Q. From the summary at the bottom of sheet No. 2 it appears that 35 of those 65 accidents in Nevada were on trains of over 70 cars?

A. That is correct.

Q. Neither exhibit No. 286 or No. 287 in any way shows the relative number of trains of over 70 cars and trains of 70 cars or less that were run during this period?

A. No, it does not. Of course those being due to defects in or failures of freight car equipment, such an accident is not associated to a train but to the individual car regardless of the number of cars in the train.

Q. Exhibit No. 288 is a comparison of information shown on exhibits Nos. 286 and 287?

[fol. 3954] A. That is correct.

Q. Exhibit No. 289, "Detail of Train Accidents, Road Freight Train Operation," this is the detail of accidents where the damage to equipment was $150 or more?

A. In excess of $150 including the cost of clearing the wreck. When I say equipment, also track. When the equipment property of the carrier and the expense of clearing the wreck exceeds $150, it appears on exhibit No. 289.

Q. I notice on the bottom of sheet No. 7 you have indicated in this exhibit where the accident was caused by sudden stop, start, lurch, or jerk of car or train it is again indicated by a double cross?

A. No, that is not entirely correct. That was not the cause of the accident. That was the cause of the injury to brakeman Hunt. The cause of the accident was a defective knuckle.

Q. There are many other accidents in here than those indicated which involve the sudden stop, start, lurch, or jerk?

A. No, I wouldn't say many.

Q. Well, let's go through this exhibit and see what we have.

A. This exhibit shows 222 items.

[fol. 3955] Q. Take the description of the accident, item No. 9, wouldn't you say that was an accident caused by a sudden stop, emergency application of the brakes due to a dirty triple valve?

A. Yes, that derailment was caused by the air brakes applying in emergency due to a dirty triple valve.

Q. And the damage was the result of that?

A. But there were no injuries.

Q. No. The next item, item No. 10, air hose burst on car, slack running in and breaking car in center, car bulging out toward main track and raking cars in passing pas-

senger trains, causing injury to express messenger in baggage car. That accident caused an injury?

A. That is correct.

Q. You haven't marked that?

A. It should not be. The passenger train was standing still—no, pardon me, it was proceeding at speed and he fell over the moment that the freight cars raked the passenger train.

Q. The cause of the freight car bulging was the slack running in?

A. That is correct, due to an air hose bursting but there was no one injured on the freight train.

[fol. 3956] Mr. Booth: These are all Arizona accidents, aren't they?

A. Yes, sir.

Mr. Mason: These are all accidents which could have been but were not prevented by the 70, or 14-car law, is that the idea?

Mr. Strouss: We will find out about that.

Q. The first one of those was one a 65-car train and the other on a 66-car train?

A. That is correct.

Mr. Mason: The accident was on the 12-car train.

A. No, the accident was on the freight train of 66 cars. The injury was on the passenger train of 12 cars.

Mr. Strouss:

Q. On sheet No. 2, item No. 27, "train parted due to some unauthorized person stepping on cutting lever." That would be due to a sudden stop?

A. Yes, no doubt but what the train stopped, but no one was injured.

Q. $200 damage?

A. That is correct.

[fol. 3957] Q. In item 43,—by the way, that accident was on a 66-car train too, wasn't it?

A. That is correct.

Q. In item 43, "Undesired emergency application air brakes caused break-in-two and pulled end sill and draw-bar out of weak car."

A. That is true, 60-car train, nobody hurt.

Q. $300 damage?

A. That is correct.

Q. Now, item 73, on sheet 3, "Train broke-in-two due to severe slack action caused by improper application of air by engineer."

A. That is correct, $245 damage, nobody hurt, 67 cars.

Q. The next item "Derailment caused by undesired emergency application of air brakes while stopping due to dirty, slow-acting triple."

A. What item was that, Mr. Strouss?

Q. No. 74.

A. That is correct, $290 damage, 67-car-train, nobody hurt.

Q. Item 77. "Air-brakes went into undesired emergency causing car to buckle."

A. That is correct. $200 damage, 65-car train, nobody hurt.

Q. Item 93, "Emergency stop made to keep from running [fol. 3958] through switch which brakeman had not thrown due to his switch key being so worn it would not unlock switch lock."

A. That is correct, 70-car train, $458 damage, nobody hurt.

Q. Now, item 98—that was a 70-car train, that previous item?

A. That is correct.

Q. Item 98, "Slack ran in when air brakes applied in emergency to stop train, damaging 49th and 50th cars from engine."

A. That is correct. 53-car train, $500 damage, nobody hurt.

Q. In item 111, "Undesired emergency application of air brakes due to branch pipe being struck by some object, caused drawbar of car to drop down, resulting in derailment."

A. That is correct, 46-car train, $1,560 damage, nobody hurt.

Q. Item 120, "Cars buckled due to rough stop when airbrakes applied in emergency."

A. $510 damage, 99-car train, nobody hurt. That was a train coming from the Los Angeles division into Yuma.

Q. Item 124, "Engine separated from train due to lock block not feeding properly, air brakes taking undesired [fol. 3959] emergency, derailing two outfit cars on rear of train."

A. 66-car train, $653 damage, and killed a lineman who was occupying one of the outfit cars.

Q. The next item, No. 125, "Train broke-in-two due to trespasser stepping on cutting lever."

A. 67-car train, $325 damage, nobody hurt.

Q. Item 139, "Break-in-two caused by drawbar pulling out of car due to defective bolts in draft rigging."

A. 47-car train, $175 damage, nobody hurt.

Q. Item 175, is that a sudden stop accident? It says, "Car broke-in-two because too weak, due to old defects, to withstand ordinary train usage." I didn't quite understand.

A. That is of the type of miscellaneous train accidents, no derailment occurred but there were 65 cars in the train and this one broke-in-two and was damaged $395.

Q. And the next item, 176, "Emergency application of brakes caused by main reservoir pipe on engine breaking."

A. Yes, that is a 65-car train, $470 damage, nobody hurt. No one was injured in item 175 either.

Q. Item 183, "Six cars buckled and damages due to heavy run-in of slack as result of emergency application [fol. 3960] when branch pipe broke on 34th car from engine."

A. 70-car train, $1055 damage, no one injured.

Q. Item 213, "Train broke-in-two due to defective knuckle on first car."

A. I have discussed that previously.

Q. Oh, yes.

A. That is a sixty-seven car train, injured brakeman, $250 damage.

Q. Item 225, "Engineer applied airbrakes in emergency when middle main rod strap of engine broke, caboose being knocked off center and conductor in caboose injured."

A. Yes, that was a 57-car train, $760 worth of damage and injured Conductor Quint.

Q. 230, "Undesired emergency caused by weak graduating spring and sluggish triple on car pulled drawbar out of second car derailing third and fourth cars."

A. That was a 67-car train, $890 damage, no one injured.

Q. Item 233, "Trespasser stepped on cutting lever of fourth car from engine, sudden stop and severe slack action damaging 63rd, 68th and 69th cars from head end."

A. That was a 70-car train, $165 damage, nobody in-
[fol. 3961] jured.

Q. Item 238, "Derailed 5th and 6th cars from engine due to air hose bursting on 5th car, causing drawbar to pull out of 3rd car and fall on track."

A. That was a 60-car train, $200 damage, no one hurt.

Q. Item 242, "Failure of engineer to properly control slack and weak condition of car caused damage to car just ahead of helper engine."

A. 70-car train, $700 damage, no one injured.

Q. Item 256, "Air hose burst on first car ahead of helper engine cut-in rear of train, causing derailment and buckling of 13th car ahead of helper engine."

A. 70-car train, $1,500 damage, nobody injured.

Q. Item 260, "Train parted when starting, drawbar being pulled out of 34th car due to brakes not being released, center sill and end frame being pulled off the car." Would you class that as that type of accident?

A. It doesn't come within the class you have been reading to me.

Q. We will leave that out. Item 264, "Emergency application of airbrakes due to trespasser stepping on cutting lever with helper engine shoving rear of train buckled
[fol. 3962] 61st car from head end."

A. That was a 68-car train, $200 damage, no one injured.

Q. Item 315, "Second car from caboose buckled due to heavy service application of airbrakes made to stop train when engine struck cow."

A. That was a 53-car train, $400 damage, no one injured.

Q. Item 346, "Three deadhead cabooses on rear of train damaged when emergency stop made to avoid striking another engine."

A. 66-car train, $450 damage, and nobody injured.

Q. Item 349, "Trespasser stepped on cutting lever, parting train, airbrakes going into emergency causing rough stop."

A. $200 damage, 58-car train, nobody injured.

Mr. Mason: I think you have overlooked No. 347. It is marked with the cross-hatch there.

The Witness: Well, the train accident wasn't due to any causes Mr. Strouss has mentioned, but the conductor received his injury on account of sudden stop.

Mr. Strouss: Well, it reads, "Scale car next ahead of caboose derailed and derailed due to up and down mo-
[fol. 3963] tion caused by ballasted weights, breaking train line, sudden stop of train, causing injury to conductor in caboose." That was a 66-car train with $355 damage?

A. That is correct.

Q. Item 367, "Train broke-in-two due to undesired emergency when stopping."

A. 70 cars in train, $402 damages and no one injured.

Q. Item 373, "Conductor applied brakes from caboose because engineer backed up without signal and switch to siding had not been thrown, slack action stopping damaging two cars and causing derailment of one car."

A. Of course, that is distinguished from the other type of accidents, because in this case the train was backing up. In the others, it was going ahead. It was a 65-car train, $180 damage, and no one was injured.

Q. Now, Exhibit 290 is a similar exhibit for Nevada?

A. That is correct.

Q. Now, I would like to go down through this exhibit the same way.

A. I beg your pardon, I would like to request that one item be eliminated which was included through inadvertence, [fol. 3964] and that is item 206.

Q. That is in Arizona, you mean?

A. No, in Nevada. I included in error an accident involving a light engine, which does not conform to the title of the exhibit. It should not have been included and it doesn't affect any of the other exhibits.

Q. The first accident of the type caused from sudden stopping, starting, lurching or jerking of train that I note on this exhibit, and if there are any I overlook that you see, I would like you to call my attention to them, is item 9. "30th car from caboose buckled due to run-in of slack as train was stopping."

A. That was a 97-car train, $400 damage, and no one was injured.

Q. And item 11, "Derailed six cars behind engine, due to coupler pulling out of engine tender and falling on track

caused by emergency action of brakes due to knuckles slipping by between second and third cars ahead of caboose."

A. That was a 55-car train, $1160 damage, and no one injured.

Q. Item 12, "Sudden stop due to undesired emergency as train was stopping in siding, caused injury to brakeman [fol. 3965] in caboose cupola and damaged 26th and 27th cars from caboose."

A. That was an 85-car train, $720 damage, and injured Brakeman G. W. Roberts.

Q. Item 18, "Derailed and buckled 5th and 6th cars from engine and damaged car behind engine due to emergency action of brakes caused by trespasser stepping on cutting lever as train backing in siding."

A. That was during a back-up movement. It was an 87-car train, $178 damage; and no one was hurt.

Q. Item 26, "Train parted as it was being stopped due to drawbar in engine tender falling out on account of carrier-iron breaking. Emergency action of brakes caused damage to seven cars and injured trainmen in caboose."

A. That was an 85-car train, $395 damage, and injured the conductor and two brakemen.

Q. Item 35, "Airhose burst on 7th car from engine. Emergency action of brakes buckled 9th car from caboose."

A. An 84-car train, $530 damage, and no one injured.

Q. Item 46, "Run-in of slack caused the 16th car from caboose to be telescoped by the 15th car."

A. 83-car train, $175 damage, no one injured.

Q. Would you consider item 47 in that type of acci- [fol. 3966] dent?

A. Yes.

Q. "Derailed 38th car from head end due to drawbar falling out of car caused by keeper in drawbar key losing out."

A. It was a 94-car train, $573 damage, no one injured.

Q. Item 48, "Sudden stop due to undesired emergency as train was stopping in yard, buckled 10th and 11th cars from caboose."

A. 84-car train, $375 damage, no one injured.

Q. Item 56, "Derailed 18th and 19th cars ahead of caboose caused by sudden stop due to undesired emergency."

A. 101-car train, $470 damage, no one injured.

Mr. Mason: Did you leave out 52, Mr. Strouss?

Mr. Strouss: Yes, that is right. "Derailed 20th car ahead of caboose due to draft rigging pulling out of car and falling on track when undesired emergency action of brakes occurred, caused by defective triple."

A. That was a 90-car train, $610 damage, no one injured.

Q. I gave you 56, didn't I?

A. Yes.

Q. 57, "Four cars damaged as train being stopped in [fol. 3967] siding due to undesired emergeney."

A. 86-car train, $263 damage, no one injured.

Q. Item 59, "Derailed and telescoped 32nd car from caboose and slightly damaging four other cars, helper engine shoving on rear, when engineer applied brakes in emergency to avoid running over a fireman who stumbled and fell attempting to cross tracks in front of train. Brakeman in caboose injured."

A. 88-car train, $918 damage, and injured the Brakeman Vandermark.

Q. Item 75, "Two cars damaged due to engineer making heavy application of air and not properly controlling slack, and helper engine shoving on rear."

A. 69-car train, $390 damage, and no one was injured.

Q. Item 79, "Derailed and buckled 64th and 65th cars from engine due to emergency action of brakes when train parted due to defective drawbar yoke strap breaking on 10th car from engine."

A. 107-car train, $788 damage, no one was injured.

Q. Item 81, "Derailed 20th and 21st car from engine caused by drawbar pulling out of 16th car from engine and [fol. 3968] falling on track due to draft key losing out."

A. That was a 66-car train, $570 damage, no one injured.

Q. Item 84, buckled 48th car from head end due to weakened condition of car, as train was being stopped to cut out helper."

A. 123-car train, $950 damage, no one injured.

Q. Item 87, "Buckled 70th car from head end due to slack action as train being brought to a stop."

A. 143-car train, $556 damage, no one injured.

Q. Item 88, "Buckled 58th car from engine while stopping in siding due to undesired emergency."

A. 90-car train, $600 damage, no one injured.

Q. Item 91, "Buckled 13th car from caboose due to emergency action of brakes caused by train parting, 4th car from engine, due to drawbar yoke strap breaking. Conductor thrown to floor of caboose."

A. 94-car train, $865 damage, injured the conductor.

[fol. 3969] Q. Item No. 94, "air hose blew off 4th car ahead of caboose, causing train to part between 10th and 11th cars from engine due to broken coupler, damaging 4 cars and injuring brakeman in caboose."

A. 86-car train, $354 damage, injured brakeman Lynch.

Q. Item No. 95, "train parted due to drawbar pulling out of 2nd car from engine; sudden stop damaged 74th and 75th cars from head end and injuring deadhead brakeman in caboose."

A. 88 cars, $200 damage, injured headhead brakeman Wakefield.

Q. Item No. 96, "Derailed and buckled 45th car from engine and damaged 3 other cars, due to improper handling of air by engineer."

A. 50-car train, $886 damage, no one injured.

Q. Item No. 97, "Derailed and damaged 19th to 22nd cars from caboose due to emergency action of brakes when train parted caused by drawbar yoke breaking on 8th car from engine."

A. 100-car train, $3,200 damage, no one injured.

Q. I am putting in a lot of stuff that is already in the exhibit but I think from your testimony in this exhibit and [fol. 3970] the one previous this is the type of accident, of course is the type of accident that is referred to as the type we have read from these exhibits or the type of accident referred to as sudden stop, start, lurch, or jerk of train?

A. No, I tried to make it clear——

Q. (Interrupting) The accident may not have been caused by that but the damage and casualty results from that?

A. It may have been and it may not have been but, as I tried to explain, the Interstate Commerce Commission does not classify train accidents as being due to sudden stop, start, lurch, or jerk of train. It is classified in an entirely different manner according to the primary cause of the accident. The narrative in many of those cases indicates that there was a sudden stop, but in many cases that was not the primary cause of the damage to the equipment.

Q. There was a run-in of slack?

A. There was bound to have been some run-in of slack if the slack was stretched and it was a sudden stop, but if anyone was injured in the caboose by reason of that slack action and it had not been a train accident, it would have been classified as sudden stop, start, lurch, or jerk of train [fol. 3971] but there is a variety of classifications. You will observe in this you have been reading to me some are classified as derailments; one I recall was a collision of one portion of the train with the other after it separated and some are miscellaneous train accidents where damage to the equipment occurred but there was no collision or derailment.

Q. That is the type of accident that is classified by the Interstate Commerce Commission where there is a buckling of a car due to slack running in by reason of a derailment or the train parting, that will take an M-b symbol, wouldn't it?

A. It would if no derailment occurred but if exactly the same type of damage occurred the identical cause with one pair of wheels or one wheel got off the track it wouldn't be classified as a miscellaneous train accident but would be classified as a derailment, and depending on the primary cause the Interstate Commerce Commission would classify the accident if it was due, for instance, to an air hose bursting, there is a code cause providing for the failures of air hose. If it was due to a coupler falling out, a knuckle breaking, or some of the other causes we have read about, the accident would not be classified by the Interstate Com- [fol. 3972] merce Commission as a sudden stop, start, lurch, or jerk, it would be classified under the various primary causes for that train accident. The same code cause, for instance, for a drawbar pulling out would be used whether it was a derailment or a miscellaneous train accident.

Q. In the case of a derailment where damage to the equipment may have resulted from the run-in of slack, they would still be classed as a derailment under the Interstate Commerce Commission classification?

A. It would be classed as a derailment and under the appropriate primary cause for that derailment.

Mr. Strouss: Rather than taking the time of reading this all in, I wonder if you would this evening check over the balance of this exhibit as to this number of accidents similar

to those that have been read in showing the length of trains upon which they occurred and without reading them all in, that information could be had in the morning.

A. Just for Nevada or do you want a comparison between Arizona and Nevada?

Mr. Strouss: We have already read into the record those for Arizona. If I have missed any, I would be glad to have [fol. 3973] you call my attention to it.

A. If you could prepare a question as to just how you want this prepared, I will be glad to do it or I can prepare an exhibit and select it by years, each of those accidents of the type you have read and compare them by years one state with the other.

Mr. Strouss: I can do that without your testifying, I think.

A. If you want that particular type you have been reading, I can list them off the exhibit.

Mr. Strouss: Just to get the number of them but I think it is probably clear in the exhibit itself.

The Court: Are you through for the night?

Mr. Strouss: I think so.

The Court: The court will be at recess until ten o'clock tomorrow morning.

(Thereupon the court stood at recess until 10 A. M., Tuesday, February 18, 1941.)

[fol. 3974] February 18, 1941, ten o'clock A.M.

Proceedings were resumed at this time as follows:

The Court: You may proceed.

JOHN J. SULLIVAN was recalled to the stand and testified further as follows:

Cross-examination (Continued).

By Mr. Strouss:

Q. Mr. Sullivan, your exhibit No. 291, casualties—

A. (Interrupting) I beg your pardon, Mr. Strouss, you requested me just before recess yesterday to continue giving the reference to those particular accidents you were reading from exhibit 290. Do you want me to give you that information now or later? I have checked the items and I

can read the items into the record if you want me to.

Q. Yes, that is all right.

A. Just before the recess, Mr. Strouss was reading from a certain particular type of accident from Exhibit 290, Train Accidents occurring in the State of Nevada and, in response to his request that I give reference to the other [fol. 3975] accidents of a similar kind, I will read into the record the item numbers appearing on exhibit No. 290. The additional numbers start on sheet 4. Mr. Strouss last referred to item 97, and I will continue. Item No. 98, 99; on sheet 5, item 109, 120, 121, 122, 123, 126, 128, 132, 133, 136, 137, 139, 140; sheet 6, 141, 142, 143, 151, 163, 165, 166; sheet 7, 170, 174, 176, 178, 183; sheet 8, 193, 194, 209, 214; sheet 9, 224, 225, 227, 228. In all of these accidents damage in excess of $150 occurred, and in two of them personal injury to employees occurred.

Mr. Booth: May I ask a question, Mr. Strouss, right there?

Mr. Strouss: Yes.

Mr. Booth: These accidents that you have been questioned about by Mr. Strouss are contained on what exhibits?

A. Well, if there were any injuries, they are contained in the series of exhibits which show for Nevada and Arizona, exhibits 276, 277, 278, 282, 283, 284, because those exhibits include casualties both on train and train-service accidents, and those train accidents shown on exhibit 290 are train accidents only and do not include the train-[fol. 3976] service accidents.

Q. You mentioned Exhibit 290. That is the Nevada exhibit, isn't it?

A. That is correct.

Q. And 289 was the Arizona corresponding exhibit?

A. That is correct.

Mr. Booth: I wanted to clear that up in the record that these were not in addition to the accidents already shown.

Mr. Strouss: That is, the ones in which injury occurred.

Mr. Booth: Yes.

The Witness: Mr. Strouss, you also asked me to obtain for you the date that the pair-track operation in Nevada

was made effective. The information I have is that the date is August 1, 1924.

Mr. Strouss: I also asked you to bring in the form T on the accident at Arlington.

The Court: Did I understand your last answer, Mr. Sullivan, to be that you started the use with the Western Pacific of this section here from Weso to Alazon in August, 1924?

A. From Weso to Alazon on August 1, 1924, the last time, but it was operated in a similar manner under fed-
[fol. 3977] eral control during the war.

Mr. Strouss: I would like to have you read into the record the statement on the form T of the accident which occurred at Arlington, Arizona, on the 30th day of July, 1939, giving the statement of the cause, and then the statement of detail of cause, nature of circumstances of accident.

A. Reading from sheet No. 92 of the monthly report of railway accidents of the Southern Pacific Company to the Interstate Commerce Commission for July, 1939; the injury occurred at Arlington, Arizona, July 30, 1939. The cause, briefly, under item 17, "brakeman either thrown or fell down in caboose." It was local freight train No. 902, consisting of 59 cars and covers the injury to R. A. Green, a local freight brakeman who suffered a fracture of the twelfth rib, left side. Detail of cause under item 26: "After setting out bad order car at Arlington and getting ready to depart, conductor got on caboose and found rear brakeman Green lying on caboose floor in an unconscious condition. Later on, being questioned as to how accident occurred, Green could remember nothing other than seeing conductor give engineer stop signal going through siding at Arlington; he got down out of caboose cupola to get his red lantern hanging on nail in caboose, everything being
[fol. 3978] obscure to him until found himself lying on the cushions on caboose floor, he having been placed on same by the conductor."

[fol. 3979] Q. Now turning to exhibit No. 291, "Casualties to All Classes of Persons, Except Trespassers, Train and Train Service Accidents While on, Employed on, or Getting on or off Passenger Trains, Reportable to the Interstate Commerce Commission, State of Nevada,

Southern Pacific Company Lines, 1923 to 1939." This includes both main line and branch?

A. Yes, but I don't recall of any injuries to passengers on any branch lines in this exhibit, but if there were any it will show.

Q. There was a change in the territory during the period covered. I mean in the first year and a half you were operating single track and didn't have the paired track arrangement with the Western Pacific?

A. No, not until August 1, 1924.

Q. Do you know that in 1923 and 1924 the branch line operations in Nevada were approximately 200 miles longer than in the last years of this period, isn't that a fact?

A. I don't think it is a fact as to passenger train operation. Possibly as to the physical characteristics of the railroad there would be some difference, but I will be glad to answer that question definitely this morning. I am hav-[fol. 3980] ing a statement prepared showing the operated mileage both in the state of Nevada and Arizona as of December 31st for each of the years from 1923 to 1939, inclusive.

Q. That is for both freight and passenger train operation?

A. It won't show it separately for freight and passenger train operation.

Q. This exhibit is a trend exhibit again, isn't it?

A. No, not altogether.

Q. This type of casualty is more or less irregular, that is, it is up one year and down another?

A. That is true, but as to Nevada my reference to sheets Nos. 2, 3, and 4, which are part of the exhibit, it also shows they are quite infrequent.

Q. It also shows, omitting the Harney derailment, there has been very little change in the last few years?

A. What change there has been is reflected in the casualty rates on sheet No. 1, columns A to X, inclusive.

Q. And that shows there has been very little change in the last two years?

A. No, I wouldn't say that; it shows fluctuation.

[fol. 3981] Q. You mean from year to year?

A. Different years, yes. In other words, there isn't any definite trend, for instance, reference may be made to 1938 which would eliminate the Harney derailment, cas-

ualties to all persons per million train-miles was less than one, whereas the preceding year it was four times that many. The year before that it was somewhat more than that, but in the year 1935 there was none but the exhibit shows the casualty rates and the fluctuation.

Q. It does fluctuate from year to year?

A. Yes.

Q. In these accidents which you have detailed, there appear to be four which were injuries caused by slack action, one on the 23rd day of May, 1932, at Cobre?

A. No, I wouldn't say that was due to slack action.

Q. It was due to a sudden stop of the train?

A. No, there is nothing there that said it was due to a sudden stop. It might have been due to the motion of the train. There is nothing on the exhibit to indicate it was due to slack action and I have no knowledge that it was.

Q. Do you have that form T available?

[fol. 3982] A. Yes, I have a photostatic copy of it.

Q. I would like to have it. What about the one on March 8th, 1937, item No. 47?

A. According to the detail, that was due to a jerk of the train, on a 12-car train.

Q. And the next, item No. 48?

A. That is correct, on a 13-car train.

Q. The next exhibit, No. 292, is a similar exhibit only applying to Arizona?

A. That is correct, except there is additional information shown on sheet No. 2 that does not appear on exhibit No. 291.

Q. Yes, there is a comparison made there of the two exhibits?

A. That is correct.

Q. Now in this exhibit, item No. 4, that is the result of slack action, isn't it?

A. No, more than likely it was due to some lateral motion of the baggage car in which the express messenger was working.

Q. How about item No. 11?

Mr. Booth: What is that item No. 4, Maricopa, 1923?

A. I understood him to say item No. 5.

Mr. Strouss: No, elderly passenger rolled against seat as train recoupled after making pickup.

[fol. 3983] A. That is a switching accident, a case where apparently the engineer coupled the train too hard and this elderly passenger was thrown against the seat but it was not any slack action of the train.

Q. Coupling at the station in putting the car in or something of that sort?

A. Yes, during that period Maricopa was the junction point of the Phoenix line and certain trains picked up and set out passenger equipment at Maricopa and this accident apparently according to the narrative occurred during that operation, which was a switching operation pure and simple.

Q. What about item No. 11?

A. That was an 8-car train, due to a sudden stop.

Q. Item No. 86?

A. Yes, that was an accident that resulted allegedly from a jerk when the train was stopping, a 14-car train.

Q. Item No. 99?

A. That was a passenger injured by an emergency stop on an 11-car train due to oversight on the part of the engineer in charge of the train.

Q. It was slack action, wasn't it?

A. Unquestionably.

Q. Item No. 136?

[fol. 3984] A. Yes, that was a jerk as the train was being started, a 14-car train.

Q. Item No. 138?

A. Yes, a 13-car train.

Q. Item No. 157?

A. Considering the speed, I would say that was some lateral motion of the car and not slack action.

Q. What about item No. 162?

A. Yes, that was a jerk of the train, a 5-car train.

Mr. Mason: It was a 12-car train, wasn't it?

A. That is right, the number was five; it was a 12-car train.

Mr. Strouss: Item No. 187?

A. Yes, 14-car train.

Q. No. 188?

A. 14-car train, when starting.

Q. No. 195?

Mr. Booth: You don't mean that is slack action, do you?

A. It was attributed to a jerk.

Mr. Booth: There is a whole lot of difference between a jerk and slack action, isn't there?

A. You don't have a running in or running out as you are starting the train, it is a jerk.

Mr. Strouss: Your classification is "sudden stop, start, [fol. 3985] lurch, or jerk of train."

Mr. Mason: Do we understand that you contend that sudden stop, start, lurch, or jerk and slack action are absolutely and inevitably synonymous?

Mr. Strouss: No, I don't contend that.

The Witness: I was answering Mr. Strouss in response to his question as to the cause assigned. There is nothing on the exhibit assigning them to any particular cause, the narrative is there and speaks for itself.

Q. What about No. 196?

Mr. Mason: I don't think there was any answer on No. 195.

A. It was due to an alleged jerk of an 11-car train.

Mr. Strouss: Did you answer No. 195?

A. I am just answering that now, on an 11-car train. That was a case of one passenger stepping on the foot of another.

Q. No. 201?

A. That was due to rough stop on account of grade crossing accident, 12-car train.

Q. No. 208?

A. That was an 11-car train, alleged to be due to a sudden stop of the train.

Q. No. 218?

[fol. 3986] A. No, there is no evidence there that that was due to any jerk.

Q. It was No. 219 I meant.

A. Considering the speed of the train, more than likely that was some lateral motion of the car and not a jerk horizontally.

Q. The exhibit indicates it was due to a lurch of some sort?

A. Yes, that is correct. The reason I mentioned the difference between the horizontal and the lateral is because you can have a lateral motion of the car regardless of the number of cars in the train.

[fol. 3987] Mr. Strouss: Now, there is one further question in connection with this exhibit, item 104, derailment at Dome. Some point of this accident was made in your direct examination. I want to ask you if it is not a fact that the locomotive which was pulling this train at that time afterwards turned over, if you know?

A. It turned over in this accident.

Q. But in subsequent operation, didn't it again turn over this same locomotive, if you know?

A. Possibly I can answer that. I have a copy of that Dome accident report.

Q. I don't mean in this particular accident, I mean afterwards.

A. Well, that is the only way I can determine it. This was locomotive No. 3122. Well, I have examined the exhibit covering passenger train accidents, and the freight train accidents, because if the engine turned over it would be a reported train accident, and I don't find where it turned over subsequently. The report of the accident happening at Dome shows it occurred to through passenger train first 104, three cars in the train, engine 3122; report states that train No. 104 arrived Yuma August 5, [fol. 3988] 1931, with fifteen cars and with the regular San Diego-New Orleans sleeper to pick up made a total of sixteen cars, making it necessary to run two sections Yuma to Phoenix account car limit law; first 104 consisting of engine 3122, baggage cars S. P. 6454 and S. P. 6472 —I don't know whether you want all that read. It mentions engine derailed to the left on outside of curve, first marks of detailment being abrasions on west end of angle bar on outside of north rail, next mark on one of the bolts of the same joint. It is a long narrative.

Mr. Strouss: I think the summary is all that is necessary.

The Court: The entire summary is already in there.

The Witness: But I can't find any reference to the engine subsequently turning over and I have no knowledge of it having turned over.

Mr. Strouss: Your exhibits, 293 and 295, are similar to exhibits 291 and 292, except that they relate to April—exhibit 294 to March and April, 1940, and this is a passenger train exhibit.

A. Yes, Exhibit 294 is a passenger exhibit for the months of March and April, 1940.

Q. And 295 is the freight exhibit?

[fol. 3989] A. That is correct.

Q. Were operations conducted in the usual manner during those freight train operations?

A. I wasn't here, but I presume that they were.

Q. You don't know whether there were any changes in the way they handled trains coming into Tucson, for example, those long freight trains?

A. No, I don't know how the physical handling was undertaken.

Q. Whether they came down and instead of pulling into the yard in the ordinary practice, stopped and sent an engine out to help them in?

A. I don't know, but when I was employed on the Tucson division that was the regular practice to send the engine down to pull them in.

Q. You don't know whether there were any changes made during this period from what it had been just prior to that?

A. No, but I presume that their practice was undertaken in the same way.

Q. Your exhibit 293 has to do with grade crossing accidents in Arizona?

A. Yes, that is correct.

Q. And Arizona only, comparing the accidents on the Southern Pacific——

[fol. 3990] A. Yes.

Q. ——with those of other railroads?

A. No, there is no comparison with other railroads.

Q. I mean separating those on your railroad from those on other railroads?

A. Yes, that is correct.

Q. What was the number of the other crossing exhibit, do you remember, the grade crossing exhibit?

Mr. Booth: The national exhibit.

A. Exhibit 268 covers the national showing.

Mr. Strouss: Now, these tables from which these two exhibits were made, those tables show the casualties by states, do they not, in the accident bulletin?

A. Yes.

Q. So that it is possible from those to make a comparison of accidents occurring in different states if that is desired.

A. If that is desired, yes.

Mr. Strouss: I think that is all. You will have that mileage?

The Witness: It should be here now, but I will have it for you.

Mr. Strouss: I am expecting some certified copies that [fol. 3991] I mentioned yesterday of reports that I will want to put in, in addition to the ones put in yesterday.

Mr. Booth: I notice at page 3907 of the record, when we spoke of substituting exhibits showing the 1939 I. C. C. figures, that the Court said, "There may be substituted in this record for these various national exhibits that have to do with this safety angle an exhibit which will bear the same number," and so forth. There are some Southern Pacific System exhibits which were taken from the reports, which we would like to substitute.

The Court: It was my understanding, Mr. Booth, that when you came to the showing of the Southern Pacific System, that this witness Sullivan did include in his exhibit the 1939 statistics, but that it was only in the national set of statistics that the 1939 was excluded.

The Witness: That is only partially correct, your Honor. There were two exhibits, the source of which was the Interstate Commerce Commission Accident bulletins and they didn't include the year 1939.

Mr. Strouss: I will say to the Court that I have no objection to the substitution in any exhibit where the exhibit [fol. 3992] was made up from the accident bulletin, whether it be national or for the Southern Pacific line. In saying that, I don't waive any objection I made to the introduction.

The Court: I understand that. The Court will broaden the scope of its order, and permit you on any of these exhibits having to do with the safety angle where the 1939 statistics were not available, they may now be added to the exhibits.

The Witness: I might mention, that the exhibits I have just referred to are exhibits 272 and 273.

Redirect examination.

By Mr. Booth:

Q. Mr. Sullivan, which of your exhibits gives the number of train accidents on all railroads of the United States for the year 1938 and years preceding?

A. Exhibit No. 269, train accidents and resulting casualties, all railroads of the United States.

Q. What was the number of train accidents from all causes, as shown on that exhibit 269, for the year 1938?

A. 5,682.

Q. In what table in the accident bulletin 107 for the year [fol. 3993] 1938 is that figure found?

A. Table No. 61.

Q. In what table in the accident bulletin No. 108 for the calendar year 1939 was the corresponding figure found?

A. It may be found in more than one table. Table No. 61 and table No. 63, table 61 having the title, "Train Accidents Showing By Classes Number of Accidents, Damage to Railway Property, and Resulting Casualties to Persons for the Year Ending December 31, 1939." Table No. 63 has the title, "Train Accidents Showing by General Classes and Causes Number of Accidents, Damage to Railway Property, and Resulting Casualties to Persons."

Q. What was the number of train accidents from all causes, all railroads in the United States, as shown by table 63 for the year 1939?

A. 6,074.

Q. Then there was an increase of 392 in 1939 as against 1938, is that correct?

A. That is correct.

Mr. Booth: I have asked the witness, your Honor, to prepare some figures breaking down this increase because to put in an amended exhibit, or rather a supplemented exhibit without any explanation would simply show the [fol. 3994] fact of an increase without showing what caused it, and I don't want to put it in in the form of an exhibit. I will ask the witness to read the figures into the record.

Q. Into what general groups are train accidents divided?

A. As to kind or causes?

Q. As to cause, four general groups.

A. Reference may be made to table No. 63, items 22 to 25, which shows first, negligence of employees; second,

defects in or failures of equipment; third, defects in or improper maintenace of way and structures; and, fourth, miscellaneous.

Q. The assigned causes of negligence of employees increased from what number to what number, 1938 to 1939?

Mr. Strouss: May I ask, are these just reading the figures from the accident bulletin?

Mr. Booth: Yes.

A. Table No. 63 on both accident bulletins 107 and 108 for the years 1938 and 1939, shows that the train accidents chargeable by the Interstate Commerce Commission to negligence of employees increased from 1,772 in 1938 to 2,238, or an increase of 466 or 26.3 per cent.

Q. Was there a decrease in accidents caused by defects [fol. 3995] in or failures of equipment, and, if so, to what extent?

A. Yes, train accidents due to defects in or failures of equipment decreased from 2,073 in 1938 to 2,039, in 1939, a decrease of 34, or 1.64 per cent.

Q. And what as to the next general cause?

A. Train accidents due to defect in or improper maintenance of way and structures decreased from 720 in 1938 to 709 in 1939, a decrease of eleven or 1.53 per cent.

Q. And miscellaneous causes?

A. Miscellaneous causes decreased from 1,117 in 1938 to 1,088 in 1939, a decrease of 29 or 2.6 per cent.

Q. Now, will you give the grand total, please?

A. Train accidents from all causes increased from 5,682 in 1938 to 6,074 in 1939; an increase of 392, or 6.9 per cent.

[fol. 3996] Mr. Booth:

Q. Mr. Sullivan, in any of your other exhibits about which Mr. Strouss questioned you on cross-examination, is there any showing of the percentage of accidents charged by the Interstate Commerce Commission to negligence of employees and, if so, will you state what exhibits they are and what the percentage is?

A. Exhibit No. 270, which is a tabulation of the data shown in the summaries of accident investigation reports insofar as they relate to accidents involving road freight trains, on page 2 negligence of employees was assigned by the Interstate Commerce Commission as the cause of 62.2

per cent of the accidents investigated for that twelve years. Examining the lower block for the year 1939 and making the calculation; it will be found that the number of accidents attributed to negligence of employees was 64.7 per cent or 2.5 per cent higher than the average for the twelve years including 1939. Exhibit No. 271, which is a similar exhibit for passenger trains but for a shorter period, it only covering six years, the average showed that 48.3 per cent of the accidents investigated was chargeable to negligence of employees, whereas for the year 1939, 61.3 per cent was [fol. 3997] charged by the Interstate Commerce Commission to negligence of employees, or 13 per cent more than the average for the whole six years.

The Court: Mr. Sullivan, referring to defendant's exhibit No. 269, line 18, column K, as to the number of train accidents resulting in casualty. What is the 1939 figure that is comparable to the 427 shown on that line? What I am getting at is this, the number of train accidents from your testimony just given apparently increased by some 392. Was there a corresponding increase in the number of accidents resulting in casualties?

A. There was an increase of eight; summary No. 216, the source of column K on exhibit No. 269, shows for the year 1939 there were 435 train accidents resulting in casualties, and as I explained in my direct testimony when I was examined on exhibit No. 269 this particular showing includes trespassers.

Mr. Booth:

Q. Yesterday Mr. Strouss introduced plaintiff's exhibit No. 304 consisting of a certified copy of a report of the Director of the Bureau of Safety of the Interstate Commerce Commission as to the accident occurring November 19, 1938, at Reno, Nevada, on the lines of the Southern Pacific Company. How many brakemen were in the caboose [fol. 3998] of that train at the time of the accident, Mr. Sullivan?

A. Four.

Q. Was that a through freight train?

A. It was, consisting of 85 cars.

Q. Made up where?

A. Sparks, Nevada.

Q. Was it eastbound or westbound?

A. Westbound.

Q. The full-crew law in Nevada is already in evidence here and four brakemen is a larger number of brakemen than that law requires. Why, if you know, were there four brakemen in the caboose of that train?

Mr. Strouss: I object to it as immaterial.

The Court: Objection overruled, you may answer.

A. The Nevada full-crew law requires a conductor and three brakemen. Had the provisions of the Nevada law been in effect on this particular train, there would have been a conductor and two brakemen in the caboose, not exceeding two brakemen, instead of four. The provisions of the California full-crew law must be observed because it is the nearest terminal to the California state line, and the number of additional brakemen required by the law [fol. 3999] are assigned to the crew leaving Sparks, Nevada.

The Court: You mean that the requirements of the California law are in excess of that of the Nevada law so far as the full-train crew is concerned?

A. That is true, your Honor, in fact there are trains that have twice as many brakemen out of Sparks than are required by the Nevada law in a train moving eastward.

Mr. Mason: Where would this train have entered California?

A. At a point known as Calvada, I don't recall now, it is a short distance from Sparks, Nevada.

Mr. Booth: It is about 14 miles?

A. Relatively that, I was going to say 15 miles.

Mr. Mason: How far would the train run in California before reaching the next division terminal?

Mr. Strouss: I object to that, if the Court please, that is certainly immaterial.

The Court: Yes, objection sustained.

Mr. Booth: Counsel brought out this accident and we contend that unnecessary brakemen in the caboose increases the hazard just as unnecessary trains run.

[fol. 4000] The Court: I don't see that that has any materiality here.

Mr. Strouss: You are not asking me to take on the defense of the California full-crew law in this case, too, are you?

The Court: No, I will sustain the objection.

Mr. Booth: You put your finger on that accident:

Mr. Strouss: I have a few more I am going to put my finger on, too.

Mr. Booth:

Q. You had some discussion with Mr. Strouss yesterday about the statistical computation of grade crossing accidents and their hazards in which you said that the statistics indicated a very close relationship of the accidents to the volume of traffic across a crossing. Will you take the 1939 accident bulletin of the Commission, bulletin No. 108, and read what the Commission says with regard to the difficulty of accurate and illuminating statistics on the subject of grade crossing accidents?

Mr. Strouss: I object to that as incompetent, irrelevant, and immaterial, and calling for conclusions.

Mr. Booth: It is the Commission's explanation of its own statistics.

[fol. 4001] Mr. Strouss: Nevertheless, I don't see it is competent evidence here.

The Court: Read the question, please.

(The question was read by the reporter.)

The Court: I will overrule the objection and we will take our morning recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows:)

Mr. Booth: I am handing the reporter a typewritten tabulation consisting of one sheet which I would like to have marked for identification.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 305 for identification.

Mr. Booth:

Q. Mr. Sullivan, referring to defendant's exhibit No. 305 for identifictaion, have you had prepared from the reports of the Southern Pacific Company to the Public Service Commission of Nevada and to the Corporation Commission of Arizona a tabulated statement showing the main track

mileage by main line and branch line as of December 31st of each year from 1923 to 1939, inclusive, in those states?

A. I have.

Q. Is that defendant's exhibit No. 305 for identification?

[fol. 4002] A. Yes, sir.

Q. Do you believe it to be true and correct?

A. Yes, sir.

Mr. Booth: Any questions?

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 305.")

Mr. Booth:

Q. Will you read the excerpt from the Interstate Commerce Commission report about which I asked you just before recess?

Mr. Strouss: I renew my objection.

The Court: Objection overruled.

A. Reading from Accident Bulletin No. 108 of the Interstate Commerce Commission, Bureau of Statistics, at page 11, under the caption, "Highway Grade Crossing Accidents," the report states: "To accurately measure the trend in accidents at crossings of railways and highways, it would be necessary to know the volume of traffic, both rail and highway, that passes over these crossings. In the absence of such data, casualty rates based on train-miles, automobile registration, and gasoline consumption in the period 1930-1939 are shown in the table 16 to throw some light on the factor of volume of traffic."

[fol. 4003] Mr. Booth:

Q. Mr. Strouss asked you a question as to whether if a brakeman was injured in operating retainers by a sudden stop, start, lurch, or jerk of train it would be classified under any of the heads shown in the note to your exhibit No. 266, and that was the first time the word "retainer" had come into the case. What is a retainer?

A. A retainer is a device which is a part of the air brake mechanism and it is located at an accessible place on the end of the car near the top, which when manipulated

retains cylinder pressure in the cylinder after the brakes have been released by the engineer in order to keep the brakes applied on the cars on which the retainer might have been manipulated while the brake pipe is being recharged from the engine.

Q. Is it manipulated or operated by hand?

A. It is.

Q. By the brakemen going to the point where the retainer is located and using his hand to turn it?

A. That is true, and it is only operated of course descending certain specified grades.

The Court: Under what circumstances would it be used? [fol. 4004] A. A retainer is used, your Honor, depending upon the average weight per operative brake in the train and depending upon the severity of the grade. Ordinarily retainers are used on the heavier trains, that is, where the weight per car exceeds a certain figure and on grades of 1.4 and more. The two factors must be present, grade descending and weight per operative brake. For example, a train of empty cars descending a 1.5 per cent grade, it would not be necessary to use retainers, whereas if that was a train, for instance, of solid loads exceeding a certain specified gross weight per operative brake or per car, retainers would be used on a certain number of the cars, not on all cars in the train.

Mr. Booth:

Q. What is the rule or practice on the Southern Pacific Company with regard to turning retainers up or down while the train is in motion?

A. They are turned up and down in motion usually at reduced speed.

Q. If a brakeman is injured by a sudden stop, start, lurch, or jerk of a train while he is operating a retainer, under what classification in the Commission's rules for classifying accidents would that accident fall?

[fol. 4005] A. Depending upon the primary cause so-called of the shock or sudden stop, start, lurch, or jerk; it would be classified under either Code Cause No. 7006, 7008, 7009, or 7810.

Q. Mr. Strouss asked you a number of questions about a class of accidents which he called "slack action" accidents, most of which related to injuries to conductors and

brakemen while in the caboose of the freight train. Referring now to train service accidents alone, under what classification or classifications would accidents of that character be classified under the Interstate Commerce Commission's rules?

A. Depending upon the primary cause of the accident, it would be classified under one of the four code causes, 7007, 7008, 7009, or 7010.

Q. Mr. Strouss asked you some questions yesterday regarding Code Causes Nos. 7000, 6411, and 6736. Why did you not include Code Cause No. 7000 in defendant's exhibit No. 266?

A. Any accident that might have been due to sudden stop, start, lurch, or jerk of train in no case would have been included under No. 7000. If it was due to a sudden stopping, starting, lurch, or jerk of locomotive and the cause was not known, it would have been included under No. [fol. 4006] 7007, which is the miscellaneous code cause for that particular type of casualty.

Q. And that No. 7007 is included in exhibit No. 266?

A. It is.

Q. As to No. 6411 and No. 6736, have you taken exhibit No. 266 and made computations on that exhibit so as to show what the averages on that exhibit would be if those causes were included for the entire period 1923 to 1938, inclusive?

A. I have.

Q. Referring to line 20 of that exhibit, the grand total of employees killed was 90. What would the total be if the two classifications I have last mentioned were included?

A. If the fatalities included in Code Causes Nos. 6411 and 6736 for the seventeen years had been included, the number would have been 95 instead of 90.

Q. The persons injured for the seventeen years were 17,302 according to exhibit No. 266. What addition would be made in the case of that figure by including these two additional classifications?

A. The figure would have been 18,789 instead of 17,302, I made an error in the addition and that would change the [fol. 4007] rate and I would like to defer giving those rate figures.

Q. Until this afternoon?

A. Yes.

Q. Mr. Strouss asked you several questions regarding the changes in mileage operated in Nevada and Arizona during the different years included in these casualty statistics. Are your tables for those two states constructed on any mileage or territorial basis?

A. No, they are not related to the road mileage operated in any way.

Q. What are they related to?

A. Depending upon the exhibit, either the total locomotive-miles, car-miles, train-miles, and in one of two instances man-hours worked by a particular class of employees which the exhibit covered.

Q. Will you turn to exhibit No. 268, please, the grade crossing exhibit?

A. Yes, as reflected by the statistics of the Interstate Commerce Commission and covers the United States.

Q. Mr. Strouss asked you a number of questions regarding the elimination of grade crossings by overpasses and underpasses. Will you look at this exhibit and say whether [fol. 4008] those eliminations, no matter how extensive they may or may not have been, seem to have had any appreciable effect on the rate per million train-miles of grade crossing casualties?

A. Examination of the exhibit year after year will show that the casualty rate related to the volume of traffic measured by train-miles has remained reasonably constant. The full figure running along with two exceptions around six or seven casualties per million train-miles.

Q. You said "volume of traffic." Do you mean volume of trains or volume of traffic?

A. Volume of traffic measured by train-miles.

[fol. 4009] Q. In connection with a number of your exhibits, Mr. Strouss asked you as to relative improvements from 1930 on; if you started those exhibits from 1930, would they exclude any significant period, and, if so, what?

A. If the exhibits started at 1930, it wouldn't have been shown, as do the exhibits as prepared, the heaviest periods of traffic preceding the depression, and wouldn't have included a showing of extremely heavy traffic and extremely light traffic and the intermediate periods of average traffic. It wouldn't have included a period with which a comparison could have been made of predominant short train operation in Nevada for the period 1923 to about 1926.

Q. Take your exhibit 262, please. The car-mile figures for Class 1 railroads in the United States shown in column B are the same in all of the exhibits, are they not, where those figures are given?

A. Where total car-miles is given for all traffic.

Q. What was the heaviest year in this exhibit in total number of car-miles?

A. The year 1929.

Q. 33,828,943,000?

[fol. 4010] A. That is correct.

Q. What was the lightest year?

A. The year 1932, with 20,350,867,000.

The Court: Mr. Sullivan, getting back to the grade crossings for a moment, I believe the testimony in this case shows that the main line mileage in Nevada and Arizona is practically the same.

A. The main track mileage, that is correct.

Q. And that, generally speaking, the volume of traffic in the two states is quite comparable, that is, the car-miles. I believe the record further shows that the number of grade crossings in the state of Arizona is probably double that that it is in the state of Nevada.

A. It is considerably more.

Q. Would the fact that we have twice as many grade crossings in this state in your opinion tend to account in part at least for the increased number of casualties and accidents in the state of Arizona as compared to the state of Nevada?

A. In my opinion, the number of grade crossings is not a factor to the extent that the number of vehicles using the crossings and the number of train movements over those crossings is concerned, because if you have in any state an [fol. 4011] innumerable number of crossings and they are not used, there wouldn't be any accidents, but if you had only half the number of crossings but four or five times the vehicle traffic passing over those crossings, you could expect the number of accidents to increase in the same proportion as the number of vehicles using the crossings, assuming that the number of train units were the same in both cases.

Q. But, now, if these crossings were not used they would be abandoned, wouldn't they?

A. That would depend; there are a number of crossings that are not used that have to be maintained on account of deed conditions, the fact that they are dedicated crossings.

Mr. Strouss: I think that is more or less of a legal conclusion, that answer.

The Court: Well, that last part may be.

The Witness: I know of my own knowledge that crossings exist on the Southern Pacific that are rarely used, and participated in personal checks of the traffic over the crossings, nevertheless, the crossings are still maintained.

The Court: But the company does maintain certain safeguards at these crossings where the traffic is heavy that [fol. 4012] you don't maintain on these crossings that are isolated and seldom used, isn't that true?

A. That is correct.

Q. Hence, theoretically at least, if you reduce the number of grade crossings, would you not thereby be in a position to more easily safeguard the traffic that was crossing the tracks and thereby eliminate a number of accidents?

A. I don't think so, because statistics show and the experience of the Southern Pacific shows that, notwithstanding every form of protection, including gates, wigwags, illuminated signs, grade crossing accidents continue to occur at the busy crossings.

Mr. Booth: What, in your opinion, is the best method to reduce the grade crossing hazard, in so far as the railroad can control it?

Mr. Strouss: I object to that as calling for a conclusion.

Mr. Mason: Well, it is following right along the lines of the Judge's questions.

Mr. Strouss: I don't think it is. The Judge has asked about conditions, but his opinion as to improving those conditions, I think is going too far.

The Court: Well, I will sustain the objection.

[fol. 4013] Q. Well, Mr. Sullivan, does your company go this far, that if an application were made for a grade crossing, you feel that that is no concern of yours, no occasion to object to it, you would be willing to have just as many grade crossings constructed as they might want?

A. No sir. From a safety standpoint, I have participated in hearings and offered testimony in opposition to the open-

ing of additional grade crossings where we felt or where I felt that the convenience of the public was adequately served.

Mr. Booth: Do you find in the 1939 accident bulletin any segregation of the number of grade crossing accidents as between city crossings and country crossings?

A. I think there is some reference.

Q. There was in a former bulletin, but I couldn't find it in there. (handing document to witness).

A. The accident bulletin for 1939 makes an analysis along different lines and they make no reference apparently as to the accidents in the cities and the rural districts as they have in previous bulletins. They go into a considerable analysis of the grade-crossing accidents, which cause con- [fol. 4014] siderable damage to property and the hazards resulting from collisions of motor vehicles hauling gasoline. I can find no reference to the segregation as between the rural and the city crossings.

Mr. Booth: I have just about concluded. I may have a few more questions. I would like to consider them at the noon recess, if the Court please. Mr. Mason has some notes that he would like to question about.

The Court: Any objection to Mr. Mason examining?

Mr. Strouss: No.

Mr. Mason: Mr. Sullivan, I just have this note with reference to exhibit No. 274. Mr. Strouss, in his questions, commented upon the fact that according to his check a substantial number of the particular accidents which he picked out occurred on trains of lengths between 67 and 70 cars. The record would show just what percentage he had figured out. Now, I will ask you to refer to defendant's exhibit 214, which is a showing and check of operations according to train lengths, at least in the actual column for the Tucson division during the months of June and August, 1938, and you will note from that exhibit that 85 per cent, [fol. 4015] approximately, of the trains between Yuma and Lordsburg fell in the bracket 61 to 70 cars. Is there anything remarkable, then, in the fact that a large proportion of the accidents occurring on trains would be on trains of between 60 and 70 cars?

Mr. Strouss: I object to that question.

The Court: Objection sustained.

Mr. Mason: Mr. Sullivan, do you find in the figures on that exhibit any possible explanation of the circumstances to which Mr. Strouss called your attention?

A. The type of accident to which Mr. Strouss called attention are infrequent in occurrence——

Mr. Strouss: Now, that is not responsive to the question.

Mr. Mason: I think he should be allowed to make an explanation.

The Court: The objection is overruled.

A. When accidents occur, they will be found, from my experience, in the group of trains that predominate. If the trains are in the group of from 60 to 70 cars, it can naturally be expected that the accidents will be found in that group.

Mr. Mason: They don't occur on trains that don't run?

[fol. 4016] A. That is correct.

The Court: They didn't have any accident on the redispatched operations, did they?

Mr. Mason: I think, your Honor, they assigned them to the trains.

Q. Now, again, in exhibit 275, Mr. Strouss found quite a number of accidents, he said, on trains of more than 70 cars. Will you refer, please to exhibit 198, and I call your attention to the fact that the recapitulation at the foot of that exhibit shows that between Sparks and Carlin, Nevada, 72.4 per cent of the trains, and between Carlin, Nevada, and the Nevada-Utah line, 88.4 per cent of the trains were over 70 cars. Do you find in those figures any explanation of the incidence of the accidents in trains of over 70 cars in the state of Nevada.

A. The accidents, infrequent in number, when they do occur, are to be found in the predominant train operation. If the trains of seventy cars or more predominate, that is where the accidents can be found. As to the operation in Nevada, I had supervision over the operations in Nevada during the years 1935 and 1936, and the operation of trains of less than 70 cars was very unusual.

Mr. Strouss: I move that that be stricken as not re-

[fol. 4017] sponsive to the question.

The Court: Yes, it may be stricken.

Mr. Booth: I will ask him the question. During 1935 and 1936, when you testified in qualifying that you had supervision as an assistant superintendent in Nevada, was it or was it not unusual to run a freight train of less than seventy cars?

Mr. Strouss: I object to that as calling for a conclusion, and not the best evidence.

The Court: The objection is overruled. He may answer.

A. It was unusual to operate freight trains of seventy cars or less.

Mr. Booth: May we adjourn at this time?

The Court: Yes, we will take our noon recess. The court will be at recess until two o'clock.

(Thereupon the court stood at recess until two o'clock P. M. this day.)

[fol. 4018] February 18, 1941, two o'clock P.M.

The witness, John J. Sullivan, was recalled to the stand and proceedings were resumed as follows:

The Court: You may proceed. Have you finished with Mr. Sullivan?

Mr. Mason: There are two or three questions.

The Court: All right.

Mr. Mason: Mr. Sullivan, in connection with your testimony on the exhibit showing the grade-crossing collisions, I think you used the term "volume of traffic as measured in train-miles." I will ask you whether the train-miles are more accurately a measure of some other characteristics of railroad transportation than volume of traffic?

A. Yes, train-miles are more properly a measure of train density, and car-miles a measure of traffic.

Q. Now, referring back to exhibit No. 266, I think that at the adjournment before luncheon you were about to read into the record the figures as they would appear if that exhibit were modified to include code causes No. 6411 and 6736 in addition to code causes 7007 to 7019, inclusive, of table No. 89 of the annual accident bulletins. Have you those figures now in corrected form?

[fol. 4019] A. I have.

Q. Now, without going into the individual years, what would the total be for the years 1923 to 1928, as that total appears in line 7 of exhibit 266 for killed and for injured, and for both killed and injured?

A. If you will permit me to make one correction. As I was reading the figures, I discovered that I had made an error in calculation on column 20 and had stated that the number of killed should have been 95 instead of 90.

Q. That is for the entire period?

A. The entire period. The correct figure is 118 instead of 90.

Q. You would show 118 if you included the other two code causes where you now show 90?

A. Yes.

Q. Going to line 7, will you give the total for the six code causes which would replace the figure 53?

A. On line 7 under column D, where the figure "53" appears, it would read "66."

Q. And in column E?

A. In column E the figure 10,701 would read 11,515, and the total in column F instead of 10,754, would read 11,581.

[fol. 4020] Q. Would that produce any change in the casualty rates in columns G and H?

A. It would produce a slightly higher average rate. In column G the casualty rate on a car-mile basis would read 7.04 instead of 6.54, and column H on a train-mile basis would read 2.96 instead of 2.75.

Q. Now, going to line 14 of exhibit 266, have you the substituted figures there based upon the inclusion of these other two causes?

A. I have.

Q. Will you read those the same as you did for line 7?

A. In column D the figure would be 34 instead of 24; in column E, 4,906 instead of 4,540; and in column F, 4,940 instead of 4,564; and in column G, the rate on a car-mile basis would be 3.69 instead of 3.41; and on a train-mile basis in column H the figure would be 1.69 instead of 1.56.

Q. Now, going to line 19, have you the substituted figures there?

A. In column D, the figure would be 18 instead of 13; in column E, 2,268 instead of 2,061; in column F, 2,286 instead of 2,074; the casualty rate in column G on a car-

mile basis 2.64 instead of 2.39; and on a train-mile basis [fol. 4021] 1.21 instead of 1.10.

Q. And have you the overall total for the entire period and the overall rates, line 20?

A. The overall rate or grand total in column D, 118 instead of 90; in column E, 18,689 instead of 17,302; in column F, 18,807 instead of 17,392; and the casualty rate in column G on a car-mile basis, 4.89 instead of 4.52; and on a train-mile basis, column H, 2.15 instead of 1.99.

Q. Now, would the substitution of the figures which you have recited produce any changes in the comparisons of average casualty rates which appear in lines 21, 22 and 23?

A. Yes, some slight changes.

Q. Will you read those substituted figures?

A. On line 21 in column G, the percentage figure is 47.59 instead of 47.86 per cent. In column H it would read 42.91 per cent instead of 43.27 per cent; on line 22, in column G, 28.46 per cent instead of 29.91 per cent; column H, 28.4 per cent instead of 29.49 per cent; and line 23 in column G, 62.5 per cent instead of 63.46 per cent; column H, 59.12 instead of 60 per cent.

Q. Now, Mr. Sullivan, do you by the presentation of these statistics, including these other two code causes 6411 and 6736; concede or suggest that the showing on exhibit [fol. 4022] 266 is in any way incomplete?

A. No, I do not.

[fol. 4023] Q. Mr. Sullivan, on exhibits Nos. 274 and 275 and as well on exhibit No. 280 which is the comparison of casualties to road freight conductors, brakemen, and flagmen on duty sustained in train and train service accidents for Nevada and Arizona, covering only those accidents caused from sudden stopping, starting, lurch, or jerk of train, have you made a study of these accidents as they are shown in individual detail in exhibits Nos. 274 and 275 to indicate their frequency or infrequency as the case may be?

A. I have.

Q. Will you look at exhibit No. 274 and indicate whether from the face of that exhibit there are shown substantial intervals in months between successive occurrences at various periods?

A. I have, and as an example, by referring to sheet No. 10 it will be observed that there were none of that particu-

lar type of casualty during the twelve months between July 19, 1935, and July 6, 1936; none between the four months, February 6, 1937, and June 17, 1937; none during the six months, December 24, 1937, to June 17, 1938; and by reference to pages 11 and 12, none during the ten months, August 5, 1938, to June 2, 1939.

Mr. Booth: Is that Arizona or Nevada?

[fol. 4024] A. That is Arizona.

Mr. Mason:

Q. Are there similar comments upon exhibit No. 275, the Nevada showing?

A. Yes, for example, by reference to sheets Nos. 6 and 7, there were none of that type of casualty during the nine months between August 22, 1935, and May 26, 1936; none during the five months between January 10, 1937, and June 22, 1937; none during the four months between August 5, 1937, and December 15, 1937; none during the eleven months between December 15, 1937, and November 18, 1938; and none during the eight months, February 13, 1939, to October 11, 1939.

Q. I take it that your study relates only to the period since 1935?

A. Yes, you can follow through in a similar manner any of the other years.

Q. Are there comparable intervals in other years?

A. Shorter or longer.

Q. Mr. Sullivan, I think in the course of your comments on the inclusion of accidents in yards in some of your showings that you indicated some relationship between yard movement and number of trains handled. Is there any direct connection between the amount of switching or [fol. 4025] other yard activity and the number of trains handled?

A. Yes, there is.

Q. What is it?

A. There is a direct relationship in switching incidental to changing cabooses and that switching which is necessary on an individual train by reason of keeping it within certain restricted limits if there are any.

Q. Do you have any example which will illustrate your testimony, such as for example, at Yuma?

A. Of course I am speaking now from my experience during the time I was there. A single train would arrive

at Yuma with one caboose and be received at one track, consisting of any number of cars over 70 to a larger number; for example, a train of 140 cars of perishable arriving at Yuma from the west would be received at one track with one caboose. That train would be made up into two trains and would have to be placed on separate tracks, a caboose placed on each train, an engine placed on each train, and occupy the two tracks, leaving at different times, while the one train would arrive at one track. That switching at Yuma or any point where yard engines were employed is undertaken and handled by yard switching crews as distinguished from road crews.

[fol. 4026] Q. I think you were asked in the course of your cross-examination with reference to exhibit No. 291 to provide the form T report in connection with item No. 3 of that exhibit, the accident at Cobre in which a passenger lost his balance and fell in the car when the train stopped. I believe the suggestion of Mr. Strouss was that that should be classed as an accident due to sudden stop, start, lurch, or jerk of train?

A. He asked me if it should not. I don't know whether he meant to suggest whether that was true or not but he asked if I would secure the form T report for his examination.

Mr. Mason: May the record show the form T report has been furnished. Do you wish to make any further use of it, Mr. Strouss?

Mr. Strouss: I am perfectly willing that it be read in if you desire. It doesn't appear to be a slack action.

Mr. Mason: It is not even a sudden stop, start, lurch, or jerk of train because the form T report, you have the copy before you, indicates after investigation it was developed there was no rough handling of the train and nothing out of the ordinary and the passenger was injured because of her advanced age and inability to take care of [fol. 4027] herself.

Mr. Strouss: I think that is correct.

Mr. Mason: I think that is all we have, Mr. Sullivan.

Recross-examination.

By Mr. Strouss:

Q. Mr. Sullivan, when you were asked regarding retainers, it is a fact there are special rules on certain di-

visions with respect to the use of retainers which appear in the employees' timetables?

A. That is correct, on each of the operating divisions.

Q. You were just asked concerning switching. In the exhibits Nos. 274 and 275, the detail there would show any of those accidents that occurred in switching operations, would it not?

A. No, not by yard switching crews. If injuries were received in road freight train operation, they would appear.

Q. This does not include switching crews?

A. No, it does not.

Q. You haven't put in any exhibit showing any such information?

A. Not separately for terminals but it is included in those exhibits which describe or refer to casualties to em- [fol. 4028] ployees on duty in all classes of service. That includes yard men and yard enginemen.

Q. It is included in the aggregate but not in detail?

A. Not in detail, no.

Q. This morning you testified you were superintendent in Nevada?

A. Assistant superintendent.

Q. When was that?

A. In 1935 and 1936.

Q. What did you mean by the term "unusual" when you say that it was very unusual for a short train to be operated?

A. Compared with the normal through operation on the main lines, the trains of considerably more than 70 cars predominated and it was unusual considering the bulk of trains operated to operate one of less than 70 cars.

Q. Would you say it was one to four or one to six or what do you mean by the term "unusual"?

A. In a 24-hour period there might be 12 or 14 trains operated. During that period there would be none of less than 70 cars. On the following day there may be with that same number of total trains, there may be one or two. [fol. 4029] Eliminating the local freight on the west end, there would be a number of days between Sparks and Ogden when no trains of less than 70 cars would be operated.

Q. Would you say the percentage would be probably less than 20 per cent?

A. I wouldn't attempt to say exactly in percentage, but the predominant operation when I was there was long train operation to the extent there would be days or twenty-four hours as I explained that there wouldn't be any trains of less than 70 cars.

Q. Would there be days when there wouldn't be over 70 cars?

A. No.

Q. Would there be days which would bring the average up for a period of a month or a year when your short trains would run as high, say, for a period of a month, 25 per cent of the trains operated?

A. No, it would't be that high. During certain seasons of the year when there is a light movement of westbound manifest freight, on account of the fixed departure times from Ogden the number would approach the shorter lengths, not necessarily under 70, on account of the lack of volume of traffic to fill up the trains.

[fol. 4030] Q. You were asked by Mr. Mason about exhibit No. 186. I will ask you to look at exhibit No. 185 which was introduced in evidence by Mr. Sines. It appears in the State of Nevada there were 1633 trains of 70 cars and less, 3198 of 71 cars, and over, during the periods for the months of January, April, July and October, 1939, or the so-called long trains being in the ratio of 66.2 per cent or one short train for every three trains.

Mr. Mason: The question is unfair in that it does not call the witness' attention to the fact that this includes the operation west of Sparks concerning which he didn't testify in answer to my question.

Mr. Strouss: I don't like that insinuation. I asked the witness to look at the exhibit and see what the exhibit states. I don't think there is anything unfair in that.

The Court: No, the Court sees nothing unfair in it. The witness is able to take care of himself. He may answer.

Mr. Mason: My question had to do with the operation on the main line between Sparks, Carlin and the State line. I think the witness' answer should be specifically so confined.

The Court: Go ahead.

[fol. 4031] A. I wouldn't question in the least the accuracy of the information that is shown on exhibit No. 185. I was not employed on that division during that time and I had nothing to do with the study from which this was prepared.

Mr. Strouss:

Q. You don't think the percentage during the period that you were employed there would be comparable to what is shown by this exhibit?

A. I am sure it would not be comparable because I rode too many trains, I know what was on the railroad.

Q. It is possible from the train sheets covering that period to make an absolute count of the trains, short and long, isn't it?

A. That is true. I don't recall whether this includes the local freight trains or not, and as I testified, excluding the local freights, I was referring to the through freight operation between Sparks and Ogden. Practically all of the local freights are shorter than the general run of through freight trains.

Q. Your testimony as to the short train being unusual was directed to through trains and did not intend to include locals?

A. That is correct.

[fol. 4032] Mr. Strouss: I think that is all.

Redirect examination.

By Mr. Mason:

Q. Your testimony did not relate to operation west of Sparks, did it?

A. No, my statements were confined to the state of Nevada, associating them to the exhibits I have offered which confined the showing to the state of Nevada and the state of Arizona.

Q. I mean your testimony as to the frequency of long train operation did not deal with that part of the Nevada lines between Sparks and the state line?

A. No, because that was operated by the Sacramento division.

Q. In your testimony as to frequency of long and short freight trains, you were likewise not referring to the line between Fernley and the California line?

A. I was not.

Q. I call your attention to the fact that exhibit No. 185 shows between Sparks and Carlin 72.4 per cent trains in excess of 70 cars and between Carlin and the Nevada-Utah line 88.41 per cent in excess of 70 cars. Is that the [fol. 4033] particular district you had in mind in your testimony as to the relative frequency of long and short train operation?

A. Read the question, please.

(The question was read by the reporter.)

A. That is the territory, that is correct.

Mr. Mason: —

Q. When you speak of trains, do you count a train as twice or three or four times between Sparks and Ogden or is it a single unit all the way?

A. My conception of a train is the one defined by the Interstate Commerce Commission, the movement of a train between terminals in charge of one crew.

Mr. Mason: That is all.

(Witness excused.)

[fol. 4034] W. H. KIRKBRIDE was recalled to the stand.

Mr. Mason: What is the pending question?

Cross-examination (Continued):

Mr. Strouss: I had asked Mr. Kirkbride to take the profile maps of the lines through Nevada and point out to me the territory which is comparable to the territory in exhibits 301, 302 and 303.

Mr. Mason: First of all, you asked him, record page 3878, whether or not there was only one curve as sharp as six degrees in Nevada, and I think he has the data on that. Will you deal with that first and then go to the comparable territory?

Mr. Strouss: That is all right.

The Witness: As to the question about six-degree curves, I would wish to refer to profile sheets V-1, P-1, and V-1, P-1 A, and the third, V-1-P3.

The Court: These profiles that you have just referred to, Mr. Kirkbride, are they in Arizona or Nevada?

A. They are in Nevada. On V-1, P-1, I have marked [fol. 4035] in yellow pencil the location of a six-degree curve in the double track just west of mile-post 229; also in yellow pencil on the same sheet the location of a six-degree curve which exists in the eastward track just west of Fleish station near mile-post 229.8. Referring to profile V-1, P-1A, I have marked in yellow pencil the location of a six-degree curve which exists in the westward track just west of the third crossing of the Truckee River near Fleish. On profile sheet V-1, P3, I have marked the location of an eight-degree curve to the right reversing to a four-degree and 30 minutes compounding to a five-degree curve to the left, located in the double track at mile-post 237.1. I wish to further say, though, that in recent years this group of reverse curves has been changed, and it is my impression that the curvature was cut down in the order of six-degree and five-degree. I wish also to say that Weso, where connection is made to the Western Pacific and for the purpose of changing the course of all eastward S. P. trains to Western Pacific track, No. 14 turnout leads to two five-degree curves and at Carlin, the west détour, which is a connection between the Western Pacific and the Southern Pacific track, for the purpose of passing Western Pacific freight [fol. 4036] trains on the S. P. tracks, a five-degree and a six-degree curve exist, and east of Carlin where the connection is from the S. P. track to the W. P. tracks two six-degree curves exist.

Mr. Mason: I think the next question was the one at page 3880, referring to profiles showing territory comparable to the territory shown on exhibits 301, 302, and 303. Is that the next question you would like to have answered, Mr. Strouss?

Mr. Strouss: Yes.

A. It is my opinion that the profiles which I have just exhibited, representing the territory from the California state line——

Mr. Strouss: That is V-1, P-1?

A. Yes; those profiles extending; the first one is V-1, P-1, extending from the California-Nevada state line and on through——

Q. I wish you would just give me the profile.

Mr. Mason: Well, I think he should be permitted to describe the territory, then he can give you the profile afterward.

Mr. Strouss: He can describe the territory after he gives me the profiles. That is what I asked for in the question.

Mr. Mason: The question is, "Will you refer to the pro- [fol. 4037] file map of the main line across Nevada, and point out what territory in Nevada is comparable to the territory shown in exhibits Nos. 301, 302 and 303?" The witness started to do that, and was interrupted.

The Court: Go ahead, Mr. Kirkbride.

The Witness: (Continuing). Continuing on to V-1, P-2, V-1, P-2A, V-1, P-3, V-1, P-3A, V-1, P-4, V-1, P-5.

Mr. Strouss: What about this one?

A. That also is included, V-1, P-1A.

The Court: If it is going to take some little time to locate we will take our recess at this time.

(Thereupon, a short recess was taken, after which the witness was recalled to the stand, and proceedings were resumed as follows:)

[fol. 4038] W. H. Kirkbride resumed the witness stand.

Mr. Mason: We had gotten down the line part way I think from the California boundary line.

A. Also the profile sheets V-2, P-1; V-2, P-2; V-2, P-3; V-2, P-4; V-2, P-5; V-2, P-6; V-2, P-7; and V-2, P-8.

Mr. Strouss:

Q. That is all the territory which you consider comparable?

A. I consider that one section of territory comparable to the territory within which the three profile exhibits previously submitted rested, but I also wish to point out two other territories, namely, the stretch between Wells and Moor, and between Valley Pass and Montello. The

profile sheets between Wells and Moor are V-4, P-19; V-4, P-20; V-4, P-21; and the profile sheets, Valley Pass to Montello, are V-4, P-27; V-4, P-28; V-4, P-29; V-4, P-30; V-4, P-31; V-4, P-32; and V-4, P-33.

Mr. Mason: In order that the record may be clear, what is that territory that you first described before you went to Wells and Moor and Montello territory?

A. I described the territory in the Truckee Canyon extending from the state line between California and Nevada [fol. 4039] to Reno-Sparks and on to Fernley where the line has by that time departed substantially from a canyon territory.

Mr. Mason: That was the first set of profiles with the initials V-1 and V-2 that you handed to opposing counsel, is that correct?

A. Commencing with V-1, P-1.

Mr. Strouss: I ask that these profiles which the witness has just referred to be marked for identification.

The Court: They may be marked.

The Clerk: Plaintiff's exhibits Nos. 306, 307, and 308 for identification.

Mr. Strouss:

Q. These are records from your office, are they?

A. Yes, sir.

Mr. Strouss: We offer them in evidence.

The Court: Had you finished your description of the other territory in Nevada covered by these profiles, Mr. Kirkbride?

A. I had not.

The Court: All right, go ahead.

A. The second location between Wells and Moor is the development up the westerly slope of the Pequop Mountains and the third exhibit from Valley Pass to Montello is the [fol. 4040] development down the easterly slope of the Pequop Mountains to Montello from Valley Pass.

The Court. So there are three territories that you consider comparable to the territory covered by the three profiles introduced the other day?

A. Yes, sir.

The Court: Mr. Strouss offered certain exhibits in evidence. Is there any objection to them, Mr. Mason?

Mr. Mason: No objection. I take it they will be reproduced and copies furnished for the record?

Mr. Strouss: I will undertake to have them reproduced if it is stipulated I may withdraw them for that purpose.

The Court: The various profiles referred to by letter and number by Mr. Kirkbride which have now been offered in evidence may be received in evidence and photostatic copies substituted in lieu of the originals which will be returned to counsel.

Mr. Mason: What was that first number?

The Clerk: 306.

Mr. Mason: Exhibit No. 306, in order that the record may be clear, the set of profiles covering the line between the California and Nevada state line and approximately [fol. 4041] the station of Fernley—what is that milepost, Mr. Kirkbride?

A. At Fernley?

Mr. Mason: Yes.

A. 275, I think.

Mr. Mason: No. 307 appears to be the section west of Valley Pass although the witness referred only to the district between Valley Pass and Montello from approximately milepost 638 west of Valley Pass to milepost 664 east of Montello. Exhibit No. 308 covers the territory from milepost 606 west of Wells to milepost 618 approximately which is just east of Moor.

The Court: I believe our record is clear now that there are three separate and distinct sets of profiles covering three separate and distinct territories which you have offered in evidence and which have been admitted in evidence as plaintiff's exhibits Nos. 306, 307, and 308.

Mr. Strouss: Yes, your Honor. That is all.

(The documents referred to were received in evidence and marked "Plaintiff's Exhibits Nos. 306, 307, and 308.")

[fol. 4042] Redirect examination.

Mr. Mason:

Q. Mr. Kirkbride, referring to the district covered by exhibit 306, the district in Truckee Canyon, will you state

generally why you consider that comparable to the territory covered by Exhibits 301, 302 and 303?

A. It is territory that we call curve track territory, the location is to a very considerable extent located on the side of the hills that come down into the river; there are bridge crossings, the gradient of the ascending track westward from Sparks to the state line is on a ruling grade of 1.1 per cent, the descending grade eastward is on a 1½ per cent grade. When one examines this track structure on the ground, you see a succession of tangents and curves equipped with spirals and suitably and properly elevated. I consider that situation comparable to the territory between Tucson and Mescal, and Mescal and Dragoon, where an examination on the ground would again also reflect the fact of curve track, the tangents, curves properly spiralled and superelevated, some steel bridge crossings, the ascending grade eastward being a ruling grade of 1.06 and the gradient descending from Mescal to Benson being 1.4 per cent, and after the crossing of the San Pedro River, the [fol. 4043] ruling grade to the Dragoon summit being 1.4.

The Court: Where do you cross the San Pedro? Is that near Benson?

A. That is about a mile east of Benson.

Mr. Mason: Mr. Kirkbride, you have also referred to the line between Wells and Moor, and between Montello and Valley Pass as being comparable to the territory shown on these three exhibits.

A. In the same way that the locating engineers had to develop a railroad out of Tucson to Mescal Summit, down to Benson, and develop out of Benson, up the barrancas to Dragoon, the development of a railroad was made from Wells up to Moor, which is approximately the levelling-off place of the Pequop Mountains. In a similar manner, the development was made downward along the easterly slopes of the Pequops from near Valley Pass to near Montello, the curvature being used in order to obtain the distance in an economical manner, and the gradient eastward ascending being a ruling grade of 1.5.

Q. That is Wells to Moor?

A. Wells to Moor, which is likewise the descending grade westward, and the gradient on the easterly slope from Valley Pass to near Montello being a ruling grade of 1.4 [fol. 4044] westward and the same grade descending.

Q. You speak of the ruling grade in this territory. When you arrive at the ruling grade, do you take into account whatever resistance there may be due to the influence of curves?

A. We do. In other words, the actual percent of grade is reduced where curves exist in order to make them exactly comparable to the grade on the tangent track.

Q. I am going to ask you to refer to exhibit 301, and see if there are any examples of that and, by the way, what is the railroad engineer's term for the reduction of the slope at points where curves are encountered in order to obtain the same total resistance to the movement of traffic around the curve and up the grade as you would encounter on a piece of straight track?

A. We call that "compensation."

Q. Do you find an example of compensation of grade and curve, if that is the correct term, on exhibit No. 301?

A. I do. For instance, it will be noted on the upper part of the profile sheet west of mile-post 1037, that the gradient on tangent track is marked "1.40" and the gradient along that portion represented by two-degree curve is [fol. 4045] 1.360. In other words, the actual rise in a hundred feet has been reduced by some four one-hundredths due to the fact that a two-degree curve was involved. Now, refer to the curve No. 187, which is a ten-degree. The actual gradient or per cent of rise in a hundred feet is one per cent, whereas on the adjacent tangents the per cent is 1.4, thus there is a flattening of the slope amounting to four-tenths. Expressed mathematically, we allow four-hundredths of a foot per degree of curve. When we are dealing with ten degrees, four one hundredths by ten degrees gave .4 which is the equivalent rise if it was straight track.

Q. Does that mean then that you have compensated grade between the beginning and end of this ten-degree curve No. 187 of 1.4; is that the way you express it?

A. The compensated grade of this railroad location, as illustrated by this territory, is a compensated 1.4 per cent grade.

Q. Do I understand, Mr. Kirkbride, that where you have rise and curve together, you can express the total amount of resistance to the movement of traffic up the side of that hill by a percentage rise of grade which will take into account the curve?

[fol. 4046] A. We can, yes, sir.

Q. Is that shown on exhibit No. 301?

A. It is.

Q. And by the illustration that you have just referred to?

A. It is.

Q. Do you have the same compensation of grade for curvature on the Nevada districts which are referred to in exhibits 306, 307 and 308?

A. We do, with this explanation that in the early days of railroading, for instance, when the line was built in the Truckee Canyon in '65 or '66, up to '69, the art of railroading wasn't developed to the point of refinement that we now realize is necessary and put into effect, so that when the railroad was built in the 1860's and 69, compensation was not known, the spiralling of curves was not known, but we have overcome that deficiency by calculating the ruling grade, wherein we take cognizance of this necessity of flattening the grade around curves, so that in effect we have the same identical compensation in the Truckee Canyon, and we have compensated grades on the two lines referred to up Moor and from Valley Pass to Montello.

The Court: Mr. Kirkbride, do highway engineers in the [fol. 4047] construction of highways use this same principle in the building of roads?

A. May I explain, your Honor, that the problem of superelevation and spiralling of your curve and gradually bringing your superelevation up is all interlocked in this problem. Now, the highway engineers do carry out the principle of superelevating their curves, or banking their curves.

The Court: That is what I was going to say, you use the term "banking," don't you?

A. That refers to superelevation. I have only referred to the compensation of a grade. I am not sufficiently advised in connection with highways to say whether highway engineers have adopted compensation of grade. I know they are coming to it by reason of the fact that I have had occasion to travel over a grade from Dunsmuir eastward, which I was told was a seven per cent grade, and my attention was directed to the fact that when they came around the curves, which were rather short, they would purposely flatten the grade as well as banking the curve, so in that case they did carry out the exact principle that we carry out in railroading.

The Court: What do you mean by "spiralling the [fol. 4048] curve"?

A. I may again refer to the fact that it was not until the 80's that they recognized the need of not only flattening the grade around curves and at other places, but there was a need of making an easement between the tangent and the curve so that the lead wheels of a locomotive would not come to a sudden, abrupt change of direction. To illustrate, we will assume a locomotive moving on a tangent track approaching a curve. Now, by means of a spiral or an easement curve, we ease the pony trucks of that locomotive from nothing, from zero curvature into the maximum curve. Let us assume that it is a six-degree. Then this spiral or easement curve changes by ten-foot ordinants from a zero degree curve to a ten-minute, to a twenty-minute, and so on up to one degree, and two, the engine negotiates that track, the train behind the engine negotiates that track without the slightest hazard of derailment and without any shock to the passenger or freight equipment or to the trainmen or the passengers riding therein. However, you wouldn't accomplish that result if you didn't at the same time superelevate your grade and use what might be called a spiral to get to your maximum elevation. Again [fol. 4049] illustrating the problem, we limit the superelevation on the curves in the territory we have been talking about, a six, seven, eight, nine or ten-degree curve, we limit it to four inches of superelevation, I mean by that the outer rail is four inches higher than the inner rail, but at the C.C. point we begin to work down from the four degrees and finally at the beginning of the spiral, which is the point where we leave the tangent we are at level track, and that principle is on the basis of allowing a certain amount of superelevation per second of speed. In other words, you figure out an engine would move 44 feet in one second, and we would decide that we would want a half-inch superelevation in 44, and the first 44 feet would be half an inch; at 88 feet we would have an inch, and so on. In eight chords we would build up to the four inches of superelevation. The same principle, of course, exists in the compensation, only we are dealing with gradients.

[fol. 4050] Mr. Mason:

Q. Getting back to compensation, I am not sure that the record is quite clear, but do I understand, taking for

example this ten-degree curve just above Curvo or any other curve on the chart, exhibit No. 301, or these other exhibits, that the effect of the one per cent rise between the beginning and ending of that ten-degree curve plus the curve resistance itself to the movement of traffic is the equivalent of a straight 1.4 per cent rise on tangent track?

A. The answer to the question, if I understand it correctly, is this, that the locomotive will exert the same amount of energy on the 1.4 per cent grade if it is tangent track as on the ten-degree curve with one per cent grade.

Q. So that again, to express it, the entire effect of grade plus curve over any part of this track can be expressed by a figure representing grade line and in this case 1.4 per cent?

A. Yes, sir.

Q. And is the same true of the district between the state line, Fernley, Nevada, and between Wells and Moor and between Montello and Valley Pass?

A. It is.

Q. Is it generally true on the rest of the railroad that [fol. 4051] you have compensated the curves and the grades on the main line?

A. It is true on all of our railroad.

Q. Referring to exhibits Nos. 301 and 303 and omitting No. 302 for the moment, I will ask you whether those two exhibits which show the line between Curvo and Sibyl, and I think No. 303 is immediately east of Sibyl and continues on to mile-post 1046 approximately, will you say whether or not those represent the most difficult or the least difficult or the average conditions between Tucson and Dragoon?

A. They represent the most severe conditions with reference to curvature.

Q. With reference to grade?

A. Yes, they represent the maximum condition with reference to grade.

Q. Taking exhibit No. 302, that is the one that shows the line between milepost 1006 approximately and milepost 1011 in the neighborhood of Irene. Will you say whether or not that represents the most difficult or the least difficult or the average and typical condition?

A. I consider it represents the severest condition.

Q. Between Tucson and Mescal I intended to add to [fol. 4052] my question.

A. Yes, this sheet is in the territory between Tucson and Mescal. I consider that this sheet represents the severest condition of curvatures and the maximum condition of gradient.

Q. Between Tucson and Mescal?

A. Yes, sir.

Q. Are these sheets which show the line between mileposts 1036 and 1046, a distance of 10 miles, that is, exhibits Nos. 301 and 303, are those the most difficult or the least difficult of the average condition in Arizona?

A. The most difficult.

The Court: I notice, Mr. Kirkbride, if my calculations are correct, that the three exhibits offered by the plaintiff covered a territory of approximately 12 or 15 miles, whereas the territory that you have now described in Nevada, the three different tracks there would be approximately 85 miles all told?

A. Yes, sir.

Mr. Mason:

Q. Now going along the lines of his Honor's last question, have you figured out what the total mileage is over the main line from Yuma via Gila and Benson from boundary to boundary, across the state of Arizona?

[fol. 4053] A. I have.

Q. What is that mileage across the state of Arizona, boundary to boundary?

A. Eastward, 392 miles; likewise 392 miles westward.

Q. Approximately 15 miles or less are shown on these three exhibits out of that total of nearly 400, is that correct?

A. Yes, sir.

Q. How much of that total mileage, 392 miles, expressed in percentage is straight track?

A. 84 per cent both eastward and westward.

Q. How much of that total mileage expressed in percentage is curved track?

A. 16 per cent both eastward and westward.

Q. And out of that 16 per cent, how much consists of curves of more than six degrees in both directions?

A. 1.2 per cent eastward and .8 of one per cent westward.

Q. Have you also the figures of the total main line mileage via Sparks and Carlin between state line and state line across the state of Nevada?

A. I have.

Q. What are those figures?

A. 438 miles eastward and 444 miles westward.

[fol. 4054] Q. How much of the eastward mileage is straight track and how much is curved expressed in percentage?

A. 77 per cent eastward and 74 westward.

Q. How much is curved track?

A. 23 per cent eastward and 26 per cent westward.

Q. Is there any Nevada mileage along the line you have mentioned which consists of curves of over six degrees?

A. None.

Q. Just as a matter of comparison, Mr. Kirkbride, are you familiar with the line between Roseville, California, and Sparks, Nevada?

A. I am.

Q. That is the line over the Sierra Nevada summits, is it not?

A. It is.

Q. Have you the distance of that line?

A. It is 137.1 eastward and 138.7 westward.

Q. Is that double track throughout?

A. Yes, sir.

Q. How much of that mileage eastward and westward combined is straight track and how much is curved track expressed in percentage?

A. The total eastward and westward mileage amounts to [fol. 4055] 275.8, of which 42 per cent is straight and 58 per cent is curved.

Q. Are there any curves in that territory in excess of six degrees?

A. We have many curves up to ten degrees.

Q. What is the compensated grade eastward?

A. The ruling grade, which of course takes into account compensation eastward, is 2.47; the descending grade from Norden is 1.8.

Q. Is that territory between Roseville and Sparks more severe or less severe or quite similar to the territory between Tucson and Mescal and between Benson and Dragoon?

A. Much more severe conditions exist.

Q. I think you have also referred in your previous testimony to the lines of the company over the Tehachapi Pass. Are there any curves in that territory in excess of six degrees?

A. The curvature there amounts to as high as ten degrees and 30 minutes.

Q. What is the ruling grade, taking into account the curvature?

A. The ruling grade is 2.5 per cent on the mountains eastward.

Q. Does that take into account the effect of curves as well?

[fol. 4056] A. That compensates for curves.

The Court: What is the maximum degree of curvature that you can safely affect on your road?

A. We do not go beyond ten or ten-thirty unless conditions absolutely demand. For instance, on our main line to Portland where we are above Dunsmuir or where we loop out to climb out of the canyon of the Sacramento we use a fourteen-degree curve, the ruling grade in that territory being 2.2 compensated. As we enter Portland at the westerly or southerly end of the bridge over the Williamette River, it has been necessary to maintain a 18 degree curve there. We have in Cow Creek Canyon, which is the old line in Portland over the Siskiyous and extending on into Eugene, we have some eleven degrees and possibly a few twelve-degree curves and a few fourteen-degree curves where we develop up the slope of the mountain from Ashland.

Mr. Mason:

Q. That is the line from Eugene via Ashland to Black Butte, is it?

A. Yes, sir.

Q. Not now used as a through main line for freight if I understand correctly?

A. It is not used as the main line, but it is used by all classes of heavy power and they handle all the freight [fol. 4057] that originates in Medford and Ashland over the Siskiyous and down into Hornbrook. It is not a heavy traffic line. It formerly was before the building of the line from Black Butte by way of Crescent Lake.

Q. Are you familiar with the line between San Luis Obispo and Santa Margarita in California?

A. I am.

Q. Does that cross a mountain pass?

A. That crosses Santa Lucia mountain, from the Salinas Valley at Santa Margarita over to the coastal plain at San Luis Obispo.

Q. Do you have any curves sharper than six degrees?

A. We have ten-degree curves on that line.

Q. What is the ruling grade?

A. The ruling grade is 2.2 per cent compensated.

Q. In your cross-examination yesterday you were referred by Mr. Strouss to your statement that there are long stretches of tangent track and flat curves ranging from zero degrees and 30 minutes to six degrees. You are referring then to Nevada but you said you were comparing the state as a whole with the state of Arizona. Do you wish to refer to the profile showing the line between Maricopa and Wymola? I show you profile sheets which [fol. 4058] begin at milepost 879 in the neighborhood of the station of Buchan including sixteen sheets which continue on to approximately milepost 960 east of the station of Naviska. Are those a part of the three main lines in the state of Arizona?

A. They are.

Q. Of the Yuma-Gila-Tucson line?

A. That is correct.

Q. Will you state from examination of those profiles what they show as to the character of the gradients and curvature in that territory?

A. Commencing with the sheet at Buchan at milepost 880, the gradient eastward first is .5 per cent, changes to .36 per cent, flattens to .19 per cent, changes to .57 per cent, .41 per cent, .32 per cent. Is it counsel's desire that I outline all of those?

Q. No, just to indicate whether there is any part of it that exceeds .6 per cent.

A. Passing through Mobile the gradient is .45, no curves; on the next sheet extending from west of milepost 885 to east of milepost 889 the gradient ranges from .38 per cent to a level grade, the maximum gradient being .4 eastward to milepost 889.

Q. What about the curvatures?

A. No curves except for a thirty-minute curve just west [fol. 4059] of milepost 888, Enid.

The next sheet extending from west of milepost 890 to east of milepost 894 the gradient commences with .4 per cent descending; increases to .6 per cent and the gradient leaving the sheet is .32 per cent.

Q. Are there any curves?

A. There is a zero degree and ten minutes curve at Heaton which extends off of the sheet and onto the next sheet which includes the territory from west of milepost 895 to east of milepost 899. The zero degree and ten minute curve continues on to near milepost 897¼ about at Maricopa, that ten-minute curve being five miles in length. The gradients range from .32 to zero grade and the gradient leaving the sheet is .20 per cent. No other curves than the one just described.

The next sheet covering the territory from about 899¼ to 904½ shows gradients ranging from .2 per cent to .04, the gradient leaving the sheet is .17 per cent; no curves exist in this territory.

The next sheet including limits between 904½ to about 909½ reflects the gradients ranging from .18 to .42 per cent to .47 per cent to .5 per cent and the gradient leaving the sheet is .26 per cent; no curves exist on this sheet.

[fol. 4060] The next sheet extending from about 909¼ to 914½ reflects gradients ranging from .21 per cent to level grade with .19 per cent leaving the sheet; no curves exist on this sheet.

The next sheet extending from about milepost 914½ to 919¾ reflects gradients ranging from .19 to level grade, the maximum grade point being .49 per cent, the gradient leaving the sheet between .29 per cent; no curves exist on this sheet.

The next sheet extending from milepost 919½ to near milepost 925 reflects gradients ranging from .29 per cent to .07 per cent and the gradient leaving the sheet being in the order of .27 per cent to .16; no curves exist on this sheet.

The next sheet extending from near milepost 924¾ to milepost 930 shows gradients ranging from .16 to level to a maximum of .27 with a .23 leaving the sheet; no curves exist on this sheet.

The next sheet extending from milepost 930 to near milepost 935 reflects gradients from .23 to .18 to a maximum

of .3 with .25 per cent leaving the sheet; no curves exist on this sheet.

The next sheet extending from milepost 935 to 940 reflects gradients from .36 to .12 to a maximum of .49 leaving the sheet; no curves exist on this sheet.

[fol. 4061] The next sheet extending from about milepost 940 to 945 reflects gradients of .49 per cent to .52 per cent and .525 per cent as a maximum with .27 per cent leaving the sheet; no curves exist on this sheet except at the leaving end there is zero degree and ten minute curve to the right which extends for several thousand feet onto the next sheet, which sheet covers the territory from about milepost 945 to 950, the gradients ranging from .45, .14 to .27 to a maximum of .36; no curves other than the one above mentioned being shown on the sheet.

The next sheet extends from about milepost 950 to 955¼, the gradients ranging from .27 per cent to .16 per cent to a maximum of .4, the gradient leaving the sheet being .32 per cent; no curves exist on this sheet.

The next and last sheet extends from milepost 955¼ to about milepost 960½, the gradients ranging from .32 to level grade, the leaving grade being .23; no curves exist except that on the lower portion of the lefthand part of the sheet there exists a thirty-minute curve.

Q. Mr. Kirkbride, from your familiarity with the Southern Pacific lines in Arizona, particularly the line from Yuma via Gila, Tucson, and Bowie to the state line, would [fol. 4062] you say that the sixteen sheets including the line between Buchan and Naviska which you have just discussed or the three sheets which are in evidence as exhibits Nos. 301, 302, and 303 are more typical and representative of the lines as a whole?

Mr. Strouss: I object to that as calling for a conclusion, the profiles are here.

The Court: The objection is overruled, you may answer.

A. The railroad as reflected by the sheets we have just described is quite typical of the railroad as a whole or more typical of the railroad as a whole in Arizona than the three exhibits that you referred to.

Mr. Mason:

Q. Have you in mind any district in the state of Nevada which resembles more or less the district in Arizona be-

tween Buchan and Naviska which you have just been describing from the profile sheets? I show you the sheets between milepost 291 and milepost 316 and ask you to examine those and state whether or not they fairly resemble the territory you have just been describing in Arizona.

A. These profiles represent the railroad in Nevada eastward from Fernley, more specifically extending from mile-
[fol. 4063] post 291 to milepost 316, a distance of 25 miles.

The Court: That is between Fernley and Heaton?

A. It extends further than Heaton to a place called Parran. I consider this territory comparable to the territory which you have described.

Mr. Mason:

Q. And is it likewise characterized by comparatively long tangent stretches?

A. It is.

Q. And curves such as ten-minute and thirty-minute curves just as you have just described?

A. A very flat curvature of that order.

Mr. Mason: I won't ask the witness to go into detail from these sheets but they are available to counsel, of course, for cross-examination. I think that is all from Mr. Kirkbride.

[fol. 4064] Mr. Strouss: Mr. Kirkbride, I would like to have you check these sheets and I want the complete set of profile sheets for the state of Arizona.

The Witness: You want a complete set, you say?

Mr. Strouss: Yes, clear across the state. I want him to identify it as being a complete set, and this has the E.P. and S.W.

The Court: Is it your intention, Mr. Strouss, to offer in evidence a profile—

Mr. Strouss: Of the complete system.

The Court: We might save a little time by permitting this witness and his associates to get them together and hand it to you as a unit.

Mr. Strouss: That is perfectly agreeable with me. I didn't think it would take very long to do it.

Mr. Mason: Apparently it will take some time. They are not numbered. We can go ahead with the cross examination of another witness.

The Court: May I further ask you if it is your intention to then cross-examine this witness as to additional profiles?

Mr. Strouss: I have no further questions.

The Court: Then Mr. Kirkbride, you may step aside, and if you will get together the profile maps of your sys-
[fol. 4065] tem across the entire state of Arizona and hand them to counsel please, you may call your next witness.

L. D. Herrell was recalled to the stand.

Cross-examination.

By Mr. Strouss:

Q. Mr. Herrell, you participated in the redispatch of the trains for June and August of 1938?

A. I did.

Q. And that study and redispatch began on May 15, 1939, or thereabouts?

A. About that time, yes, sir.

Q. And lasted about four months?

A. Until about the first of September, I believe, maybe later; about four months.

Q. Just explain what was done.

A. Well, we took the same traffic that was handled, and the actual amount and redispatched it.

Q. When you say "we" what do you mean by "we"?

A. Well, I did my part from El Paso to Lordsburg, I took the same traffic that was handled in the actual opera-
[fol. 4066] tion and redispatched it, using larger trains.

Q. Who was working with you?

A. The chief dispatcher of the Tucson division.

Q. That was Mr. Baker?

A. Mr. Baker, and later Mr. Cassady, and they had other assistants. I did the work of the Rio Grande Division alone.

Q. Now, how did you balance your traffic from day to day, by car or by tonnage?

A. Oh, by car.

Q. Did you attempt to balance the tonnage?

A. No, sir.

Q. How did you determine the tonnage in the assumed trains?

A. Well, in the trains I operated westward from El Paso, the manifest trains were generally run with the same loads that they had on the actual operation, filling them with empty P.F.E.'s.

Q. Then, did you take the weight of the empty P.F.E. car?

A. I averaged 53 M's to the car.

Q. In redispatching, in order not to exceed the tonnage rating of your locomotive, it would be important to know the tonnage of your train?

A. Yes, we had that. We took the actual tonnage from [fol. 4067] the train sheet, and then if I added 30 empty P.F.E.'s to that manifest train, I would multiply 53 by 30 and add that to the tonnage of the actual train, which would give me the tonnage of the redispatched train.

Q. You took the tonnage of your actual trains, that is, the loads from the train sheet or from the report that came in on the train as it arrived?

A. That is correct.

Q. If that train was broken up in any way, the loads, how would you determine then; did you break any of your trains up or make them up so far as loads were concerned.

A. Not westward, I ran practically the same loads, adding empties only. The trains eastward, I took them as given to me by the chief dispatcher of the Tucson division at Lordsburg.

Q. You don't know how the tonnage of that train as it was originally made up in Yuma from a small train to a large train was determined?

A. No, I took that from what they gave me.

Q. Now, how did you identify the locomotives that you used?

A. As 4100's.

Q. You didn't have any particular number?

[fol. 4068] A. No, we used a certain class.

Q. The class of 4100's?

A. The class of 4100's, yes.

Q. No definite locomotive or any definite number like 4101?

A. No, sir.

Q. Well, you have quite a few sidings on your division in addition to those that are proposed to be extended and were used in this operation as lengthened sidings, haven't you?

A. Yes.

Q. In other words, you have quite a number of short sidings, shorter sidings than the ones, the 100-car sidings that were set up for this operation?

A. Yes, sir.

Q. You use those sidings in your regular operation of trains at the present time, and in the past?

A. We do.

Q. And the sidings being closer together, that gives you an opportunity to move your trains closer together for meets, don't they?

A. Yes, sir.

Q. If only fifty per cent of the sidings which are now in [fol. 4069] use were of length sufficient to accommodate a hundred-car train, it wouldn't be possible to handle long trains with the same flexibility, I mean having the same opportunity to move them up for meeting points unless you sawed the long trains through short switches.

Mr. Mason: It seems to me that that is rather a multiple question.

The Court: Well, if the witness doesn't understand it, he can state, otherwise I will overrule the objection.

Mr. Strouss: Do you understand what I am getting at, Mr. Herrell?

A. I don't believe I can quite grasp that.

Q. Under the proposed operation, only about fifty per cent of the switches are of a length sufficient to accommodate a hundred-car train, are they not?

A. You mean the sidings?

Q. Yes, I mean the sidings. Isn't that true?

A. I don't know how many sidings we have over there.

Mr. Mason: It is shown on the exhibits.

Mr. Strouss: I thought you were familiar with the map, with the proposed sidings set up.

A. I am; I know what sidings I asked to be extended. [fol. 4070] Mr. Strouss: I don't think I have that exhibit here.

Mr. Mason: That is exhibit 197.

The Witness: Well, I believe that map shows there are about sixteen or seventeen sidings that were not to be extended, and there are eight that were to be extended to hold 125 cars each. There are some that will hold considerably more than seventy cars now that it wouldn't be necessary to extend, such as Strouss and Deming, and Aden will now hold 80 cars, and there is an additional auxiliary track there that will hold about forty.

Mr. Strouss: Of course, to take advantage of that would mean cutting the train in two.

A. If necessary.

Q. And if a train were over—if the two trains meeting were both 100-car trains, it would mean that you would have to saw them around through an eighty-car switch?

A. No, we could leave 80 cars in the siding, and 20 or twenty-five cars on the auxiliary track.

Q. I mean in a station where you wouldn't have an auxiliary switch, but only an eighty-car siding.

A. Well, that would be rather bad train dispatching to get two 100-car trains to a siding which holds only eighty [fol. 4071] cars. We don't handle them that way.

Q. That is what I am getting to, Mr. Herrell, by having only this number of switches, of sidings, which will accommodate a hundred cars, it does reduce the points where you could have trains of that length meet, does it not?

A. That is correct.

Q. And, of course, as you testified a few minutes ago, having more sidings and nearer together, does give you an opportunity to make your meeting points closer where you can keep moving your trains up and save time; that is true?

A. That is true.

Mr. Strouss: That is all.

Redirect examination.

By Mr. Mason:

Q. Mr. Herrell, as I look at Exhibit 197 and remember your testimony, to make the extensions as contemplated by the exhibit, would give you ten points in the district between Lordsburg and El Paso, not including either Lordsburg or El Paso, where you could make meets with 125-car trains; am I correct?

A. That is correct.

[fol. 4072] Q. What is the distance between Lordsburg and El Paso?

A. 149 miles.

Q. Then that gives you a meeting point every fifteen miles on the average, would it?

A. Less than that; well, I don't think it would be quite that far between sidings, it wouldn't be over that.

Q. Let us consider one other point. You have west of El Paso, the double track extending to Anapra, what distance is that?

A. As I remember, it is approximately nine miles.

Q. Then the distance from Lordsburg to Anapra is a single-track district?

A. Yes, approximately 140 miles.

Q. You would have ten meeting points then in 140 miles, would you?

A. Yes, sir.

Mr. Mason: That is all.

Mr. Strouss: That is all.

Mr. Mason: May Mr. Herrell be excused permanently now?

Mr. Strouss: Yes.

(Witness excused.)

[fol. 4073] W. P. Herbert was recalled to the stand, and testified further as follows:

Cross-examination (continued).

By Mr. Strouss:

Q. Now, your exhibits 178, 179, and 180, Mr. Herbert, in those exhibits you make comparisons between the Tucson division, the Salt Lake division and the Pacific lines?

A. Yes, sir.

Q. Now, when you refer to the Pacific lines, do you include the Salt Lake division and the Tucson division?

A. Yes, I do.

Q. In other words, when you are making the comparison of the Pacific lines with the Tucson division, you are also including the Tucson division in the Pacific lines?

A. Yes, the Pacific lines is the total for all operating divisions in the Pacific lines.

The Court: And the Pacific lines are correctly shown here on exhibit No. 1?

A. That is right.

Mr. Strouss: That consists of quite a number of divisions, does it not?

[fol. 4074] A. Yes.

Mr. Mason: Two exhibits, 115 shows the divisions by mileage, and Mr. Kirkbride's exhibit, a map similar to number 1, I don't recall the number at the moment, shows the outlying boundaries of the divisions. It is No. 154. There are nine divisions altogether, as shown by 154.

Mr. Strouss: And the exhibit then isn't a comparison between the Tucson division and the other divisions of the Pacific lines other than the Salt Lake division?

A. No, it is a comparison between the Tucson division and the Salt Lake division as two separate divisions, and as a matter of information to show what the comparison is with the Pacific Line as a whole, including the Tucson and Salt Lake divisions.

Q. Taking your exhibit 180, for example, if you were to leave out the Pacific lines, take only the divisions other than the Tucson and Salt Lake divisions, the dotted line representing the Pacific lines would drop down lower than it appears upon the graph on the exhibit, isn't that a fact?

A. No, I don't know; it would have the combined influence of the Salt Lake division and the Tucson division.

[fol. 4075] Q. Is it possible from your exhibit 179 to take out from the Pacific lines which appear on sheet 3, the Tucson division which appears on sheet 2, and the Salt Lake division which appears on sheet 4, and get the comparison between the other divisions and the Tucson division?

A. From the face of the exhibit?

Q. I mean, would the figures show there? Deducting from the totals for the Pacific lines the Tucson and Salt Lake divisions, would leave the totals for the other divisions?

A. Yes, that would be the difference, would be all other divisions.

Q. That would give a comparison?

A. Yes, it would. You would have to make separate calculations at the foot of the sheets.

Mr. Strouss: Yes, that is true.

The Witness: You would have averages of averages if you didn't do that.

The Court: But in all of your exhibits, Mr. Herbert, wherein you are seeking to draw these comparisons, you are treating of nine divisions comprising the territory shown on Exhibit 1 as the whole, as one unit?

A. Yes.

[fol. 4076] Q. Then you are comparing the whole, which you term the Pacific lines, with the showing made in the Tucson division and in the Salt Lake division, which are part of the whole?

A. That is right.

Mr. Strouss: Now, your testimony as to the crossing count in cities, I am not sure that I correctly understood your testimony there. Does that include crossings within one mile of the yard limits on each side of the station in a town or city?

A. It included crossings within one mile of initial switches.

Q. Of what?

A. Of the initial switches at those particular towns or cities.

Q. Well, I was wondering what that might mean. So far as Phoenix is concerned, for example, there are quite a few crossings both east and west of the station in Phoenix, are there not?

A. Yes, but with Phoenix we chose the city limits.

Q. The city limits?

A. I believe that I might have to check up on that to make absolutely sure. I have included there eleven crossings in Phoenix.

[fol. 4077] Q. I think you only went to the city limits.

A. Will that answer your question?

Q. Yes, that answers my question. Of course, the built-up part of the city extends beyond the city limits, that is, the legal boundaries of the city, and there are street crossings even beyond the legal boundaries?

A. Well, whether they are considered streets or not, I don't know; outside of the city limits they are usually considered county highway crossings.

Q. But your count ended at the legal boundaries of the city?

A. Yes, we took in eleven crossings in Phoenix.

[fol. 4078] Q. What about Tucson?

A. I wish to correct that at Phoenix, I took in twenty-two crossings at Phoenix; at Tucson, seven.

Q. Other towns like Yuma and Douglas, are they on the city limit basis or what?

A. Wherever we could, we took it from the initial switches; at Phoenix it is rather hard to establish the initial switch and still get all the city crossings.

Q. On that basis you counted 82 crossings within cities, is that the way I understood it?

A. Yes.

Q. What did you mean by "cities" in that respect?

Mr. Mason: I think the witness named them.

Mr. Strauss:

Q. Did you name all of them?

A. I named all I considered, yes.

Q. If you named all of them, I will pass that. In your exhibit No. 200 you showed a total of 654 crossings in the state. That would leave 572 unaccounted for. It is a fact that the Southern Pacific for a big part of its mileage in this state runs through quite populated territory?

A. Yes, through the Salt River Valley and the Gila Valley on a branch line is also quite populated and has a num-[fol. 4079] ber of crossings.

Q. From below Buckeye to Picacho you are going through farming country that is populated on both sides of the road?

A. Yes, from about Buckeye to south of Chandler and from Chandler to Picacho it is not so densely populated. You have some at Coolidge, a small area there.

Q. There are communities on both sides of the track?

A. There are farms on both sides of the track.

Q. And crossings to connect those communities?

A. Yes.

Q. Near Mesa and Chandler and little towns like Kyrene and Gilbert which are not on your railroad but are connected to Mesa and Chandler by highways that cross your tracks?

A. Yes.

Q. They are connected to other communities, farming communities around there connected with Gilbert and Kyrene?

A. Yes, they will cross in one or two places from Kyrene over to Gilbert.

Q. You have instances where there are towns that are not immediately adjacent to your tracks, may be back a mile or two or three miles from the tracks but have cross-[fol. 4080] ings over your tracks to communities connected with those towns. Those crossings would not be counted in this count. I mean take a place like Litchfield which sets back four or five miles. There are crossings which would provide means for farmers to come into Litchfield?

A. Crossing our tracks?

Q. I think so.

A. If it crosses our tracks, it is included in this count.

Q. It wouldn't be in the town?

A. Perhaps not, there would only be one of the crossings from Litchfield across the track.

Q. Out around Tolleson there are a number of crossings through that section that cross the tracks?

A. Yes, right in that particular district of Tolleson they have a crossing on every section for a few miles there.

Mr. Strouss: I think that is all.

(Witness excused.)

The Court: Is there anything else you wanted from this witness, Mr. Mason?

Mr. Mason: I don't think so.

The Court: We will be at recess until 9:30 tomorrow morning then.

(Thereupon the court stood at recess until 9:30 A.M., February 19, 1941.)

[fol. 4081] February 19, 1941, 9:30 o'clock A. M.

Proceedings were resumed at this time as follows:

The Court: You may proceed.

Mr. Strouss: These are the profile maps for Arizona.

Mr. Mason: Yes. Now, I am advised that the documents that you have there, Mr. Strouss, are the profiles of the line from Yuma to Cavot via Gila and Bowie, and from Tucson to the state line west of Rodeo, New Mexico, via Douglas.

Mr. Strouss: May we have the profiles from Yuma to Cavot marked for identification?

The Court: Yes, they may be marked.

The Clerk: Plaintiff's exhibit No. 309 for identification.

Mr. Strouss: And the profiles of the line from Tucson to the New Mexico line through Douglas.

The Court: That may also be marked.

The Clerk: Plaintiff's Exhibit No. 310 for identification.

Mr. Strouss: Now, we offer in evidence plaintiff's exhibit 309 for identification.

Mr. Mason: No objection.

The Court: It may be admitted.

[fol. 4082] (The documents referred to were received in evidence and marked "Plaintiff's Exhibit No. 309.")

Mr. Strouss: And plaintiff's exhibit No. 310 for identification.

The Court: It may be admitted.

(The documents referred to were received in evidence and marked "Plaintiff's Exhibit No. 310.")

Mr. Mason: I suggest as a matter of mechanics that these are permanent records of our company and to impound those in court——

Mr. Strouss: I am not going to undertake to say we will pay for photographing all these exhibits. I don't think it is incumbent upon me to undertake to pay the expense of having all those photographed.

The Court: Of course, Mr. Mason, the Court will be disposed at the proper time, if it becomes necessary, to release the originals where substitutions can be made of certified copies. It may be possible, Mr. Strouss, by the time you get through with them that there will be only certain ones that you will be primarily interested in.

Mr. Strouss: That is true, but there was testimony yesterday as to what was typical territory in this state, which would make all of them necessary.

[fol. 4083] Mr. Mason: I don't suppose that plaintiff will be permitted to withdraw them from the custody of the court to work with them, will he?

Mr. Strouss: I understand from Mr. Sines you have a copy of these profiles in San Francisco.

Mr. Mason: Yes, we have copies of them, but what I suggest is this: We have furnished copies of all of the exhibits we have introduced even though it was some expense to photograph them or trace them, as the case might be; now the State comes and offers something and doesn't give us

anything with which to work and doesn't give itself anything with which to work. How can we write a brief based upon exhibits in the custody of the Court?

Mr. Strouss: I think you are in better position than I am. You do have other copies.

Mr. Mason: I certainly am not going to consent to your taking material out of the possession of the Court unless I am given a counterpart copy of them.

The Court: Well, we will cross the bridge on the matter of the release of any of them when we get to it.

Mr. Mason: I suggest, your Honor, that it is at least a [fol. 4084] course fraught with difficulty, and I think somewhat prejudicial to the proper trial of the case and particularly to the proper presentation of it by brief to have documentary exhibits introduced where copies of the exhibits are not furnished to the opposition.

Mr. Strouss: These are records of your company and I am informed that you do have copies of them. I don't think there is any point to this argument at the present time.

Mr. Mason: Our company covers from Portland to Tucumcari and over to Ogden. To say that they are records of our company is of very little use to us. Now, if those are going to become a part of the record, I suggest, in all deference, that we should be given copies of what the State introduces as documentary exhibits. If they were merely physical exhibits, there would be some point to the fact that they couldn't be duplicated.

The Court: I am going to overrule the objection at the present time.

Mr. Mason: I don't offer it as an objection, I offered it as a suggestion to Court and counsel.

Mr. Strouss: If I can I will have copies made but I won't say to the Court that I will promise to do that; I don't know that I can. May this be marked for identification?

[fol. 4085] The Court: It may be marked.

The Clerk: Plaintiff's exhibit No. 311, for identification.

Mr. Strouss: I offer this in evidence. I don't have copies of that at the present time but will procure them and see that you have them.

Mr. Mason: What has been handed to me here, your Honor, is a certified copy of certain investigation reports. I haven't had a chance to examine them, except the first

one relates to an accident occurring on the Pennsylvania Railroad. Now, if this is a part of the plaintiff's case, why, it properly comes into the case when the plaintiff has the job of going forward. If it is for the purpose of cross-examination, I don't know what witness is to be called in connection with the cross-examination on these. I don't know what place these have in the case right now.

The Court: State your purpose, Mr. Strouss.

Mr. Strouss: These are the certified copies of the reports of the Director of Safety covering five accidents that were included in the exhibit of Mr. Sullivan regarding the summary reports of the Interstate Commerce Commission, giving the details of the different accidents covered by the summary reports. Now, I have heretofore put [fol. 4086] in the one at Reno on the Southern Pacific.

Mr. Mason: That was during the cross-examination. Mr. Sullivan has been excused.

Mr. Strouss: No, I beg your pardon, Mr. Sullivan wasn't excused. There was the reservation that these certified copies that I was expecting from Washington, I reserved the right to introduce those certified copies through Mr. Sullivan. I think the Court will remember.

Mr. Mason: I don't know how Mr. Sullivan could testify to them, he didn't have anything to do with them.

The Court: Did I understand you to say, Mr. Strouss, that these particular accidents, the first one of which appears to be on the Pennsylvania Lines, the next one on the Missouri-Kansas & Texas Railroad, were specifically referred to in either the direct or cross-examination of the witness Sullivan?

Mr. Strouss: They are among the accidents which are shown on the exhibit.

The Court: Which exhibit do you have reference to, please? I have examined this proposed exhibit. Apparently none of these are on the defendant's lines. Do you care to examine them, Mr. Mason?

Mr. Mason: I have seen some of these before. I know [fol. 4087] about them.

Mr. Strouss: Exhibit 270 is the exhibit I referred to.

Mr. Mason: Well, do you wish to call Mr. Sullivan for further cross-examination. As I view these, these are part of the plaintiff's case in chief, or whatever the showing is to be called when the plaintiff takes the burden of going forward on March 25th.

The Court: Mr. Strouss, referring to exhibit 270, specifically, take the first accident you refer to and point out to the Court where there is any reference in this exhibit to that accident.

Mr. Mason: What is that first one, Mr. Strouss?

Mr. Strouss: 1768. It is shown in the index on page 23, sheet 23, as investigation number 1768.

Mr. Mason: Deans, New Jersey, June 7th, 1932. Well, of course, if it appears in the index it enters into the computation.

Mr. Strouss: It appears on page 17 under the heading of items of draft rigging. It is numbered 1768, the fourth one in the second group.

The Court: The objection is overruled.

(Thereupon, the document referred to was received in [fol. 4088] evidence and marked "Plaintiff's Exhibit No. 311.")

The Court: I don't see that there is anything Mr. Sullivan could add to it; he probably has no personal knowledge of those accidents.

Mr. Strouss: No, it would be only to ask him to identify the reports as the same reports covered by the exhibit.

Mr. Mason: I don't know that there was any objection made specifically to the introduction of this exhibit, but if there was I should like to have it understood there is no such objection upon the ground it is not the best evidence or hearsay or that it is irrelevant.

[fol. 4089] Henry W. Cassady was recalled as a witness and having been previously sworn testified further as follows:

Cross-examination.

By Mr. Strouss:

Q. Mr. Cassady, you are chief dispatcher on the Tucson division of the Southern Pacific Company?

A. Yes, sir.

Q. What part of the redispatch did you participate in?

A. The passenger trains for 1938, the Phoenix line freight trains for one month, December, 1938; the redispatch for

the month of April, two different kinds of trains, in 1940, that is, twenty-seven days in the month of April only.

Q. Where did that take take place? Where was it you did this redispatching?

A. San Francisco.

Q. Who was present and just what happened? Was it similar to what Mr. Herrell testified to yesterday? In other words, you were there in a group?

A. Yes.

Q. What was done?

A. In what particulars?

[fol. 4090] Q. Explain how you worked.

A. On what?

Q. On redispatching these trains.

A. Which ones?

Q. December of 1938.

A. I did not redispatch them, I simply put them on the work sheets, the white sheets, to move the total number of cars to show what we could have done by long train operation. We didn't enter station by station time, we didn't use a regular train sheet in this Phoenix work. The traffic over there is very light and we didn't consider it necessary to take a regular train sheet and work the trains up.

Q. How long were you working on this, making up this sheet or these work sheets?

Mr. Mason: Are you referring now to December, 1938, only?

Mr. Strauss: All work that you participated in.

A. I believe about five months.

Q. You didn't redispatch any trains on the Phoenix line?

A. No.

Q. Just put them on the work sheets?

A. That is all.

[fol. 4091] Q. In going through that I wonder whether you might not have reached somewhat the same result in the saving of trains by observing the law, I mean not exceeding the car limit, if you had the same time to sit down and try to rearrange your trains and keep them within the law?

A. I don't think so, no.

Q. I wonder if you would turn to December 5th. The sheets there show both the actual and the redispatch?

A. Yes, sir.

Q. Will you read into the record the trains as they appear in the actual and then in the redispatch, beginning with the fifth of December through and including the twelfth of December?

A. Westward from Tucson to Phoenix on December 5, 1938, first 903 identified as PFX-5—do you want it complete?

Q. Just the consist in addition to what you have given.

A. Seventeen loads, 49 empties leaving Tucson; arriving Phoenix with 15 loads and 51 empties.

Q. It is eastward that I want, Mr. Cassady.

A. Eastward freight train, Phoenix to Tucson, December 5, 1938, actual, extra left Phoenix with 10 loads and 26 empties, arriving Tucson with 10 loads and 23 empties. [fol. 4092] On redispatch this train was not operated.

Q. Give the following days.

Mr. Mason: I think the witness should explain that it shows on the sheet why the train was not operated on redispatch.

Mr. Strouss: I submit, if the Court please, I have a right to put my evidence in, in my own way.

The Court: That is right.

The Witness: A On December 6, A-139 was operated with 37 loads leaving Phoenix, 42 loads arriving Tucson. A local freight train, an extra, was operated with 8 loads and 32 empties leaving Phoenix, 26 loads and 26 empties arriving Tucson on the actual. On the redispatch A-139 left Phoenix with 47 loads, 12 loads of which were from the train of the previous day and from the drag of the same date, left Phoenix with 47 loads and 26 empties, arrived Tucson with 52 loads and 24 empties. A switcher was operated—do you want that—a switcher was operated to Chandler only—the switcher was operated from Phoenix to Chandler, a distance of 48 miles, did all necessary switching.

Mr. Strouss: That is the so-called turn-around?

[fol. 4093] A. That is all. Eastward on December 7th, Phoenix to Tucson, we operated A-140 out of Phoenix with 47 loads and no empties, into Tucson with 48 loads and no empties; on the redispatch this train was operated with 55 loads and 6 empties leaving Phoenix, arriving Tucson with 76 loads and 6 empties. The additional cars as shown on the

redispatch were from the extra east that was operated leaving Phoenix with same loads and 32 empties and arriving Tucson with 26 loads and 26 empties of the previous date. I might add, for information, that this drag was mentioned on the previous day, left Phoenix at 9 P. M. and arrived Tucson at 5:40 A. M. 904, A block, on the actual left Phoenix at 2:10 A. M., arriving Tucson 6:35 A. M.

On December 8th, A-141 out of Phoenix with 47 loads and 15 empties, arriving Tucson with 50 loads and 11 empties; a dead freight, an extra out of Phoenix, with 17 loads and 40 empties into Tucson with 23 loads and 31 empties, actual. On redispatch A-141 left Phoenix with 47 loads and 40 empties, arriving Tucson with 50 loads and 33 empties. The extra cars on A-141 out of Phoenix were empties into Tucson which were those handled by this extra east and we also operated another switcher to Chandler and return on that date.

[fol. 4094] On December 9th, A-143 out of Phoenix, 59 loads and no empties, arriving Tucson with 67 loads and no empties. Local or dead freight out of Phoenix with 7 loads and 53 empties into Tucson with 8 loads and 48 empties. On the redispatch A-143 had 71 loads out of Phoenix, 85 loads into Tucson. The local switcher or dead freight left Phoenix with 12 loads and 74 empties, arriving Tucson with 10 loads and 51 empties. The extra cars on A-143 also on this local extra were from the extra that left Phoenix at 9 P. M. on the eighth, arriving Tucson 5:05 A. M. No. 904 train arrived Tucson at six o'clock.

On December 10th, eastward from Phoenix to Tucson, A-144 out of Phoenix with 53 loads and no empties, into Tucson with 63 loads and no empties. The dead freight or the drag local out of Phoenix with 11 loads and 28 empties, into Tucson with 15 loads and 20 empties. On the redispatch A-144 left Phoenix with 53 loads and 20 empties, arriving Tucson with 63 loads and 20 empties. The dead freight was run as far as Coolidge only, because that was the destination of the other cars not handled in A-144.

Q. What was the consist to Coolidge?

A. The consist of this switcher here was 3 loads and 10 [fol. 4095] empties, 3 oil for Coolidge and 10 empty system boxcars.

On December 11th, eastward from Phoenix to Tucson, A-145 out of Phoenix with 61 loads, into Tucson with 67. On the redispatch A-145 out of Phoenix with 69 loads and

7 empties, into Tucson with 75 loads and 7 empties, the extra cars being the drag that was eliminated on December 10th. By the way, the drag on December 10th arrived Tucson at 6:40 A. M. on December 11th, the A block at 7:05 on December 11th.

On December 12th, eastward from Phoenix to Tucson, A-147 out of Phoenix with 57 loads and 9 empties, arriving Tucson with 57 loads and 6 empties. A-148 out of Phoenix with 24 loads and 28 empties, into Tucson with 28 loads and 26 empties. On the redispatch A-147 had 57 loads and 20 empties out of Phoenix, into Tucson with 57 loads and 17 empties. A-148 had 24 loads and 28 empties out of Phoenix, 28 loads and 26 empties into Tucson, the same as on the actual.

Mr. Strouss: No further questions.

[fol. 4096] Redirect examination.

By Mr. Mason:

Q. Mr. Cassady, from the testimony that you have just given on your cross-examination, it appears that the trains eliminated in the eastward movement during the week that you discussed were, generally speaking, a drag leaving Phoenix at 9 P. M. or later each day?

A. Yes, sir.

Q. And what you did according to your testimony as I understand it was to redispatch the cars handled on that drag so that they left Phoenix on the redispatch on the regular train in the very early morning?

A. That is right, except the short cars, there were switchers operated to handle the short cars.

Q. You operated switchers on the redispatch?

A. Just the same.

Q. And the times of the arrival of the redispatched cars at Tucson or cars handled on the redispatched trains to Tucson were from one to two hours later than if they had been handled on the preceding day?

A. That is correct as to loads only.

Q. In your redispatch handling in December, 1938, you said you didn't actually redispatch trains. I take it you [fol. 4097] reconsisted the trains?

A. That is right.

Q. As between Phoenix and Tucson and with reference to the intermediate points?

A. That is right.

Q. But you did not make up redispatched train sheets showing times at intermediate points?

A. No, sir, we did not.

Q. When you say you did not redispatch, you mean from the time standpoint?

A. From the time standpoint; only from the consist.

Q. Did you balance out your car handling during December, 1938, so that the same number of cars were handled east in your redispatch handling as were handled in the actual?

A. Yes, except I believe we had a few empties that moved Gila line rather than Phoenix line eastward. We matched car for car in the westward movement.

Q. Did you match car for car on the load movement?

A. Yes, matched car for car. The westward movement, if you will pardon me, is of vital importance in order to get the empty reefers to the loading points over there and [fol. 4098] we had to move a certain number of empty P. F. E.'s into this loading territory daily.

The Court: Do I understand that these operations about which you have just been cross-examined all have to do with operations between Phoenix and Tucson?

A. Phoenix and Tucson only.

Mr. Mason:

Q. Mr. Cassady, did you operate westward from Tucson to Phoenix during this week between the fifth and twelfth and generally during the month of December, 1938, in the same manner as you have indicated throughout your testimony as to the eastward operation?

A. Yes.

Q. Did you redispatch the westward cars and eliminate trains in the same way?

A. I think we eliminated some trains, I can't remember. We redispatched the cars, as I mentioned before, the empties were balanced and of course the load was balanced daily.

Q. In the operation of your redispatched trains eastward and westward, did you undertake to balance your power and your crews between Tucson and Phoenix?

A. Absolutely, yes, sir.

Q. So the result was to operate the same number of [fol. 4099] trains westward on the redispatch as had been operated eastward on the redispatch?

A. Eastward as had been operated westward because that is the away-from-home terminal.

Q. Do you recall whether you had to deadhead any power or crews during the month of December, 1938?

A. It seems as though there were some deadheads and maybe some light power, I can't recall it. I haven't looked that over.

Q. All of that would show up on the white work sheets?

A. That would show up on the sheets, yes, sir.

Mr. Mason: That is all.

The Court: May this witness be excused now?

Mr. Strouss: Yes.

The Court: You may be excused.

[fol. 4100] B. S. Sixes was recalled to the stand and testified further as follows:

Cross-examination.

By Mr. Strouss:

Q. I think your early exhibits pretty well speak for themselves. I will start with exhibit 189, if you will turn to that.

A. All right, I have it.

Q. In examining that exhibit, it appeared that at El Paso in 1939 6659 more cars were forwarded westward than were received eastward. Had you calculated that?

A. 6,659?

Q. Yes.

A. Yes.

Q. While at Ogden it appeared that 7,721 more were received eastward than were forwarded west?

A. Yes.

Q. Now, is that because the empty cars going east over the Ogden route are returned west over the Southern route to some extent?

A. You say empties going east?

Q. Maybe loads going east, but empties returning west are returned over the Southern route rather than back [fol. 4101] over the Ogden route. I might add along that

same line your next exhibit, 190, shows the total car-miles in each state and it appears that in Nevada the percentage of empties is, if my calculation is correct, 36.54 per cent of the total car-miles, while in Arizona the empties are 41.1 per cent of the total car-miles. In other words, there is a little less than five per cent more in Arizona car-miles, empties, than in Nevada. I am wondering, from the two exhibits, if it might be that a certain percentage of your empties are returned this way rather than by Ogden.

A. I wouldn't want to make a guess at that. That would be quite a study, to determine what it is, because there are so many different kinds of equipment involved.

Q. Have you calculated the percentage of empties to total car-miles on Exhibit 190?

A. You say had I?

Q. Yes, had you?

A. No, I had not.

Q. My calculation was 36.54 per cent empties in Nevada, and 41.1 per cent for Arizona.

Mr. Mason: Is that for any particular year?

Mr. Strouss: I was using 1939 as the year, yes, I didn't calculate the other years. Now, I think your exhibit 191 [fol. 4102] speaks for itself.

Q. Turning to exhibit No. 193, in preparing this exhibit and using the Pacific lines, you included the Tucson and Salt Lake divisions as a part of the Pacific lines?

A. Yes.

Q. There might be some difference in the graph if you were to limit the Pacific lines to the divisions other than the Tucson and Salt Lake?

A. Yes, that would change the graph.

Q. Now, of course, both gross ton-miles per train hour, and net tons per train would include all trains operated, that is loads and empties, or trains with mixed loads and empties, would it not?

A. Yes.

Q. So that the number of empties which are handled in one division would have its effect upon both the showing as to the gross ton-miles per train hour and net tons per train?

A. Any difference that might occur would be more marked in the net tons per train than it would be in the gross tons per train hour.

Q. But there would be a difference in both graphs, it would be greater in the net tons per train than any other, [fol. 4103] but there would still be a difference in the gross ton-miles per train hour also, would there not?

A. I don't know whether I can agree with you or not about the gross ton-miles per train hour. That is a function of locomotive loading and speed. The first thing that an operating organization, chiefly the chief dispatcher, figures on is to load his locomotive to the tonnage that it is capable of handling, and they take into consideration the schedule that the train has to make also. A trailing load behind the locomotive could consist of loaded cars as well as empty cars as far as building a train load is concerned. Then, too, if a train did have to be lighter, it would go faster probably, so it might build up the same gross tons per train hour.

Q. I am glad you said that because I understand from prior witnesses that if long and heavier trains were operated, they would operate as fast or faster than the short trains.

A. I don't think you have stated the entire problem.

Q. Referring to the lower chart, net tons per train, if any statement as to the preceding statement is correct, that the ratio of empties in Nevada is 36.4 per cent while in Arizona [fol. 4104] it is 41.1, or a little less than five per cent greater, if the ratio of empties in Arizona were brought down to that of Nevada it would increase the average tons per train as shown at the bottom of the lower graph, would it not? In other words, if you had a greater ratio of loads than you now have, it would increase your average net tons per train?

A. Yes.

Q. Now, would the car loading have some effect, also, upon both the lower and the upper graphs?

A. By car loading you mean the net tons per car?

Q. Yes, per loaded car.

A. It would have very little effect upon the upper graph.

Q. It might have some?

A. Well, I won't agree with you there, but it will have an effect on the lower graph.

Q. Will you turn to your 521's for 1939? What division do you have there?

A. This is the Rio Grande.

Q. Turn to the Salt Lake division or the Tucson, whichever one you find first.

A. Tucson.

Q. And at the bottom of the page is the item of net tons [fol. 4105] per loaded car. I want it for the year of 1939.

A. All right, Tucson for the year 1939.

Q. That shows, does it not, main line operations, net tons per loaded car east 20.0 tons?

A. Yes.

Q. West 20.5 tons?

A. Yes.

Q. Total 20.1 tons?

A. Yes.

Q. Now, will you turn to the Salt Lake division?

A. All right.

Q. East, 21.2?

A. Right.

Q. West, 23.1?

A. Yes.

Q. Total, 21.8?

A. Correct.

Q. That will show a loading the, or total loading, comparing the total loadings, of 1.7 tons per car greater in Nevada, or on the Salt Lake division than on the Tucson division, will it not?

A. Yes.

Q. And if that were added, taking a train of, say 60 cars, 60 loaded cars, that would be 104 additional tons [fol. 4106] added to a train of 60 cars?

A. Yes.

Q. Your column, then, for Tucson with that added car loading would be raised, would it not?

A. Yes.

Mr. Mason: How much would it be raised, Mr. Sines?

A. 104 tons.

Q. Or to 816?

A. Yes.

Mr. Strouss: Of course, as you said before, if this was for the lower graph there would be the additional raising of the column for whatever additional effect empties had on it?

A. You cannot double shoot on this, can you?

Mr. Mason: Not if you are going to put 60 loads in 70-car trains.

Mr. Strouss: I don't think I am double shooting this, Mr. Sines. I am asking you about tons per loaded car, not about average tons per train. Your data which is set out in 521 is tons per loaded car.

A. That is right. This is not tons per car, but tons per loaded car.

Mr. Strouss: That wouldn't be double-shooting would it? [fol. 4107] Mr. Mason: Please read Mr. Strouss' question just prior to the witness's remark about double shooting.

(Thereupon the following question was read by the reporter: "Of course, as you said before, if this was for the lower graph there would be the additional raising of the column for whatever additional effect empties had on it?")

Mr. Mason: Now, I suggest, Mr. Strouss, that either you are double-shooting or you are not; you can take your choice.

Mr. Strouss: The witness is capable of answering the question.

Mr. Mason: I don't think he should be confused by asking him a question and withdrawing it right away and saying, "That is not what I mean."

The Court: Go ahead, I think the witness can take care of himself. If he doesn't understand the question he can so state.

The Witness: Can you say it another way?

Mr. Strouss: Of course, the added car loading of 1.7 tons per loaded car would raise the column which represents the Tucson division, would it not?

A. That is right.

Q. Now, lowering the ratio of empties to the same ratio [fol. 4108] that it is in Nevada, would that still further raise the Tucson division column?

A. I don't think—it would if it were possible, but I don't think you have taken into consideration everything that has to be taken into consideration. If we were able to raise our loading, of course, in this Southern territory, we wouldn't need as many empties returning in the opposite direction; that would change exhibit 190 the percentages that were figured on 190 wouldn't apply.

Q. Of course, from your exhibit 189, it would appear that you are returning more cars westward than you are receiving in El Paso eastward?

A. That is right.

Q. You are returning more empties than you are loading and returning eastward, we might say.

A. That is still right, we are doing that.

Q. Now, isn't there another factor that should be taken into consideration so far as these graphs are concerned, and the column represented Tucson division, and that is the Phoenix line. As Mr. Cassady testified a little while ago, if you heard him, that that is a line of light traffic. Wouldn't that have its effect upon the tonnage for the division as a whole?

[fol. 4109] A. The Phoenix line is a light traffic line thinking of the total tonnage moving over the line. I don't recall that Mr. Cassady said that the trains operating on that line are light tonnage trains.

Q. Let me ask you this question: It is true that at least during the melon season and the lettuce season there are turn-arounds or gathering trains operated on that line?

A. That is right.

Q. And they are quite small trains? Are they not?

A. I would want to check that. I expect by the time they get back to Phoenix they are pretty well loaded, but in the gathering aspect, the gathering trains will be lighter than the through trains, yes.

Q. Of course, there is nothing like that in Nevada, you don't have the same type of trains in Nevada?

A. No.

Q. Now, in exhibit 194, I have asked you to get the information concerning the employees?

A. That is right.

Mr. Strouss: And that is to be put in, if the Court please, [fol. 4110] Mr. Sines has said that he will get it some time during the recess, and we will put it in at the time we reconvene.

Mr. Mason: What information is it?

Mr. Strouss: On the matter that appears in lines 20 to 37, inclusive, for the years 1930, 1931, 1932, 1933, 1935, 1936 and 1937.

The Court: As to which exhibit, Mr. Strouss?

Mr. Strouss: 194.

The Witness: That is right. That is my understanding, and that data is in the course of preparation in our time-keeping department in San Francisco.

The Court: We will take our morning recess at this time.

(Thereupon a short recess was taken, after which the witness B. S. Sines was recalled to the stand and proceedings were resumed as follows:)

[fol. 4111] Mr. Strouss: Mr. Sines, if you will turn to exhibit No. 198. As I understood your direct testimony, this is typical of the white sheets which were made?

A. That is right.

Q. First I will ask you to get the tonnage on the trains both actual and the redispatch. Do you have that?

A. Yes, sir.

Q. Will you give that for the actual first?

A. Y-310, 6,356 M's; Y-311, 5,850 M's; PY-412, 5,480 M's; C-413, 6,150 M's; C-414, 6,559 M's; CY-414, 5,200 M's; C-415, 6,630 M's; Y-312, 6,058 M's; Y-313, 6,114 M's.

Redispatch, Y-310-311, 10,530 M's; CY-412, 5,950 M's; C-413, 8,800 M's; CY-414-C-414, 8,650 M's; C-415, 8,450 M's; Y-312, 6,175 M's; Y-313, 9,300 M's.

Q. As I understood from the redispatch, there was no effort made to balance the tonnage in this redispatch, that is, it was the balancing of cars rather than the balancing of tonnage?

A. That is right.

Q. How was the tonnage in these assumed trains determined?

A. By using an average of 50, 51, or 52 M's for an empty [fol. 4112] car and an average of 90, 95, 96, 97, or 100 M's per loaded car, depending upon the average weight of the cars in the trains actually operated.

Q. Of course this redispatch is based upon operations of 1938?

A. That is right.

Q. Do you have the 1938, 521's? Will you turn to the Tucson division. The net tons per loaded car——

A. East, 19.8; west, 19.8; total, 19.8.

Q. Will you take the form 521 for 1940 and give the same?

A. East, 21.4; west, 21.0; total, 21.3.

Q. Your redispatch would not work with the 1940 carloadings, would it?

A. We made a 1940 redispatch.

Q. I mean this redispatch here, for example, CY-412—by the way, your tonnage rating for these engines was sixty-two hundred twenty M's, was it not, over this territory?

A. Yes.

Q. CY-412 had 5,950 M's?

A. Yes.

Q. The difference in loading there as I calculate it is a ton and a half per car?

[fol. 4113] A. Yes.

Q. Sixty-two loads would increase your M's over your engine rating, wouldn't it, so that you would either have to use a helper or——

A. Sixty-two times one and a half is 93 tons or 186 M's added on to the 5,950 is 6,136 M's.

Q. Take Y-312, that is 6,175 M's on your redispatch?

A. And 65 cars, yes. That would run that over the rating. There would be fewer cars handled on the redispatch and there would also probably be an offset on the actual however in the tonnage of the actual trains.

Q. On the actual, variables are shown under wages but you don't show that on the redispatch but from your testimony on direct examination that was taken in by a lump sum calculation, isn't that correct?

A. That is right.

Q. Why did you do that that way on the redispatch rather than carry it as it was in the actual?

A. The items that are carried in the variable column are unpredictable to a certain extent. It depends upon what the train and engine crews do themselves at initial and final terminals and it was also easier to handle in a lump [fol. 4114] sum, assuming that these variable allowances would increase or decrease with the number of trains run, that is, the number of crews having an opportunity to accumulate those variable payments.

Q. In exhibit No. 199 I wish to take these section by section. The first section, will you just explain what that covers? That has to do with unnecessary delays?

A. At El Paso, Rodeo, and Lordsburg, points east of and outside of the state or Arizona.

Q. This first section, what typical operation would that be, taking a car out of one train because of the Train Limit Law and putting it into another?

A. That is right, that was a typical operation in all instances except the first, and even there it is taking a car out of one train and putting it into a second train which would not have had to be run if it were not for the law.

Q. The delays which are shown here are the delays which occur at the terminal whether or not that time may or may not have been made up?

A. Yes, those are the times that occurred at Lordsburg and were the notations appearing on the dispatcher's train sheets or perhaps the conductor's delay reports in some [fol. 4115] instances, making an explanation of the extra amount of time spent there.

Q. Section 2, what is a typical operation which is covered by that section? I wondered whether I was correct in my analysis that this differs from the first one in that a car is taken out and left, say, at Yuma and then picked up by a later train?

A. That happens when train No. 1 is involved but does not happen when No. 43 and No. 5 are involved for any great length of time although there is a delay as you will note occasionally in column F when just trains Nos. 5 and 43 are involved, but the difference between Section 1 and Section 2 is that Section 1 is an extraterritorial delay or interference and Section 2 is a delay that occurs right here within the state of Arizona at Tucson and Phoenix.

Q. Section 3 would be similar except it is at Yuma and train No. 6 is involved?

A. That is right.

Q. Going back to sheet 5, involving Section 2, I wondered if there is some explanation of why the long delay on April 9th, an hour and fifty minutes?

A. Undoubtedly there is an explanation, but I don't remember. I can determine what it would be, however, [fol. 4116] if you want it.

Q. The exhibit would indicate it was all due to the necessity of switching cars because of the law and I wondered if that were actually true?

A. I will give you a pretty good guess. We had to handle those two cars shown in column H by operating a second No. 5 out of Phoenix. The situation developed so

quickly that we didn't have a crew and an engine ready to handle second No. 5, so second No. 5 couldn't get under way until the preparatory time had been used up and we got the crew down to the station and got the engine fired up. In the first instance, of course, it was because we couldn't handle as many cars in the first No. 5 as we wanted to.

Q. You might, during the noon hour, if it is convenient check and if that explanation is not correct——

A. I will be glad to do that.

[fol. 4417] Q. Now, 3A is similar to section 2, except that it has to do with Train No. 6 at Yuma, is that correct?

A. That is right.

Q. What about section 3B?

A. Well, the difference between 3A and 3B is that 3A is confined to Yuma, as is indicated in column D, whereas 3B, the occurrences happened at Tucson and El Paso, and it has the added feature there of having to put those cars back in the train that they came from, from train No. 6, because those cars are probably destined to some point on the Texas and New Orleans Railroad.

Q. Now, 4A, that is similar except that it applies to train No. 4?

A. That is right.

Q. And 4B would be similar to 3B, except that it applies to train No. 4?

A. Yes.

Q. And 5A and 5B are similar to 3A and 3B except that they apply to train 44?

A. That is right.

Q. And 6A and 6B, the only difference is that they apply to other trains?

A. That is right.

Q. Now, Section 7A and 7B—maybe I shouldn't take [fol. 4418] them together. 7A, that is interference at Los Angeles?

A. Yes.

Q. Just what is the nature of that interference?

A. I can answer that by referring to section 10. That is on sheet 20, item 98. On July 22nd, the diner T and N.O. 926 was cancelled between Phoenix and Los Angeles on Train No. 5. In order to make pick-ups and stay within the fourteen car limit, it was necessary to leave No. 5's

diner at Phoenix instead of carrying it on to Los Angeles. However, we have to serve breakfast on No. 5 next morning before that train gets to Los Angeles, so we have to deadhead a diner out of Los Angeles to meet train No. 5, and train 820, shown on sheet 12, takes that diner out of Los Angeles.

Q. And that is the operation which is shown under 7A?

A. Yes; and they meet train No. 5 up at Colton or some place up the hill and have to stop No. 5 and put that diner in after it has been set out by 820, of course, then they go into Los Angeles with the diner.

Q. Now, what is the type of operation which is shown under section 7B?

A. We are speaking here of westward trains, and this [fol. 4119] represents the work that was done on those trains at Yuma, putting them back together again in order to save expense when it was possible and desirable west of Yuma.

Q. Now, section 8 is delay to deadhead equipment, Yuma to El Paso?

A. That is right.

Q. And section 9, changing the routing of cars?

A. That is right.

Q. In going over these, I notice that the same item number will appear in different sections.

A. That is right.

Q. That is because that particular item comes under different types of operation that are set up here in the exhibit?

A. That is right, and because breaking an established routine has innumerable ramifications. Like dropping a stone in a puddle of water, it spreads out in all directions, and you have to do things to trains elsewhere, in some cases between Yuma and Los Angeles and intermediate stations, just because you cannot run 14 cars across the state. When we were making this exhibit we first set it up just to tell the story surrounding each event, but we found that we who [fol. 4120] worked on it couldn't comprehend its entire scope, so we classified it according to these subdivisions in this exhibit.

Q. I think section 10 is rather clear, cancelling the movement of cars?

A. Yes.

Q. Section 11 appears to be an error in figures there, item 68, shouldn't that be 96 locomotive miles incurred in column E? I notice items 72 and 84 are both 96 for that same Indio to Beaumont movement.

A. Well, there is an item 77 that only has 50.

Q. I wondered whether there was

A. I don't think so. If we found work for helpers on the other legs of the trips, we didn't charge those locomotive miles against the Arizona Train Limit Law, and that is what is involved here, as I understand it.

Q. I understood with items 72 and 84 here, helper Indio to Beaumont, 96 miles, the distance would be either 96 or 50 miles. I was just calling it to your attention. It is to my advantage, I suppose, to have the lesser mileage.

A. I don't think there is an error. However, we will check that.

[fol. 4121] Q. Section 12, delay to loaded cars. I think that is clear. And sections 13A and 13B and 14. Now, exhibits 214 and 215.

A. All right.

Q. Of course, the results which would appear in these exhibits, 215 is a graph of what appears on 214, that is correct, is it, so far as trains are concerned?

A. You might say that is a fact, but you cannot compute the figures shown on 215 from the information which is shown on 214.

Q. No.

A. The picture is the same, yes.

Q. Of course, with both of those exhibits, the results which are obtained would only be true if your redispatched, your assumed operation, works out as you have set it up. I mean, if there should be any change, if your engines failed to carry the tonnage for the rating which had been given to them for the rate of speed over this division which would change your redispatched, that could change the result of both of these exhibits, could it not?

A. To the extent that they would be changed they would be changed, yes.

Q. Everything has to work out just as you have assumed
[fol. 4122] it will in order to give this result.

A. If it doesn't, there is something wrong with our arithmetic here.

Q. Sometimes pencil points get wrong. Turn to Exhibit 220.

A. Yes?

Q. Looking at the actual at Wellton.

A. All right.

Q. There appears to be two meets there indicated on the actual, are there not?

A. Yes.

Q. Now, going to the assumed, will you tell me what is the difference between the actual and the assumed at that point?

The Court: You say this was at Wellton, Mr. Strouss?

Mr. Strouss: Yes, at Wellton. On the actual, let's see, S.S.W., what is that, 317?

A. Third, 17.

Q. And S.S.W. second, 17, G.B.W. 16 cross passenger train, line for train 6 at Wellton?

A. That is right.

Q. On the actual there are two meets indicated?

A. Yes.

Q. What is the difference between that and the [fol. 4123] assumed?

A. I can't tell by looking at this chart. We will have to look at our actual and redispatch train sheets, and see what time those trains got to Wellton.

Q. It appears to be about 5:30 according to this on both operations.

A. That is right—wait a minute, GBW16 and the redispatched gets to Wellton at about 5:20, whereas on the actual he got there at about 5:30, and SSW3rd 17, was right behind GBW16 and got to Wellton a little bit earlier on the redispatch than he did on the actual, which probably made it——

Q. (Interrupting) Doesn't the chart show an indication that the third 17, took the siding at Wellton?

A. He stopped there, I don't think he would have to go into the siding. This is at the end of the double track. Maybe 6 paused momentarily at Wellton in actual operation, to let those two trains come onto the double track.

Q. But he didn't pause in the assumed?

A. Maybe he didn't have to pause in the redispatch.

[fol. 4124] Mr. Strouss:

Q. C-413 on the actual, he left east yard about midnight?

A. That is right.

Q. And he had a meet coming out of the yard or just after he came out, or coming out of the yard as would appear there, is that right?

A. DF-3627, yes.

Q. That is eliminated on the assumed operation?

A. Yes.

Q. And it is eliminated by having 413 depart from the yard about twenty minutes or a half-hour later?

A. We don't have any DF-3627.

Q. No, you don't have any DF-3627 on the redispatch.

A. Maybe that train was eliminated entirely because we were running fewer trains on the redispatch than we are on the actual.

Q. Let's go over to Y-312 at east yard. On the actual there appears to be a meet but not on the assumed. What is the difference in the operation there, why did Y-312 passenger train meet at east yard in the actual and why isn't there a meet for those two trains in the assumed?

A. On the actual Y-312 had to stop at east yard in order to permit No. 1 to enter the double track. On the redis- [fol. 4125] patch he didn't have to stop there to permit No. 1 to enter.

Q. Both trains appear to have reached that point about the same time on both actual and redispatch according to this chart?

A. No, on the actual Y-312 left Yuma about 10:15 and arrived at east yard at approximately 10:40; but on the redispatch he left Yuma about 10:30 and arrived at east yard at almost eleven o'clock, maybe at 10:55.

Q. The meet, then, is eliminated in this instance by delaying his departure from Yuma about fifteen minutes?

A. That is the way it worked out. I don't propose to answer for what chief dispatcher Baker had in his mind when he set these things up, but I do recall his testifying that he established the leaving time of these trains from terminals and then his assistant took over and operated the trains out of the terminal. The departure times from the terminals depended on the arrival time of the trains

into Yuma and the amount of work that had to be done on the trains at Yuma. My own conclusion, or my opinion, is that Baker did not consider this for that particular feature when he set the departure time of that train for 10:30.

[fol. 4126] Q. Let's go to Gila. Under the actual there is a meet, C-414 and CY-414 with a drag freight, two meets there. Why isn't there a meet on the redispatch C-414-CY-414 in the drag freight?

A. On the actual DF-3660 spent from 9:50 approximately to 11:40, or an hour and fifty minutes, in Gila and departed immediately after the arrival of CY-414 which would indicate that he was held in Gila until both C-414 and CY-414 had arrived, but on the redispatch the Ajo drag arrived in Gila at 10:25 and departed at 11:40 approximately, having spent an hour and fifteen minutes there and departing perhaps twenty or twenty-five minutes after the arrival of C-414 and CY-414, indicating that he was not held in Gila until the arrival of that train but that he stayed there because of station work or some other reason.

Q. There wasn't a meet, then, between those two trains in the assumed?

A. There wasn't a meet in the sense that one train was delayed by the other, no.

Q. At Stockham I was wondering why it is not indicated as two instead of one meet with Y-314 and 315?

Mr. Mason: That is on the redispatch?

Mr. Strouss: Yes.

[fol. 4127] A. Second train 903 met Y-314-315 on the double track. You have a comparable situation although not with the same trains on the actual, at five P.M. where C-414 met DE-2521 on the double track or near the end of the double track and we didn't score a meet.

Q. Coming down to Drury on the actual it is at Benson, DF-3742 and C-415 met at Benson?

A. That is right.

Q. On the redispatch C-414 goes off the sheet just before it would meet the drag however?

A. That is right.

Q. The same is true of C-413 and the drag at Lisbon?

A. That is right, and there again you find counterparts on the actual. I call your attention to what happened at Bowie at twelve midnight, C-414 and DF-5014, the trains we are talking about.

Q. Now at Lordsburg CY-412 and the drag freight, the drag appears to have reached Lordsburg about 7:10 and CY-412 about ten or fifteen minutes after that?

A. Yes.

Q. Then, the drag left about a half-hour later?

[fol. 4128] A. That is right.

Q. CY-412 about three-quarters of an hour later?

A. Yes.

Q. Why was that not a meet?

A. Neither one of the trains was delayed by the other and we didn't score that for the same reason that we did not score what happened to DF-5027 or CY-411 on the actual at Lordsburg or C-412. No interference between trains, no meets in the sense that one train delays another train.

Q. Of course this exhibit and the results that are reflected would only be true if your redispatched or assumed operation worked out exactly as you assume that it will? I mean if there are any delays or engine failure.

A. We duplicated delays and engine failures, you know, and in doing that we were leaning over backward because we are going to operate less engines on the redispatch than we are on the actual, but we duplicated engine failures, failure for failure, we didn't take seven-tenths or eight-tenths of the number of failures.

Q. An AC-8 has never been operated on this territory?

A. Never in regular service, no.

[fol. 4129] Q. You have by your redispatch assumed that it will pull certain tonnage over this territory and make certain speeds, is that correct?

A. That is right.

Q. Of course if it should fail to do that year results here would be changed?

A. That is right.

Q. This graph in exhibit No. 222, as I understand from your testimony on direct examination, that is to show the minimum locomotives that would be required in order to carry out your operations during this period. In other words, twenty-seven locomotives would be the minimum that would be necessary for this operation?

A. That is right. This chart is set up with twenty-seven locomotives in actual operation and we added three more for shopping, giving us thirty.

Q. Your three would be more or less standby locomotives, is that what you mean by "shopping"?

A. Yes.

Q. You didn't attempt to make a graph for this in-and-out on this actual operation to see what that picture might have been?

A. No, but I did make a check of the requirements of thirty, based on locomotive-miles, checking it against the locomotives in actual performance and found that the [fol. 4130] number of units reduced in approximately the same ratio as the locomotive-miles actual against redispatch.

Q. From this exhibit and the next, No. 223, you appear to have assigned for redispatch thirty-three principal engines, is that correct? That is the total principal engines that you have, leaving out the south line?

A. Yes, thirty-three.

Q. What in the actual?

A. Corresponding to that thirty-three would be forty-five. There is involved in that also, see the note in column C, Section 4.

Q. Yes, that is what I didn't understand.

A. Helper service.

Q. In trying to calculate the locomotives in actual there, it appeared to me you had sixty-one principal locomotives and eight helpers in actual and thirty-three principal and fifteen helpers in the redispatch?

A. Where do you get the eight helpers?

Q. Five in item 2, Gila-Estrella helper, and three San Simon.

A. All right, and on the redispatch you gave us credit for five in the same territory, did you?

Q. Yes, and then there would be ten in the Tucson-[fol. 4131] Dragoon which would make thirty-three principal and fifteen helpers in the redispatch?

A. All right.

Q. If I figured this correctly, there are thirty-six principal engines shown Yuma, Tucson, via Gila and twenty-five Tucson, El Paso via Lordsburg, which would be sixty-one principal locomotives.

Mr. Mason: I think you are both working at cross purposes. Obviously that twenty-five you just mentioned in-

cludes the helpers between Tucson and Dragoon according to the note.

Mr. Strouss: That is what I am asking Mr. Sines. I want to find out how many principal engines were in the actual and how many helpers?

A. They don't work that way in actual operation. Sometimes they are in helper service and sometimes they are in principal service.

Q. You have sixty-nine locomotives in actual, leaving out the south line?

A. All right, sixty-nine.

Q. And forty-eight in the assumed?

A. That is right.

Q. What is the train-miles eliminated by the redispatch? You have that on one of your exhibits, do you not?

[fol. 4132] A. Yes, exhibit No. 226. The locomotive-miles eliminated, Mr. Strouss, for the north line, that is, from Yuma to El Paso, are 142,838 for the two months June and August, 1938.

Q. The locomotive-miles for the redispatch for the same period are 355,501?

A. Yes.

Q. The locomotives' decrease is twenty-one locomotives?

A. Yes.

Q. In determining the increase in locomotive investment, you have taken the total pounds of the twenty-one locomotives to be released and the total pounds of the new locomotives to be used, the AC-8's, and subtracted the pounds of the old locomotives from those AC-8's and multiplied that by a per pound price to determine the increase in investment, is that the way that works out?

A. That is right. Just a minor correction, that the other locomotives in the assignment on the redispatch are included here also, not only the new AC-8's but the old ones also.

[fol. 4133] Q. Yes. Now, why did you take away the weight of the 21 locomotives?

A. I didn't take it away. Don't you see how this works here?

Mr. Strouss: I thought I did. Don't you subtract?

Mr. Mason: That is why I think both the last question and answer are incorrect. Mr. Strouss' explanation of his understanding of the way the calculation is made is clearly

wrong from the face of the exhibit, and I don't think the witness understood the question or he wouldn't have answered as he did.

Mr. Strouss: Mr. Sines, how do you arrive at that amount, $284,149?

A. That calculation occurs in lines 9 to 16, columns G, H, I and J. We find that the total weight of locomotives in actual service is 31,731,800 pounds. The locomotives necessary on the redispatch are 32,872,960 pounds, and the difference in weight or the increase of the redispatched over the actual is 1,141,160 pounds. Multiplying that by the average price at which we are now buying locomotives gives $284,149.

Q. But you have added thirty new AC-8 locomotives weighing 22,614,000 pounds?

[fol. 4134] A. Yes.

Q. Purchased new?

A. Yes.

Q. But your increase in investment is only 24.9 cents a pound times 1,141,160; that is the difference or added pounds after putting the AC-8 locomotives in service here and taking out the 21 older type locomotives?

A. Yes, that represents the net change in locomotive weight and locomotive investment.

Q. Figured at the price today for locomotives?

A. Well, estimated 1940 price, yes.

Q. And the 21 locomotives which are removed from service here, the effect of that is to use them in reducing the pounds of locomotives put in service here?

A. Yes, it reduces the locomotives put in service here, also reduces our locomotive requirements on the system, we won't have to buy so many locomotives if we put these locomotives in service here in Arizona. We won't have to buy so many locomotives for our system requirements over the next ten years if we are allowed to put these big ones in service in Arizona. That is the theory behind this exhibit.

Q. Those older locomotives will be put in service on [fol. 4135] other divisions if they are taken off this division, that is what you mean by that, I take it.

A. Yes, sir, our locomotives are wearing out all the time.

Q. Now, has depreciation been given any consideration in this calculation?

A. The depreciation on the increased investment in locomotives?

Q. The depreciation on what is already in service?

A. Perhaps I can answer that this way. We have a depreciation rate here for our increased investment.

Q. But you haven't in considering these old locomotives in your investment account here, you haven't depreciated those? Has any consideration for depreciation been given? Maybe I can make clear what I am trying to get at. As I see this calculation here, you have put in service thirty new locomotives with a total pounds of 22,614,000. Now, that would mean an investment, in considering your old locomotives, that would mean an investment of 24.9 cents times 22,614,000 pounds, would it not?

A. Yes.

[fol. 4136] Q. But you have reduced that investment here by subtracting the weight of locomotives now in service?

A. That is right.

Q. And valuing those locomotives at the present cost price of your AC-8's?

A. That is right.

Q. And in valuing those locomotives in service, you haven't given any consideration to depreciation?

A. Well, I think I have, and I will tell you why I think I have. I am looking for that exhibit bringing together our investment. 225, I think it is. There is a locomotive depreciation rate indicated in column F of 2.9 per cent, and that is the depreciation rate which we charge in accordance with the Interstate Commerce Commission's accounting regulations, whether locomotives be new or old. The reason behind that is that a locomotive investment is a continuing thing. We retire old units and buy new ones; we are going to have to do that whether we set this law aside here in Arizona or whether we don't. If we are fortunate enough to take 21 locomotives that have seen some service here in Arizona away from Arizona to be used elsewhere, it is not going to cut that depreciation rate [fol. 4137] down anywhere or we haven't benefited at all in the general aspect so far as the Southern Pacific locomotive investment is concerned.

Q. But your depreciation here on 225 is, of course, taken on the $284,149 investment?

A. Sure. That is all we would be allowed to set up by the Interstate Commerce Commission.

Q. Your exhibit doesn't show when any of these locomotives now in service were purchased does it?

A. No.

Q. Nor the actual cost of those locomotives now in service?

A. No, it doesn't, although they cost much less than this 249 dollars when they were bought.

The Court: We will take our noon recess at this time until two o'clock.

(Thereupon the court stood at recess until two o'clock P. M. this day.)

[fol. 4138] 2 P. M., February 19, 1941

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed.

B. S. Sixes resumed the witness stand.

Mr. Strouss:

Q. Mr. Sines, on your exhibit No. 224 the price of $3,414 per caboose, what is the basis of that price?

A. That is a price that was furnished by the mechanical department as being the cost of constructing steel cabooses.

Q. That is the present-day cost?

A. I think it is a cost that is a couple of years old, I don't know that we have built any steel cabooses lately. The last time we built any steel cabooses that was the price.

Q. The twenty-one cabooses which by your study would be unnecessary, you wouldn't just junk those, would you?

A. No, sir, we would use those cabooses some place else on this railroad and our total system requirements would be reduced by twenty-one cabooses.

Q. Then, of course, that does not necessarily mean [fol. 4139] twenty-one new cabooses?

A. Sure it does, over a period of years. If we have to maintain twenty-one cabooses in operation, we have to replace them at some time or other.

Q. If the law were to be set aside, under your exhibit this is the number of cabooses that you would not require for your operations; the cabooses that you were to take out of service certainly wouldn't be the newest cabooses that you have? If you were to retire a caboose, you would retire the old cabooses, would you not?

A. We wouldn't retire any cabooses. It is not a question of retirement, it is a question of deferring or not having to spend any money at all for new cabooses at some future date.

Q. Without any consideration for depreciation?

A. Yes, the depreciation is shown on cabooses as 3.27 per cent on exhibit No. 225 in column F. I might add, Mr. Strouss, I have handled caboose investment just like the locomotive investment. I have charged depreciation on one side and depreciation on the other side. One acts as an increasing investment and the other acts as a decreasing investment.

Mr. Mason:

Q. Is it investment or annual charges?

[fol. 4140] A. So far as depreciation is concerned, it is an annual charge.

Mr. Strouss:

Q. Will you turn to exhibit No. 249. This exhibit is a comparison of the Tucson division, Pacific lines, and the Salt Lake division to show the trend in freight train locomotive loading and its effect on fuel consumption?

A. Yes.

Q. Both main and branch line operations are included in this exhibit?

A. That is right.

Q. And the Pacific lines include both the Tucson and the Salt Lake divisions?

A. That is right.

Q. I notice on sheet 2 in column J pounds of fuel per thousand gross ton-miles in 1929 the figure was 98 pounds of fuel per thousand gross ton-miles and in 1930, 117 pounds?

A. Yes.

Q. That is an increase in that year of 19 pounds?

A. Yes.

Q. It was in November of 1929 that the Tucson division was extended, was it not?

A. No, July of 1930.

[fol. 4141] Q. So that at least for a part of the period of 1930 the operation between Tucson and Lordsburg enters into the computation?

A. If you will remember, Mr. Strouss, I explained that I took the restated figure for the year 1930 which was published in 1931 and which gives the comparison with the Tucson division as it existed for the entire year of 1931, so as far as these statistics are concerned there is a clean break there between 1929 and 1930. You don't have to concern yourself with the fact that that change occurred in the middle of the year.

Q. You mean the operation between Tucson and Lordsburg is included for the period in your computation here?

A. The operation from Tucson to Lordsburg was set up for the entire year of 1930 when the figures were restated in 1931.

Mr. Mason: May I interrupt, in order to make this clear, these figures for 1930 represent the statistics of the Tucson division as if it had included the 1931 limits throughout the year 1930?

A. Exactly.

Mr. Mason: Is that what you had in mind, Mr. Strouss?

Mr. Strouss: Yes. And the figures from there on [fol. 4142] through to the end of course would be of the division as it is now constituted, that is, including that section from Tucson to Lordsburg?

A. Yes.

Q. The addition of that territory would have considerable effect upon this problem of pounds of fuel per thousand gross ton-miles, would it not?

A. It did to the extent shown there in those figures in column J.

Q. Do you think from 1930 on is properly comparable on to the period ahead?

A. No, that is why I broke it and set this exhibit up as I did.

Q. The territory between here and Lordsburg brings in a considerable help district?

A. Two helper districts.

Q. As the result of that, there is the added locomotive-miles, the locomotive working as a helper and returning light?

A. Yes.

Q. Which adds to the fuel consumption?

A. Yes.

Q. And that all comes into this period beginning with 1930?

A. Yes.

Q. Would a difference in carloading have any bearing [fol. 4143] upon pounds of fuel per thousand gross ton-miles?

A. No, I would say that would be so remote that it would not have to be given consideration.

Q. There isn't any showing as to what the carloadings were in the different years over the period to say whether there was any variation in carloadings except as we showed this morning?

Mr. Mason: I think there is a showing.

The Witness: Mr. Mason had some exhibits. I guess we could compute, however, but it would be quite a job.

Mr. Strouss:

Q. Mr. Masson in connection with his exhibits Nos. 162, 163, and 164 I think in response to a question of the Court why he had not carried exhibit No. 163 back to 1930 stated it was because of the change in the divisions and he didn't think the period before that was comparable to the period after 1930.

A. That is right.

Q. Do you agree with him on that?

A. Insofar as the particular items that are considered on this exhibit, I agree with him and I repeat that is the reason I set up my exhibit as I did, I am speaking about exhibit No. 349.

Q. It is true as shown by exhibit No. 305 that over this [fol. 4144] period there has been quite a bit of change in both the main line and branch line mileage operated?

A. In mileages there has been, that is right.

Q. The branch line mileage in Nevada has been reduced from, what was the figure in 1923?

A. 303.

Q. To what in 1939?

A. 153.

Q. And there has been a reduction on the Tucson to some extent?

A. From 648 to 465. Part of the Nevada change was due to standardizing and reclassification on the branch line from the state line into Fernley, I think that is something like 60 miles. We made main line out of branch line in 1929.

[fol. 4145] Q. And, of course, the main line in Arizona at the beginning of the period was slightly under 400 miles with 144.93 miles of branch lines?

A. Yes. A moment ago, Mr. Strouss asked me what the branch line mileage had been in Arizona. Well, I read the figure 648 for the year 1924, and 1923 it shows 1444.93. In other words, there was an increase between 1923 and 1924 in Arizona.

Q. That was due to the merger, was it not, the acquisition of the Arizona Eastern Lines, which brought in a lot of branch lines?

A. Yes.

Q. And also some on the E.P. and S.W.?

A. Yes.

Q. Your assumed operation with the AC-8 locomotives, of course, the fuel cost would have to be considered with respect to the fuel used by that type of locomotive, would it not? I mean, for your assumed operations. I mean a larger locomotive will consume a greater amount of fuel ordinarily.

A. It does to move itself, that is right.

Q. You have some of these locomotives operating now, the AC-9's operating on the Rio Grande division?

A. Yes, they are coal-burners and they are operating [fol. 4146] between El Paso and Tucumcari.

Q. When did they go into service, in 1940?

A. In the fall of 1939.

Q. That operation did result in the reduction of helper and light locomotive-miles during the year 1940, did it not?

A. I don't think—well, I know we haven't any helper territory between El Paso and Tucumcari. It reduced locomotive-miles and train-miles a lot.

Q. Increased your cars per train?

A. Yes.

Q. You might, if you will, take the 521's for 1940, Rio Grande Division.

A. All right.

Q. That shows, does it not, that for the year 1940 there was 1,840,881 locomotive-miles principal.

A. 1,840,881.

Q. And for 1939?

A. 1,951,086.

Q. And in helper service?

A. In 1940, 3,053, and in 1939, 9,440.

Q. The total locomotive-miles, including principal, helper and light.

A. 1,885,278 for 1940, and 2,014,750 for 1939.

[fol. 4147] Q. Now, your cars per train, main and branch?

A. For 1940, 62.4, and for 1939, 55.9.

Q. Now, main line only?

A. Main line for 1940, 66.3; 59.2 for the year 1939.

Q. Now, on your No. 521's, pounds of fuel per gross ton-mile?

A. Main and branch 95.2.

Q. And for 1939?

A. Main and branch 94.6.

Q. Now, the ratios that you have computed here in your exhibit 249 are carried over into your next exhibit, 250?

A. That is right.

Q. Your exhibit 249 is on both main and branch line operations?

A. Yes.

Q. While you are applying that ratio to main line operations only now in exhibit 250?

A. Yes.

Q. And the same would be true of Exhibit 251?

A. Let us get back on that, the last couple of questions there.

(The last three questions and answer were read by the reporter.)

The Witness: I was mistaken, I should have said no.

[fol. 4148] Exhibit 250 is for the Tucson division, main and branch.

Q. You have no redispatch of any branch line operations, have you?

A. No, but I took the results of the redispatch for June and August, 1938, and applied them to the statistics of

June and August, 1938, and I found what the effect would have been on the entire Tucson division of setting up the same condition that would have prevailed if we had had long-train operation in Arizona, because that wouldn't have affected our branch-line operation in any way.

Q. You mean long-train operation wouldn't affect your branch-line operation?

A. No.

Q. Now, your locomotive repairs, exhibit 254?

A. All right.

Q. As I understood your testimony on direct examination, you took the record of locomotives of the different types from the entire Pacific lines except the territory between Roseville and Eugene, and Roseville and—what was the other?

A. Sparks.

Q. And Sparks. Is that right?

[fol. 4149] A. Well, that story is a little bit involved. The AC-6's which I testified to and which I think we all wrote in on our exhibits operated between Roseville and Sparks, and then I made a further study of the F-5's and I selected those F-5's which had spent all or most of the ten years of their existence in the territory between Roseville and Sparks and Roseville and Eugene, and compared that group of F-5's with those F-5 locomotives which had not operated in that particular territory.

Q. You stated the other day that you don't keep a record by division of locomotive repairs?

A. No, we don t.

Q. You formerly did?

A. Until 1932 we did.

Q. As shown by those earlier records, the amount charged to locomotive repairs on the Tucson division was lower than other divisions except New Mexico, Stockton and Salt Lake?

A. I don't know, I have never made that particular comparison.

Q. Of course, the divisions like the Western and the Coast division and the Shasta, locomotive repairs run higher up there than they do on the other divisions?

[fol. 4150] A. Well, it might have, but as I say, I don't know what we did have there. I notice this though, you said the Salt Lake division was lower than the Tucson.

Mr. Strouss: Yes, the Salt Lake division is lower than the Tucson. I found it was in 1926 that was the year I checked, per gross ton-mile; on the train-mile it was higher.

[fol. 4151] Mr. Strouss:

Q. Now, Mr. Sines, on exhibit No. 297, "Estimated Cost of a Terminal at the Arizona-New Mexico State Line," when was it decided to build that terminal?

A. I don't think we would ever build that terminal.

Q. What was the purpose of the exhibit?

A. As I understood it, it was to demonstrate what it would cost us if we were to reduce the extraterritorial effect of this law to a minimum in New Mexico and Texas by building a terminal as close to the Arizona boundary as possible.

The Court: Irrespective of the physical conditions that exist at the state line?

A. Yes, and irrespective of the train operation that would be entailed too.

Mr. Strouss:

Q. Of course it is only about three or three and a half miles from there to Steins which is the summit of the hill?

A. That is right.

Q. That is a pretty crooked territory there, too, isn't it?

A. It has curves.

Q. At Cavot where this terminal would be situated, it is pretty much on a curve?

A. That is right, there is considerable curvature there [fol. 4152] and I would never think of building a yard with that much curvature in it.

Q. A grade of 1.4 per cent?

A. That is right.

Q. It is only 22 miles into Lordsburg from Cavot?

A. That is right.

Mr. Strouss: That is all.

Redirect examination.

Mr. Mason:

Q. Following out the thought of Mr. Strouss, Mr. Sines, it would be perfectly easy to avoid the expense of building

a terminal at Cavot by running short trains into and out of Lordsburg, Wouldn't it?

A. He has limited himself to Lordsburg. We actually have run short trains to El Paso.

Q. The same way that if we wanted to avoid a violation of the law instead of building a terminal at the state line at Yuma, we could run them into and out of Indio, couldn't we?

A. That is right. I think you lawyers express that by saying it is a matter of degree.

Q. As a matter of fact, it is quite impracticable to build a terminal at Cavot in order to avoid the extraterritorial ef-
[fol. 4153] fect, isn't it?

A. Yes, I have said we probably never will build such a terminal.

Q. Insofar as the New Mexico boundary is concerned, it is impracticable, if not impossible, in a railroad sense, in an operating sense to avoid the extraterritorial effect of the law without violating it?

A. That is right.

Q. Just as it is at Yuma, I take it?

A. I would understand that, yes.

Q. Going back to some of your earlier cross-examination, insofar as the showing on exhibit No. 193 is concerned and particularly the showing of gross ton-miles per train-hour, does the relationship of the total number of empties to the total number of cars handled have any effect upon the showing of gross ton-miles, or, to state it another way, do I understand that a gross ton is a gross ton whether it consists entirely of the weight of an empty car or partly the weight of a loaded car and partly of the lading in the car?

A. That is right.

Q. Is your gross ton-mile showing affected either way by the percentage of empty cars to total of cars handled on either division?

[fol. 4154] A. No.

Q. In connection with this exhibit, or at the time you were being questioned in connection with this exhibit, Mr. Strouss suggested that some of your answers indicated that the longer and heavier trains do not or would not be operated as fast as the shorter trains compelled by the Arizona law. Did you intend any such inference by any of your answers?

A. No, you would have to look at the entire picture. With fewer trains and with less interference on the railroad, we will be able to have a better schedule performance than with

more trains and with greater interference. Under the second situation it means longer trains and larger power to handle those trains.

Q. With heavier trains would you use the same or heavier power?

A. We would use the heavier power, the power we have set up here.

Q. Now as to the showing of net tons per train, I think in this connection you were referred to exhibit No. 189 and I believe to some other showing which indicates there is a slight difference in the percentage of empties to total amount of cars handled as between the Tucson and Salt Lake [fol. 4155] divisions. Giving effect to that difference in percentage and giving effect likewise to the difference in loading per car to which your attention was directed from the form 521 which was stated to be higher on the Salt Lake division than on the Tucson division, will the combined effect of those two differences overcome the difference in net tons per train which is shown in the lower half of exhibit No. 193?

A. No, it would not, but I want to explain my answer. Perhaps you missed my answer to Mr. Strouss where I said I couldn't agree with him that that difference of empty cars on exhibit No. 189 would change the net tons per train appreciably, so, confining my answer simply to the difference in average tons per loaded car, the Tucson division showing would only increase by one block, it would still be out-distanced by the Salt Lake division which would be three and a half blocks higher for the year 1939.

Q. What is the primary factor, if you can state, which accounts for the difference between the net tons per train as between the Tucson division and the Salt Lake division as shown on exhibit No. 193?

A. The long trains run on the Salt Lake division and [fol. 4156] short trains compelled by the Arizona 70-car law are the principal factors having to do with the difference in the showing on exhibit No. 193.

Q. It was suggested to you that the Phoenix line was a light traffic line and that that might have some effect upon the Tucson division showing because it is included in this showing of main line. Does the light volume of the total freight traffic on the Phoenix line have any substantial effect here, and if so in what way?

A. Light volume has very little effect. The only thing that can affect these showings is the loading per train. The trains on the Phoenix line are somewhat lighter on the average perhaps than on the main line, but when you add it all up I doubt that you would ever notice it on this exhibit.

Q. Then this is a showing of train loading rather than volume or density of traffic on the main line itself, isn't it?

A. Sure, this is entirely a train loading exhibit. Incidentally, one thing that makes those light trains on the Phoenix line is the Arizona Train Limit Law. There are times when we could exceed the 70-car limit there.

Mr. Strouss: May I ask, do you have records that will give [fol. 4157] that Phoenix operation that we may have to examine?

A. It can be gotten.

Mr. Mason: We put in an exhibit of a redispatching study showing the length of trains on the Phoenix-Tucson run during the month of December, 1938, and as they could be increased if it were not for the law.

A. It would have to be worked up from basic data, that is, the conductors' wheel reports.

Mr. Strouss: What about your train sheets, wouldn't they show that?

A. Well, it would give you an indication but I wouldn't want to make a comparison between train sheet figures and accounting department figures for this item here.

Mr. Mason:

Q. On exhibit No. 198 you were asked about the tonnages of trains and I think you indicated that empty refrigerator cars were considered to have a weight of 53 M's?

A. 52 or 53, yes, something like that.

Q. And loaded cars were computed to have 93 to 95 M's?

A. 90 to 100, depending on the average of the particular train or trains that were being redispatched.

[fol. 4158] Q. I think you were referred to the form 521 for the year 1938 as showing an eastward loading on the Tucson division of 19.8 tons per car as I got the figure. Is that correct?

A. Something like that.

Q. What would 19.8 tons amount to in M's? Would it be approximately 40 M's?

A. Yes.

Q. What would that give as the average weight of the loaded car?

A. Forty and fifty-two would be ninety-two.

Q. You were asked also about variables and your answer was that the variables for the purposes of the redispatching study were computed in proportion as they bore on the actual to the basic amount of wages paid, is that correct, subject to certain constants?

A. May I have the question read?

(The question was read by the reporter.)

Mr. Mason: Perhaps I better withdraw and reframe the question.

Q. You show a certain amount of variable payments on exhibit No. 198 as paid to the train and engine crews on the actual operation?

A. Yes.

Q. For the purpose of the redispatched operation you [fol. 4159] computed the variable wages in a lump sum, didn't you?

A. Yes.

Q. How did you arrive at that lump sum?

A. That is demonstrated on exhibit No. 229 and can be explained by referring to the first three items in column D, the variable payments for actual operation were $1,373.95. The train-miles reduce in that district in the ratio of ninety-four thousand to sixty-eight thousand. I reduced the variable amount, $1,373, by the ratio 94 over 68 and obtained the amount in the redispatch cost line of $1,040.95.

[fol. 4160] Q. Why did you use the ratio of actual train-miles to redispatched train-miles to obtain the amount of the reduction in variable wages in the redispatching study?

A. Because those are items that vary with the number of crews operating, the time that they spend in getting their trains started from terminals and time they spend in tying up in away-from-home terminals, the time they spend away from home, and which is paid for as held-away-from-home-terminal time, if there be any, and over-time, and this method was as accurate as any that could be devised, in my opinion.

Q. Do the amount of train-miles made by train crews measure the opportunity for the occurrence of these services which are paid for by these variable amounts?

A. Yes.

Q. Do you find that in experience by checking days against other days in the actual operation?

A. I don't know that I went that far into it, but it is a fact that if they are not running, they are not going to have any opportunity to get any of these variable payments.

Q. Now, on exhibits 214 and 215, Mr. Strouss suggested that the factor of speed entered into the redispatch showing [fol. 4161] here. In other words, he said, as I recall his question, that each showing in so far as it related to redispatched operation, depended upon the redispatched trains operating with the loads, and making the speeds that were contemplated by the redispatching study. I want to ask you whether train speeds enter at all into the showing on exhibits 214 and 215.

A. There is no showing of speed on either of those exhibits.

Q. He also asked you, I think, in connection with these and other exhibits whether or not your showing for the redispatched operation did not depend upon the AC-8 locomotives performing in accordance with plan. Now, I want to ask you this: In the first place, does the Ac-8 locomotive resemble any other oil-burning type previously installed in service on the Southern Pacific lines?

A. Yes, AC-4's, 5's, 6's and 7's.

Q. How long has the AC-6 been in service?

A. Since 1930.

Q. Has it been in service in territory similar to or more difficult than Arizona?

A. Much more difficult than Arizona. Between Roseville and Sparks.

Q. Has it been used in other territories similar to Arizona [fol. 4162] in a general way?

A. No, not the AC-6's, the AC-6's have been confined to that one territory.

Q. Has the AC-8, since it has been placed in service, been used in territory similar to or more difficult than Arizona?

A. Yes, the AC-8's were used on the Coast lines.

Q. Between what points?

A. Between Los Angeles and San Luis Obispo; they have made a few runs between San Francisco and Bakersfield in passenger service, they have been used quite extensively for freight service between Los Angeles and Yuma.

Q. And between Los Angeles and Bakersfield?

A. Not in freight service, that has been confined to passenger service.

Q. Have the AC-6's been used in freight service between Roseville and Eugene?

A. There have been a few scattering trips up there, but not many.

Q. And the experience of the AC-6 extends over several years, does it?

A. Since 1930.

Q. Does the experience with the AC-4's and 5's extend prior to that?

[fol. 4163] A. Yes, the AC-4's were obtained in 1928 and 1929, and the AC-5's were also obtained in 1929.

Q. Mr. Sines, having that experience in mind, is there anything conjectural about the performance of AC-8's in service in Arizona?

A. No.

Q. Now, going to exhibit 305, because it happens to be the next one concerning which you were questioned, I think your attention was called to the fact that there was a considerable reduction in the branch line mileage in Nevada over the period covered by the exhibit. I want to ask you, in the first place, if a large part of that reduction is not due to the abandonment of narrow-gauge mileage in Nevada?

A. Yes.

Q. Do you recall what the extent of the service on the narrow-gauge was?

A. I think it was tri-weekly, down one day and back the other.

Q. Did that accumulate any substantial amount of train-miles or car-miles as compared with the total of the Salt Lake division?

A. No, that would never be noticeable in any statistics.

Q. Now, some of this other was due to the abandonment [fol. 4164] likewise of the Moundhouse branch?

A. Yes.

Q. Was that likewise a line of infrequent service?

A. Yes; some of that mileage had only on call service, meaning that trains might not go down there for several months.

Q. Would that accumulate train-miles or car-miles to any extent, compared with the total of the division?

A. No.

The Court: We will take our mid-afternoon recess.

(Thereupon, a short recess was taken, after which the witness B. S. Sines was recalled to the stand, and proceedings were resumed as follows:)

Mr. Mason: Mr. Sines, does the abandonment of branch lines of light traffic volume account similarly for the reduction in the branch line mileage in Arizona, as it is indicated over the period shown on Exhibit 305?

A. Yes.

Q. You have participated, have you not, in some of those branch-line abandonment cases?

A. Yes, that is right, many of them.

Q. And whether or not those branch-line operations were [fol. 4165] continued or abandoned, would the effect be substantial upon the ton-mile, train-mile, and car-mile figures, for the state or for the entire division?

A. No, it would have very little effect.

Q. In your cross-examination you were asked to refer to the form 521 figures for 1940 and 1939 having to do with fuel consumption on the Rio Grande division. Now, I will ask you first of all whether those form 521 figures that you read have to do with the division as a whole or with only that part of the division over which the AC-9 locomotives are regularly operated?

A. The figures that I read include the entire Tucson division.

Q. The Rio Grande division, wasn't it?

A. The Rio Grande division.

Q. Would that include the lines west of El Paso as well as the district between El Paso and Tucumcari?

A. Yes, west of El Paso on both lines, Lordsburg to El Paso and Tucson to El Paso.

Q. Now, are the AC-9's regularly operated in freight service west of El Paso?

A. No.

Q. Do the figures which you have read necessarily indi- [fol. 4166] cate the results of the performance of the AC-9's in and of themselves?

A. No.

Q. Do you know, and, if so, will you state whether any special study of the performance of AC-9's in the territory between Lordsburg and El Paso was undertaken?

A. No special study was undertaken, but in connection with some water tests that we were making, we ran two of these big coal burners between El Paso and Lordsburg for a number of trips.

Q. Did you make a study of their fuel consumption on those trips?

A. And that gave me an opportunity to make a comparison between the fuel consumption of those locomotives and the fuel consumption of the locomotives which were operating alongside of them at the same time.

Q. Have you the results of that study here?

A. Yes.

Q. This was a special study of these particular trips, was it?

A. Yes, there were about eighteen round trips that were made by these AC-9's in February, 1940.

Q. What was the fuel consumption per thousand gross ton-miles registered on these trips with the AC-9's, and [fol. 4167] how did it compare with that of the locomotives in regular service in the same territory?

Mr. Strouss: May we have the basic records on that?

Mr. Mason: I think it was a special study.

The Witness: The source records, Mr. Strouss, were the fuel tickets for those nineteen round trips.

Mr. Strouss: Is this a regular operation, a regular train operation?

A. Oh, yes, these locomotives handled trains; the average loading of the AC-9 locomotives eastward and westward was 3,291 tons. The average loading of the F-3's and 4's which were operated at the same time was 2,685 tons. They handled big trains. There was an increase in the load per locomotive of 22.6 per cent, that is, the AC-9's load was 22.6 per cent greater than the F-3's and F-4's.

[fol. 4168] Mr. Mason: Mr. Sines, were the trains longer when handled by the AC-9's on the average than were handled by other locomotives in the same territory at the same time?

A. Yes, in relation to that tonnage. I didn't have the number of cars per train but it would be something in the ratio of 22.6 per cent greater.

The Court: Did I understand you to say these AC locomotives were used in a regular run across the state of Arizona?

A. No, between El Paso and Lordsburg.

Mr. Mason:

Q. On the Rio Grande division?

A. Yes.

Q. But they were handled as regular trains?

A. That is right.

Q. Not special test trains?

A. No.

Q. What were the fuel consumption figures per thousand gross ton-miles for those AC-9's on those trips?

A. The AC-9's consumed fuel at the rate of 109.1 pounds of fuel per thousand gross ton-miles and the F-3's and F-4's which were operating at the same time consumed fuel at the rate of 115.6 pounds of fuel per thousand gross ton-miles. The fuel economy, therefore, was 5.63 per cent.

[fol. 4169] Mr. Strouss: Would you repeat the tonnage?

The Court: The reporter can read it back to you if that will suffice.

Mr. Strouss: It is back a little ways.

The Witness: A 3,291 tons for the AC-9's and 2,685 tons for the F-3's and F-4's.

Mr. Mason:

Q. That was the average train tonnage, not in M's?

A. In tons, this is, yes. In that connection I would like to call attention to exhibit No. 251, my fuel economy exhibit in the territory between Lordsburg and El Paso. I have heretofore testified that Nos. 249, 250, and 251 are exhibits which are all tied in together bearing certain relationships one with the other, and I set them up as best I could so the relationships would be consistent. The fuel economy that I have just testified to during this period in February, 1940, indicates a fuel economy of 5.63 per cent, when the loading increased 22.6 per cent. On exhibit No. 251, as a result of the redispatched study of June and August, 1938, the loading would have increased 25.5 per cent and I claim a fuel saving of 7 per cent, the 7 per cent being comparable to the 5.63 per cent I have spoken of before.

Q. Mr. Strouss also referred in his cross-examination [fol. 4170] of you on the form 521, Rio Grande division, to the reduction in helper service, I think it was from some eight thousand miles to some three thousand miles for the year. Where are helpers employed on the Rio Grande division?

A. Well, you know I couldn't figure out where that might have happened.

Q. Would it be on the Dawson branch perhaps?

A. I don't know. It is a very infrequent operation. It might have been on the branch or it might have been on the main line, I don't know. It only represents for the year 1940 one-sixth of one per cent of the total locomotive-miles.

Q. I seem to recall that between Douglas and Bisbee and Douglas and Bisbee Junction there is sometimes helper service or someone testified that some of those westbound trains have to be helped once in a while?

A. That could happen, I don't know.

Q. Now as to exhibit No. 254 concerning which you were questioned, I understand that these figures are system figures of shop repairs for these various types of locomotives for the ten-year period?

A. That is right.

Q. And include all divisions, the valley divisions and the [fol. 4171] Tucson division and the mountainous divisions and all the others referred to by Mr. Strouss?

A. Yes, the division basis doesn't enter into this exhibit No. 254 at all.

Q. Mr. Strouss also suggested to you I think that locomotive repairs when they were kept by divisions showed a somewhat lower figure per unit locomotive or train-mile. I take it he had in mind on the Tucson division rather than on certain other divisions which he mentioned. If AC-6's or AC-8's were used on the Tucson division, would you expect the repair cost per locomotive-mile to be lower than for the AC-6's and AC-8's used between Roseville and Sparks?

A. Yes.

Q. You spoke also in your cross-examination of having made a study of a certain number of F type locomotives which were used predominantly in mountain service and a certain number of locomotives of the same type which were used predominantly in valley service?

A. Yes, sir.

Q. What period was covered by that?

A. Ten years, 1930 to 1939.

Q. How many locomotives used in mountain service were [fol. 4172] studied?

A. There were eight and fifteen but I can't remember how they were placed, whether it was fifteen in the valley or eight in the valley.

Q. What was the relationship or the difference in the repair rate as between the mountain locomotives and valley locomotives?

A. The valley rate was 11.6 per cent lower than the mountain rate.

Q. That would be in line with the experience suggested by Mr. Strouss on the Tucson division for the year 1926 as compared to some other divisions, would it?

A. Yes.

Mr. Mason: I think that is all.

Mr. Strouss: I have no further questions.

The Court: You may step aside.

Mr. Mason: Subject to the right which we should like to have understood, and I don't suppose there will be any question about it however to meet and reply to any new matter which the State may offer in its case, the defendant rests.

Mr. Strouss: I had intended to state to the Court somewhat at length our position at this time but there are one or two recent cases which I would like to refer to the Court [fol. 4173] and for that reason I would like, if the Court will permit, to file a brief typewritten statement, serving counsel with copies of course, of our legal position so far as the case is concerned and I will do that within the next week.

It is our contention—I will just briefly state the points that we have in mind—so far as this law is concerned, in the field of train length legislation that until Congress has occupied that field the State has the right to enact laws regulating the length of trains; that Congress has not occupied the field, and, therefore, the State had at the time the law was enacted and still has the right to legislate with respect to length of trains.

Third, insofar as the question of the constitutionality of the Act with relation to the Interstate Commerce Commission provisions of the Federal constitution and the fourteenth amendment, if there is any rational basis for the enactment of the law by the State under its police power, it must be sustained as against both objections, that is, that if violates the commerce clause or that it violates the four-

teenth amendment, notwithstanding it may affect or burden interstate commerce.

[fol. 4174] The Court: That is under its police powers?

Mr. Strouss: Yes, under its police powers. That its constitutionality is not to be determined by weighing in the judicial scale the merits of the legislative enactment, but by the determination as to whether or not there is any rational basis to sustain the law, and, fifth, the legislature, the people in this instance since this was a referred measure adopted by the people, is presumed to have acted upon a rational basis in enacting the law and the burden is upon the defendant to prove that the law is without rational basis, without reasonable grounds for its enactment.

Briefly, those are the points upon which we make our contention that the law here is a valid law and properly adopted by the State. There are a number of cases; one case that is clearly recent which states our position I think quite fully is the case of South Carolina State Highway Department against Barnwell Bros. in 303 U. S. at 117.

The Court: You don't have the Law Edition citation?

Mr. Strouss: I don't have the Law Edition. It is 58 Supreme Court, 510. It that case—I am not going to take time now to read at length because as I have asked the [fol. 4175] Court I would like to state our position by written memorandum and in that will include the citation of this case and in doing so I will try to get the Law Edition citation, I think I can do that. This was a case where the constitutionality of a South Carolina law limiting the width and weights of trucks on highways was questioned on the ground that it invaded a field of interstate commerce already occupied by Congress by the enactment of the Federal Motor Carriers Act and that it violated the commerce clause by imposing an undue burden on interstate commerce and violated the fourteenth amendment because it took property without due process of law, so as the Court will see the very points which are involved in the case before this court were before the Supreme Court of the United States in this case of the highway department against Barnwell Bros. and in that case the Court in quite clear language pointed out what is the function of a court in passing upon the constitutionality of a law. That it is not the province of the Court to weigh the policy of the law but to determine solely the question of whether there is a ra-

tional basis for the adoption by the legislature of an enactment of the law. That if there is any rational basis whatsoever, if the matter is debatable, then the constitutionality must be sustained and that the legislature is presumed to have acted upon a rational basis in enacting a law and, unless it is shown to the contrary, the presumption will carry to sustain the constitutionality. I will not go any further with that case because in giving the memorandum I will cite it and probably will quote from it.

[fol. 4176]

The Court: That memorandum will be in the nature of an opening statement of the State's position?

Mr. Strouss: Yes.

The Court: Coupled with what you have stated here today?

Mr. Strouss: Yes.

Mr. Mason: I don't know that it is incumbent upon the defendant to state its position, but I can state it perhaps from memory, without referring to any memorandum.

[fol. 4177]

In the first place, we believe that the regulation of lengths of interstate trains and thus of interstate commerce moving in interstate trains is a field which even without any declaration by Congress belongs to the Federal government exclusively under the Commerce Clause and that the field of regulation into which the Arizona Train Limit Law enters is an exclusive Federal field. We think the decisions of the Supreme Court sustain our position in that regard with respect to this particular character of regulation and the particular subject matter which is regulated. But we say, as a second point, that even if this be a field in which the State is permitted to regulate, that the regulation here undertaken is not merely the incidental regulation of interstate commerce which a state may reasonably undertake or may properly undertake but this is a direct regulation of commerce not merely within the state boundaries but a laying of hands, if you please, upon interstate commerce as it approaches Arizona, while it crosses Arizona, and after it has left Arizona. In other words, that there is a direct and

[fol. 4178]

inescapeable extra-territorial operation of the law which cannot be avoided, physically speaking, in so far as our company is concerned, because it is impossible, or at least wholly impracticable, impossible in a sense of relative expense to construct terminals exactly at the state line

in which the reconsisting of trains may be undertaken. Therefore, the company faces the alternative of either operating its trains into the state under sufferance and there reconsisting them so as to meet the restrictions of the law, as it does at one boundary, or operating its trains to a terminal outside the state and there reconsisting them as it does at the other boundary. In the one case, it faces the peril of a multiplicity of prosecutions. In the other case it submits to the extra-territorial burden for a distance of at least eighteen miles, and in some cases a distance of 164 miles.

Besides the point of regulation, in an exclusive Federal field, a regulation outside the boundaries of Arizona, both of which, of course, are forbidden by the Commerce Clause, we have the point that this is a regulation of commerce within Arizona far beyond the incidental effect and that [fol. 4179] there is likewise an imposition of constant, substantial and continuing burden upon interstate commerce. And we think in that respect the evidence is clear and indisputable that the law imposes delay and interference and imposes very substantial burdens in a financial sense upon the conduct of interstate commerce from, to, within and across Arizona.

Now, if it can be argued that this is a field of regulation into which the State may enter in the absence of regulation by Congress, and I understood that to be the contention of counsel for the State, or in other words, if it be argued that this is a joint field which either may enter and which the State may properly enter in the absence of regulation by Congress, then we ask, what is the field, and the answer must be, and we assume that it is, that this is a regulation by the State in the interests of safety, and particularly, it is an undertaking by the State to regulate trains to those lengths which can safely and adequately be controlled. If that is so, then we point to the fact that the Congress has already entered the field by having legislated as to safety in having passed the Safety Appliance Acts and the safety [fol. 4180] sections of the Interstate Commerce Act and delegated to the Interstate Commerce Commission powers of regulation and enforcement in that field, and the Congress having entered the field of such regulation the State is forbidden to make any regulation in that field because it is elementary that where Congress has entered a particu-

lar field the State can neither supersede nor supplement nor amend a Federal regulation.

Finally, we say that all other considerations apart, this regulation of length of trains can be supported, if at all, purely as a safety measure. It certainly is not supportable on any other ground, and I don't know from my experience in other train limit cases, I don't know of any other excuses being offered for a train limit law, and I don't imagine that counsel for the State intends to offer any other substantial reason for the enactment of this statute. In the preceding cases, certainly no other substantial reason was offered. If this law be considered then as an attempt to regulate in the interests of safety, in the first place it is based upon conditions as they existed in 1912 and previously because it was enacted and approved in 1912, and so far as we know has never been reconsidered. It is elementary again that a [fol. 4181] law which may be reasonable, which might have been reasonable under one set of circumstances may become wholly unreasonable and unjustified as conditions change. We think that we have shown and we think it can hardly be disputed that conditions have very greatly changed in the twenty-nine years since the first enactment of this law, but if it were undertaken to enact this law today it would still be wholly unjustified because experience has demonstrated, we think, beyond the shadow of a doubt that this law is wholly ineffective as a safety measure, that it does not promote the safety of men, or the safety of trains or the safety of passengers, or the safety of anyone; that instead of resulting in increased safety and the reduction of accidents, it greatly contributes to an increase in accidents and casualties and in damage to railroad equipment and property.

We think that the experience of the operations under this law, especially since 1923 when long-train operations were undertaken in other territories and couldn't be undertaken in Arizona as shown, that the 70-car limit or a 14-car limit as the case may be, is productive of increased hazard and whereas in other territories, particularly in one territory [fol. 4182] where substantially similar, or almost identical conditions exist, the casualty rates have been declining and have continued to decline markedly, and the casualty rates in Arizona have declined much less and the law not only does not prevent accidents but it actually contributes to their happening.

So that on all of the grounds which I have recounted, the law must be held unconstitutional as in violation of the Commerce Clause because of its invasion of an exclusive federal field, its inevitable extra-territorial effect, its regulation of commerce within Arizona as well as without, the heavy and disproportionate burdens which it imposes on interstate commerce, its invasion of a field which Congress has itself occupied and therefore occupied to the exclusion of the State and, finally, because if ever it could have been justified, it certainly is not now justified in the light of experience as an appropriate regulation in the interest of safety.

The Court: Mr. Strouss, so there be no misunderstanding when we do reconvene the only matter or matters that you are reserving the right to present further documentary evidence is the introduction of additional certified copies [fol. 4183] of the Interstate Commerce Commission, is that right?

Mr. Strouss: No, these are the ones I was referring to.

The Court: Just what is it that you intend to take up under your right of cross-examination of the defendant's witnesses?

Mr. Strouss: So far as Mr. Sullivan is concerned, I don't remember now that there is anything, I think that was the only thing I had left.

The Court: In other words, you are all through now with your showing on your cross-examination of the defendant's witnesses?

Mr. Strouss: Yes, with the exception that Mr. Sines is to bring in some matter.

The Court: Yes.

Mr. Strouss: But so far as any cross-examination, asking them any questions, I am finished.

The Court: You are through.

Mr. Strouss: Yes.

The Court: The record may show that the hearing in this case will be recessed until Wednesday, April 9th, at ten A. M.

(Thereupon the court stood at recess until April 9, 1941, at ten o'clock A. M.)

[fol. 4184] April 9, 1941 ten o'clock A. M.

All parties being represented at heretofore noted, proceedings were resumed at this time as follows:

The Court: You may proceed.

Mr. Mason: Your Honor, with the concurrence of the opposition, we are going to put on some additional or substitute evidence for the defendant.

The Court: All right.

Mr. Mason: This is in accordance with the agreement just prior to the close of the hearing and some discussions we have had in the meantime with Mr. Strouss. We will call Mr. Sullivan. Your Honor will recall that at the close of the previous sessions, Mr. Sullivan stated that the annual accident bulletin of the Interstate Commerce Commission for the year 1939 had just become available, and it was then proposed to bring down to date so as to include the year 1939 certain exhibits relating to national casualty statistics which included only the year 1938.

The Court: Yes, I recall the agreement.

Mr. Mason: And to substitute those exhibits in the record for the exhibits which included only 1938.

[fol. 4185] John J. Sullivan was recalled to the stand, and testified further as follows:

Redirect examination.

By Mr. Mason:

Q. Have you prepared now, Mr. Sullivan, a series of exhibits which you will identify by number in substitution for those which were previously of record and which included only the year 1938 as to statistics taken from the annual accident bulletins of the Interstate Commerce Commission?

A. I have.

Q. Will you identify those exhibits by number and produce the substitute exhibits?

A. Nos. 262, 263, 264, 265, 266, 267, 268, 269, 272, 273, and No. 293.

Mr. Mason: Your Honor, we ask that the substitute exhibits which have been identified by number and which have been distributed be received in evidence in lieu of the exhibits with the same numbers previously introduced, and that the exhibits with the same numbers be withdrawn and deleted from the records.

The Court: Any objection, Mr. Strouss?

[fol. 4186] Mr. Strouss: I have no objection to the substitution, except that I do want the record to show that any objection that was made to the original exhibits also runs to these substituted exhibits.

The Court: The record may show the State's objection, and that it is overruled and the substitution may now be made.

Mr. Mason: I want to ask you about these exhibits, Mr. Sullivan. Are they identical with the exhibits of the same numbers which have now been withdrawn and for which they are substituted, except for the addition of the year 1939 in each case?

A. Yes, with the further qualification that the total for the last period now includes five years instead of four, and where a grand total is shown there is a corresponding correction, and there has been some change in the figures representing the calculations of decrease one period with another, all of which however result from the inclusion of the statistics for the year 1939.

Q. You have recomputed the totals in each case for a period of five years, 1935 to 1939, instead of a period of [fol. 4187] four years, from 1935 to 1938, have you?

A. That is correct.

Q. And then a grand total for a seventeen-year period, 1923 to 1939, instead of a sixteen-year period, 1923 to 1938?

A. That is correct.

Q. And your comparison of average casualty rates where such comparisons appear are of the two six-year periods ending in 1928 and in 1934 respectively, and the five-year period ending in 1939, instead of two six, and one four-year period?

A. That is right.

The Court: There is no change in the figures for the year 1938 and previous years?

A. None whatever.

Mr. Mason: The exhibits are in the same form as the ones for which they are now substituted?

A. They are.

Q. And present exactly the same corresponding statistics for 1939 as for previous years?

A. That is correct. It should not be overlooked also, that in the course of my testimony in referring to comparison of average casualty rates, I believe in some cases I referred to the item number or line number without any further description, and of course in those cases there has [fol. 4188] been a change in the item or line number resulting from the inclusion of the year 1939.

Q. I take it, then, in that respect, the substituted exhibits would be self-explanatory?

A. That is correct.

Mr. Mason: Do you have any questions, Mr. Strouss, as to the substituted exhibits?

Mr. Strouss: No questions.

Mr. Mason: Your Honor will also recall that on the last day of the preceding session, there were introduced some copies of certain Bureau of Safety investigation reports covering accidents on railroads other than the Southern Pacific, the certified copies having become available only on the last day. They had been referred to previously in Mr. Sullivan's discussion, but had not become available. They were intended for use, I believe, in Mr. Sullivan's cross-examination.

Mr. Strouss: That is correct.

Mr. Mason: And were introduced, I take it, as part of that cross-examination.

Mr. Strouss: Yes, of course, merely for the purpose of having him identify the five accidents as accidents which were included in the exhibit which Mr. Sullivan presented.

Mr. Mason: We have also obtained certified copies which [fol. 4189] were not available at that time, of five accident investigation reports of the Interstate Commerce Commission corresponding to the five investigation reports, although not as to the same accidents, of course, which form Exhibit 311, and since Mr. Sullivan is on the stand and this is the first appropriate time at which they could be introduced, we offer as part of his redirect examination and as responsive to the exhibit 311, which Mr. Strouss introduced, these five copies of the investigation of the five accident reports.

Q. Have you brought those reports, Mr. Sullivan?

A. I have handed them to Mr. Strouss for examination.

Q. Have you spare copies?

A. I have not.

Mr. Strouss: Is there any way of getting these except sending in for them?

A. I have all of them except one on the way? and I think possibly I will be able to obtain extra copies of that.

Mr. Mason: You expect to be able to supply extra copies?

A. Yes.

Mr. Strouss: I have no objection.

[fol. 4190] Mr. Mason: We ask that they be marked for identification as Exhibit No. 312.

The Clerk: Defendant's Exhibit No. 312 for identification.

The Court: There being no objection, they may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 312 in Evidence.")

[fol. 4191] Mr. Mason:

Q. Mr. Sullivan, will you take up in their order the five reports which jointly form exhibit No. 312 and state briefly their numbers and the railroads, dates and locations?

A. Report No. 1935——

Q. By the way, I should ask you this——

Mr. Strouss: Pardon me, what is the number of this exhibit?

Mr. Mason: No. 312.

Q. Do those reports relate to accidents which are included within the scope of your exhibit No. 270?

A. Yes, and one of them is included in No. 271.

Q. That is, exhibit No. 270 is the freight train accident exhibit and No. 271 is the passenger train accident exhibit?

A. That is correct.

Q. Will you proceed as to 1935?

A. Report No. 1935 covers the derailment of a freight train of 66 cars due to the failure of an arch bar truck on the Pennsylvania Railroad at Cly, Pennsylvania, on September 9, 1934, as a result of which the adjacent track was damaged, causing the derailment of a 107-car freight train, the wreckage of this second train striking a passing freight train consisting of 57 cars on a third track.

[fol. 4192] Reports Nos. 1975 and 1976 cover two accidents on the Chicago, Rock Island & Pacific Railway, one at

Tiffin, Iowa, and one at Ottawa, Illinois, both on April 4, 1935. The train involved in the accident at Tiffin consisted of 18 cars and when it derailed due to a broken arch bar truck it struck another freight train standing on the siding and derailed and damaged the equipment in that train. The accident at Ottawa involved a freight train of 27 cars which was due to the collapse of the side frame of an arch bar truck, the wreckage following an adjacent track and was struck by a freight train of 53 cars moving in the opposite direction on the adjacent track.

Report No. 2050 covered the derailment of a freight train of 39 cars on the Chicago, Rock Island & Pacific Railway near La Salle, Illinois, March 3, 1936, due to the condition of the fourteenth car in the train which permitted the greater weight to be carried on the right side and allowed an excessive rocking motion of the car when aggravated by track conditions, the wreckage following an adjacent track and being struck by a freight train of 57 cars traveling in the opposite direction on an adjacent track.

[fol. 4193] Report No. 2069 covers an accident of a 57-car freight train which occurred on the Southern Railway near Efland, North Carolina, June 11, 1936, caused by a run-in of slack.

Report No. 2430 covers the derailment of a passenger train consisting of 8 cars due to excessive speed on a sharp curve on the Baltimore & Ohio Railroad near Clarion Junction, Pennsylvania, on June 5, 1940, the derailment being followed by a side collision with a freight train consisting of 59 cars moving in the opposite direction on an adjacent track.

Mr. Mason: That is all for Mr. Sullivan.

Mr. Strouss: I would like a chance to read these reports before I release him.

The Court: The Court will grant you that right, Mr. Strouss.

Mr. Strouss: There are one or two questions I would like to ask now and it might be I will have further questions.

[fol. 4194] Recross-examination.

By Mr. Strouss:

Q. These are accidents which were included in the exhibit made from the abstract of reports of the investigation of the Interstate Commerce Commission?

A. Yes, they were made from what are described as the Quarterly Summaries of the Interstate Commerce Commission.

Q. Quarterly abstract of the summaries?

A. I don't recall the reference to any abstract. It is referred to as the Quarterly Summary.

Q. These are the complete reports as made by the investigator?

A. There is this distinction, the reports that I have just referred to in the record are the reports of the Director of Safety to the Interstate Commerce Commission. Exhibits Nos. 270 and 271 previously introduced were compiled from the quarterly summaries of the investigation of accidents by the Interstate Commerce Commission as a body. The summaries, of course, are prepared from the individual accident reports.

Q. They are summaries of the Director's reports, are they not?

[fol. 4195] A. Yes.

Q. And these are the complete reports?

A. They are the complete reports of the Director of Safety, not the complete reports of the Interstate Commerce Commission.

Q. They are the complete reports of the Director of Safety, are they not?

A. That is correct.

Q. And the reports which you have and from which your exhibit is made is a summary of these reports?

A. I think it can properly be described as that. That is not the title, however, of the Interstate Commerce Commission publication from which I prepared exhibits Nos. 270 and 271.

Mr. Strouss: That is all.

Redirect examination.

By Mr. Mason:

Q. Exhibit No. 270 is prepared from documents issued by the Commission itself in print, is it not, over the seal of the Commission?

A. That is correct.

Mr. Strouss: These reports here are also issued by the Commission itself over its seal, are they not?

[fol. 4196] A. They are at the present time, within the last year, but previously they were not. I have noticed in some of the reports received during the past few months that they are now issued over the seal of the Commission but that was not the procedure previously.

Mr. Mason: Subject to Mr. Sullivan being recalled for further questioning after Mr. Strouss has examined those, that is all we have at this time.

The Court: You may step aside.

(Witness excused.)

Mr. Mason: Your Honor, Mr. Strouss prior to the adjournment asked us to supply certain information and there was also some few incidental omissions which we should like to supply by recalling Mr. Sines at this time. I may say that the testimony which we are now to introduce through Mr. Sines has been submitted in outline form to Mr. Strouss previously. That is correct, isn't it, Mr. Strouss?

Mr. Strouss: Yes.

[fol. 4197] B. S. Sixes was recalled as a witness in behalf of the defendant and having been previously sworn testified further as follows:

Redirect examination.

By Mr. Mason:

Q. Will you refer to your exhibit No. 194, Mr. Sines? I believe you were requested, either off the record or during the course of your cross-examination by Mr. Strouss to prepare a supplementary exhibit or furnish supplementary information which would show the classes and numbers of employees of the Tucson division for each of the calendar years 1930 to 1940, inclusive, covering only those employees classed in the transportation division?

A. That is right.

Q. Have you prepared such an exhibit?

A. I have.

Mr. Mason: We ask that this statement which has just been distributed be marked "Exhibit No. 313" for identification.

The Court: It may be marked for identification.

The Clerk: Defendant's exhibit No. 313 for identification.

[fol. 4198] Mr. Mason:

Q. Was exhibit No. 313 for identification prepared by you or at your direction, Mr. Sines?

A. It was prepared at my direction.

Q. From what sources?

A. From our accounting department copies of I. C. C. Wage Statistics, Forms A and B, "Monthly Report of Employees, Service, and Compensation." The reports themselves are monthly reports and in order to comply with the annual figure we added the sums of the twelve monthly reports and divided by twelve to get the average annual figure.

Q. This exhibit, I take it, was prepared in the same manner as exhibit No. 194 but is restricted to the particular classes of employees which are shown in lines 20 to 38 of that exhibit?

A. That is right, in accordance with Mr. Strouss's request.

Q. Has the exhibit been checked and compared?

A. It has.

Q. Will you say whether or not it is true and correct?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

[fol. 4199] Mr. Strouss: No, I have no questions.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 313.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 313.")

Mr. Mason:

Q. Mr. Sines, I believe you were also requested by Mr. Strouss to obtain and furnish in exhibit form information as to the freight tonnage ratings of Santa Fe locomotives over those portions of its line between Needles, California, and Clovis, New Mexico?

A. That is right.

Q. Have you obtained the information as to such tonnage ratings?

A. I have.

Q. And compiled then in the form of an exhibit?
A. Yes.
Q. Is that statement now before you?
A. Yes.
Q. Entitled, "Freight Tonnage Ratings of Locomotives between Needles, California, and Clovis, New Mexico"?
A. That is right.

Mr. Mason: We ask that this statement be marked "De-
[fol. 4200] fendant's Exhibit No. 314" for identification.
The Court: It may be marked.
The Clerk: Defendant's Exhibit No. 314 for identification.

Mr. Mason:

Q. From what sources did you obtain this information?
A. This information was obtained as a result of correspondence between myself and Mr. Mahoney and the two assistant general managers of the Santa Fe in whose districts these locomotives operate. Mr. Strouss and I agreed that we could handle this in this manner rather than calling a Santa Fe witness back to identify and testify as to accuracy.

Q. I take it, then, we will have no objection on the ground of hearsay?
Mr. Strouss: No.

Mr. Mason:

Q. Is this exhibit No. 314 for identification an accurate reproduction of the information furnished you by the Santa Fe officials?
A. Yes, sir.
Q. I notice on the line "Gonzales to Winslow" and likewise on the line "Riordan to Winslow" you show under
[fol. 4201] tonnage rating "CL." What does that mean?
A. Those districts are in Arizona and are also on sections of railroad where the gradient is descending in the direction indicated and the number of cars permitted by the Arizona car limit controls the tonnage ratings of the engine.
Q. I notice that Gonzales is actually in New Mexico. Is that approximately the Continental Divide?
A. It is the summit on that part of the railroad. I suppose it could be the Continental Divide.

Q. Other than on those two lines, the ratings are shown in tons rather than in M's as in the case on the Southern Pacific, is that correct?

A. Yes, sir.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 314.

Mr. Strouss: I have no objection but I would like to ask a question or two.

The Court: The exhibit may be introduced in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 314.")

[fol. 4202] Mr. Strouss: When you say that the tonnage rating between Riordan and Winslow is the car limit, of course, if you had an engine on an ascending grade where the tonnage rating was such that the number of cars to make up that tonnage would exceed the car limit, you wouldn't say the car limit controlled the tonnage rating of that engine, would you?

A. No, but this is all descending grade, in accordance with my understanding of the Santa Fe profile that is in evidence.

Q. But I notice that you bring in the car limit law as rating the engine, which really isn't the fact, the train-limit law has nothing to do with the rating of an engine, does it?

A. On any ascending grade, it doesn't, no.

Q. Well, it doesn't on a descending grade; it may limit the number of cars you can pull, but it doesn't have anything to do with the tonnage rating of the engine, does it?

A. I don't think you could properly say that engines are rated down hill.

Mr. Mason: I think we can both agree, Mr. Strouss, that the train limit law is based upon the number of cars and has nothing to do with the tonnage rating of the engine.

[fol. 4203] Mr. Strouss: That why I couldn't understand about that in this exhibit.

Mr. Mason: Mr. Sines, isn't this the way it is furnished to you and isn't this the way it is published by the Santa Fe?

A. I don't know whether they publish it or not; this is the way they gave it to me.

Mr. Strouss: That is all.

Mr. Mason: Now, Mr. Sines, have you before you a statement in one sheet entitled, "Redispatch Study—Locomotive Mileage, Yuma, Arizona to El Paso, Texas, for Period June and August, 1938?"

I have.

Mr. Mason: May we have this statement marked Defendant's Exhibit 315 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 315 for identification.

Mr. Mason: Did you prepare this statement, Mr. Sines?

A. It was prepared under my direction and supervision, and has been checked by me.

Q. From what sources has it been prepared?

A. From the actual and the redispatch train sheets in the first instance, and checked against the white work sheet A in the second instance.

[fol. 4204] Is it related to or does it correspond to any exhibit based upon the redispatching study previously in evidence?

A. Yes, it is related to Exhibit No. 226.

Q. Exhibit No. 226 shows the total locomotive miles in Column D, both actual and redispatch, for the period June and August, 1938, for the districts between Yuma and El Paso, excluding the Phoenix line. Now, does this relate to the same territory and the same locomotive-miles?

A. Yes.

Q. I take it then that this is simply a break-down of the locomotive-miles as to classes of locomotives?

A. That is right. The figures in line 11 of Exhibit 315 will be found in Section 11 of Exhibit 226 in Column D.

Q. And the figure in line 13, is that found also on Exhibit 226?

A. In Section 13.

Q. Is this exhibit a true and correct reflection of the underlying sources that you have mentioned?

A. It is.

Mr. Mason: Any questions, Mr. Strouss?

Mr. Strouss: The figures shown in column C, your redis-[fol. 4205] patch locomotive-miles, of course, those figures

depend upon your redispatch working out the way that you assume that it will, your assumed operation?

A. That is right.

Q. And the same would be true of the savings which you show in line 12, that if your assumed operation doesn't work out as assumed, why, that figure wouldn't be what you have there; isn't that true?

A. That is right. I want to make this plain, too. When I answer that way, that if the redispatching fails to work out in exactly the same manner as our study did, of course, those figures would be changed, but only to the degree that it did fail to achieve the results of our study.

Q. But to that degree it would be changed?

A. Yes, and furthermore, as far as I am concerned, I cannot say whether the savings would be greater or less. I think this is a good figure.

Mr. Mason: Have you any further questions?

Mr. Strouss: No.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit No. 315.

Mr. Strouss: Objected to as irrelevant and immaterial, and purely speculative.

[fol. 4206] The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 315.")

Mr. Mason: Have you a statement, Mr. Sines, similar in form to No. 315, but relating to the period April 4th to April 30th, 1940, actual operations, compared to redispatched operation, with no restriction and using A. C. power and long sidings?

A. I have.

Mr. Mason: We ask that this statement be marked "Defendant's Exhibit No. 316 for Identification."

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 316, for identification.

Mr. Mason: Will you refer to a prior exhibit, Mr. Sines, and state whether or not Exhibit No. 316 corresponds to it?

A. Yes, Exhibit 316 contains figures the same as those appearing on Exhibit 242.

Q. What do you undertake to show with respect to the figures which appear on Exhibit 242 by the showing on Exhibit 316 for identification?

A. The total locomotive-miles in column D, Section 11, [fol. 4207] of Exhibit 242, are broken down by classes of locomotives on Exhibit 316.

Q. From what sources did you obtain the breakdown on Exhibit 316?

A. From the actual and redispatch train sheets and the white work sheet A.

Q. Was this Exhibit 316 prepared in the same manner and along the same lines as No. 315?

A. It was.

Q. And is based upon the April 1940 redispatching study?

A. Yes.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: Questions which I asked you concerning Exhibit 315 if applied to Exhibit 316, column C and line 11, your answer would be the same if those questions were applied to this exhibit?

A. Yes.

Mr. Mason: Have you any other comments before the exhibit is offered, Mr. Sines?

A. No.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit No. 316.

Mr. Strouss: Objected to as irrelevant and immaterial, and speculative.

[fol. 4208] The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 316.")

Mr. Strouss: May I ask just one question concerning Exhibit No. 315?

Q. In line 13, the ratio of 17.89 per cent to 100, what is that taken from?

A. That will be found on the bottom of Exhibit No. 229.

Mr. Mason: There may be other places in which the development of that ratio appears, but that happens to be one.

Mr. Strouss: I thought it should be connected up.

Mr. Mason: Yes, it should be.

Q. The ratio was predicated, as I read Exhibit 229, upon the relationship between the total traffic expressed in gross ton-miles handled during the two months of June and August, 1938, and the total handled in the year 1938 over the lines covered by the exhibit?

A. That is right.

Q. Now, turning to a statement which has been circulated, Mr. Sines, have you before you a statement in one sheet entitled, "Redispatch Study.—Locomotive Shop [fol. 4209] Repairs, Yuma, Arizona, to El Paso, Texas, for Period June and August, 1938?"

A. I have.

Q. Was this prepared under your supervision, or by you personally?

A. This was prepared by me personally.

Mr. Mason: May we have this statement marked No. 317 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 317 for identification.

Mr. Mason: From what sources was No. 317 prepared, Mr. Sines?

A. The figures in columns B and E are taken from Exhibit 315, and the figures in columns C and F are taken from Exhibit 254, except as to the figure in column F, line 10, which is the result of the computation indicated at the bottom of the sheet in Exhibit 317.

Q. Now, you show a basic figure in the computation at the foot of the sheet. Does that figure appear on Exhibit 254 as that exhibit was corrected during the course of its introduction?

A. Yes, that is an addition that I made to 254.

[fol. 4210] Q. Appearing as line 8 on the exhibit?

A. That is right.

Q. As expanded in the course of its introduction?

A. That is right. The next ratio on Exhibit 317—

Q. Appearing in the computation at the foot of the sheet?

A. Yes,—is weight ratio of the two locomotives, the upper one being for the AC-8, the upper figure being the

weight of the AC-8, and the lower figure being the weight of the AC-6.

Q. In thousands of pounds on drivers?

A. Yes—pardon me, in tons of total weight of locomotive.

Q. Now, what is the source of the factor contained in the parentheses?

A. That is the relationship to which I testified on the last day of the hearing before our last adjournment, and in which I explained that locomotives in valley service, the locomotives which I had studied which were in valley service accumulated repair rates, which were 11.6 per cent lower than similar locomotives which had been in mountain service.

Q. Now, I take it that the summations which are found [fol. 4211] in line 11 are of the preceding figures which appear in the lines above?

A. They are.

Q. And the figure in line 12 is obtained in what way?

A. Subtracting the figure in column G, line 11, from the figure in column D, line 11.

Q. And the figure in line 13, column G, is obtained how?

A. Is made in the manner indicated by expanding 17.89 per cent to 100 per cent.

Q. In the same fashion as on other exhibits where the factor or ratio 17.89 per cent has ben used as explained by you previously?

A. That is right.

Q. Have you used any sources other than exhibits and testimony already of record in the preparation of this No. 317?

A. No.

Q. Is the exhibit true and correct?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: This is based, I take it, on the locomotive-miles savings as shown on the previous exhibits?

[fol. 4212] A. Yes, the previous exhibit 315.

Q. Exhibits 315 and 316, do they include helper locomotive-miles as well as principal engine miles?

A. Yes.

Q. Where there are double-headers, it would include the locomotive-miles of both engines?

A. That is right, all the locomotives in main line freight service for the periods stated.

Q. It wouldn't include switch engines, however?

A. No.

Q. It would include road engines doing switching work while out on the road?

A. Yes.

Mr. Strouss: That is all.

Mr. Mason: Would it include all light engine-miles as well?

A. Yes.

Mr. Mason: We offer the exhibit in evidence as Defendant's Exhibit No. 317.

Mr. Strouss: Same objections as to the two previous exhibits.

The Court: The objections are overruled. It may be admitted.

(Thereupon, the document referred to was received in [fol. 4213] evidence and marked "Defendant's Exhibit No. 317.")

Mr. Mason: Mr. Sines, there is one feature of this exhibit perhaps you didn't mention, in the title you show the words "Locomotives shop repairs."

A. That is right.

Q. Does this exhibit purport to cover the cost or saving in cost as to all classes of locomotive repairs?

A. No.

Q. I will ask you to refer, if you will, please, to Exhibit No. 257.

A. Yes.

Q. Now, having in mind the title of this exhibit "Locomotives shop repairs," will you explain the significance of that feature of the title in that feature of the showing on Exhibit No. 317, having before you Exhibit 257 as well.

A. We are able to accumulate for individual classes of locomotives only the shop repair costs. There are other locomotive repair costs called "running repairs," which we do not allocate to individual types of locomotives, but

which is dependent upon the service the locomotive is in, and when comparing types of locomotives, should compare the relationship and size and weight and power of the locomotives. Exhibit 257 indicates what the relation has been [fol. 4214] between shop repairs and total locomotive repairs.

Q. Do you undertake, on exhibit No. 317, to make any showing at all of running repairs for these locomotives?

A. No, but the next logical step beyond Exhibit 317 is to expand the figure in line 13 by 55.5 per cent to see what the total of both running and shop repairs would be.

Q. You say expanded by 55.5 per cent, how would that be done?

A. By dividing the figure in line 13, column G, by 55.5 per cent to find out what 100 per cent or all the locomotive repairs would be.

The Court: We will take our mid-morning recess.

(Thereupon, a short recess was taken, after which the witness was recalled to the stand, and proceedings were resumed as follows:)

[fol. 4215] Mr. Mason:

Q. Mr. Sines, have you a statement similar in form to No. 317 bearing the title, "Redispatch Study, Locomotive Shop Repairs, Yuma, Arizona, to El Paso, Texas, for period April 4th to April 30th, 1940"?

A. Yes.

Q. "Actual Operation Compared with Redispatched Operation with No Restriction and Using AC Power and Long Sidings"?

A. Yes.

Q. Was this prepared in fashion similar to exhibit No. 317?

A. The same.

Q. What sources were employed in its preparation?

A. The figures in columns B and E are taken from exhibit No. 316. The figures in columns C and F come from exhibit No. 254 and the computation made at the foot of exhibit No. 317 and columns D and G are computations of the preceding two columns.

Mr. Mason: Your Honor, before we discuss the exhibit further, I neglected to have it marked. May it now be

marked for identification as defendant's exhibit No. 318?

The Court: It may be marked.

[fol. 4216] The Clerk: Defendant's exhibit No. 318 for identification.

Mr. Mason:

Q. Now as to the derivation of the figure in line 9, column F, is that the same figure already explained in connection with exhibit No. 317?

A. It is.

Q. Otherwise do the comments already made in connection with exhibit No. 317 apply equally to exhibit No. 318 for identification?

A. That is right.

Q. Is the exhibit true and correct as a reflection of the underlying sources which you mentioned?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 318.

Mr. Strouss: The same objections.

The Court: The objections are overruled, it may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 318.")

Mr. Mason:

Q. Mr. Sines, does exhibit No. 318 bear any relation, and [fol. 4217] if so what relation, to exhibit No. 255?

A. Its indication is the same as the indication on exhibit No. 255. Exhibit No. 255 shows the saving in locomotive shop repairs which were made during the period April 4th to April 30th when long freight trains were run in Arizona and adjacent territory. Then exhibit No. 318 indicates the additional savings in shop repairs which were available if we had run longer freight trains and if we had used the large AC power and had extended the sidings.

Q. Can you obtain from exhibits Nos. 318 and 255 any idea of the saving in shop repairs as between short train

operation under the law and long train operation with long sidings and AC power?

A. Yes, adding the figures together.

Q. Adding the figure in line 10 of exhibit No. 255 and line 11 of exhibit No. 318?

A. That is right, it will give an indication of the savings which are available by adoption of long train operation.

Q. Referring to exhibit No. 255, I notice that the title reads, "Locomotive Repairs." Is that title precisely accurate?

A. No, the word "shop" should be inserted to read "Loco-[fol. 4218] motive Shop Repairs."

Mr. Mason: If there is no objection, we should like to have the record copies changed accordingly and ask also that counsel change their copies so as to insert the word "shop" after the word "locomotive" and before the word "repairs" in the first line of the title.

The Court: The correction may be made.

Mr. Mason:

Q. Is there any other comment on exhibit No. 318?

A. No other comment.

Q. Mr. Sines, will you refer, please, to exhibit No. 220, an enlarged copy of which appears on the easel showing train movements between Yuma and El Paso on June 18, 1938?

A. Yes.

Q. You will recall in your cross-examination it was suggested that the chart was possibly in error in its indication of certain train meets at Wellton made by train No. 6?

A. That is right.

Q. Have you made a check of the chart and of the actual train sheet for that day?

A. I have.

Q. Will you say whether or not the showing of two train meets by No. 6 and the two passing freight trains at Wellton [fol. 4219] at approximately five-thirty on June 18, 1938, is correct or whether there should be a different showing on the exhibit?

A. The exhibit is incorrect in showing two meets; there should only be one meet shown.

Q. That is on the actual, is it?

A. Yes.

Q. And the figure "2" then which appears in the line opposite Wellton and Asher for train No. 6 and the westward freight trains should be deleted, is that correct?

A. That is right.

Q. What change, if any, does that make in the summation which appears at the foot of exhibit No. 220?

A. That would reduce the total 254 to 253.

Q. Would it reduce the total 232?

A. Yes, that would be 231.

Q. Calling your attention to exhibit No. 298, did you in compiling exhibit No. 298 rely upon exhibit No. 220 to plot any of the points in the chart on sheet No. 2?

A. I did. On sheet 2 there is indicated the number of meets and passes which occurred in actual operation on June 18th directly beneath the title.

[fol. 4220] Q. It shows the figure "254" there?

A. The figure 254 would become 253.

Q. You show upon the plot on June 18th a dot within a circle. Did you move that point?

A. Yes, that goes down one unit or half a square on this particular scale.

Q. Does that have any effect upon your equation or formula that you show opposite the curve line on sheet 2?

A. No, the effect of this change on the equation and the location of the line on the chart is inappreciable. I computed it to see exactly what difference there would be and found that I couldn't compute any difference practically because it only would reduce meets and passes that you read off the chart by one-tenth and in reading the meets and passes in columns E and I on the sheet No. 1 of exhibit No. 298 we read it to the nearest even number.

Q. Would you compute the difference then of your figures in columns E and I by reason of this change?

A. No.

Mr. Strouss: Did your rule fail you this time?

A. No, it was beyond the reach of my slide rule.

[fol. 4221] Mr. Mason:

Q. I think the question was asked you as to the segregation of service as between main and branch lines within the two states of Arizona and Nevada. Have you made a study of the records to enable you to give that segregation?

A. I have had figures compiled which will segregate train-miles and car-miles between main and branch line service for the states of Nevada and Arizona.

Q. For what year?

A. For the year 1940.

Mr. Mason: Those are figures for which you asked, Mr. Strouss?

Mr. Strouss: I didn't remember, Mr. Sines was in error on his page I think.

A. I gave a page reference in this memorandum which is incorrect. I am not sure that Mr. Strouss asked for that specifically but it came up as a result of my cross-examination and on my cross-examination, as I recall, I read the segregation for the Salt Lake and Tucson divisions but we wanted to bring it within state boundaries and I said I would undertake to get those figures. The train-miles for Nevada, main line, in 1940 were 1,952,586; branch lines, 93,508. The car-miles for Nevada, main line, were 163,430,040 and branch [fol. 4222] lines were 1,051,932. The train-miles for Arizona for 1940, main line, were 2,539,843; branch lines, 230,548. Car-miles, Arizona main line, were 150,439,093 and branch line 5,472,113.

Mr. Mason:

Q. I think some reference was made in certain of your exhibits to a change in division limits which occurred on the Tucson division in July, 1930. Will you describe just what changes were made in division limits at that time and how the divisions in Arizona were affected?

A. Prior to July, 1930, we operated three divisions east of Yuma, Arizona. The New Mexico divisions extended from El Paso east to Tucumcari; the Rio Grande division extended from Tucson to El Paso via both north and south lines and the Tucson division extended from Yuma, Arizona, to Tucson, Arizona. In July, 1930, we consolidated the New Mexico division with the Rio Grande division and gave to the Tucson division that part of the Rio Grande division which extended from Tucson to Lordsburg. The limits between the Tucson and Rio Grande divisions are now located at milepost 1145 on the north line approximately three miles west of Lordsburg and at milepost 997 on the south line approximately fourteen miles east of Tucson.

Q. Between Tucson and Mescal there are presently alter-[fol. 4223] nate tracks, are there not, one eastward and the other westward?

A. Yes.

Q. To what divisions do those belong?

A. The westward track belongs to the Rio Grande division and the eastward track belongs to the Tucson division.

Q. Does the westward track belong to the Rio Grande division all the way into Tucson or only as far west as milepost 997?

A. Only as far west as milepost 997.

Q. I think also there is some question in the record as to the runs of passenger train crews in the territory between Los Angeles and El Paso. Will you explain what the limits of the runs of the passenger train crews are?

A. Yes. Passenger train crews, meaning conductors, brakemen, flagmen, and baggagemen, operate from Los Angeles to Yuma, from Yuma to Tucson via both Gila and Phoenix and from Tucson to El Paso via both Lordsburg and Douglas. The engine crews, consisting of engineers and firemen, operate over the same districts with the exception of the two districts east of Tucson where both the engineer and fireman change at Lordsburg and Douglas.

[fol. 4224] Q. As to freight train crews, what are the freight terminals between Los Angeles and El Paso?

A. The freight terminals are Los Angeles, Indio, Yuma, Gila, Phoenix, Tucson, Lordsburg, Douglas, and El Paso.

Q. Do both trainmen and enginemen on freight trains change at those points?

A. They do.

Q. Will you refer to your exhibit No. 226 and also to exhibit No. 236 and No. 242. I think it was stated generally in the course of your testimony in the redispatch study, and this would apply likewise to the testimony of the dispatchers that the same trains were handled in the redispatch as were handled in the actual?

A. Yes.

Q. For example, on sheet 2 of exhibit No. 226 in note No. 1 you refer to a decrease of 612 engine water cars. Will you explain that? Did you in the redispatch study eliminate the use of the auxiliary water-carrying car which is used in short train operation?

A. Yes, we did that because the tender of the AC-8 locomotive is so much larger than the tender of the locomo-

tives now in service that it made it unnecessary to haul the [fol. 4225] water cars. Our statement as to having handled the same business on the redispatch as was handled in actual operation was true generally as you said with respect to commercial business and company freight.

Q. And including empties?

A. Including the movement of empty cars. There was just this one detail that I thought should be explained.

[fol. 4226] Q. Does a similar explanation apply to certain eliminations of water, engine water cars, that is, the auxiliary water tender on Exhibits 236 and 242?

A. That is right.

Q. I think the record is fairly clear as to the extent of helper districts in the affected territory between El Paso and Los Angeles, but I am not sure that it shows those helper districts west of Yuma. Are there helper districts on the Los Angeles division between Los Angeles and Yuma?

A. Yes.

Q. And where?

A. Eastward the helper district is from Colton to Beaumont, and westward from Indio to Beaumont.

Q. Are those freight helper districts?

A. Yes, and when the passenger trains exceed certain limits, they are also passenger helper districts.

Q. I think it has been testified that the locomotives now in use in Arizona have been or presently are in use in Nevada. Can you say whether or not locomotives now in use in Arizona both east and west of Tucson are also in use in California, and if so, where?

A. That is right. Thinking of the locomotives as classes, [fol. 4227] the locomotives in service on the Tucson division will also be found on the Los Angeles Division with the exception of the F type locomotives, and they are in service on other California divisions, such as the Coast division, Western division, Sacramento division.

Q. And the San Joaquin division?

A. No, there are no F type locomotives presently assigned to the San Joaquin.

Q. Are the S. P. type locomotives in service on California divisions?

A. They are, particularly the Los Angeles division.

Mr. Mason: That is all.

Recross-examination.

By Mr. Strouss:

Q. You say that those helper districts in California are helper districts for passenger trains when they exceed a certain limit. What is that limit?

A. It is ten or eleven cars, ten with some trains, and eleven with other trains.

Mr. Strouss: That is all.

Mr. Mason: I want to say, Mr. Strouss, we appreciate your courtesy in permitting us to put in this supplemental [fol. 4228] information. Some of it was, I think, in answer to your suggestions, but other of it was not.

Mr. Strouss: Mr. Sullivan has given me copies of the exhibits which were introduced.

Mr. Mason: Oh, yes.

Mr. Strouss: I will try to look those over during the noon hour.

The Court: Do I understand, then, Mr. Mason, that the defendant now rests in this case?

Mr. Mason: Yes, the defendant rests.

[fol. 4229] Rebuttal

Mr. Strouss: May this be marked for identification? It is a book entitled "Southern Pacific Company, Pacific Lines, Airbrake Rules and Regulations."

The Court: It may be marked.

The Clerk: Plaintiff's Exhibit No. 319 for identification.

Mr. Strouss: Now, I have a book bearing the title, "Southern Pacific Company, Pacific Lines, Rules and Regulations of the Transportation Department, June 15, 1930." May that be marked for identification?

The Court: It may be marked.

The Clerk: Plaintiff's Exhibit No. 320 for identification.

Mr. Strouss: Now, I understand from Counsel, that counsel for the defendant will stipulate that these are the rules of the Southern Pacific Company in effect at the present time. They were given to me by Mr. Sines.

The Court: I take it, Mr. Strouss, that while you are having them marked and will offer in evidence the entire book or pamphlet of the rules, it is understood that only such as you or opposing counsel see fit to refer to will be-[fol. 4230] come part of the record?

Mr. Strouss: That I intended to suggest when I made the offer.

Mr. Mason: I think the books which have been marked for identification, Plaintiff's Exhibits 319 and 320, are the current issues of the books, 319 being the Airbrake rules and regulations, and 320 the rules and regulations of the Transportation Department effective, as to the Airbrake book, on February 1, 1939, and as to the Transportation rules and regulations, on June 15, 1930. The latter have been amended, and the amendments are apparently pasted in in the proper places.

Mr. Strouss: In order to be sure that we have these, I will call Mr. Sines as a witness; if there is any question about that, I want to know what I am offering.

The Court: I understood Mr. Mason to admit that they were.

Mr. Mason: I said that I thought they were. I have no other information than that about them.

The Court: Mr. Sines, those books are full and complete, and contain the rules now effective on the defendant's railroad?

A. (By Mr. Sines) That is my understanding; they were [fol. 4231] given me by our local people here in Tucson. I can't testify about the rules or anything like that.

The Court: The Court will assume, Mr. Strouss, that those are the full and complete rules.

Mr. Strouss: They were given me under the request that they produce the rules. I will offer in evidence Plaintiff's Exhibit No. 319 for identification, with the suggestion, as the Court has suggested, that whatever parts of the exhibit are desired to be used be indicated.

The Court: No objection, I assume.

Mr. Mason: No objection.

The Court: It may be admitted in evidence.

(The document referred to was received in evidence and marked, "Plaintiff's Exhibit No. 319.")

Mr. Strouss: I offer Plaintiff's Exhibit No. 320 for identification.

The Court: It also may be received in evidence.

(The document referred to was received in evidence and marked, "Plaintiff's Exhibit No. 320.")

The Court: The court will be at recess until two o'clock.

(Thereupon, the court stood at recess until two o'clock P. M. this day.)

[fol. 4232] April 9, 1941, Two O'Clock P. M.

Proceedings were resumed at this time as follows

The Court: You may proceed, Mr. Strouss, with the rebuttal.

TRACE H. COOPER was called as a witness on behalf of plaintiff, and being first duly sworn testified as follows.

Direct examination.

By Mr. Strouss:

Q. State your name, Mr. Cooper.

A. Trace H. Cooper.

Q. Where do you live, Mr. Cooper?

A. Needles, California.

Q. What is your business?

A. Locomotive engineer.

Q. Will you please tell the Court your experience in railroading?

A. I have been on an engine now for some thirty-seven years, thirty-one of it on the Santa Fe at Needles as fireman and engineer. Prior to that, some four years with the B & O, S. W. in Indiana, and a couple of years on the L. & N. in Kentucky.

[fol. 4233] Q. How long have you been an engineer?

A. Since August, 1916.

Q. And all of that time has been with the Santa Fe?

A. Yes, sir, continuously.

Q. You were fireman on the Santa Fe prior to that?

A. From November, 1909, to August, 1916, as a fireman.

Q. What type of service have you run in, passenger or freight?

A. Freight service, mostly.

Q. Have you been in passenger service at all?

A. Oh, I have handled some passenger trains, but I have never had a regular assignment in passenger service.

Q. What territory have you worked?

A. Over the entire Arizona division, that is, from Seligman, Arizona, to Bakersfield, California, and down to Parker, Arizona.

Q. Down to Parker?

A. Arizona, yes, sir.

Q. You have, as an engineer, operated trains over all of that territory?

A. Yes, sir.

Q. What territory are you working in now?

[fol. 4234] A. I am working on the second district of the Arizona division; that is between Needles, California and Barstow, California.

Q. Have you an assigned run there?

A. A freight run, cut-out pool freight run.

Q. What length trains are you handling as an engineer on the Santa Fe?

A. Well, I have handled all the way up to better than a hundred cars.

Q. What is about the longest train you have handled?

A. I have handled them up to probably 110 or 112 cars, one I believe of 112 cars I handled out of Barstow. That is quite a while ago.

Q. Will you tell the Court what the duties of a locomotive engineer are, starting at the time you are called.

Mr. Booth: You mean on the Santa Fe or the Southern Pacific?

The Witness: I think the duties are about the same.

Mr. Mason: The witness is not qualified to answer the question as to the Southern Pacific so far as his qualifications indicate now.

Mr. Strouss: He can testify as to what the duties of an [fol. 4235] engineer are on the railroad he operates on, certainly.

The Court: You may proceed.

A. Well, in his preparatory time for his trip it is necessary, after he is called, that he register out in the proper form on the government sheet, register his watch, compare it with the registered clock there, or certified clock, then his duties take him to the roundhouse to prepare his engine for his trip. It is necessary that he examine all work reports, such things as that, and inspect his engine, and see that it is in proper condition for the trip, and see that it has the necessary supplies and tools, and oil his engine around. By that time, generally, the brakeman is after you to put you on the train, then you go out and couple on to your train, the conductor will probably show up later with your

orders, you will read and compare your orders with the conductor, also compare time with him; then, if everything is clear, and you have the authority, you are ready to proceed after you make your necessary air tests and things of that kind.

Q. Then, when you are on your run, what are the duties of the engineer?

A. Well, he has many duties on his run, the operation of [fol. 4236] his locomotive, and keeping his eyes open for any obstructions; making his different meets, such things as that.

Q. What about block signals?

A. Oh, he has to watch for all block signals; they are spaced about a mile apart, all block signals, look out for a flag along the track or any obstructions.

Q. Do you have any duties with respect to observing the train itself?

A. At all times it is an engineman's duty to keep a sharp lookout for any defect in the train, as well as trainmen.

Q. Of course, the operation of a locomotive is an important duty, I imagine?

A. Very important duty.

Q. How is that operated?

A. I don't just get your question.

Q. Are there gauges and throttles and things of that sort?

A. You mean you want me to start in?

Q. Yes.

A. Well, in operating your locomotive, the first thing to do is to know that you have a right to move, and in the next case get your brakes released and have everything in the clear, the cylinder cocks open and open your throttle gradu- [fol. 4237] ally and get your engine to moving. If you have a train behind you, the attempt is to start as gently as you can until you get the entire train in motion, and then you can give her the gun.

[fol. 4238] Q. Now when you have a train moving, how do you stop it?

A. Generally a train is stopped by the use of the brakes, the air brakes, but of course a condition might be such on an ascending grade where we would make a gravity stop without the use of brakes.

Q. Is the operation of an air brake a part of the duty of the engineer?

A. Yes, sir.

Q. What, if anything, must the engineer know about the construction of the air brake equipment?

A. He is required to pass a certain examination to qualify him as an engineer and he must know certain things about the air brake in order to be able to operate it successfully.

Q. Your test for promotion includes an examination of your knowledge of the construction of air brakes?

A. Yes, sir.

Q. Are you familiar with the Santa Fe green book which is in evidence here as exhibit No. 152?

A. Yes, sir.

Q. That has in it I have noticed a description of the construction of brakes and their operation. Are you required [fol. 4239] as an engineer on the Santa Fe to be familiar with that part of the green book?

A. Yes, sir.

Q. Are you examined when you are up for promotion?

A. Yes, sir.

Q. How about firemen?

A. A fireman takes his examination in three courses, his first, second and third year examinations. The first two don't have very much regarding an air brake but the third one, that is the examination that qualifies him as an engineer and on the Santa Fe a fireman in his third year examination takes both a written and an oral examination. The written examination comprises a set I think of 624 questions, it used to be, I am not so positive about that exact number but it is near that, and the transportation rules have about a like number of questions for a written examination. After he completes this, he is given an oral examination from his written examination.

The Court:

Q. Mr. Cooper, counsel asked you about a promotion as an engineer. Are there any promotions after you reach the status of engineer that require further examination?

A. We are called upon quite often, such as air brake cars [fol. 4240] that come over the property and other things like steam heat and air conditioning and things like that, but it is not an examination. It is a form of instruction that we get there, they come along to post us on that stuff.

Mr. Strouss:

Q. Your examination includes an examination as to your knowledge of the operation of the brake also?

A. Yes, sir.

Q. That is also covered by the green book?

A. Yes, sir.

Q. Over the time that you have been operating trains as an engineer have you in addition to your experience there made any study of air brakes?

A. I have. I have always been interested in it since I was a kid when I first started to railroad and I have kept up with it as far as I could, and as I say I have always taken an interest in it and learned what I could about it because I am curious enough to generally want to know something about what I am doing.

Q. In your duties are you required occasionally to make repairs of brakes?

A. Running repairs on the road, such as broken air pipes or something like that.

Q. From your experience and study have you acquired a [fol. 4241] knowledge of the construction and operation of the air brake equipment such that you would be able to describe the air brake equipment on a train?

A. I believe I have a fair knowledge of it.

Q. Will you please describe to the court what the brake equipment is on a train, beginning with the engine?

A. The air brake apparatus on an engine, I would start first with the compressor. That is the air pump for compressing the air for use throughout the train. This compressor stores the air in what is known as the main reservoir. That is for the purpose of storing and cooling the air. This pressure from the pump is exhausted into the main reservoir through quite a length or coil of pipe, that also is for the cooling of the air. We have next different gauges to denote the pressure in the different parts of the system. We have a gauge for the brake pipe, a gauge for the main reservoir, a gauge for the equalizing reservoir, and a gauge for the brake cylinder pressure on the engine alone.

Q. That is, all of those gauges are on the engine?

A. Those gauges are on the engine. Of course, these gauges are all connected by suitable piping. Then we have [fol. 4242] two brake valves, one is the automatic brake valve, that is for conveying the air to and from the train,

operating the brakes on the train. Then we have an independent brake valve which is used for the engine brake only. When operating a light engine alone we use that brake. Then we have a feed valve placed on there as a brake pipe governor that is what it is. It carries a predetermined amount of pressure in your brake pipe. That is connected to your main reservoir by the way of your brake valve. We have a pump governor on there that stops our compressor when we have gained a predetermined amount of pressure in our main reservoir. The Santa Fe uses a duplex governor, what we call the high and low pressure. At the present time on the Santa Fe we use 110 and 130 pounds' pressure in that reservoir. Our feed valve is set for 90 pounds. Then we have the distributing valve on an engine that is used during the automatic operation. The lower portion of this is used when we apply the brakes automatically. The upper portion or the application portion is used when we apply the independent brakes, independent of the train brakes. Then we have the brake cylinders and retaining valve, whistle signal valves.

[fol. 4243] Q. The independent brake that you speak of, that is an independent brake on the engine itself?

A. On the engine itself, yes, sir.

Q. Will you describe that brake to the court?

A. The independent brake is used when we are operating the engine alone or we use it at times to assist in holding a train or at times if the grade is right and the condition is right in stopping a train with it. It is a small valve much smaller than the automatic and it is operated by main reservoir pressure. We have a reducing valve on there that is just exactly the same as the feed valve of the smaller type which reduces the main reservoir pressure down to a point for what the brake cylinder pressure is set for on the engine. On our freight engines that reducing valve is set for 40 pounds. On our passenger engines it is set for 50. This reduced main reservoir pressure flows to this independent brake valve and when the independent valve is placed in application position the air flows to the application cylinder, also into the application chamber. It moves the application piston, this pressure, and when the piston moves it carries with it what is known as the supply valve and opening the main reservoir port from the main reservoir direct to the [fol. 4244] brake cylinder on that engine. This air that reaches the brake cylinder forces the pistons out and forces

the shoes against the wheel. Now it stays in that position until you release it. You place your brake valve in release position and it simply lets this air out through the same pipe from the application cylinder. Then this pressure in the brake cylinder which is backed up against your application pistons, it forces your pistons back to release position carrying with it an exhaust valve which exhausts that brake cylinder pressure to the atmosphere at the distributing valve.

Q. That brake operates independent of the brakes on the cars on the rest of the train?

A. Yes, sir.

[fol. 4245] Q. Now, this brake applies against what wheels of the engine?

A. The driver wheels and the tank wheels.

Q. Is that brake used to any great extent?

A. No, you can't use it to any great extent without overheating your tires, you will slip your tires if you try to use it too much, but of course, in making light movements, why, we use it all the time.

Q. What do you mean by "tires?"

A. The tires are around our driving wheels.

Q. In other words, the driver, driver wheel has tires on it?

A. Has tires on it.

Q. Which are contracted on there by heat?

A. Yes, they are heated, then sweated on there. If you overheat them, they will fall off.

Q. That is the danger in using the independent engine——

A. Using them continuously, yes, sir; you can't use them continuously.

Q. Now, you mentioned the reservoirs on the engine; will you describe those a little more——

[fol. 4246] A. The main reservoirs, you mean?

Q. Yes.

A. Why, the main reservoir on the engines we are operating, we have two of them, they are connected together by a system of piping. I don't know just how many feet of piping that is, but it is inch-and-a-quarter pipe that connects the two reservoirs together, but it is quite a length of pipe, and it is used for cooling the air after it leaves the compressor going into the reservoir. On our engines they are about 18 to 20 inches in diameter, and possibly about eight feet in length, the two of them, and that is the storage for

the air used on the engine and throughout the train and all the auxiliaries throughout the train.

The Court: At what temperature is that air ordinarily kept?

A. Well, I don't know that, your Honor. I don't know just how hot it gets, but I have seen it get awfully hot; if we had a stuck valve, or something, sometimes it will get pretty hot, we have no way of telling just how hot it is only by feeling of it. Sometimes your brake valve will get awfully hot, but that is generally due to a gummed valve like a receiving or discharge valve usually a discharge or intermediate valve of your pump, that is due to backlash and getting [fol. 4247] it hot like that, otherwise, it doesn't get hot at all, it stays fairly cool.

Mr. Strouss: And each one of these reservoirs is about 18 to 20 inches in diameter?

A. Something like that; they might not be that large, might be some difference, but that is a close figure on it.

Q. How does this air which is stored in the main reservoirs get back to the train?

A. That is admitted to the train by the way of the engineer's automatic brake valve through the brake pipe.

Q. What is this automatic brake valve?

A. That is a valve that is placed on the engine for the engineer to operate his brakes with, on the train as well as the engine, you see. It is a valve that has but two movable parts to it, it is a rotary valve which is moved by the handle you operate it with and the equalizing piston. The main reservoir pressure, from the moment you start your pump when it flows into your reservoir, it flows right unrestricted to the top of this rotary valve in your brake valve, then with the brake valve in certain positions, the air passes through the rotary valve down into the brake pipe and flows [fol. 4248] throughout the train. It also at the same time flows in and charges the equalizing reservoir equal with the brake pipe and balances the pressure on both sides of the equalizing piston.

Q. Now, what is the purpose of the valve, the engineer's valve?

A. The purpose of it is to apply and release the brakes and recharge your train, distribute the flow of air, in other words, throughout the train.

Q. And how do you do that?

A. Well, when we couple to a train, we will start the pump, pump our pressures up, and then—excuse me, you mean how do I put the air back in the train?

Q. Yes, how do you get it?

A. After we get a pressure in the main reservoir, we can put the air back in the train pipe in two different manners, in either full release or running position of the brake valve, but generally speaking, full release position has the largest and most direct opening to your brake pipe, so if we want to charge a train in a hurry, we will kick it over in full release position. That opens the largest ports in that brake valve [fol. 4248] direct into the brake pipe. The brake pipe begins right underneath the engineer's brake valve, that is the beginning of it, right underneath the brake valve. Now, the air flows back under the tank and back to the head car through the hose and back throughout the train through the brake pipe.

Q. Now, just explain the rest of the operation of this valve.

A. The brake valve?

Q. In different positions.

A. The valve that we are using at the present time, the E.T. six valve, is a six position valve. Its first position is full release, second is running, the third position is holding, the fourth is lap, the fifth is service, and the sixth is emergency, or the big hole. Now, you want me to operate that brake valve?

Q. Yes, if you will.

A. Well, I would say first that an automatic brake valve is like almost every part of the airbrake system, it works on a basis of equalization, and when you break the equalization you get results. In this valve body we have an equalizing piston, and when I charge the train up I put the same pressure on the top of the piston that I have underneath it, [fol. 4250] exactly the same if I want to operate that brake on the train, I will place my brake valve in service position. In service position you draw the air from what is known as Chamber D, or the equalizing reservoir, it is a cavity just above the top of the equalizing piston. We reduce that through a restricted port opening and exhaust it to the atmosphere at the emergency exhaust on the side of the brake valve. Now, to make myself clear, I will start with a ten-pound reduction. That is even. I will reduce the pressure

ten pounds in this equalizing reservoir in service position; now, the brake pipe pressure underneath that piston is ten pounds greater; that pressure will raise that piston up. When it raises it up it has a stem on this piston and on the end of the stem is a seat that seats in the valve body that controls brake-pipe pressure. Now, when it raises up it will let the same amount of pressure out at this brake-pipe exhaust port as I took out of the Chamber D above it, or it will flow through until it is a little bit less than the weight of the valve and it will drop and seat again. Now, I have taken ten pounds from Chamber D, I have also taken ten pounds from the brake-pipe. Now, that brake-pipe runs back throughout the train regardless of its length, and it [fol. 4251] takes that much pressure away from the triple piston under each car throughout that train, and applies the brakes.

Q. That is in service application?

A. In service application.

Q. How would that brake work if you were going to release the brakes now, I mean the valve.

A. By releasing it? Why, I would place the brake-valve in release position, that will build the pressure up in the brake-pipe, you see, on all the triple pistons throughout the train, and force the triple pistons to release position.

Q. You are building up pressure there. What about your feed valve, that is another valve you have on an engine?

A. The feed valve, that is one of the most sensitive valves, I believe, that we have to contend with. It is nothing but a brake-pipe governor. It is a valve that we use when we are running along over the road and are not using the brakes and have to have something there, a sensitive valve to take care of any leakage through the train as we are running along. This feed valve is the valve that does that. It is connected from the main reservoir by the way of the automatic brake-valve and it is set at a given pressure. On the [fol. 4252] Santa Fe it is 90 pounds, and just as soon as the pressure in that brake-pipe is less than the tension of the spring, regulating spring, on the feed valve, the feed valve will open and supply the leak. As soon as it supplies the leak, it equalizes and closes again.

Q. In other words, it keeps your brake pipe pressure?

A. At a given pressure.

Q. How does the air get back from the engineer's valve back into the train?

A. Through the brake-pipe.

Q. What is that?

A. That is a pipe, an inch and a quarter pipe, that runs, starts at the engineer's brake-valve and runs throughout the entire train. It is connected under each and every car to the triple valve which operates the brake on that individual car. It is connected by a cross-over pipe from the main brake-pipe to the triple valve.

Q. This pipe starts from the locomotive?

A. Starts from the locomotive, yes, sir.

Q. Goes back under the tender?

A. Yes, sir.

Q. Then it goes under each car?

[fol. 4253] A. Under each car.

Q. That is, through the center of the car?

A. Well, I wouldn't necessarily say the exact center, but it goes under the car from one end to the other.

Q. How is it connected from car to car?

A. By air-hose and couplings.

Q. What would be the length of the pipe itself?

A. Under the individual car? Well, let us take a fifty-foot car, it is, I believe, perfectly safe to estimate about 57 or 58 feet of brake-pipe under one 50 foot car.

Q. Does that include the connecting hose?

A. That includes the hose on both ends of the car.

Mr. Mason: Are those the only kind of cars you have on the Santa Fe?

A. No, we have other lengths, but I was estimating on a 50-foot car.

Mr. Strouss: I suppose by mathematics you could figure out what the length would be on a different car.

A. Oh, yes.

Q. It is the length of the car plus the connecting hoses on each end, isn't that correct?

A. Yes, sir.

[fol. 4254] Q. It wouldn't take very much subtraction or addition to figure that out?

A. No.

Q. And you were not intending to say that all cars were built of fifty feet?

A. No, I didn't intend to make such a statement as that.

Q. Then the triple is connected to the main brake-line how? I believe you said by a branch line.

A. By what we call the cross-over pipe, which connects to the main brake-pipe and then connects to the triple valve, and on this cross-over pipe is the cutout cock, where, if it is necessary to cut that brake out for any reason, we use that cutout cock, then bleed the reservoir.

Q. By "cross-over," if I understand you correctly, there is the main brake-pipe line which goes out through under the car?

A. Yes.

Q. Then somewhere along on that brake-pipe line would be a Tee.

A. Yes, sir.

Q. From which will be taken a branch line or cross-over line over to the triple valve?

A. Yes, sir.

[fol. 4255] Q. And on that cross-over line is this——

A. —cutout.

Q. —cutout cock that you were talking about.

A. Yes, sir.

Q. And that is between the triple valve and the main brake-pipe line?

A. Yes, sir.

Q. Then what is the rest of the equipment on a freight car, brake equipment?

A. Brake equipment on a freight car consists of a triple valve and auxiliary reservoir and brake cylinder, the brake-pipe and its connections, the hose and the cutout cock, the angle cock, and a retaining valve.

The Court: Do I understand from that, Mr. Cooper, that there is an auxiliary reservoir under each car?

A. Yes, sir, used as a storage for air under each car to operate the brake on that individual car.

Q. Is that of small storage capacity?

A. Yes, it is about 1,740 cubic inches, I believe, something close to that.

Mr. Strouss: This brake-pipe line, does it have other fittings than this tee that I spoke of?

A. Yes, it has the angle cocks on both ends of it, and, [fol. 4256] some of them have what we call slow bends in them. They don't put any sharp bend in a brake pipe under a car for the reason that it increases the frictional resistance in the pipe when endeavoring to charge these brakes.

Mr. Mason: Your Honor, I haven't objected to the witness volunteering answers such as he has done, but it does occur to me that he has not shown any particular qualifications to show the reason for the construction of an apparatus under a car particularly. I concede his familiarity with the airbrake apparatus on an engine. I ask that the last answer undertaking to describe the reasons for lack of sharp bends in the pipe under freight cars be stricken as volunteered, not responsive, and also because the witness has shown no qualifications.

The Court: Well, it was volunteered. The motion to strike will be denied.

Mr. Strouss: Now, will you just go on and describe the other parts of the equipment, Mr. Cooper?

A. We have a triple valve under the car that derives its name from what it does. It does three things, it applies the brakes, it releases the brakes, and it recharges the auxiliary reservoir. I will give an outline of the valve. It [fol. 4257] has a piston in the valve body in the cylinder, and to this piston is attached a slide valve and a graduating valve, and when the piston moves, these valves move with it. The triple piston operates exactly in the same manner and on the same basis, that of equalization, as I formerly described in an equalizing piston on a brake valve. When you charge a train with the air pressure, the air flows back to the brake-pipe, through the cross-over pipe, and into the triple valve body and against the face of the triple piston, and if that triple piston is not in release position, the pressure will force it over to release position. When that valve is in release position there is a small groove in the bushing, it is about the size of a toothpick and it is cut in the valve bushing. The air in the brake-pipe that charges this auxiliary reservoir goes through that small groove and charges the auxiliary reservoir equal with the brake-pipe. It gives you equalization on both sides of your piston again. The air that you put into that auxiliary reservoir is for the purpose of applying the brake on that individual car. I will make a brake reduction of, say, ten pounds with

the automatic brake-valve on the engine. I will take [fol. 4258] ten pounds of pressure away from that triple piston on the brake-pipe side of it. I take the pressure away from that brake-pipe faster than it can back through this small groove from the auxiliary reservoir, consequently, I again break the equalization on that piston. The auxiliary pressure being greater now than the brake-pipe pressure, forces the piston to its left, carrying with it its slide valve and graduating valve and admits a like amount of pressure from the auxiliary reservoir to the brake cylinder, and that air goes into the brake cylinder and applies the shoes to the wheel, forces the piston out, remains in that position till I get ready to release it or make a further reduction. When I get ready to release it, I place my brake-valve in release position and build up the brake-pipe pressure higher than the auxiliary. That forces the triple to release position. When it goes to release position, I again open this feed groove up here, recharge the auxiliary and the exhaust valve is opened, which exhausts the brake cylinder pressure to the atmosphere at the retainer.

[fol. 4259] Q. You have mentioned the auxiliary reservoir. What is that reservoir?

A. The auxiliary reservoir is provided as a storage for air under each and every car and you use that air to apply the brakes with.

Q. It is under each car?

A. Under each car, yes, sir.

Q. Near the triple?

A. The triple valve is connected to it and the auxiliary reservoir is connected to the brake cylinder. They are all connected together.

Q. How does the air get into that auxiliary reservoir?

A. By way of the feed groove from the brake pipe. With a K-valve we have another feature on there, if you want it, I didn't give you the quick service feature on that or the retarded release, I just gave you the straight plain operation of a triple valve.

Q. You might explain this to the court.

A. In the early days when we were operating the old quick action triple valve the Westinghouse people figured they had a device——

Mr. Mason: I object to that.

The Court: Yes, the objection will be sustained as to that.

[fol. 4260] The Witness: Well, anyway, we have the uniform recharge and retarded release spring placed in the K-2 valve and what it does, and its purpose in placing it in there was to try to overcome slack action.

Mr. Mason: Now, again, your Honor, the witness is explaining and is simply expressing his opinion and conclusion and I think that should be stricken.

Mr. Strouss: He is operating this brake equipment every day and certainly it is part of his business to know what that is put in there for.

The Court: The court will deny the motion. Go ahead.

Mr. Mason: Will you read the last answer?

(The last answer was read by the reporter.)

Mr. Mason: I would like to find out the witness's qualifications on that matter as to the purpose of the manufacturer.

The Court: Do you wish to examine him on that?

Mr. Mason: Yes.

The Court: All right, go ahead.

Mr. Mason:

Q. Mr. Cooper, have you ever been employed by any manufacturer of air brakes?

A. No, sir.

Q. Have you ever had any connection with any manu [fol. 4261] facturer of air brakes?

A. No, sir.

Q. Have you ever been consulted by any manufacturer of air brakes in connection with designing or redesigning of air brakes?

A. No, sir.

Q. Would your answers be the same if I were to ask you if you were connected with or consulted by a manufacturer of triple valves?

A. Yes, sir.

Q. Have you ever of your own motion submitted to a manufacturer of air brakes or triple valves any design such

as you have described for the elimination of certain features or the production of certain features of its action?

A. No, sir.

Q. Have you ever been in any official position with the Santa Fe having to do with the construction, operation or purchase of air brakes by the Santa Fe for its cars?

A. No, sir.

Q. Or with any other railroad?

A. No, sir.

Q. I take it then that your only knowledge of the purpose for which these were placed in the triple valve was gathered from what somebody told you?

[fol. 4262] A. No, I wouldn't say that. I gathered the knowledge I have individually from handling it.

Q. As an engineer do you have to apply the brakes on individual cars through the use of the brake apparatus on the individual cars or don't you always apply it from your valve on the engine?

A. Apply it from the engine when I am handling it, yes.

Q. Then your only purpose for which a change may have been made in the construction of the triple valve, how did you gain that if not from having someone tell you?

A. I gained it from handling a train.

Q. You gained the only result from handling the train but how did you know why the manufacturer changed the design of the triple valve if he did change it?

A. I guess you are right on that, what the design was, but I know what it did and it accomplished their purpose to a great extent.

Q. If you don't know what their purpose was except from hearsay, how can you say that?

Mr. Strouss: I don't think the witness said the manufacturer's purpose was to design anything.

Mr. Mason: No, I had it read carefully and he said the purpose of placing this particular apparatus which he de[fol. 4263] scribed was to eliminate or do something about slack action. How does he know what the purpose was? He confessed that he knew it only because somebody told him.

Mr. Strouss: He said nothing about the purpose of any manufacturer.

The Court: It is quite evident to the Court that this witness has had a lot of experience in the actual operation of these various types of valves and it is equally clear from

the manufacturing or production standpoint he has had no experience, so if the witness will confine himself to his experience in the operation of these valves without going into the purpose that the manufacturer may have had in mind you may proceed.

Mr. Strouss: I submit, your Honor, he has never stated the purpose of the manufacturer was anything.

The Court: Go ahead, Mr. Strouss, and confine it within those limits.

The Witness: Can I put it this way——

Mr. Booth: You haven't been asked any question.

Mr. Strouss: He was trying to give an answer.

Mr. Mason: He is trying to give a lecture now. You will obviate a good deal of nervousness on our part if you will [fol. 4264] ask the questions, Mr. Strouss.

The Court: We have listened to quite a few lectures during the case, so go ahead.

Mr. Strouss: If you will proceed.

A. I was trying to give a description of the additional features added to a K valve and what they accomplish over and above what we had in the quick action standard valve. The quick action standard triple valve had nothing but an emergency feature to it. That is the service and emergency feature over and above a plain triple. When the K-2 valve was introduced they added what was known as the quick service feature. That feature will or was provided for that purpose and will——

Mr. Mason: Now——

The Court: Yes, I will sustain the objection to that as to what it was provided for. Tell what it does in actual operation?

A. It applies the brakes on a long train easier with a smaller reduction than the old standard, that is, quick service. It does that by venting a portion of the brake pipe air in each car to the brake cylinder instead of exhausting it all the way out the engineer's brake valve. The uniform recharge and retarded release, they have a spring in there that when the valve is in that position, uniform recharge and [fol. 4265] retarded release position, the spring is compressed, it restricts the flow of air from the brake cylinder to the atmosphere and from the brake pipe to the auxiliary. You accomplish that on the head end of the train and that

is to get the air to the rear of the train and release the rear brakes and hold the head end applied and created a smoother handling of the train and it certainly does it.

Mr. Mason: I wonder, Mr. Strouss, if you will ask the witness to give us the dates of this change?

A. The K-2, I would have to guess at that but it is back in probably 1913 or something like that.

Mr. Mason: Just after 1912 was it?

A. Somewhere in there the K-2 came out. I don't know, I am guessing at that.

Mr. Strouss:

Q. Before that the air was all vented out the engineer's valve?

A. Yes, sir, you had to draw it all out at the engineer's brake valve. This new improvement utilized a portion of that waste of air in the brake cylinder under each car and was quite a saving and it would apply the brakes quicker throughout a long train more uniformly.

Q. You mentioned the brake cylinder as part of the equip- [fol. 4266] ment of a car. What is that?

A. The brake cylinder is where you build up your pressure to exert the force against the wheels, the shoes against the wheels. It is a piston in a cylinder and the piston is connected with suitable rods and levers that when the air is placed in this cylinder it forces the piston out and forces the shoes against the wheel.

Q. Is there any additional parts of this brake equipment which you haven't already described? Have you described the retainer?

A. We have a retaining valve which is placed on the exhaust pipe from the triple. A retaining valve, we have several different kinds. We have the two-position retainer and the three and some are merely a weighted valve and others are operated by spring pressure. It is a very simple device that is attached to the exhaust pipe from a triple valve and placed on a boxcar near the running board on the top of the car and when the brake cylinder pressure with the handle in operative position, turned up, when the brake cylinder pressure exceeds the weight of that valve in the retainer the pressure will raise the valve off of its seat and blow away

at the exhaust port but just as soon as the pressure in the cylinder is reduced below the weight of that valve it will [fol. 4267] drop and close the exhaust.

Q. That is a fixed pressure, a predetermined pressure?

A. Yes, it depends on the weight of the valve. The one most commonly in use is the 15-pound weight and then we have the double three-position retainer that had a 10 and 20 pound but that was spring pressure in those, but the same thing.

Q. When that retainer is operating, it retains a certain amount of pressure in the brake cylinder?

A. Yes, sir.

The Court: That would be uniform on all the cars in the train?

A. Where the retainer was in service, yes, sir.

The Court: We will take our mid-afternoon recess at this time.

(Thereupon a short recess was taken after which proceedings were resumed as follows.)

The Court: You may proceed.

Mr. Strouss:

Q. Mr. Cooper, you have explained the different parts of the brake equipment. Now will you explain how the brakes operate on a train? You might begin when you first couple into a train with your locomotive.

A. My first duty is to charge the train. We do that by [fol. 4268] permitting the main reservoir pressure to flow back by way of the brake valve into the brake pipe and charge the auxiliaries on each of the cars equally with that of the brake pipe.

Q. What pressure do you carry?

A. On the Santa Fe we carry 90-pound brake pipe pressure, 110 and 130 main reservoir pressure.

Q. When your train is charged, your brake pipe line will have a 90-pound pressure and your auxiliary reservoirs will have 90-pound pressure on the Santa Fe?

A. Yes, sir, we make a brake pipe reduction with the automatic brake valve. We reduce the brake pipe pressure on the face of each and every triple piston throughout the train. The auxiliary pressure being greater moves the triple

piston and deposits ten pounds' auxiliary pressure into the brake cylinder. Ten pounds of pressure from the auxiliary placed in the brake cylinder will give you 25 pounds' brake cylinder pressure, two and a half times more than your reduction. That is their ratio. It remains in that position until you are ready to release the brake. You release the brake by building up the brake pipe pressure greater than the auxiliary, forcing the triple pistons back to release position, opening the feed groove and recharging your aux- [fol. 4269] iliary and opening the exhaust port from the triple valve to the atmosphere and exhausting the brake cylinder pressure.

Q. Are there different types of brake applications?

A. Yes, we have both service and emergency.

Q. What is the difference?

A. In service position you make a gradual reduction in the brake pipe pressure and your triple pistons respond slowly, gradually, and apply the brake, but in emergency you exhaust the pressure suddenly from the triple and the brake pipe, it gives a sudden reduction, it makes a quick movement of the triple pistons and the triple pistons will move with velocity enough that it will strike the graduating post and spring and compress it. That movement permits your triple piston to travel slightly further in its bushing than it does in service position and opens what is known as the tail port or emergency port and this auxiliary pressure on top of your emergency pressure, that forces that piston in a downward position. As it goes down, it has a stem under it, it unseats what is known as a rubber seat valve or the emergency valve. It knocks that valve off of its feet. [fol. 4270] Brake pipe pressure when the valve was first charged is ever present in what is known as cavity Y or that pressure underneath the brake pipe check valve in the valve body. The brake pipe pressure quickly raises that check valve and flows directly to the brake cylinder along with the auxiliary pressure. By getting that quick action you accumulate about ten or twelve pounds' more pressure in the brake cylinder in emergency than you do in full service. Full service is merely an equalization of the pressures in the auxiliary, the brake pipe and the brake cylinder. To figure that say on a 70-pound brake pipe pressure it is easier to figure 20-pound reduction in the brake pipe on a 70-pound brake pipe pressure would give you full equalization in the

three, 20 pounds from the brake pipe leaves 50. Twenty pounds from the auxiliary leaves 50, and 20 pounds of auxiliary pressure placed into the brake cylinder, two and a half times 20 is 50, 50, 50 and 50 and any further reduction than that is simply a waste of air and creates pump labor.

Q. When you have charged your brakes and on the Santa Fe say your main reservoirs carry 110 and 130 pound pressure, they will have that pressure and your brake pipe line will have 90 pound pressure?

[fol. 4271] A. Yes, sir.

Q. And your auxiliary reservoir under each car will have 90 pound pressure?

A. Yes, sir.

Q. Your brakes are in release at that time, aren't they?

A. Yes, sir.

Q. When you apply the brake what is the operation?

A. I reduce the pressure in the brake pipe.

Q. Where do you do that?

A. I do it with the engineer's brake valve in the cab of the engine.

Q. You move that to service position?

A. I place it in service position and make that reduction. I do it as I explained formerly in the operation of the automatic brake valve by raising the equalizing piston, exhausting the same amount of pressure from the brake pipe at the brake pipe exhaust that I formerly took from the equalizing reservoir on top of the piston.

Q. In other words, when you place the engineer's valve in service position that causes——

A. (Interrupting) That causes automatic operation of the equalizing piston.

[fol. 4272] Q. And permits the exhausting of a certain amount of air from the brake pipe?

A. The same amount that I took out in the service exhaust port from the equalizing reservoir itself.

Q. Then what is the operation with that reduction of the brake pipe pressure, what happens in the cars?

A. That reduces the pressure on each triple piston and causes the triple valve to operate and apply the brake under each car. The brake pipe is one continuous pipe throughout the entire train and any reduction that I make on it I get that reponse throughout the train.

Q. Go ahead and tell how that applies to brakes.

A. It reduces the air on the brake pipe side of the triple piston, it breaks the equalization, in other words, on that triple piston, and as soon as the equalization is broken on it, it is perfectly free in its bushing, the greater pressure will move the piston toward the weaker pressure. There is a slide valve connected to this piston that when the piston moves it will eventually pick up the slide valve and pull the slide valve with it. The piston will move until it comes to rest against the graduating post and in [fol. 4273] that position the slide valve will register with a port under the seat of the valve which will permit the auxiliary air around the slide valve to flow through that opening into the brake cylinder. That pressure will continue to flow through this opening and into the brake cylinder until the pressure in the auxiliary is a little less or enough to overcome the frictional resistance of the valve. Then the brake pipe pressure which is still here will force the brake valve back to what we call lap position. When it goes back to lap position the slide valve does not move due to a quarter inch of slack or lost motion but it does move the little graduating valve which is inside the slide valve. The graduating valve does nothing but controls this service port that permits the auxiliary air to flow to the brake cylinder. It shoves it back far enough to close that port and the instant that does that the reduction stops and the equalization is effected on the pistons and it stands there until a further reduction is made or until a release is made.

Q. In applying a brake you release or exhaust air from the brake pipe?

A. In applying the brakes I take the air out of the brake pipe. In releasing a brake I put the air in the brake [fol. 4274] pipe.

Q. This exhaust is up in the locomotive, is it, from the brake pipe?

A. That is in the engineer's brake valve underneath the engineer's brake valve in the valve body. The equalizing piston controls that port. When it is off its seat the brake pipe air can blow away to the atmosphere; when it is on its seat it blocks it from blowing away to the atmosphere.

Q. Where does the application begin to take effect?

A. Generally at the point where the reduction is started if the equipment is O. K. If you start the reduction on the head end of a train you generally get your action on the head brakes first. If you start it on the rear of the train, you would have it on the rear of the train first.

The Court: How would you start it on the rear of the train?

A. The conductor has a valve in the caboose or you could use it with an angle cock on the rear of the train, open an angle cock. Any reduction in the brake pipe regardless of where it is will apply the automatic brake on a train.

Q. There is a valve in the caboose?

[fol. 4275] A. Known as the conductor's valve, yes, sir.

Q. Is that used very often?

A. It is used by the trainmen quite a bit when the occasion arises. It is mostly used for an emergency case where they have to stop. The proper manner of stopping a train is generally getting a signal to the head end and let the enginemen stop it but in case they couldn't get a signal or something like that the conductor will use the valve on the caboose but it is mostly in emergency cases that it is used.

Q. Are there any peculiar problems or difficulties in the operation of brakes and the handling of trains that you have to guard against?

A. I don't get your question.

The Court: Read the question.

(The question was read by the reporter.)

A. Yes, we are up against a proposition, the greatest of it is in train handling, operating a train with an automatic air brake is to get control of the slack.

Mr. Strouss: What do you mean by "slack"?

A. Slack is that lost motion that exists in each and every one of the freight cars around the drawbars.

Q. In the Southern Pacific Company air brake rules [fol. 4276] and regulations, exhibit No. 319 in evidence, appears this statement, "Smooth train handling depends on the effort to control slack and how to prevent it from

running in and out harshly." In your experience in operating trains have you found that statement to be true?

A. Very much so, yes, sir.

Q. (Reading "Where so controlled no draft gear in fair to good condition will be damaged. Slack action cannot be prevented but by acquiring knowledge of the various causes for it and exercising forethought in the use of steam, train brakes, independent engine brake and sand, it can be controlled, even to the extent of avoiding further injury to damaged draft gear." In your experience in operating trains have you found that to be true?

A. To a great extent, yes, but there are some times where an engineman cannot control it. We get trains made up, loads and empty——

Mr. Booth: Your Honor, I think the witness has answered the question and is now proceeding to something else.

The Court: Yes, I am inclined to agree with you.

Mr. Strouss: He says that sometimes that is true but [fol. 4277] others not.

Mr. Mason: Let the record speak for itself rather than have counsel tell us what the witness said.

Mr. Strouss: I think I have a right to address the Court without counsel telling me what to do and what not to do.

The Court: Certainly, Mr. Strouss. If the witness has not finished his aitswer, he may proceed. I was of the impression that he had and to save argument and referring to the record proceed with the next question.

Mr. Strouss:

Q. You say there are times when that is not true?

A. Yes, sir.

Q. What do you mean by that?

A. There is a difference in trains. I have found in my experience a number of different kinds where it is absolutely impossible to control the slack in a train and you would try every conceivable means at your command but you would still handle them rough. Other times you would be handling a train or the train would be handling rough with you and you would learn about it from the trainmen. You could change your method of manipulation and possibly [fol. 4278] overcome it, but other times, no.

The Court: So you would learn about it from the trainmen, you mean the engineer himself up ahead couldn't tell?

A. Yes, sir, we can half kill them on the rear end at times and we will never know anything about it until they come over and tell you.

[fol. 4279] Mr. Strouss: Now, the further statement appears, "the heavier the engine and the longer the train, the greater is the care required." Have you found that to be true in your experience, Mr. Cooper?

A. Yes, sir, the longer the train the more slack.

Mr. Booth: We move to strike out the last sentence. The witness answered the question and said "Yes."

Mr. Strouss: Will you explain what your experience has been in that respect.

A. My experience in that is that for every car picked up in a train adds just that much slack to it, it adds the amount of slack that that individual car contains, and the longer the train the more cars you have, the more slack you have in that train to control, and consequently, it is harder to control because there is more of it.

Q. Still reading from Exhibit 319, "When slack runs in or out one part of the train gradually attains a lower speed than the other, and the shock is the result of draft gears having suddenly to make the speed uniform on the instant slack is all in or out. How heavy the shock will be depends mainly on the difference in speed that must [fol. 4280] instantly be made uniform and on the weight that must suddenly be altered in speed." Have you found that to be true in your experience?

A. Yes, sir, that is a description of slack action. Slack action is created in that manner, by one part of the train trying to stop, the other part trying to go, or the reverse, it creates a slack and starts it to running.

Q. Now, reading again from Exhibit 319 at page 9: "With high pressures and large main reservoirs it is very easy to overcharge the head end of the train; many detrimental effects result, such as stuck brakes, flat and broken wheels." What has been your experience in that respect, Mr. Cooper?

A. It is just that. You overcharge the head end of a train invariably in trying to release your brake on the

rear end, that is where you have a heavy train down a mountain grade and in trying to recharge your train you invariably get more or less of an overcharge on your head end. Now, an engineer usually works or tries to avoid that by using, after he comes back from his release to running position, a kick-off to get rid of the brakes on the head end, because the overcharge on the head end will immediately reapply the brakes on the head end, consequently they don't get any cooling period, and it is a dangerous [fol. 4281] procedure to follow it by not getting rid of it, and you will find you will burn the wheels up if you have very far to go.

Q. Now, does the fact that the gauge on the engine shows a high pressure, necessarily mean that the pressure is up on your brake-pipe line back in the train?

A. No, that is entirely a false pressure; your gauge will show you this overcharge on the head end while the rear end isn't charged at all.

Q. Reading from Exhibit 319: "Many are of the impression that because the brake-pipe gauge shows higher than the auxiliary reservoir pressure is intended to be, that all brakes are released. As a matter of fact, this is a condition that exists only on the first few cars in the train, the pressure at the rear not having sufficiently increased to release the brakes. In fact, twenty-five cars back from the engine it cannot be determined whether the brake-valve handle is in release or running position. With a large capacity feed valve, the brake-valve handle should be held in release position not to exceed twenty-five seconds when releasing brakes only is the object. The excep- [fol. 4282] tions to this rule are when charging the brake system and braking on grades under all conditions." Have you found that to be true, Mr. Cooper? What has been your experience in respect to it?

A. Well, I couldn't say as to that twenty-five or thirty cars back, because I don't know that, but I do know that what is expressed there is absolutely correct about the false pressure on the head end.

Q. And the failure of brakes to release?

A. Yes.

Q. Have you had that experience?

A. Oh, yes.

Q. Now, the green book which is in evidence as Exhibit 152, at page 28, states: "Tests have demonstrated that following a full service application with a type C car train, it often takes from six to ten seconds for the release wave of air to pass from the engineer's valve to the rear car." What has been your experience in that respect?

A. That is what I judge to be a pretty correct figure. That is a 50-car train?

Q. A 50-car train.

A. That is a pretty good figure.

Q. In other words; when they release——

[fol. 4283] A. For the release wave to reach there.

Q. From the engine to the rear car?

A. That doesn't mean that you would release that brake in that time.

Q. What do you mean by that?

A. I mean, that after the release wave reached the 50th car, it has to build up sufficient pressure back there to force the triple piston to release position and start the recharge. The recharge takes place after the piston has been forced to release position.

Q. So that after the air wave has passed from the engine to the rear car——

A. It will take just a little time after to force the valve to release position, till the pressure builds up high enough on it to force it over.

Q. It then begins to recharge?

A. Yes, at that point.

Q. Now, if the train were a hundred cars, would that still take longer?

A. Oh, yes; oh, yes, quite a bit longer.

Q. Now, how would that affect your ability to control slack in a train?

A. Your ability to control slack in a train rests solely on your ability to apply and release the brakes throughout [fol. 4284] the train. If you are operating a train where you are unable to keep it fully charged down the grade and you fail to operate your brakes on the rear or fail to release them, you are liable to run into a serious slack action.

Q. Now, on page 11 of Exhibit 319, appears this statement: "An automatic brake application will cause the brake-pipe pressure to reduce faster at the head end of the train than at rear. This results in the head brakes applying

in advance of those at the rear, and tends to bunch the train and compress the draft gears." Have you found that to be true, Mr. Cooper?

A. Yes, sir, the head brakes would apply first.

Q. In other words, with an application of brakes, that is, there is an exhausting of the air at the engineer's valve in the engine, I believe that is what you testified to?

A. Yes, it will start the brakes to applying on the head end first.

Q. That exhausting of the air reduces the pressure in the brake-pipe line?

A. The quick service feature of the triple valve assists a whole lot in that, in making that reduction throughout [fol. 4285] the train more uniform but it is not completely uniform yet. The head brakes will apply in advance of the rear brakes.

Q. Well, reading further: "In releasing, the head brakes commence so much before those at the rear that as far as holding power is concerned, they are practically off before the rear ones start to release, causing the slack to run out rapidly."

A. Yes, sir.

Q. That you have found to be true?

A. Yes, sir.

Q. "Just how serious the results may be largely depends on how heavily they are applied, the amount the draft gears are compressed, and how slowly the train is moving." Has that been true, in your experience?

A. Yes, sir.

Q. Now, what is the character of the territory in which you have been working, Mr. Cooper?

A. Well, it is very little of it level, there is some of it a rolling country, hogback country, but most of it is what you would call, I presume, a mountainous territory, one-and-one-half-per cent grade.

The Court: Did I understand you to say that you were operating between Seligman and Barstow?

[fol. 4286] A. At the present time, I hold seniority there between Seligman and Bakersfield, that is the Arizona division, but I am operating an engine at the present time, holding a run between Needles and Barstow, that is, I am operating a cut-out pool, rather, between those points, into Barstow some time.

Mr. Strouss: Mr. Cooper, I give you Defendant's 118 in evidence. I wonder if you could take that and sort of indicate to the Court how the air operates on a train?

A. Well, how many cars does that consist of, anyway?

Q. It is testified there were 160 on there.

Mr. Mason: I think the record shows that this was a regular 160-car train on the Chesapeake and Ohio. The exhibit shows 160 cars.

The Witness: Now, your question, Mr. Strouss?

Mr. Strouss: Using that exhibit, explain to the Court how you apply the brakes on a train, and this statement No. 319 that in applying brakes the head end will begin to apply ahead of those in the rear.

A. Well, I was just trying to see with a train that length of how much air it would take with our present equipment [fol. 4287] to apply the brake throughout that train.

Q. Do you know how many cubic inches of air it would take to fill a brake-pipe on one car, about a 40-foot car?

A. A forty-foot car, I believe is around 3100 cubic inches. Well, to tell the truth, I wouldn't want to start out with that up there.

Mr. Booth: I am going to suggest, your Honor, that the witness is hardly qualified to discuss operation of a 160-car train. He says the longest train he ever operated is 112 cars.

Mr. Strouss: Well, I imagine the air goes back through,——

The Court: ——proportionately. The objection is overruled. Go ahead.

A. Well, to control that train on a mountain grade, that being a train of coal and 160 loads——

Mr. Strouss: I don't believe you understood my question. I wanted you to explain to the Court how the brakes are operated. I mean, you have said there is an application of the brake that you used the engineer's brake valve in the——

A. Service position.

Q. And that causes——

A. The automatic operation of each and every one of those triple valves in that entire train.

[fol. 4288] Q. Your engineer's brake valve is up here on the engine?

A. On the engine, and the last triple is on that caboose in the rear.

Q. And when you apply the brake, you put the brake valve in——

A. Service position.

Q. Service position, and that causes——

A. The automatic operation of each and every triple valve throughout the train.

Q. How does it do that?

A. By reducing the brake-pipe pressure up on the head-end of the train, on back under each individual car as you go back to the rear end. With a train of that length, your service reduction would have to be—Well, I don't know just how on a 160-car train, but it would take, I would judge you wouldn't apply that brake under ten pounds.

Mr. Booth: Your Honor, the witness is guessing at it. We object to that, "I judge so and so," he is not producing the result of any experiments or personal knowledge.

The Court: Yes, I will sustain the objection as to that.

Mr. Strouss: What operates this brake on this last car [fol. 4289] back here?

A. The engineer's brake valve on the engine.

Q. Up on the engine?

A. Yes, sir.

Q. It is operated by the passing of a wave of air back through the air, or the taking out of air?

A. Yes, sir, the same thing. They are all operated in the same manner on all triples.

Q. Are there any peculiar methods used in braking trains in mountain territory, Mr. Cooper?

A. Well, we use different methods, we adopt them among the men mostly; our green book advocates about the same rule as the Southern Pacific in train handling, but we have adopted different methods from that in that book in order to assist us in handling the train.

Q. Well, among railroad men, are there different methods that have a common name?

A. Yes; we use what is called the "bridge" and the "overcharge" methods.

Q. And the short hold and the long hold?

A. Yes, the short cycle method of braking, the short cycle method is the approved method, but the men get away

from that at times on long trains, excessively long trains where they have trouble in maintaining their brake-pipe [fol. 4290] pressure in holding the train.

Q. What is the short cycle method of braking?

A. That is a method which I use myself exclusively, and it is what we call a slightly heavier reduction with a shorter hold, you get the brakes under them, and you feel them, you have them grabbed, why you kick them off, recharge, and do the same thing over, just a series of it, but it is among some of the men in train handling, it isn't the desirable way with them, because it creates the racing of a train more or less and a variation in the speed. Good train handling consists in maintaining a uniform speed, and where you are maintaining uniform speed you avoid to a great extent wheel heat and slack action to a great extent also, but there are certain dangers that go with the long hold, the bridge, and the overcharge methods.

Q. What is the long hold? Let us describe each of those methods.

A. The long hold is just the reverse from the short. You get the air under them and you hold it there as long as you can and ride the train. It is the bridge, the long hold is the bridge method, and the long hold is included in the overcharge method.

[fol. 4291] Q. What is the overcharge?

A. The overcharge method of braking a train, before you tip the summit, you put an overcharge in your brake pipe. An overcharge in a brake pipe is the pressure above the adjustment of the feed valve, or the train line governor, you put a false pressure back in the brake-pipe higher than the feed valve is set for, then when you descend the hill, start to descend, you have got that additional pressure to start with over and above your feed valve pressure, and by the leakage in the train, sometimes if you can catch it just right will start the application for you, but if it don't, why, just a slight reduction with your brake valve will give you the result, and then you ride it; and the dangers that exist in that and the reason that I have been away from it myself is, that you lose control of the brakes back on the rear of the train in that case, those that you apply, because if you want to release that brake, the pressure is so high in the brake-pipe and the frictional resistance so great that it is almost impossible to get a release

wave back on a long train to kick that brake off. The consequences are, it rides until it naturally leaks down itself to a point where you can kick it off.

[fol. 4292] Q. Are there any dangers?

A. Oh, yes. That is a bad one, lots of dangers exist there in busting of wheels, sliding of wheels, overheating, it takes the control away from the engineman. He should have control of that brake at all times, and he loses it with that method.

Q. Are there any dangers in connection with the long hold?

A. With the bridge method, I don't like the bridge method for the same reason. It has its dangers, the bridge method is simply a matter of getting air enough under a train to steady it at a given speed and then find the point on the valve body just where you can put the air into the brake-pipe as fast as it is leaking away. If there is no leakage in your train, you can't do a job of bridging. Possibly, the best leakage to do a job of bridging is four pounds to the minute, then you have a good train to bridge. You place your brake-valve handle between lap and running position just far enough that you open the port from the feed valve to the brake-pipe that will let the feed valve put the air in as fast as it is leaking away, and you are maintaining that pressure down the hill, and the trouble is, the fellows [fol. 4293] who use that, they hold it too long, and the longer they hold it the greater are the dangers. Now, for instance, a rubber seat valve on a triple valve leaking to such an extent that you can't hear it blow at the triple exhaust on an individual car back there with that long hold, why, that will put brake-pipe pressure into that brake cylinder, and so if you had a 90-pound brake-pipe to start with and you hold your train with about eight or ten pounds, you still have eighty pounds pressure in your brake-pipe, and in this long hold, that little leak in there that you can hardly hear will put that 80 pounds in that individual car, that is enough brake pressure to bust a wheel; if it doesn't bust it, it is going to slide it right now.

The Court: The court will be at recess until ten o'clock tomorrow morning.

(Thereupon, the court stood at recess until April 10, 1941, at ten o'clock A. M.)

[fol. 4294] 10 A. M., April 10, 1941.

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed.

TRACE H. COOPER resumed the witness stand.

Mr. Strouss: Mr. Cooper, yesterday you testified concerning the duties of a locomotive engineer. I have plaintiff's exhibit No. 320, rules and regulations of the transportation department of the Southern Pacific Company, rule 874, "enginemen must be alert in all matters pertaining to safety and while running must keep a constant and vigilant lookout, carefully note all signals, observe position of switches affecting their movement and watch for obstructions and defects in track. They must frequently look back for signals and indication of defect in train especially while rounding curves and approaching sidings." Are those similar to the duties which you have as a locomotive engineer on the Santa Fe?

A. Yes, sir, that is practically a standard rule.

Q. Yesterday you testified concerning the engineer's valve and stated that that valve had six positions and I be-[fol. 4295] lieve you described two of those positions, the release position and the service position. Will you now describe the other four positions of the engineer's valve?

A. The remaining four positions would be running position, holding position, lap, and emergency. Running position is the position in which the brake valve is carried while running along when the brakes are inoperative or not being operated rather. The feed valve is in control of the brake pipe while the brake valve handle is in that position and any leak that might occur in the train pipe throughout the train or any other leak of this kind is controlled by that valve. The main reservoir pressure flows to this feed valve and is there reduced to the brake pipe pressure, in fact it enters the valve at main reservoir pressure which in that position is 110 pounds and leaves the valve to the brake pipe at the reduced pressure of 90 pounds. That pressure is reduced by the means of a regulating spring and a supply valve which allows the pressure to flow through the valve and when the pressure flowing through the valve reaches a predetermined pressure or the adjustment regu-

lating spring, the spring reacts and closes the flow of air [fol. 4296] to the brake pipe. Any reduction throughout the train is taken care of in that manner by the feed valve. That is running position.

Holding position is exactly the same as running position only it is provided on the brake valve to hold the engine brakes applied during an automatic operation of the brake while releasing the train brakes. The only distinction between running and holding position on an automatic brake valve is that in running position the distributing valve release port is open and in holding position this port will be closed. The closing of that port in holding position holds the engine's brakes applied in holding position.

Q. Now lap position?

A. In lap position all ports in the valve are closed, that is the position we carry our brake valve in after we have made an application of the brakes. We return our valve to lap, that means all ports are closed except in one instance, some instances it is connected up, that is the high pressure pump governor is connected by way of the automatic brake valve. Lots of times that is connected direct to the main reservoir and does not come by way of the brake valve, but if it comes by way of the brake valve the port leading from [fol. 4297] the main reservoir to the high pressure pump governor will be open on lap.

Q. Now emergency position?

A. Emergency position is the position we use in an emergency case when we desire quick action throughout the train. By placing the valve handle in emergency position we open the largest ports in the brake valve direct to the atmosphere and exhaust all of our equalizing reservoir pressure and our brake pipe pressure direct to the atmosphere at the automatic brake valve through the emergency exhaust port. In an emergency position the equalizing piston does not move, it remains on its seat but we exhaust the pressure in another way and through a larger opening. When I place the brake valve in emergency position I immediately exhaust that pressure from the brake pipe equalizing reservoir on the engine and that exhausts the pressure in the brake pipe accordingly throughout the train. We have on the tank of the engine what is known as a vent valve, it is provided to insure emergency. If the emergency was failing to run rapidly enough to throw the

first triple into emergency, this vent valve is there to assist it, it just creates a larger opening to the atmosphere from the brake pipe, that is its purpose. That emergency action [fol. 4298] runs throughout the train——

Mr. Mason (Interrupting): Just a moment, the question was addressed to the position of the engineer's brake valve and nothing was said as to the action of the train. The rest of the statement is volunteered.

——Mr. Strouss:

Q. Will you please go ahead, Mr. Cooper?

Mr. Mason: I would like to have the question asked.

Mr. Strouss: I am asking him to explain the action of emergency on the train.

The Court: Objection overruled, go ahead.

A. When this reduction is made at the engineer's brake valve as I said before, it immediately exhausts all of the pressure from the valve body from the equalizing reservoir and the brake pipe. This creates the emergency reduction or the sudden reduction on the triple pistons throughout the train. It starts with the first one first and on back through the entire train through every triple piston. The reduction is so sudden by that heavy reduction in brake pipe pressure that the triple pistons will assume the emergency position. In that position they move their extreme length in the valve body and open a port known as [fol. 4299] the emergency port that allows the auxiliary pressure to flow to the top of the emergency piston, also to the brake cylinder, forcing the emergency piston down which unseats the emergency valve or the rubber seated valve, and that allows what pressure remains in the brake pipe to rush into the brake cylinder along with the auxiliary pressure. Those two pressures equalizing in the brake cylinder in emergency give you a slightly higher brake cylinder pressure in emergency than it does in full service.

[fol. 4300] Mr. Strouss: Now, Mr. Cooper, does the length of the train have any effect upon the braking of the train?

A. Yes, sir; the longer the train the longer it takes the brakes to apply.

Q. Will you just explain how that is in an application of the brakes first?

A. Well, in applying the brake, we start our reduction at the head end of the train, and that reduction necessarily has to pass back through the entire train to every car in the train. It starts with the head car first, and then goes to the second car and on back, and the more cars you have in the train, the longer it takes to apply them, quite naturally, because the reduction has to go throughout the entire train. If I wanted to apply the brake on a 70-car train, I would have to make that reduction on that triple valve 70 cars away from the engine. If I want to apply it on a hundred car train it is just the same, no difference.

Mr. Mason: Your Honor, I haven't offered any objection to this testimony on the ground that it is not proper rebuttal, but so far I am mystified as to what, if anything, it may be in rebuttal of, what the purpose of the testimony is. [fol. 4301] Do I understand that it is the State's contention that the brakes on our trains are inadequate to control trains of more than 70 cars; is that the State's contention?

Mr. Strouss: If the Court please, I am surprised quite a little if I understand the defense to say that they have presented no evidence here that this law has any purpose in the aid of safety. Then I move the Court for judgment for the plaintiff, because certainly if there has been no showing here that there is a purpose in this law to protect property and life, if there hasn't been any evidence on the part of the defense, and I am in accord with Mr. Mason, I don't think there has been, then certainly we are entitled to judgment against the defendant, because there cannot be any showing of any unconstitutionality without showing that this law was not enacted in the aid of safety.

Mr. Mason: Now, do I understand then that this testimony purports to be in rebuttal of our safety showing?

Mr. Strouss: It is for the purpose of showing, I think it is quite evident to the Court if not to counsel, that this evidence is for the purpose of showing that this law has as [fol. 4302] one of its purposes safety.

Mr. Mason: Safety in what respect? Limitation of trains to the length that can be controlled by the type of airbrake? This is airbrake testimony, and presumably it is addressed to the point that trains must be limited to 70

cars in order to control them. Will you say yes or no, Mr. Strouss?

Mr. Strouss: I don't think I have to go into detailed explanation at this time of my testimony. The law has for one of its purposes, the safety of persons and property.

Mr. Mason: Now, your Honor, the law purports to limit freight trains to 70 cars and, as Mr. Strouss says, that is for the purpose of safety of persons and property. I take it, that it is a maintenance of employment first. If the law's ostensible purpose is to limit trains to 70 cars and no more, it must be because trains of greater length are unsafe to operate. Now, this is all airbrake testimony; this testimony must be for the purpose of showing that with the types of airbrakes used on Santa Fe trains, trains of longer than 70 cars cannot be controlled and stopped. Is that its purpose? Why are we dealing with the subject of airbrakes [fol. 4303] except for the purpose of showing that they do or do not control trains?

Mr. Strouss: I don't think I am required to sit here and answer counsel's questions.

Mr. Mason: I want to know what this is in rebuttal of. All this testimony of airbrakes is plucked out of thin air so far as our case is concerned. If it is rebuttal, what is it rebuttal of? If it is to show that the law is unconstitutional, if so, in what respect and for what reason. We were not ourselves backward in stating the purpose of our testimony whenever it was questioned. Is there any mystery about this, Mr. Strouss?

Mr. Strouss: Now, if the Court please, our rules require, if I remember them correctly, possibly counsel haven't read the rules of the courts in this state, that they address themselves to the Court and not to counsel. I don't think I am required to sit here and answer questions of counsel.

Mr. Mason: Your Honor, I move that all this testimony be stricken, and further questions along the same lines, that an objection be sustained on the ground it is not proper rebuttal.

The Court: The motion to strike will be denied. Pro- [fol. 4304] ceed.

Mr. Strouss: Now, Mr. Cooper, will you just explain in the same way, the effect an increase in the length of the train has upon your releasing the brakes in the train?

A. We experience more or less trouble in releasing

brakes on trains as the length varies. After I have applied the brake on the train, and I do that by taking the pressure from the brake pipe, now, I have got to return that pressure back into the brake pipe. My source of supply is the engine.

Q. What do you mean, you have to return that back into the brake pipe?

A. To recharge it for another brake application, or to release the brake. My source of air supply is the main reservoirs on the engine, and when I am ready to release the brake, I place my brake valve in release position, which starts a release wave from the main reservoir through the train to each and every one of these triple pistons. Now, our trouble in that, the longer the brake pipe the more air we have to use, and on a brake pipe reduction where the pressure is reduced in it, when we attempt to release we are up against that resistance in that brake pipe in addi- [fol. 4305] tion to what other resistance there is in the pipe to build the pressure up to force the triple piston to release position, so that I can again effect a recharge. As an illustration of forcing the pressure back against the pressure in the pipe, may I just say as an example that you have a flat tire on your automobile. When you go to pump it up by hand, when you first start to pump that tire up, there isn't much resistance, but as that pressure increases in there, you work harder to get it in there. That is what we are up against in forcing a release wave back through these long trains to get the brakes released, and we don't start our recharge to replenish our pressure there until the pressure has forced the triple piston to release position, and then we have to put the pressure back into our auxiliaries through a tiny opening not any larger than the small end of a toothpick. Now, you figure one hundred cars, say they were 50-foot cars, or 40-foot cars, 40-foot cars would be 4000 feet, 50-foot cars would be 5000 feet, that 100th car is 5000 feet from its source of supply, and I have to force that pressure back from this engine to that triple valve to kick that brake off and recharge it, and in mountain grade braking we don't have the time, before we [fol. 4306] can get that pressure back to the rear end after making a brake application our train is gaining in momentum to such an extent that we have to go after them again, and after about the second application that way, we don't

operate the brakes on the rear end of trains of that length, we are just helpless.

Q. That is in mountain operation?

A. Yes, where you are working the brakes continuously down the grade.

Q. As you make an application, then release and grab them again after they have picked up momentum?

A. Yes, sir.

Q. And that there isn't time between the release and the application to build up the brakes again?

A. Yes, sir.

Q. Now, you spoke about leakage a while ago. Has that any effect upon your brakes?

A. Brake pipe leakage is considered one of the detriments to the airbrake system; it applies the brakes harder than the engineer desires, it creates pump labor, it is instrumental in damage to equipment, wheels, and everything else.

Q. Is there any fixed leakage which you are permitted to have in your train, or limitation upon the amount of leak- [fol. 4307] age which you are permitted to have in your train before you can leave a terminal?

A. On the Santa Fe we are allowed five pounds per minute permissible. If there is more than five pounds' leakage in a train, we are permitted to make a stand on it, but they still reserve the right that we will leave with the train with more than that leakage on an order from the superintendent.

Q. Now, is there any difference in braking of loads and empties?

A. Yes, sir.

Q. What is that?

A. When you load a car you decrease the brake efficiency on that car to the extent of the load. In other words, an empty car is much easier to stop than a loaded car on account of the weight. We put the same brake cylinder pressure into a loaded car as we will into an empty car, and it might not have any effect on it at all on holding it, where that same amount would stop the empty. It is the loading of the car that decreases the brake efficiency. We use the same cylinder pressure at all times, but it decreases in efficiency as you load the car.

[fol. 4308] Q. What about in mountain operations, the picking up of speed?

A. A load will gain its momentum a great deal faster than an empty, and we use more air to hold it, requires more brake cylinder pressure to hold it, consequently it requires more air.

Q. Now, in exhibit 152, the Santa Fe green book, appears this statement: "The difference in grade over which the train may be passing when the brakes are applied—for example, one portion of the train may be on an ascending grade, when the grade would assist the brake in stopping the cars; and another portion of the train may be on a descending grade, in which case the grade would oppose the effort of the brake to stop the cars. Such a condition requires care and judgment on the part of the engine man as regards the time and manner of operating the brake to prevent as far as possible severe shocks and strains due to the action of the slack in the train." In your experience, have you found that to be true, Mr. Cooper?

A. Very much so. That covers, Mr. Strouss, the handling or controlling of slack on what we call hogback country, where one part of your train is ascending and the other [fol. 4309] part is descending. It is a critical condition for an engine man to have to use his brakes while the train is in that position, but sometimes it arises where it is necessary, he gets a flag or something, and he has to stop, and there is no way on earth of making a quick stop under such characteristics as that that you can avoid terrific slack action in a long train.

Q. Now, at page 17 of Exhibit 152, there appears this statement: "Shocks are caused by the difference in holding power and speed throughout the train, and to consequent running of the slack. The longer the train the greater may these differences become." Have you found that to be true in your experience, Mr. Cooper?

A. Positively so.

Q. Now, yesterday you testified concerning the use of the conductor's valve. Are there any peculiar dangers in respect to that valve?

A. There is in this respect, that when the conductor's valve, that is the valve on the caboose, when that valve is used it is because, generally speaking, that they fail to get a signal to the head end due to the position of the train or something, and the conductor is attempting to stop the

train for some reason or other, and the engine man doesn't [fol. 4310] know anything about it, and that is where the dangers lie. Now, if this engineman should receive the stop signal after the conductor has started that reduction on the rear end, and of course, when he gets his signal he is going to try to stop too, and you are making the reduction from both ends then, or trying to, and that is nothing less than a calamity. We have lots of break-in-two's from the use of that valve and lots of rough handling because of that misunderstanding. It is not necessary at any time to use the conductor's valve, if they can get the signal to the head end any time, except in time of emergency, of course, the train in the ditch or something, the conductor widens on the valve and stops it. We have a new valve, we call it new, which has got an improvement over the old valve that we formerly had, and it has about five positions on it. That valve can be opened in its first position without doing any damage to the train, in my opinion, if you will permit me to express it, but it won't hardly stop the train. The opening in that first and second position in that valve is so arranged that the opening is just a little bit larger than the opening in the feed valve on the engine, [fol. 4311] which is putting air into the brake pipe at that time as the conductor is taking it out, consequently, that makes a very gradual reduction on a train, and you will run a long ways and the trouble is the trainmen, when they are using that, they lose their patience and they get it too wide. Now, if the engineman——

Mr. Mason: Just a moment. I think that has gone about far enough in the matter of hearsay. The witness obviously is not in position to tell what the trainmen do in the caboose because he is in the engine. Is this based upon your own personal observation?

A. No, I never saw the conductor apply the air on me.

The Court: Well, I will sustain the objection as to the action taken by the conductor, of which this witness has no knowledge. I would like to ask this question, Mr. Cooper: I understood you to say that as an engineer there were six different positions that you could place this in in stopping your train or using these airbrakes. Now, is the conductor limited to one?

A. May I explain that to your Honor? I stated there are six positions of the engineer's automatic brake valve. There

is only two of those positions in which I am taking the air [fol. 4312] out of the brake pipe to apply the brakes. The other three positions I am putting air into the brake pipe to keep the brakes released and recharged.

[fol. 4313] The Court: How many positions does the conductor have?

A. The conductor has just a simple valve, and what I mean by the six positions, maybe I am wrong in that, there might be only five, I have looked at the valves but not so carefully, but the first position opens the opening to the brake pipe so much. The second position gives her just a little bit more opening and when he gets it all the way down he has it all the way open, wide open. He does that not to make it all at once and throw the train into emergency.

Mr. Strouss:

Q. The different positions simply determine the amount of reduction that is made?

A. He has no way of determining the amount of reduction. He has a gauge and can see the reduction it goes down to but what I mean, it is not an automatic operation with him back there like it is with your brake valve. It is just a straight cut-out cock and he opens it up a little bit at a time by these different positions. It is a different arrangement, it is not a brake valve at all. It is a valve provided for emergency only and they are not required to use it unless they think it is an emergency.

Q. Yesterday in describing the brake equipment you [fol. 4314] mentioned the retainers. Those are only used in mountain operation, isn't that true?

A. Yes, sir, mountain operation.

Q. They are located where on the car?

A. On a boxcar they are located up near the running board, that is the top of the car, anywhere from a foot, some of them are a little bit further down probably from the top of the car. On a tank car they are generally on the side and on a flatcar or gondola they are on the end of the car.

Q. When those are in use, what is done with the retainer?

A. When you want to use the retainer?

Q. Yes.

A. The retainer is used to maintain a certain portion of the brake cylinder pressure during the release of the brakes. The single retainer, as we call it, is generally a weighted valve and we have the three-position retainer which is

operated with a spring also, ten and twenty pounds. This single weighted valve would retain fifteen pounds brake cylinder pressure in the brake cylinder while the brake was being released in this way. The retainer is connected onto the exhaust pipe from the triple and all the brake cylinder pressure must go out this pipe and by this retaining valve. [fol. 4315] As long as the pressure in the brake cylinder exceeds the weight of that valve, which is fifteen pounds, it will hold it up off its seat and the air will blow out to the atmosphere but just as soon as the weight exceeds the pressure the weight will drop to its seat and stop the flow of air and retain it in the brake cylinder.

Q. When the retainer is in use there, how is it put in use? Is there a handle or something to turn it?

A. There is a handle on the retainer. When the trainmen who operate the retainers are required to use them, they go over the top of the car and they turn these handles up into operative position. When the handle is down, it is cut out completely, it doesn't operate and they do that on each and every car on which they wish to operate the retainer.

Q. Would that be all of the cars in the train?

A. All of the cars are equipped with retainers.

Q. They wouldn't use all of the retainers?

A. No, no, not as a rule where the retainers are in use. They alternate them, turn them up here, one here and one there and alternate them so that in case of wheel heat developing from their use they will go over and alternate [fol. 4316] them, cut this one out and cut that one in.

Q. Are there any dangers in connection with the use of retainers?

A. Yes, sir, they are hazardous for the trainmen to operate in the first place and they create undue wheel heat.

Q. That is because the brake is kept applied?

A. Applied all the time, they never let the brake release, very seldom. If the retainer is holding to any length of time at all, it will never let that brake release, consequently you will never get any relief until you stop the train and cool the wheels.

Mr. Mason: Your Honor, I should like to have some explanation of the pertinency of this testimony. I don't like to object and keep interrupting but I don't see what pertinency rebuttal testimony respecting retainers has insofar

as the defendant's lines are concerned. I am informed from what I consider good authority that retainers are not in use at all on defendant's lines in Arizona or New Mexico between Yuma and El Paso. I don't know how much they are in use on the Santa Fe but I am informed also on what I consider good authority that they are not in use between Barstow and Seligman where this witness operates.

[fol. 4317] Mr. Strouss: We have in evidence, if the Court please, the Southern Pacific timetables. If they are not in use, they have a rule that provides for the use of them, on page 10 of Tucson division timetable, exhibit No. 175 under the heading "Air Brake Rules, Rule 43, Retainers will be used on grades of 1.4 per cent to 1.5 per cent on freight trains of less than 110 M's per operative brake when necessary in the judgment of conductor and engineer; on freight trains averaging 110 M's and over on grades of 1.4 per cent to 1.5 per cent, and on all freight trains on grades of 1.5 per cent and over retainers will be used as follows: 1.4 per cent to 1.5 per cent, inclusive, one retaining valve for every 150 M's; over 1.5 per cent to 1.8 per cent, inclusive, one retaining valve for every 140 M's. Over 1.8 per cent and so forth."

Mr. Mason: Now, if your Honor please, this exhibit to which Mr. Strouss now refers was introduced at his request. It is true it was introduced through Mr. Baker, one of our witnesses, but at his request and he is in effect rebutting his own testimony or explaining it, if that be the proper word. In the second place, there are no grades between El Paso [fol. 4318] and the Arizona line in excess of 1.4 per cent as his own testimony shows, as the profiles that he has introduced in evidence show. So he is undertaking to rebut that which he has himself introduced. They are simply exploring something, however it may be of academic interest, it is not proper rebuttal and is irrelevant and immaterial.

The Court: The objection is overruled. Proceed.

Mr. Strouss: Will you read the last question.

The Court: We will take our mid-morning recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows)

The Court: You may proceed.

Mr. Strouss:

Q. Mr. Cooper, just before recess you testified that one of the dangers in the use of retainers is that it will hold the brakes on too long and heat the wheels?

A. Yes, sir.

Q. Is one of the duties of the engine crew as well as the train crew to observe the train during operation, to notice any indications of wheel heating?

A. Yes, sir, we have to watch that very carefully, especially where retainers are being used.

[fol. 4319] Q. When some indication of wheel heating is noticed, what is done?

A. The usual thing is for the trainmen to go over the train and turn it down to release the pressure. That creates a very dangerous thing for the brakeman.

Mr. Mason: I object to the remainder of the answer as voluntary.

The Court: Yes, it may be stricken.

Mr. Strouss:

Q. In the application of brakes—a question I intended to ask before—is that a straight application of air from the engineer's valve to the brake?

A. Not on our trains. It is an automatic brake on our trains. We have straight air on some of our switch engines and things like that and if you will permit me to explain the difference in that between an automatic brake and a straight air brake. A straight air brake is operated by taking the pressure at the reservoir and putting that pressure direct into the brake cylinder and forcing the piston up and applying the shoe to the wheel and when you release it, it is the same way, there is no automatic operation in the straight air brake. We have the straight air on a lot of automobiles and busses and things like that but on a freight train we [fol. 4320] have the automatic brakes. When we apply the brake on a freight train, it is necessary that we break the equalization. It is based on equalization. We put the same amount of pressure on a triple piston, the valve that operates the brake on that car, we put the same amount of pressure on both sides of it. We have brake pipe pressure on one side and when the brake is fully charged we have auxiliary pressure on the other side, the piston is floated. In order

to apply that brake on each of those cars throughout the train, it is necessary that a reduction in brake pipe pressure be made to break that equalization. In other words, we break it by decreasing with the automatic brake the brake pipe pressure on the brake pipe side of the triple piston. Now, that breaks the equalization. I reduce this pressure here below this pressure here. The piston is just floated in the cylinder. Now as soon as that pressure is reduced over there, this greater pressure will force the piston to move to the weaker pressure and when it moves it carries with it the slide and graduating valve which are attached to the piston stem and it moves over there and registers the port which allows the pressure on this side now to flow to [fol. 4321] the brake cylinder until it is a little bit less or equalization again effected so that the brake pipe pressure will force it back to its lap position. That is the automatic operation. That is the distinction between an automatic brake and the straight air brake.

The Court: But you only use the straight air brake on switching?

A. There are very few switching engines any more that use it. Some of them of the older type still use a straight air valve but they are not in use on trains.

Mr. Strouss:

Q. Do you know what type of triple valve or air brake is used on the cars that are operated over the division that you work in?

A. Yes, sir.

Q. What types are they?

A. The triple valves?

Q. Yes.

A. We have the K-2 valve and some AB valves.

Q. Your AB's, are those of a type that you can tell them by their appearance?

A. By their appearance, yes, sir.

Q. Do you have very many of those in trains that you have operated?

A. We have some, yes. All of our later equipment in the [fol. 4322] boxcars and refrigerator cars are equipped with the AB but none of our old equipment has the AB on it.

Q. About what percentage of the equipment that you have worked on would you say is equipped with the AB?

Mr. Mason: I object to that on the ground the witness is not qualified unless some foundation is laid.

The Court: The objection is sustained.

Mr. Strouss:

Q. Have you observed the cars in trains on which you have been the engineer?

A. Yes, sir, I have observed any number of them.

Q. And observed them with respect to the triple valves that were part of the equipment on those cars?

A. Yes, I have taken an interest in that. I am interested in knowing how many of them we would have in a train and lots of times I ask the carmen as they go over the train as to how many AB's we have got. I don't think I have ever had a train out any time that consisted of——

Mr. Mason: (Interrupting) Just a moment. I ask that that answer be stricken after the reference to the inquiry [fol. 4323] of the carmen and I would like to inquire a little myself.

The Court: Yes, the answer may be stricken and you may take him on voir dire.

Mr. Mason:

Q. How many trains in actual number have you actually checked personally and without reference to inquiry from the carmen as to the number of AB's?

A. Mr. Mason, the engineer has generally got other duties to perform besides going back on a train to look at those individual trains.

Mr. Mason: I ask that the answer be stricken as not responsive and the witness be instructed to answer the question. Will you please read the question, Mr. Reporter? May I have the answer stricken?

The Court: Yes, it may be stricken.

Mr. Mason: Will you read the question?

(The question was read by the reporter.)

A. Do you mean trains I am going to handle or trains I have seen going by?

Mr. Mason: Trains that you were handling.

A. I have not checked any of them.

Q. Have you gone down to the yards or stood on the sidings elsewhere and checked trains going by to see how many AB's there were and counted them?

A. Yes, I have.

[fol. 4324] Q. How many?

A. Probably one or two that I have been interested in and looked at them.

Q. I understand you have never checked any train that you were handling and only one or two others?

A. Not the AB, no; go back and look at them.

Mr. Mason: That is all.

Mr. Strouss:

Q. Since the AB valve has been in use on the Santa Fe, have you noticed any difference in your ability to control slack action in the train?

A. No, I have not noticed any difference whatever. We don't have enough of them to make that I don't believe.

Mr. Mason: Your Honor, I will ask that the last portion of the answer be stricken.

The Court: The last portion of the answer may be stricken.

Mr. Mason: He does know how many we have.

Mr. Strouss:

Q. Have any difficulties with respect to train handling developed since the AB brake has been in use?

A. Yes, sir, if you will permit me to explain why I say "Yes."

Q. If you will explain.

[fol. 4325] A. Prior to the introduction of the AB brake we had practically eliminated undesired emergency to a great extent. We had it at times but the introduction of the heavy spring into the K had it practically eliminated or we felt so anyway. When the AB brake was introduced about the latter part of 1933 and the early part of 1934, we again were up against undesired emergency in most every train we would get that was equipped with an AB brake. In fact, we know that the AB was causing the trouble because we would cut them out and get away from it. We could never get them to kick standing but as soon as we got them to running it was just one kick after the other. The trainman would go along and cut out the AB brake and eliminate it.

The Santa Fe at that time had instructions out that we must stop with our undesired emergency and make the required test and report it by wire to the next terminal. Now we have got so much of that that they have canceled those instructions and we no longer make any report on them whatsoever. When they kick with us, we take it on the chin, do the best we can and go on.

Q. Does the engineer have any duties in connection with observing the train, Mr. Cooper, that is, while the train is running?

[fol. 4326] A. Yes, sir, that is part of our duties. The rules require that we keep a lookout for any defect within our vision that we can see. We are supposed to watch the train the same as the trainmen are.

Q. What part of the train are you expected to observe?

A. That is the head portion of it where the engine is attached. I can only observe a portion of it. My duties require me to keep a lookout most of the time the way I am going but on curves and things like that we take our observation, especially where we are braking a train down a hill, we watch to see how the train is braking; at night-time to see how the fire is flying and look for any defect that might occur, a hot wheel or anything that might cause us trouble.

Q. Brake rigging down?

A. Yes, that is one of the things, wheels sliding, brakes stuck, brakes failing to release.

Q. What effect, if any, does the length of the train have on the performance of that duty?

A. The trains get so long at times that we cannot inspect them, we cannot see, we are limited to vision.

Q. Referring to defendant's exhibit No. 118, the engi-
[fol. 4327] neer's duty with respect to observing that train would require him to observe back——

A. (Interrupting) Yes, his duties would require him to observe any defect that occurs in that train, but his eyesight is not good enough, he can't see that far, he couldn't observe it.

Q. Is it ever necessary for the engineer to communicate with the crew on the rear of the train?

A. That might be as to his orders or something like that, yes, it would be necessary in that manner.

Q. Or for the crew on the rear of the train to communicate with the engineer?

A. Yes, if they want to issue some instructions to the enginemen or conductor, it is necessary for him to come over there to do it. The Lord knows he can't talk from that caboose to that engine.

Q. Does it occur occasionally while a train is moving that it is necessary for communication between the crew on the rear of the train and the engine crew on the engine?

A. Oh, yes, that develops. The conductor might pick up some instructions or something on the rear of that train as they go by an office and he might want to communicate it to the head end someway or other and he has no means of doing it.

[fol. 4328] Q. How do they ordinarily communicate?

A. Why, that is by signals, hand signals.

Q. And how are those given?

A. Why, if he wants me to stop, he gives me a stop signal.

Q. And at night?

A. A fusee is a signal at night, they will crack a fusee and when we see it from the head end, we immediately stop, because we know that is what he wants.

Q. And now, where is the signal given from?

A. He will start the signal from the caboose here.

Q. In other words, in order to communicate between the train crew on this train and the engine crew, it is necessary for the enginemen on that end to see the signal given by the trainmen back here in the caboose?

A. Absolutely, unless the conductor had started a trainman over the train while it is running there to give the signal.

Q. You would either have to see the signal back here or ask trainmen on top of the train to pass the signal?

A. Yes. It is impossible, the limit of vision, to see the length of the train while you are running along on account [fol. 4329] of the dust and weather conditions, you couldn't see a signal on that caboose in the daytime. At nighttime now, we get our signals transmitted easier than in the daytime, because I can see the red flare. In the daytime it is an impossibility. That is ridiculous, a train of that length.

Mr. Mason: I don't know but that the last remark should be stricken as volunteered. The witness doesn't claim any knowledge of conditions on the Chesapeake and Ohio. This

train was testified to by the assistant to the president of that road, as being typical of trains operated on the Chesapeake and Ohio.

Mr. Strouss: Is your ability to start and stop a train affected any by the length of the train, Mr. Cooper?

Mr. Mason: I object to the question, and again I suggest that unless it be the contention of the State that there is some issue in this case as to the ability of the brakes to function properly to control and stop trains of more than 70 cars, the question and the answer are immaterial and irrelevant, as well as not being proper rebuttal.

The Court: The objection is overruled.

[fol. 4330] A. Yes, sir.

Mr. Strouss: Will you explain that?

A. The longer the train, quite naturally the heavier it gets, and requires more pressure to charge the train. It is a lot easier for an engineman to handle a train of reasonable length than it is to handle one of an unreasonable length, due, as I explained here, the matter of handling that train successfully and controlling the slack in it on these grades, for every car added to that train we add just so much slack. With the older equipment, that slack will run from ten to twelve inches per car; on the newer equipment it has been reduced some, they have added heavier equipment, and cut the slack down to probably, I would say, seven or eight inches per car, but with 70 cars and on an average of eight inches of slack, we will say, to the car, with 70 cars that would be 560 inches of slack in that train that I have got to control, and in the operating of the brakes, we have to take that into consideration, it is a prime factor, the slack. Now, we will apply the brake on the train, on the long train, in fact, it is easier to apply the brake on a long train while it is fully charged than it is to release that brake after you apply [fol. 4331] it, for this reason, in applying a brake, taking a hundred-car train and applying the brake on it with the quick service features of our K valves, I can probably apply that brake on that 100 cars with everything fully charged up with about a seven or eight-pound reduction in the brake pipe. I will apply it, I am starting with a 90-pound brake pipe, and make, say, a seven-pound reduction on it, and I get the brake applied on the rear end of that 100-car train; now, it is up to me to release that brake from the engine,

and I have got to build the pressure up through that enormous brake pipe, 100 cars there probably, if it is 50-foot cars, I have five thousand feet to force that air back through that train pipe and kick that brake off back there, and I am forcing it back against all that resistance in the brake pipe. After I have forced it back there and got the triple to release position, if I have time to do it, then the recharge starts, then I have to wait until the air can equalize back there to re-apply that brake. That is the trouble we experience on our grades, our inability to keep the rear end of those long trains charged up while descending these grades, and it results in the failure to operate the rear end of the [fol. 4332] train, the brakes are absolutely worthless. While the law gives us 100 per cent air, we haven't got it because we cannot get it there.

Q. Now, does the length of the train have any effect upon the distance within which you can stop that train? That is, will that distance increase or decrease?

A. Yes, sir, it will take you longer to stop those long trains than it does a shorter train because you have the slack to take care of in that, you have to control it. Of course, if a train is longer, naturally it is going to be heavier.

Q. Do you have any grade crossings in your territory, highway grade crossings?

A. Yes, we have a reasonable amount of them.

Q. Are there any problems, engineer's problems in connection with operating through territory where there are a great many grade crossings?

A. Yes; he has to be alert at places like that, at these crossings, and we are up against it all the time. Many narrow escapes at them, and lots of times they don't escape, these automobiles, trucks, and things, and we have to be on our guard at crossings. We don't have so many of them in the desert country where I am operating at the present [fol. 4333] time, we have only possibly two or three that amount to anything there, but other parts of the country we have plenty of them.

Q. Now, a train approaching a crossing, where it would appear that it might strike an automobile, what will the engineer do to avoid it, what can he do to avoid striking that automobile?

A. Well, he has the emergency feature on his train and he is permitted to use it in case of a life or loss of property like

that, but I have seen such results from the use of that where the trainmen were off their guard, that I have always promised myself faithfully that I am going to give that fellow on the caboose as much consideration as I am this fanatic driving this car, because I have seen that happen, big-holing a train unexpectedly to trainmen, I have seen it put them in the hospital.

Q. If you attempt to stop a train under those conditions, would it be necessary to use the emergency application of the brake?

A. To avoid the accident, possibly so.

Q. And have you any opportunity to bunch slack?

A. You have no time to prepare for your stop. An engineman that uses any common sense in train handling, Mr. [fol. 4334] Strouss, if he knows he is going to make a stop, with these long trains especially, or with short trains, as far as that goes, he starts back at a good reasonable distance to make his stop. He does that in order to get control of his slack, but where these sudden stops are forced upon you where you have to make them now, you have no chance for preparation to make the stop, and you just take it on the chin, and the trainmen do likewise.

Q. In your experience in operating engines, is there any length of train which you as an engineer feel that you can safely handle and control the slack?

A. Well, that is a hard question to answer. I have seen slack action in short trains, but of course, I have seen it worse in the longer trains, but I have always liked, just a personal like, about handling a train of anything around 60 to 65 cars makes a nice train, anything below that up to 60 or 65 cars, makes what we consider a nice train.

Q. And as your length of train would increase over that, do your problems in safely controlling that slack increase?

A. Yes, sir.

[fol. 4335] Mr. Mason: Your Honor, I will ask that the answer be stricken. That is one of those leading questions——

The Court: Yes.

Mr. Mason: When counsel wants to argue the case with his witness, I think that is going too far; I think the question and answer should be stricken.

The Court: The question and answer may be stricken.

Mr. Strouss: As the length of the train increases, what, if any, effect does it have upon your ability to safely control the slack in the train?

A. You increase the length of the train and you increase the slack in the train, because every car added adds just that much more to it, and quite naturally, if you have a long train you have more slack than you have in a shorter train, and it is more difficult to control because there is more of it.

Mr. Strouss: Take the witness.

Mr. Mason: If your Honor please, there are some features of this testimony, as to which I should like to take more time. I would rather defer cross-examination of Mr. Cooper if I may to a later convenient time. I assume Mr. [fol. 4336] Strouss will have no objection to deferring cross-examination.

Mr. Strouss: Oh, no. Of course, I don't like to keep Mr. Cooper here any longer than possible. I would like to complete his examination so that he can leave this week.

Mr. Mason: Yes, I can do that.

Mr. Strouss: I am willing that they have the time. I like the same courtesy shown to me that I showed to them, that the witness be examined so that he can get away as early as possible.

The Court: Certainly.

Mr. Mason: I will release him as soon as possible.

The Court: You may step aside, Mr. Cooper.

[fol. 4337] E. J. Durnil was called as a witness in rebuttal and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Strouss:

Q. Will you state your name, please?

A. E. J. Durnil.

Q. Where do you live, Mr. Durnil?

A. Tucson.

Q. What is your business?

A. I am a conductor with the Southern Pacific Company.

Q. What experience have you had in railroading, Mr. Durnil?

A. Approximately 30 years.

Q. Will you just state that experience to the Court?

A. Well, I was a brakeman, starting out as a brakeman, was promoted to conductor March 26, 1917. I worked alternately from 1917 as a brakeman and conductor up to about 1935, when I then became a regularly assigned conductor. At the present time I am holding an assignment as conductor between Tucson and Lordsburg, New Mexico.

Q. Is that in freight or passenger service?

[fol. 4338] A. Freight service.

Q. Now, has all of your railroad experience been with the Southern Pacific Company?

A. No, no, I was first employed as a brakeman by the Atcheson, Topeka & Santa Fe at Clovis, New Mexico, from 1910 to September, 1912. Following that I was employed by the Union Pacific at Denver for a short period, then the Oregon Short Line at Pocatello, Idaho, and came to the Southern Pacific Company in December, 1912.

Q. Over what territory have you worked?

A. I worked over the entire territory from Yuma, Arizona, to El Paso, Texas.

Q. What territory are you working on now?

A. Between Tucson and Lordsburg, freight service, also, I do extra passenger work.

Q. You do, then, some passenger work?

A. Yes, sir.

Q. Does the Southern Pacific Company have rules relative to the duties of conductors and brakemen?

A. Yes, sir.

Q. And are you required to pass examinations covering those rules?

A. Yes, sir.

Q. Will you in your own way, Mr. Durnil, explain to [fol. 4339] the Court, the duties of a brakeman, beginning when he first is called for duty.

A. The first duty of a brakeman, he must have a standard watch, must have that watch inspected twice each month, semi-monthly. Reporting for duty in some terminals, he signs a register showing the time he goes on duty; he then reports to his train, performs the duties of preparing his caboose; if he is the flagman, the placing of markers, lighting his lights, marker lights, and his red lights, inspects his train to let off hand brakes; some trainman, swing, brakeman, he performs the same, except he makes a check of the train, taking numbers, initials, and

classifications of the cars, gives that check to the conductor; the head brakeman, he lets off brakes preparatory to the train departing from the terminal. After they leave the terminal——

Q. Does the head brakeman go to the roundhouse to accompany the engine when it cuts into the train?

A. At Lordsburg and at Gila they do, but at Tucson, Yuma and Phoenix, they do not. The yard men place the road engines on the trains, and after the engine is placed on the train, the brakemen are supposed to know [fol. 4340] that the engine is on, then they release the hand brakes if there are any handbrakes set.

Q. Now, are there further duties before their run begins?

A. That just about constitutes their initial duties at the terminal.

Q. Is that true of all terminals, or are there some places where the trainmen are required to assist in testing the air?

A. At Lordsburg, New Mexico, and Gila, Arizona, the trainmen get their engines from the roundhouse, perform whatever necessary switching may be done, and when the engine is attached to the head end of the train, they make a terminal air inspection of the train. After the pressure is brought up to 80 pounds on the caboose, the engineer makes a reduction of the air, the brakemen make a personal inspection of each car in the train to ascertain if the air is properly working in every car. If they find it is, they give a release signal and the engineer releases the air. Should they find any cars in the train with the air cut out, they are supposed to notify the conductor and those cars are supposed to be switched immediately ahead of the caboose and brought to the next terminal where the car inspectors make the necessary repairs on the car. If the [fol. 4341] train is O. K. to go, then the trainmen permit it to roll by out of the terminal to see that all the brakes are properly released.

Q. What do you mean by "permitting it to roll by?"

A. The engineer takes the train out about eight miles per hour, and the trainman stands still and watches the car roll by, particularly noting that the air is released on all these cars.

Q. Now, will you continue with the duties of a brakeman while the train is in operation?

A. After the train is in operation, the first duties of the trainmen is to familiarize himself with the train orders, particularly note the conductor's train register of overdue, superior trains, also, confer with his timetable of any immediately due superior trains, and see that the orders are fulfilled. If he notices any overdue superior trains, it is his duty to call it to the attention of the conductor and the engineer. That is the limit of responsibility of the brakeman, so far as orders is concerned. He then watches and observes the train on both sides while in motion, notices the position of train order boards. When the train is stopped, it is necessary that they pick up and set out [fol. 4342] cars; in setting out cars it is necessary to secure the car by hand brake, also in picking up into the train they are supposed to see that the hand brake is released, and take particular attention that the air is properly working in the car picked up.

The Court: Can those hand brakes on any individual car be released other than from the top of the car?

A. No, sir; they also load or unload any merchandise that may be required to load; they brass cars when necessary, cut the air out of cars when necessary, and make proper report to the conductor, or if they note any defects in tracks, bridges, or any other irregularities, they are supposed to report them to the conductor or the engineer that proper reports may be made to the superintendent; supposed to cut road crossings, pay particular attention to traffic over those crossings when other trains are approaching to avoid any accidents, and are under the general supervision of the conductor as to any other duties that may be required of them.

Mr. Strouss: Have they duties with respect to passing signals?

A. They are supposed to pass signals from the rear to [fol. 4343] the head end of the train, and to the engineer.

Q. Have they any duties with respect to flagging of trains?

A. Yes, when a train stops, under circumstances in which it may be overtaken, the flagman must proceed back immediately with the proper flagging equipment, which consists of, daytime, red fusees, red flag, and torpedoes; at night time, the red lantern, white lantern, fusees, and torpedoes.

The Court: How far back is the rear brakeman supposed to go?

A. He is supposed to proceed back at least one quarter of a mile and place one torpedo, proceed on back at least one-half mile and place two torpedoes, return to his one torpedo, if recalled, he is supposed to take up his one torpedo, and by night leave a red fusee burning. That is prescribed, known as Rule 99 of the Rules and Regulations of the Southern Pacific Company.

[fol. 4344] Mr. Mason: The volume to which the witness has referred is in evidence as I recall as exhibit No. 320.

Mr. Strouss: That is correct.

Mr. Mason: I have no objection to the witness undertaking to give the substance of the portion of rule 99 but the rule being in evidence speaks for itself. He said a quarter of a mile and the rule says a sufficient distance to insure protection and that means more than a quarter of a mile or half a mile as the circumstances require.

Mr. Strouss:

Q. Suppose retainers were being used, would the trainmen have any duty?

A. Yes, it is the duty of the trainmen where it is required to turn up his retainers and ride out with them, releasing those that the wheels may become too hot and it is his duty to release that retainer, and on working retainers on empty cars he places a retainer on every other car and alternates with the others down the grade.

Q. When trains are using sidings, has he any duties then with respect to switching?

A. Yes, the trainmen must line the main line switches and derails in proper position for the train movement; likewise when they leave the siding they must line those [fol. 4345] switches and derails back in proper position.

Q. The duties you have been relating, are those duties that apply to freight or passenger service?

A. Well, generally those are freight brakemen's duties with the exception of rule 99 which also are the duties of passenger trainmen.

Q. There are different types of freight service, by that I mean through, local, mixed?

A. Yes, that is correct.

Q. Are there different duties with respect to local freight operations than apply or are in addition to those in through service?

A. Yes, local freight service is supposed to do the station switching at stations where it is necessary, load and unload freight, fill water cars as required.

Q. What about through trains?

A. Through trains are trains generally with all through freight in them, go from one terminal to the other without any switching service except on some occasions the chief dispatcher will have you pick up some cars at certain places.

Q. Are there any duties peculiar to mixed train operations?

A. A mixed train operation is where you handle both [fol. 4346] local freight and passengers which require one brakeman to take care of the passengers and also assist in switching and loading and unloading freight and picking up and setting out cars and setting hand brakes, cutting crossings, and other work as directed by the conductor.

Q. Are there any additional duties on the part of the brakeman which apply in passenger service?

A. Passenger trainmen are also supposed to observe their train while running, inspect it when standing still by placing their hands on the journal boxes, also noting brake beams or any other defect that they may be able to find. They are also supposed to be courteous to the passengers, provide seats for them, assist them with their baggage, see that they are detrained at their proper stations, work retainers when necessary and also other duties that may be required by the conductor.

Mr. Strouss: I am about to pursue a different subject, your Honor.

The Court: Very well, the Court will be at recess until 2 P. M.

(Thereupon the Court stood at recess until 2 P. M. this day.)

[fol. 4347] 2 P. M., April 10, 1941.

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed.

E. J. Durkil resumed the witness stand.

Mr. Strouss:

Q. Mr. Durnil, before lunch you were discussing the duties of a brakeman. Had you completed the description of those duties?

A. There is one more I would like to add, a very important duty of the brakeman and that is to consult the bulletin boards before going out on each trip, which is a very important duty of the brakeman to note any changes that may have been made by the superintendent.

Q What are the duties of a conductor?

A. The duties of a conductor are practically every rule in the book, that is, of the rules and regulations of the transportation department. In order to properly function in his duties he must have knowledge of those rules and in addition all special instructions appearing in the timetables, all special instructions appearing on bulletin boards by the superintendent and all special instructions and circulars [fol. 4348] from the general office relating to his duties as a passenger conductor, change in tariffs, and so forth. Particularly referring to transportation rule 843, I quote for the information of the court, "The general direction and government of the train is vested in the conductor and all other persons employed on the train will obey his instructions. Should there be any doubt as to the authority or safety of procedure, he will consult the engineer, who will be responsible with him for the safety and proper handling of the train and such use of signals and other precautions as circumstances may require. He must obey the instructions of the yardmaster within yard limits and be governed by the directions of agents in doing work at stations and conform to the instructions issued by the traffic and accounting departments."

I also wish to quote rule 844, "Before leaving initial station, the conductor must be assured that all members of his crew are on hand, that the brakes are in proper working order, hand brakes released, and his train is provided with the proper tools, supplies, and flagging equipment."

Also rule 845, "Conductors must assure themselves that their subordinates are competent and instruct them if neces- [fol. 4349] sary in the proper performance of their work and caution them as to its risk. Incompetency and disobedience must be reported."

Rule 846, "The protection of the train is the most important. The conductor must not allow other duties to interfere therewith. They must require their flagmen to act with the utmost promptness and in strict accordance with the rules. A trainman must be stationed when practicable on the rear of every train while in motion."

Also I would like to refer to general rules appearing on page 3 of the book of rules: "Safety is of the first importance in the discharge of duty. Obedience to the rules is required. To enter or remain in the service is an assurance of willingness to obey the rules. The service demands the faithful, intelligent, and courteous discharge of duty. Promotion depends upon faithful discharge of duty and capacity for greater responsibility. Suggestions from employees intended to promote safety, economy or service, are solicited and will receive consideration. The public judges a railroad by quality of service, condition of the property, and by the appearance and conduct of its employees."

There are also many other duties prescribed in the book [fol. 4350] that the conductor must have full knowledge of in order to properly perform his duties both in freight and passenger service.

Q. In freight service he has some particular duties, a record of the consist of his train?

A. Yes, the first important duty is when the conductor goes on duty to compare his watch with the standard clock in the register room. After he has consulted the bulletins he then calls for his orders and checks the train register of all overdue superior trains. He then receives his orders and checks his train orders against his clearance card which is issued by the operator and dispatcher. He must particularly note that he has all of the orders that his clearance card calls for, that the orders are properly addressed to him, that they have the signature of the chief train dispatcher and particularly note that they have been completed and the time the order was completed and familiarize himself with these orders and know positively that they are proper before he starts to deliver them to the engineer. When he meets the engineer, he compares time with the engineer. He gives the engineer his orders together with the train register check. The engineer reads the orders and if they are found to be O. K. then the train proceeds.

[fol. 4351] Q. Describing the duties of a brakeman, you referred to one of his duties as that of replacing journal brasses?

A. Yes, sir.

Q. When is that required?

A. When a journal becomes overheated, if in the judgment of the conductor and that judgment is based upon the extent of the heat of the journal and the appearance of the brass. If it appears that the brass is broken or cracked, we re-brass the car which requires that we get the engine back if possible, get the jack off the engine and bar and blocks, get the dope buckets with the packing waste; the brasses and crow-foot and take them to the car where we jack up the car from the journal box sufficient space to permit us to take out the brass and wedge. Then we inspect the journal to determine whether or not it has been cut and we replace the new brass, first cooling off the journal as best we can by carrying water in buckets or having the engine right handy to get it off the engine. Then we let the jack down and repack the box with oil waste. Then we apply what we call a cooler, it contains about four or five buckets of water with a hose attached. We attach this cooler to the journal box and permit a little water to drop [fol. 4352] on it while we then take up steam. This requires close attention on the part of the brakeman, sometimes it is necessary to leave them out there to carefully guard this car to see that it does not heat again. Sometimes it is necessary to rebrass them a second time but generally speaking if you re-brass them once they then go along pretty good.

[fol. 4353] The Court: How long does this process take?

A. Sometimes, I would say about the quickest it can be done, about 45 minutes, sometimes longer. That depends, Your Honor, if we happened to be at a side track where we can bring the engine back to get our material to the particular location of the car, we should do it in 45 minutes. If it is in the vicinity of the main line where we have no side track and we have to carry that to the car, it takes much longer, an hour and fifteen minutes, or an hour and thirty minutes, and that necessitates, if possible, the conductor getting in touch with the dispatcher to inform him of our delay or sometimes if we are at a station where we can converse with the dispatcher, he then will either instruct us to rebrass it or set the car out.

Mr. Strouss: Do you have many occasions to replace these journal brasses?

A. Why, the past year or two we have had very few as to what we used to have several years ago.

Q. Does the length of the train have any relation or effect upon the necessity or time required to replace these brasss?

A. Yes, that is an important factor. First, each additional car taken in the train is one added responsibility, and [fol. 4354] also, the observing of the car or cars to see that they do not run hot. Sometimes, in picking up these cars, trespassers or others have removed the waste from the journals, which requires us to repack those journals before we move them, if we can. Sometimes, just half of it has been removed, which causes the journal to run hot by insufficient oil waste in the box, which prevents any lubrication.

Q. Now, if you are able to observe these cars in time, you often are able to correct the trouble before it is necessary to rebrass journals?

A. Yes; sometimes in our standing train inspection we detect a journal bearing becoming worn or a little hot, and in that case we go to the engine or the caboose and get a packing iron and hook, some water and some fresh waste, if necessary, and we repack that box, and in many instances they go along all right. However, if we don't locate them and they become very hot, in most of the cases we have to rebrass them.

Q. Is it possible to sometimes observe this car while the train is in motion, and prevent the replacing of the brasses?

A. Yes, to the best of our ability we make close running observation of the train, the best that the naked eye will [fol. 4355] give us to see that no bearings become hot.

Q. Now, in connection with broken knuckles or draft gears, what are your duties in that connection, if there happens to be a broken knuckle?

A. Well, a broken knuckle, we first have to determine what the cause is; when we find it is a broken knuckle, we either go to the engine or to the caboose and get a knuckle, and take it up and put it in the car. Sometimes we can do this very handy by throwing it off the engine and have the engineer pull down, put it on the car and take it back and put it in; other times it is impossible to do that because in a territory where the view of the engineman is obstructed

or he would be unable to back up the train when we pull down, in that event we will have to carry the knuckle ourselves.

Q. Now, in the operation of these trains, is there some provision made for the inspection of the train?

A. Yes.

Q. And by whom is this inspection made?

A. The inspection is made by the trainmen and the conductor assists also.

Q. Are there some points where inspections are made [fol. 4356] by others than trainmen?

A. Yes, at terminals such as Tucson, Phoenix, Yuma, and El Paso, Douglas, these inspections are made by regular car inspectors.

Q. And how do they make that inspection?

A. Two men, one takes each a side, and they inspect the brake-beams, note whether the air is working in the car, flanges, draw-bars, and a general inspection to determine any defects that may exist in the car.

Q. Have there been any changes in the points at which car men make inspections?

A. No, the present arrangement has been in effect here now for a good many years.

Q. There were, prior to that, additional car men?

A. Yes, years ago we had car men at Lordsburg and at Gila Bend also.

Q. Now, the trainmen also make inspection, I believe?

A. Yes, every stop, so far as the trainman is concerned, is an inspection; it is the duty of the brakemen immediately to start out inspecting the train as soon as it stops.

Q. Now, is that covered by rules 827 and 828?

A. Yes.

[fol. 4357] Q. Will you read those two rules?

A. Rule 827: "The running gear, brake and draft rigging of trains must be inspected by trainmen as often and as closely as practicable while on the road. If defects be discovered they should be corrected if possible; cars unsafe to run must be set out. Special attention must be given to hot bearings. Places at which freight trains must stop for inspection, or the maximum distance a freight train may run without stopping for inspection, will be designated in the timetable." On the Tucson division, the maximum speed a freight train may run without inspection, as appearing in the time-table, is 65 miles.

Q. You said "speed"; you meant distance?

A. Yes, the distance. On the Rio Grande, the maximum distance is 60 miles, and on the branch line of the Tucson division it is 40 miles.

Q. Now, your rule 828.

A. Rule 828: "Speed of a freight train must not exceed eight miles per hour for a distance sufficient to permit running inspection when starting. Trainmen must closely watch to see that brakes are released, and if necessary must signal enginemen to stop if wheels are found sliding. Each trainman will be held responsible for wheels slid [fol. 4358] under that part of the train in his charge. Conductor in reporting flat wheels must give the name of trainman in charge. They must mail promptly to the superintendent a report of flat wheels discovered under the cars in their train."

Q. Now, you say there are two types of inspection made by trainmen, a standing inspection and a rolling inspection?

A. Yes, sir.

Q. How is the standing inspection made?

A. Well, if the train is in the side track, the swing brakeman and the rear brakeman go up the train, one on each side, the head brakeman proceeds back from the engine on one side until they meet. Then they all continue on up to the head end inspecting both sides of the train, which includes journal boxes, brake-beams, drawbars, flanges, or that cars are all released, that the air is released on all the cars.

Q. Then you make the rolling inspection?

A. Yes, when the train again starts to proceed the rear and swing brakemen get to the head end and they permit the entire train to roll by.

Q. And at what rate of speed?

A. Eight miles per hour.

Q. Now, how are the inspections made at night?

[fol. 4359] A. At night they are made the same way, except the trainmen carry electric lanterns.

Q. Are they the same type of lantern a carman would have to determine that?

A. No, they are a different type of lantern. Our lanterns don't have reflectors on them like the car inspector lanterns do.

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TRANSCRIPT OF RECORD

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Supreme Court of the United States

OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY, APPELLANT,

vs.

STATE OF ARIZONA, EX REL. JOE CONWAY, ATTORNEY GENERAL OF THE STATE OF ARIZONA

APPEAL FROM THE SUPERIOR COURT OF THE STATE OF ARIZONA, COUNTY OF PIMA.

FILED APRIL 12, 1944.

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Q. You are required in making that inspection, a standing inspection, to walk along with the lantern to throw the light under the train?

A. That is right. To make a good inspection, the train must be standing at a point where the trainman has a good place to walk, so that you won't have to observe where you are walking and can keep your lantern on the cars. If you have a bad place to walk, you are almost forced to keep the lantern in front of you to see where you are walking; you might walk into a bridge that is not decked and cause injury to yourself.

Q. Now, is there any part of the train that each brakeman is responsible for in making this inspection?

A. Yes, assuming that the train was on the main line the entire distance, where the flagman had no opportunity to get ahead of the caboose, the swing brakeman and the head [fol. 4360] brakeman would each be held responsible for the cars in the train, the head brakeman would have half of them and the swing brakeman would have half of them. However, if the train is in several sidings where the flagmen can come and properly inspect his part of the cars, then he would be held responsible.

The Court: You refer to the rear brakeman. That is the flagman?

A. The flagman, yes, sir.

Mr. Strouss: What happens if they fail to notice the defect?

A. If they fail to notice the defect, and it causes damage, they are held responsible for that failure. The responsibility is placed by a fair and impartial investigation of the employee involved.

The Court: What penalty, if any, is invoked?

A. They assess discipline in the judgment of the superintendent by demerits. It all depends upon the seriousness of the accident, what damage. We have had certain cases where wheels had been overheated by hand brakes, failure to get off hand brakes, that caused serious derailments, busted wheels, where the trainmen responsible were dismissed from the service. We have had other cases where cars have slid flat, where the trainmen was assessed ten or [fol. 4361] twenty demerits, whatever the judgment of the superintendent thought was sufficient for the failure of the rule.

Q. Are there any dangers in connection with making these inspections?

A. Yes, an inspection is a very important functioning of the trainmen for the safety of ourselves as well as all others. If the defect can be detected while the train is standing, and corrected, it may save a serious wreck, and a heavy expense to the company.

Q. Are there any dangers to the trainmen, particularly at night, in making inspections?

A. Yes, by night it is a little more difficult because visibility is not so good, and you are more liable to overlook something at night-time than you would in the day-time.

Q. Now, one of the defects you should look for are triple valves that are sticking?

A. Yes, you often find, when you are inspecting a train, a car that has failed to release, and the retainer valve is blowing which would slide the wheels when the train started. However, the brakeman finding this would get the air out of this car and bleed air out of the cylinder, placing a rock under the bleed cock to prevent any leakage, and report [fol. 4362] same to the conductor.

Q. What danger is there in a slid flat wheel?

A. A slid-flat wheel, if it has slid to such an extent that it makes it condemnable, is very dangerous; it may break rails or it may go over frogs, it may bust the wheel and put the train off the tracks.

Q. Are there dangers too resulting from wheels heating?

A. Very much so, it is one of the most dangerous features that we have on freight trains.

Q. And what causes that; I mean, the wheels to heat?

A. Failure of the airbrake to properly release or handbrakes being set on the car can heat the wheels, which brings the brake shoes with pressure against the wheels.

Q. Now, what effect, if any, does the length of the train have upon the inspection?

Mr. Booth: I think we better object to that as a matter of opinion going to the merits of the case.

The Court: Read the question.

(The question was read by the reporter.)

The Court: Well, the objection is overruled. You may answer.

[fol. 4363] A. The longer the train, the longer it takes to inspect it, and the more cars in a train the more liability of defects.

[fol. 4364] Mr. Strouss:

Q. What about the time required to inspect? Does it also increase the time required to inspect?

A. Yes, it also increases the time.

Q. While your train is in motion on the road, has the trainman any duties with respect to watching and observing things?

A. Yes.

Q. Will you explain that?

A. The trainmen on the rear in the caboose take position on each side in the cupola. It is their duty to constantly observe the train while in motion and quite often get down from the cupola and go to the rear platform, ascertain if they can smell any hotboxes or sticking brakes particularly going through cuts where the drift of the wind may give them a smell. Also on curves where they can observe but on tangent track where the train has traveled any distance it is very difficult to see very far up the train and more particularly in the summertime when the heat is severe.

Q. Is there any dust to amount to anything in the territory where you operate?

A. In some particular localities there is quite a bit of dust. However, in many other places it is slag ballast [fol. 4365] and there is very little dust.

Q. What is the nature of the defects and things that you are attempting to observe?

A. Quite often the engineer is required to set the air after the train has been rolled by, by the trainmen. He may make one or more applications of the air and the train may run out a distance 40 to 50 miles before stopping. In that case it is very necessary for the conductor and the trainmen on the rear to know to the best of their ability that all the cars in the train are properly released. In other words, we want to be sure that there are none of those brakes sticking which may cause the wheels to bust. The only way we have of knowing is with our naked eye by observation to the best of our ability to look. However, at nighttime it is a little easier because if the wheel is sticking it will throw fire or if a hotbox it will start throw-

ing fire. We can see that very plainly providing we are on straight track or in curves but in the daytime it is most difficult to observe the defects on tangent track.

Q. Is your ability to observe defects affected in any way by the length of the train?

A. Very much so. The more cars you have in the train places you a greater distance from the engine and in the [fol. 4366] summertime when the heat is very great it is very difficult to see very far up the train because of the heat.

Q. Referring to plaintiff's exhibit No. 118, could you from that explain to the court what your duties as a trainman would be in observing defects in that train?

A. I assume that the train is on tangent track.

Q. It appears to be.

Mr. Mason: No, it is not. It was so testified it was on a long curve.

The Court: I believe that is the testimony, Mr. Strouss, that it was on a curve. The picture itself would indicate that.

A. Well, if it is on a curve, the trainmen in the rear would be able to observe 40 or 50 cars probably from the rear. Of course, night time there would be fire flying should there be any defects under any of the cars but in the daytime on tangent track from my experience it would be impossible to determine a defect 80 cars from the caboose or engine with a train of that length of cars.

Mr. Strouss:

Q. You would be required——

Mr. Booth (Interrupting): The witness is not qualified, [fol. 4367] he has never worked on a train of 160 cars. How could he be qualified to look at a photograph and testify to some ideal condition which he has never observed? We object to this as incompetent.

Mr. Strouss: Ideal condition?

Mr. Booth: A suppositious condition, perhaps I better use that expression. He is just making a pure guess and we object to it as incompetent.

Mr. Strouss:

Q. Your duties would require that you observe half of that train, that is, the rear brakeman half of the train for

defects and the other half would be under the rules under the observation of the head brakeman?

A. That is correct.

Q. They would be expected to observe and see any defects that were in that train?

A. That is right, under the rules they are responsible and I would say any trainman on either the engine or caboose would to the best of his ability and his eyesight observe the best he could any defects.

Q. Are there any defects in connection with the operation of that train?

Mr. Booth: That is objected to as a matter of opinion and suppositious.

[fol. 4368] The Court: Yes, the objection is sustained on the ground of the inexperience of this witness to any train of that length.

Mr. Strouss: I hadn't finished my question yet.

The Court: I beg your pardon, go ahead and finish your question.

Mr. Strouss:

Q. Are there any dangers in connection with the operation of a train in failing to observe defects in that train?

A. Yes.

The Court: Just a minute, you are referring to any train?

Mr. Strouss: I am not referring to this train, no, any train.

The Court: Objection overruled, go ahead.

A. Yes, there are many dangers.

Mr. Strouss:

Q. What are they?

A. Hot bearings, journal bearings, sticking brakes, broken flanges, defective drawbars.

Q. What would a broken flange cause?

A. A broken flange would cause the car to derail, climb the rail.

Q. Is that true of the other defects that you mentioned?

A. Yes, for example, an overheated wheel would bust [fol. 4369] and cause the train to derail; a drawbar knocked in or dropped down would cause the train to break in two and cause a sudden stop.

Q. If a trainman were to go out on top of the car, can he properly observe the train from the top of the car for defects?

A. On tangent track, no, but on curves he could see forward and backward as to the running gears of the cars, but immediately before him and behind him on top he could not.

Q. We had in the testimony heretofore some reference to slack action. Are you familiar with slack action? Do you know what that is?

A. Yes, sir, I am very familiar with slack action as I believe all trainmen in freight service are.

Q. You have observed the action of slack in trains?

A. Yes, sir.

Q. Will you just give your description of slack action in your own words, just what you mean by it?

A. In every car there is between five and seven inches of slack in your drawbars and when you assemble 60 or 70 cars together you have a car length and a half to two [fol. 4370] car lengths of slack in the train. That slack while the train is in operation has a tendency in certain localties to run in and run out. Each time the slack runs in from the rear it runs in and makes a little stop and then it jerks out, particularly where a train is going over a hogback without even the engineer setting the air, it will do that. Also trains at a speed of eight or ten miles an hour or twelve where the slack is stretched out for some reason or other as you come to an emergency stop the head cars stop immediately and the rear cars run into them which causes a very severe stop and jar on the rear end of the train and in quite a few instances injures trainmen on the rear end of the train.

Mr. Booth: We move to strike the last addition as volunteered and not called for by the question.

The Court: It may be stricken, the last portion.

Mr. Mason: Beginning with the words, "in quite a few instances."

Mr. Strouss:

Q. You say in some territory slack action is more severe than in others, that is, I believe you said on hogbacks and dips?

A. That is right.

[fol. 4371] Do you have any of that type of territory in the division or territory where you work?

A. Yes, we have some between Dragoon and Cochise, Arizona.

Q. Did you state what the effect of that slack action is so far as the caboose is concerned and the occupants when it runs in and runs out?

A. When the greater portion of the head end of the train gets over the hogback—scratch that, please. As the head end of the train approaches the hogback, the rear end of the train runs in and when the majority of the train gets over the hump back the train runs out, the slack runs out which causes a jar at the rear or the caboose and it is necessary for us trainmen to hold on to prevent—to hold on for our own safety.

The Court: Do you have any warning of that?

A. Well, sometimes we experienced men are working over that territory and we know he is going to hit it and we are on guard; inexperienced men not familiar with the territory may be off-guard and not know that.

Mr. Strouss:

Q. Assume an emergency stop by the engineer where the slack in the train is stretched out. Would you have any notice of that in all probability?

[fol. 4372] A. No, there is never any notice of an emergency stop. They are the worst that we may have.

Q. There are methods which have been adopted by the men to protect themselves, are there?

A. The only method we have to protect ourselves particularly the brakeman in the cupola is by hanging on as tight as they can to the grabiron in the cupola. The conductor downstairs has no place to hang on, he sits on the cushion and grabs hold of the cushion which sets on a locker and hangs on there to the best of his ability.

Q. In your railroading experience have you ever suffered any injuries from slack action?

A. Yes, I have been injured. I had three fractured ribs one time from slack action.

Q. What length train was that?

A. This was on May 25, 1924. I was the conductor on extra 3638 west. This was a local freight train consisting of engineer W. O. Olson. The train consisted of 50 cars,

(reading) "approaching Provo station about five-thirty P. M. engineer made an application of the air and the brake took undesired emergency action resulting in a severe jar in the rear of the train, train stopping, which threw conductor Durnil from the desk in the caboose on which [fol. 4373] he was sitting against the corner of the locker inflicting severe bruises to ribs on the right side." I would like to make a correction, 50 cars in the train, 3 loads and 47 empties. I lost nine days' work over this accident. That was entirely due to an unexpected emergency stop of the train.

Q. That was a reportable accident?

A. Yes, sir, that was a reportable accident.

Q. Have you had any other instances of slack action where you have been injured or where it was not a reportable accident?

A. I have been in several during my experience. However, there were no reports made because no damage was done and the extent of the injury was not of a serious nature.

Q. Has the length of the train any relation to slack action?

A. Yes.

Mr. Booth: That is ojected to as calling for an opinion and conclusion of the witness. The rules of evidence so far have been very assiduously observed here, but here is a witness put on the stand and asked to give his opinion as to one of the essential issues in the case.

Mr. Strouss: There might be some difference of opinion as to whether these rules of evidence have been so care- [fol. 4374] fully observed heretofore.

Mr. Booth: They have certainly been insisted on so far as I know.

The Court: The objection will be overruled.

Mr. Strouss:

Q. Was that the only reportable accident you were involved in?

A. No, I was involved in another accident due to slack action and break-in-two while acting in the capacity of rear brakeman on train second 412, engine 3635, engineer J. E. Anderson, conductor J. H. Burke, train consisted of two loads and 63 empties, 2840 M's. This occurred on

December 4, 1920, involving a personal injury to brakeman Durnil and W. C. Hughes. It happened about 3:55 P. M. Brakeman Durnil received lacerations of the lower lip; brakeman W. C. Hughes, right side strained and bruised. This was an eastbound freight train, second 412, running about eight miles per hour, had a break-in-two near Vail, Arizona, on account of knuckle breaking on car Rock Island 36713, the eleventh car from the engine. This throwing brakeman Durnil against caboose, he sustained the above injury. Also threw the brakeman W. C. Hughes, who was on the rear platform of caboose, against caboose, resulting in the above injury. Investigation develops that [fol. 4375] while train was descending a grade the pin lifter on the west end of Rock Island 55280 had raised. The slack action in the draw head permitted the pin lifter to be pulled out on account of the pin lifter chain not long enough to take up the slack, causing knuckle to open, breaking knuckle on the end of I. C. 94337, an empty gondola eight cars from the engine. Emergency knuckle was applied and train started to move and had moved the train about a train length. Then knuckle gave way on Rock Island 36713, the eleventh car from the engine, causing a heavy run-in of the slack from the rear, damaging the following cars: M. C. 9563, box, derailed, superstructure demolished, steel center-sills badly twisted, trucks damaged, amount of damage $750; C. B. & Q. 10800, box, not derailed, two sides damaged and steel centersills broken or bent, amount of damage $200; I. C. 43337, knuckle broken, $4; Rock Island 36713, knuckle broken, $4. First break-in-two was due to a short lifter on car Rock Island 55280. This break-in-two so weakened the equipment that when the train pulled out to haul up the grade the weak parts gave way and second break-in-two resulted, slack not being bunched on this train on portion of the train descending the grade, [fol. 4376] break-in-two occurred on that end, slack in rear running in damaging the cars. As stated, no defect in the equipment. It consisted of two loads and 63 empties, or 2840 M's.

Mr. Mason: If I may interrupt the witness, he is evidently reading from something and not testifying from his own recollection.

The Witness: That is my own record.

Mr. Mason: Your own record. Did you survey that damage?

A. I was the brakeman on the train.

Q. And were injured, weren't you?

A. Slightly, lip injury.

Q. Reportable?

A. No, I don't believe this was reportable so far as personal injury was concerned.

Q. You went and investigated all of those cars, did you?

A. Yes, sir, I got the record.

Q. You didn't make the estimates of the damage yourself?

A. Oh, no.

Mr. Booth: What are you reading from?

Mr. Strouss: This is a copy of your testimony given in the former case which you have here to refresh your memory?

A. That is right.

[fol. 4377] Mr. Booth: What former case?

Mr. Strouss: In the case of Southern Pacific Company against K. Berry Peterson.

Mr. Mason: You mean the first Arizona Train Limit case?

Mr. Strouss: Yes, sir.

Mr. Booth: He is reading from his testimony in that case?

Mr. Strouss: Yes, he is refreshing his memory as to that accident.

The Court: We will take our mid-afternoon recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows.)

[fol. 4378] Mr. Strouss: Mr. Durnil, I asked you this question, then got over to another before you answered. Has the length of the train any relation to slack action?

A. Yes, very much so. The more cars in the train, the more slack action you accumulate.

Q. Have you worked on—what length trains have you worked on, Mr. Durnil?

A. Why, I have worked on trains as high as 125 cars; possibly a little more.

Q. Now, is there, in the caboose of the freight train, any air gauge?

A. Yes, there is a conductor's valve in the cupola of the caboose.

Q. Is there a gauge there also?

A. Yes, an air gauge also.

Q. Are the trainmen required to observe that gauge?

A. Yes.

Q. Have you at different times in mountain operations observed the air gauge in the caboose?

A. Yes, sir.

Q. Has that been on both short and long trains? I mean trains of around 70 cars and trains of under 60 cars?

A. Yes, sir.

[fol. 4379] Q. Are you able to state from that whether the air pressure has been maintained on the rear of those trains?

A. Very few exceptions is the pressure maintained on the rear that is on the head end, there may be a slight deduction, maybe five pounds.

Q. Now, have you observed in mountain operation, whether or not, on trains of around 70 cars, the brakes on the rear end of the train will release at all times?

Mr. Mason: Now, I think, with all deference to the question that it is indefinite and objectionable for that reason. The "mountain operation" is a very hazy term. If that is addressed to Arizona, there are certain districts in Arizona, which might be so specified. If it is addressed to other sections, they would not be so specified.

The Court: Reframe your question, Mr. Strouss.

Mr. Strouss: What territory are you operating in, Mr. Durnil?

A. Tucson to Lordsburg.

Q. In that territory you have——

A. ——1.4 grade.

Q. And in that operation have you observed the operation of the brakes so as to observe whether or not the rear brakes were applying and releasing?

[fol. 4380] A. Yes, that is part of our duty to observe to the best of our ability the operation of the brakes, see that they set or release, and quite often we have to stop the engineer, because of the failure of one car, or more maybe, not releasing and wheels becoming heated.

Q. And have you had occasions where your brakes were not applying on your end of the train?

A. Well, with the heavy tonnage, exceptionally heavy tonnage, it may be difficult for the engineer to keep his pressure up on the rear in descending a grade, because of the frequent reductions he has to make from his engine to obtain the required speed. Sometimes before the rear end is properly released he is again setting them from the head end, which causes more or less slack in the rear of the train. However, with a lighter train, that condition may not exist. With a train of empties as against a train of loads, the empties brake much better than the loaded cars.

Q. Do your rules require that certain commodities be placed in particular places in the train?

A. Yes, the I. C. C. rules regarding powder or dynamite, it has to be placed at least 15 cars from the engine or 15 from [fol. 4381] the caboose; inflammables must not be put next to explosives, and they must be at least five cars from the caboose or the engine; open top cars loaded with rails, poles, or other material that may shift, are not to be placed against gasoline or explosives or ahead of the caboose.

Q. Now, do you have many trespassers in the territory?

A. Yes, we have had quite a few trespassers over the territory; in fact, so many we couldn't keep them off.

Q. Do they present any particular or peculiar problems for the trainmen in train operation?

A. Yes, they cause considerable trouble by breaking our trains in two sometimes, stepping on pin lifters, sometimes they become injured and require us to get them to some station where they can get medical aid, and I have had them turn the angle cocks in our train and stop the train because they desired to de train at a certain point and they knew the train wasn't going to stop. That is a very serious thing for them to do and it lays us very liable to accidents or injuries.

Q. Has the length of the train any relation to the handling of trespassers?

[fol. 4382] A. Yes, they scatter all over the train from one end to the other.

Q. And that makes your problem of handling them more difficult?

A. That is correct.

Q. Now, are you familiar with the use of retainers?

Mr. Mason: Just a moment. I would like to inquire as to the purpose of the last testimony. Is it now contended that the Arizona Train Limit law is necessary in order to preserve the unusual hazards from trespassers on long trains?

Mr. Strouss: Are you inquring of me?

Mr. Mason: Yes. I am inquiring of you. I would like the Court to take notice of the question and require counsel to respond if he will be so kind.

Mr. Strouss: I will make my argument at the present time, if counsel so desires.

The Court: Go ahead.

Mr. Mason: I would like to see the materiality. All this contention is not disclosed by the pleadings, the defendant hasn't offered any testimony with reference to this and it is not in the pleadings. I didn't know the law was passed to prevent hazards from trespassers.

[fol. 4383] The Court: Proceed.

Mr. Strouss: Read the question.

(The question was read by the reporter.)

A. Yes, sir.

Q. What are the duties of a trainman with respect to the use of retainers?

A. Well, he turns up the retainers where it is necessary and also turns them down, and it is his duty to closely observe the cars on all the retainers he turns up to see that the wheels do not overheat, and if he finds one that is overheated, it is his duty to release the retainer on that particular car.

Q. And is it necessary for him to be on top of the car to release the retainer?

A. Yes, it is necessary that he be on top.

Q. Are you familiar with the rule on the Tucson division with respect to the use of retainers?

A. Yes; it is recorded in the time-table, I believe.

The Court: You were present in court this morning when that was read?

A. Yes, sir.

Mr. Strouss: That rule provides that retainers will be used on grades of 1.4 per cent to 1.5 per cent on freight trains of [fol. 4384] less than 110 M's per operative brake when necessary in the judgment of conductor and engineer. Does the length of the train have any relation to the use or necessity for the use of retainers?

A. In this way, the length of the train which may increase the tonnage, where in the judgment of the conductor and the engineer it would be an added safety for the trainmen to use the retainers for proper brakage of the train descending that particular grade; in other words, it is my experience, if the engineer requested the retainers to be used because of meeting certain trains while descending this grade, it would be necessary for us to do that for absolute safety in assisting the engineer in properly controlling his train at the required speed, that he may be able to stop this train at a given point where opposing trains may take a siding for him or he may have to take a siding for superior trains.

The Court: Are you accustomed to using these retainers on your run between Tucson and Lordsburg?

A. No, sir, we haven't used those retainers on that particular territory for a good many years since the operation of the heavier power now. When we had the small consoli- [fol. 4385] dated engines, we did use retainers.

Mr. Strouss: Now, Mr. Durnil, is it necessary for the train crew on the rear of the train to communicate at times with the engineer?

A. Yes, we communicate by hand signals by day, lantern signals by night.

Q. And how are those signals given?

A. They are given by hand in the daytime by the brakeman in the rear, or the conductor. In other words, if you are ready to proceed, you put your hand in the air and wave it back and forth. If you want to stop, you put out both hands and throw them up and down. By night, if you want to stop, it is customary that we light a fusee where the engineer will see that fusee and know we want to stop.

Q. Now, if the signals can't be seen, what do you do?

A. If signals cannot be seen and it is determined in the judgment of the conductor that it is an emergency, under the rules he has the privilege to use the conductor's emergency valve and bring the train to a stop.

Mr. Strouss: Take the witness.

Mr. Mason: If your Honor please, it might be well to defer [fol. 4386] this witness's cross-examination. I assume it will offer no embarrassment to him to come.

Mr. Strouss: No, but for the morning I have no witnesses ready to go on.

The Court: Is there any phase of this that you might proceed with, Mr. Mason, with the understanding that the Court will recess at your convenience and permit you to finish the cross-examination in the morning?

Mr. Mason: I think I might have some questions. It would be some advantage probably to read over the testimony, then I could cut the testimony down, some of it may amount to repetition.

Cross-examination.

By Mr. Mason:

Q. Mr. Durnil, you referred to the fact that you had suffered a personal injury in a slack action accident in 1925, I think it was, wasn't it?

The Court: 1924.

Mr. Mason: 1924, yes. That was a train of less than 55 cars, wasn't it?

A. I believe it was 47 empties and three loads.

Q. My record agrees with you, except in the length of the train, which my record shows was 53 cars. It was either [fol. 4387] 50 or 53 cars, something along that line, was it not?

A. Yes, sir.

Q. Now, is that the only personal injury that you have suffered in train or train service accidents?

A. To my recollection, that is the only one due to slack action, yes, sir. As to the other one that I quoted, in the other there was no loss of time.

Q. You have suffered a personal injury in train operation on a short train since 1925, have you not?

A. The only one I can recall, Mr. Mason, is in attempting to let off some hand brakes in the Tucson yard, along about 1934 or '35, where I sprained my back, to the best of my recollection.

Q. My record indicates that on October 3rd, 1934, you suffered an 18-day disability on a 58-car train at Tucson, due to wrenching back while releasing hand brake?

A. That is correct.

Q. That was on a 58-car train?

A. I don't remember, Mr. Mason.

Q. You wouldn't dispute the fact?

A. No, I wouldn't dispute the fact.

[fol. 4388] Q. If it is shown here. Do you say that you have in your railroad career run as brakeman or conductor or both, on trains of more than 70 cars?

A. Only as a brakeman.

Q. When was that?

A. That was during my employment with the Atcheson, Topeka and Santa Fe Railway.

Q. You have never served on any Southern Pacific train of more than 70 cars?

A. Yes, I have, for a very short period between Tracy, California, and Roseville, and on one or two or three occasions between Steins, New Mexico, and Lordsburg, on the Tucson division.

Q. You served on the Stockton division, between Tracy and Roseville prior to coming to Arizona, did you not?

A. No, after coming to Arizona, then I returned to California for a short period in 1914.

Q. In 1914?

A. That is correct.

Q. Then, since 1920, except for an occasional train between Steins and Lordsburg, all your service has been on trains of 70 cars or less?

A. That is correct.

Q. With the exception that on April 29th last year you were conductor on a train of more than 70 cars?

[fol. 4389] A. No, sir.

Q. You were not?

A. No, sir.

Q. You wouldn't challenge the time return and daily report showing your signature and showing the train consist, would you?

A. Yes, I would; it is not a fact, I was not.

Q. Then all of your experience with long-train operation that you have related here this afternoon as to the inability to make inspections and to passing signals and to observing the condition of the train in motion, and the extent of the air pressure in the caboose, so far as it relates to long-train operation, is gathered from your experience in 1914 and not since?

A. No, it is gained from my experience when I first started out in 1910 to September, 1912, where I was engaged in long-train operation with the Santa Fe railroad. Having been in several break-in-two's and emergency stops

in long-train operation, I had an opportunity to gain knowledge at that time of long-train operation.

Q. That was now 29 years ago?

A. Yes, sir.

Q. You have no experience with long-train operation on [fol. 4390] Southern Pacific lines in any territory since 1914?

A. No, I have not.

Q. And in so far as your testimony relates to long-train operation on the Southern Pacific, it is purely speculative and not based upon your experience at all, is it?

A. It is based on my experience in handling trains of 70 cars and having knowledge by experience of slack action on trains of 70, but I have a good opinion what it would be on 80 or 120, because I have been on trains of more than 100 cars where I have had that slack action. There is no difference then than there is today.

Q. Well, you don't know that of your own experience, do you?

A. Yes, that is a matter of experience.

Q. You don't know of your own experience whether the freight car equipment and the locomotives are any different today than they were in 1912?

A. Oh, yes, they are lots different today.

Q. The freight cars are built considerably different, aren't they?

A. Correct.

Q. And the locomotives are much larger?

[fol. 4391] A. With one exception. The locomotives, at the time I was employed with the Santa Fe, were of a Mallet type engine.

Q. Do you know whether or not the locomotives of today have a great deal larger air reservoir capacity?

A. They do.

Q. And there are different types of triple valves on the freight cars?

A. Yes, sir.

Q. Than there were in 1912?

A. Correct.

Q. They have been vastly improved, haven't they?

A. I would say yes, I couldn't deny that fact.

Q. Do you know anything about the appliance on the freight car called a draft gear?

A. Does that mean that is in operation with the air brake?

Q. No, I don't mean that. Do you know what the draft gear is?

A. That is the gear that holds the brake beams and the drawbars.

Q. Well, do you know what it is?

A. It is the drawbars, that is the draft gear.

Q. So far as you are concerned, the drawbar and the draft gear are the same thing, are they?

[fol. 4392] A. The draft gear is the drawbar, yes.

Q. Do you know what the draft gear consists of, Mr. Durnil?

A. Well, on these new type, they consist of springs in the draft gear that regulates the slack in that draft gear in these new type cars; some of the older first ones came out with springs and a cross-arm in between, to hold the draft gear in. They are now changing those to the spring type.

Q. Now, the only feature of the draft gear with which you are acquainted are the springs, is that correct?

A. Well, and by observation, that is all, I can't tear them down and break them up.

Q. You have never examined the draft gear?

Mr. Strouss: I don't think this is proper cross-examination, your Honor. I didn't examine the witness as to the draft gear and its construction.

The Court: The objection is overruled.

A. The only knowledge I have of the draft gears is by observation. I have never had occasion to make a thorough investigation as to the construction of the draft gear, and what it is made of, because the manufacturer does that, I [fol. 4393] don't.

Mr. Mason: Then you don't know of your own observation of the draft gears, how the motion in the draft gear is controlled?

A. By springs, I think.

Q. And only by springs?

A. The springs, which have the regulation of the slack in that particular draft gear.

Q. Now, is there any other place besides the draft gear, Mr. Durnil, any place on the car where slack is developed, or where slack exists?

A. Well, there is a little slack between the knuckles from one car to the other, about enough that you can get your finger between.

Q. Amounts to about seven-eighths of an inch, doesn't it?

A. I judge that would be a good figure.

Q. And that is entirely free slack?

A. That is right.

Q. And the motion in the draft gear throughout is controlled by the spring?

A. Well, I wouldn't be positive about that, but that is my opinion about it.

Q. And that is cushioned by the springs, is it?

A. You can call it cushioned if you want to, I don't use that word.

[fol. 4394] Q. But it is, according to your understanding and view, developed against the resistance of the springs, is it?

A. Well, it is my understanding in those, that there has to be a certain amount of slack in each car, so the engineer can take this in order to start the train on these heavy grades; the slack, when he goes back it shoves it in, and when he pulls it out it comes out. Now, as to all the material that is in all these late model cars, I couldn't tell you, because I have had no break-in-twos with those cars. They are regulated in there, some by crossbars and some by springs that holds the draft rigging into the sill of the car to prevent them from pulling out.

[fol. 4395] Mr. Mason: Now, Mr. Durnil, when the slack is stretched out does that pull the springs out in the draft gear?

A. That pulls the drawbar out, pulls it clear out as far as it will go.

Q. Does that extend the springs in the draft gear?

A. I don't know, I never got under there to look but evidently the springs are there for a purpose.

Q. The resistance is developed against the resistance of those springs?

A. I would say so.

Q. Is it the same way when they are pushed in?

A. I imagine they are there to regulate this slack.

Q. You have never heard of a frictional draft gear, have you?

A. I have heard of it, but I couldn't describe it.

Q. You don't know anything about the use of friction members in a draft gear to control the motion?

A. I will have to tell you I am not competent to testify as to the construction of those cars, not competent.

[fol. 4396] Q. You spoke of a slack of five to seven inches per car. Does that include the draft gear motion and the free motion at the coupler face?

A. What I meant by that was that amount of slack in the drawbar at each end of the car.

Q. You said it was from five to seven inches per car?

A. That is right, and there are two drawbars in the car.

Q. Does that include the seven-eighths of an inch at the coupler face?

A. No, I don't include that.

Q. When did you make a measurement to enable you to state that there is that much slack in each car?

A. I didn't make any measurement. I will have to say this regarding that, the late equipment that has been purchased the last year or two, there isn't quite as much slack as there used to be in the old constructed cars; they varied to a great extent. The new type cars now that we are getting from the manufacturer, I believe the slack, or at least it appears to me, is more quickly regulated than in the old type car.

Q. You have never made any measurements?

A. No, not lately. I measured one car years ago and [fol. 4397] found seven inches in it.

Q. One car?

A. That is right.

Q. How long ago was that?

A. About seven years ago.

Q. You told us at considerable length of the duties of a brakeman, Mr. Durnil. Do the brakemen on a freight train have any duties to perform when a meet is made with another train?

A. Yes, sir.

Q. You didn't mention that. Will you describe what those duties are?

A. Their first duty is to be sure and call it to the attention of the engineer and conductor that those trains are going to meet so they won't overlook them, and the duty of the head brakeman, when they take the siding, is to open the main line switch and the derail and the rear brakeman lines them back and after the train stops they then inspect their train.

Q. When the head brakeman opens the switch, does he run ahead of the engine?

A. Sometimes he runs ahead, sometimes the train is brought to a stop, it all depends on the location, the grade condition, the tonnage, and several other factors enter into that.

[fol. 4398] Q. He has to detrain and go ahead of the train to open the switch, does he?

A. On a heavy train most of the head brakemen would run and get those switches without stopping the train. If it is going downhill, the engineer stops.

Q. Does the head brakeman have to get on the train while it is in motion after the train starts up to enter the switch?

A. Yes, sir.

Q. When the train has completely entered the siding, what happens then to the switch?

A. The rear man throws the switch back to the main line and also the derail.

Q. Does he detrain from the train while it is in motion opposite the switch?

A. From the rear end of the caboose, yes, sir.

Q. When the train leaves the siding after the meet has been made, who gets the switch?

A. The head brakeman lines the derail and the switch of the train to go out and the other brakeman lets the train roll by and after it all gets out on the main line the flagman lines the derail and main line switch back in normal position and locks it.

[fol. 4399] Q. Does the train stop after it gets out on the main line?

A. Sometimes it does and sometimes it doesn't. It depends on the grade whether the engineer can hold the train or not.

Q. Isn't it usual for the rear brakeman to run after the train and catch it while it is in motion?

A. That is right, if he can.

Q. That happens every time a train takes sidings for a meet or pass, doesn't it?

A. That procedure is followed, yes, sir.

Q. If more trains are run, there are more meets, aren't there?

A. Well, I wouldn't say "Yes" to that.

Q. Have you any doubt of it?

A. Oh, yes, double track, for example, they move 50 trains and they don't bother you at all.

Q. Let's confine ourselves to the Tucson division with which you are familiar.

A. All, right.

Q. We have double track on the Tucson division in three localities, haven't we?

A. Yes, sir.

Q. And the balance is single track?

A. That is right.

Q. And the larger part of the main freight line is single [fol. 4400] track, isn't it?

A. Yes.

Q. From Lordsburg to Mescal, from Stockham to Wellton, and from Dome to East Yard?

A. That is right.

Q. All about 55 miles, isn't it?

A. Yes, sir.

Q. And on that single track territory isn't it a fact that in your judgment the more trains that are run in both directions the more meets will be made?

A. When you are speaking of meets, I have met four and five trains at one stop. With good dispatching you may meet five or six trains with only ten or fifteen minutes delay with good train dispatching. Generally, our trains here are run in kind of blocks thirty minutes to an hour apart and sometimes much closer. The inferior train goes to a certain place for the first section. He may meet two or three more sections at that same siding and then he may proceed twenty miles and meet two or three more sections with the very minimum of delay if you have got good dispatching. However, if you have poor dispatching and are spread out and the trains are off their orders, they do require taking the siding and more delay.

[fol. 4401] Q. If you have a fleet of seven trains to meet and you can meet them three at a time as you suggested, you will have three stops to meet them?

A. That is correct.

Q. If you have a fleet of eleven trains to meet and you can meet them three at a time you will have that many more stops?

A. That is right. In all single train operations that is true, you can't get away from that, single track operations.

Q. And each time that you multiply the meets and passes you multiply the number of times that those men have to

get down on the ground to throw switches and climb the train while it is in motion after they have done it, don't you?

A. Yes, every time the train stops the brakeman has to get on the ground whether it is a meet or whatever it is.

Q. You spoke of having to rebrass cars. You have been a freight conductor for quite a while, haven't you?

A. Yes, sir.

Q. How many times in the course of a roundtrip to Lordsburg do you have to re-brass a car?

A. Only as a passenger conductor did I brass a car, a dining car twice between here and Lordsburg and set the car [fol. 4402] out at Lordsburg but on freights since I have been assigned over there I want you to understand I don't work very regularly. I haven't brassed a freight car since I have been assigned between Tucson and Lordsburg but I don't work regularly like the regularly assigned conductors do.

Q. Is that because of your duties as local chairman?

A. Yes, sir.

Q. By the way, you are local chairman of the local lodge of the Brotherhood of Railway Trainmen, aren't you?

A. Yes, sir.

Q. Referring again to meets and passes, suppose that between the end of the double track at Stockham and Picacho there is one train in each direction, there would only be one meet, wouldn't there?

A. That is right.

Q. Suppose there are two trains west and two east, how many meets?

A. You could only have one if they were close enough together. If they were spread out, thirty or forty minutes apart, you would have two meets.

[fol. 4403] Q. You would have four, wouldn't you?

A. If you had two trains coming east and you were going west?

Q. I said two trains in each direction.

A. That depends on the dispatcher and the right he gives you. He may give you the main line and you could ride along and there also may be some first-class trains involved that you have to get out of the way of and you stay right there and the second-class trains may have the right of way over you. It is pretty hard to answer those questions

specifically, Mr. Mason, because I am sure you should realize that in railroading there are so many things that can come into it that you don't think of.

Q. You are going on to volunteer a long answer here, but I don't care whether you have freight or passenger trains. If you have two trains in each direction, each will have to meet the other two, won't it?

A. That is correct.

Q. You will have four meets, won't you?

A. What do you mean by four meets?

Q. Each train will meet two others and you have two trains in each direction.

A. Generally in one direction the trains will have the [fol. 4404] right and sometimes they don't know anything about you, they will keep going right on about their business. You may be in a sidetrack for them but they have no orders on you at all.

Q. Isn't a meet when a train goes by another going in the opposite direction?

A. That is right, you meet one and you may be at that same sidetrack and meet the other, those two meets you have at the same sidetrack. Again you may meet one at this sidetrack and on the orders you have give you time to go to the third sidetrack which would cause your train to take siding twice. That would be two meets. Is that what you mean?

Q. You either have the choice of waiting at a siding while two successive trains come by, in which case you enter the siding only once or you meet your two successive trains at two successive sidings if they were spaced sufficiently apart?

A. That is right.

Q. And you have less delay at either siding?

A. If they are on orders, yes.

Q. But in either case you have made two meets?

A. That is right.

Q. So if you have two trains in opposite directions you are bound to have four meets, aren't you, because the second [fol. 4405] westward train will meet the two eastward trains and the same way that the first westward train will meet the two eastward trains?

A. Well, in train dispatching the dispatcher gives the two eastward trains probably right over the two westward trains and he waits for them. You have to meet two trains east,

you take the siding for the first train and if you have sufficient time on your orders to go to the next siding you go down and take siding. That is the two times that you take siding to meet two trains. There may be another fellow behind you and he will do the same thing in addition, what I mean he would take two, that would make four. Is that what you are getting at?

Q. That is the fact, isn't it?

A. You didn't put it that way.

Q. All right, as long as you make it clear, it is all right with me. You spoke of the difficulty of observation of the train while moving by brakemen sitting in the caboose?

A. In the cupola.

Mr. Strouss: Pardon me, Mr. Mason, if you are going to spend any length of time on that I would prefer to recess as I have an appointment.

The Court: Very well, the court will be at recess until ten o'clock tomorrow morning.

[fol. 4406] 10 A. M., April 11, 1941.

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed. You are going to complete your cross-examination of this witness, Mr. Mason, at this time?

Mr. Mason: I think so, your Honor. There is some material I wanted to use in connection with his cross-examination that may not be available until this afternoon, but I think I will finish with the questions that I have before the morning recess. I would like to have the privilege of recalling him after the noon recess if necessary.

The Court: The Court will grant you that privilege. You may proceed.

E. J. DURNIL resumed the witness stand.

Mr. Mason:

Q. Mr. Durnil, you and I had some discussion yesterday of the possibility of your having handled a train of more than 70 cars from Lordsburg to Tucson on April 29, 1940.

You were then positive that you had not been conductor of such train. I am going to show you form S-1310 which is a switch list and I am also showing the document to opposing [fol. 4407] counsel, a switch list of a train entitled, "extra west, engine 3705, leaving Lordsburg 7:35 A. M., April 29, 1940, arriving Tucson 4:40 P. M. of that day," the switch list being on the face and the reverse of the form and I will ask you to look at it and see if that is not your signature and your handwriting at the top?

A. Yes, that is my switch list and that is my signature. After my testimony yesterday that I didn't think I handled one, I thought that over again last night and it seems as though I did remember of handling a train of slightly over 70 cars either from Bowie to Tucson and if I had my train book I could definitely determine whether I did it from Lordsburg to Tucson or from Bowie to Tucson.

Q. I didn't suggest in my question yesterday that you handled them all the way from Lordsburg to Tucson. My question yesterday suggested that you had handled a train of more than 70 cars on April 29, 1940, and that is all I said. This shows 73 cars into Tucson, does it not?

A. That is correct, but I think those were handled between Bowie and Tucson. My train book would reflect that evidence if I had it but I didn't have it.

Q. You spoke yesterday in your testimony of passing [fol. 4408] signals back and forth between the head end and rear of the train. In practice do you find that you are able to pass signals readily between the front and rear of trains of 70 cars?

A. Yes, a great deal of that relies particularly on the alertness of the head brakeman to always be watching towards the rear of the train for any signal that may be given from the rear of the train.

Q. That is part of the head brakeman's duties, isn't it?

A. That is right.

Q. You had no difficulty in passing signals between the head brakeman and the caboose on trains of 70 cars?

A. No, if the train is straight, and generally by getting on top, in daytime with your hat or by night lighting red fusees you can generally pass the signals to the engineman.

Q. As a matter of fact, Mr. Durnil, in Arizona particularly the air is generally pretty clear, isn't it?

A. With the exception in the summertime, as I have previously testified, in the daytime in the extra heat it is diffi-

cult to see and distinguish signals accurately because of the heat waves.

[fol. 4409] Q. You don't have any obstruction to vision on account of fog, do you?

A. Occasionally in the winter months we do have considerable fog in Arizona, particularly this winter.

Q. That is the first time I ever heard that confessed by an Arizonan.

A. I regret to have to confess it, nevertheless it is true.

Q. You rarely have any serious or long continued obstruction to vision on account of rain storms, do you?

A. Yes, occasionally we do have rain storms in our summer months and also this winter we have had an excessive amount of rain.

Q. How many times in the course of the last year have you had any obstruction to vision while you were operating and attempting to pass signals from front to rear or otherwise to observe the train on account of rain or fog?

A. I will have to confess that myself particularly I haven't had any this winter because, as I have previously stated, I haven't worked very regularly but I have had other trainmen inform me of the extreme heavy fog and rain at various points this winter.

[fol. 4410] Q. Your answer as to interference is entirely based on hearsay from others?

A. And my knowledge of the weather.

Q. You have no interference as to vision on account of snow storms or blizzards, do you?

A. Occasionally in the Lordsburg district we do have snow storms, but not in Arizona.

Q. You have no serious obstructions to vision, generally speaking, along the line on account of heavy vegetation overhanging the track?

A. Not very often, no, sir.

Q. You have none on account of heavy smoke hanging in the air from manufacturing districts, do you?

A. No, sir.

Q. None on account of buildings over the larger part of the route, do you?

A. No, with very few exceptions, maybe at Tucson.

Q. You stated that before you start out you and your brakemen or you, if you are working as a brakeman, when

you make your standing inspection of your train try to find any cars where the air is not working, is that correct?

A. You are now referring to a terminal train inspection?

[fol. 4411] Q. The initial terminal inspection.

A. That is correct, that is one of the features, yes.

Q. In practice you rarely find any cars where the air is not working, isn't that so?

A. No, we occasionally do.

Q. When did you find the last one?

A. I wish to add to that this, at the terminals where carmen are not maintained the connecting conductor may advise the other conductor outbound of a certain car in the train cut out for some particular reason. Likewise, there may be a car in that train that the air is not working on.

Q. You say there may be?

A. It has happened.

Q. When did it last happen with you?

A. I didn't come in with any specific cases, Mr. Mason.

Q. You have no record or memory of any specific case where that has happened with you?

A. I presume if I had access to the records of my own reports and other conductors' reports that I connected with that that fact could be developed.

Q. You have known about this case for a long while, haven't you, Mr. Durnil?

A. Yes.

[fol. 4412] Q. You have known you were going to be a witness for at least seven weeks, haven't you?

A. No, I didn't, no, sir.

Q. You have had ample opportunity to prepare, haven't you?

A. Conductors or brakemen, you are speaking now of brakemen, brakemen do not maintain such records.

Q. I am speaking of any instance that you know of that will illustrate and support your testimony that you gave here yesterday. As local chairman of the B. R. T. you have had quite an active interest in this case, haven't you?

A. Oh, yes.

Q. You still haven't prepared yourself with any specific instance to support that part of your testimony?

A. That is a matter of record with the carrier and if those records were brought in I could verify my own records because it is a case where the instructions are placed

to brakemen and conductors by bulletin of those questions and we are cautioned to live up to them or required to live up to them and we do it and we find those cars every once in a while. Furthermore, going into Lordsburg we are supposed to wire the terminal there of such cars in advance [fol. 4413] if we possibly can so that the car repair men there, not inspectors, but car repair men maintained there can be called and brought on duty to repair that car at that terminal so the car can continue on. I want to add further it is a matter of record with the carrier and our train books and our records are filed with the carrier and as an employee I do not keep those records.

Q. As a matter of practice, these cars where the air is not working are repaired at Lordsburg before you get them from the other division and you turn them over to the other division and they are repaired at Lordsburg before they proceed?

A. They are supposed to be and if not our instructions are to switch them back directly ahead of the caboose. However, at Gila Bend that is not true, they are not repaired at Gila Bend.

Q. You cannot recall for me, can you, any instance where you have found such a defective car at Gila?

A. No, I would have to answer that as I previously did. I don't maintain that record except in my train book which I do not have available and they are not retained in my possession.

Q. Going to your testimony as to picking up cars and re- [fol. 4414] leasing hand brakes when they are picked up. That is a duty associated with the individual cars picked up, isn't it?

A. Yes, sir.

Q. It has nothing to do with the length of the train in which the car is to be placed?

A. Yes.

Q. How?

A. Assuming that I started at a station with 65 cars and I was instructed to pick up five more cars at that particular station that would increase my train to 70 cars.

Q. A job that you do on the five cars has nothing to do with the fact that you have 65 cars, has it?

A. Yes, it requires in picking up those five cars that we ascertain if the air is properly working in those five cars

when we pick them up and also that the journal waste is not taken out of those cars which is liable to burn off the journal.

Q. Isn't that a duty that relates itself to those individual cars?

A. That is true, that is our duty.

Q. You speak again of the possibility of a flat wheel on a [fol. 4415] car which may lead I take it to a derailment?

A. Yes, a flat spot on a wheel that is condemnable must not be handled in the train. It should be set out.

Q. If it is so handled, it may lead to a derailment?

A. It has possibilities of breaking rails particularly in the winter time.

Q. A broken flange on a wheel is likewise likely to lead to derailment?

A. Correct.

Q. If a hot journal box is not detected, you may have a journal burned off, may you not?

A. That is true.

Q. Which will also lead to derailment?

A. Correct.

Q. Those are all defects in or failure of the freight car equipment itself, aren't they?

A. Yes, and I might add there that broken arch bars also can lead to derailment.

Q. You don't have any arch bars anymore, do you?

A. Yes, we occasionally have broken arch bars.

Q. How long since you have had a bar in one of your trains equipped with an arch bar truck other than possibly work equipment?

[fol. 4416] A. I was a conductor on a train at the time I was assigned between Yuma and Gila in the year 1924 or 1925 in which I had a broken arch bar on a car of Southern Pacific oil at Theba station.

Q. 1924 or 1925?

A. Yes, sir, at Theba station.

Q. That is the last broken arch bar that you can remember?

A. That I can remember, yes, sir.

[fol. 4417] Q. Now, each of these defects or failures, whether it be a flat wheel or a journal failure, or a flange, broken flange, is a defect of the individual car, isn't it?

A. That is right.

Q. And it is a defect which may happen in a train of 40 cars?

A. Yes; for example, referring to a broken arch-bar, the car may be slightly overloaded.

Q. But it is a defect of the individual car?

A. That is right.

Q. And it may occur in a train of 70 cars?

A. Yes, or a hundred or a hundred and fifty.

Q. Or a hundred; or a hundred and fifty?

A. That is right.

Q. But if you have, let us say, a thousand cars to move, whether you move them in 50-car trains or in 70-car trains, you will expect about the same number of defects in the movement of that thousand cars, won't you?

A. Well, yes, we are trained to always expect to find defects, that is why we inspect the trains at every opportunity. There is no way of man knowing when steel or iron is going to break.

Q. These defects then, if you have a thousand cars at Lordsburg to move to Tucson, may occur no matter what [fol. 4418] the length of the train in which they are moved, whether they are 50 or 70 cars or anything in between?

A. No, you never know when a defect is going to develop.

Q. Now, do you contend that those defects result in hazard to the trainmen?

A. Most certainly so.

Q. Now, suppose that you handle those thousand cars all in 50-car trains, you will have twenty trains, won't you?

A. Yes, sir.

Q. You will have four trainmen, including the conductor?

A. Yes, sir.

Q. On each one of those 50-car trains?

A. Yes, sir.

Q. Or 80 men exposed to whatever hazard there may be from these defects, is that so?

A. Well, if we to the best of our ability observe the rules and observe our trains, it is easier on 50-car trains as you stated, to properly observe and police that train, much easier than if it were 70, or a hundred car-train.

Q. Still, Mr. Durnil, if you have twenty trains to move these thousand cars subject to these defects, you will have [fol. 4419] 80 men exposed to hazard, not including the engineer and fireman?

A. That is true.

Q. If you have all of that thousand cars and you move that all in 100-car trains, you will have ten trains?

A. Yes, sir.

Q. And 40 men exposed to the hazards?

A. Yes, but there is a great difference there in ten cars and twenty.

Q. We will get to that later. You referred to the rules governing the duties of a conductor and likewise to rules 827 and 828, which relate to the duties of the brakemen in making inspections; you read those rules out of the Rules and Regulations of the Transportation Department for the System, didn't you?

A. Yes, sir.

Q. I take it that those rules apply in New Mexico as well as in Arizona?

A. Yes, sir.

Q. California?

A. Yes, sir.

Q. Nevada?

A. Yes, sir.

Q. And if those rules are lived up to, why, the inspec-
[fol. 4420] tions will be just as carefully made in New Mexico as they are in Arizona?

A. That is right.

Q. Or anywhere on the System, is that correct?

A. That is right, an inspection is an inspection, as permitted in our time-table instructions previously testified, the distance a train can travel before it has to be inspected, in other words, 65 on the Tucson division and 60 on the Rio Grande.

Q. Now, I think you said that these inspections covered by Rules 827 and 828 were necessary in order to find possible defects before they became serious and led to derailments?

A. That is correct.

Q. They are primarily for the purpose of discovering these defects in or failure of the freight car equipment itself which may lead to these derailments; is that correct?

A. That is correct.

Q. And I think you said also that the inspection was more difficult on a train of a hundred cars than it was on a train of seventy cars?

A. It takes longer to make the inspection; yes, sir.

Q. But it is no more difficult?

[fol. 4421] A. There are 30 more cars in that train to inspect than in the 70.

Q. Otherwise, it is no more difficult to make it?

A. For standing inspection it is not, except the time factor involved, but for running observation it is much more difficult.

Q. It is more difficult, is it, to roll a train of 100 cars by at eight miles an hour and make the inspection than it is to roll the 70-car train by at eight miles an hour and make the inspection?

A. No, I wouldn't say that there would be any difference in letting a 100-car train roll by than a 70-car train, so far as the rolling inspection is concerned, except there are other factors to take into consideration, and that is the particular territory or the grade you are standing on that the rolling inspection has to be made. We have localities between Tucson and Lordsburg that they engineer would be unable to maintain the speed of eight miles per hour, assuming we had a hundred-car train of ten, twelve or fifteen thousand M's in the train.

Q. I am going to question you on that. How do you know that the engineer is unable to maintain that speed? You [fol. 4422] have never worked on a train of a hundred cars in Arizona?

A. I know from my knowledge of railroading, of the trains we handled of 70 loads, in certain localities the engineer is unable to maintain a speed of eight miles per hour for rolling inspection at certain places because of the grade.

Q. What are those places?

A. Benson or Steins would be one eastward, where the engineer would be impossible to maintain his speed of eight miles for rolling inspection, just east of Steins where we cut out the helpers.

Q. Any other place?

A. Also westward out of Steins, where we may be in the side-track and have the switches to line back, it would be necessary there after the rolling inspection was made to stop the train because the engineer is unable to maintain that with his independent engine brake, and at Mescal going eastward.

Q. Mescal going eastward?

A. Yes, sir, a tonnage train of 70 loads, 65, between 65—6,500 or 7000 M's.

Q. Well, your statement is based entirely upon your observation of trains of 70 cars and less and not upon any [fol. 4423] observation of trains of greater length operating in this territory or anywhere else?

A. Well, I wouldn't say anywhere else, if you leave that off, but I would say in Arizona, my experience the last 27 years in Arizona.

Q. You have never had any experience with trains of more than 70 cars handled by the present type of locomotive owned by the Southern Pacific Company other than the one 73-train that you handled?

A. Not on the Southern Pacific, but I have on the Santa Fe.

Q. You haven't had any experience with the present type of Southern Pacific locomotives on the Santa Fe?

A. My experience on the Santa Fe was a Mallet type engine, which is equivalent to our 5000-class or 4100-class engines here now.

Q. You say the Mallet type on the Santa Fe in 1913 or 1914——

A. 1911.

Q. —30 years ago, was the equivalent of the AC-6 and AC-8 locomotive on the Southern Pacific today?

A. No, I wouldn't say definitely that is a fact.

[fol. 4424] Q. Have you ever been in engine service?

A. No, sir.

Q. You don't know much about engines, do you?

A. I have ridden them a lot as head brakeman, but I am not qualified to testify to an engine.

Q. Do you know the wheel arrangement of the Mallet type you speak of?

A. They were two engines put together.

Q. Do you know the wheel arrangement of the AC locomotive?

A. They had 16 drivers, if I remember correctly.

Q. On what?

A. On the Mallet type on the Santa Fe, they were 1100-class engines.

Q. Do you know what their tractive effort was?

A. No.

Q. Do you know what type airbrake they carry?

A. They had the Westinghouse airbrake.

Q. It wasn't the 8-ET type, was it?

A. Well, of course, I cannot specifically state, but they

had the double pump with the Westinghouse airbrake on those Santa Fe Mallets.

Q. Your last experience was 30 years ago on the Santa Fe?

A. That is right, and we handled several trains of over [fol. 4425] 100 cars in that particular part of the railroad on a grade of one and one-half per cent.

Q. Mr. Durnil, when a train is moving and it is necessary to pass a signal or make a signal at the caboose which has to be seen and acted on at the engine, what signal, if any, is necessary?

A. Well, I think, as previously stated, if the train is moving by day——

Q. Just a minute. Do you have to give a proceed signal?

A. It is the duty of the conductor when the train is standing to give the proceed signal.

Q. I am asking you when a train is moving and you make a signal from the caboose, do you make a proceed signal?

A. Not necessary under the Southern Pacific rules to give a proceed signal while the train is in proceed motion.

Q. It is a fact, isn't it, Mr. Durnil, that the only signal you have to give from the caboose to the engineer when the train is moving under any circumstances is a stop signal?

A. No, I wouldn't agree to that.

Q. What other signal do you have to give?

A. Sometimes it is necessary at side-tracks where we [fol. 4426] have to back out, back up signals are given.

Q. Do you give back-up signals when the train is moving forward? When the train is moving, what signal other than the stop signal do you have to give the engineer?

A. We give back-up signal and the continuously back-up signal; we are also under a certain rule here while a train is running it parts, it is the duty of the trainmen to take action to stop the detached portion of the train and give break-in-two signals, and particularly where you are operating on double-track at night time, you also have to protect trains from the opposing direction because you may have obstructed the other track.

Q. Is that a signal you give to the engineer?

A. That is right; that is a signal you give to the engineer.

Q. To protect the train on the other track?

A. Yes, sir.

Q. That is in case of a break-in-two, is it?

A. That is right; the train is in motion, you asked about signals, the train is in motion, it is the duty of the engineer to know on double-track of that fact and have the head brakeman with red light protect the trains in the opposite [fol. 4427] direction until we positively know that the opposing track is in no way foul that this train may collide with, that is the duty of the conductor and the engineer and it is the duty of the brakeman to be on top and give those break-in-two signals where it can possibly be done.

Q. Now, what rule are you referring to?

A. Well, I will find it in a minute. One of the rules that would apply in the protection of trains in the opposite direction would be Rule 99.

The Court: Well, that protection, Mr. Durnil, would come after the train had stopped, would it not?

A. That is right, after the train parted while in motion, then came to a stop.

Q. Well, possibly you didn't understand Mr. Mason. If I understood him correctly, he was asking you what signal or signals you would give to the engineer when your train was in motion proceeding forward, other than the stop signal?

Mr. Mason: And I said also from the caboose, Mr. Durnil.

A. That is correct. Well, this would be from the caboose or the rear portion of the train.

Q. Will you find the rule which covers it?

A. Well, it is in here if I can find it regarding the train- [fol. 4428] men stopping the detached portion first.

Q. Well, I don't think you will find it, Mr. Durnil, in the book.

A. Yes, sir, it is in here.

Q. I suggest that you take the time during the morning recess, and I will proceed to some other questions.

A. All right.

Q. Mr. Durnil, you were present in the courtroom when Mr. Cooper testified, were you not?

A. No, sir, not all of his testimony, no, sir, I wasn't; part of the time I was here.

Q. Irrespective of that, if a break-in-two occurs, Mr. Durnil, in your experience, doesn't that result in setting the brakes on both portions of the train?

A. No, the forward part of the train, in point of the break-in-two, would be stopped by the air and, assuming that the rear part of it, the air wasn't so good, would cause it to go further than the front portion, it would be the duty of the trainman to set hand-brakes to stop that rear portion before it collided with the front portion of the train.

Q. Do I understand then that if the train line breaks, [fol. 4429] the brakes wouldn't be set on the rear portion?

A. They might be set but they might not be quite so prone to stop so quick as the forward portion, which would cause it to collide with the front part of the train.

Q. Now, Mr. Durnil, have you ever had a case of a break-in-two where you were a member of the crew, either conductor or brakeman, where the rear portion of the train failed to stop as a result of the setting of the air, because of the break-in-two?

A. No, Mr. Mason, but I would like to quote your Rule 102 now, which has a bearing upon that question, on page 51. "If a train should part while in motion, trainmen must take necessary precautions to prevent damage to the detached portion. Should there be a sudden application of the brakes which may cause damage to the train or obstruct the adjacent track, train parting signal 14-F must be given, and engine and trainmen must immediately display stop signals to trains on other tracks. Trains receiving these signals must stop and not proceed until it is known that the track is not obstructed." That is what I referred to before, and I would quote that rule as being an answer to your question.

[fol. 4430] Q. That says, "which may cause damage to the train or obstruct the adjacent track."

A. Damage to train would mean our train, and the adjacent track would be on double-track. The trains may be operating in the opposite direction on the other track.

Q. Let us look at 14F a moment.

A. That is a whistle signal.

Q. And not a hand signal from the rear. The rule speaks of a whistle signal and I asked you about hand signals. Is that what you mean when you say signals must be given from the rear, you refer to whistle signals?

A. The whistle signal is when the engineer gives three blasts of the whistle, indicates a break-in-two, the engineer is positive that his train is broke in two; however, the conductor could apply the air in emergency from the caboose,

taking it away from the engineer gradually, and the engineer wouldn't know whether his train was broke in two or not. It has been the practice of trainmen while being on top to give a vertical signal with the lantern in a round position that the train had parted. That was particularly followed for many years when trains were handled where they [fol. 4431] were not all air in the trains; it is still a practical practice we would use in road and yard among ourselves to notify the others that the train had parted.

[fol. 4432] Mr. Mason:

Q. Now, Mr. Durnil, there is no provision in rule 102 or anywhere else in the book, is there, for the giving of a train parted signal by hand from the rear?

A. No, not now. There used to be.

Q. The reference you gave me was to a whistle signal given audibly from the engine, wasn't it?

A. 14-F calls for the engineer to blow three blasts of the whistle to indicate the train had parted.

Q. If the train is in motion then the stop signal is a signal principally that you have to give from the caboose which must be understood by the engineer?

A. By day or by night with a red fusee.

Q. That is a stop signal, isn't it?

A. A red fusee is our understanding that they want to stop and we stop. However, that is not covered in the rules.

Q. Just a moment. Suppose that the stop signal is not seen by the engineer, do you then have any step that you can take to bring the train to a stop?

A. Yes, the conductor will use the conductor's emergency valve.

Q. That applies the brakes throughout the train, does [fol. 4433] it?

A. Yes, sir.

Q. Starting at the caboose?

A. Starting at the caboose first.

Q. And proceeding forward through the train?

A. That is right. There are two ways to handle that from the caboose.

Q. I don't want any volunteer answer here, Mr. Durnil. If the emergency application of the air by the emergency valve starts at the caboose and proceeds forward through the train serially with the last car and the next to the last

car and so on, there cannot be any run-in of slack from the rear as if the emergency were made in the head portion of the train, can there?

A. The run-in would be on the head end, not on the rear in that case.

Q. So there would be no danger of slack injury to the men in the caboose, would there?

A. No, but there would be danger to the head brakeman on the head end of the train.

Q. On account of the application of the brakes at the rear end?

A. Yes. As a conductor I may slam those brakes on with full force to stop the train as fast as possible. In that case [fol. 4434] there would be a most severe jerk to the head end of the train.

Q. Have you any record of any slack action injury to the head brakeman or any other member of the crew on the engine of the train where application was made of the air in emergency by the conductor on either a long or short train?

A. I have no records, Mr. Mason, to produce.

Q. Has anything of that kind ever happened on a train where you were conductor?

A. No, not directly under my charge, no.

Q. I have a record of several cases, one or two cases, where you applied air in emergency from the emergency valve. As a matter of fact, has any casualty occurred in any instance where you as conductor applied the air in emergency?

A. I will answer that this way, that I don't maintain a personal record for my review and should I, they are a matter of record with the carrier that I cannot recall at this time.

Q. If there were serious casualties involved because of slack action due to application of the air in emergency at the conductor's valve, you would remember that, wouldn't you?

A. If it was real serious I would.

Q. You remember back thirty years, all the way from 1911, all of your experience on the Santa Fe, you would [fol. 4435] remember these intermediate affairs if they were serious?

A. I know I have never caused a trainman to be killed by my handling of the air from the rear but I can't recall

whether there was any slight personal injury or not to some trainman because of my action in handling the air.

Q. In any event, you cannot recall any reportable injury, can you?

A. No, I cannot because I haven't the records.

Q. If the train is stopped there are occasions when you have to give signals to the engineer at the head end?

A. Yes.

Q. When the train is stopped and still intact, not broken up or separated for purposes of switching. One of those signals is a proceed signal, isn't it?

A. Correct.

Q. Another signal may be a back-up signal?

A. Correct.

Q. Which is in the nature of a proceed signal except it involves a reverse movement?

A. Correct.

Q. Suppose the engineer does not see your proceed sig- [fol. 4436] nal or your back-up signal because of the length of the train let us say, does that involve any hazard?

A. Under that circumstance I would try to space my brakemen in a position——

Q. (Interrupting:) Just answer my question, please. Does it involve any hazard because the conductor fails to see a proceed or back-up signal?

A. I don't understand your question when you say the "conductor fails."

Q. I should have said the "engineer," just correct that. Do you understand the question?

A. Read the question, please.

(The question was read by the reporter as follows: "Suppose the engineer does not see your proceed signal or your back-up signal because of the length of the train let us say, does that involve any hazard?")

A. Not because he failed, no, that wouldn't.

Q. Nothing at all happens, does it?

A. No, not while the train is standing still, with this one exception, Mr. Mason, I want to make an exception and I think I have a right to make it.

Q. All right.

A. Under the circumstances of a train going into a sta- [fol. 4437] tion where a train is following and I as a conductor know I have to stop my train at that station and I

want to drop off my flag, the flag gets off, I want the engineer to pull a little further on down to afford proper protection for my train so that the flagman can get the train at the following stop. I give the engineer the signal to proceed on down a quarter of a mile so he then would stop and I may have ample protection to my train to prevent any rear-end collision.

Q. In circumstances of that kind you would simply be trying to cover up your own failure to see that rule 99 was observed?

A. No, sir.

Q. When you are on the track under circumstances where you are likely to be overtaken by a following train, it is the duty of the conductor and the rear flagman to drop off in time to prevent a rear-end collision and have a sufficient distance back?

A. It is the duty of the flagman and the conductor in case the train is making such speed that the flagman is unable to drop off to comply with rule 99, that we drop off fuses at frequent intervals to inform the engineer of the following train that we are immediately ahead of. Further, I tried [fol. 4438] to explain the condition may arise where it is necessary that I stop my train. I am going to have to stop my train but before I get it fully stopped I want to get my flagman off to afford proper protection and I want my train to go at least a quarter of a mile further to give the following train ample time to be stopped, particularly on heavy grades, descending and heavy grades. It is necessary that we do that to afford ample time for the following train to be able to stop because at stations under the block system they can close in on them and that is why these signals, it is important that these signals be given either to proceed or to stop or sometimes just to go ahead, not a highball but just a go-ahead signal, to move your train a little bit further.

Q. When was the last time that you had a rear-end collision because of failure to give adequate protection to the rear on account of the inability to get the engineer to pull ahead?

A. I never had any rear-end collision, Mr. Mason, thank God.

Q. You have always seen that your flagman or yourself observed rule 99, have you?

A. To the best of my ability, yes, sir.

Q. You have always been able to afford protection?

[fol. 4439] A. Yes, sir.

Q. Have you ever under any circumstance had to give this proceed signal to an engineer standing on the main line after you had stopped short of a station because you didn't have sufficient protection?

A. No, that never happened to me, but as a conductor I am supposed to have that knowledge and to function under those conditions.

Q. It has never happened to you. You only think it might happen?

A. I don't want it to happen, either, Mr. Mason.

Q. Yesterday you spoke of the use of retainers and the necessity of brakemen riding out where retainers are used. It is a fact, isn't it, that retainers are not used between Tucson and Lordsburg?

A. We don't use them anymore except——

Q. (Interrupting:) Do you ever have any riding out by trainmen?

A. No, sir.

Q. Rule 869 is not applied to any territory between Tucson and Lordsburg, is it?

A. No, sir, except if we want to make some particular move at some particular station that requires the trainmen [fol. 4440] to be properly distributed over the train to pass signals the conductor will instruct him to get up there and do that.

Q. As far as the observance of the rule because of steep grades, you just don't do it?

A. No, sir.

Q. You spoke of hazards in making inspections at night. I take it that the hazard is one of stumbling and falling along the right of way while undertaking to see the defects or possible defects in the cars?

A. That is true, that is one of them, yes, sir.

Q. Isn't that the only substantial hazard in making standing inspections at night?

A. Yes, that is about the only one. Under our instructions every stop is an inspection stop if it is only five minutes or ten minutes or whatever it is and it doesn't mean at a station, any place a train may be stopped it is our duty to inspect the train. The hazard in that inspection is one of proper footing to prevent injury to yourself or looking out for bridges that are not decked, at night time

you may walk into one if your are not watching where you are walking. In that connection, Mr. Mason, I refer you to the rule——

Q. (Interrupting:) Just a moment, you have told me what [fol. 4441] the hazard is. The hazard is one of failure——

A. (Interrupting:) Yes, but I would like to quote this rule.

Q. All right, what is the rule?

A. Page 5, rule M of the rules and regulations, it says, "Employees must exercise care to avoid injury to themselves or others. They must observe the condition of equipment and the tools which they use in performing their duties, and when found defective will put them in safe condition, if practicable, reporting defects to the proper authorty.

"They must inform themselves as to the location of structures or obstructions where clearances are impaired.

"They must expect trains or cars to move or be moved at any time, on any track, in either direction.

"They must not stand on the track in front of an approaching engine or car for the purpose of boarding it." Now that rule, Mr. Mason, the first duty of an employee or trainman is the first wording of the general rule on page 3, it says, "Safety is of the first importance in the discharge of duty." In your question it would be the duty [fol. 4442] of this particular trainman or conductor inspecting his train to caution himself as to any injury to himself in the performance of his duty. That requires him looking directly ahead to see that nothing happens to him in the performance of this duty and that is what we try to do to the best of our ability.

Q. This hazard to the trainmen while making inspections as I understand you is the hazard of stumbling or falling or missing your footing at a undecked bridge?

A. That is correct.

Q. That is the only substantial hazard which he encounters while he is making the standing inspection at night?

A. That is right, generally.

Q. Do you contend that that hazard is any greater because the train consists of more than 70 cars?

A. Just to this extent, more than 70 cars, I don't know how many more you are assuming there.

Q. Does the hazard of stumbling or falling along the right of way increase with the length of the train?

A. You would have an additional amount of territory to cover which might, because of that additional territory, [fol. 4443] involve you in turning your ankle or stepping off the undecked bridge, where if the train was of shorter length you wouldn't have to walk that far.

Q. That is the extent of the hazard then?

A. Yes, and I want to say further, inspecting trains at some of our regular stops, water stops and other places where the footing is good I would testify that the hazard of inspecting the trains where the footing is good is very, very slight.

Q. That has no relation to the length of the train you are inspecting, does it?

A. If the footing is good and you have a good place to walk all the way.

The Court: We will take our morning recess at this time.

(Thereupon a short recess was taken after which proceedings were resumed as follows:)

Mr. Mason:

Q. I think you said that you had in the course of your career undertaken to observe the air gauge in the caboose on the various trains where you served?

A. Yes, that is part of the conductor's duty to keep a constant watch over the air gauge in the rear of the caboose.

Q. Did you observe the air gauge in the caboose on any [fol. 4444] trains of more than 70 cars?

A. As the record shows here, I only handled one train of 73 cars but I recall my experience while on the Santa Fe as a rear brakeman it was then my duty to also watch the gauge on the rear of the caboose on trains of more than 70 cars.

Q. The last time that you observed the air gauge in a caboose on a long train other than the 73-car train that you referred to was thirty years ago on the Santa Fe, is that right?

A. That is right, of more than 70.

Q. Do I understand you to say from your observation the air brakes do not apply in handling trains down the grades in Arizona on the rear cars of the train?

A. I believe I testified in handling a train of 70 loads descending a grade that in braking the train down the hill

where the engineer had the use of his air, he would be setting the air the second time before the air fully releasd the first time on the rear end of the train.

Q. Then do I understand that you assert that the air brakes are not working effectively on the rear end of that train?

A. At various times it is necessary, we have to stop him and cut the air out of some of the cars that hang on and [fol. 4445] will not release and may cause overheating of the wheels. That is due to going down the grade and constant use of the air.

The Court: Mr. Durnil, do I understand from your testimony that if the air brakes were not properly working in a car, say in the center of the train, that that would interfere with the operation of the air brakes in the cars to the rear of that defective car?

A. No, that would only interfere with that one individual car, the brakes on that one individual car. It would not affect the brakes on the other cars unless this particular car went into emergency action. That, then, would affect all the brakes in the train.

Q. That is rather an uncommon occurrence?

A. No, I wouldn't call it uncommon, your Honor, it happens quite frequently that we are required to stop the train because of a certain brake, some location in the train not properly releasing.

Mr. Mason:

Q. Mr. Durnil, when is the latest instance when you were a member of a crew when an undesired emergency took place resulting in a reportable casualty?

A. I could not say definitely, Mr. Mason, as to the par- [fol. 4446] ticular instance or the date other than what I testified in my own individual case.

Q. If there had been an undesired emergency resulting in a sufficiently serious casualty to a member of your crew to result in more than three days' disability, you would remember it, wouldn't you?

A. I couldn't say I would, Mr. Mason, for a minor personal injury of three days or four. In twenty-seven years it would be pretty hard to make that definite statement without some record.

Q. Do you assert that on your 70-car trains which you were handling then that the brakes are not applying satisfactorily on the rear cars?

A. No, I didn't make that statement, not applying satisfactorily. I stated that occasionally descending these grades where the engineer is constantly using the air that we very frequently have to stop the train and cut the air out of some particular car. For example, here a few days ago I stopped my train at Fenner, Arizona, descending from Dragoon to Benson because the fire was flying on one particular car and I got a fusee signal to the engineer and stopped the train and went up myself and inspected this train to ascertain if there wasn't something wrong with [fol. 4447] that particular car.

Q. Do you assert that the air brakes would not function properly on the rear ends of trains of more than 70 cars in this same territory?

A. My answer to that, Mr. Mason, would be the more cars and the more tonnage you accumulate in the train is just an additional effort on the part of the engineer to properly brake the train down grade. There is no instruction by the carrier nor the manufacturer as I understand it to tell us when the triple valve may become defective. That is part of our job, to keep a constant watch for these defects and catch them and correct them before any accidents occur.

Q. Have you in your experience, Mr. Durnil, had any derailments of trains where you were conductor or brakeman due to a flat wheel?

A. No, I can't recall that I have.

Q. When was the last derailment in which you were a member of the crew which took place because of a broken flange on a wheel?

A. I was the conductor of a train westbound, Lordsburg to Tucson, either in the year 1928 or 1929 where we had a broken flange and our train was derailed in the cut about a mile and a half west of Benson, Arizona—just [fol. 4448] a minute, I will have to correct that date, I believe that was in the war days of 1918, somewhere along in there probably.

Q. You haven't had anything of that character in the last twenty years, approximately?

A. No, sir, I have not.

Q. Are you familiar with the change in the construction and type of the wheels on freight cars which has taken place particularly since 1925?

A. The changes in them?

Q. Yes.

A. Particularly I noticed that many of these cars, the new equipment coming out, has steel wheels instead of cast-iron wheels.

Q. You are familiar also with the fact that the single plate wheel has largely replaced the double plate wheel that used to be in use?

A. No, I didn't know that. I have made no study of the construction of the new cars to qualify me to testify as to the manufacturers' changes in them.

Q. You don't contend, do you, that the crew consisting of the conductor and three brakemen which you have in Arizona is unable to make an adequate standing or rolling [fol. 4449] inspection of a train of more than 70 cars, do you?

A. Read that back again, please.

(The question was read by the reporter.)

A. There would be several factors involved in making a proper standing and rolling inspection of a train of more than 70 cars. First, it would require a little longer time; second, if my train was off of the main track where my flagman could assist by taking one side and the brakeman the other side, also when the train has been inspected and we start then to make our rolling inspection it would take longer for the train to pull by you and after the train pulled by and we all boarded the caboose we would then have to give a proceed signal to the engineer that the members of of the crew were all on and the train was ready to proceed.

Q. Do the rules require you to give a proceed signal after a rolling inspection?

A. There is no rule in the book that requires it, but it is necessary that the engineer know that we are on the caboose and if he doesn't he should stop until he gets that signal.

Q. You still haven't answered my question yet. Do you contend that the crew of a conductor and three brakemen

couldn't make an adequate inspection regardless of the [fol. 4450] time element if the train was more than 70 cars?

A. They could make an adequate inspection by using the time necessary.

Mr. Mason: Subject to one or two other questions which I may have after the noon recess, that is all for the time being.

The Court: Do you have any further questions, Mr. Strouss?

Mr. Strouss: Yes, I think I will ask those.

[fol. 4451] Redirect examination.

By Mr. Strouss:

Q. You just spoke about the rolling inspection, Mr. Durnil, and the necessity of giving a signal to the engineer to proceed when the train has rolled by. That rolling inspection is under rule 828?

A. Yes, that rule is covered by Rule 828.

Q. And under that rule the train is prohibited from exceeding eight miles per hour for a distance sufficient to permit running inspection when starting; that is correct?

A. That is correct.

Q. That is at least one instance where a signal other than a stop signal is required to be passed from the rear end to the head end, although the rules do not in so many words say that?

A. That is correct. It is necessary that we give a proceed signal, because the engineer must know that the members of the crew are on the rear end of the train.

The Court: Well, Mr. Durnil, when an inspection of the type that you have just mentioned is made where the cars roll by you, does that leave both brakemen and the conductor at the rear when that inspection is completed, [fol. 4452] or is the front brakeman still up with the engineer?

A. Yes, if the members of the crew from the rear of the train, your Honor, get to the head end to permit the rolling section of the entire train the head brakeman will take a position near the head end of the train to watch for proceed signals after the conductor and brakeman get on the caboose.

The Court: Pardon me, it is the rear brakeman and conductor then that make this rolling inspection?

A. Either that, or in some instances, just the swing brakeman and the conductor, and in some instances just the swing brakemen, the conductor doesn't get up there. However, if the other members of the crew don't reach the head end of the train, then it is the duty of the head brakeman to roll his part of the train by to about the point where he knows the rear brakeman or the swing brakeman were when the train started, and that is in accordance with the rule.

The Court: Another question: When a train parts, does the rear segment of that train automatically stop, or does it require some application by the conductor, of the conductor now in the caboose, to bring that to a stop?

A. No; when a train parts while in motion, generally [fol. 4453] the entire train will go in emergency application of the air.

The Court: Both segments of the train?

A. Yes, sir, except, as I tried to explain and I have so testified, it is permissible from Gila and from Lordsburg to assemble cars to the rear of the train which may have the air cut out, to bring them to the terminal for repairs. Assuming that we had five assembled directly ahead of the caboose with the air cut out and the train parted on some hogback or some hump, it would be necessary that we take action to stop that detached portion as best we could to prevent it from colliding with the head-end portion which would demolish the cars and maybe our lives would be endangered by the collision.

The Court: Go ahead.

Mr. Strouss: You were asked concerning the new draft gear. Is it a fact, notwithstanding any changes that may have been made in draft gears, that you still do have slack action in trains?

A. Yes, sir, very much so.

Q. Is it a fact that the equipment, the new equipment is heavier or lighter than the equipment which has been used previously, that is, year after year?

[fol. 4454] A. The equipment is much heavier now than the older equipment. By being of a heavier capacity car permits a heavier contents load of the car, which plays a

very important part in so far as slack action is concerned.

Q. That is, the car or the car and contents which is moving in this slack action is heavier now than previously?

A. Yes, sir.

Q. Now, you were asked about increase in meets and passes and with more trains the necessity of brakemen getting on and off the train? When you make a meet, take a siding for a meet, do you make an inspection of your train at that time if the time is sufficient?

A. Yes, you can kill two birds with one stone there. By meeting a train you can also inspect your train, and if you inspect your train, that would prevent another stop some place to inspect. In other words from the point of that inspection, you are permitted to travel on the Tucson division an additional 65 miles before you again had to stop for inspection.

Q. Well, you have been asked to give dates of different things. Have you any reason for keeping a record of the [fol. 4455] different events that occur while you are at work?

A. No; but I would like to just add in the record that when I was first promoted, and for several years, I carried a little note book, I made a record of each individual trip for my own personal use and also answering questions of my superior officers. The reason I quit that book I was summoned to a lawsuit in the court of El Paso, Texas, as a witness for the company on a damage claim, and the Court wouldn't accept my record unless it was recorded in the train books, so I eliminated that particular part of my record, and immediately recorded all my trips in my train book, and in that case the carrier would furnish me the book and I could then testify as to the train movements.

Q. Now, you were asked concerning defects in cars such as broken wheels, broken flanges, and the like, and the assumption then being based first upon a 20-train operation, then a 10-train operation, as to the number of men who were affected by the hazards. These hot wheels and hot journal boxes, and these other defects, is it possible that you are able to observe those in time to prevent them [fol. 4456] reaching such a condition that they are liable to cause a derailment of the train?

A. Yes, with the 50-car train, it would be much easier for the trainman to observe 50 cars in a train than it would

in a train of 100 cars, and detecting any defects by stopping and correcting them, which may prevent a serious accident.

Q. And if you are unable to observe the defects, such as a heating wheel, is it then that it becomes overheated to the point of breaking?

A. That is true. That is a very dangerous condition on our railroad when that occurs.

Q. You were asked concerning the conductor's valve, and, as I understood the question, it was with the use of the valve with the train stretched——

Mr. Mason: That is not the question I asked. I asked as to the use of the valve, I didn't say whether the train was stretched or not.

Mr. Strouss: In using the conductor's valve, is there any difference in the use of that valve when the slack is stretched in the train and when the slack is bunched?

A. Yes, there is a great difference.

Q. Just explain that.

A. When the slack is bunched and it is necessary to use the conductor's emergency valve, there are two provisos [fol. 4457] recorded in Rule 16 of the Air Brake Rules and Regulations instructing how to use the conductor's valve. The first one is, "When there is immediate danger to life or property, the valve must be opened suddenly to full extent and left in that position until train stops, then closed." Now, if the slack is bunched and it was necessary for me to comply with that part of the rule by suddenly opening the air to emergency application, that would stop the rear portion first and cause a severe jerk on the head end of the train and possibly break the train in two, either drawbars or knuckles. In the second instance, the rule states: "When it is imperative that the train be stopped within a reasonable distance, for example, when a hot box is noted and a stop signal cannot be transmitted to the enginemen, the valve must be opened gradually and with care to avoid emergency action until it is known that the brakes are reducing the speed of the train, and opening maintained until train stops, then closed." Now, the second portion of this, it isn't an emergency, but it is necessary that the conductor stop the train. Several reasons would be for that, one, probably the conductor figures the engine- [fol. 4458] man hasn't sufficient time to make the next sta-

tion for some superior train and he attempts to pass signals to the enginemen and it may be in a curve territory the conductor cannot wait until he goes too far, he must take action very quickly to stop the train to get it in off the main track for the superior train. Other conditions may be, the conductor may figure there is a brake sticking or some dust flying up the train that may indicate something wrong, but not serious, he would then gradually stop the train and go up and ascertain what that trouble is.

The Court: That is what you were referring to in answer to Mr. Mason that there were two methods of the conductor stopping it?

A. Yes, sir, under Rule 16 of the Air Brake Rules.

Mr. Strouss: That is page 28 of Exhibit 319, Rule 16.

Q. When you apply that brake in the caboose, emergency application, does the engineer know that the brake is being applied?

A. If it goes into emergency, he knows it immediately, because it will jerk his engine.

Q. He doesn't know it until you make the application?

[fol. 4459] A. No, he doesn't know it until I make the application. He doesn't know then definitely that I have applied the air from the caboose. He may assume that an air-hose pulled off or that the train parted. The engineer has no way of knowing what happened until he is informed.

Q. And if he was working the steam before you made that application, he would be at the time it was made?

A. Yes, that is true.

Mr. Strouss: No further questions.

Recross-examination.

By Mr. Mason:

Q. You don't find anything in Rule 828, do you, Mr. Durnil, that says that you must give a proceed signal to the engineer after you have made the rolling inspection at eight miles per hour?

A. There is nothing in that rule, Mr. Mason, that requires a signal to be given.

Q. Now, suppose that the proceed signal is given from the rear end of a long train, by that I mean a train of more than 70 cars, and the engineer fails to get that proceed

signal, is there going to be any hazard to the train?

A. The engineer isn't supposed to go until he gets the [fol. 4460] signal.

Q. He will go at eight miles an hour until he gets it?

A. No, he will stop.

Q. Then there won't be any hazard in that, will there?

A. No, if he makes the regular stop, no, except he won't go until he gets that signal.

Q. So the failure of the engineer to receive the signal from the rear end after a rolling inspection simply maintains matters until he does get it, doesn't it? He either stops or continues to roll at eight miles an hour until he gets the proceed signal?

A. The engineer uses his judgment about that by the length of the train and the telegraph poles and when he figures that we ought to be on the rear end, he is watching, either himself or the rear brakeman, for that signal, and if he doesn't get that signal and neither does the brakeman give him the signal he will stop; and of course every additional stop made is additional hazard to trainmen on the rear by slack action.

The Court: Would that be true at an eight mile an hour speed?

A. Yes, if the engineer attempted to stop it with his [fol. 4461] straight air, that would cause the cars to all jam right in, because after we make a rolling inspection, the engineer very much dislikes to use his automatic air, because if he does he spoils the rolling inspection for his trainmen, because he is setting the brakes in the train, then we would have to do it all over again if we wanted to know positively that every airbrake in that train was released, and the engineers avoid as much as possible using that air after we have made a rolling inspection until the momentum of the train is picked up to such an extent that he has to use the air to reduce the speed of the train or make another stop.

Mr. Mason: Do you know of any casualty to a trainman which has resulted because of the engineer having stopped after a rolling inspection where he failed to get a signal from the rear end and where there was, as you say, a run-in of slack at the time the stop was made?

A. No, I couldn't say that I know of any casualties, no, sir.

Q. Then the hazard is one of these imaginary things that doesn't result in casualties, isn't it, so far as your experience goes?

[fol. 4462] Mr. Strouss: You are talking about his knowledge.

Mr. Mason: His knowledge and experience, yes. He speaks of hazards but produces no casualty to support the supposed hazards.

A. I have no data of any casualties over that.

Q. Now, in answer to the Court's question, I think you discussed the cutting out of inoperative—of cars with inoperative brakes. Can you give the date and the train number, or some other reference to identify the instance where you had as many as five cars which you switched to the rear of the train because of the air being cut out on those cars?

A. No, sir, I have no record here to produce prior to the placing of the heavier springs in these triple valves that we now have. We used to have, particularly in the hot weather, considerable undesired emergency action, which required constant tests to be made to try to locate these bad triples.

Q. And those have practically disappeared?

A. That is where we would cut the air out of these cars and get them into the terminal.

Q. That has practically disappeared since about 1930 with the introduction of the heavier graduating spring in the K type triple valve, hasn't it?

[fol. 4463] A. Yes, that has been very greatly overcome, we have very little trouble with them now, with the AB brake now, when the air goes in emergency it naturally takes all the air out of the train, which is in effect an emergency air appliance and will stop the train.

The Court: Mr. Durnil, a few moments ago you spoke of killing two birds with one stone in making an inspection at the same time that you were having a meet with another train. Does it ever happen on your district that the train is stopped for the sole and only purpose of making this inspection, which is required every 60 or 65 miles?

A. Yes, sir, particularly between Tucson and Gila Bend on the manifest important trains, on which we are given right over all other trains except first class, that we would

make a continuous run, say, from Tucson to Casa Grande, where we would inspect the train there and also take water there probably.

Q. Now, would that inspection stop be directed by your train dispatcher?

A. No, that is in our special instructions in our timetable, the engineer and conductor must see that the train is brought to a stop for that inspection; the dispatcher doesn't [fol. 4464] have anything to do with that.

Q. You report to him that you had stopped?

A If it is a telegraph station, he knows that it stopped.

Q. He makes provision for that in your running time?

A. That is right. However, we may go 50 miles, your Honor, meet a train, take water and inspect the train, which would be killing three birds with one stone, then we would be permitted to go an additional 68 miles from that point before we would be again required to make an inspection of the train.

Mr. Mason: You run as far as you can always without stopping, don't you?

A. Under the time-table instructions, we don't exceed that.

Q. What I mean to say is this, you make as few stops as possible when you are handling your train.

A. That is right.

Q. The reason is, as you have expressed yourself in answer to one of my questions, each additional stop involves additional hazards?

A. That is true, slack action and so forth.

Mr. Mason: That is all.

Mr. Strouss: That is all, Mr. Durnil.

[fol. 4465] The Court: It is so near the noon hour, that I presume it is not advisable to put on another witness. The court will be at recess until two o'clock.

(Thereupon, the court stood at recess until April 11, 1941, at two o'clock P. M.)

[fol. 4466] 2 P. M., April 11, 1941

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed. Call the next witness.

ANDREW W. KENNEDY was called as a witness in behalf of the plaintiff and being first duly sworn testified as follows:

Direct examination.

By Mr. Strouss:

Q. Will you state your name, please?
A. Andrew W. Kennedy.
Q. You reside in Tucson, do you?
A. Yes, sir.
Q. What is your business?
A. I am a locomotive engineer at present.
Q. Employed by whom?
A. Southern Pacific Company.
Q. Will you state to the court your experience in railroading?
A. You want the experience I have had in train service or the complete service?
Q. You might as well give your complete service.
[fol. 4467] A. I put two and a half years in the shop. I put on all the driving boxes between El Paso and Yuma for sixteen months as a machinist. I worked on the bridge gang a short time, very short time, and I quit the bridge gang and later I went to work in the shop for about two months and I quit the shop and hired out on the road, firing, in 1916.
Q. You have been continuously——
A. (Interrupting) Except the time I was in the government service.
Q. You have been continuously in the employment——
A. (Interrupting) Of the Southern Pacific Company in engine service.
Q. When were you promoted to engineer?
A. I was promoted in 1925 but I have a date as an engineer in January, 1926.
Q. What service do you work in, passenger or freight?
A. In freight service.
Q. In what territory?
A. I work between Tucson and Lordsburg.
Q. Do you have an assigned run?
A. Yes, sir.
Q. What length of trains have you operated as an engi-
[fol. 4468] neer?

A. I have handled from 100 cars down to 10 cars in freight service.

Q. Will you state to the court the duties of an engineer on the Southern Pacific, beginning, at the time he is called for service?

A. When we are called for service we get an hour or an hour and a half or two hours call and we report at the round-house, supposed to report thirty minutes early. I generally get down there a few minutes ahead of that if I can. We have to register out, compare watches, and make a notation on the register, read the bulletins to see if there is anything new. Then we go out to the engine and I look at the water glass and steam gauges and look the engine over in the cab and I also check to see if we have the necessary tools and supplies, water, oil and sand. Then I oil around, and while oiling around I inspect the engine to see that it is in serviceable condition, see that my lubricator is full and see what is needed on the engine to make the trip. As a rule, then, we move up a little bit and take drinking water on the engine. From there we go out to the train. In Tucson, where there is a switchman employed, the herder puts us on the train; he [fol. 4469] is a switchman, but at other places where there should not be a herder or switchman employed the brakeman either puts you on the train or if there is a little switching, why we have to do that also before we couple up to the train. Do you want just as if I was going to start on out?

Q. Yes.

A. When we couple up to the train, you understand the car toad generally makes the joint and couples the air and when the train is pumped up he gets the signal back there from the car toad in the rear that everything is satisfactory back there, then he gives me the set-up signal and I make the required reduction and the car man goes back, and when everything is satisfactory to him he comes over and gives me the release signal. About that time the conductor is generally over there with the orders and I have to check the register, check for all the trains due, have arrived or left, and read my orders to see what they contain, see what I am going to run at and one thing and another. When I find out what I am going to run at, I tell the fireman and he puts up his indicators. I also must go down and see that the indicators are properly displayed. About that time the blue light that is on the head of the engine should be off, if the blue [fol. 4470] light is off, taken off by the car man I am ready

to go. I leave there. I must observe all the signals, switches, and one thing and another until I get out of the yard and when I get out on the road I must observe all signals from there on until the end of my run. I have to keep a continuous watch on the track on account of there might be a flag anywhere and especially around curves where I have a good chance to view the train. There are places on the district where it is necessary for me to shut off and adjust the slack and places where I practically shut off to nothing and handle the air down the hill. I stop, take water, and one thing and another, inspect my engine to see that the bearings are all right, maybe oil around, just continuous like that until I reach the other end of the line. When I reach the other end of the line, the trainman or the switchman, the herder, cuts you off and takes you back to the roundhouse. There I look my engine over. Of course I have looked the engine over on the run to see if there is anything that needs reporting or anything has happened and it is necessary for me to register in and make out a work report, make out my time slip, and I am through for that trip.

[fol. 4471] Q. In operating the locomotive are you required to understand the operation of the air brakes?

A. Yes, sir.

Q. In taking your examination for promotion are you examined with respect to the operation of the air brakes?

A. Yes, sir.

Q. You are familiar with the air brake equipment on the locomotives of the Southern Pacific Company that you work on?

A. Yes, sir, on the kind that I work on, yes, sir.

Q. Will you describe to the court the air brake equipment on the locomotives on the engines you work on?

A. Do you want the equipment or do you want how it works?

Q. I want the equipment first.

A. We have an air pump, that is first. Then the pipe from there to the main reservoir, a pipe from one main reservoir to another main reservoir. The pipe from there to the engineer's automatic brake valve. There is an independent brake valve. There is a feed valve, there is a reducing valve, there is a distributing valve, also an equalizing reservoir. [fol. 4472] There are brake cylinders and a hose connection that goes back to the brake cylinder on the tank. Some engines have as high as five brake cylinders.

Q. Do those brake cylinders operate the independent brakes on the engine?

A. No, sir, the independent brake—well, the brake cylinder is what operates the brakes on the engine and tender but the brakes are operated either by the independent or automatic.

[fol. 4473] Q. Now, that is the equipment?

A. That is the equipment on a locomotive.

Q. You have two main reservoirs?

A. Yes. Now, there is more air equipment, but as far as brake handling is concerned. Now, we have the air sanders and air bell-ringer, automatic bell-ringer, and we have the air agitater to agitate the sand.

Q. Those don't have anything to do with the braking equipment?

A. No, that is why I didn't mention it.

Q. Now, you have two main reservoirs?

A. Yes, sir,—pardon me, we also have air gauges that does come in the airbrake equipment.

Q. Your main reservoirs, are they the same pressure?

A. The main reservoirs are the same pressure.

Q. What pressures do you carry?

A. The minimum is 110 and the maximum is 125.

Q. Now, how does your air get from the engine to the train?

A. The air that gets to your train from the engine goes, it comes from the main reservoir up to near the engineer's brake valve, it either must go through the feed valve or the automatic brake valve.

[fol. 4474] Q. Now, this automatic brake valve, will you describe that, the automatic brake valve on a Southern Pacific engine?

A. The automatic brake valve on a Southern Pacific engine is a brake valve so designed that you can make practically any rate reduction desirable. It is so designed that it will not apply the brakes too rapidly that will cause undesired emergency; it is also designed so you can apply it in emergency.

Q. How many positions does your brake have?

A. It has six positions.

Q. What are they?

A. The release, running, holding, lap, service and emergency.

Q. Did you hear Mr. Cooper's testimony?

A. I heard part of it.

Q. His description of the Santa Fe brake and the positions——

A. Why, just identically the same as the Southern Pacific.

Q. Then the air from the locomotive passes to the train either through the engineer's valve or through the feed valve?

A. That is correct.

Q. And how does it get then back to the train after it [fol. 4475] passes these valves?

A. Well, there is only one valve that it passes, the engineer's brake valve, I don't call it a brake valve, you can call it a brake valve if you wish, but it goes into the brake pipe, from there it goes down under the engine through a hose back through another brake pipe, and one in each car on down, which is all one brake pipe.

Q. Did you hear Mr. Cooper's testimony as to brake equipment on cars?

A. Yes, sir.

Q. Is that the same on the Southern Pacific?

A. Yes, that is the same.

Q. Now, in operating these brakes, how do you make an application of the air, just to explain the operation of the brakes, start with the time you couple into the train, what do you do?

A. You mean now I am making application for running along, or for terminal test, or application to stop?

Q. First to charge your train.

A. You charge your train to within—well, the train appears to you to be charged, but the rule says within five pounds, the car man will give you a signal to apply the brakes.

The Court: How long does that take?

[fol. 4476] A. Now, if the train is empty, why, it takes—now, that depends upon equipment, it depends on whether it is K or AB, and how many cars are in a train. You can charge a short train much sooner than you can a long train, and it also depends upon the leaks. Now, we don't have many cases—I mean AB's. It takes ten minutes to charge a train to 70 pounds with an AB if the pressure is maintained

at 70 pounds continuously from zero, but we don't have many of them.

The Court: How long does it take with the others?

A. With the K's, why it only takes about—well, there is 2440 cubic inches in a K, and 6000 in an AB, you can figure that out, it is a little better than a third of the time.

Mr. Mason: Just so I may understand this, this is an initial charging when the train is standing at the terminal?

A. That is from nothing.

Q. When the train is standing at the terminal immediately after coupling up?

A. Yes, sir.

The Court: Now, if that train had been in use, that is different?

A. That is different.

[fol. 4477] Mr. Strouss: If you had made an emergency application, you would have to recharge?

A. Yes, but that is still a different case, because your auxiliaries and emergency reservoirs still contain air.

Q. But your brake pipe wouldn't?

A. No, your brake pipe wouldn't.

Q. What pressure do you carry in the brake pipe?

A. The standard pressure in the brake pipe on the Southern Pacific is 70 pounds, but it is permissible to carry 90 in freight service if the engineer deems it necessary.

Q. How do you make an application of the brakes?

A. You place your brake valve in service position, you watch the gauge pointer from the equalizing reservoir, and you try to make your reduction by watching the gauge pointer from the equalizing reservoir and if it indicates around eight pounds or seven pounds or ten pounds, the automatic brake valve will automatically—that is, you move it back to lap, you understand, after you draw it down so much, and the automatic brake valve is so designed that it makes the rest of it, it allows the service piston to raise, [fol. 4478] you know, and air comes out of the brake pipe and it is taken care of through the automatic brake valve.

Q. The operation then is that in placing the brake valve in service position——

A. It will continue to apply until you move the automatic brake valve back to lap.

Q. And in placing it in service position, that permits a certain amount of air to exhaust to the atmosphere?

A. Well, it will continue to exhaust unless you place it in lap, you make your own amount of reduction.

Q. What is the effect upon the brakes then in the train?

A. Why, the brakes begin to apply on the head end and gradually apply down through the train, they apply in a gradual way, gradually set, and they are set on the head end first.

Q. Now, in making a release of the brakes, how is that done?

A. Well, that release, as a rule, they generally release on the head end first; it is possible, and on standing still we try to drive the air back to the rear end as much as we can, but it don't get there first.

Q. What is the operation on the engineer's brake valve [fol. 4479] in making a release of the brakes?

A. In a release of the brakes standing still, you go to full release and you stay there about 25 seconds, I suppose, 20 or 25 seconds, and gradually come around to running, and after you have hesitated, I would say, a reasonable time, you go in release and make what we call a fairly long kick-off; it may not seem long by seconds, but it is quite long, and then you make a short kick-off, and I have made a right short kick-off to prevent an overcharge on the head car.

Q. Now, in making a release, what is the operation there in respect to the air?

A. In making a release?

Q. Release of the brakes?

A. What is the operation?

Q. In so far as the air going into or out of the brake pipe?

A. In releasing the brakes, you have to build the air up in the brake pipe and in the brake pipe side of the triple valve, and you must build the pressure up greater than the pressure is on the auxiliary reservoir to drive that triple in the position towards the auxiliary reservoir, and you have to carry a slide valve and graduating vaive, and they [fol. 4480] are supposed to release in two pounds, but it is a fact that some triples don't release under five pounds, and it is a mighty good one that does release with two pounds' variation, differential.

Q. Now, are there any difficulties or problems, particular difficulties or problems in the operation of brakes and the handling of trains which you have to guard against?

A. Yes, there are a lot of things that you have to take into consideration in handling a train in regard to handling the brakes.

Q. I want to read to you from Exhibit 319, Southern Pacific Company, Air Brake Rules and Regulations, page 8: "Smooth train handling depends on the ability to control the slack and how to prevent it from running in or out harshly." Have you found that to be true?

A. I have found that to be true.

Q. Is that one of your problems or difficulties?

A. That is one of the most important things that an engineer must consider at all times, is the slack action.

Q. Reading further: "Where so controlled, no draft gear in fair to good condition will be damaged. Slack action cannot be prevented, but by acquiring knowledge [fol. 4481] of the various causes for it, and exercising forethought in the use of steam, train brakes, independent engine brakes and sand, it can be controlled, even to the extent of avoiding further injury to damaged draft gear." Have you found that to be true?

A. That is true.

Q. Is it always possible to control——

A. Well, it is true that you have to try to arrange to adjust this slack the best you can, that is true, but there are times and quite often that you can't adjust at all; you can't absolutely take care of all of the slack, no, is that what you mean?

Q. Yes.

A. I just didn't understand you.

Q. Reading further: "The heavier the engine and the longer the train, the greater is the care required."

A. That is right.

Q. "When slack runs in or out one part of the train gradually attains a lower speed than the other, and the shock is the result of draft gears having suddenly to make the speed uniform on the instant slack is all in or out. How heavy the shock will be depends mainly on the difference [fol. 4482] in speed that must instantly be made uniform and on the weight that must suddenly be altered in speed." Have you found that to be true?

A. That is true, but there is still some changes there. You understand, the faster you are traveling the easier it is for the slack to adjust itself; the slower you are traveling, even if one speed is slow and another speed is not much

faster, say, at four miles an hour, you stop at once, and the other is traveling five miles an hour, that shock is still serious, but traveling at a high rate of speed you can adjust the slack better.

Q. At low speed, is there any greater braking power with your brakes?

A. Oh, yes, much more.

Mr. Mason: Do you really mean that, Mr. Strouss, or do you mean more effect from the braking power?

Mr. Strouss: Whichever way you want to interpret that question.

Mr. Mason: You get 70 pounds of air at 70 miles an hour the same as at five.

The Witness: Yes, but there is much more braking power at different speeds.

[fol. 4483] Mr. Strouss:

Q. Reading further from exhibit No. 319, "With high pressures and large main reservoirs it is very easy to overcharge the head end of the train; many detrimental effects result, such as stuck brakes, flat and broken wheels. Many are of the impression that because the brake pipe gauge shows higher than the auxiliary reservoir pressure is intended to be, that all brakes are released; as a matter of fact this is a condition that exists only on the first few cars in the train, the pressure at the rear not having sufficiently increased to release the brakes. In fact, 25 cars back from the engine it cannot be determined whether the brake valve handle is in release or running position."

A. That is true, I have found that to be true.

Q. In other words, when the gauge on the engine shows the pressure equal to or in excess of the brake pipe pressure, you still may have back 25 or 30 cars a pressure considerably less than that shown on the brake pipe gauge?

Mr. Mason: I object to the question, the witness is not shown to be properly qualified, it is not indicated he has ever ridden 25 cars back or had any gauge back there.

The Court: Yes, the objection will be sustained.

[fol. 4484] Mr. Strouss:

Q. Mr. Kennedy, in operating your train you are required to observe it while you are in motion, are you not?

A. Yes, sir.

Q. In so observing are you able to tell whether the brakes are applied or not applied in different parts of the train?

A. Yes, sir, especially at night.

Q. From that would you be able to judge whether the brake pipe pressure was charged up to what your gauges show?

A. Yes, sir, but that is not the only way of telling. I can tell on the gauge. I may not be able to tell the number of cars back it has charged but I can tell pretty closely.

Q. How do you tell that?

A. You learn that in running, you learn that by watching your gauge pointer. Another way is by placing your brake valve in lap position and allowing the brake pipe air to equalize.

Q. Reading from page 11 of exhibit No. 319, "An automatic brake application will cause the brake pipe pressure to reduce faster at the head end of trains than at rear. This results in the head brakes applying in advance of those at [fol. 4485] the rear, and tends to bunch the train and compress the draft gears."

A. I have found that to be true.

Q. (Reading) "In releasing, the head brakes commence so much before those at the rear that, as far as holding power is concerned, they are practically off before the rear ones start to release, causing the slack to run out rapidly. Just how serious the results may be largely depends on how heavily they are applied, the amount the draft gears are compressed, and how slowly the train is moving." Have you found that to be true?

A. I have found that to be true.

Q. Does the length of the train have any effect upon the ability of the engineer to control the slack in the train?

A. Yes, it has a great deal to do with it.

Q. What effect does it have?

A. In the first place, very seldom if ever you have the same pressure on the hind end that you have on the head end.

Mr. Mason: I object to the answer and ask that it be stricken. The witness has shown absolutely no qualification to state what the pressure is at the rear end. It is not indicated he has ever ridden in the rear end for the purpose of [fol. 4486] observing pressure at the rear end.

The Court: Objection overruled. He stated he could tell.

Mr. Mason: I think he only stated he could tell whether

the brakes had released at the rear end. He didn't state that he could tell what the pressure was at the rear end.

Mr. Strouss: He stated, if the Court please, he could tell by his engineer's gauge and valve whether or not the difference, not the amount in pounds, but whether there was a difference in the pressure.

The Court: The court has ruled on the objection.

A. I would like to make that a little different. I said I could not tell the number of cars that it was charged the same as on the head end but I can tell pretty close whether it is very near or whether it is a long ways from being charged, I can tell.

Mr. Mason: Just a moment, I would like to inquire, I don't believe the witness is qualified and I would like to inquire because I think he is going beyond the bounds of his qualifications.

The Court: Go ahead.

Mr. Mason:

Q. You didn't state, did you, that you have any means of [fol. 4487] telling what the air pressure is in the brake pipe at the caboose?

A. I was not asked that question.

Q. Have you any way of telling from the engine or from the gauges in the engine what the air pressure is in the caboose?

A. I can by lapping my brake valve.

Q. What does that show you?

A. It shows me if I wait long enough it will show what the equalization is.

Q. Will it show what the pressure is in the caboose?

A. Yes, sir, it will show what the pressure is in the caboose when the air equalizes.

Q. Where does it show it?

A. It shows it on the brake pipe gauge pointer in the cab, brake pipe pressure.

Q. You can tell that in a train of any length?

A. Yes, sir, any length I can tell.

Q. You can tell that regardless of the fact there may be an angle cock turned in the middle of the train?

A. I can tell that, it depends on whether the angle cock is turned, I can tell when the angle cock turns, I can't tell whether it is ten cars or sixty cars.

[fol. 4488] Q. If you wait long enough after turning your handle to lap position in the engine cab, you can tell what the reading is on the conductor's gauge at the conductor's valve in the caboose?

A. After I let the air equalize.

Q. After turning your brake handle to lap position?

A. I put my brake valve to lap position until the air equalizes; I can tell the pressure on the gauge in the caboose.

The Court: Is the lap position that you refer to as being one of the six positions that the engineer's brake valve is carried in, is that comparable to neutral in a car?

A. Yes, sir.

Mr. Mason:

Q. You say that you can tell just what the conductor's valve reading will be?

A. No, sir, I don't exactly mean that. I can't tell the pressure back there, the gauge may not read the same as mine.

Q. I thought you said you could tell what the reading would be on that gauge?

A. Oh, no; I don't mean that, sir.

Q. When you say that you know what the pressure is back there from your gauge in the engine, do you take into account the leakage in the train line?

[fol. 4489] A. We will say we got 70 cars and we got an ordinary everyday train. The air will equalize in a reasonable length of time and then from there on it will leak down a little more, yes, but you will not miss it but very, very little.

Q. You say it will equalize but that equalization is subject to leakage, is it not?

A. No, sir, equalization and leakage are two different things.

Q. What I mean is this, what you see before you on the gauge in the engineer's cab does not necessarily represent the pressure in the train line at the caboose because you have leakage to take into account?

A. You are right, when you are running along, you are correct.

Q. Again, I would like to ask you this, you say if you leave the lap position a long enough time you can tell what

the pressure is in the train line of the caboose. How long do you have to leave it there?

A. That depends on the length of the train and the leakage.

Q. If you don't know what the leakage is, you don't know how long it would have to be?

[fol. 4490] A. We would make a terminal test when we leave, three pounds for thirty seconds. If we are carrying eighty pounds we make it from sixty-five, but we carry seventy pounds and make it fifty-five. We take the leakage from fifty-five pounds on a seventy-pound brake pipe pressure.

Mr. Mason: All right, Mr. Kennedy, there are responsible authorities that do not agree with you.

The Court: The objection is overruled, proceed.

Mr. Strouss: Will you go ahead and explain?

A. I don't know where I was at.

Q. I will reframe the question. First, you mentioned three pounds per second. Is that the amount of brake pipe leakage that is allowed under the Southern Pacific rules?

A. Yes, sir.

Q. Three pounds per second?

A. Three pounds per second, that is when you make the terminal test—no, no, three pounds in thirty seconds I said.

Q. I meant thirty seconds and I had it written down thirty seconds. To reframe the question I asked before, does the length of the train have any effect upon the ability [fol. 4491] of the engineer to control the slack action?

A. Yes, sir.

Q. Will you explain that?

A. The length of the train makes it harder to apply the brakes on the rear end, they are slower to apply on the rear end and the slack will run in on you. Also the pressure is not as great on the rear end, they do not set as hard on the rear end and also if the pressure is very much less on the rear end and you make the average reduction that you make every day some of the brakes do not apply at all on the rear end and if they did apply on the rear end a brake that did apply only four pounds did not apply as far as developing energy against the brake shoe. I will have to explain that maybe so you will understand. We will say we make a seven-pound reduction or an eight-pound reduction, we will say seven, it doesn't make any difference, a

seven-pound reduction on the brake on the head car; I can get within half a pound of it, is that close enough without figuring it out?

Q. Yes.

A. Probably eight and a quarter pounds, maybe nine pounds on the head car. All right. Now we will say we take 70 cars and the pressure is three pounds different. It is a known fact that the pressure is much less than that [fol. 4492] sometimes.

Mr. Mason: Your Honor, I move to strike that statement, "It is a known fact."

The Court: It may be stricken.

Mr. Mason: There is no authority for that.

The Witness: The gauges show it, we are handling it every day.

Mr. Mason: I ask that that last remark be stricken.

The Court: The Court has ruled on it, it may be stricken.

The Witness: You have the three pounds' difference, you would make a four-pound set on the rear end. Four pounds goes into the brake cylinder, fills that space that is known as vacuum, there is nothing there and we are working against atmospheric pressure. In reality it takes pretty close to three and three-quarters or seven-eighths or something like that but with the tension of the spring you can say four pounds of air that you have to take out of the auxiliary reservoir to go into the brake cylinder to fill this space that the eight-inch pistons travel. If the piston travel is longer it takes more and you fill that space ready to develop energy but you have no brakes, no pressure against the brake shoes.

[fol. 4493] Mr. Strouss:

Q. What effect does the length of the train have on the releasing of the brakes?

A. You understand there is resistance and there are angle cocks and curves in the brake pipe, down through that hose, and the length, there is an amount of friction that builds up in a brake pipe and the further you go back the pressure gets weaker and weaker until you have very little pressure or effort to try to even get back there. You can go far enough that it won't get back there.

Q. What territory are you working in, have you stated?

A. I work between Tucson and Lordsburg at the present time.

Q. Is that a mountainous territory?

A. Yes, we have four hills over there.

Q. Is there any particular problem in handling trains and handling slack in mountainous territory?

A. Yes, between Tucson and Lordsburg is the most difficult district to handle the slack.

Q. In exhibit No. 319, Southern Pacific air brake rules, page 29, appears the following: (reading) "Rule 19. Heavy grade braking; the one-application method must be em-
[fol. 4494] ployed when descending grades and using retaining valves. The engineer must charge the brake system to standard pressure before leaving summit of grade, then after leaving, make one or more brake pipe reductions and permit train to attain the desired speed. After this has been accomplished, pressure on the gauge must be observed and the brakes released. The brake valve handle must be in release until the pressure is restored before returning it to running position. Just before the train begins to gain speed, one reduction must be made, bringing it down to where it was immediately before releasing. After brake valve exhaust closes and train is about to slow down again, release must be made as before. This operation must be continued while descending the grade, the speed being kept low enough to permit restoring the amount of air used on the previous application." Is that the method of braking?

A. That is the method of braking, yes, sir.

Q. Is that what is known as the short cycle?

A. Short cycle or short hold.

Q. You are familiar with the long hold and the overcharge?

A. Yes, sir, I understand the overcharge and the long hold.

[fol. 4495] Q. But the short cycle method is used?

A. It is used here, yes, sir.

Q. Do you have any difficulty in controlling slack by the use of that method?

A. Yes, slack runs in occasionally and slack sometimes runs out.

Q. Does the length of the train affect your ability to control the slack in mountain operation?

A. Yes, sir, it has all to do with it.

Q. Will you explain that?

Mr. Mason: I suggest, your Honor, that this question has been asked and answered. I don't know why it must be repeated.

Mr. Strouss: I haven't asked him about the controlling of slack and its effect on long trains in mountain operation.

The Court: No, the objection is overruled.

Mr. Strouss: Go ahead.

A. Controlling slack going downhill, you understand your train is fully charged as near as you can charge it and when you make your first application and you slow your train down to a reasonable speed, a speed that you think you can recharge and a speed under the maximum, say it is 35 miles an hour, we try to maintain an average speed if [fol. 4496] we can. We don't try to slow it too slow like we used to years ago, but we slow it down to where we think we can recharge the brake pipe and release them. Using this short cycle method, short hold, like we do, we have loads, they release of course the same as the empties, but the loads pick up and here we go and before we have time sometimes to charge the brake pipe the speed is so high we have to go after them again. That time means you got to use more air and from that time on then you are liable to have more or less slack because you are getting less air to the rear of your train, less time that you are recharging it, you don't get it recharged any more. You charge it but not fully charge it.

Q. Are those brakes applied then on the rear of your train?

A. Sometimes they don't ever apply at all on the rear of the train.

Q. The rest of your train is carrying the braking load?

A. Yes, sir.

Q. Are there any dangers in the long hold method?

A. Yes, sir, there is danger in the long hold. It brings about hot——.

[fol. 4497] Mr. Mason: I object, if your Honor please, the witness has testified he does not use the long hold and the rule book shows that the short hold is the one that is required. I don't know why we have to discuss the long hold at all. It is obviously a discussion of mere moonshine as far as this case is concerned.

The Court: Objection overruled.

Mr. Strouss: Go ahead.

A. The long hold system, you apply the brakes and hold them applied a long time. Some people call it bridging. The reason why they call it bridging is because they put the brake valve half-way between neutral, as you spoke of, and holding position, or, in other words, running position you might say. The purpose of it is to keep air going back into the brake pipe, to prevent any further leakage, prevent the train from slowing anymore and to keep your speed up and you hold your speed and you can run for two or three miles if you have good luck and happen to be fortunate enough to make the proper amount of reduction that you don't have to release any or have to set any more but it heats the wheels and is prohibited here. At least they don't want you to have anything to do with the long hold. There [fol. 4498] are places where they wouldn't say anything. Some places for a very short distance but you use the long hold for three or four miles and the wheels gradually get hot and when they cool off they are liable to crystallize and if the wheel doesn't break here it may break in Yuma or someplace else and they don't want it handled in the long hold.

Q. Is the overcharge method, does it have similar dangers?

A. Overcharge has similar dangers. There is the possibility of getting the brake stuck that you cannot get off and you have to stop and bleed it off.

The Court: We will take our mid-afternoon recess at this time.

(Thereupon a short recess was taken after which proceedings were resumed as follows.)

[fol. 4499] The Court: You may proceed.

Mr. Strouss: Mr. Kennedy, do you have any duties with respect to observing the train while it is in motion?

A. Yes, sir.

Q. What are those duties?

A. Well, we always keep an eye peeled back as much as possible in addition to watching the head, and especially around curves and any place you can observe your train, there might be dirt flying, at night there might be fire, or smoke in daytime from a hot-box, from a brake sticking, sometimes we do find something dragging it throws up a little dust or something like that, you know, it might be a

brake beam down. We also have to watch back for signals, sometimes they want to stop, and that brake beam may be dragging on the rear end, at night we may see a red fusee, we have to keep our eye peeled for that.

Q. One question with reference to slack, are there any peculiar territories, any peculiar territory in the district you operate which affects slack action?

A. Yes, we have—now, you are talking about just the train running along, or on side-tracks where you pull out?

[fol. 4500] Q. A train running along.

A. We have hogbacks, we have two places between Dragoon and Cochise where slack runs in on us, one just before you get into Manzoro, and another place after you leave Manzoro before you get to Dragoon, before you get to Cochise, we have a place coming off of Steins down at—I can't think of the town now, the second siding this side of Steins, Vanar, and we have a place on the west end, we have several places, we have one place on the west end just a little short place, one day I was riding deadhead in the caboose and banged my head against the door. I said, "What is that?" He said, "That is our alarm clock," just out of Gila Bend we were going 40 miles an hour, I was deadheading in the caboose and it is about three-and-a-half miles, I could tell you on the time-table, I never did check it, but it is just out of Gila Bend, just a short distance, a little hole, I got an awful wallop, I wasn't used to deadheading, I didn't know what went on.

Q. Is it necessary in operating a train for the trainmen on the rear end to communicate with the engineer at times?

A. At times it is very important that he should know what they want to do back there.

[fol. 4501] Q. How is that done?

A. Hand signals, or light signals, a fusee.

Q. That is the only means?

A. That is the only means we have, yes, sir.

Q. What effect, if any, does the length of the train have upon your ability to stop the train or to start it?

A. Well, you understand, the longer the train the slower the brakes apply and the slower they start to apply and the less they do apply on the rear also, where you can stop a train with 70 cars, a length of 70 cars, it would take to stop a train of a hundred cars on the same grade, perhaps a hundred, I cannot give you this right to the foot, but almost twice as far as 70 cars. I never measured it, I didn't go

that much in detail, I didn't handle enough of them, but it is more than the length.

Mr. Strouss: Take the witness.

Cross-examination.

By Mr. Mason:

Q. Mr. Kennedy, you have 15 years' seniority as an engineer?

A. I have about 15 years as engineer, yes, sir.

Q. How long have you been actually running as an engi-
[fol. 4502] neer?

A. Well, sir, I ran a little bit in 1926 for the first couple of years, few years, I ran a little bit, very small trip or two in the wintertime, the depression came on and I didn't run for several years, I don't know how long, then I believe I made one or two trips, then maybe a couple of weeks, then 1936 or sometime along in there came along, and I don't remember, I don't keep no record, I know I went back firing one time, but I know I only made one trip firing when I did go back that time, I have no record, but since 1936, as near as I can recall I practically have run continuously.

Q. You have been employed as an engineer then continuously for about the last five years?

A. I would say, I couldn't tell you exactly.

Q. Prior to that time then, since 1926, your employment as an engineer——

A. Fireman.

Q. —was more or less infrequent, you spent most of your time back firing?

A. Yes, sir.

Q. I wish, as a courtesy to me and to the reporter as well, that you would not interrupt the question.

[fol. 4503] A. Thank you.

Q. Now, you have never run an engine, have you, between Lordsburg and El Paso?

A. Yes, sir.

Q. Have you run an engine between Tucson and Yuma on either one of those districts?

A. Yes, sir.

Q. Your seniority extends from Yuma to El Paso, does it?

A. Yes, sir.

Q. But in so far as that district is concerned, you are comparatively a junior engineer, aren't you?

A. Well, I don't think so; I don't consider myself so.

Q. Well——

A. My hair is getting quite white.

Q. I refer to your place on the seniority list.

A. Oh, well, I am a fairly young man on the list, but——

Q. Your place on the seniority list determines whether you shall have the choice of runs, doesn't it?

A. Yes, sir; I am holding the best run on the Tucson division.

Q. You are holding the run of your preference now?

[fol. 4504] A. Yes, sir, and I can hold it on any district in the Tucson division.

Q. What are you in, through freight service between Tucson and Lordsburg?

A. Yes, sir.

Q. I understand that you have made quite a study of air-brakes?

A. Well, I have studied it some, yes. I enjoy studying air, I study machinery.

Q. You have been familiar with the locomotives on the Tucson division and between Yuma and El Paso since prior to 1916, haven't you?

A. You mean since that, from 1916?

Q. Yes, and before that.

A. Yes, and before 1916.

Q. Now, these locomotives——

A. Now, you are talking as a road man, I wasn't in engine service prior to 1916.

Q. But you have observed them pretty closely from working on them and around them, haven't you?

A. Yes, sir.

Q. You are using now predominantly the 5000 Class locomotive?

A. At the present time I am using mostly 5000, yes, [fol. 4505] sir.

Q. And they have a new and improved type of brake equipment, haven't they?

A. The 5000 has the E. T. 6.

Q. Are you sure it isn't the 8 E. T.?

A. The E. T. 6.

Q. You have double pumps on all those 5000 class engines?

A. Yes, sir.

Q. And double reservoirs?

A. Yes, sir.

Q. What is the capacity of those reservoirs?

A. I don't know, I don't have it in my pocket, I did know, and I can get that.

Q. What is the tractive effort of those 5000 class locomotives?

A. I don't know on the form you have what the tractive effort is, I can tell you what they pull on different grades on our district.

Q. You don't know the tractive effort?

A. No.

Q. Do you know what the weight on the drivers is?

A. It is over three hundred thousand.

Q. Do you know what the boiler pressure is?

A. Yes, sir.

[fol. 4506] Q. What is it?

A. 225.

Q. How much oil do you carry in the tender?

A. How much oil? We carry about 4800 when it just about full, we don't fill it right to the top.

Q. How much water?

A. We carry 16,152, I think it is.

Q. You are sure it isn't 12,000?

A. Oh, I know it is 16,000.

Q. The brake equipment on the freight cars that you handle in your trains is the same on all of the cars regardless of the ownership name stenciled on the side, isn't it?

A. Why, the cars that I handle are every day cars.

Q. You handle foreign line cars as well as Southern Pacific Company cars?

A. Yes, sir, anything I happen to get.

Q. And P. F. E. cars?

A. Yes, sir.

Q. And the brake equipment works the same on them all?

A. Well, there is some difference, but speaking the way you would say, it is the same brake equipment.

[fol. 4507] Q. It is either the K-2 type triple valve, or the AB valve, isn't it?

A. It is either the AB or the K-2.

Q. When you spoke of slack action, now, if I understand correctly, slack action is the effect of the slack in the train as it is developed as the train moves, is that correct?

A. Slack action is developed by one part of the train wanting to run faster or slower than the other.

Q. And it is the effect of the train motion upon the slack, isn't it?

A. Well, there would be no slack if the train wasn't moving.

Q. Wouldn't the slack be there?

A. The slack would be there, but not as we speak of it if the train was standing still.

Q. The slack is something that belongs to each car, isn't it?

A. The slack is the amount of loose space between each car.

Q. When they are coupled?

A. When they are coupled together.

Q. It is the amount of motion of which the draft rigging of the car is capable when the car is coupled, isn't it?

[fol. 4508] A. The give.

Q. And the slack action is the accumulated effect of that as you move along in different situations, isn't it?

A. Yes.

Q. I think you said that slack action is determined to some extent, or at least the effect of slack action is determined to some extent by the speed at which the train is moving?

A. No, pardon me, if I said that; I said the slack—I said the shock is determined on the speed, I said the shock would be not so harsh traveling at a high rate of speed because at high speed it is easier to absorb the shock.

Q. That refers, I suppose, only to the slack action that develops when there is an emergency at the head end of the train, isn't that correct?

A. No, that applies all the time even whether you set the air.

Q. You won't feel the shock so great from slack action if the speed is high, is that correct?

A. That is correct, whether you set the air or not.

Q. Then the harsh effect of slack action, I take it, is only at low speeds?

A. That is when you get the hardest blow, is at low [fol. 4509] speed.

Q. Now, I think you said that the braking power is greater at low speed. Isn't the braking power the ratio of the effect of the brakes, the effect of the pressure on the wheels by the brakes used to the weight of the car?

A. Do you want me to go into detail?

Q. No, I want you to answer my last question.

A. The brakes are not the same, and speed makes a world of difference in the brake effort.

Q. Speed makes a difference in the result?

A. Yes.

Q. Because at low speed you have no momentum, and at high speed you do?

A. Yes, and you don't get that much co-friction.

Q. Mr. Kennedy, you said that by waiting long enough, you could tell from your gauge in the engine, if you placed the valve handle in that position, what the pressure in the train line was at the rear end of the train?

A. Yes, sir.

Q. And that is, irrespective of the possibility that——

A. Wait a minute, providing it is cut through.

Q. Providing it is cut through?

A. Yes, sir.

[fol. 4310] Q. That is provided that there isn't any angle cock turned then?

A. Well, now, I was speaking, when I answered your question, after taking the tests and running out on the road, and setting the brakes, I could tell by the equalization of the pressure, the pressure and one thing and another, but I didn't expect you to state—I can tell if you turn an angle cock in a train, and I am running along, it won't be long until I can tell it is turned.

Q. You say this test you can make at the engine will enable you to tell what the gauge reading should be in the caboose then?

A. If the air is cut in.

Q. If the air is cut in. Now, you agree pretty well with what is set forth in this airbrake book, don't you, as a proper method to follow in the handling of trains?

A. Yes, sir.

Q. Let me read you something from page 31—you are probably very familiar with it: "After train has been made up and yard test plant or engine is attached, an inspector will observe gauge in caboose or one attached to

brake pipe hose at the rear of train"—now if you can tell from your gauge in the locomotive by placing your brake [fol. 4511] valve handle at lap what the brake pressure is in the rear end, why is it necessary or desirable as shown in this rule, for the inspector to observe the gauge in the caboose, or to attach a gauge in the rear of the train?

A. The inspector wants to know that that brake pipe is charged sufficiently so that it will act the same as when it gets on the road when he makes the test.

Q. You want to know that too?

A. Yes, sir, and so does he.

Q. It is more important to you because you are going to ride the train?

A. Yes, and I can tell by shooting the air back there whether I have 50 cars or 80.

Q. It is necessary, according to the rule here, with which you have agreed, to make that rear end test with the gauge in the caboose or attached to the train line, isn't it?

A. Well, there are cases occasionally can happen where we do get a plug test to satisfy the engineer.

The Court: What do you mean by a plug test?

A. You charge your brake pipe, you have somewhere or for some various reasons the brake pipe has been broken, you understand, and maybe with something may pick up [fol. 4512] cars or in local work some place, cut a couple of crossings, and we blow one long blast of the whistle and that is a signal for the trainman to open up the angle cock on the rear end, we make a little set on the head end and put the brake valve on neutral, you know, lap position, and we watch for the brake pipe gauge pointer to go down, gradually go down, that shows as you let the air out of the rear end, that shows we can make the reduction at the rear end, I can also make a reduction clear back to the rear end.

Mr. Mason: In other words, this rear end test which is covered by Rule 24 of the Airbrake Book shows that the train line is connected through and is not obstructed from front to rear of the train.

A. That is the intentions of it.

Q. You referred to the Tucson-Lordsburg district as stormy, and you referred to it also as mountain operation.

A. Pardon me.

Q. Just a minute. I am going to ask you a question. The maximum grade in that territory is 1.4, isn't it?

A. If I understand it correctly, there are two places, one place is 1.48, one place, 1.49.

[fol. 4513] Q. Aren't you familiar with the time-table?

A. Yes, sir, I am familiar with the time-table.

Q. I want to show you something from the time-table which is in evidence here at the request of the counsel for the State, who called you as a witness, and I take it you will accept it as correct, because he put it in evidence. Looking at page 10 of the current Tucson division time-table, No. 112, I will ask you if it doesn't show under the head "Bowie Subdivision, Rule 33," that 1.4 grades are the highest grades on the main line, and they are in the territory between Tucson and Lordsburg?

A. I hate to mention this, but I never thought I would have to say it, but a friend of mine years ago, twelve or fourteen years ago, a civil engineer for the Southern Pacific Company, he is not a friend, he just happened to serve in the army with me, he talked to me one time and told me the different points as to what the grade was. He invited me to come up there and I refused to go.

Mr. Mason: This is all interesting; I didn't expect the hearsay declaration in answer to my question. I move to strike it out as pure hearsay and volunteered.

The Court: The motion is granted. The last statement [fol. 4514] of the witness may be stricken as hearsay.

Mr. Mason: Mr. Kennedy, do you obtain any different rate of pay for the handling of the same type of locomotive between Tucson and Lordsburg than you would obtain if you handled the same type of locomotive between Tucson and Gila?

Mr. Strouss: Objected to as immaterial.

The Court: I don't know the purpose of it.

Mr. Mason: The purpose is to show that there is no mountain differential in so-called mountain territory.

The Court: Objection overruled.

A. No, we get the same rate of pay. I don't believe I mentioned mountains—I mentioned we had four hills.

Mr. Mason: Your counsel mentioned it, and you agreed with it, I believe your counsel said you had mountain operation.

The Court: Well, the record is made, and it speaks for itself. Go ahead.

Mr. Mason: Now: Mr. Kennedy, you have never worked in engine service excepting between Yuma and El Paso?

A. Do you want to know all the districts I have worked in engine service?

[fol. 4515] The Court: Just answer the question, Mr. Kennedy.

A. Yes, I have worked more than between Yuma and El Paso.

Mr. Mason: In engine service?

A. In engine service.

Q. You didn't mention it in giving your qualifications in answer to the question of your counsel. As I got your answer, you started firing on this division?

A. I worked in this division, but I have worked at Globe, Douglas, I have worked on several branch lines, I have worked at Nogales.

Mr. Mason: Now, we will just confine ourselves to main line operation here for a moment.

Mr. Strouss: You didn't ask him as to branch line operation.

Mr. Mason: I don't propose to examine him as to branch line operation. I judge that would be improper.

Q. You don't use retainers in this operation between Tucson and Lordsburg?

A. No, sir.

Q. The use of retainers is characteristic of mountain operation, isn't it?

A. Yes, sir.

[fol. 4516] Q. Now, I take it from an answer to your counsel that the controlling of the train, whether in valley or mountain territory, consists in the largest part of controlling the slack in the train?

A. That is true, that is one of the things.

Q. And the balance of the controlling of the train is the ability to stop it when you want to?

A. To stop it when you want to.

Q. Or slow it down when you want to?

A. Or to slow it down when you want to.

The Court: A lot depends upon the individual skill of the engineer, I take it, Mr. Kennedy?

A. Yes, sir, that is a great deal, the experience of the engineer has a great deal to do with it. Equipment has some to do with it, a good engineer with no equipment couldn't do anything.

Mr. Mason: You have no fault to find with the Southern Pacific Company equipment?

A. No, no.

Q. Now, you were asked if you agreed with this statement, the heavier the engine and the longer the train, the greater is the care required?

A. That is right.

Q. The heavier the engine, Mr. Kennedy, the greater the compensation of the engineer, is it not?

[fol. 4517] A. Yes, sir.

Q. So that the care which you are required to give to your job when the engine is heavier and the train is longer is paid for?

A. Oh, yes, no complaint there.

Q. You don't mean to say, do you, Mr. Kennedy, by your agreement with that statement read to you by counsel as to the greater care required, that you cannot by the exercise of that care control a longer train and a heavier engine?

A. I don't really understand what you are trying to ask me.

Q. Well, you don't mean to state, do you, Mr. Kennedy, that in your experience you cannot in ordinary circumstances control any length of train that you are required to handle in any part of the territory where you hold seniority?

A. What I meant to say was, the larger the engine and the larger the equipment and one thing and another, you understand, it adds more cars, more length, and heading out of these side tracks or heading into them, you have to use more skill, it is just a little more job.

Q. You have that additional skill and additional care to enable you to do it, don't you?

A. Yes, but you understand if you have a little engine [fol. 4518] and only five cars, you could always keep the slack out.

Q. Well, you are always able to control your trains, aren't you?

A. I do pretty good, but I don't always control them.

Q. Now, within the last twelve months, Mr. Kennedy, you handled from Lordsburg to Tucson on April 16, 1940, a 91-car train?

A. I don't know whether it was 91 or 94, I didn't know.

Q. According to my records you had no occurrences at all of any kind during that trip?

A. No, and I didn't intend to have, either.

[fol. 4519] Mr. Mason:

Q. You handled it I suppose with a 5000 class engine?

A. Yes, sir, it was a 5000.

Q. A few days later on April 25, 1940, you handled a 94-car train from Tucson to Gila?

A. Yes, sir. I don't know the date, but I take it for granted that is correct.

Q. You remember those two trains?

A. Yes, sir, but I don't remember just the date?

Q. You remember that you handled the train from Tucson to Gila without any difficulty?

A. Yes, sir, I remember that.

Q. That includes handling that train on a one per cent grade out of Tucson yard for a little way west, doesn't it?

A. Yes, sir.

Q. And up a .8 or .86 grade from Maricopa to Estrella?

A. Yes.

Q. And down a 1.02 per cent grade from Estrella to Gila?

A. Yes, sir.

Q. You accomplished that without any trouble?

A. Certainly I accomplished it without any trouble and intended to do so.

[fol. 4520] Q. You handled that train I assume with an F type engine, an F-4 or F-5?

A. I had a 5000 on the Tucson-Lordsburg. You must have the record of the engine I had.

Mr. Mason: No, I don't happen to have it.

A. It must have been a 3700.

Q. That would be the F type west of Tucson?

A. I suppose so.

Q. As a matter of fact, throughout your entire career as an engineer on the Tucson division you have never been involved in a slack action casualty in which a trainman or any other person suffered a reportable injury, have you?

A. No, sir, not that I know of. I don't remember of ever having one.

Q. That includes your operation east of Lordsburg as well as west?

A. Yes, sir, anywhere.

Q. On both long trains and short trains?

A. Yes, sir.

Q. Using the word "long trains" to mean trains of more than 70 cars. You have never had any casualty according to the record I have before me, Mr. Kennedy, on any train in which you were engineer because of failure to see or understand a signal whether passed from rear to front [fol. 4521] or otherwise?

A. No, sir, I have had no trouble.

Q. That would apply also to long trains as well as short ones?

A. You understand the long train, I handled that more carefully and you understand a signal on a long train, I make the brakeman get up on the top somewhere to get the signal. When I get the signal from him that is satisfactory as far as I am concerned.

Mr. Mason: I think that is all, thank you, Mr. Kennedy.

Redirect examination.

By Mr. Strouss:

Q. Mr. Kennedy, you were asked about your work between Lordsburg and El Paso. In operating over there what have you found with respect to the braking conditions in that territory?

A. Well, you know that is a hotbox country and you avoid applying the air if possible. That is more or less a steam job.

Q. Is it a territory where it is necessary to use the air to any extent?

A. It is possible that you can come from El Paso to Lordsburg and never set the air. It can be done. You are [fol. 4522] talking about train brakes now?

Q. Yes, I am talking about train brakes.

A. You are not talking about engine brakes?

Q. No. This train that you handled of 91 cars I believe counsel said from Lordsburg to Tucson, did you say you had no difficulty with that?

A. Pardon me, that didn't come from Lordsburg, I picked that up at Bowie. We had the slack run in but I didn't injure anybody.

Q. How about your brakes on the rear end of that train?
A. The rear part of the train was floating.
Q. By "floating" you mean the brakes were not applied?
A. The brakes didn't apply. I made about a seven point set and barely they came in. I couldn't make a heavy set, it would hit them too hard.

Mr. Strouss: That is all.

Recross-examination

By Mr. Mason:

Q. You didn't report any difficulties with that train?
A. No, sir.
Q. You had no trouble whatever in handling it?
[fol. 4523] A. No, sir, I didn't intend to have.
Q. No brakeman or conductor or other person in the caboose was injured?
A. No, sir, and I hope I don't ever injure any one of them, I don't want to.

Mr. Mason: That is a very commendable record, Mr. Kennedy, thank you.

(Witness excused.)

The Court: Do you want Mr. Durnil?
Mr. Mason: No, not at this time.

(Discussion off the record.)

The Court: We will recess then at this time and the only matter then will be the cross-examination of Mr. Cooper.
Mr. Mason: Yes.
The Court: The court will be at recess until ten o'clock tomorrow morning.

(Thereupon the court stood at recess until 10:00 a. m. April 12, 1941.)

[fol. 4524] 10 *P.* M., April 12, 1941.

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed. Come forward, Mr. Cooper, for cross-examination.

TRACE H. COOPER resumed the witness stand.

Cross-examination.

By Mr. Mason:

Q. Mr. Cooper, you have been in active service at Needles and on the Arizona division of the Santa Fe as an engineer since 1916, I think you said?

A. 1916 as an engineer.

Q. You stand pretty high in seniority as an engineer on the Arizona division, don't you?

A. Well, I am in freight service, yes. I am near the top. There are some seven or eight men senior to me in freight service over there at the present time.

Q. You have actually run in passenger service at some time, haven't you?

A. I have caught passenger trains but not a great deal.

[fol. 4525] Q. Your seniority as an engineer enables you to have a certain amount of choice as to the kind of job you will work and the place or locality where you will work, don't it?

A. That is in freight service, yes.

Q. That is what I mean.

A. Yes.

Q. Your seniority district, as I understand it, extends from Seligman on the east through Needles and Barstow and down to Bakersfield on the west?

A. Yes, sir.

Q. Subject to the right of men who may stand senior to you, you can have the choice of any job that may be open anywhere between Seligman and Bakersfield?

A. Yes, it is all one seniority district.

Q. That is what you mean, what any of us in the railroad business mean when we say that you exercise seniority choice to bid for a position in the service?

A. Yes, sir.

Q. So that you can have any job in engine service, subject of course to the rights of the men ahead of you, anywhere in that entire territory?

[fol. 4526] A. Yes, sir.

Q. You say that you are only a few places out from holding a passenger job now?

A. That is out of Needles, on either the first or second district out of Needles, probably about eighth I guess from a passenger assignment.

Q. That means in a practical sense that you can hold any freight assignment that may be open anywhere between Seligman and Bakersfield?

A. Well, mostly, yes. That doesn't include the Parker locals between Barstow and Parker. They are preferred and men who hold those runs are far in the clear in passenger service.

Q. As to main line freight service, you can hold almost anything that you might want to bid for?

A. Yes, in a pool service.

Q. I take it that this run that you hold now, the cut out pool out of Needles westward, is more or less a preferred assignment?

A. It is among the freight runs, yes.

Q. Did you say that the present length of the trains you are handling in the territory west of Needles runs higher than 70 cars generally?

A. No, not at the present time.

Q. You have trains of considerably more than 70 cars [fol. 4527] eastward from time to time, don't you?

A. Oh, yes.

Q. And westward, don't you handle long trains?

A. Occasionally, but they are not a standard thing now. In fact we have handled more short trains lately than we have ever handled before.

Q. What type of locomotive are you using generally?

A. We are using a 3800 and 3900 class engine. We have a small engine, too, a 3100.

Q. What is the wheel arrangement of the 3800?

A. 1-10-1, five drivers, pony truck and trailer.

Q. You mean it is a 2-10-2?

A. Yes.

Q. What is known as the Santa Fe type?

A. Yes.

Q. What is the tractive effort?

A. Oh, goodness, I don't know. I haven't any figures on that.

Q. Did I understand you to say that these locomotives are frequently inspected by representatives of the Interstate Commerce Commission?

A. Surely they are, yes.

Q. That inspection includes, of course, the inspection of the brake equipment as well as the balance of the locomo- [fol. 4528] tive, doesn't it?

A. I believe it does. They go over them pretty thoroughly when they come out, those inspectors.

Q. The territory east of Needles, between Needles and Seligman, Mr. Cooper, you have operated in that territory, have you?

A. Yes, sir.

Q. That is all short train territory, using the words "short train" to mean a train of 70 cars or less?

A. 70 cars, yes.

Q. Whereas the territory west of Needles is unrestricted as to train length, isn't it?

A. Yes, sir.

Q. In your present job, Mr. Cooper, you run west out of Needles in double-header service, do you?

A. Yes, sir.

Q. As far as Ash Hill?

A. Sometimes a station known as Pisgah, some twelve or fifteen miles further west.

Q. Your service is in the nature of helper service for the westward trains, isn't it?

A. Yes, sir.

Q. Then you turn around at Ash Hill generally?

[fol. 4529] A. Yes, sir.

Q. And run east double headed on the eastward trains?

A. At times, but we help quite a few trains east again between Cadiz and Goffs, a distance of 39 miles.

Q. That is against a one per cent grade between Cadiz and Goffs?

A. Yes, sir, one per cent.

Q. Did I understand you to say a few moments ago that it is the eastward trains that exceed 70 cars when you handle them?

A. I wouldn't say that they exceeded, some of them do and some of them don't.

Q. They run as high as 85 and 90 cars, don't they?

A. Yes, they do.

Q. When you are attached to one of these eastward trains you are the lead locomotive, are you?

A. Yes, sir.

Q. As the engineer of the lead locomotive, you are in control of the train?

A. Yes, sir.

Q. You control this train from your lead locomotive down a grade between Ash Hill and the foot of the hill [fol. 4530] at Amboy of 2.3 per cent, don't you?

A. No, I don't couple into the train at Ash Hill. When I am helping a train east, I get them at Cadiz, I couple into them at Cadiz and help them up to the top of the hill.

Q. You don't couple in at Ash Hill on an eastward train?

A. No, we will run light as a rule from Ash Hill to Cadiz.

Q. After you have coupled into a train at Cadiz and helped it to Goffs, do you continue in that train to Needles?

A. No, we did years ago but that has been discontinued.

Q. You run light again, do you, from Goffs back to the terminal at Needles?

A. Yes, sir.

[fol. 4531] Q. Then you don't in your present job handle any of these eastward trains down grade?

A. No, I don't handle any of them at the present time.

The Court: Is the braking power increased when you have a double-header, two engines on?

A. Yes, sir; the object of using one engine is that it puts so much weight on the head end of the train where you are braking it automatically that it causes bad slack action at times, too much weight in the front end, it runs away from the train or into it either way.

Mr. Strouss: I don't believe the witness understood your question.

Mr. Mason: I was going to ask the same question.

The Court: Go ahead.

Mr. Mason: When you have two locomotives on the train, does that give you more air-reservoir capacity at the head end?

A. No, that doesn't unless we ask for it. It is there in case we need it, that reservoir capacity, but the lead engine——

Q. The second locomotive isn't cut in then?

A. He isn't cut in for that purpose, no, he is just like a box-car in a train.

[fol. 4532] Q. The brakes on the second locomotive are actuated from the engineer's brake valve in the lead engine in the same way as if it were another car?

A. Yes, sir.

Q. All the second engine does then is to furnish additional power going against a grade?

A. Yes.

Q. But no additional braking power going down hill by reason of its additional air reservoir?

A. No. May I just explain this. In case we should need it, if I am running short of air, or something, my compressor isn't up to standard and I need it, we have whistle signals to call his attention to it and we can ask him to cut in and help us.

Q. And that is done very simply by the turn of a valve in the cab of the second engine?

A. The cutout cock underneath the automatic brake valve.

Q. Now, you spoke in your testimony of the K type triple valve which took place in 1913, which you say was an improvement. There have been numerous other improvements in the triple valves on the freight cars since 1913, haven't there, Mr. Cooper?

[fol. 4533] A. On the freight cars?

Q. Yes, and the brake equipment generally?

A. Why, no, there hasn't been any improvements on the K since the quick service and the retard release uniform discharge.

Q. Hasn't there been the addition of the heavy graduating spring?

A. Oh, that was a feature.

Q. You spoke of that in your testimony.

A. Yes, that came out about 1925.

Q. That was a very substantial improvement, wasn't it?

A. Why, one of the most wonderful things they ever put in the valve, yes.

Q. In addition to that, Mr. Cooper, haven't you in your experience found that the hose connections are very much better nowadays than they were twenty years ago?

A. Oh, yes, we have had improvements of that kind in there, and the equipment, I guess, is put together stronger, you might say that.

Q. Now, in addition to these improvements on the cars, don't you consider that the addition of larger reservoirs on the engines is an improvement in the braking equipment?

A. Well, I don't know those large reservoirs you spoke [fol. 4534] about, our reservoirs are the same size they have always been.

Q. Well, with the increased size of the locomotives, haven't they increased the size of the reservoirs?

A. Well, we haven't changed our locomotives.

Q. Not in the 25 years?

A. Oh, yes, we have in 25 years, but since the K came out, I guess our present locomotives came there a short while after that, probably three or four years.

Q. You have had increases in the size of your locomotives since 1913, haven't you?

A. Yes, the present locomotive of 38 and 3900, 2-10-2 type, and the others were the same engines, but smaller, they were 2-10-2, but smaller than our present locomotives, they were nine and sixteen hundreds.

Q. That is the numerical class, that is all?

A. Yes.

Q. Don't you consider that the double compressors that you have, is an improvement over the single compressor that used to be attached to the locomotives?

A. We don't have that.

Q. Don't you have double compressors on your locomo- [fol. 4535] tives?

A. No, we are using single compressors.

Q. What brake equipment do you have?

A. Westinghouse.

Q. What is the numerical style of it? Are you familiar with the 6-E. T. equipment?

A. Yes, sir.

Q. With the 8-E. T.?

A. Yes, that is what we have on these engines, No. 8.

Q. Isn't that an improvement over what you used to have, a great deal?

A. They have on the engines, the engine brake itself, there is a slight improvement in that, in the distributing valve, but the other is just the same, the reservoir capacity is all the same.

Q. By the way, Mr. Cooper, how long have you been operating the cut-out pool from Needles westward to Ash Hill?

A. Well, this last time I have been on one of those turns about four months, I guess, something like that, that is a guess, five months possibly.

Q. Is that an assignment that you have occupied a great deal during the last several years?

A. Yes, I have been on that assignment three or four [fol. 4536] different times in the past four or five years.

Q. On that assignment you have considerable time to attend to your duties as local chairman of the Brotherhood of Locomotive Engineers, don't you?

A. That is my purpose in staying on it, it keeps me at home, I am home every day on that assignment, practically so.

Q. Mr. Cooper, there was read to you an excerpt from the Southern Pacific Airbrake Book to the effect that the heavier the engine and the longer the train the greater the care required, and you were asked if that were true, and you agreed with it?

A. Yes, sir.

Q. I take it that you agree then, that the handling of a longer train with a larger locomotive simply requires greater care on the part of the engineer?

A. Yes, sir.

Q. But it is possible, with the exercise of that care, to achieve that control, is it not?

A. Well, not at all times. You do your best all the time.

Q. You wouldn't be willing to say, with your experience and your knowledge and qualifications, that you can't con-
[fol. 4537] trol any train that is handed to you?

A. That is, if I get your question right, that I can't control the train. The purpose of that is to control it properly. I would probably stop the train, yes, I didn't say I couldn't stop it, I say, I ofttimes get hold of trains where you cannot control them properly. That is, the slack, no matter how hard you try. Occasionally you get hold of one of them you are going to rough, you can comply with all the rules you know of, or all the methods you know of, and you are absolutely unable to control it properly.

Q. Do you believe, with the present methods of operation and the present type of airbrakes, and with the other locomotives appropriate to the size of the train, that you are not able to control and stop trains that are given to you?

A. Oh, I can stop it, I didn't say I couldn't stop it; it is how I stop it.

Q. And control it?

A. I can't control slack in all of them, no.

Q. You are a skillful engineer, of course?

A. Well, I try to be.

Q. And when you have a longer, heavier train, you apply your skill to its control, don't you?

[fol. 4538] A. Every bit of it that I have got.

Q. Have you any specific instance within the last—well, any specific instance at all, any specific date and train that you can tell us about when you were unable to handle and

control a train either of 70 cars or less, or more than 70 cars, and as a result had any slack action resulting in a reportable casualty to anybody?

A. I haven't brought any dates of those with me, Mr. Mason, but I have had the thing happen to me a number of different times, I cannot give the dates.

Q. You remember if you had such a serious lack of control as to result in an injury to anybody that took him out of his job for more than three days?

A. No, I haven't injured anyone that I know of personally, but you wouldn't want me to tell you about some I have seen, would you?

Q. I didn't ask you about any you have seen, but I assume that you are prepared with dates and names and extent of injury, and so forth?

A. Not of my own personal knowledge, no.

Q. You haven't any personal knowledge?

A. No, I haven't brought any of that stuff with me, and I kept no record of trains of that kind, but I can tell you [fol. 4539] about them if you want to know.

Q. You cannot tell us about them of your own personal knowledge?

A. No, but where I have been implicated in different cases of the men, representing the men on it, but I have had none personally.

Q. You referred to this 160-car train on the Chesapeake and Ohio, a photograph of which was shown you, Exhibit 118?

A. Yes, sir.

Q. You are very familiar with operations on the Chesapeake and Ohio, are you?

A. No, I am not.

Q. You don't know then whether the Chesapeake and Ohio engineers have any difficulties in handling those trains?

A. No, I don't know anything about that.

Q. You don't know whether the handling of those trains results in slack action casualties to the trainmen?

A. No, I don't know anything about that; I haven't checked up on that, but I would like to see them take one of them down these mountains.

Q. You don't know what the grades may be on the main lines of the Chesapeake and Ohio?

[fol. 4540] A. No.

Q. You don't know that those grades run in excess of one-and-a-half per cent?

A. No, I don't know that.

Q. You spoke of the use of the conductor's valve, Mr. Cooper. Have you been on the engine when the conductor's valve was used in the rear of the train to stop in emergency?

A. Yes, numerous times.

Q. Has it ever resulted in your being injured personally?

A. No, not personally.

Q. Has it resulted in the injury of anybody in the cab of the engine?

A. No, no.

Q. Has it resulted in the injury—I mean by injury, a reportable injury.

A. No, no.

Q. A reportable injury is an injury involving more than three days' disability to an employee on duty?

A. Yes.

Q. You haven't seen the use of the conductor's valve result in any reportable injury?

A. No. That is, to persons?

Q. Yes. Now, I think you have said in part of your testi- [fol. 4541] mony that a rule which was read to you from the Southern Pacific Book of Rules was practically standard. I take it, that the Airbrake rules are also practically standard?

A. Yes, they run pretty close together, they may be worded a little bit different, but the meaning of the rule seems to run right along with the rules in the Santa Fe green book, they run parallel.

Q. You had considerable discussion of slack, Mr. Cooper. Now, I take it by slack you refer to the motion which is built into freight cars for the purpose of assisting in the operation of the train; is that correct?

A. Yes, sir.

Q. And that includes this free motion at the coupler face, does it not?

A. Yes, sir.

Q. About seven-eighths of an inch, is that right?

A. Yes, it takes in all the slack.

Q. And includes also whatever motion there may be in the remainder of the draft rigging?

A. Yes, sir.

Q. You are familiar with the draft rigging on freight cars?

[fol. 4542] A. Well, not too familiar, it is a little bit out of my line; I know what they are.

Q. You know that the coupler shank is attached to the body of the car by means of a draft gear, don't you?

A. Yes, sir, I know that.

Q. And that in the draft gear there are certain springs and friction members which permit a certain amount of motion against resistance?

A. Yes, sir.

Q. And you refer to that motion as a part of the slack built in to the car?

A. I do.

Q. Now, that slack is necessary for train operation, is it not?

A. Yes, sir, as I see it.

Q. It assists you in starting a train, doesn't it?

A. Yes; lots of times we couldn't start at all if we didn't have the slack to start off.

Q. It is essential where you have a train to start the cars one at a time?

A. Yes, sir.

Q. The fact that there is this motion between the coupled cars permits you to do that?

A. Yes, sir.

[fol. 4543] Q. Where your engine couldn't start a solid train all at once against a grade, or even on the level perhaps?

A. Well, it could if it wasn't so heavy. In other words, if we didn't have any slack in there you couldn't overload them, they would have to put something on there they could start with.

Q. Well, the slack permits you to handle a train which the engine can haul once it is in motion, but which it couldn't start from a standstill against a grade?

A. Yes, I believe that.

Q. Now, slack is also useful in that it enables the train to pass around curves, does it not?

A. It has to have it.

Q. And it has to have slack in order to enable the train to pass over little dips and humps, doesn't it?

A. Yes.

Q. There has to be this motion between cars in order to adjust to the irregularities of the roadbed?

A. Yes, it is necessary.

[fol. 4544] Q. Do you know how much pulling force it requires or how much striking force it requires in order to produce the maximum amount of motion of which a friction draft gear is capable?

A. No, I haven't a chart on anything such as that. I have seen it registered on a dynamometer car but I don't know.

Q. You make a difference, don't you, between slack on the one hand which is the motion or possible motion which is in the cars and built there and the slack action on the other hand, don't you?

A. Make a distinction between them?

Q. Yes, isn't slack action simply the result of the slack as the result is developed in train operation?

A. I don't get that question at all. Slack is slack with me.

Q. Yes, I know, but the slack is always there, isn't it?

A. Always.

Q. But slack action doesn't always take place, does it?

A. Not if you have it controlled.

Q. Slack action does not take place at all when the train is standing, does it?

[fol. 4545] A. No.

Q. But the slack is there?

A. The slack is there, yes.

Q. Isn't a correct definition of slack action, "The accumulated effect of the possible motion defined as slack as such effect may be created or brought into play as a result of train operation"?

A. Yes, you don't notice any slack when the train is standing.

Q. It is only the train operation that creates slack action?

A. Yes, it is while you are moving.

Q. The subject of grade crossing collisions, Mr. Cooper, I understand that you have comparatively few grade crossings in the territory between Needles and Ash Hill or Pisgah where there is any substantial hazard of grade crossing collision?

A. We only have four principal highway crossings in that run.

Q. When you approach a grade crossing, when you are running along in charge of a train, do you approach it prepared to stop?

A. A grade crossing?

Q. Yes.

A. That depends on where we are. If we are in yard [fol. 4546] limits we are supposed to.

Q. I mean where you are running along in the open country?

A. No.

Q. Where you approach a grade crossing within yard limits you are controlled by the rules applying to all yard limits?

A. Yes.

Q. The grade crossing doesn't add anything to the fact that you keep your train under control prepared to stop within yard limits?

A. No, but you have to keep your eyes open pretty carefully.

Q. Suppose you were approaching a grade crossing in open country, outside of the yard limits, and you saw an automobile or some other motor vehicle approaching the grade crossing or adjacent to a grade crossing in a position where he can go on the grade crossing before you get there?

A. You mean racing with me for the crossing?

Q. Not necessarily racing, but rolling up to the crossing or perhaps standing there as you approach the crossing. That happens all the time.

A. Where he is standing there it is all right, but I have gone after them pretty hard on numerous occasions where I have these sillies racing with me for it.

[fol. 4547] Q. Where they are racing with you for the crossing, do you slow down prepared to stop short of the crossing?

A. I always do, I always get the air on if I see a fellow pulling that.

Q. You let him have the grade crossing ahead of you?

A. I don't want to hit him.

Q. Of course not, but do you slow down for every crossing in that way?

A. No, no, I just say where I see some silly racing for the crossing.

Q. Normally, except for those people, who may be racing with you, you go up to the grade crossing at full speed?

A. Normal speed, yes, if I have the right of way, sure.

Q. Suppose that somebody gets on that grade crossing just in front of you, can you with the emergency stop in time to avoid an accident if you are approaching at full speed?

A. No, not at all times, no. It might help, you might get stopped and you might not, but in the case of life or property like that we are permitted to use the emergency.

[fol. 4548] Q. As a matter of fact, you couldn't stop in time to avoid a collision with an automobile driven on the track right in front of you even if you were running a light engine?

A. Not if you run right up in front of me, no.

Q. The length of the train does not make any difference about your ability to avoid a collision with the automobile, whether it be a light engine or a 10-car train or a 150-car train, does it? Your locomotive will still hit that automobile if it is driven on the track in front of you?

A. If he drives right up in front of me, yes, but there are times when we have a train like that and we try to stop to avoid it and that is where we wreck a train lots of times making these unknown stops where we don't know it in advance.

Q. Have you made any tests of the distance within which you can bring a freight train to a stop?

A. Not any personal tests, no.

Q. You haven't made any tests of the distance according to the weight of the train or the size of the locomotive.

A. No, I haven't made any tests on it.

Mr. Mason: I think that is all, thank you, Mr. Cooper.

[fol. 4549] Mr. Strouss: That is all, Mr. Cooper.

The Witness: Thank you.

The Court: Do I understand that we have no other witnesses?

Mr. Strouss: No, your Honor, I haven't any. The time that has been required for putting on the evidence has gone considerably faster than I had anticipated. I will not have any delay from now on as I will have witnesses here at all times.

The Court: Gentlemen, it is also understood, I take it, that we reconvene on Monday?

Mr. Strouss: Yes.

The Court: Then the court will be at recess until Monday morning, April 14th, 1941, at 10 A. M.

(Thereupon the court stood at recess until 10 A. M., April 14, 1941.)

[fol. 4550] 10 A. M., April 14, 1941

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed.

CHARLES E. STEVENSON was called as a witness in behalf of the plaintiff and being first duly sworn testified as follows:

Direct examination.

By Mr. Strouss:

Q. Will you state your name?
A. Charles E. Stevenson.
Q. Where do you reside?
A. El Paso, Texas.
Q. What is your business?
A. Locomotive engineer.
Q. You are employed by the Southern Pacific?
A. Yes, sir.
Q. How long have you been in railroad service?
A. I worked in the shop from October, 1906, until March, 1908. I started firing on September 18, 1909. I was promoted July 4, 1916, and have been in continuous service ever since.
Q. Over what territory have you operated engines as an engineer?
[fol. 4551] A. All the territory between Yuma and El Paso, north line.
Q. Have you worked on the south line?
A. I fired four trips between Tucson and El Paso.
Q. Where are you working now?
A. That also includes Yuma to Phoenix and Phoenix to Tucson.
Q. In other words, you have worked on all——
A. On all Southern Pacific property, Tucson and Rio Grande divisions between El Paso and Yuma.

Q. That is the main line?
A. Main line.
Q. You are working where now?
A. Between El Paso and Lordsburg.
Q. Have you an assigned run there?
A. Yes.
Q. Are you working in freight or passenger service?
A. Freight.
Q. Have you worked in passenger service?
A. An occasional trip.
Q. What length trains have you operated?
A. Almost any length train up to 100 cars. I have operated one train of 126 cars.
Q. How long have you been working in that Lordsburg-[fol. 4552] El Paso territory?
A. I worked a few months in 1932, a few months in 1934, and I went back in December, 1934, and have been there continuously since.
Q. Will you, just in a general way, give the duties of a locomotive engineer?
A. After being called, I arrive at the roundhouse, register out time due to leave, compare your watch, look over the bulletin book, proceed to the engine, examine the water glass gauges and gauge cocks, turn on the air pump if not already on, see that you have the proper pressure in your gauges, proceed to oil around, observing drivers and rods and different parts of the locomotive for any possible defect before making the trip. You proceed to the yard where the herder takes charge of you, puts you on the train, make a yard test prescribed by the rules. After the test is over, the conductor is there with the orders and if everything is set we proceed on our trip.
Q. On your trip you have duties?
A. Leaving town we watch out for street crossings and for signals and any obstructions on the track. When we are out we observe the running gear of the train, particularly on curves and every opportunity.
[fol. 4553] Q. As an engineer on the Southern Pacific, are you required to have a knowledge of the brake equipment and its operation?
A. Yes.
Q. Are you given an examination on that?
A. When we are promoted we take a mechanical examination and also on the transportation book of rules.

Q. In operating and handling a train, are their peculiar difficulties that you meet in handling a train? I have in mind the matter of controlling slack in a train, is that one of the difficulties?

A. Yes, we experience a good deal of difficulty in this location of controlling the slack due to the uneven rolling country. We have a great many hogbacks a number of different places on our line.

Q. In any of the territory has the controlling of slack anything to do with the smooth handling of the trains?

A. It has everything to do with it.

Q. Exhibit No. 319, Southern Pacific Company (Pacific Lines) Air Brake Rules and Regulations, reading from page 8, "Smooth train handling depends on the ability to control the slack and how to prevent it from running in or out harshly." Have you found that to be the rule?

[fol. 4554] A. Yes.

Q. (Reading) "Where so controlled, no draft gear in fair to good condition will be damaged. Slack action cannot be prevented, but by acquiring knowledge of the various cause for it, and exercising forethought in the use of steam, train brakes, independent engine brake and sand, it can be controlled, even to the extent of avoiding further injury to damaged draft gear." Have you found that to be true in your experience as an engineer?

A. Yes, very much so.

Q. Can you always control the slack in a train?

A. No, not with the long trains, we are unable to control it. We can do a fair job of attempting to control it, but on the long trains it simply cannot be done.

Q. (Reading) "The heavier the engine and the longer the train the greater is the care required," you have found that to be true?

A. Yes.

Q. Again reading, "With high pressures and large main reservoirs it is very easy to overcharge the head end of the train; many detrimental effects result, such as stuck brakes, flat and broken wheels." Have you found that to be true?

[fol. 4555] A. I have found that to be the case, more particularly on the long trains than on the shorter trains.

Q. (Reading) "Many are of the impression that because the brake pipe gauge shows higher than the auxiliary reservoir pressure is intended to be, that all brakes are released;

as a matter of fact, this is a condition that exists only on the first few cars in the train, the pressure at the rear not having sufficiently increased to release the brakes. In fact, 25 cars back from the engine it cannot be determined whether the brake valve handle is in release or running position.'' Have you found that to be true in your experience?

A. Yes.

Q. Reading from page 11 of exhibit No. 319, ''An automatic brake application will cause the brake pipe pressure to reduce faster at the head end of train than at rear. This results in the head brakes applying in advance of those at the rear, and tends to bunch the train and compress the draft gears.'' Have you found that to be true?

A. Yes.

Q. (Reading) ''In releasing, the head brakes commence so much before those at the rear that, as far as holding power is concerned, they are practically off before the rear [fol. 4556] ones start to release, causing the slack to run out rapidly. Just how serious the result may be largely depends on how heavily they are applied, the amount the draft gears are compressed, and how slowly the train is moving.'' Have you found that to be true in your experience?

A. Yes.

[fol. 4557] Q. Now, in mountain or grade operation, is there anything peculiar to the controlling of slack on mountains and grades; is there any peculiar difficulty there?

A. Yes, we find that on grades, that braking, where you have to make repeated applications, that often times there is insufficient time in between these reductions to recharge the rear end of this train, and you are unable to apply those brakes on the rear end of a long train because of the insufficient time between reductions. The train will increase in speed after releasing and before you have had time to recharge that rear end you are required to apply the air again, and you are naturally going to get a surge, a run-in and run-out.

Q. What is the effect upon the time required to recharge your brake pipe; what is the effect of the increase in length of train upon your ability to recharge your brake pipe line?

A. Well, as the brake pipe increases in length, it takes that much longer to recharge those brakes at the rear end.

Q. Is that also true in making a reduction of the air?

A. The same thing. They apply much slower the further [fol. 4558] away from the brake valve; naturally, it is much slower to apply that brake.

Q. Reading from Exhibit 319, page 29, Rule 18: "Light Grade Breaking: When descending light grades, particularly when retaining valves are not used, build up the braking power by making light brake pipe reductions consistent with grade, speed and weight of train, spacing the reductions so as to have the brake application as heavy as permissible without exceeding a full service by the time a release is necessary or desirable. Heavy Grade Braking: The one-application method must be employed when descending grades and using retaining valves. The engineer must charge the brake system to standard pressure before leaving summit of grade, then after leaving, make one or more brake pipe reductions and permit train to attain the desired speed. After this has been accomplished, pressure on the ga-ge must be observed and the brakes released. The brake valve handle must be left in release until the pressure is restored before returning it to running position. Just before the train begins to gain speed, one reduction must be made, bringing it down to where it was immediately before releasing." Is that the method of braking that you use?

[fol. 4559] A. Yes, sir.

Q. Is that what is known as the short cycle method?

A. Yes, sir.

Q. Do you know what is the long cycle or long hold method?

A. Yes, it is making a light application and allowing a train to ride for a longer time before coming to a stop.

Q. Are there any dangers connected with that?

A. Yes; the long hold method has a tendency to heat wheels and naturally to cause flat spots which are later picked up.

Q. This short cycle method, that is the method you were speaking about in stating the difficulties in connection with grade braking?

A. Yes.

Q. And if I understand you correctly, you state that the difficulty there is that when you first grab a train and release, and then you have to grab it again, because of its increase in speed you have to grab again before you have time to recharge your train, how does the length of the train affect that?

A. The length of the train would affect your grade brak-
[fol. 4560] ing because you have insufficient time to fully re-charge the brakes before you would have to re-apply the brakes to control the speed.

Q. Now, is it because of the longer time?

A. The longer time required to recharge the rear end of a long train.

Q. You have operated engines on trains, you have stated, in Arizona, that is, between Lordsburg and Yuma, both through Gila and through Phoenix?

A. Yes.

Q. Is there any territory in Arizona where that type of braking would be necessary?

A. Yes, we have a number of places between Tucson and Lordsburg, out of Steins, New Mexico, and Dragoon, Arizona, Mescal, Arizona, where this type of braking is required.

Q. Now, in the territory that you are working at the present time, is it necessary to use the brakes to any great extent?

A. Yes, going east on trains we use the air as many as, well, as little as six times, and even more, that is just for regular stopping and grade braking.

Q. Between Lordsburg and El Paso?

A. Between Lordsburg and El Paso.

Q. But is that a territory where you would have grades [fol. 4561] which would require frequent application of brakes?

A. No.

Q. And what about coming west?

A. Westbound we are able to handle 100 cars very frequently over the entire district without using the automatic brakes at all.

Q. You know, of course, what retainers are?

A. Yes.

Q. Have you operated trains where the retainers were being used?

A. Yes, years ago I have used retainers.

The Court: Are those retainers used any where between El Paso and Yuma, in your experience?

A. Not in the last few years.

Mr. Strouss: Referring to Exhibit 175 in evidence, page 10, Rio Grande Division timetable, under the heading

"Freight and Mixed Trains, Air Brake Rules: The conductor and engineer, after consulting may use necessary retainers on trains of less than 100 M's per operative brake, when such train has loads on head end or when it is necessary to adjust slack." Then again reading: "Sufficient retainers will be used on westward trains between Planeport and El Paso to adjust slack." Now, retainers are sometimes used to adjust slack?

[fol. 4562] A. In the judgment of the engineer and the conductor, you can use the retainers to adjust slack on long trains.

Q. Would the length of the train, assuming a territory such as you have described, where short cycle braking is necessary, and you have stated it is because of the length of the train, your ability to get the air back to the rear end is affected, would the increase in the length of the train have any effect upon the necessity to use retainers for the purpose of adjusting the slack?

A. Yes, they would assist in holding the head end of the train during the period of release to give you a little more time to try to recharge this rear end. That is the idea of the retainers, to assist in holding while release and recharging is in operation.

Q. Now, you testified that one of your duties is to observe your train while in motion?

A. Yes, sir.

Q. What is the purpose of that?

A. Well, if there is any brakes sticking or if dust is kicking up in any particular place, it is an indication a brake beam might be dragging or some brake rigging; if it is smoke, either hot wheels or a hotbox, and we try to be alert [fol. 4563] and look back at every opportunity to detect those defects.

Q. What effect, if any, does the increase in the length of the train have upon your ability?

A. The length of the train has a great deal to do with it, because you can only see a reasonable distance back. The longer the train the more obscure the view would become.

Q. Have you recently, or within the last two or three years, had an experience which would illustrate the difficulty in observing defects?

A. Yes, I had an experience here several years ago on a hundred-car train about four A. M. on straight track between Gage and Quincy, in looking back I noticed a peculiar

light that attracted my attention. The right-of-way fence posts, there was a glare that came to every post, I got to watching it, every post, it wasn't as strong as the flashlight, there was enough light to light the post, so I told the brakeman about it, and he got on the step and hung out as far as possible and said he couldn't see it. I slowed down, and dropped him off, and he got back to this locality, which turned out to be about 40 cars, he swung me down, I stopped, the train crew from the rear end walked up, I didn't then [fol. 4564] know what was the matter, they made a cut and took this head end to Quincy. When I came back I picked up the conductor and he said, "We have a hotbox back there, it is so hot I am afraid to move that car with this cut." We went back and got this one car, we poured hot water on it, more preferably than cold, and this box was a white heat, set it out on a spur at Quincy, then returned and got the other portion. We had to put the rear portion of our train in the siding at Quincy and take the head end about three-and-a-half miles further to Wilna, we had to make this move in order to clear up the main line for a number of eastbound trains, No. 2 and several freight trains. When we left Deming we had sufficient time to make Separ, which was a hundred-car siding. The length of it, being so far back and being a type of hotbox that it was—there was no possible chance for us to observe from the engine, if it hadn't been for this light on the fence, I doubt if any of us would have seen it in a case of this kind, the lids on these boxes are dustproof so, naturally, when they get hot and catch fire, the fire will burn up the waste and toward the back, and the fire will come out against the wheel, so the wheel is about [fol. 4565] two-and-a-half feet in toward the track from the outside of the car, so it would be an impossibility for us to see a thing of that nature from the head end.

Q. Now, is there a danger that results from the failure——

Mr. Booth: We object to that as asking the witness for an expression of opinion.

Mr. Strouss: Well, from your experience, do you know what may be the results or what are the results of failure to discover these hot journals?

A. Oh, yes, it wouldn't have taken much longer until it would have broken or burned off.

Q. What happened to the car then?

A. It generally lets the car down, and oftentimes derailment.

Q. Now, in operating a freight train, is it ever necessary for the train crew on the rear of the train to communicate with the head end?

A. Yes, they observe the side of the train the same as we do. If they see anything wrong they attempt to get a signal to us.

Q. How do they signal?

A. In the daytime it is rather difficult to get a signal.

Q. What method is used?

A. If they cannot get a signal to us, they use the con- [fol. 4566] ductor's valve in the caboose.

Q. How do they give a signal in the daytime?

A. Well, by getting up on top of the caboose, although that is rather dangerous, if we should stop short we would knock them off of there. They hang out at the side and wave, or at night-time they use a red fusee.

Q. How does the length of the train affect the ability to give these signals?

A. Well, the longer the train, it is just that much further away from you.

Q. In operating these long trains in the territory you are now working, have you experienced any difficulties in receiving signals?

A. Oh, yes, lots of times. I have had the air applied on me many times and been told afterwards that they had been trying to get me to stop for some time.

Q. And when the conductor or a trainman on the rear of the train signals you and you don't get the signal, what do they do then?

A. They use the conductor's valve.

Q. That is when they pull the air on you?

A. Yes, sir, the expression "pulling the air on you," I had that experience at Lanark on a 97-car train, we had [fol. 4567] stopped there for inspection. After calling the flag in, one of the men had walked up the north side of the train and crossed over possibly 50 cars from the engine. By that time the flagman had come in and this man 50 cars from the engine gave us a signal to proceed. I pulled out slowly, giving him a chance to inspect that part of the train and get on. He got near what seemed the rear end of the train, we saw the man get on, it was assumed he gave us a signal, if he gave us a signal we didn't see it, we hadn't

proceeded more than twenty or twenty-five cars until we felt the train begin to settle down. He had pulled the air. In pulling by a few cars ahead of the caboose he discovered a brake-beam down on the south side, wasn't noticeable to him going up the north side. If we had seen the signal we could probably have stopped and avoided using the conductor's valve.

[fol. 4568] Q. Is there a danger in using the conductor's valve?

A. Yes.

Mr. Booth: That is asking for his expression of an opinion.

Mr. Mason: Furthermore, the witness is not qualified.

The Court: The objection is overruled, he may answer.

A. I have had experience where a conductor or one member of the train crew pulled the air and broke the train in two. I had that happen at Wilna. We had stopped and set some cars out there and after calling in the flag and getting the signal to proceed we pulled out and had gone possibly 50 car lengths when the train parted, broken knuckle. After we coupled up and arrived in Lordsburg I found out the conductor had walked up beside the train with a flashlight. He was so far from the head end that nobody saw him. He hollered at the rear brakeman as he went by, we were then pulling out and he said he couldn't get on in the dark. In that particular case he broke the train in two in applying the conductor's valve.

Mr. Strouss:

Q. You were talking about slack action. Is there any [fol. 4569] type of territory where slack action is more difficult to control than in others?

A. Yes, we have rolling territory over there, little sags, open humps three or four particular places that it is impossible to control the slack due to the fact that the head end is going uphill and the rear end is running in against it on ascending grade and the center of the train will be in a hollow. When the head end goes over the top of the hill, which this location is Pronto, we have the reverse movement, the head end will start running away and the rear end will start running the other way, due to the ascending grade.

Q. How is it affected by an increase in the length of train?

A. It is increased, the more cars the more slack.

Q. Is there that type of territory on the Tuscon division between Yuma and Lordsburg?

A. Yes, in a number of places. Do you want them named?

Q. Do you have them?

A. We have a very bad one west of Chamiso and between Cochise and Manzoro; on the west end going into Ligurta, near Smurr, Arizona, numerous ones.

Q. Is your ability to start a train affected by the [fol. 4570] length?

A. Yes, with the longer trains we have to use extreme caution in starting them. There is more weight involved and more slack. We have to use extreme caution in starting those trains to avoid pulling them in two.

Q. What about the length of time required?

A. It takes a longer time to start them and a longer time to stop them.

Q. Have you found any difficulty in stopping these trains as the length increases?

A. Yes, I had one experience on this 126-car train that had in the neighborhood of 12,000 M's. I hadn't used the automatic any place between Lordsburg and Deming and in making the station stop at Deming I figured in advance, due to the increased weight, that I no doubt would have to take a longer distance than I had been using ordinarily with the average 100-car train. So I started in at the west distance signal at Camp Cody, that is approximately two and a half miles to the depot, the point where I intended to stop. I made a ten-pound reduction on this train and immediately felt a surge, it seemed as if the engine gained speed, picked up more than what we were running. I im- [fol. 4571] mediately set another ten pounds and it finally began slowing down and when I passed over the west switch of Deming I was making in the neighborhood of 20 or 25 miles an hour. That is not yard speed but it happened that everything, all signals were green but I couldn't have done anything anyway had they been red. I continued, put the brake valve in service position and I finally stopped at the coal chute about 40 cars east of where I had intended to stop. After setting out seven cars I made an inspection at Kenzin, I picked this point out on account

of a slow order there, I just figured on driving by and stopping because I didn't feel I could slow that train down to the fifteen miles per hour in releasing and I picked out a milepost two miles from this slow order and I went over the slow order at reasonable speed but I didn't stop at the slow order, it took me another two miles and a half to stop that train. I experienced the same difficulty between Strauss and Anapra, that is a ten-mile hill on which we have to use the air. After leaving Lizard I set the air, made one ten-pound reduction and let it ride and the train finally slowed down going into Anapra and I added another ten pounds to it to stop, I never did release it in three and a [fol. 4572] half miles. After arriving at El Paso and I put this train away, I was very much concerned over it and took it up with the road foreman, Mr. Newell, and we had quite a little controversy on it and he came to the conclusion there was an obstruction in the brake pipe some place, but later here in Tucson I talked to Grover Graden, our road foreman, at that time, and we found out that in a tight train line you were not able to make your reduction sufficiently fast enough to draw the air back over 70 or 80 cars. Consequently those cars back of this point were simply feeding from your auxiliary through your leakage groove into the brake pipe and recharged that brake pipe as fast as we were drawing it out of the brake valve. That is the difficulty in long trains, that is the length is to increase friction in your brake pipe.

Q. And the getting of your air back for the reduction in the other brake?

A. Yes, sir.

Mr. Mason: You wouldn't mind deferring his cross-examination for a little while?

Mr. Strouss: No, that is all.

The Court: You may step aside. Call the next witness.

[fol. 4573] Benjamin T. Cheek was called as a witness in behalf of the plaintiff and being first duly sworn testified as follows:

Direct examination.

By Mr. Strouss:

Q. Will you state your name, please?

A. Benjamin T. Cheek.

Q. Where do you live?
A. Tucson, Arizona.
Q. What is your business?
A. Locomotive engineer.
Q. You are employed by the Southern Pacific Company?
A. Yes, sir.
Q. What has been your experience in railroading?
A. I have worked for the Southern Pacific Company entirely. The first work I did was as a station employee at Benson in 1896 and 1897. I went firing about March, 1897, and was promoted to yard engineer in 1901 and road service in October, 1902. I have been working road service continuously since that time.
Q. Since 1902?
A. Yes, sir, October.
[fol. 4574] Q. Over what territory have you worked?
A. The entire seniority district from El Paso to Yuma and all the lines, I have made trips on all of them. I have also worked some on the south line but just in emergency but my regular district is via Bowie, Lordsburg and via Gila Bend, that is the regular seniority district. I am at present assigned via Phoenix line both ways, Tucson to Yuma, in passenger service.
Q. What type of service have you worked in, that is, passenger or freight?
A. I have worked in every class of freight service they had for a number of years from 1902 until 1924 at various points all over the road with the exception of between Tucson and Yuma. Since 1924 I have worked almost entirely in passenger service.
Q. You are now working in passenger service?
A. Yes, sir, I am assigned to train No. 3 westward and No. 44 eastward via Phoenix.
Q. What is your seniority?
A. Number one.
Q. What length of trains have you operated?
A. Before I came to work out of Tucson in 1923 I was employed out of El Paso in freight service regularly, vari-
[fol. 4575] ous sorts, work trains, local freights, mostly pool freight between El Paso and Lordsburg and we had trains of all kinds and lengths there up to as much as 110 cars. We had small engines at that time compared to the ones we have now. I, of course, didn't handle any trains

of over 70 cars in Arizona but I have handled passenger trains of all kinds from a motor car up to 14 in Arizona since 1924.

Q. Since 1924 you have been continuously in passenger service?

A. Yes, sir, with the exception of a trip probably once in a while out of here on helper service during the rush period. Once in a while they may call on us to make a trip in helper service eastward or on our lay-over.

Q. Were you in the courtroom when Mr. Stevenson testified?

A. Yes, sir.

Q. And Mr. Kennedy?

A. No, I wasn't here then.

Q. You heard Mr. Stevenson's testimony as to the duties of an engineer?

A. Yes, sir.

Q. Are the duties of an engineer on a passenger train similar to those on a freight train?

A. I would say they are the same as far as the prepara- [fol. 4576] tion and requirements before starting, the service is practically the same.

Q. After you get into your run, how are your duties different?

A. In passenger service of course the conditions are quite different from freight service, principally about the speed with which a train runs. Of course the requirements of the service are entirely different, picking up passengers, mail and express instead of hauling freight traffic and is generally superior as far as train movement is concerned. We don't have to stop for opposing trains as often.

Q. In your work as an engineer you are required to know the brake equipment on the train and its operation?

A. Yes, sir.

Q. That is true in passenger service?

A. Yes, sir.

[fol. 4577] Q. There is additional equipment on a passenger engine over that of a freight engine, so far as air is concerned, and signals?

A. Why, yes, sir, we have a communicating whistle signal used so that the trainmen can communicate with the engine when it is necessary to inform us what they want done at times.

Mr. Strouss: I think that we could take a recess. I don't like to start in on the rest of this and stop. I think I will make better time.

The Court: We will take our mid-morning recess at this time.

(Thereupon, a short recess was taken, after which proceedings were resumed as follows:)

Benjamin T. Cheek was recalled to the stand, and testified further as follows:

Direct examination (Continued).

By Mr. Strouss:

Q. Mr. Cheek, is there slack in a passenger train?

A. Yes, sir, there is slack in both ends of each car and the drawbar and locomotive tender.

Q. And do you have slack action in passenger train [fol. 4578] operation?

A. Yes, sir.

Q. Is that affected in any way by the length of your train?

A. Naturally, there is slack in each car, and the longer the train the more slack in the train.

Q. Your passenger cars, are they, as compared with freight cars, heavier or lighter?

A. Well, the cars themselves are heavier than the ordinary freight car, that is, empty. They run considerably heavier in that respect, the actual weight of the car.

Q. And the Pullmans, are they a heavier car?

A. Yes, sir, the standard sleepers, sleeping cars, are considerably heavier than the day coaches and baggage cars.

The Court: Did I understand you to say that the passenger car is much heavier than the *the* freight car? What was the answer?

A. I said the empty car.

Mr. Strouss: That is, the empty passenger car is substantially heavier than the empty freight car?

A. That is right.

Q. And the Pullman cars are still heavier?

A. They are heavier than the day coaches, and baggage [fol. 4579] car, they are heavier equipment, such as dining cars and club cars, they run very heavy also.

Q. Do you know the length of passenger equipment, cars?

A. They vary considerably, I think from around 40 feet to in the neighborhood of 90 feet, that is from drawbar, I think they range in different lengths about that much extreme from one length to the other.

Q. Now, you said the length of the train does affect the slack action in the train?

A. Yes, sir.

Q. What about your ability to control it?

A. Well, we have experienced considerably more slack action in the long train,—We call them long trains in Arizona, a 14-car train, than you would in a short one, particularly in starting a train or stopping, or when running at speed where there is a change in the grade, the slack shows up at any time where the speed of the different cars change in relation to each other from any reason, where you change the speed of the head end of the train where the rear is not corresponding, it will run-in or run-out.

Q. Do you have territory on the Tucson division where [fol. 4580] that occurs?

A. Yes, sir, many places.

Q. Is that running-in or out of slack in that type of territory affected by the length of the train?

A. Yes, sir, even in passenger service they have a number of places where we have to take some action to avoid slack action that we can feel in eleven cars or over in running at speed, that is particularly on descending grades.

Q. Now, in handling passenger trains and controlling the slack, must you give consideration to the fact that it is a passenger train occupied by people who are not accustomed to train operation?

A. Yes, sir, I would say that we do. It seems like in riding a passenger train, the average public, they are glad to ride with more confidence, they must not expect to be knocked around; they will be in most any position in the car, and we try to handle them to avoid any sudden retarding of the train or jerking it out, it might throw them off-balance, throw them against something in the train, or throw them down.

Q. In making the emergency application on a passenger train, are you able to control the slack?

A. Well, I would say no, different conditions running [fol. 4581] at high speed, we may not have an extremely

heavy jar in the train, but going slow after making an emergency application on passenger trains, we haven't much opportunity to control the slack, we may have a heavy jar.

Q. You don't have an opportunity to bunch your slack before the application is made?

A. Don't have an opportunity to do anything, only to stop, if an emergency comes up when you are going slow you wouldn't have time to do anything.

Q. Have you had occasion to make emergency stops in the last year or two?

A. Yes, several times.

Q. Have you made some notations?

A. Yes, sir, I have made some notes from what record I had where these cases came up.

Q. Would you just relate to the Court those instances?

A. Well, on December 17, 1938, on Train No. 3, leaving Tucson yard after we had made our running air-brake test west of the station and were going on out of the yard, you might say on approaching the north Main Street, there was a colored man drove a sedan automobile onto Main Street after we had passed Seventh Street, and he apparently never gave heed to the train or signal and stopped [fol. 4582] suddenly right in the middle of the westward main track, we were close enough upon him so that there was no way to avoid striking the automobile except setting the emergency. We did that. We stopped probably about 25 feet from the automobile. So far as I know there was no damage to the train or people in the train that was reportable. We stopped the train, of course, very suddenly and got the automobile off the track and we went on. In that particular case we had a train of 14 cars. I am quite sure there was fourteen cars.

Mr. Mason: What date was that?

A. December 17, 1938.

Q. What was the number of the train?

A. No. 3, Conductor McMindes. On the same date, we were quite late leaving here that day, about at or near Milepost 932, which is approximately two-and-a-half or three miles east of Chandler, we call it east of Chandler, it is really south by direction, on approaching Milepost 932, there is a road crossing two poles east of there, there was a man drove a Chevrolet Sedan onto the track at the

same time the train got there, fireman A. A. Kennedy, and he gave me warning, of course, when he saw the man wasn't going to stop, we were right there upon him, we made an [fol. 4583] emergency application. In that case it killed the man and his little daughter. We were going 60 miles an hour, and, as far as I know, there was no one injured in the train in that case. We were running at high speed.

In Phoenix yard, March 1, 1939, about Milepost 908½, after making a reduction of speed, approaching Phoenix yard, and the train running on time on the orders that we had, we were not making the maximum speed permissible, we reduced the speed somewhat more on account of an automobile going south on 24th Street, apparently wasn't going to stop at the crossing. The woman driving the car finally stopped at the crossing, I released the brakes, and after that I noticed a child lying on the track some distance west of the crossing, a little baby girl. We made an emergency stop for that. We had 14 cars in that case, and, as far as I know, there was no injury to the passengers. Of course, there was some slight spotting of the wheels because of the train stop but not sufficient for any repairs to be made.

On April 5, 1939, on Train No. 44, with 11 cars, Fireman A. M. Adams, struck an empty cattle truck on a road crossing approximately a quarter of a mile east of Station named Conger. This was about seven o'clock in the morn-[fol. 4584] ing, or thereabouts, broad daylight, we had 12 cars and making 60 miles an hour, and this boy drove his truck up to the crossing, apparently didn't see the train, and wasn't going at high speed; when the fireman determined he wasn't going to stop he hollered to me to set the emergency. He said, "Big hole her," is the common expression for that with railroad men. And a few days, let's see, on January 29, 1940, Conductor McMindes, on Train No. 3, a man flagged us very violently and suddenly at the road crossing at Station called Cowden, a short distance west of Phoenix. We made an emergency stop and he said there was something the matter with the track, but we didn't find anything the matter with it.

On February 24th, this case was not an emergency application, but I rough handled the train as I call it, felt the slack action very plain going into Tempe station between the switches, a boy of about 15 years of age threw himself down over the rail, put his neck on the rail, stayed

there long enough so that I had to set the brakes heavily to avoid hitting him, and by the time I got the train stopped he got up and ran away. We stopped the train suddenly.

Mr. Mason: When was that?

[4585] A. I don't know whether that was reported to the Company or not. I told the station agent about it; February 24th, on Train No. 3.

Q. February 24th last year?

A. Of 1940, yes, sir; Train No. 3. I don't know how many cars we had in the train.

On October 21, 1940, Train No. 3, Conductor G. Shaw, leaving Tucson yard about 6.30 A. M., a man drove a truck onto Main street and stopped with his automobile truck about over the center of the eastward main track, there are two tracks there parallel with each other, the rear of his truck didn't clear the main track, and I made an application of the brake, figured that he could get off if everything was all right. He immediately started backing his truck up like he was going to get off the track, but when he got about on to the westward main track, he turned the car, the steering wheel, sharply to the right and back the car lengthwise over the righthand rail of the track our train was approaching on and headed the car directly towards our engine. Then I had to apply the emergency to keep from striking this automobile after I could tell what he was going to do. We had 12 cars in that case, and we stopped probably 15 feet from the car, something like that.

[fol. 4586] I had another case in Phoenix yard, and I am not positive about the date, but I think it was April 17th, on Train No. 44. We were approaching Seventh Street this side of Phoenix passenger station and a laundry truck disregarded the wigwag signal, and there was a man going northward on Seventh Street and stopped to change a flat tire on the left front wheel of his automobile, and he had the extension jack handle out screwing the jack upward apparently to change his tire, and he was just in the clear of the train going by, so I was quite sure we could pass him all right so long as he stayed in that position. As we got closer, there was an automobile pulled up alongside of his car to about the center line of the street looking at it from my side, parallel to this car with the flat tire, and the laundry truck that was going in the opposite direction, or south. When we were right near the street intersection and whistling for the crossing, the fireman, A. M. Adams,

yelled to me to stop, so I pulls the emergency, and I couldn't see what was the matter, I was confident there was something the matter, and we just narrowly missed this laundry truck by just inches. In that case, there was an elderly lady who was being accompanied to the toilet, [fol. 4587] as I was informed by the conductor.

Mr. Mason: If your Honor please, this is hearsay, I object to it.

The Court: Yes, the objection will be sustained as to what the conductor told you.

The Witness: Well, the information that I got——

Mr. Mason: Your Honor, I object to any statement.

The Court: Objection sustained.

The Witness: The lady had her fingers smashed by the closet door closing on her fingers.

Mr. Mason: I ask that that statement be stricken and disregarded.

Mr. Strouss: Let me ask him: Are you required to make a report when a casualty occurs in a case?

A. They required me to make an accident report, and that is the information they gave me in filling out the report, I didn't know it myself.

Mr. Mason: You don't know anything about this yourself?

A. No, only we stopped the train in emergency at the street.

The Court: Sustain the objection.

The Witness: I didn't see the lady or talk to her.

[fol. 4588] Mr. Strouss: We ask that the defendant produce the reports made by the employees in connection with this accident.

The Court: You mean made by this employee?

Mr. Strouss: By the conductor or trainmen.

Mr. Booth: That is rather an unusual request I think.

Mr. Strouss: It is not an unusual request. The reports are in their custody and they are objecting to the testimony and they have the report of the accident. I haven't been able to find a form T on it to the Interstate Commerce Commission so I can't get it that way.

Mr. Mason: All that has been said about that accident, which would indicate it was reportable, has been volun-

teered hearsay on the part of the witness. I don't know that we have any such report. I will say this for the information of counsel, and it is obvious if he has been observing the papers before me, I have all the reports I have been able to find of any accidents on which Mr. Cheek has made reports and I haven't anything for this April 17, 1940.

The Court: Then you are avowing that the records of the company show no such report?

Mr. Mason: I have nothing before me. I haven't made [fol. 4589] any search myself but search has been made by our staff and I wouldn't say that it does not exist but it is not in court and is not in our possession across the street. It may be in our possession somewhere but a search so far has not disclosed it. Naturally we tried to get everything we could when we knew Mr. Cheek was going to testify and we don't want to be caught off guard.

The Court: Well, it is not here and cannot be produced at the moment so you may proceed.

Mr. Strouss:

Q. Have you anything further, Mr. Cheek?

A. The nature of the equipment on these passenger trains, they have what is commonly referred to as the conductor's valve so the trainman can stop the train as the occasion may arise or in their opinion is necessary and once in a while someone gets hold of that who is not authorized and will pull a cord and stop the train.

The Court: Mr. Cheek, is that conductor's valve in each of the cars or in the rear car?

A. They are in each car, as I understand it, on passenger equipment ordinarily. There may be some exceptions but I am quite sure they are in all the cars of the Southern Pacific. There is a cord attached, some of them go clear [fol. 4590] through the cars and others are in the end where the conductor can pull the cord to set the brakes.

The Court: That is comparable or similar to the conductor's valve that is in the caboose?

A. Yes, sir, the same purpose as I understand. On train No. 44, March 13, 1941, immediately after passing Camp station in Phoenix yard west of the passenger station someone pulled the conductor's valve on that train and stopped

the train in emergency, a train consisting of 12 cars. That is all I have had in the last two years.

Mr. Strouss:

Q. In passenger train operation is there any duty on the part of the engineer with respect to observing his train?

A. Yes, sir, we are required to look back at each opportunity on curves and occasionally on tangents to note the condition of the cars to be sure that they are getting along all right and if there is any defect in the train to take what action is necessary.

Q. Does the length of your trains in passenger service affect your ability to observe?

A. I will say that even with a train of 14 cars on a tangent, from the locomotive you would not be able to see any of the running gear of the cars back any distance; of [fol. 4591] course you cannot see the trucks at all from the locomotive.

Q. In observing is it necessary to observe the trucks?

A. To be of any particular value you might say as an inspection the trucks are probably where you would be more apt to have trouble or some defect. On curves, in a passenger train if they are short enough we can see from one end to the other, if the curve is not long or not obstructed by buildings and cuts and things like that.

Q. The trains travel at pretty high speed, don't they?

A. The maximum speed permitted on the Tucson division is 65 miles an hour. In the territory that I work on most of it is sixty and in several instances they have speed restrictions for various reasons on the track on account of curvature and city ordinances and things of that sort but the biggest part of the time we naturally run at the maximum speed permitted for passenger service on account of the service requires us to do so to maintain the schedule.

Q. Does that have any effect in raising dust?

A. Yes, the faster you run the more dust you get. We make considerable dust in dry weather, particularly in some places where it is naturally silt and like forms of [fol. 4592] soil.

Q. How do the trainmen pass signals on a passenger train?

A. I didn't understand.

Q. How do they signal from the train to the engineer on a passenger train?

A. With a communicating signal device.

Q. Have you had any difficulty with that?

A. We have some trouble with it on the longer trains. At times it works when not desired and sometimes we don't get the number of blasts, the trainmen are trying to give the engineer to give him the information necessary.

The Court: Will you describe that equipment a little in detail just how that operates?

A. It consists—without being technical, I am not a mechanic—they have a valve in each car that the trainman pulls a cord and it makes a reduction in the whistle signal line. There is a whistle signal valve on the locomotive that is operated by reduced air pressure and has quite a large diaphram on it and the reduction in the signal line moves this diaphram momentarily and as long as there is a reduction in the line the whistle will blow from the air in the line itself and each time they pull this whistle [fol. 4593] down they allow time in between blasts sufficient, the whistle will blow each time they pull the cord.

The Court: The trainman would be actually blowing the whistle in your engine?

A. That is what it amounts to, yes, sir, that is the intention of it. When they want to communicate, we have a certain number of blasts for certain signals and that is what they endeavor to do.

Mr. Strouss:

Q. That is not a steam whistle?

A. No, it is a little bit of an air whistle.

Q. Just a small air whistle?

A. Yes, a little short air whistle. It makes a sound about like a policeman's whistle probably, not a very loud sound.

Q. Does the length of your train have any effect upon your speed to make your schedule and prevent delays?

Mr. Mason: Your Honor, I object to this question. I don't believe it has any materiality to the rebuttal that the state is undertaking, it doesn't seem to have any direct

bearing on the safety issue which seems to be the burden of the State's rebuttal.

The Court: Overrule the objection.

The Witness: Will you repeat the question?

[fol. 4594] (The last question was read by the reporter.)

A. Naturally, the heavier the train is the more difficult it is to accelerate the train and the longer it takes to get the train to maximum speed on ascending grade or on long heavy grades; if you get enough cars you probably wouldn't be able to maintain the schedule.

Mr. Strouss: Take the witness.

Cross-examination.

By Mr. Mason:

Q. Your entire experience in train service since 1924 has been in passenger service, hasn't it?

A. Practically speaking, yes, all of those assignments have been in passenger service.

Q. You are not undertaking to discuss here in this testimony anything with respect to freight service, are you?

A. Well, I haven't worked in freight service for years.

Q. For seventeen years?

A. Yes, sir.

Q. I take it you are familiar with the air brake equipment on passenger cars?

A. To the extent of handling it regularly.

[fol. 4595] Q. It is quite different from the air brake equipment on freight cars, isn't it?

A. As I understand, yes, sir.

Q. The air brake equipment on passenger cars is such that you obtain immediate application or practically immediate application throughout the train when you make a reduction at the engine don't you?

A. Much quicker than you would on freight trains, yes, sir.

Q. It is a very rapid application throughout the train, isn't it?

A. Yes, compared to freight service.

Q. Another thing is you have more braking area on passenger cars than you do on freight cars, do you not, in the sense that you have six wheel trucks at each end instead of four wheel trucks?

A. I don't know as that would make any particular difference. I think the brakes are figured out at a certain percentage according to the weight of the cars on the trucks but they do have six wheel trucks on most of the cars.

Q. Practically all of the cars that you handle have six wheel trucks, don't they?

A. The majority of them, yes; I guess they do.

Q. The brakes you say, as you understand it, are ad- [fol. 4596] justed to have a certain amount of braking area and pressure in proportion to the weight?

A. I think that is the system they figured out. Naturally, they can't have above a certain amount maximum brake power.

Q. When you add more cars to your train and add more weight, you also add more brakes, don't you, in exact proportion?

A. They have brakes on each car.

Q. So you don't have any addition of weight without braking power in the longer train, do you?

A. That is right.

Q. You haven't handled many trains longer than 14 cars, have you?

A. I have never handled any with passengers in them.

Q. Are you quite sure as to that?

A. In passenger service I am quite sure.

Q. According to the record I have before me, on April 12, 1940, you handled train No. 3 from Tucson to Yuma. Do you remember that?

A. No, I don't. What was the date?

Q. April 12, 1940.

A. No, I don't recall it.

Q. Do you recall that during the month of March and April, 1940, there were a number of occasions when there [fol. 4597] were trains of more than 14 cars handled in Arizona?

A. There were some there, but I don't recall that trip.

Q. The document I have before me is form S-2370, time return and delay report of engine and train employees and as I read the report it shows you handled in that train No. 3——

Mr. Strouss (Interrupting): I think that should be put in evidence.

The Court: Yes.

Mr. Mason: I will show it to you and the witness when I am through with it, Mr. Strouss, don't bother me.

The Court: You may finish your question but there may be no answer to it until you have an opportunity to object.

Mr. Mason: I will continue with the question. 16 cars from Tucson to Phoenix and 15 cars from Phoenix to Yuma as nearly as I am able to make out.

A. Are you sure you have my name on that?

The Court: Just a minute.

Mr. Mason: I want to show the form to Mr. Strouss.

Mr. Strouss: I ask that the form be put in evidence if [fol. 4598] the question is going to be asked.

Mr. Mason: I don't want to unload all these little documents in the record as exhibits.

The Court: If counsel insists on it.

Mr. Mason: If counsel wants to put it in, he may put it in, I am not going to put it in.

Mr. Strouss: Then we object to the evidence going in.

The Court: The objection will be sustained then.

Mr. Mason: If Mr. Strouss is going to insist upon the rules of evidence, we will offer the document in evidence.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 321.")

Mr. Mason:

Q. Now look at exhibit No. 321, Mr. Cheek. That shows you were engineer on that train?

A. Engineer, yes, sir, but I don't remember a thing about it ~~if I did~~.

Q. You would not challenge the time return and delay report, would you?

A. No, I don't deny that.

[fol. 4599] Q. That is the official report which was turned in?

A. It shows two engineers on there.

Q. That is the official report that was turned in as the result of which you received your compensation for that service?

A. That is not my report, that is the conductor's report.

Q. I show you another document here which is a conductor's time return and delay report for April 13, 1940.

and it shows you as the engineer of train No. 44 from Yuma to Tucson. Your Honor, I will offer the second time return and delay report in evidence and we will have these photographed so Mr. Strouss will not be without full information as to both of them.

The Witness: Yes, that is the conductor's report.

Q. It is a fact, isn't it, on this particular run on train No. 44 on April 13 you handled 13 cars from Yuma to Phoenix and 15 cars from Phoenix to Tucson?

A. I don't recall it if I did.

Mr. Mason: I will ask that this second time return and delay report showing the run of train No. 44 on April 13 be marked in evidence.

The Court: Any objection?

[fol. 4600] Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 322.")

Mr. Mason: We will agree to supply copies either by photograph or some other reproduction so that counsel will have them.

Q. Mr. Cheek, according to the record I have before me you have had only one incident or accident occurring while you were engineer of a passenger train in which a person, whether a member of the crew or a passenger, I don't refer to trespassers of course, suffered injury while on the train because of an emergency stop and any jar or jerk which may have occurred, is that correct? Do you know of any more than one such incident?

A. Well, from time to time they ask us about different cases where we get notice about and they ask for information whether we handled the train in any way or not pertaining to someone stating they had injury or something of that sort but I have no record of any other. The only one I know of was the lady.

Q. What was the record you were reading from?

A. I just took that off my report like the conductor's report you have there. The date and the delay is all I have, where I showed delay stop on the back of my engineer's trip report.

[fol. 4601] Q. Now, according to the record I have before me, and also, I recall your own statement, do you recall

an emergency stop that you made at Phoenix on April 17, 1939? Have you a note of that?

A. What is the date?

Q. April 17, 1939.

A. That is one that I said I was quite sure that was the date, but I had no record of it. I remembered that case, at least. April 17, 1939.

Q. April 17, 1939?

A. That is one I mentioned about, I believe, that an old lady was injured.

Q. This was at eight o'clock in the morning, was it?

A. Yes, sir.

Q. And you made an emergency stop at the Seventh Street crossing in Phoenix in order to avoid striking a laundry truck?

A. That is right.

Q. And according to the file that I have before me, which does not contain the copy of the form T report, I guess there was no form T made, there was no reportable casualty, although a passenger 80 years old did suffer a slight contusion?

[fol. 4602] A. They told me the old lady was a good sport and didn't make any claim on it.

Q. So that there was no reportable casualty in connection with that rough stop?

A. So far as I know, I don't know anything about that.

Q. Now, there were ten cars in that train, were there not?

A. I don't know; I have no record of that, but it wasn't a long train.

Q. I want to show you form C. S. 2611, which I have already shown to opposing counsel, Employees Report of Accident. Is that your signature on the form that you hold before you?

A. Yes, sir.

Q. Will you state whether or not it shows at the top that there were ten cars in the train?

A. Yes, sir, ten cars.

Q. So that the only time that any person has been injured, even though not a reportable casualty, where you made an emergency stop of a passenger train in Arizona has been on a ten-car train?

A. I haven't told of other cases where they made claim, but I have no records.

Q. You don't know of any other?

[fol. 4603] A. No; you see I have no connection with passengers unless they ask me about train handling afterwards.

Mr. Strouss: May I ask counsel—Mr. Cheek has only testified from 1938 to the present time. Did you intend your question to cover all his period in service?

Mr. Mason: I asked him if he could recall any others.

A. We have no connection with the passengers. They ask us about it afterward, so that we get the information, that is all.

Q. Mr. Cheek, you made a report here on the form that I just showed you, in which you mentioned the slight injury to this old lady passenger, and signed the form. Now, don't you make inquiry as to injuries in all cases?

Mr. Strouss: Just a minute. I wasn't going to object to this 2611 being in, but in view of this question I ask that it be put in, because the 2611 shows that it is made on information given him by the conductor. Now, the question isn't fair.

Mr. Mason: I am going to ask this, Mr. Cheek.

Q. Don't you inquire of the conductor in every case where you think there may have been some possibility of [fol. 4604] injury?

A. Well, I wouldn't know anything about it unless the conductor told me in the first place, or some representative of the company asking me about it. In this case I made it out in the trainmaster's office from the information they gave me; I knew nothing about it at all.

The Court: Do you recall having made any previous similar reports?

A. You mean on this case?

Q. Yes.

A. Not in this particular case.

The Court: I think you misunderstood my question. I asked you if — recall on other occasions having made a similar report to this.

A. They give us information from time to time if anyone makes a claim for any kind of an injury, it may not be anything pertaining to train handling whatever, and they require us to make out an accident report whether we handle the train roughly, or any knowledge we have about it, if

we don't know, we fill out what information they give us, as I understand, it is stated on them, "Don't know," "Don't know," "Don't know," if we don't know.

Mr. Mason: You have made out these form 2611 reports [fol. 4605] on every occasion where there was an accident, haven't you?

A. Where they told me that I knew of, yes.

Q. You make them out whenever there is a grade crossing accident, don't you?

A. Sure, if I am implicated in the accident, and they want information.

Q. Now, as to observation of the train, Mr. Cheek, did I understand you to say that when the train is proceeding on tangent track, you cannot see the wheels under any of the cars?

A. That is right.

Q. It doesn't make any difference what may be the length of the train?

A. No.

Q. And when you are on curves you can see some of the cars behind you, can't you?

A. Yes.

Q. You see the rear cars more readily than you do the cars near to the engine, don't you?

A. Well, that is conditional. We can see, if you first go on a curve you see the head end first, as you get further around you see further back.

Q. The length of the train is no handicap to seeing the cars in the train from the cab as you go around the curves, is it?

[fol. 4606] A. Well, the further away, of course, the smaller any object looks, the visibility is less.

Q. But you still see them, don't you?

A. Probably, and may not, according to what it is.

Q. Now, as to the emergency valve, or the emergency cord, Mr. Cheek, that is available on every car of the train, isn't it?

A. I believe so.

Q. It is available no matter what the train length may be, whether it is ten cars or fifteen cars?

A. I think so.

Q. By the way, did you refer to a case in March of this year, about a month ago, where the conductor's valve was used?

A. I think so.

Q. That was on a train of twelve cars?

A. Yes.

Q. There were no casualties, were there?

A. No, not that I know of.

Q. Did the train break in two?

A. No, we were running 60 miles an hour.

Q. The conductor's valve, or rather, the emergency cord, which is the equivalent to a conductor's valve on a freight train, if used, stops the train without any action by the en-
[fol. 4607] gineer, doesn't it?

A. Yes, decidedly so.

Q. It opens the train line and sets the brakes right now?

A. Yes, they go on plenty, the train stops.

Q. I think you said before, where application of that kind is made, no matter where it is made on the train, the application is immediately, or virtually so, throughout the train?

A. Yes, it takes effect very quick.

Q. Now, this communicating cord which is used to actuate a small whistle in the engineer's cab is entirely different from the emergency cord?

A. That has no connection with the brakes, it is just a signal.

Q. It simply uses the air to sound a whistle signal close to the engineer?

A. That is right.

Q. And that is available in every car of the train, isn't it?

A. I believe so.

Q. And it makes no difference what the length of the train, they can still communicate with you by virtue of that signal?

A. Yes, sir.

[fol. 4608] Q. You don't have any occasion, have you, noted in your memorandum book, Mr. Cheek, when you have failed to receive a signal communicated to you on a passenger train?

A. Well, I have had signals not satisfactory.

Q. Have you any record of any casualty because of failure to receive or understand any signal from the rear end?

A. None that I know of.

Q. Have you any record of any accident to the train without casualties because of failure to receive or understand a signal?

A. No, but we do take action sometimes on a signal sometimes when it is not intended or necessary; in other words, the trainman didn't pull the whistle at all, or we didn't get the signal blast in the cab that was intended by the trainman in some few cases.

Q. But in no instance that you can recall has there been any accident or casualty on that account?

A. I have had none.

Q. Now, you spoke of the duties in the general operation of passenger trains. Are those in accordance with the rule book?

A. I don't believe I understand your question.

[fol. 4609] Q. You testified as to your duties in general in the operation of passenger trains as passenger engineer, did you not?

A. Yes, sir.

Q. Are your duties in accordance with the Book of Rules?

A. Yes, sir.

Q. With the Air Brake Book and the General Transportation?

A. Yes, and the instructions from time to time.

Q. And those books like the Air Book and the Transportation Book of Rules, those are applicable all over the System, are they not?

A. Yes, sir.

Q. Applicable in New Mexico?

A. All over the Southern Pacific System.

The Court: It is quite evident that we cannot finish with this witness. The court will be at recess until two o'clock.

(Thereupon the court stood at recess until April 14, 1941, at two o'clock P. M.)

[fol. 4610] 2 P. M., April 14, 1941

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed.

BENJAMIN T. CHEEK resumed the witness stand.

Mr. Mason: Your Honor, before we proceed any further with the cross-examination I think a word of explanation may be in order. In the direct testimony of the witness reference was made to an accident on April 17, 1940, according to my notes and I am sure that they are accurate in that respect, taking place at Phoenix yard. At that time I looked through the files of accidents in which Mr. Cheek or his train had been involved and I found none for April 17, 1940, and when the suggestion was made by opposing counsel that I should produce the record I said there was none to produce and there was none for April 17, 1940. It developed later in his examination that there was this occurrence at Phoenix on April 17, 1939, as to which we have a report which has been shown to the witness. That was the occurrence which involved a bruise to the hand of an aged lady passenger which occurred at the time the train [fol. 4611] stopped. According to the report before made, I will ask you if that is according to your information as well, Mr. Cheek, it occurred when the door closed on the lady's hand, is that correct?

A. That is what they said.

Q. It was not due to falling on account of the sudden stop?

A. No, not as I know of.

The Court: In other words, the confusion arose by reason of the fact that the witness was off a year in the date?

Mr. Mason: Yes. I have here the file on the accident and Mr. Strouss may examine it. There is no form T report because there was no report of the casualty.

Mr. Strouss: My request was made at the time the witness was stating what had occurred and objection was made and counsel on cross-examination brought out what the witness had been trying to say.

Mr. Mason: I asked him about an accident on April 17, 1939, because I wanted to develop that the only occasion where a person was injured in a train which he was han-

dling was this unreportable injury. That is the only occasion that you can recall, isn't it, Mr. Cheek?

[fol. 4612] A. That date is correct, I made a mistake if I said 1940; it was 1939.

Q. That is the only occasion when you had an unreportable injury to a passenger on a train which you handled, isn't it?

A. As far as I know.

Q. As a matter of fact, you have one of the finest records in passenger service that has ever been compiled by this railroad, haven't you?

A. I couldn't say that.

The Court: Well, at least that is rather remarkable service.

Mr. Mason:

Q. You have a record of at least twenty years last past without any disciplinary action other than commendation?

A. As far as I know.

Mr. Booth: We all admit that.

The Court: The modesty of the witness presents the answer.

Mr. Mason:

Q. I think, Mr. Cheek, that you are rather proud of your ability to handle passenger trains, aren't you?

A. Well, I try.

Q. You succeed, too?

A. I have had complaints, you never get good you know in my business.

[fol. 4613] Q. Just to be honest with us in the courtroom, do you think any of those complaints against your handling are well founded?

A. Well, I couldn't say. They have a right to make complaints if they feel things are not successfully handled, of course.

Q. I think you told us that passenger train brakes, especially the brakes on passenger train cars, are different in nature than the freight train car brakes in that they take hold at once even when a service application is made?

A. I don't intend to tell you that they take hold at once but the entire train will be applied much quicker than they would on a freight train.

Q. It is almost simultaneous?

A. Yes, practically so in service.

Q. There is no opportunity for the rear end of a passenger train to run into the front end because of the application of brakes on the front end where there has been a failure to apply on the rear end, is there?

A. I couldn't say that. They always set slightly in advance on the front end. If the train is running at speed, they might not notice the slack movement but if you apply the brakes at real slow speed the head end will stop before [fol. 4614] they set on the rear end at all.

Q. Isn't there just as much jar on the head end of the train when you set the brakes at slow because of the sudden stop?

A. I don't think so.

Q. Isn't it like the emergency stop with an automobile?

A. I don't ride the rear end of the trains much. If the head end stops before the rear end applies, they kind of bump, so to speak, and the other way they simply stop like you stop an automobile going slow.

The Court: Is that run-in action greater when you are going at a high rate of speed than at a low rate of speed?

A. You probably get a severe jar at real low speed, I mean where you stop almost immediately even with a light application of the brake the head end of the train will probably stop as quick as the brakes apply. In other words, before the air can be reduced on the rear end, there will be some slack action. It might not be severe but nevertheless it will move in against the rest of the train before the brakes can set.

Mr. Mason:

Q. You have had no real experience in the operation of [fol. 4615] long passenger trains, have you?

A. I found I did in two cases.

Q. The two that I mentioned this morning?

A. Yes.

Q. Other than those you have never operated a passenger train of more than 14 cars?

A. I got to thinking about it, I might possibly have in New Mexico during the war-time conditions.

Q. Not since 1920, then?

A. No, I haven't worked over there since 1923 and I believe they did operate a few trains. I worked on passengers considerably over there from 1915 to 1923 when the regular man took leave of absence, sometimes as much as 60 or 90 days at a time and I believe—you see they had no restrictions and the company may have possibly in a very few cases handled additional cars between Lordsburg and El Paso, which is in New Mexico. I couldn't say because I kept no record.

Q. You don't of your own personal experience since 1920 at least and again except for the two instances we have agreed upon, know anything about what the difficulties actually may be in handling trains of 15 or more passenger cars?

A. Only just from practical knowledge of handling trains [fol. 4616] in general. I have ridden in a few cases at least in California where they had more but I never handled the train.

Q. You are only judging from handling trains of 14 cars or less?

A. As far as actual knowledge is concerned, you might say, yes.

Q. There was no incident of any kind in connection with your two trains last year, was there?

A. Not that I recall. We had the additional cars just for part of the trip and as far as I know I made no note of anything that I know of.

Q. You arrived in accordance with schedule, did you not?

A. I believe we did. According to my record, we did at Yuma and were two minutes late at Tucson.

(Discussion off the record.)

[fol. 4617] Redirect examination.

By Mr. Strouss:

Q. You spoke about not being able to see the trucks on passenger trains?

A. That is right.

Q. Are you able to observe smoke when a journal is hot and smoking?

A. You mean fourteen cars?

Q. Well, suppose a car were up near the locomotive?

A. Well, it of course will be all according to the condition, if the wind was blowing, and the speed of the train and the condition of whatever it is smoking. At times you would see it very plain and other times you wouldn't see it at all.

Q. That is one way of detecting hot journals?

A. Yes, sir.

Q. Would the length of the train affect your ability to see the hot journal in that way?

A. Yes, particularly in passenger trains at high speed, unless the journals, you might say, are smoking badly, quite often it wouldn't be noticeable on account of the speed you are going into the atmosphere, and quite often the passengers' draining basins that have water in them, you know, the lavatory, why, the water, believe it or not, looks very [fol. 4618] similar to colored smoke when you are running at high speed when it hits the ground, but you can, of course, see the smoke if things are making very much smoke, providing the place is visible to you.

Q. When you make an emergency stop, do you get off the engine and go back to see if anybody is injured on the train?

A. No, only in cases where we have struck an automobile or trespassers on the track, of course, I went back to see if I could do anything for them.

Q. So far as a passenger on a train is concerned, if they were injured, the only way you know about that is by somebody telling you?

A. That is right.

Q. Is this the only—the 2611, which counsel referred to this morning, is that the only 2611 that you have ever filed?

A. No, no, no, I have had other requests to file them where people have claimed to be injured that I know nothing about, and they would give me the information as to where they claimed they were injured and what they claimed, and asked me to make a statement on it about the handling of the train and so forth; I have had to make them [fol. 4619] out several times.

Mr. Strouss: That is all.

Recross-examination.

By Mr. Mason:

Q. Mr. Cheek, as a matter of fact, the detection of hot wheels or hot journals is largely in the hands of the trainmen by virtue of the smell of the burning oil or grease?

A. Well, I would say, in my opinion, that they would ordinarily have to smell it or see it.

Q. And they can open the vestibule doors if there is any reason to suspect any hot journals, can't they?

A. Yes, they do that, as I understand it.

Mr. Mason: I think that is all, Mr. Cheek.

The Court: This witness may then be excused?

Mr. Mason: Yes.

CHARLES E. STEVENSON was recalled to the stand, and testified further as follows:

Cross-examination.

By Mr. Mason:

Q. Mr. Stevenson, you have seniority as an engineer from [fol. 4620] July, 1916, have you not?

A. Yes, sir.

Q. And your seniority extends over all of the territory except the Douglas line and the Phoenix line between Yuma and El Paso, possibly some of the branches?

A. Yes, sir.

Q. But it includes all of the main lines through Lordsburg and Gila?

A. Yes, and we have a percentage of the mileage which permits us to maintain one or two crews.

Q. You stand pretty high on the list of engineers on this seniority district, don't you?

A. Well, I am still in freight service.

Q. Well, you hold a regular assignment in freight service?

A. Oh, yes.

Q. Does your seniority permit you to hold that assignment in any part of the seniority districts?

A. Yes, I can hold a run on most any district outside of the helper districts.

Q. You could hold a run, for example, between Tucson and Gila if you like?

A. Yes, Yuma and Gila, Yuma and Phoenix——

Q. You then have your choice of working east of Lords-
[fol. 4621] burg or west of Lordsburg?

A. Yes, sir.

Q. If you were handling trains west of Lordsburg, you wouldn't handle any long trains, would you?

A. No.

Q. Now, you were asked as to whether you agreed with certain passages taken from the Air Brake Book, Exhibit No. 319. As a matter of fact, Mr. Stevenson, is there any part of the Air Brake Book or the instructions contained therein with which you don't agree?

A. I try to conform my operations to the Air Book.

Q. Do you consider that this is a satisfactory code of instructions to use as an engineer?

A. It is the guide by which we are to operate.

Q. Is there any part of it which you think is wrong or mistaken?

A. I wouldn't say.

Q. As an engineer, you want to handle your train in the safest and best manner possible, don't you?

A. Yes, I attempt to.

Q. And you also attempt to handle it in accordance with the book, don't you?

[fol. 4622] A. As nearly so as possible.

Q. By handling it in accordance with the book, do you or do you not achieve the maximum of safety and expedition?

A. Well, in trying to operate in relation to the Book, we somewhere near achieve the results of trying to maintain slack action.

Q. You mean, to control it?

A. To trying to control it.

Q. Well, are there any of the instructions in the Book, which you as an experienced engineer would want to have changed?

Mr. Strouss: I object to that as immaterial.

The Court: No, the objection is overruled. You may answer.

A. I don't think that they would be interested in the opinion of just one engineer concerning that book, whether it is good or bad.

Q. You have no suggestions to make at the present time?

A. No, sir.

Q. You particularly were asked whether you agree with the statement that the heavier the engine and the longer the train, the greater is the care required, and you said that you did agree with it?

[fol. 4623] A. I do agree with that.

Q. Then you agree that when the engine is heavier and the train is longer, it can be handled if you use greater care?

A. You must exercise greater care.

Q. And when you do exercise greater care you are successful, aren't you?

A. Not in all cases.

Q. And it is equally true that you are not successful in all cases with lighter engines and shorter trains, isn't it?

A. That may be true.

Q. By the way, this exercise of greater care with the heavier engine is paid for in this sense, that the heavier the engine the higher the rate of compensation to the engineer?

A. Oh, yes, that is based on weight on drivers.

Q. This Air Book, by the way, applies just as much in New Mexico and Texas as it does to Arizona, doesn't it?

A. Oh, yes, that is the Pacific lines.

Q. It applies equally in Nevada and Oregon?

A. Yes, sir.

Q. You know that it does?

A. Yes, it is a Southern Pacific Company standard book.

[fol. 4624] Q. The same way with the rules contained in the Book of Rules of the Transportation Department, Exhibit 320, is that true?

A. Yes, sir.

Q. That is the System Code, isn't it? Now, you were asked about Rule 19 of the Air Book. Do you use Rule 19 in any of the territory between Lordsburg and El Paso?

A. Would you quote the rule?

Q. It is the one relating to heavy grade braking, it was quoted to you.

A. Well, we have no heavy grades where we would use retainers that that refers to.

Q. That rule applies when using retainers on heavy grades, does it?

A. Yes.

Q. Well, as a matter of fact——

A. (Interrupting:) But we are permitted to use retainers if in our judgment we think it would be necessary.

Q. As a matter of fact, you don't use them?

A. No, we do not.

Q. Not even on the longest trains?

A. No.

Q. How long since you, yourself, have operated a train when retainers were used?

[fol. 4625] A. If I remember correctly, the last retainers I recall using was between Tucson and Lordsburg district and on the Tucson-Gila district between Estrella and Bosque; that has been a long time ago.

Q. A very long time?

A. About 1920, I guess.

Q. Retainers haven't been used in that territory, so far as your own experience goes, for twenty years?

A. That is right.

Q. Then your statement that with the longer train more retainers must be used is not based upon any recent experience or any current experience?

A. No; I simply stated that in the time-table we are permitted to exercise our judgment in that respect, to handle a heavy train to help adjust the slack if we think it is necessary.

Q. Isn't that true, Mr. Stevenson: That retainers are used in proportion to the weight of the train and the number of operative brakes in the train? In other words, where the weight of the train per operative brake exceeds a certain figure?

A. Our rule doesn't read that way. It reads, 100 M's per operative brake or under, or up to and including, it is [fol. 4626] less than a hundred.

Q. And the necessity for the use of retainers is determined according to the weight per operative brake?

A. That is the idea, the heavier train and the weight is distributed evenly like over 100 M's per operative brake, then in your judgment you may use retainers.

Q. If you have a 70-car train or 60-car train, we will say, of heavy loads such as slag or coal, where you had more

than a hundred, or 125,000 pounds per operative brake, you might use retainers?

A. Yes.

Q. If you had a 125-car train of empty refrigerators where you had only about 53 M's per operative brake, you wouldn't need them at all, would you?

A. Yes, we would; we would need them on the head end to assist in controlling that slack.

Q. You would? Have you used them on a train?

A. We never had a train of that type. 100 cars of empties is all I handled, I have a record of one 126-car train.

Q. On a hundred-car train of empties, have you used retainers on any of these trains in this territory?

[fol. 4627] A. No, because these 100-car trains are westbound trains and we are able to negotiate that territory oftentimes with the use of only the engine brakes.

Q. Now, those trains would have 53 M's per operative brake, approximately, wouldn't they?

A. Approximately, yes.

Q. Or less than half as much as a solid train of slag or coal loaded in gondola cars?

A. I might add there——

Q. Isn't my statement true, less than half as much loading per operative brake than if you had a solid train of slag or coal?

A. Yes, if I had that same train in slag or coal, as you speak of, I would feel it would be necessary to use retainers to adjust the slack, and I do use the retainer on this tank for a distance of six miles westbound to control the train.

Q. On the engine tank?

A. Yes, on the engine tank.

Q. That is really not the same as using retainers throughout the train?

A. In this respect, because the engine brake, the idea of the engine brake is operated with the retainer turned up, and then released, and by using tire coolers, giving a suffi-
[fol. 4628] cient time for the retainer, about the time you think it has leaked off, we re-apply, and for a distance of six miles we are able with the assistance of the tank brake and retainer between applications, we couldn't use it for six miles without burning the tires up; that is the only instance I have of using retainers.

Q. That is where you are using the engine brakes and not the train brakes?

A. Just the engine brakes.

Q. And that keeps the engine brake applied?

A. No, it keeps the tank brakes applied, the engine brake is released, but there is a check valve in the return line which has to go through the retainer, in that way the air is retarded slowly.

Q. That keeps the tank brake applied and gives you a little drag on the train, although you don't use the train brakes at all?

A. Don't use the train brakes at all, avoid it if possible.

[fol. 4629] Mr. Mason: I think you said—if you didn't I will ask you the question anyway—so far as slack action is concerned, Mr. Stevenson, the effect of slack action depends a great deal upon the speed of the train, doesn't it?

A. We get slack action at our maximum speed of 40 miles an hour in certain localities.

Q. But the momentum of the train in case there is an emergency application at the front end will keep the train moving and prevent the solid run-in?

A. The shock may not be so great at high speed.

Q. It will be substantially less, won't it?

A. The few instances I have seen where the air was pulled the shock was pretty great.

Q. You say you have had the air pulled on you from the rear end?

A. Yes, I have had it twice.

Q. The emergency valve used?

A. Yes.

Q. When the emergency valve is used by the conductor, the air applies first at the caboose, doesn't it?

A. Yes, sir.

Q. In that case there won't be any run-in of slack from the rear, will there?

[fol. 4630] A. No, it will run out.

Q. It will stretch the slack, won't it?

A. It will stretch the slack in that particular instance.

Q. The jar, if any, will be felt on the engine?

A. That would be mostly felt on the engine because it would depend upon a particular track that the train was on at the time. If the train was bunched and the man at the rear end of the train pulled the air, you naturally are going

to get a very severe run-out and break the train in two. I have a case that I can relate where that happened just that way.

Q. You had a break-in-two at Wilna on December 28, 1925, where the emergency valve was used in a 100-car train?

A. Yes, broken knuckle.

Q. No one was injured?

A. No one was injured that I know of.

Q. The entire damage consisted of a broken knuckle?

A. Yes.

Q. You also had an application of the air from the caboose at Camp Cody on October 18, 1936?

A. Break-in-two in two places.

[fol. 4631] Q. That was a 93-car train, wasn't it?

A. I couldn't give you the exact number but I know there were six or seven sleepers on the rear end of that train. That made it equivalent to the length of 100 cars.

Q. Dead-head sleepers?

A. Yes.

Q. There was no injury to anybody?

A. Not that I know of.

Q. None reportable, at least?

A. Not that I know of.

Q. You also had a break-in-two at Pembroke on the west end of the division on March 23, 1932, didn't you?

A. If you have more information on it, I can tell you.

Q. According to my record you had a broken knuckle in a 69-car train at Pembroke on March 23, 1932, because of the engineer's failure to control the slack in the train?

A. I don't recall having that charged to me.

Q. I show counsel and the witness form No. 7489, engineer's break-in-two record bearing what purports to be the signature of Charles E. Stevenson and ask you to look at the form, Mr. Stevenson, and state if that is your signature?

[fol. 4632] A. Yes, that is my signature.

Q. Does that refresh your recollection as to the break-in-two at Pembroke on the date I mentioned?

A. I don't recall it but if I am permitted to read what I said——

Q. Yes.

A. You said I was unable to control the slack.

Q. I said the report indicates an inability to control the slack.

A. (Reading) "On third attempt at taking slack, slack ran out breaking knuckle seven cars ahead of the caboose. I started train after taking slack second time, then stalled while taking slack third time, slack ran out. Must have had a few brakes at the rear that were slow in releasing. After putting knuckle in started train on second attempt. Delayed 103 about twenty minutes."

Q. You delayed the passing passenger train?

A. That is very bad territory, that is uphill.

Q. I was going to ask you if that is not the grade from Pembroke to Mohawk?

A. No, it is at Pembroke west, it is right downhill and we oftentimes have to back up over two miles when we can't start.

Q. You say that you were going downhill?

[fol. 4633] A. No, I think we were east, that report will show.

Q. That train was first 416 so it must have been eastbound?

A. It was eastbound because it is all uphill.

Q. You were going uphill from Pembroke to Mohawk?

A. The particular spot the train was standing on was down and at the distance signal it descends more making a sort of hook out of the rear end of the train in starting.

Q. You worked pretty steadily during the year 1940, didn't you?

A. I lost thirty days.

Q. Just the month of August?

A. August.

Q. Was that a vacation?

A. Yes, sir.

Q. Other than that you worked steadily making more than twenty trips every month during the other eleven months, didn't you?

A. It averaged about that.

Q. Nearly all of that was in freight service and a little in passenger?

A. Just an occasional trip.

Q. My memorandum indicates that you made 245 trips [fol. 4634] altogether during the year. Would that be about right?

A. That would be pretty close to it. I averaged ten or eleven roundtrips a month and worked eleven months.

Q. You had no reportable accidents or casualties on any train that you were operating during the year 1940, did you?

A. No, I don't believe in 1940.

Q. All of that period was, insofar as freight train operation was concerned, spent in the long train territory between El Paso and Lordsburg?

A. Yes, sir.

Q. As a matter of fact, Mr. Stevenson, you have never been yourself a reportable casualty during all of your career, have you?

A. To myself?

Q. Yes.

A. I can't give you the date, but I could look it up, that I fell off the engine at Smurr a good many years ago, fifteen or eighteen; just two or three days' disability. I slipped off the step.

Q. My memorandum indicates that you lost two days in 1926?

A. That is probably right.

Q. Which would not be a reportable casualty?

[fol. 4635] A. No, I was just off two or three days, I don't recall which.

Q. That two days' disability occurred in connection with a slip while the engine was standing, did it?

A. Yes, we were standing still. I attempted to get down and the handrail or my glove was greasy and my hand simply slipped down the rail and I was not able to hold myself. The step struck me in the back a little and skinned my back and I laid off a couple of days.

Q. You referred to the passing of signals from the rear end. Have you ever had a casualty occur on a train where you were engineer or fireman because of the failure to see or understand the signal given from the rear end?

A. No, no one was reported injured to me that I know of.

Q. Have you ever had a casualty occur on any train where you were fireman or engineer which was due to the use of the conductor's valve on the rear end? By "casualty" I mean personal injury to a member of the crew involving more than three days' disability.

A. No, I can't say that I have.

Q. You spoke I think in your testimony of the case where [fol. 4636] the conductor's valve was used after starting

in a 97-car train where you had seen the man get on and subsequently the valve was used. You actually saw the man get on the rear end, did you?

A. What we actually see is the man, as we get further away from the man he appears as a dark object and we see a light between him and the train and as that dark object closes up to the train that is all we have to view, that the man has gotten on. His giving the signal after that is out of the question.

Q. When the valve was used on this 97-car train, there was no casualty, was there?

A. None at all.

Q. So far as your own personal experience is concerned, there isn't any actual hazard from the use of the conductor's valve?

A. Yes, there is.

Q. You told me it has never resulted in a casualty in your experience?

A. In my experience I have seen them break a train in two.

Q. Those break-in-two's haven't resulted in any casualties?

A. No, it was lucky there wasn't anybody standing there. [fol. 4637] I have never had the experience I have related there and fortunately or unfortunately there haven't been any.

Q. When you speak of a break-in-two, the breaking of a knuckle which keeps the train from moving is a break-in-two, isn't it?

A. Yes, anything that has parted outside the coupler being open is a break-in-two.

Q. It results in whatever delay is necessary to replace the knuckle?

A. Yes.

Q. And put the train together again at the point of the break?

A. Yes, sir.

Q. Usually that is a comparatively short delay, isn't it?

A. It depends upon the distance the break is from either the engine or the caboose.

Q. You have break-in-two's on trains of less than 70 cars, don't you?

A. Yes, I have had one or two.

Q. You had this break-in-two, for example, at Pembroke on 69 cars?

A. Yes, that is a different case, that is starting a train, slack action had nothing to do with that break-in-two. That is, it says the slack ran out but I mean running along, [fol. 4638] slack action had nothing to do with it.

Q. That was not a break-in-two due to the use of the conductor's valve?

A. No.

Q. It was due to the run back of slack as you started the train?

A. Yes.

Q. You have discussed the long hold method of train braking?

A. Yes.

Q. That is not an authorized method under the book, is it?

A. No.

Q. And you don't use it?

A. No.

Q. Have you any record of any casualty due to a failure on the part of the engine crew to see a possible defect of freight car equipment from the engine?

A. A casualty?

Q. Perhaps I better refresh your memory. You spoke of the engineer's duty to observe the train from the engine and try to see how it is running?

A. Yes.

Q. Have you any record of any casualty to any train, [fol. 4639] long or short, where you may have been engineer or fireman which was due to your failure to see any difficulty in operation?

A. I cannot recall any casualty that was caused by our failure to observe.

Q. Mr. Stevenson, when a train is proceeding down a slight grade I take it there is a tendency of the rear end of the train to close up on the front end a little bit, isn't there?

A. Yes, sir.

Q. That is what you call bunching of the slack?

A. Run-in.

Q. If the slack is bunched as you proceed down grade and you have an emergency application on the front end, you cannot have any run-in of slack further, can you?

A. That would depend upon whether you were on tangent track or curved track, the slack would adjust itself. If it was straight track, the slack would be in.

Q. The slack tends to adjust itself because of the springs and friction members in the draft gears, doesn't it?

A. It adjusts itself but it follows the line of least resistance in a grade condition.

[fol. 4640] Q. If you have loads on the head end of the train and empties on the rear, again the situation is different than if you have empties on the head end and loads on the rear?

A. You would possibly get the reverse movement.

Q. If you had empties on the head end and you have to make a sudden application of the air at the front end, your loads will tend to run further after the application than empties would?

A. Yes.

Q. The consequent run-in from the rear will be less, will it not, if you had empties on the rear and loads on the head end?

A. Empties on the rear and loads on the head?

Q. Yes.

A. The natural tendency would be for the loads to run away from the empties.

The Court: In other words, that is an ideal condition if you have a mixed train to put your loaded cars next to the engine?

A. They do that but it is not ideal.

The Court: Would that be preferable to having your loaded cars on the rear?

A. If I may state, years ago we used to handle those kind of trains and were very unsuccessful. They put 10 cars on the head end and 20 cars on the rear end, about [fol. 4641] 10 cars ahead of the empties. That was to distribute the weight throughout the train because the idea of 30 cars of oil and 30 cars of—boxcars—the weight was so great that we were unable to control it against the brake

pressure, empty and the loaded, the differential in the braking power of the two cars.

Mr. Mason:

Q. Mr. Stevenson, the slack action in a train depends to some extent upon the distribution of the loads and empties if the train consists partly of loads and partly of empties, doesn't it?

A. You would get better adjustment of slack if the weight were properly distributed.

Q. Isn't this also true, that when you are starting a train from a standstill, especially if you are starting from a level or against a slight grade, the slack will be stretched in the front part of the train but not in the rear?

A. It will be stretched in the front part and as the weight will pull on the springs at the rear.

Q. The draft gears are the place where the stretch will occur?

A. Yes.

Q. Besides the very slight amount at the coupler faces? [fol. 4642] A. Yes.

Q. While you have a fairly complete pull out from normal to extended position at the front end of the train, you won't have but very little pull out at the caboose, will you?

A. I couldn't say.

Q. You don't know how much force it takes?

A. I don't know how much force.

Q. You don't know what the striking or pulling force measured in pounds would be?

A. No, I have no way of knowing.

Q. The tractive effort of your locomotives expressed in pounds, do you recall it at the moment?

A. No, I have no figures on the tractive effort.

Q. You are generally running in the territory east of Lordsburg in freight service on which the Southern Pacific has 5000 class engines?

A. Yes, 5000 and 3700, some 3600, F-3's and 4's.

Q. The 5000 class locomotive according to the figures already of record has about 84,200 pounds of tractive effort. You don't disagree with that, do you?

A. I don't have any record and I don't know.

[fol. 4643] Q. The large F-type locomotives, the F-4 and F-5, have about 75,150 pounds of tractive effort. You don't

know then that with those friction draft gears it takes from two hundred to five hundred thousand pounds of pulling or striking force to move the draft gear from normal to fully extended position?

A. No, I have no way of knowing.

Q. You are not familiar with the construction of the draft gears on freight cars, are you?

A. I have seen the spring arrangement, I have an idea that they cushion both ways, so as to speak.

Q. You are not familiar with the friction members of the draft gear?

A. I never had one taken apart.

Q. You don't know about those at all?

A. No, that is a car man's work.

Q. You do know that these draft gears have a cushioning effect both as to run-in and run-out of slack?

A. Yes.

Q. By the way, this slack in freight trains is necessary, is it not?

A. Yes, sir.

Q. You couldn't hardly start a train without it?

[fol. 4644] A. You couldn't start a train with a solid block.

Q. It is necessary to enable you to round curves and go over dips and humps?

A. Yes, sir.

Q. And otherwise necessary to the irregularity of the pull of the engine and the roadbed over which it runs?

A. A certain amount of slack is necessary.

The Court: We will take our mid-afternoon recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows:)

The Court: You may proceed.

Mr. Mason: That is all we have with Mr. Stevenson.

Mr. Strouss: I have one question I overlooked when Mr. Stevenson was on direct examination.

The Court: The Court will grant you permission to ask it, Mr. Strouss.

[fol. 4645] Redirect examination.

By Mr. Strouss:

Q. Mr. Stevenson, have you recently within the last two or three years on a train that you were pulling had an accident where there were casualties to trainmen?

A. Yes, I had one accident, an undesired emergency on June 30, 1937, 100 cars, engine 4360 west.

Q. What happened?

A. There were two brakemen in the caboose who were thrown to the floor and injured or bruised up quite badly. I don't know just how much time they lost. Their names were Hudson and Fontaine.

Q. It was a reportable accident?

A. I believe it would be, yes. They naturally lost a number of days.

Q. On cross-examination you were asked about your seniority and your right to work west of Lordsburg where trains of 70 cars and less are operated. Is there a difference in the operating conditions so far as the capability of handling trains is concerned in the territory east of Lordsburg as compared with that west of Lordsburg?

A. I would say so, you have to exercise more care and judgment in handling the longer and heavier trains.

[fol. 4646] Q. I believe you testified that in a great many instances coming west from El Paso the full distance to Lordsburg you would not have to use the automatic brake at all?

A. That is right.

Q. And that with the exception from Strauss to Anapra going east on trains from Lordsburg to El Paso without using the automatic brake?

A. We would have to use the automatic brake some place in there to stop that train for inspection and water, but very few places between Lordsburg and Strauss that we could stop that train with the air brake, the grade conditions are not such that we can make these automatic.

Q. It would only be for the purpose of stopping for inspection or water?

A. Yes.

Q. Would that be true of the territory west of Lordsburg?

A. No, I should say not, you could make a great many brake applications.

Mr. Strouss: I think that is all.

[fol. 4647] Recross-examination:

By Mr. Mason:

Q. The territory west of Tucson as far as Yuma isn't very much different than the territory between Lordsburg and El Paso, is it?

A. From Tucson to Maricopa is practically one water grade, where our grade is more or less rolling up and down, it is changeable. Out of Lordsburg it is slightly downhill four or five miles, then uphill fifteen or sixteen miles; then we are rolling over the Continental Divide and slightly downhill to Deming. Then slightly uphill over Aden, it is more rolling country than between here and Maricopa and the grade changes at Maricopa and ascends to Estrella.

Q. As a matter of fact, your ruling grade between Lordsburg and El Paso is variously .8, .55, 1 per cent and then a small amount of about .9?

A. That would be about it.

Q. Your ruling grade between Yuma and Tucson is 1 per cent and a very small amount of 1.02 between Pembroke and Mohawk and between Lava and Sentinel?

A. Yes.

Q. But otherwise very much less, and the 1.02 between [fol. 4648] Gila and Estrella?

A. Yes.

Q. And then less than 1 per cent between Estrella and Tucson in either direction, isn't it?

A. Yes.

Q. As to this undesired emergency which you mentioned, you don't know whether either of those injured men were a reportable casualty, do you?

A. I believe it was, I believe they lost a week or more.

Q. You don't know?

A. I couldn't state positively.

Q. You didn't see them, did you?

A. I wouldn't see them after I got in. I know they didn't work the next few trips.

Mr. Mason: That is all.

(Witness excused.)

Mr. Mason: Your Honor, I wonder if we may withdraw exhibits Nos. 321 and 322 for the purpose of having them

reproduced and substitute photostats or true copies otherwise?

The Court: Photostatic copies may be received in lieu of the originals.

[fol. 4649] WILLIAM H. HAUSMAN was called as a witness in rebuttal, and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Strouss:

Q. Will you state your name, please?
A. William H. Hausman.
Q. Where do you reside, Mr. Hausman?
A. Los Angeles, California.
Q. What is your business?
A. Railroad man, broken down.
Q. Are you working at railroading now?
A. No, sir.
Q. What railroad experience have you had?
A. Since 1916.
Q. With the Southern Pacific?
A. On the Northern Pacific until 1923, since 1923 on the Southern Pacific.
Q. What service?
A. Transportation department, trainman.
Q. Have you been promoted?
A. Yes, sir.
Q. When were you promoted?
A. April, I think, in 1927.
Q. What territory have you worked on the Southern [fol. 4650] Pacific?
A. The entire Los Angeles division.
Q. What length of trains have you worked on?
A. All the lengths from caboose hop to 150 cars.
Q. By "caboose hop" you mean caboose and engine?
A. Caboose and engine.
Q. That has been on the Los Angeles division?
A. Yes, sir.
Q. Now, is it necessary at times in the operation of trains for the train crew on the rear of the train to give signals to the head end?
A. Yes, sir.

Q. What effect, if any, has the length of the train upon the ability to pass signals to the head end?

A. That depends on your weather conditions; there are times when it is impossible to see a signal or get a signal over 15 cars.

Q. What about a hundred-car train?

A. Well, the brakemen are supposed to be distributed out in order to get the signals and pass them on to the engineer, but the conditions on curves and everything, when you don't have opportunity to do that, you have to [fol. 4651] operate by guess and go.

Q. Is that when a train is moving?

A. Yes.

Q. That they are distributed out over the top?

A. Yes, sir.

Q. I expect in your railroad experience you know what slack action is?

A. Yes, sir.

Q. And from your experience on short and long trains, what, if any, is the effect in the increase in the length of trains so far as slack action is concerned?

A. On the long trains your slack action is more severe than on a short train.

Q. The shock is more severe?

A. The shock, yes, sir.

Q. You have been injured in slack action on train operations?

A. Yes, sir.

Q. I believe you called my attention to three different accidents which resulted in injury to yourself, the first being on the 19th day of April, 1931. Will you relate that incident?

A. That, I think, was down on what we call the Iris Hill, when we go down there they try to keep that train under control down there in order to take water at Nyland, they [fol. 4652] get to going too fast down there and the engineer, as a rule, uses his straight air in place of his emergency to avoid getting hot wheels.

Mr. Booth: I can't hear you.

The Witness: I was going down there to spot water going into Nyland, there is quite a grade down there, they try to control the train there without using their emergency air in order to make the stop and save the jar, they use the

straight air there; that is where you get your slack action, going down there, that is where I first got hurt.

Q. What happened when you were hurt?

A. We were going down there pretty fast and what I call slammed a jamb on, and I was thrown against the front of the caboose and fractured my arm here.

Q. Were you disabled?

A. Along about fifteen days, I was off, something like that. The doctor released me to go back to work at that time, I think it was around fifteen or twenty days, I couldn't say exactly how long it was at that time.

Q. You called my attention to another accident in which you were injured, which occurred in 1935 at Stoneman, [fol. 4653] June 24, 1935. Will you relate that incident?

A. That was when I was assisting the conductor in making out his reports; I was sitting up close to the desk, he was sitting at the desk, and I was sitting on the bunker box, we had a doubleheader, and the engineer says he just used his straight air going down that sag, the slack action came and drove me into the desk and broke three ribs.

Q. Were you disabled in that incident?

A. Yes, sir.

Q. How long?

A. I think it was practically two months that I was off then, or probably a little longer.

Q. Now, on the 21st day of October, 1937, were you again in an accident which caused you injury?

A. Yes, sir.

Q. By the way, I have neglected to ask you how many cars were in that train in 1935?

A. In 1935?

Q. At Stoneman.

A. I think we had around 124 or 125—oh, at Stoneman, 96 cars; I believe we had.

Q. And the one descending the Iris Hill in 1931, you had how many?

[fol. 4654] A. One hundred twenty-five, I believe is correct.

Q. Now, the accident at Yuma in October of 1937?

A. We had 122 empty stock cars.

Q. What happened there?

A. Well, I couldn't say what happened on the head end; slack action in there, severe slack action throwed the conductor and myself from one end of the caboose, I went

through the bottom panel of the door on the other end of the caboose, head first.

Q. Where were you when the slack action began?

A. Following the conductor out of the rear door of the caboose.

Q. And when it ended?

A. Lying on the floor in the opposite end of the caboose under the door.

Q. Did you suffer personal injuries in that accident?

A. Quite a few of them; my face was all disfigured, my nose was practically cut off, and it reacted on an injury to my back.

Q. Any ribs broken in that accident?

A. In the last one?

Q. Yes.

[fol. 4655] A. No, there wasn't no ribs broken then.

Q. Did you suffer a disability there so that you were not able to work?

A. I haven't been able to work since.

Q. Did you spend any time in the hospital?

A. Yes, I was in the hospital at Indio. The Company got after the doctors there to get me out of the hospital to send me to San Francisco and didn't seem to like that hospital up there very well, because the treatment I had there before——

Mr. Booth: What has this to do with it? We object to that, to these personal reminiscences.

The Court: Yes, the objection is sustained. The last part of the statement may be stricken from the record.

Mr. Strouss: Read the question, and then start answering.

(The question was read by the reporter.)

A. Yes, sir.

Q. How much?

A. About three weeks there at Indio, not in the hospital. I was in the hospital, I think, for about a week, then I had a place right across the street from there, across the railroad track that the doctor told me I could stay over there and come over and take my treatments from him there at [fol. 4656] Indio. I was there about three weeks or more, then I went to Los Angeles and I doctored there with Dr. Null, a company doctor at Eagle Rock, oh, for three or four months.

Q. And you have not been able to work since?
A. No.

Mr. Strouss: We have copies of the form T reports which were furnished us by the Southern Pacific Company on the first two accidents. I am getting a certified copy of the Form T filed with the Corporation Commission on the accident which occurred at Yuma, which the witness has testified to.

Mr. Mason: We have no objection to putting them in evidence.

The Court: They may be admitted in evidence.

(The documents referred to were received in evidence and marked, respectively, as Plaintiff's Exhibits Nos. 323 and 324.)

Mr. Mason: Do you want to reserve a number for the third one?

Mr. Strouss: Yes, I will reserve 325 for the Form T filed with the Corporation Commission.

Mr. Mason: Covering the accident at Yuma October 21, 1937.

Mr. Strouss: That is correct.

[fol. 4657] Q. Mr. Hausman, on Exhibit 324, which is a Form T report for the accident which occurred in June, 1935, the Form T appearing to be signed by C. F. Donnatin, Superintendent, appears this statement: "Brakeman while seated on locker seat at desk in caboose claims he was thrown off balance by slack action, striking his side against caboose desk. There was no unusual handling of train, no defects in equipment, and accident was due to failure of brakeman to properly protect himself while riding over district with which he was thoroughly familiar." Had you omitted any method of protecting yourself of which you knew at that time?

A. You always have to get yourself braced practically all the time going around any of those cabooses with long trains at any time. At any moment you are liable to have that slack action.

Q. You were doing everything you knew to protect yourself at that time?

A. Yes, sir, I was sitting down; of course, a man has to use his hands, and he cannot hang on all the time.

Mr. Strouss: Take the witness.

Mr. Mason: Your Honor, we would like to defer cross-examination if we are to have any. I am not sure we will have any.

[fol. 4658] The Court: Very well, the cross-examination will be deferred until tomorrow morning. The court will be at recess until tomorrow morning at ten o'clock.

(Thereupon, the court stood at recess until April 15, 1941, at ten o'clock A. M.)

[fol. 4659] 10 A. M., April 15, 1941

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: The witness who was on the stand when we recessed, Mr. Hausman, do you desire to cross-examine him, Mr. Mason?

Mr. Mason: I have a very few questions.

The Court: Come forward, Mr. Hausman, please.

WILLIAM H. HAUSMAN resumed the witness stand.

Cross-examination.

By Mr. Mason:

Q. Mr. Hausman, in your testimony yesterday you mentioned three accidents that had happened to you on various trains of more than 70 cars. Now I want to ask you isn't it a fact, Mr. Hausman, on September 30, 1935, you had a very serious accident which caused you to be disabled for 123 days?

A. In 1935?

Q. Do you remember it?

A. Was it in 1935?

Q. September 30, 1935, at Los Angeles on a train of 21 cars, you claimed to have slipped on the caboose floor [fol. 4660] and fallen?

A. Yes.

Q. That is correct, isn't it?

A. Yes, sir.

Q. You were disabled for 123 days, weren't you?

A. Yes, sir.

Q. And received from the company as compensation or allowance on account of the accident the sum of $2,800?

A. Yes, sir.

Q. That accident happened according to your statement while the train was standing, didn't it? Is that correct?

A. That is correct.

Q. Do you remember an accident that happened at El Centro on July 6, 1930, where you were conductor of the train, a train of four cars?

A. Where I run a nail in my foot?

Q. Yes.

A. Yes.

Q. You were disabled then for five days, were you not?

A. Yes, sir.

Q. That also happened while the train was standing, didn't it?

[fol. 4661] A. Yes, the switcher was down there in the yards.

Q. That likewise was a short train?

A. It wasn't a train.

Q. There were only four cars being handled and they were standing still?

A. Switching, yes.

Q. Do you remember an accident that happened on January 9, 1937, at Waldorf, California?

A. Yes, sir.

Q. You were then a brakeman on a 7-car train, were you not?

A. Seven or nine, passenger train.

Q. Seven-car passenger train. The train was moving at a speed of 10 miles an hour or less?

A. Or more, we were heading in there.

Q. You were heading in to switch?

A. Yes.

Q. You were getting off the train just before you reached the switch?

A. Just before we entered into the passing track.

Q. You were the head brakeman, were you?

A. The rear brakeman.

Q. You were getting off the train just after it entered the switch and in order to turn the switch back so as to [fol. 4662] line it up for the main line?

A. Yes, sir.

Q. This is the ordinary move that a rear brakeman has to make whenever the train heads in, in order to make a meet, isn't it?

A. Yes, sir.

Q. On that occasion you were so seriously injured when you stepped off the train that you lost 96 days, is that correct?

A. A re-injury to my back.

Q. You received from the company as compensation for the time lost and the injury the sum of $2,250?

Mr. Strouss: I object to that as immaterial.

The Court: You mean as to the amount of it? In what way is it material, Mr. Mason? I will hear you but I am inclined to sustain the objection as to the compensation paid.

Mr. Mason: Perhaps it is not directly material except it goes to show that the witness is one of these people who capitalizes his injuries and who really lives, as you might say, on the blood money that is paid him for that.

The Court: I will sustain the objection.

Mr. Mason: That is all, Mr. Hausman.

Mr. Strouss: That is all.

(Witness excused.)

[fol. 4663] Louis A. Fail was called as a witness in rebuttal and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Polley:

Q. Will you state your name, please?

A. Louis A. Fail.

Q. And your occupation?

A. Conductor.

Q. And who are you connected with?

A. Southern Pacific Company, Rio Grande division.

Q. And how long have you been so connected?

A. My seniority dates as brakeman from November 29, 1911. As conductor from May 22, 1916.

Q. And what other experience have you had in railroading?

A. I began railroading when I was fourteen years old as a messenger boy on the Santa Fe and Argentine. I continued on as messenger boy, oh, I think, and yard clerk, about three years; then I was a caller, then I think it was the fall of 1909 that I started in as switchman, and I have been in train service continuously since that time.

[fol. 4664] Q. At the present time have you a regular assignment as a conductor?

A. Yes, sir.

Q. And over what territory is that?

A. El Paso, Texas, to Lordsburg, New Mexico.

Q. And over what territory of the Southern Pacific have you worked?

A. Between El Paso and Yuma, all lines with the exception of Florence to Christmas, Fort Huachuca to Lewis Springs, and also on the Coast division from Santa Barbara to San Francisco.

Q. What length of freight trains have you worked on during that time?

A. Well, all lengths up to 136 cars.

Q. And numerous trains containing over one hundred cars?

A. Yes, sir.

Q. Does the Southern Pacific Company have rules relative to the duties of brakemen and conductors?

A. Yes, sir.

Q. Are you required to take an examination on those rules?

A. Yes, sir.

Q. I will hand you State's Exhibit 320, and ask you whether or not those rules are contained therein?

[fol. 4665] A. Yes, sir.

Q. And you are familiar with them?

A. Yes, sir.

Q. Will you state and describe the duties of a freight brakeman from the time he is called until the time he gets his train started?

A. Would you want his duties described out of El Paso or out of Tucson, Arizona, or out of Yuma? There might be a little difference because of the fact that in Arizona you have three brakemen, in New Mexico and Texas you have two, and if you want me to describe the duties, we will say, of a flagman, from the time he reports at El Paso to prepare himself and the run, a flagman is required to be at

the caboose at least thirty minutes before the train is called to depart. The flagman fills the lanterns, markers, builds the fire, and has the caboose in shape to make the journey, and checks his flagging equipment and any other supplies that are furnished him, or rather, furnished the caboose.

Q. Now, at El Paso, does the brakeman assist in inspecting the train before the start?

A. Nothing more than to let the hand-brakes off.

[fol. 4666] Q. That inspecting is done by——

A. Car men. This brakeman's duties, the flagman is responsible for the rear of that train, of course, at all times, and his instructions at El Paso are to remain at or near the caboose due to cars being thrown in on this track that the train is being made up on and to protect and see that the cars are not kicked out on the lead in the way of switching movements being made behind him maybe to other tracks; while the duties of the head brakeman, he has to show up there not later than thirty minutes before leaving time and it is his responsibility to see that all of the brakes are let off the train except the rear five, which the flagman is responsible for, and those brakes are left on there to hold the train in this track and so that it won't run out and be side-swiped by switching movements behind it.

Q. What are the duties of the conductor?

A. The conductor is supposed to show up at the caboose thirty minutes before leaving time and check up with the flagman and see that the caboose is in shape to make the trip in the way of supplies, then he proceeds to the head end of train, taking initials, numbers, and light weights of cars, and watching for broken seals on the cars as he is checking [fol. 4667] the train.

Q. Is there anything else you would like to add concerning the brakeman's or conductor's duties at the station?

A. Yes, the conductor's duties, I consider that one of the most important times of his trip, he goes to the telegraph office and checks the register against opposing and over-due trains, trains that would interfere with his head rights or moving or leaving the terminal, and receive his orders, then gets his waybills and delivers the orders to the engineer and compares time, and both are satisfied that

they have the right to leave town. That I would consider was about all that is necessary.

[fol. 4668] Q. After the train leaves the station, what are the duties of the brakeman?

A. The brakeman's duties are to continuously be on the alert, look out for any defects that might occur in the running equipment of the train and while moving they are continually watching the train, the head brakeman from the gangway of the engine and the rear brakeman from either the cupola or rear platform of the caboose.

The Court: In Arizona what position does the swing brakeman take?

A. The swing brakeman at times, his duties might require him to be in the middle of the train to pass signals. He helps to inspect the train at all times, in other words, he is what we call the boss brakeman. If there is switching to be performed, he is the fellow who does it, oversees it. In other words, he receives the instructions from the agent at the station telling him where he wants these cars arranged at his station and he also inspects the train at all stops.

The Court: While the train is in movement, does this swing brakeman ordinarily ride in the middle of the train or does he spend part of his time in the caboose or up in the locomotive?

A. In that case it depends on what he has to do. If [fol. 4669] he doesn't have any work to do over at any of these towns he is going to come through like Maricopa or these other places, he may be found in the caboose but he is kind of a free lance on there, he is supposed to be where the work is, where the duties are to be performed and he could still be riding on the engine and be in his proper place as well as if he were riding on the caboose and be in his proper place. One of his main duties is to keep sharp lookout and inspect the train.

The Court: But the head brakeman and the flagman ordinarily stay in their respective positions at the head end and back end?

A. That is true, the head man is required to be on the head end to head in through sidetracks while the rear man is required to be on the rear end to protect the rear end of the train, be out flagging.

Mr. Polley:

Q. Does the swing brakeman observe the train while it is in motion?

A. Oh, yes.

Q. Do members of the train crew pass signals from the caboose to the engine?

A. That depends on how many cars you have.

Q. That is one of their duties, is it not?

[fol. 4670] A. Yes, that is true, if there is cause to give these signals that is their duty.

Q. What duties do they have in relation to protecting the train at crossings?

A. That is one part that the swing man helps to play. Usually where there are road crossings to be cut and coupled up and protecting people when they go across these road crossings when you have an opening made in the train, that is a duty that comes under the swing man. He is in the middle of the train, possibly the head end is around a curve or the view is obstructed to the engineer and between him and the head brakeman they pass signals to one another in coupling or uncoupling these crossings at public highways.

Q. Does rule 99 of exhibit No. 320 require anything of the train crew?

A. It is one of the most strict rules in the book, that is the protection of your train, rule 99.

Q. Will you read it, please?

A. (Reading) "Rule 99. When a train stops under circumstances in which it may be overtaken by another train, the flagman must go back immediately with flagman's signals a sufficient distance to insure protection; one-fourth [fol. 4671] mile from rear of train, if such distance has been reached before being recalled, he must place one torpedo on the rail; one-half mile from rear of train, or at the point from which recalled if less than one-half and more than one-fourth mile, he must place two torpedoes on the rail two rail-lengths apart; if less than one-fourth mile, he must, if safety to train requires, leave a lighted fusee. If conditions, such as curves, foggy or stormy weather, or descending grade, require, he must continue back a greater distance, placing two additional torpedoes. He may then return to the single torpedo, where he must remain until relieved by another flagman or recalled by

the whistle of his engine. When recalled he may remove the single torpedo and return, unless a following train be seen or heard approaching under conditions in which his train may be overtaken by such train, in which event he must go toward the approaching train displaying stop signals.

"When a train is seen approaching closely before flagman has reached the required flagging distance, he must immediately place one torpedo on the rail, and continue in the direction of the approaching train, displaying stop signals: By night, or by day when conditions warrant, a [fol. 4672] lighted fusee must be displayed.

"By night, or by day when conditions warrant, flagman must leave a lighted fusee to protect his train while returning.

"When circumstances require, train must be moved forward a sufficient distance to afford protection.

"The front of the train must be protected in the same way, when necessary, by the brakeman; if not available, the fireman.

"When a train is moving under circumstances in which it may be overtaken by another train, the flagman must take such action as may be necessary to insure protection. By night, or by day when the view is obscured, lighted fusees must be thrown off at proper intervals.

"Before a train fouls the main track in pulling out of a siding or other track, flagman must, if necessary, go back with stop signals a sufficient distance to provide necessary protection.

"When day signals cannot be plainly seen, owing to weather or other conditions, night signals must also be used.

"Conductors and engineers are responsible for the protection of their trains in both directions."

Q. You mentioned the word "torpedo," what is a tor- [fol. 4673] pedo?

A. A torpedo is a small cap with explosives in it that makes an explosion when run over by the train wheels.

Q. You place it on the rails?

A. That is right. At this time I would like to say that this rule has been changed due to our streamlined conditions and the distance has been increased from one-half to three-quarters of a mile which is something new and

it hasn't had time to be put in this book of rules. However, we are instructed by bulletin as to its effect.

Mr. Mason: Where you read "one-half mile" at the bottom of page 47 in the first paragraph of rule 99, that should be "three-quarters"?

A. That is right.

Mr. Mason: In both places?

A. That is right, that is due to our speedier trains.

The Court: The explosion of this torpedo under the engine has a very distinct meaning to the engineer?

A. Yes, sir.

The Court: It tells him to stop?

A. One means stop and two means reduce speed and [fol. 4674] run under caution, expect to find the main track occupied.

Mr. Polley:

Q. Are trainmen required to set and release retainers when retainers are used?

A. Yes, sir.

Q. Do they have any duties in connection with hand brakes?

A. Yes, sir.

Q. Just what are they?

A. When cars are set out on sidings, a car must be secured with the hand brake. If your engine should be disabled and the train was set out, then the train is secured by the hand brakes both head and rear ends, a sufficient number in your opinion to anchor the train.

Q. Are they required to check brake beams?

A. They are required to check everything. In making an inspection of the train there are brake beams, that is one of the main objects that they are searching for in making an inspection of the rolling equipment or running gear equipment of the train.

Q. What do they do if they find a brake beam down?

A. It depends. If the brake beam hasn't been damaged, I mean by that bent or sprung or twisted, there are times when they are able to rehang them and put them back [fol. 4675] up in position. However, the brake cannot be operated because we don't have bolts of sufficient size and length to hang these brake hangers so we usually take the

bleed rod from the brake cylinder and more or less wire them up and then cut the air brake out so that the air brake is inoperative.

Q. Would any damage result if the brake beam was down and was not detected?

A. Yes, it can cause derailment or damage to switch points or damage to the block signal wiring of the track or it could cause a number of things.

Q. Are they required to cut out cars?

A. Yes.

Q. What are their duties in that connection?

A. When the air brake is sticking, the triple valve is not functioning properly or when the brake rigging has been damaged and is inoperative or not safe to operate the car is then cut out, the air brake I mean is then cut out.

Q. Are they required to open and close switches?

A. Yes, sir, at all sidings where it is necessary to take siding for the meeting or passing of trains.

Q. Do they have any duties in connection with refrigera-
[fol. 4676] tor cars?

A. Yes, sir, we had refrigerator cars loaded with different kinds of perishable commodities, most any kind that you can think of, such as tomatoes or potatoes or onions or apples or lettuce or mixed vegetables or most any commodity and under certain conditions they haul these commodities differently. Some of the more perishable nature they pre-cool that car, by that I mean they get the car cooled before they load it and others like onions or potatoes or tomatoes possibly they don't undertake to pre-cool the car and they haul that commodity with the vents open when the temperature is above thirty-two to forty-five degrees. Our latest instructions are to close tomatoes, some instructions say forty degrees and some forty-five, while potatoes and apples are closed at thirty-two and when the temperature rises above that the brakemen are required to open the vents.

Q. Where are the vents located?

A. There are four lids on the tops of the end of each refrigerator car possibly about three and a half feet square or something like that.

Q. When they are raised, do they extend above the top of the car?

A. Yes, sir, the lid extends possibly up eighteen inches.
[fol. 4677] Q. Are trainmen required to make reports on

the train? In other words, do they have any clerical duties to perform?

A. No, they have no clerical work to do.

Q. Are they ever required to make repairs while on the road?

A. Yes, they are required to help repair anything that becomes disabled if it is in our power to do so, to keep the train moving.

Q. Are they sometimes required to repair journals?

A. Yes, sir, and that sometimes runs into quite a little job.

Q. Are they sometimes required to repair a knuckle?

A. Yes, sir, and that runs into quite a little job. I think those knuckles weigh, there are two types, and I think one weighs 92 pounds and the other weighs 98 pounds, or thereabouts, and when you put one of those on your shoulder to carry it out on a 90-car train to where this outfit is broken in two, and some of the places along the track where there isn't any shoulder on the track for you to walk on and you have to come down here maybe, oh, 20 or 30 feet below the fill and walk through the weeds and stumble in climbing over boulders, and walk down through [fol. 4678] gullies that have culverts over them but they don't have any footpath on, and at the same time with this ninety some pounds on your shoulder, and looking out for rattlesnakes, it does run into a job.

Q. Now, do trainmen have any duties in connection with local service that are peculiar to that service?

A. Oh, yes, in local service, they unload way freight, set out and pick up cars, pick up disabled cars set out by other freights to rebrass these cars.

Q. How about mixed trains?

A. On mixed trains—a mixed train means that it hauls passengers and freight both, and the flagman is usually the one that is required to take care of the mail and express on this mixed run, while the head brakeman takes care of all the switching, the setting out and picking up.

The Court: You only have those mixed trains on the branch lines?

A. That is right. In our territory anyway, that is all.

Mr. Polley: What are the duties of a conductor in passenger service?

A. Well, you show up at your initial terminal thirty [fol. 4679] minutes before leaving time and you check the register, obtain your orders, and then you meet the incoming conductor and get the through tickets from the incoming conductor, and any information that he has to give you pertaining to any passengers on the train, such as minor children being sent through without any caretaker or parents.

Q. Does that happen frequently?

A. Yes, quite often. That, I would say, was not such a major duty, the child is usually well behaved, but after all you have to watch out for this child; you go through the train and you take care of the tickets, take up the tickets from everyone aboard, or all aboard are accounted for.

Mr. Mason: If your Honor please, aren't we wandering a little ways away from the case when we talk about the duties of a passenger conductor as to collecting tickets and taking care of minor children?

Mr. Strouss: If the Court please, it is showing his duties, the work he has to do, and would go to the matter of his ability to look after the train as a whole and look after the safety of the train, it has a lot to do with safety, the duties that he has to perform.

[fol. 4680] The Court: Objection overruled.

Mr. Polley: Does he have any additional duties concerning passengers, that is, the care?

A. Yes, we have the old folks to look out for and wait on, and in other words make yourself useful and take care of people that are on that train, as well as helping to get it over the road. Now, of course, you understand the engineer, he is supposed to be infallible, we are all supposed to be infallible, but after all it is my duty, if the engineer passes the station ahead of time, I am held equally responsible for the engineer, and my duties require me to go back through the sleepers day and night, the berths are all made down and if I don't keep right on my business I will become lost back there because it is dark, and I am going over that road by his whistle.

Q. Now, when additional cars are added to the train, is the number of passengers increased?

A. Oh, yes, they don't haul passenger cars for nothing empty around here unless they have to; there are more people to look after.

Q. Has a passenger conductor any duties with relation to inspection of the train while it is running?

A. Yes, we are all responsible for that, and we are re-
[fol. 4681] quired to patrol the train day and night. By that, I mean going back from the head end to the rear end and opening doors to try to see. However, that is almost an impossibility, because there is so much sand blowing, and dirt, and also water from the toilets, wash basins, splattering and blowing back there, that it is impossible to look forward and see anything. You can look back toward the rear and you might see if there was anything blazing, but it is very doubtful. The greater part of your inspection is due to smell. As far as hot boxes are concerned, it is smell that you are trying to safely operate on.

Q. Now, in describing the duties of a freight brakeman, you testified that one of his duties was to rebrass journals. Just what is that operation, or why is it necessary to rebrass journals?

A. Well, due to maybe several reasons, the car might be overloaded, would cause it to run hot, the journal might be rough or have been rough prior to the time this car was loaded, or the box may lack oil or packing that lubricates this journal, or the waste may have been removed by trespassers to build a fire to keep warm by, we have that happen quite often, and we have instructions to stop cars that
[fol. 4682] have been standing out on sidings in the country for a long time, we are required to inspect every one of those journal boxes before we load it and pick it up, because the hoboes might have pulled the packing out, and we would get into trouble before we knew it if we didn't inspect them. There are many reasons that will cause a box to run hot.

Q. In other words, hot boxes cause the necessity for rebrassing the journals?

A. That is right, the journal has become what we call irritated.

Q. Do hot boxes develop suddenly or over a period of time?

A. Sometimes they do and sometimes they don't. And that is one thing that I would challenge anyone on, I have handled many a one, I suppose thousands. Some I have had good luck with, and others I haven't.

Q. Well, sometimes is it possible to detect a hotbox before it becomes too serious?

A. That is right.

Q. And how is that detected?

A. Either by smell or sight.

Q. In other words, you can either smell it burning or see it?

[fol. 4683] A. That is right, and that is the only way you have of knowing.

Q. Now, when one is detected, is it sometimes possible to prevent it from getting any more serious?

A. Yes, sir, sometimes when we catch them in time we can doctor them up and have no more trouble with them.

Q. What do you mean by "doctoring them up"?

A. I mean by pushing back the packing which oils the journal, or we pour water in there sometimes, this packing works out toward the front of the box and then there is nothing at the back of the journal to raise this oil to lubricate it and that is what causes it to run hot.

Q. When a hotbox has gone too far and it is necessary to rebrass the journal, just what do you do? Explain that in detail.

A. Well, the first thing, about the biggest job of it, is to get the tools up to the car.

Q. Where are they located?

A. Well, everything is located necessarily—and when I say everything, that means quite a lot, on the caboose, except the jack and the jackbar. However, that jack and jackbar, up until three or four years ago was kept on the caboose, but due to hard times or circumstances that I know [fol. 4684] nothing of, the jack was removed from the caboose, and only one on the engine, so that it makes it mighty inconvenient. We stop for a hotbox, and the head man, he doesn't know whether it is necessary to brass the car until he has come back and had a look at it, then you would have to send him back to the engine; this might be 91 cars and it might be three cars, there is no certain car that is going to run hot, and no certain position, so that he has to return to the engine regardless of the conditions, and get this jack and jackbar. I don't know the weight of these jacks but I would say that the first ten car lengths you carry one of them, oh, they are about, the ones we have, are probably eight or ten inches square and maybe

ten or eight inches high, probably the first ten car lengths you carry this jack it would weigh maybe about 30 pounds, but the second ten carlengths you carry this jack it goes up, and if you carry it 90 car lengths, I suppose it would weigh that many pounds or thereabouts.

Mr. Mason: If your Honor please, I object to this. It doesn't seem to have anything to do with safety of train operation, this described operation for which brakemen obviously are paid, it is part of their job.

[fol. 4685] Mr. Strouss: We have a right to rebut the evidence as to the delays and the time that can be made in the operation of these long trains.

Mr. Mason: This seems to relate to the sore backs and sore shoulders of men who are carrying out their duties in carrying a jack along the length of the train and doesn't seem to have anything to do even with the delay.

The Court: The objection is overruled.

A. If permitted, I might border upon the safety of what this rebrassing the cars——

Mr. Mason: I suggest that we proceed by question and answer.

The Court: Yes, just answer the question.

Mr. Polley: Let us confine ourselves to the job of actually rebrassing the journal.

A. The conductor in our territory, with two brakemen, the conductor, he goes back to the caboose and gets a pail of dope. I would imagine this water bucket will hold three gallons, and that is filled with oil-soaked waste, and then it is necessary to take up a jack block, and it is made of oak about three inches thick and about thirty inches long and about 12 inches wide, which is pretty heavy, a Keeley can that will hold at least ten gallons of water, the packing [fol. 4686] hook and packing iron. Those are the instruments that you use to push this packing in or pull the old out with; then you have two biased wedges that are probably 18 inches long and made probably out of oak four by four, cut biased. That is placed on top of the wheel of the car under the floor of the car to hold the wheel down, and when the head brakeman returns with this jack, the jack is placed upon this jack block underneath the journal box and the box is jacked up, raising the box higher than

the journal of the wheel, so that the old brass may be removed and new brass put in.

Q. Then are the tools returned?

A. Yes, sir; sometimes we are able to pull up and load them on the caboose, and other conditions may prevent it.

Q. About how long does it take to complete this whole operation here?

A. Well, if you knew that you were going to brass them when we stop, you couldn't do it under thirty minutes. If you had these tools handy and right at it, it couldn't be done under thirty minutes. I would say that any hotbox that is going to have to be rebrassed up the train, we will say, 25 cars from the caboose, or 25 cars from the engine, [fol. 4687] one hour would be pretty good time to do it in.

Q. Has the length of the train any effect upon the time necessary?

A. Oh, yes, the length of the train puts your tools further away probably from where this might be.

Q. Suppose the hotbox occurred at night; are there any greater difficulties confronted there?

A. Well, at night you locate it by the blaze, and after you go up and see, of course, when we first see a hotbox we take a bucket of water, we don't know how long it has been blazing, but as quick as we see it blazing, that is when we try to get it stopped; it could have been blazing and blazing bad underneath the car next to the wheel and not flaring out, and it might have been carrying on, so the important thing is to stop as quick as you see it, then the difficulties are carrying these tools up to the job in the dark, and walking through these weeds is another question too, we have rattlesnakes over in our country, I don't know how you fellows feel about it, but they will give you their attention and it makes it kind of bad walking through the weeds, I am a little bit afraid of them.

[fol. 4688] Q. How often are you required to replace journal brasses? Is this merely theory or something to be actually contended with?

A. Oh, it is something to be contended with almost every trip. Now we don't have boxes that require rebrassing every trip, but we have new wheels under cars and I think that that is just an unwritten rule with a trainman, when he sees a new wheel he will put his hand on the journal box to see that it is all right, because we are interested until,

that wheel gets down to a bearing; I mean the journal comes down to a bearing, then it is all right. New wheels, we pay particular attention to, that is our duties in inspecting the train. If we find fresh oil splattering against the wheel, we know that oil has been heated a little bit, we pay attention to that.

Q. Are there any places where carmen rebrass the journals?

A. Yes, on my district we have Lordsburg, at Lordsburg we don't have car inspectors, we have what is called an emergency repair station, two carmen on duty in the daytime and one at night, and upon their receipt of a wire from the incoming conductors they will meet the train and make the necessary repairs.

[fol. 4689] Q. Now, in your opinion, what effect does the number of cars in a train have upon the necessity to replace journal brasses?

A. Well, now, I don't——

Q. Well, I will ask you this: Do more cars make it more difficult to detect a hotbox?

A. Yes, because you understand there are four boxes on each side of each car, and the more cars the more boxes to watch out for and the more responsibilities, the more danger.

Q. By the same crew?

A. Yes, sir.

Q. The same number in the crew. And if a hotbox is not detected, does it burn off?

A. If they have my personal record here, they will find whether they will burn off or not, I have dropped two of them. Yes, sir, and that is very essential, and one thing that trainmen are alarmed over at all times, is the burning off——

Mr. Mason: Just a minute. That trainmen are alarmed at all times, that is hearsay. If it is the witness who is alarmed, that is different.

The Court: Yes, I will sustain the objection to that. It may be stricken.

Mr. Polley: I believe you have testified that if detected in time, hotboxes can be prevented?

[fol. 4690] A. Yes, sir.

The Court: We will take our mid-morning recess.

(Thereupon a short recess was taken, after which the witness was recalled to the stand, and proceedings were resumed as follows:)

[fol. 4691] Mr. Strouss: If the Court please, yesterday I had two exhibits, copies of form T in connection with Mr. Hausman's testimony, and stated I would have today a certified copy of another form T. I received the copy, but I notice that the certificate does not have the seal of the Commission. I have given it to counsel, however, and they have agreed it is a true copy.

Mr. Mason: We will waive the lack of formal certification.

The Court: That is the one you reserved the number for?

The Clerk: Number 325.

The Court: It may be admitted in evidence.

Mr. Strouss: I think we might take the form T and leave the certificate out.

Mr. Mason: That is satisfactory.

The Court: The certificate may be removed and the form T admitted in evidence.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 325.")

[fol. 4692] Louis A. Fail resumed the witness stand.

Mr. Polley:

Q. Mr. Fail, I believe you testified this morning that sometimes it was necessary to repair broken knuckles on your run. Will that happen very often?

A. Well, I might say not any oftener than hotboxes appear and are necessary to be brassed but at times you do break them.

Q. What happens when a knuckle is broken?

A. The coupling is just broken so that you can't handle it anymore. One thing that causes more knuckles to be broken on our district than any other one cause that I know of is due to trespassers climbing on and off the train and getting around on them and they step on these cutting levers, which is a lever at the end of the car that we push down that raises the lock block in the coupler that allows it to uncouple. Then we will say that this trespasser steps on a cutting lever on the rear end of a

train of most any length. Of course the longer the train the greater the shock is going to be at the far end away from it. Then you are liable to have a broken knuckle some place near the engine because the weight of the engine [fol. 4693] is there and this air is setting, going up through this cut of cars just like lightning and when it gets up there and there is something up there to hold this upper end there is no whip cracker effect to it, something is going to give and we have a broken knuckle.

The Court: In other words, it doesn't break the knuckle at the point where the train was broken in two?

A. That is right, that is what causes the break-in-two maybe up there. Then we will reverse that move and he may step on a cutting lever up near the head end and may cause the trouble to be back on the rear end. Those are conditions that happen right along and I would say in my experience that causes more broken knuckles than knuckles wearing out or bad action of the air. Of course we have those, too, but we have them of all nature.

Q. Is it always possible to replace or repair a broken knuckle on the road?

A. No, I would rather have that to be a broken coupler. A broken coupler, it is necessary to change it out then.

Q. What does that job entail?

A. We have a chain that is possibly, I would say as long as from here to that door which is probably ten feet I [fol. 4694] suppose, eight to ten feet long and this chain is made out of iron I would say that was one inch thick, links. I would say that these links are—I don't know—maybe six inches long. Then these hooks are made out of iron, the long link that is about fourteen or sixteen inches long on one end is made out of heavier iron than the links are and it may be made out of inch and a half iron and the hook I would say is probably made out of inch and three-quarters or two-inch iron and it is usually about that long. When we encounter trouble of a broken draw bar there is certain conditions that we can get rid of that car. If the coupler is on the far end from the engine, we can always maneuver and take it to the next town or set it out and get rid of it that way. That is one of our easy ways of getting rid of it, but if it is on the rear portion of the train that is the hard way. Then it is necessary under any circumstance so long as you are

doing this job with your engine, by that I mean not anyone coming up behind you with another locomotive doing it, it is necessary for you then to chain that car. You can't do anything with it except handle it with the chain.

Q. Where is the chain located, where are they kept?

[fol. 4695] A. They are kept in a compartment underneath the caboose. There are chains kept on the locomotive in the tank boxes.

Q. It is necessary to pack that chain from the locomotive or the caboose to the car?

A. Under certain conditions, yes, sir, it is necessary for you to carry it. There are other ways that you might be able to throw the chain off there to the bad order car and hook the chain on the car and drag the chain back. There are several tricks to handle it, but there are many cases where you have to carry the chain.

Q. Does the job of chaining two cars together consume very much time?

A. Yes, sir, I would say that after you got the brakeman there with you, which might be several car lengths from the engine or might be close to the engine, if it was close to the engine the brakeman couldn't do anything until the conductor got there to help him because if is not a one-man job.

Q. How much does a knuckle weigh?

A. There are two types on the Southern Pacific, I think it is 92 and 98 pounds or 92 and 96 pounds but this chain, [fol. 4696] I would say it is a good deal like the knuckle, when you start out to carry it, it is not too tough but the longer you go the tougher it gets and there are not I don't think two men in this room who could pick it up bodily and carry it any great distance and I would say by that that it probably weighs from 400 to five or six hundred pounds, I don't know, but they weigh plenty. They have to be to pull the train.

Q. What effect does a long train have upon the frequency of broken knuckles and broken couplers and draft gears—let me read you a statement on page 12 of State's exhibit No. 319—(reading) "Draft gears in fair to good condition are not pushed in or pulled out. They are either driven in or jerked out, both implying a severe shock." Does the length of the train have a tendency to increase that shock?

A. Yes, sir.

Q. And the fact that the shock is increased, does that have a tendency to make broken knuckles more frequent?
A. Yes.

Mr. Mason: I object to the question as calling for a conclusion of the witness without any foundation. Your Honor, he has not presented anything here except speculation, no [fol. 4697] statistics to show what the frequency may be of broken knuckles on long trains or on short ones.

Mr. Polley: He has been a conductor for twenty years and he certainly knows the operation of a train.

Mr. Mason: That doesn't qualify him to state how frequently these things occur unless he shows something more than speculation.

The Court: It is true probably, he can only testify as to his personal experience. If you will limit it to that, the objection will be overruled.

Mr. Polley:

Q. Will you limit it to your personal experience then?
A. Yes, it is just every trip with me.

Mr. Mason: You have a broken knuckle every trip?
A. No, I don't have a broken knuckle every trip but I have cars in weakened condition every trip and the weakened condition must be caused from weight or pressure or something wears that iron out. Those are things that we have to be on the lookout for due to the fact that carrying irons become worn. We have one type of car that we have more trouble with and it is a private line tank. When you run along at speed, the cutting lever on the coupler bounces [fol. 4698] up. This is a tank line, a private tank line, and are broke in two many times.

The Court: What is the name of the private tank line?
A. G. A. T. X., General American Tank Car Company.

Mr. Polley:

Q. Mr. Fail, in the operation of trains are there any provisions for the inspection of those trains? First, limit your testimony to others than the train crew.
A. The rules say that the section men and bridge repair men and all working along the track will observe the train as it goes by.

Q. Are any inspections made by car men?

A. No, not between these repairs stations, no.

Q. Are any inspections made by what are called car inspectors at terminals?

A. Oh, yes, at terminals where car inspectors are maintained, and that is Tucson, Arizona, between Yuma and El Paso.

Q. That is the only place where car inspectors are maintained?

A. Yes, that is 251 miles from Yuma to Tucson via Gila Bend, and it is 312 miles from Tucson to El Paso via Lordsburg.

[fol. 4699] Q. During the time you have been railroading for the Southern Pacific, has there been a decrease in the number of points at which car inspectors are maintained?

A. Yes, when I commenced with the Southern Pacific we had car inspectors and repair men at Deming, New Mexico, and we had them at Lordsburg, we had them at Bowie, Arizona, we had them at Gila Bend and today they have been eliminated at Deming; they have been eliminated at Bowie; they have been eliminated at Lordsburg with the exception of these three repair men; they have been eliminated at Gila Bend. I suppose that is all.

Q. Has that resulted in more responsibility being placed upon the crew?

A. Yes, sir, the train that I might be called to take out of Lordsburg eastbound could have been run from the last stop, which is San Simon, Arizona, to Lordsburg, which is 39 miles, without a stop, without anyone inspecting that train. On arrival of this train at Lordsburg the in-bound crew gets off and the out-bound crew, which would be me, takes charge. There is no switch engine located at Lordsburg and it is necessary for the brakemen to give their time to switching off cars or on cars and changing cabooses [fol. 4700] when otherwise they could be inspecting the train. As soon as this switching movement is completed, we make a hurry up effort to set the air, release it, one side of the train is pulled by the flagman and that is all of the inspection that that train possibly will get for 60 more miles which will be Deming where we stop for water.

Q. I will hand you State's exhibit No. 320 and ask you whether or not there are any rules which govern the inspection of trains by the crew?

A. Oh, yes.

Q. Particularly rule 827 and rule 828, will you just read that?

A. (Reading:) "Rule 827. The running gear, brake and draft rigging of trains must be inspected by trainmen as often and as closely as practicable when on the road. If defects be discovered they should be corrected if possible; cars unsafe to run must be set out. Special attention must be given to hot bearings. Places at which freight trains must stop for inspection, or the maximum distance a freight train may run without stopping for inspection, will be designated in the timetable."

Q. Let me ask you the question, "What is the maximum distance in the territory in which you work that the freight [fol. 4701] train may be run without inspection?"

A. Not to exceed 60 miles.

Q. Very well, proceed.

A. (Reading:) "Rule 828. Speed of a freight train must not exceed eight miles per hour for a distance sufficient to permit running inspections when starting. Trainmen must closely watch to see that brakes are released and if necessary must signal enginemen to stop if wheels are found sliding. Each trainman will be held responsible for wheels slid under that part of the train in his charge. Conductor in reporting flat wheels must give the name of trainman in charge. They must mail promptly to the superintendent a report of flat wheels discovered under the cars in their train."

Q. How does the train crew go about performing a standing inspection?

A. By walking up each side of the train, noting all moving parts on that car including the seal on the door which is very essential. The wheels, the brake beams, the journals, the flanges and the brake pistons.

Q. Do they look for anything else?

A. Well, I will say if they see all of that, no, they prob- [fol. 4702] ably wouldn't have to look for anything else. If they see all of that it is about all they could visualize.

Q. What is a rolling or running inspection and what is its purpose?

A. There are places where we make rolling inspections on our end between El Paso and Lordsburg and I will drop from the engine to the caboose and let the train pull by. However, I am only seeing one side of that train, but where we have the third brakeman with 100 cars, possibly the

swing brakeman and I will allow the train to pull by and we will see both sides.

Q. What is the main purpose of that inspection?

A. To see that all of the brakes are released, that there are no brakes sticking, all the air brakes are operative and doing what we want them to do. Now there are places that if we continue according to this rule, according to that air brake rule there, we get to going so fast we couldn't get on them so it kind of breaks up our inspection. We will take, for instance, points like Steins. Steins pass is right on a pinnacle; Dragoon, Arizona, is likewise the same; and at Benson it is bad. If we allow that whole train to pull by us, what we are interested in is to see that that air brake [fol. 4703] is off, that there will be no brakes sticking and heating the wheels. Then if he don't set the air and he gets them to going, I mean by "he" the engineer, he gets to going so fast that the engineer has to set the air to pick us up or he would run off and leave us.

Q. What effect does that have upon your inspection?

A. He has undone it. Then if we were to carry through like the rule says, of course the rule isn't so elastic, after he sets the air we would have to stop him, go to the head end and pull that entire train by and until we got down the mountain we would be stopping him every train length anyway but we are not that technical and we take chances, we try to be good fellows with them. However, if we break a wheel, there are records where they haven't been such good fellows with us but we try to make the inspections the best way we can.

Mr. Mason: I take it that it may be understood that the witness is referring to his own personal experiences?

The Court: Yes, the record may so show.

Mr. Mason: These generalities go far beyond the limit of experience unless limited by such understanding.

[fol. 4704] Mr. Polley:

Q. Does the weight of the train and the length of the train have any effect on the ability of the engineer to control the speed of this train at eight mile an hour for the rolling inspection, especially on a descending grade?

A. That is true, because the weight is there and he cannot hold it with his independent brake valve.

Q. That requires him to do what?

A. Set the automatic air on the entire train.

Q. And that completely nullifies the rolling test?

A. That is right, it puts us in a worse shape because under this condition when we get on the caboose we are unable to determine if all the brakes are off of all the cars; we hope they are.

Q. And that was the very purpose of making the test to begin with?

A. That is right.

Q. What effect will it have if some of the brakes are sticking?

A. They will heat the wheels. If it was an empty car, it might slide the wheels from a standing start. If it was a heavy loaded car, it would heat the wheels. I don't think the brakes would be strong enough to slide the wheel from [fol. 4705] a standing start. It might be under conditions of wet rail or frosty rail.

Q. How are these inspections made at night? What light do you have?

A. We have electric lanterns that are very good for what we want them for, to give signals, but the difference between our lantern and a lantern that a car man is furnished with is that we have a little bulb about like a flashlight bulb, I believe they are four or six watt bulbs, they are just little ones and as far as our duties outside of inspecting the train they are very good. They are all right, but the car man has a reflector on his electric lantern and he has a reflector probably four or five inches across that puts a ray of light on there that you can really see something with.

Q. Mr. Fail, from your experience can you state whether or not you can inspect a 100-car train, a standing inspection, as quickly as you can a 70-car train?

A. I cannot.

Q. According to the company rules, if you were required to, could you give the 100-car train as efficient an inspection as you could the 70-car train?

[fol. 4706] A. I could in a longer period of time.

Q. Suppose they set the time, could you spend as much time on each car in the 100-car train as you could on the 70-car train?

Mr. Mason: I object to the question as based upon an assumption of facts not in evidence.

The Court: Objection sustained.

Mr. Polley: I think, if the Court please, if you will refer to exhibit No. 220 with the redispatched trains the longer trains run across the state of Arizona just as fast as do the short trains.

The Court: That was redispatch; no, I will sustain the objection.

Mr. Polley:

Q. Suppose, Mr. Fail, that you failed to discover a defect, what effect if any would that have upon you?

A. It has this effect, it may interfere with my future welfare in remaining in the service of the Southern Pacific Company. In one instance it did, due to a hot journal. At that time we were moving somewhere around 25 cars of cement to Phoenix, Arizona. We had a very rush message on this that it was badly needed and to not set out one of these cars without permission from the chief train dispatcher. We arrived at Rudder, New Mexico, and found [fol. 4707] this journal running warm. We doctored it up, did every known trick we are familiar with and it wouldn't respond to treatment. I talked to the chief train dispatcher four miles beyond and he told me to try to worry along with it if I could, so we operated it under water from one of these ten-gallon keeley cans, we have a hose that runs down to the journal and we arrived at a place called Cambray, New Mexico, which is 62 miles west of El Paso and we stopped this car in front of the depot and put the garden hose on this journal and cooled it off slowly and rebrassed this car. If my memory serves, we rebrassed this car again at Parma, New Mexico, which is four miles west of Deming. However, at Deming we put the garden hose on this journal again and had it completely cold leaving there. We rebrassed it at Parma and carried this car on to Gage, New Mexico, and doctored it again at Gage. We carried it on to Separ then and at Separ it was necessary to rebrass this car as the old bearing was broken. At that point, which is an open telegraph office, the same as Deming and Cambray, New Mexico, that I was later forced to use the operators as witnesses that I had given this car attention at these points, found two car repair [fol. 4708] men at Separ with the emergency tool car and they rebrassed this car. Leaving Lordsburg I had engineer Cheek pulling me and we made it up that the train would

not be moved faster than twenty miles an hour for that twenty miles, Separ to Lordsburg, and at no point do I recall that he moved the train any faster. Arriving at the station board, which is one mile east of Lordsburg, this journal gave way and piled nine of them in the ditch and I was informed in an investigation that it was a $27,000 wreck.

[fol. 4709] Q. Mr. Fail, going back to the inspectors now, ordinarily, is a train always stopped specifically for the purpose of making inspection, or sometimes is inspection made while the train is stopped for other purposes?

A. That is true. I will put it this way, inspections are made at all stops, and some stops are made specially to inspect the train, other stops are made to meet or allow trains to pass. However, we have a place on the east end—I mean by the east end, between Lordsburg and El Paso—that the enginemen and trainmen prefer to stop there and make an inspection because they can stop these long trains without using the automatic air-brake valve. This track lies right at the top of a hill so when we go up this hill into this place, they keep sawing off on the steam and let the train die down, and in that way we don't have to use the automatic air.

Q. Are you familiar with the length of freight cars used in Southern Pacific service now?

A. Yes, sir.

Q. What are those lengths?

A. Well, we have, I suppose, tank cars are the shortest, we have some private tanks that I would say run thirty, around thirty feet, then from that on up to 65 feet 6 inches, [fol. 4710] and some of one line is 66 feet 6 inches, in freight equipment. In passenger equipment they are longer.

Q. I am speaking of freight. Does that include the over-all length, the couplers and everything?

A. No, that includes the inside length, that doesn't include the over-all length.

Q. In order to determine the over-all length, you would add to that the length of the coupler?

A. The coupler and the end sill of the end of the car that the coupler comes out of, you add that all on, which would be on some cars possibly two feet, may be a little bit longer.

Q. Now, is there any particular reason why you know the length of freight cars?

A. Yes, when I leave El Paso I am required to wire Lordsburg, New Mexico, the end of my run, and where the other crew takes charge, the number of long cars in this train, so that they can determine how many cars to give them into Arizona, providing they want to have them so they can meet or pass. I have had a train, trip before last out of El Paso, that had 18 fifty-foot cars in it, and then other trains that I handle may be three, four, five or ten, it just depends probably on what the commodity, if it were [fol. 4711] automobile parts, why, they are hauled in a special car, automobile car, and those range from 40 to 50 feet.

Q. Now, in your experience in your train operation, have you experienced any trouble with sticking triple valves?

A. Yes, sir.

Q. What happens when a triple valve sticks?

A. That sets the air brake under the car and heats the wheel, burns the brake shoes, or heats the brake shoes. I have seen cars that you didn't find in time like, well, in summer, middle summer when the weather is hot, your vision is poor and if you have one then that creeps on, a triple that creeps on, you may go a long ways before you find it.

Q. What is the effect of the heating of wheels?

A. Well, it could either cause the wheel to lock or slide or it could cause it to heat and break.

Q. And what would that cause?

A. A wreck, derailment.

Q. When you find a sticking triple valve, what do you do?

A. We usually cut the car out.

Q. And how do you do that?

[fol. 4712] A. There is a valve, the train pipe runs direct from the car, ordinarily direct, sometimes they transverse from one side to the other of the steel underbeam, but we will say that it goes in a through direction, then when this brake is set on, there is what we call a branch pipe that branches from the main train pipe and comes down to this brake cylinder that operates this brake into the triple. All right, there is a valve right here that we can turn and makes this brake inoperative and not interfere

with the flow through the car, but this valve is set down there.

Q. Then the other brakes in the train have to do the braking for that one car?

A. Yes, takes its place.

Q. Do you know how long it will take to slide a wheel flat?

A. That just depends, that would depend upon the quality, I might say, of the wheel or the texture, the hardness of the steel, the size of the rail, the weather conditions. If it was a frosty rail, it might slide quite a little ways.

Q. But, sooner or later it would become flat?

A. Yes, sir.

Q. What is the effect or result of a flat wheel?

[fol. 4713] A. Well, a flat wheel, if flat enough, will break a rail if it is allowed to turn over, if you put a flat spot on it like that, it would be questionable whether it broke itself or broke the rail, one. When that flat part came over it would be like hitting with a hammer.

Q. Do you have rules with respect to flat wheels?

A. Yes.

Q. What is that?

A. They are condemnable and removable from the car two and a half inches or over, they are condemnable, they take the wheel out.

Q. Now, when the train is moving out on the road, do trainmen have any duties to watch and inspect the train?

A. Well, that is about the main duty that they have, is to keep a continual watch out for that train, the running gear of the train, both looking back at the track after the train has passed over it to detect if beam rods or brake beams or anything of that nature is dragging, marking the ties or giving you some indication that you might be in trouble and not see it up there.

Q. Now, where does the head brakeman watch? Where does he watch from?

[fol. 4714] A. Well, he watches from the gangway of the engine providing he is up there. If warm weather, he might select a place in a low coal car where he could get down close and look along, but usually, if it is bad weather, from the gangway of the engine.

Q. And where do the other brakemen and conductor watch from?

A. Well, if you have two brakemen, they sit on each side of the cupola of the caboose and the conductor usually sits down on the cushion or at the chair at his desk, and the way I do, I raise the side windows in the caboose and look up alongside the train, I am down near, and I am in a draft where if there is any smoke coming back, scent of any kind, I can detect it.

Q. How can you detect a hotbox on the rear of a train?

A. By smell or sight only. If it blazes or is smoking, smoking in the daytime, if you are not in too dusty a country, you may see it. However, it is pretty hard in places on the district I work to see anything.

Q. Do curves have any effect upon your ability to see a hotbox?

A. They are advantages.

[fol. 4715] Q. They are?

A. Absolutely. That is where we do get a look at the train going around the curve.

Q. Do cuts have any effect?

A. No, not favorable; sometimes they do. I would put it this way, that if you had a box blazing, the blaze from the box might flare on that cut if it is a clean cut like, and dirt, a deep cut, deep enough so you could get a reflection from the hot box, yes, that would be an advantage.

Q. Does the weather have any effect upon the ability to observe?

A. Well, we don't have too much snow in this country, but if it was snowing you wouldn't be able to see anything. Our greatest difficulty over there obstructing our vision is sand.

Q. Is your ability to observe defects affected in any way by the length of the train?

A. Yes, sir, because we have places like leaving El Paso, I would say we go seven miles with a hundred car train before you see the engine. If we encounter trouble leaving El Paso, we pull out over nine public street crossings, and that is right in the heart of the city, and on the track that we go out westward on, the buildings are so close that they [fol. 4716] will barely clear a man hanging on the side of a car, you wouldn't dare hang on the side of a car going out there.

Q. Out on the road does the length of the train have any effect on your ability to see defects?

A. Yes, it is like you can tell a man at two blocks to see who he is, you can see him at three blocks, but couldn't recognize him, it goes like that, the further the vision the less——

Q. As I understand it, the head brakeman remains on the engine most of the time?

A. No, that depends upon what the duties as to making stops, meeting trains, he will allow part of his train to either pull by him when they pull in the side-track, or if the train is approaching to be met, he will stay on the engine and let the train pull by him after he has opened the switch and headed the train out again.

Q. I mean, especially when the train was in motion.

A. Well, that depends, there are times when he may, to satisfy himself, make a rolling inspection and drop off and let half the train pull by him going up a hill where the speed is slow and he is able to get back on again.

[fol. 4717] Q. Now, referring especially to defects such as hotboxes, fallen brake beams, and broken flanges, can a trainman detect these defects from the top of a freight car?

A. No, I wouldn't say that he could, but there are conditions, if you were on a curve he could probably see the rear half of his train on the running gear, but I would say that the top of a boxcar is the poorest place to try to detect any defects on a train.

Q. Do you know what slack action is?

A. Well, I have had lots of it, I don't know whether I will be able to explain it or not, but I have had plenty of it.

Q. Will you give your impression of what it is?

A. Well, it is, you may call it lost motion between the cars in the couplers, it is either retarding the speed or increasing the speed that causes slack action.

Q. Have you observed slack action during your operations?

A. Yes, sir, lots of it.

Q. Which is the most severe, the running in of slack or the running out of slack?

Mr. Mason: Just a moment, Mr. Fail. I object to the question on the ground that the witness is not properly [fol. 4718] qualified. He has never, so far as his qualifi-

cations go to show; made any measurements, he hasn't even discussed any familiarity with slack running out.

Q. Have you ever measured the severity of the shock, Mr. Fail, in a run-out of slack?

A. Technically, no. The only thing I can speak of is from experience.

Q. And you never measured the severity of the shock from a run-in of slack, have you?

A. I wouldn't have any way to determine.

Q. You have never had a casualty of any kind in your own experience, from a run-in or run-out of slack?

A. Yes, I have had plenty of them.

Q. You have yourself?

A. Yes.

The Court: We are probably now getting into cross-examination.

Mr. Mason: I was trying to determine his qualifications. I will stand on the objection.

The Court: If the witness is qualified from his own experience, the objection is overruled.

Mr. Mason: There is a question before you to be answered.

Mr. Polley: Will you read the question?

[fol. 4719] (The question was read by the reporter.)

A. I would be unable to determine which might be the worst, they are both bad at certain points. If, as a general thing, I had to state which could be the worst, then I would state that the run-in was the worst, but we have two places on that particular district, and four or five places between El Paso and Yuma, Arizona, where the slack cannot be controlled.

Mr. Polley: Now, in that connection, have you had any experience in or around Pronto, New Mexico, with slack action?

A. Yes, sir, that is one of the places that I had in mind that the slack cannot be controlled, regardless of how hard the engineer tries to save you. Pronto, New Mexico, is located on, you might say, a pinnacle, a hump, or what we call a hog-back. Going eastward on these trains, before the engine is able to get over the hill, the rear end of the train is going downhill, so that there is no way to know if a man wasn't acquainted with the territory where this

thing is going to happen, but we have all been over there so long, different length trains give different points at which the slack action will go in or where it will run out, but the thing in this matter is, that the locomotive up there [fol. 4720] weighs several thousand pounds, and it is still going up hill, and it is still pulling too, but the momentum of these cars gets going so fast that they get to going faster than the locomotive, your engine may be up on the top of the hill and the engineer is working the steam now trying to out-run that slack, keep away from it, but he can't do it, and the rear end will just hit it, and if you haven't a hold you will go to the front end of the caboose or thereabouts if the stove don't stop you, then he gets over the pinnacle and starts on down the hill and just as soon as that rear end comes up, down the hill the caboose goes in. I didn't mention that when he gets on the hill in the first part of this movement, the slack works back to you until you get this jerk, this pulling effect, and it is just about as bad as the other one at this point, I wouldn't be able to determine which one would be the worst.

Q. At any rate, in some territories, slack action is more severe than in other territories?

A. That is right.

Mr. Polley: I was going to take on a different angle here.

The Court: Well, the court will be at recess until two o'clock.

(Thereupon the court stood at recess until April 15, 1941, at two o'clock, P. M.)

[fol. 4721] 2 P. M., April 15, 1941.

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed.

Louis A. Fail resumed the witness stand.

Mr. Polley:

Q. Mr. Fail, just before the noon recess you testified that slack action is more severe in some territory than in others. What effect does slack action have on a train operating over hogbacks?

A. Those are the places that no one is able to control the slack regardless of what efforts the engineer puts forth. He cannot get away from the slam-bang in the caboose or at the end of that train.

Q. I want to read you an excerpt from page 16 of State's exhibit No. 152 and see whether or not you agree with that statement, "the difference in grade over which the train may be passing when the brakes are applied, for example, one portion of the train may be on an ascending grade when the grade would assist the brakes in stopping the cars, and another portion of the train may be on a descending grade, in which case the grade would oppose [fol. 4722] the effort of the brakes to stop the cars. Such a condition requires care and judgment on the part of the enginemen as regards the time and manner of operating the train to prevent as far as possible severe shocks and strains due to the action of the slack in the train." Now from your experience, can you say whether that statement is correct?

A. Yes, that is absolutely correct, but that is for general conditions or places that you would encounter in your trip or tour, but I speak of places like Pronto that are exceptions to the rule. Pronto and between Kenzin and Anapra on the west end down here at Ligurta, Arizona, and there are other places that are exceptions to the rule. That is a general way of handling it in your line of tour, but there are places like Pronto that it cannot be controlled.

Q. What effect does the speed of the train have on the severity of slack action?

A. The speed, if you can continue fast enough to keep that locomotive going and keep it running away from this train, you wouldn't have any run-in because it would get out of the way, but the momentum of the cars catches up with the engine and if you try to run the locomotive so fast [fol. 4723] to keep away from that slack then you would be exceeding the speed limit.

Q. Suppose on the running inspection that you testified about this morning when the engine pulled the cars by at about eight miles an hour, suppose the engineer threw it into emergency going at that speed, what effect would that have upon the rear end of the train?

A. I wish you would state the question again.

The Court: Read the question.

(The question was read by the reporter.)

A. I would say at eight miles an hour it would be just like an explosion, that is about as near as I can describe it because at eight miles an hour it would be instant. The slower the speed the quicker the stop and the harder and rougher the stop, and if he threw it into emergency going eight miles an hour I am pretty sure he would damage anything.

Q. I will ask you if that situation is explained by this rule, page 13 of exhibit No. 319, "It is undesirable to make a heavy initial reduction of low speed due to the high brake shoe friction and to the more rapid application of the head brakes than those at the rear." Is that why there is a severe shock?

[fol. 4724] A. Yes, I should think so, but most any application, if it is quick action desired that the engineer wants at such a low rate of speed, it will be plenty bad.

Q. Mr. Fail, how does the train crew protect itself against slack action?

A. If they are in the cupola, we have a lazy board that is probably in some cabooses, it is eighteen or twenty inches wide, in my caboose No. 234 it is about twenty inches wide and we have a cushion that is probably eighteen inches wide. We have a three by ten inch oak block and it is probably twenty-four inches long. The cushion is a little bit longer than this lazy board that we sit on. We have this block to put our feet against which gives us about a foot or ten or twelve inches space so that we can block ourselves good. We have a grab iron on the side of the cupola, we have an iron rod that goes through the cupola. We are able to get hold of these and prop our feet like that and take it sometimes. Other times if the action comes from an undesired emergency of any nature where we are not expecting it then it is a scramble and we are liable to be knocked out of the cupola.

Q. Usually do you have any warning of impending [fol. 4725] slack action?

A. None. A stranger, regardless of the amount of experience he has had, can ride over my district and get injured because you must learn these places.

Q. Are there any dangers in slack action? I am referring to dangers to the train crew?

A. It hasn't been very long ago that I was skidded about sixteen feet in the caboose, on the floor, and I don't know whether that place is healed yet or not, but I might be able to show it if there is any question arises, but that was from slack action. We had a long train and I had been checking over the orders and schedules of another train, in fact I had just got to it. I thought I was getting in the location where I should take hold and hold on but my mind was on other things.

Q. You have made many trips across your territory during the last several years, have you not?

A. Yes, sir, I would say in the neighborhood of four thousand miles a month.

Q. Has any official of the company ever ridden with you in the caboose on a ninety to one hundred car train?

A. Not to my knowledge, not that long. I have had them in the caboose with work trains and short trains. I have [fol. 4726] personally invited different ones to ride the caboose with me but on these long trains they kind of laugh and in a joking way say, "Well, I believe I will ride the engine, I don't believe I will ride back there with you."

Q. Have you in your railroad experience ever experienced a reportable injury as a result of slack action? You understand what I mean by a reportable injury, I am referring to the Interstate Commerce Commission rules.

A. We are getting into deep water on that because there have been hundreds of scratches and bruises that haven't been reported. I will tell you why we don't report them.

Mr. Mason: I object to the statement of the witness, the question is plain and simple and demands a plain and simple answer. The rest of it is all volunteered. He can either say he has suffered a reportable injury or he has not.

The Court: I will sustain the objection on the ground it is voluntary.

Mr. Polley:

Q. To get back to reportable accidents, have you ever had any yourself?

A. At Columbus, New Mexico, I think about 1933 or 1934 I was moving one hundred condemned cars from El Paso to Hachita to store them and an air hose blew off some- [fol. 4727] where about the twelfth or fifteenth car from the engine. We were going slowly up this hill just leaving

Columbus, New Mexico, when this happened. I was in front of the swing brakeman, sitting in the cupola crosswise with my side to the front window when this happened and it threw the swing brakeman against me hard enough to break two ribs, I think it was, and my spectacles. I don't recall what time I lost but I do recall that the company paid for repairing my glasses. That is the way I remember that trip.

Q. About what speed was that train making?

A. I don't believe over ten miles an hour, not fast.

Q. Was that the only reportable accident you have had as a result of slack action?

A. I am satisfied there have been many others but as I started to say a moment ago there are many slight injuries that are not reported.

Q. Have you seen other members of the crew injured as the result of slack action?

A. Yes, sir, from these slight injuries that we are slammed around in the caboose, we don't report them unless someone is injured so that he is going to lose time, because here a few short years ago, and I think some of the officials [fol. 4728] still practice the thought in this matter, that if you are injured, instead of a reportable injury then there must be man failure and we must find the fault that caused you to be injured and you receive discipline. That has been done here on this Tucson-Rio Grande division.

[fol. 4729] Q. Have you ever seen objects in the caboose dislocated?

A. Yes, sir; I have had the water barrels knocked down, and that has not happened so long ago, I would say, within the past ninety days, and I have seen the stove knocked over, which is bolted to the floor with two quarter-inch rods, one on each side of the stove. I have skidded on a cushion the length of the locker, possibly 12 feet, many times, I have been knocked over out of the chair as I sat sideways to the end of the caboose when I am doing my clerical work, and when we have undesired action of the automatic brake, either intentional or unintentional, I am due for a slam if it is at a place that I am not expecting slack action.

Q. Have you yourself experienced or seen any other members of the crew hurt fairly severely without causing them to lose three days?

A. Oh, yes, I have seen them, plenty of them, that have been braking on with me knocked from the cupola to the

floor, but I couldn't give you the dates. If he is able to walk and live, we don't want to report it, because at the end of our run we don't want to be called to the trainmaster's office and grilled for a statement and sacrifice one [fol. 4730] hour or two hours or three hours of our time, we would rather skip it if he is not injured too bad.

Q. Have you seen damage done to the equipment as the result of slack action that didn't amount to $150?

A. Oh, yes.

Q. Was it considerably damaged?

A. Well, I don't know what goes on inside of those cars, but I am satisfied that there must be plenty of damage to the commodity in the car to withstand that shock, the commodity couldn't be braced against such terrific impacts as that.

Q. From your experience, what effect would you say the continual fear of slack action has on the health of trainmen?

Mr. Mason: I object to the question. There has been no showing that this witness has any particular fear of slack action.

The Court: Well, the Court will make the same ruling as heretofore. If the witness will limit it to his own experience, the objection will be overruled.

A. To my own experience, I make several trips——

Mr. Mason: I take it, the question is as to the effect on his health, the question will be understood as limited to [fol. 4731] any effects on his health. It is a pity that we cannot incorporate him in the record as an exhibit, then we would have it answered.

The Court: Go ahead.

A. I have rode these long trains and had different trips and be worked up to such a nervous state that I wasn't even hungry, go to bed without eating.

Q. Now, what is the effect of slack action on equipment? Does it weaken it if it does not break it?

A. It is bound to weaken it, and many times these cars come to us through interchange of other railroads that are, I might say, not condemnable to put them on the rip track to delay the load to make the repair, they are not in that bad a state, but they show signs of being roughly handled.

Mr. Mason: Now, I suggest, if your Honor please, that the witness is in no position to say that the damage done on another railroad is because of slack action or because of contacts while switching one or two cars. Unless he is able to qualify, I object to any further testimony along this line.

The Court: Yes, the objection is sustained.

[fol. 4732] Mr. Polley: Has the length of a train or the number of cars in a train any relation to slack action?

A. Yes, sir.

Q. And what?

A. It is the weight behind that in these run-ins or these run-outs, it is the strain that is placed upon those springs and draft riggings and the severe slack action of shoving in or jerking out is bound to wear the plates that hold this draft gear within the steel beam at the end of the car that carries the coupler, and that was what I intended to say, that some of these cars have more slack action than other cars, because they are worn when they come to us, when we get hold of them, and some of these cars, you take the new car, the new automobile, the new equipment that the company has been buying, there isn't a lot of loose lost slack action in that car, we will say possibly three inches to the drawbar or six inches to the coupler between the two cars would cover it all, but it is these old cars that come to us that have been in service for years that I will say that some of these cars—and I want you to know that I have measured some, and I am here to state that some of these old cars have as much as six inches lost motion in [fol. 4733] the drawbar.

Q. Do your rules require that certain commodities be placed in a particular part of the train?

A. Yes, sir.

Q. Will you just go ahead and explain that, what those rules are?

A. Livestock, we are required to carry all livestock on the head end of the train, and if we have some commodity that is bulky, we will say, like oil well machinery, we always carry that on the head end next to the engine, and anything of a fragile nature that can't take it, is to be carried on the head end. Now, bananas, we carry bananas next to the caboose for the convenience of the banana messenger to regulate the ventilators, he accompanies that

shipment so that the bananas won't be chilled or they will arrive in perfect order.

Q. Now, referring to the rule on livestock, when did this rule go into effect, if you remember?

A. I would say that it was after 1923; it was after we started to pulling the big trains on the east end over there, and I don't recall just what year it was, but after they started pulling big trains, why, they forbid us to put live-[fol. 4734] stock on the rear end of them, they were to be carried next to the engine.

Q. Prior to that time they did carry livestock on the rear end of the train?

A. Yes, sir; we have had wooden underframe stock cars, and any time that any cattle was loaded in the wooden underframe cars, which were many at that time, they would go ahead of the caboose.

Q. Now, are cattle shipments accompanied by a caretaker?

A. Sometimes, and sometimes not.

Q. When they are, where does he ride?

A. In the caboose.

Q. Wouldn't it be more convenient if the cattle cars were placed next to the caboose?

A. It would be more convenient for him, but pretty rough ride for the cattle. They might be knocked down going over these hogbacks from slack action, and I have seen it where one gets knocked down and the next one falls over him, and it isn't but a short time until you have five or six piled up.

Q. Do you have a card in your hand entitled, "Warning To Caretakers and Others?"

A. Yes, sir.

Mr. Polley: We ask that this be marked for identifica-[fol. 4735] tion.

The Court: It may be marked.

The Clerk: Plaintiff's Exhibit No. 326 for identification.

Mr. Polley: And where did you get that?

A. Those cards are nailed up in all cabooses on my district.

Q. Do you know their purpose?

A. They are warning to stockmen and caretakers of any nature, to be careful.

Mr. Polley: We offer the card in evidence.

Mr. Mason: I would like to inquire about it.

Q. You say that this card, Exhibit No. 326 for identification, is in your cabooses?

A. Yes, in all cabooses in the El Paso-Lordsburg District.

Q. This card purports to be issued by the Southern Pacific lines in Texas and Louisiana. You are not employed by them, are you?

A. I am employed by the Southern Pacific.

Q. This card is on the train, whether it consists of thirty cars or forty cars, or any number?

A. It is standard equipment on all cabooses between El Paso and Lordsburg.

Q. Do you know whether it is used in Arizona or not? [fol. 4736] A. I couldn't say that; I haven't been in Arizona since 1927, I think, in freight service.

The Court: I take it that you are now engaged exclusively in the freight service, rather than passenger?

A. Well, I am getting to the age where I am doing a little bit of passenger work too. This November, I will have thirty years.

Q. But the majority of your work is with freight trains?

A. Yes, sir; I have made about six trips, I guess, since the first of the year, to Tucson in passenger service.

The Court: You offer this in evidence?

Mr. Polley: Yes.

Mr. Mason: I take it that counsel will supply us with photostatic copies?

Mr. Polley: Well, the witness testified they are in each caboose.

The Court: Well, it may be admitted in evidence.

Mr. Mason: I object to it; I don't see its materiality. Furthermore, it is not a publication issued by the defendants, it is not an admission against interest of the defendant, I don't see its materiality in any event.

[fol. 4737] The Court: The objection will be overruled. It may be admitted in evidence.

(The document referred to was received in evidence and marked, "Plaintiff's Exhibit No. 326.")

Mr. Polley: Will you take Exhibit 326 and just read it into the record, please?

The Court: It is already in the record. I don't think you need to read it in.

Mr. Mason: If it is read, then we can have the exhibit withdrawn.

The Court: All right, read it into the record then.

The Witness: This is starting with "Warning,"——

Mr. Mason: Couldn't we just have it copied by the reporter. I have seen it.

The Court: May the Court see it?

Mr. Strouss: Let the Court see it. (Hands the card to the Court.)

The Court: Thank you.

(Plaintiff's Exhibit No. 326 reads as follows: "Warning to Caretakers and Others. A freight train may start or stop suddenly at any time. Guard against falling or being thrown over or between cars. Avoid stepping on uncoupling lever as a break in two of train may be caused. Failure in either case may result in your injury or death. [fol. 4738] Southern Pacific Lines In Texas and Louisiana.")

Mr. Polley: In your operations, Mr. Fair, do you come in contact with trespassers upon your trains?

A. Yes, sir.

Q. What do you mean by trespassers?

A. Men, women and children, and babies, riding these trains, these freight trains.

Q. Commonly known as hoboes?

A. Yes, sir, unauthorized passengers.

Q. Do they present any problem to the trainmen?

A. Yes, sir, one of our greatest problems.

Q. Will you go ahead and elaborate on that, please?

Mr. Mason: Can't we proceed by question and answer instead of putting the witness in gear and letting him roll down hill?

Mr. Polley: The witness knows more about this that I do.

Mr. Mason: It places the opposing counsel in an unfair position. We have no opportunity to object to volunteered statements.

The Court: That is true.

Mr. Strouss: He is asked to state what the problems are.

The Court: Counsel said, go ahead and elaborate. Well, [fol. 4739] I will overrule the objection. Go ahead.

Mr. Mason: Perhaps I could have a running objection to all of this on the ground that it is certainly hardly to be contended that the Arizona Train Limit law was enacted for the benefit of trespassers, and that the whole subject is immaterial and irrelevant. Now, if it be relevant as to the safety of trainmen, of course, that may be developed in the course of the testimony, but in so far as it purports to relate to the safety of trespassers, I object to it on the ground it is immaterial and irrelevant.

The Court: Well, I think your objection is good if the purpose of it was to show the danger to these trespassers, but I take it that that is not the only angle of this. Hence, the record may show your running objection and it is overruled. Go ahead.

A. The dangers are to the trainmen employed on these trains when they climb around on these cars and step on cutting levers and board the train and gives that undesired quick stop that we are unable to anticipate and we are off balance, we are off watch, and it is due to the fact that these fellows will get on the train and not sit down and be [fol. 4740] seated and just ride, they are continuously walking around looking for a better place to ride; maybe it is cool and he is trying to get out of the wind or something, and he steps over the train and steps on a cutting lever. Due to the long trains, we cannot get them all bunched and quieted and keep them from running around, and that is the danger of the thing.

Mr. Polley: If you remove them from one part of the train, do they stay off?

A. No, sir, you can't keep them off, they will get back on some place.

Q. Well, as the length of the train increases, what about this problem of handling trespassers?

A. Well, it is just more than we can take care of, and the company doesn't offer us any help through the police department in helping rid the trains of hoboes. We have a rule in the book of rules that we will rid the train of hoboes. We can't. The company realizes that they can't, because they have started it at different times, and they found out they made a failure of it in El Paso, and they just can't keep them off, and they quit trying.

[fol. 4741] Q. Now is it ever necessary for the train crew on the rear end of the train to communicate with the engineer?

A. When you get too far away from him, he cannot see you.

Q. Is it ever necessary that you do pass a signal from the rear end of the train to the engineer?

A. Yes, sir.

Q. Do you have any phone system?

A. No, sir, we have signals that we give him for different things.

Q. Just what are those signals?

A. It could be a back-up signal, a high ball, a proceed signal; it could be call in the flag or whistle out the flag; it could be most anything you want him to do, you can communicate with him.

Q. Just how do you communicate with him?

A. By hand signals or lamp signals.

Q. Let's confine it first to the daytime?

A. It would be with hand signals, with a piece of paper, your hat or a broom or any object that is big enough so he can see you. He couldn't see your bare hand back there, he couldn't recognize any kind of signal you would make with your bare hand. I don't say that he couldn't but I doubt [fol. 4742] very much if he could recognize your signal 70 car lengths away. You take your glove or something that wigwags or waves and make the signal to him so he can see it.

Q. In the daytime that is the only method you have of signalling the engineer from the rear of the train?

A. That is right.

Q. And at night?

A. We have fusees, it makes a red flare or if you are up closer you can give him a lantern signal.

Q. If the signal to stop cannot be seen by the engineer or if he does not respond to it, what does the conductor do?

A. He pulls the air with the conductor's valve, that is opening the air pipe at the rear of the train.

The Court: That makes an emergency application. What I am getting at, can any skill be exercised in the application of that conductor's valve so as to lessen the shock?

A. Sometimes, your Honor, I think I have skill and the next time I don't do so good, but I try to use skill, I do my best to do it but I don't do it according to the rule. It is due [fol. 4743] to the lack of courage on my part that I don't do it according to the rule and I quote you——

Mr. Polley (Interrupting): What rule is that?

A. Rule 16 in the air brake rules and it instructs the conductor, "When there is immediate danger to life or property the valve must be opened suddenly to full extent and left in that position until train stops, then closed," and I have had thirty years' experience and I am afraid to do that. I have never done that.

Q. Why?

A. I can't get propped good enough where this valve is to hold on tight enough as to what might happen and I don't do that and I don't think anyone else ever does.

Q. Is the operation of the conductor's valve a safe operation ordinarily?

A. Ordinarily, yes, sir. I have opened it many and many a time and never been hurt but I don't jerk it open like that rule says.

Q. I don't believe you have completely answered the Court's question. Will you read it back, please?

(The Court's question was read by the reporter as follows: "That makes an emergency application. What I am getting [fol. 4744] at, can any skill be exercised in the application of that conductor's valve so as to lessen the shock?")

A. I would say that the easier that you pull this conductor's valve the less chance of a severe shock.

Mr. Strouss: May I ask the witness a question?

The Court: Yes.

Mr. Strouss:

Q. Mr. Fail, in reading that part of the rule to the court that reads, "When there is immediate danger to life or property the valve must be opened wide," of course you don't mean by that to say that in every instance where it is necessary to stop the train that the rule would require that you open the valve wide?

A. No, and it wouldn't mean there is life in danger every time I pull that conductor's valve either.

Mr. Strouss: This rule continues, "When it is imperative that the train be stopped within a reasonable distance, for example when a hotbox is noted and a stop signal cannot be transmitted to the enginemen, the valve must be opened gradually," under those circumstances you wouldn't be required to open it wide?

A. No.

[fol. 4745] Mr. Strouss: Then I think the answer to the Court's question, I think that is what the question was referring to.

A. My method of opening it would be to open it and let it blow off about ten pounds. Then after I detect and felt I had all brakes of the train in an operative position, then it wouldn't make any difference what I did to it, if I have them all set, but not jerk it wide open.

Mr. Strouss: That is what the Court had in mind?

The Court: Yes.

Mr. Polley:

Q. Have you ever experienced delay at short sidings with long trains?

A. Yes, sir.

Q. How did that delay come about?

A. Well, we have between El Paso and Lordsburg 149 miles westbound and we have one sidetrack—these sidetracks are 108 car sidings, I think, 108 or 110 and they begin at Lanark, Afton, Chappel, Akela, Deming, Mongola, Separ between El Paso and Lordsburg, and if you are not able to make these stations with these long sidings, some are three or four stations apart, and if you cannot go from one long sidetrack to the next then you are held at this first one to meet two, three or four trains. I have met that [fol. 4746] many and more at these long sidetracks. In other words, the dispatcher puts you in the hole, in the clear out of the way and lets the fleet go until things clear up. You get message right along not to saw this passenger train or "don't saw this freight train." By a "saw" I mean you have 100 cars would be in this sidetrack and you have 30 sticking out here at the back end. To meet the passenger train you let him in the pocket, then you pull up and pull those 30 cars into the sidetrack and let that train go. If your head rights won't permit you to continue on the trip and you are to meet somebody else there, then it is necessary to open this switch and back those 30 out again and get the track set for the other fellow to come and get into the pocket and we pull around him and let him go. We have done that with trains in both directions many times.

Q. Does that operation take time?

A. Yes, sir, I would say that the nearest you can do it in would be about six minutes, to clear a train from the

time you flag him at the far end to get him into this pocket, to saw him by, about six minutes.

Mr. Polley: Your witness.

Mr. Mason: I could ask him a lot of questions this after- [fol. 4747] noon but I think it would save time probably if we could postpone the cross-examination until tomorrow morning.

The Court: Very well, you may step aside. Call the next witness.

A. T. Ash was called as a witness in behalf of the plaintiff and being first duly sworn testified as follows:

Direct examination.

By Mr. Polley:

Q. Will you state your name, please?
A. A. T. Ash.
Q. Your address?
A. El Paso.
Q. You are employed by the Southern Pacific?
A. Yes, sir.
Q. In what capacity?
A. Freight conductor.
Q. What has been your experience in railroading?
A. A little over thirty-nine years in train and yard service, the last twenty-eight years practically all in freight service.

[fol. 4748] Q. You have been both a brakeman and a conductor?

A. Yes, sir.
Q. Do you have a regular run as a conductor now?
A. Yes, sir.
Q. How long have you had such run?
A. About a year I guess this particular time, or a good many years—I have been promoted at different intervals—I first had a regular turn over twenty odd years.
Q. Over what territory do you now work?
A. Between El Paso, Texas, and Lordsburg, New Mexico.
Q. Over what territory of the Southern Pacific Company have you worked?

A. I have worked over all their territory between El Paso and Tucson, both lines, with the exception of the Globe branch.

Q. Have you worked west of Tucson?

A. Not in many years. I have worked out of Tucson, between Tucson and Gila, in 1909 but only for a short time. I went in the main yard service here in Tucson.

Q. What length of freight trains have you worked on?

A. All lengths from a few cars and caboose up to 100, 128 [fol. 4749] I believe.

Q. Have you worked on very many trains in excess of 85 cars?

A. Yes, we handle now frequently trains of 100 cars.

Q. Do you work in both passenger and freight service?

A. Yes, sir, I do some extra passenger work.

Q. Have you for some time?

A. Yes, for the last ten or twelve years I have done considerable passenger work.

Q. Are you familiar with the rules of the Southern Pacific Company relative to the duties of trainmen, brakemen and conductors?

A. I am.

Q. Are you required to take examinations on those rules?

A. Yes, sir.

Q. Were you in the courtroom this morning?

A. Yes, sir.

Q. Did you hear Mr. L. A. Fail testify concerning the duties of a freight brakeman?

A. I did.

Q. Can you state whether or not his testimony was true and correct from your experience?

A. Substantially correct insofar as the duties of a freight [fol. 4750] brakeman are concerned.

Q. Did you hear him testify concerning the duties of freight conductors?

A. I did.

Q. Do you know whether or not he correctly detailed those duties?

A. I think he detailed them about as clearly as anyone could.

Q. Did you hear him testify as to the procedure of rebrassing journals?

A. I did.

Q. Was his explanation true and correct as far as you know?

A. Yes, sir, I would say so from the experience I have had with the same type of work.

Q. Did you hear him testify as to the repairing of knuckles on the road?

A. I did.

Q. Was that explanation true and correct?

A. Yes, sir.

Q. What effect does the number of cars have upon the necessity to replace journal brasses?

A. Each car has a certain amount of length, a certain length, and as the cars are added it increases the responsibilities and the difficulties in performing that service.

[fol. 4751] Q. What causes the necessity of replacement of journal brasses?

A. Many things. The principal thing is the lack of lubrication. Friction is what causes hotboxes and when they are properly lubricated you seldom have hot journals.

Q. Is it more difficult to locate and detect hotboxes on long trains than it is on short trains?

A. Yes, sir, the further away the object is from you the harder it is to detect, either by sight or by smelling hot metal or the hot oil, whichever the case may be.

Q. If a hotbox is detected sometimes can it be fixed so it does not result in a bad journal?

A. Oh, yes, if you catch it in time you can often correct it by repacking it, seeing that it is properly lubricated and handle your car into your terminal without brassing it, but if it goes too long and the babbitt is melted down out of your journal bearing, your brass, then there is only one thing to do and that is rebrass the car.

Q. And that takes time?

A. It takes time and effort, yes, sir.

Q. Did you hear Mr. Fail explain how cars are chained together when there is something wrong with the draft gears or knuckles or couplers?

[fol. 4752] A. Yes, sir, I did.

Q. Was that a fair account of that?

A. I think he gave a very fair explicit definition of the procedure in chaining up cars which had damaged draw bars, broken knuckles, and so forth.

Q. Do you agree with his statement as to the method in which freight trains are inspected by train crews?

Mr. Mason: Your Honor, all these questions are very leading. It is simply an adoption of the other man's testimony and it seems if we are going to continue all we need to do with Mr. Ash is to say that he adopts Mr. Fail's testimony on direct and cross-examination and we can excuse him.

The Court: I think counsel had in mind the same thing the Court has, certainly we need not go over the detailed operation with each of these witnesses. It is purely cumulative. I will overrule the objection.

Mr. Mason: My objection is that the questions are highly leading and suggestive. After all, the witness probably has some words of his own which he could use if given the opportunity.

The Court: Read the last question.

(The question was read by the reporter.)

[fol. 4753] The Court: The objection is overruled.

A. I do with one exception. The general inspection of the train, Mr. Fail detailed the objects he is apt to find defective such as the draft gear, brake beams and flanges, and so forth—strike the draft gear, please, that is what he overlooked, I got it in the wrong place—he overlooked the draft gear which is one of the most important things of an inspection of a freight train. There are many things in connection with the draw bar draft gear of a car that can go wrong that cause you untold trouble on these big trains, such as the carrying iron coming down ——

The Court: Are you speaking of the inspection that the trainmen make?

A. Yes, sir, that we make ourselves at inspection points, and I just wanted to have this draw bar gear in the record as being one of the important factors of the procedure; because lots of times the draw bar itself is in place but the iron that holds it up to the belly of the car comes loose and lets it drop down and uncouples you which causes a severe slack action and damage to equipment and creates a hazard for those operating the train.

Mr. Polley:

Q. Have you experienced any difficulty or trouble with [fol. 4754] sticking triple valves?

A. Yes, I have.

Q. Do you have that trouble very often?

A. Not on reasonable trains but long trains often, when the brakes are set and you have trouble in releasing them. One car or two out of 100 will refuse to operate after you get back, you find them on the rear end, after you get back past a certain number of cars.

Q. Is it more difficult to detect a sticking triple on a long train than on a short one?

A. It would depend which end of the train it was on, the further any object is from you the harder it is to detect of course, like a hotbox or smoke from the wheels. If it is close to you, you can see it more readily than you can if it is further from you.

Q. Would it take more time to inspect a 100-car train than it would to inspect a 70-car train?

A. Yes, sir, it takes a certain amount of time to inspect each car; as you add the cars you add the time.

Q. Do you know what slack action is?

A. I know what it is, yes, sir. My years of experience have taught me what slack action is but explaining it in the professional language, I don't know that I can do that. All [fol. 4755] I know is what I have learned by my experience, but slack action as I view it is the slowing up of one portion of the train while the other portion is still traveling at a high rate of speed. For instance, this is a run-in and you get the same slack action when the head end increases and the hind end slows up, you get what we call a run-out. One is equally as bad as the other.

Q. How do the trainmen protect themselves against slack action?

A. We attempt to keep in a position properly braced and holding on to where you can protect yourself against injuries. When that occurs, if you know when it is coming of course a man can protect himself against severe slack action, but if it is unexpected then he is bound to get slammed if he is not prepared against something, whatever is in front of him, whether it be the stove or table or desk or partition, sometimes the end of the caboose.

Q. Have you in your railroading experience ever suffered any injury as a result of slack action?

A. I have suffered injuries and many of them and got marks on me like any other trainman. I have notations of a [fol. 4756] few slack action accidents I have been involved in.

Q. I want first just the slack action accidents in which you suffered an injury?

A. At Rodeo, New Mexico, on September 26, 1926, I was on a train of 70 cars consisting of 40 cars of cattle and 30 P. F. E. refrigerator cars. We pulled into the sidetrack to meet a train and as the stop was made on this sidetrack we had an undesired emergency and at that time I was on the back platform of the caboose and my weight against the handrail across the end of the caboose. The shock was so great that my weight bent that grab iron into the end of the caboose where it had to be straightened out, and killed 65 head of these cattle that we were handling on the hind end of the train at that time contrary to the rule. And I have the mark on my leg yet that shows the blood vessels as they will in your flesh when they are broken.

Q. Have you suffered other injuries as the result of slack action?

A. I was knocked out of the cupola coming into this town, I don't have that date but it is a matter of record in the company's office.

Mr. Mason: Have you the year?

[fol. 4757] A. It was somewhere near this time, it was the same crew I was working with at Rodeo. An undesired emergency of a train of refrigerator cars, it knocked me out of the cupola and as I hit the floor I went over the top of the stove; the other brakeman out of the other side came down and landed right on top of me. It threw the conductor down out of his chair, knocking a couple of teeth out against the end of the car. That was conductor R. A. Powers.

Mr. Polley:

Q. What was the length of that train?

A. That was a 70-car train.

The Court: We will take our mid-afternoon recess at this time.

(Thereupon a short recess was taken, after which proceedings were resumed as follows.)

[fol. 4758] The Court: You may proceed.

Mr. Polley: Mr. Ash, do you know of any other accidents caused by slack action in which trainmen were injured in which you were involved?

The Court: In which he was injured?

Mr. Polley: Other trainmen.

Mr. Mason: Where he was personally present, you mean?

Mr. Polley: Where he was personally present.

A. Yes, I have two that happened coming into the Tucson yard here, where Conductor Preston, when I was a member of the crew and present on September 26, 1926, the train consisting of 70 cars, Conductor W. H. Preston had stepped out on the back end of the caboose to hand off the switch list at the east end of the yard, which is one of the regular routines of his duties; I was just climbing on top of the car ahead of the caboose to set the brakes, the drawbar key worked out of the head car in the train, and gave it enough slack to separate the air hose, which gave us an undesirable emergency and the worst you can get; we were going at a very low rate of speed, possibly six or eight miles an hour, the impact was so great on the rear end, that it threw Conductor Preston's cheek against the corner of the caboose, and [fol. 4759] cut a gash in his cheek that laid him up some 60 days, he didn't return to the crew until some time in November. It severed the nerves in his cheek and he is twitching from that today. I was on top of a Rock Island automobile car, 50 foot car ahead of the caboose. It threw me over on the next car, but I was able to bounce and slide and I fortunately didn't get injured. J. W. Rhodes, the other brakeman, was standing behind the cupola that holds the rail in the cupola and it threw him clear over it, his hold saved him from any severe injuries. However, it did injure the special agent who was riding with us, Mr. Patterson, slammed him, it threw him off the cushion he was lying on against the partition and injured him to some extent, not as bad as Mr. Preston was injured. This shock knocked Conductor Preston unconscious and threw him to the ground. I helped pick him up and put him in the caboose. Now, that train was never really parted, except the train line itself.

Q. Is there a valve in the caboose called the conductor's valve?

A. Yes, sir.

Q. Are you familiar with its operation?

A. I am.

[fol. 4760] Q. When is it used?

A. In an emergency. It is more or less called a conductor's valve, but it is used as a last resort in emergency.

Q. And when it is applied or used, what does that do to the brakes?

A. It sets the brakes the same as the engineman sets them only more severe, you don't have the equipment there to do but one thing, that is to set the brakes, he can set them more gradually than you can. It has practically the same effect as far as slack action is concerned when it is set from the rear as an undesired emergency has setting the brakes from the engine.

Q. Do you know of any incident in which you were present and participated when the conductor's valve was used?

A. Yes.

Q. And one of the enginemen was injured?

A. I do. On September 7, 1925, I pulled the air on a 70-car train by opening the conductor's valve in the caboose backing into the Tucson yard here to keep from running into cars that were being shifted back and forth on the lead, which is across the track we were using, and in doing that the shock was so severe it threw the engineer against the [fol. 4761] back of the cab as he had just looked around for a signal, and knocked five of his teeth out. That was Engineer F. E. Riley.

Mr. Mason: That was in 1925?

A. Yes, sir, September 7th. Of course, those teeth never grew back. The company replaced the man's teeth, that is, they had a bridge put in for him, which was the next best thing to repair the job.

Mr. Polley: Now, as I understand, that is all of the accidents you know of as a result of slack action in the class that were reportable?

A. Those were the ones that I have been personally involved in, yes, sir.

Q. Have you seen other members of the crew knocked around and bruised in the caboose when the accident wasn't reported?

A. Yes, a number of those. Those happen frequently; I have been knocked around myself recently and made no report of it, just healed up this arm now, but I made no report of it, that is the easier way out, the arm gets well, in this case nothing was said about it.

Q. Is that a common practice of trainmen to not report those?

Mr. Mason: I object to that; it is again apparently here [fol. 4762] say.

Mr. Polley: He knows——

The Court: Well, I will sustain the objection. He can speak as to his own experience.

Mr. Polley: Have you ever observed objects in the caboose dislocated as a result of slack action?

A. Yes, sir.

Q. What objects?

A. I have had the stoves uprooted and knocked down, dislocated, stove-pipes knocked down, glass broke out of the caboose from the jar, the door has glass in it, the upper panel, that is often broken out, the windows in the cupola or in the end of the car are broken out from slack action. There is a window broken in my cupola right now, I have it patched with two buttons, one on each side, with a wire through it, couldn't get it fixed, it is that way right now, caboose 658.

Q. Does the possibility of slack action worry you in any way?

A. Well, it is nerve-wracking. You are expecting on these long trains, you are expecting something to happen most any time. I am pretty long-legged, I usually get my legs wrapped around some object to hold while I am doing [fol. 4763] clerical work to keep me from being slipped around. We try to do our clerical work while going upgrade, it is steadier and safer, you don't have the run-ins unless they make a sudden stop for some reason.

Q. Now, you have worked on both long trains and short trains, have you not?

A. I have.

Q. Has the length of the train any relation to slack action?

A. Yes, each car has its own individual slack and as you increase the cars you increase the slack action. It is more severe on a long train than a short train.

Q. Are you familiar with the rule that requires livestock be placed in the front end of the train?

A. I am.

Q. Do you know why that rule is in effect?

A. Well, it is for the safety of the stock; they don't get the slack action up there as they do at the rear end of the train.

Q. What effect does slack action have on a carload of livestock?

A. Well, it knocks them down, they are piled up, injured, killed, as it was in the case that I related a few minutes ago [fol. 4764] at Rodeo, those stock were in the wrong place, they were in the hind end of the train, they had broken backs, broken legs, and horns knocked off.

Q. Do you have other rules concerning the placing of other commodities in the train?

A. Well, there is no set rule, but it is for safety, fragiles that are more liable to break are placed on the head end of the train as much as possible to get away from breaking or damage to the commodity.

Q. Now, you heard Mr. Fail testify as to his problems with trespassers. Has your experience been similar?

A. Very similar, they are an extreme nuisance on these freight trains, they cause lots of trouble by stepping on cut levers and separating your train, which doesn't only create a possibility of someone being injured from the sudden stop, but they cause you serious delays in handling your train over the division.

Q. Are they harder to control and watch on long trains than they are on short trains?

A. Yes, they are; like any other obstacle you have in the operation of trains, the more cars you have the more you have to look after it, and it seems that they can never get [fol. 4765] located on a train, they are always running around looking for a better place to ride to get out of the wind or something.

Q. How are signals passed from the train crew on the rear end of the train to the engineer in the cab?

A. Well, they are relayed from one to another. You have got first to get, I would say, if he is available, the head brakeman in view of the engineer, and the next man in view of him, and yourself or the man at the rear of the train, they relay the signal one to another.

Q. When a train is in motion, are the members of the train crew spread out over the train?

A. Not as a general thing.

Mr. Mason: I take it this all relates to operation in New Mexico where he runs?

The Witness: Anywhere.

Mr. Polley: Where he operates.

Mr. Mason: He says he hasn't been over here in how long, seventeen years?

A. No, I worked over here exclusively up until about 1929.

The Court: Proceed.

The Witness: There was something said about the west end out of here; that is way back.

[fol. 4766] Mr. Mason: I suppose I have that confused. I understood you had been working out of El Paso since about 1927.

A. No.

Mr. Polley: Then it would be necessary for the trainmen on the rear end of the train to attract the attention of the engineer?

A. Yes. Of course, if you are standing——

Q. No, I am limiting my question to a train in motion.

A. In motion you have to attract him in some way, and, if there isn't anyone on the engine looking around, looking back, why, then it is a problem. If the reason for signalling him is important enough, why, as a last resort you would apply the air if you wanted him to stop.

Q. Does the length of the train have any effect upon your ability to signal the enginemen?

A. Yes, it is like any other distance, the further away you are from the engine the more difficult it is to relay and pass signals from where you may be up to the engine.

Q. And I take it, if the signal can't be seen you apply the air?

A. As a last resort, yes, sir.

Q. In New Mexico, have you experienced any delay with [fol. 4767] long trains at short sidings?

A. Yes, with the long trains they arrange for them to stay at sidings that will hold them as a general thing, which does result in very serious delays. I was at Akela, New Mexico, with a hundred-car train some time back—this is a matter of record in the company's records, Engineer Jim Wiley and myself with a message to stay there for several trains that were superior to us, and also Train No. 2, the Sunset Limited. We were at Akela two hours and forty-five minutes before No. 2 left Lordsburg. We stayed at Akela for them, I wouldn't say offhanded just how long we were

there, but some five hours; no place to eat or anything, was one of the sore spots.

Mr. Polley: That is all.

Cross-examination.

By Mr. Mason:

Q. What is your seniority date?
A. August 9, 1912.
Q. As Conductor?
A. No, as brakeman.
Q. What is it as conductor?
A. February 7, 1917.
Q. You have twenty-four years and two months seniority [fol. 4768] as conductor, haven't you?
A. Yes, sir.
Q. And I take it that you seniority extends from Yuma to Tucson, Yuma to El Paso?
A. Yuma to El Paso. I might qualify this: My seniority is on the south line, El Paso to Tucson, and of course, since the merger we have acquired seniority from Tucson to Yuma over the other line.
Q. Were you originally employed by the El Paso and Southwestern?
A. Yes, sir.
Q. Now, does your seniority date of February 7, 1917, give you that date between Yuma and El Paso?
A. On certain jobs after the S. P. men get their protected number of crews, then my date applies.
Q. Does your date apply west between Tucson and Lordsburg as well as west of Tucson to Yuma?
A. Yes, sir, oh, yes.
Q. And your seniority enables you to work between Lordsburg and El Paso in the same way that it would between Tucson and Yuma?
A. Yes, sir.
Q. That is, you get the preference on the Lordsburg-El [fol. 4769] Paso North line route after the protected Southern Pacific employees are taken care of?
A. Yes, sir.
Q. Then, in a practical sense you can elect whether you want to work between Yuma and Gila or between Gila and

Tucson, or between Tucson and Lordsburg, or between Lordsburg and El Paso, can you?

A. Yes, sir, or between El Paso and Douglas, or between Douglas and Tucson.

Q. Could you hold a regular job in freight service between Douglas and Tucson at the present time?

A. Yes, sir.

Q. Or between Lordsburg and Tucson?

A. Yes, sir.

Q. Or in either of the districts between Tucson and Yuma, couldn't you?

A. Yes, sir.

Q. Then there are four short train districts where you could work at the present time, aren't there?

A. Yes.

Q. In addition to that, the district between Tucson and [fol. 4770] Douglas is predominantly a short train district?

A. Yes, to Rodeo.

Q. It is predominantly a short train district in New Mexico as well?

A. They haul 100-car trains to Rodeo, 165 miles, 52 miles in Arizona, it is.

Q. Mr. Ash, it is in evidence here by an actual train count that less than two per cent of the trains operated during four typical months of 1939 between Rodeo and El Paso over the South line consisted of 71 cars or over. You wouldn't disagree with that, would you?

A. Well, I have no way, I have kept no track, but I have worked on and handled many a hundred-car train between El Paso and reduced at Rodeo, took 70 or whatever the case might be, on into Douglas.

Q. Well, do you know whether or not, at the present time, I mean in 1939 and '40, the proportion of long trains, and when I say long trains throughout my questioning I mean trains of 71 cars or more, the proportion of long trains on the district between Rodeo and El Paso is greater than two per cent?

A. Well, I wouldn't question it because I have kept no [fol. 4771] record, but I might add that for the greater proportion of that time they only ran one train each way a day on the local work, and naturally over that 217-mile district they couldn't haul a very long train and make the time and do the work they do, that is true.

Q. Then in a practical sense, Mr. Ash, there are five short train districts out of the six on which you hold seniority where short train operation is either exclusive or at least predominates to the extent of about 98 per cent; that is correct, isn't it?

A. I wouldn't disagree with your percentage, I don't know.

Q. There are four districts out of the six over which you hold seniority where short train operation is compelled by the Arizona law, that is correct, isn't it?

A. That is right.

Q. But you still continue to work between Lordsburg and El Paso on the only district where you will handle long trains to any extent, isn't that so?

A. That is right; I could qualify that. I believe I am entitled to.

Mr. Mason: I am not asking you. If your counsel wants [fol. 4772] to ask you why you do it, they may ask you.

The Court: Your counsel may ask you at the proper time.

Mr. Mason: You are not forced to work between Lordsburg and El Paso, are you?

A. I am forced to work there or leave my home which I have long since established in El Paso, a family and all.

Q. Then you have worked over that district largely for about twelve years; haven't you?

A. Well, between there and Hachita, we cut out Hachita, New Mexico, that was the terminal on my line when I established myself in El Paso.

Q. You established yourself in El Paso in 1929, did you?

A. I did.

Q. And at that time the Arizona law was in effect?

A. Yes, sir.

Q. And at that time there was no limitation of trains in New Mexico?

A. No.

Q. So you voluntarily went to El Paso to work out of El Paso instead of working in Arizona where the short train law was in effect?

A. Yes, sir.

[fol. 4773] Q. Then you voluntarily put yourself in a place where you would undertake long train operation, didn't you?

A. I didn't go down there to work on long trains, I went down there and bid in and was assigned to and worked on the old Drummer Special, it was a mixed train running between El Paso and Douglas. That was my reason for going to El Paso, personal, financial reasons.

Q. You have stayed there ever since?

A. Yes, sir.

Q. In spite of the fact that train lengths in New Mexico have increased, and haven't increased beyond 70 cars at least in Arizona?

A. Yes.

Q. And in spite of these supposed dangers of operation of long trains which beset the employees in the caboose, haven't you?

A. They are not supposed to be dangers.

Q. You have stayed there in spite of these dangers which you have considered real?

A. I have.

Mr. Strouss: May the witness answer the question before counsel interrupts him?

Mr. Mason: When you might have avoided these supposed [fol. 4774] dangers or real dangers by coming to Tucson or Yuma. You could have, couldn't you?

A. By leaving my home and my interests, yes.

Q. As a matter of fact, Mr. Ash, from the safety standpoint and because you prefer to work in New Mexico, the Arizona law doesn't mean anything to you from the standpoint of safety, does it?

A. Yes, it means a lot. It means everything to me.

Q. How does the Arizona law affect you, who continue by preference to work in New Mexico outside of its limitations, how does it afford you any protection?

A. Well, I have got a right to work here, if I wanted to come here I would have the protection of it, but personal reasons, financial reasons that don't immediately appear, that is the reason I have established my home in El Paso. I have my family there, school facilities, and if you please, my daughter is working there, and I am not walking off and leaving that for the sake of working in Arizona.

Q. Mr. Ash, your presence over there in El Paso is purely voluntary and not compelled by anything that the company has done to you, is it?

A. Oh, no.

[fol. 4775] Mr. Strouss: I think that has been asked and answered, if the Court please.

The Court: It has been asked and answered.

Mr. Mason: I just want to emphasize it.

[fol. 4776] Q. As long as you continue voluntarily to stay at El Paso and work between El Paso and Lordsburg or Lordsburg and Douglas, the Arizona law does not afford you any personal protection?

A. It furnishes me a lot of protection if I work into Douglas.

Q. I am not asking you that. As long as you stay over there, it does not afford you any personal protection?

A. You said if I worked to Lordsburg or Douglas and I said if I worked to Douglas it affords me a lot of protection.

Q. How long since you have worked into Douglas in freight?

A. It has been several years—

Q. (Interrupting) You are voluntarily working then—

The Court: Let the witness finish his answer. Were you through, Mr. Ash?

A. I was trying to tell him the condition of operation has changed. We used to move into Douglas, but the run I worked on moved over to the other side and naturally that is the only place that is left for me.

Mr. Mason:

Q. You are working then between El Paso and Lordsburg still when you might work between Tucson and Lords-[fol. 4777] burg or between Tucson and Yuma on either of these districts, leaving out the south line entirely?

A. As stated to you before, sir.

Q. As long as you continue as you have for several years past to work between Lordsburg and El Paso, the Arizona law does not personally afford you any protection, does it?

Mr. Strouss: That has been asked and answered.

The Court: The objection is overruled.

A. I want to stay in the rule but I want to tell you, you can't ask me the question and answer it yourself and get me to agree with you, if that is in order.

The Court: Well, the witness is not expected to argue with the attorney, Mr. Ash. You can answer the question.

A. That is what I was attempting to do when I was shut off.

The Court: There is a question now before you. Read the question and answer that and make any explanation you desire.

A. As I said before, my personal reasons, staying in my home, that is the only job that is left for me without being taken away from my home and as long as I desire to re-[fol. 4778] main there and work I believe that is my personal affair.

Mr. Mason: Your Honor, I submit that is not any answer to the question.

The Court: The question may be answered yes or no and any explanation that you may have may stand. Read the question, Mr. Reporter.

(The question was read by the reporter as follows: "As long as you continue as you have for several years past to work between Lordsburg and El Paso, the Arizona law does not personally afford you any protection, does it?")

A. Not as long as I am working over there, it doesn't, no, sir.

Mr. Mason:

Q. As a matter of fact, the Arizona law does result in the trains being shorter between Lordsburg and El Paso than they otherwise would be, doesn't it?

Mr. Polley: Just a second, we didn't ask the witness anything like that.

The Court: That objection is overruled.

Mr. Strouss: I object to it as calling for a conclusion. I don't know how he would know what brings about the make up of trains over there. That is a matter for the railroads themselves. He takes what they give him.

The Court: That is probably true. I will sustain the [fol. 4779] objection.

Mr. Mason:

Q. Mr. Ash, the trains coming into Lordsburg from the west come in in the size appropriate to the Arizona law, don't they?

A. Yes, 70 cars or less.

Q. When they run eastbound they generally run eastbound through Lordsburg to El Paso without change?

A. In some cases, and there are cases——

Q. (Interrupting) About three out of four cases they do, don't they?

A. I couldn't tell you how many but often they will run five trains in from Lordsburg and three out.

Q. In some cases or many cases that you have yourself seen and handled, they run the trains right through Lordsburg?

A. Right through as they arrive, yes.

Q. You spoke of the westbound train which you said was held at Akela for a possible five hours. That was a 100-car train, was it?

A. Yes, sir.

Q. What was the consist?

A. Refrigerator cars.

Q. Empties?

A. Empties, yes.

[fol. 4780] Q. It was what you call an empty drag, wasn't it?

A. Yes, sir.

Q. You were, inferior on that account to all the other trains on the road, weren't you?

A. Yes, sir.

Q. During the last eight years, and by that I mean the years commencing with January 1, 1933, Mr. Ash, you have not yourself suffered a reportable casualty of any kind, have you?

A. No.

Q. There has been no member of any crew on any freight train on which you were employed who suffered a reportable casualty of any kind, has there?

A. I don't call to mind any just now.

Q. You have had a number of reportable casualties on passenger trains where you were conductor or brakeman?

A. Yes.

Q. And everyone of those passenger trains consisted of 13 cars or less, didn't they?

A. I couldn't tell you the number because I don't have the record but I wouldn't dispute your record on that because I know your record is made up from my reports.

[fol. 4781] Mr. Strouss: I don't want that statement to be taken that we agree with the statement of counsel as to what their records show is a fact. If they want to put their records in evidence, let them do it but we are not going to do it by counsel testifying what they are.

Mr. Mason: If the witness wants to disagree he certainly has that privilege.

Q. Do you recall any accident happening to a passenger train where you were a conductor or member of the crew?

A. Yes.

Q. Involving a train of more than 14 cars?

A. The number of cars I couldn't say because I don't have my record. I recall a woman getting up in the seat at Lordsburg to get her hat, stepped down and sprained her ankle.

Q. When was that?

A. In the last few years, I wouldn't say how long ago it has been.

Q. In the last eight years?

A. Oh, yes.

Q. Was it reported?

A. It was reported.

Q. The train was standing at the time, was it?

A. Yes, standing at Lordsburg station.

[fol. 4782] Q. You don't know how many cars were in the train?

A. No, I don't.

Q. If the train was standing, the length of the train wouldn't have anything to do with the casualty?

A. Nothing whatever.

Q. That is the only casualty you can recall in passenger train operation during the last eight years?

A. No, I recall another one, a woman stepping on a bottle in the club car and sprained her ankle.

Q. Do you know where that was?

A. Somewhere between here and Douglas on the south line, conductor Morrisey.

Q. You were a brakeman at that time?

A. I was the flagman.

Q. Was the train moving at the time?

A. Yes.

Q. That happened in Arizona, did it?

A. If my recollection is right, it seemed to me we reported it at Douglas or called the doctor or something to look after her.

Q. Do you remember the number of the train?

A. 44.

Q. That train, if it was in Arizona, consisted of 14 cars [fol. 4783] or less?

A. Yes.

Q. You have spoken of slack action and you say I think that it consists of either a run-out or run-in?

A. That is where you get your injury or jar, from run-in or run-out.

Q. You say they are both equally bad?

A. Yes, sir.

Q. The jar is about the same in both?

A. Yes.

Q. You get the sudden jar from the run-out of slack when there is an emergency application at the rear end, do you?

A. No, you can get it from an emergency application of the air or the train starting or going over a hump or hog back as we call it, the head end goes over and gives you a jerk, that is what we call a run-out.

Q. That would be a run-out?

A. Yes, sir.

Q. You also can get a run-out of slack I suppose if the air is applied in emergency at the caboose or by the conductor's valve at the caboose when the train is running, can you?

A. If it was bunched, you would get a run-out because [fol. 4784] when you apply the conductor's valve the brakes set on the hind end of the train first and naturally you would get a run-out.

Q. That doesn't give any jar or jerk to any members of the crew in the caboose, does it?

A. It gives them a jerk when the engine goes against that train of cars.

Q. There is no slack action in the caboose as a result of the application of the air in emergency at the conductor's valve, is there?

A. Oh, yes, when that rear end of the train, when the brakes take hold on the rear portion of the train and the

engine runs out you get a run-out, the engine gives you a jerk.

Q. The caboose stops first, doesn't it?

A. That is right?

Q. And the others run away from it?

A. That is right, it jerks the caboose out from under you practically.

Q. Have you had any reportable injury to a member of the crew in the caboose as the result of the use of the conductor's valve that you can recall? I want you to understand what I mean by a reportable injury, in the case of an employee on duty it means an injury which incapacitates him for more than three days in ten days following the [fol. 4785] injury?

A. I don't recall one except the one I related here a while ago with engineer Riley when I knocked his teeth out and I couldn't say how long he was off, but he was off several days.

Q. We have searched our records and we cannot find any record of a reportable injury to engineer Riley, but that, as I recall your stating, was on a 70-car train?

A. Yes, sir, we were backing into the Tucson yard.

Q. Backing in?

A. Yes, before they built the crossover here we used to come down to Tucson, if you are familiar with the Nogales operation, we came in over the Nogales line. The westbound train when it hit this yard was headed east, headed east on the Southern Pacific main and backed in and that is what we were doing at the time.

Q. The conductor's valve was used at what was the head end of the train in direction and motion, you were moving backwards?

A. Yes, we were backing west. Of course the engine was on the east end.

Q. The conductor's valve was used as the caboose was moving westward?

[fol. 4786] A. Moving westward, the slack was stretched.

Q. You say the slack was stretched when the train was backing in?

A. It was bound to be. When I set the brakes on the back end the engine came back against it the same as it goes away.

Q. The other accidents you have told us about, you have told us about a 70-car train which involved an injury to conductor Preston in the Tucson yard?

A. Yes, sir.

Q. You spoke also of an undesired emergency but didn't give us the date or the name of the person injured or the place which occurred in 1926 on a 70-car train?

A. Coming into the Tucson yard, that was south yard junction. We used to go into the south yard.

Q. You don't recall who was hurt?

A. Yes, I said conductor Powers. He had some teeth knocked out.

Q. You have given us now a story of four slack action accidents, three of them in 1926 and one in 1925?

A. That is right.

Q. One at Rodeo in 1926, 70 cars?

A. Yes, sir.

[fol. 4787] Q. One when conductor Powers was injured entering Tucson yard in 1926?

A. Yes, sir.

Q. One when conductor Preston was injured on September 9, 1926, a 70-car train also?

A. That was September 26 Preston was injured.

Q. You mean to say you had an accident at Rodeo on September 26 and also at Tucson on September 26?

A. Wait a minute. The one at Rodeo was in 1925. I believe you have the accident to Preston of record, September 26, 1926.

Q. We have a record that corresponds to yours exactly and it is in evidence here but it shows the date as September 9, 1926?

A. Of Preston?

Q. Yes.

A. O. K., that is the one.

Q. You have four of these. All of them happened on 70-car trains, didn't they?

A. Yes, sir.

Q. And three of them happened in Arizona?

A. Yes.

Q. It is fair to state, isn't it, Mr. Ash, that the 70-car limitation in Arizona did not prevent or ameliorate those accidents?

[fol. 4788] A. No, but I have never agreed with anybody that a 70-car train was not a long train.

Q. That is the limit in the law that you are now attempting to defend, isn't it?

A. That is right.

Q. You don't know whether the injury to conductor Powers was reportable or not?

A. I am sure it was because he was off, I couldn't say how long, he was working in Preston's place when that happened.

Q. Was any member of the crew injured at Rodeo in that accident?

A. Myself but we didn't report it. It was one of those we let go but I still have the mark.

Q. There was no record as a reportable accident?

A. No, there would be no reportable record but the bill for those cattle. They got teams, plows and scrapers to dig trenches to bury them in when we got them unloaded.

Q. I think you said that the matter of sticking triple valves generally took place at or near the rear end of the train. Is that correct?

A. Near the rear. The further away from the engine the less they can control them. They can control them back [fol. 4789] to a certain point but after that——

Q. (Interrupting:) About how far back do they commence to be evident?

A. I don't know how far the Westinghouse people claim they can control them now.

Q. I am asking as to your experience. About how far back do these sticking triple valves begin to show up?

A. It starts back about fifty; that is the line of demarcation I think.

Q. And from then on back to the caboose?

A. Yes, sir.

Q. Would you say about the sixtieth car is where they begin to show up mostly?

A. They vary, not always, but it is in the rear portion.

Q. The nearer to the rear end I suppose in a long train the worse the condition?

A. The longer the train the worse the condition.

Q. And the condition is worse on the rear end rather as the train gets longer, that is, it is worse on the 90th car in a 90-car train than it is on the 70th car in a 70-car train?

A. Sure.

Q. Of course the nearer the rear end it is the nearer it is to the caboose?

[fol. 4790] A. That is right.

Q. And the easier for the men in the caboose to detect it?

A. We detect them back there but the trouble comes in getting it stopped.

Q. That leads me to a discussion of the matter of passing signals. When the train is stopped, Mr. Ash, do you have to pass signals then?

A. If you want to move your train you do.

Q. There are three signals that you generally give when the train stops, aren't there, one is a proceed signal, isn't it?

A. Yes.

Q. The second is possibly a back-up signal if you want to back up?

A. Yes.

Q. Is there any other?

A. If you want him to stop.

Q. He is already standing. I am talking about the signals you give when the train is standing.

A. If you want him to back up or proceed.

Q. Those are the only two that you give him when he is standing?

A. You give him a signal——

Q. (Interrupting:) Suppose that your engineer doesn't see or understand your proceed signal and the train is [fol. 4791] standing. Suppose he doesn't see or understand it, does anything happen?

A. No, nothing happens. You will have to——

Q. (Interrupting:) Nothing happens except you have to go forward to a point where you can give the signal and have it understood?

A. Nothing happens except the delay.

Q. There is no hazard involved, is there?

A. Ordinarily not.

Q. And the same way if the back-up signal is not s or understood, all you have to do is to see that it is understood. So nothing happens except delay?

A. Nothing happens while you are standing, no.

Q. If the train is moving, proceeding, is there any signal you have to give other than the stop signal?

A. To get him to stop.

Q. Is there any other signal you would give while the train is moving other than the stop signal?

A. No, not if that is what you wanted.

Q. You would not give him the proceed signal if he is already going?

A. Not if you want him to stop.

Q. You wouldn't give him the back-up signal?

[fol. 4792] A. No.

Q. So the stop signal is the only signal that you use when the train is moving, isn't it?

A. It depends on the condition. If you want him to stop, the stop signal is the one you would give him.

Q. If an emergency is present where you think hazard may be involved, the stop signal is the only one you use, isn't it?

A. Yes.

Q. If the stop signal is not understood, then you pull the air in the caboose, don't you?

A. Yes.

Q. I think you told me that there is no hazard involved to the men in the caboose because of the stop caused by pulling the air in the caboose?

A. No, I didn't tell you that.

Q. Have you any case of any injury or death of any person or member of your crew caused by pulling the air in the caboose?

A. No, because——

Q. (Interrupting:) The only instance you can tell us about, an injury caused by pulling the air in the caboose is an unreported injury to an engineer?

A. I wouldn't say it was an unreported injury.

[fol. 4793] Q. It is an injury that you remember to an engineer?

A. It is an injury that I remember to the engineer and it is an injury that I know this company remedied by replacing the teeth and they are not replacing any teeth unless there is a report.

Q. Was there a casualty sufficient to incapacitate this engineer from the performing of his ordinary duties for more than three days?

A. I couldn't say that, I haven't got the record on that but I know it was reported because I made the report.

Q. You know it was reported to the Arizona Commission or the Interstate Commerce Commission?

A. It was reported to the railroad officials; whether they reported it to the Commission or not I don't know.

Q. You don't know how serious the injury was insofar as the performance of duty by the engineer was concerned?

A. With five teeth knocked out I am sure he was laid by and his mouth was pretty badly skinned and bruised.

The Court: Mr. Ash, the point counsel is getting at and what the Court would like to ask you, when you apply your [fol. 4794] conductor's valve the danger then, the hazard is to the engineer and the parties ahead, possibly the swing brakeman or the engineer and fireman and not to the occupants of the caboose?

A. Your Honor, if you are moving forward and your slack is bunched on your train and you apply the air from your caboose, you get a severe run-out of that engine which practically jerks the caboose out from under you and that is what I meant about the injury to an employee, a possible injury to an employee in the caboose when you pull the air.

Mr. Mason:

Q. You cannot tell us of any case that you know of where an employee in the caboose has been injured because of the run-out of the slack after the application of the air in the caboose?

A. I have pulled the air very few times.

Q. Then it is a situation that arises relatively infrequently when you feel compelled to pull the air, is it?

A. I will take an awful chance before I will touch the air on a 100 car train. To avoid a serious accident or damage is about the only reason you would pull the air.

Q. Do I understand you to say when you do pull the air [fol. 4795] in the caboose it results in a severe jar at the head end of the train if the slack is bunched?

A. If the slack is bunched, he jerks the caboose out from under you.

Q. Is there a jar at the head end as well?

A. Yes, he will feel it.

Q. I understand you to say that the jar is as severe as if the air was applied at the head end?

A. Yes.

Q. Can you find anything in the rule book as to the placement of livestock at the head end of the train?

A. No, sir.

Q. As a matter of fact, it is permissible to place live-stock at any point in the train that the drover or caretaker handling it desires?

A. You can place them on the hind end of the train if the caretaker assumes the responsibility and you have to start and make notations on your stop report that they were placed in the rear of the train by request of the caretaker.

The Court: By reason of the fact that these cattle must be fed at stated intervals, would require them either being placed at the front of the train or the rear so that they [fol. 4796] could be readily switched on your sidetrack, wouldn't it?

A. Yes, sir, and I might state, your Honor, at Lordsburg where I handle the cattle we come into Lordsburg and that train comes to a rest in the train yard, the rear end of the train is right opposite the stock chute. The caboose will stop—here are tracks 1, 2, and 3—and the stock chute is just in the clear on track 4. It is just as square across as you are from me now. However, we must handle that stock on the head end of the train. The same thing applies at Tucson. The stock comes in here from the east, the greater portion of it is handled west. The westbound trains stop in the Tucson yard and the rear end of that train is right up at the stock yard but the stock must be handled at the head end of the train.

Mr. Mason:

Q. While the rear end of the train stops opposite the stock chute at Lordsburg, it is across three or four tracks, isn't it?

A. There are only four tracks there.

Q. You couldn't handle this stock direct across these three or four tracks without blocking the tracks, could you?

A. I never attempted to convey that that was the thought.

Q. Isn't it a fact that the stock are placed on the head end [fol. 4797] particularly entering Lordsburg because the engine can handle them without breaking up the rest of the train and taking them to the stock chute immediately?

A. No.

Q. It is a fact that the engine can do so?

A. It can do it, but what I was trying to convey to the judge was that if they were in front of that caboose, that

caboose is changed at Lordsburg, that is the first move it makes ordinarily, it comes around and takes that caboose off and then spots the stock.

Q. They can do it just as readily from the head end without disturbing the caboose, couldn't they?

A. They could, but they would be delaying the train. The first move is change the caboose, that is the regular routine work. We change the caboose and then unload the stock.

The Court: Does the engine that pulls you in do this switching?

A. Yes, sir. There is no yard force there and the incoming crew from El Paso do the Lordsburg switching and ninety times out of every one hundred when you go in there with stock you bring your train in the yard, reach up [fol. 4798] and get the outgoing caboose with your road engine, holding on to your stock which they unload there, which lots of them do, and you go to the rear end of your own train, take off your caboose, put the Tucson caboose on there and then unload your stock, whereas if it was safe to handle them on the rear end of the train it would be a much quicker operation in Lordsburg by having them back there.

Mr. Mason:

Q. I understand you to say that trespassers present a greater hazard to you on long trains than on short ones?

A. Yes, sir, they have more cars to run over and play on, choose from.

[fol. 4799] Q. Now, you don't say that you have any more trespassers on a long train than on a short train?

A. I didn't infer that at all.

Q. It is just that they have a longer playground?

A. That is right, more chances to cause you trouble.

The Court: How often does that happen that a trespasser, a hobo would actually cause the break-in-two of your train, in your experience?

A. From my experience, it would happen to a crew once or twice a month. Climbing on and off the cars, your Honor, the stirrup in the ladder of the car is on the side, you see, of the car, as you know. There is also a ladder on the end of the car, and right under that end of the ladder is the operating lever that pulls the pin that separates your

train, and they will step on that, you know, in either climbing up or down, not knowing in many cases what they are doing.

Mr. Mason: Now, Mr. Ash, when they step on the cutting lever that causes a break-in-two?

A. Yes, sir.

Q. You are required to report all break-in-twos?

[fol. 4800] A. That is not reported, it causes no damage to your train.

Q. Won't it set the air?

A. Sets the air, yes.

Q. Doesn't it break off the air hose?

A. No, they separate, they are fastened in a way when they are stretched out they will pull off an air hose, but a general thing, it doesn't.

Q. It also causes hazard to the crew?

A. Why, sure.

Q. Now, have you in the last eight years had any reportable injury to yourself or any member of your crew caused by slack action resulting from a break-in-two where a trespasser stepped on a cutting lever?

A. No, I haven't; I have been one of the lucky ones.

Q. It hasn't happened to any one of your trains to cause anyone injury?

A. No.

Q. Now, Mr. Ash, if you have, let us say, a thousand cars at Lordsburg, coming into Lordsburg that have to be moved to El Paso, and you move those thousand cars in fifty-car trains, you will have twenty such trains, won't you?

A. Yes.

[fol. 4801] Q. And you will have twenty crews, twenty conductors, won't you?

A. Yes.

Q. And forty brakemen or more?

A. That is right.

Q. And they will be exposed to this hazard, such as it is, of break-in-two and injury from the action of the trespassers, won't they?

A. The result of a break-in-two on a 50-car train is just half what it is on a hundred.

Q. Well, let us say on a 70-car train, the only slack action accidents you have told us about were on 70-car trains, and you told us about four of them, let us move our

thousand cars then in 70-car trains, you will have fourteen of them, with twenty cars left over, is that right?

A. That is right.

Q. You will have fourteen conductors and forty-two brakemen, fifty-six men exposed, won't you?

A. You would have twenty-eight brakemen.

Q. You would have only two brakemen?

A. Yes.

Q. Don't you have three brakemen on some of your trains in New Mexico?

A. After it goes over seventy.

[fol. 4802] Q. Then, with some of your trains at least, you would have to move that thousand cars in more than seventy car trains, wouldn't you, you would have twenty cars left over otherwise, at Lordsburg?

A. Yes.

Q. You have three brakemen when you have more than seventy cars?

A. More than seventy cars.

Q. You would either have fifteen conductors or thirty brakemen, forty-five men exposed, or you would have seventy-one car trains and an increased number of brakemen to move the thousand cars?

A. Yes.

Q. Now, if you move that in trains of, well, let us say, 125 cars, you would have eight such trains, wouldn't you?

A. Yes.

Q. You would have eight conductors and sixteen brakemen exposed?

A. Yes.

Q. Twenty-four men. If you don't have any more trespassers on long trains than you do on short ones, your danger, so far as the men are concerned, is the danger of the [fol. 4803] exposure to this possible casualty, isn't it?

A. That is where the danger comes, but——

Q. And where you move——

Mr. Strouss: Let the witness answer.

Mr. Mason: He answered my question.

The Court: No, if he wants to make an explanation there he may.

The Witness: The danger comes, but when you increase your train lengths, you increase the possibility of the cutting in two, because they are continually moving around,

they never get set, or as we say, "stay put," they are looking for a better place to ride, they are uncomfortable. In other words, we are not furnishing them as good service as they are looking for.

Mr. Mason: Then you will still agree with me, will you not, Mr. Ash, that if you move those thousand cars in seventy-car trains, you will have exposed 42 men, and if you move them in 125-car trains, you will expose only 24.

A. The number is correct, yes.

The Court: When you have a straight train of boxcars, where do your trespassers, your hoboes, ride?

A. Well, if they are closed cars, sealed, they will ride on top or in between, any place they can get. You often [fol. 4804] find them standing on the drawbars between the cars trying to get out of the wind.

Q. They don't ride the rods any more?

A. They are steel structures, there are no more rods. You do find them on the brake beams. I have found them on the brake beams and on the truck frames of passenger trains. I have even found them, hoboes, Judge, underneath the pilot and under the old coweatchers. There are slats under, two slats not over four inches wide, I found a hobo in under there riding.

Mr. Strouss: It is seventeen minutes after four.

The Court: The court will be at recess until ten o'clock tomorrow morning.

(Thereupon the court stood at recess until April 16, 1941, at ten o'clock A. M.)

[fol. 4805] 10 A. M., April 16, 1941

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed with the cross-examination of Mr. Ash.

A. T. Ash resumed the witness stand.

Cross-examination.

By Mr. Mason:

Q. Mr. Ash, you worked pretty steadily during the year 1940, didn't you?

A. Yes, fairly. I was off on one vacation and the rest of the time just occasional trips I was off.

Q. According to the notation I have, you made 164 trips as conductor and 57 as brakeman. Would that about agree with your recollection?

A. I wouldn't dispute that at all. I know I worked in both services.

Mr. Strouss: Are you talking about freight service?

Mr. Mason: Both freight and passenger. I was going to mention that now.

Q. In passenger service you made 48 trips as a brakeman [fol. 4806] and 22 as conductor according to my record?

A. I presume that is correct.

Q. In freight service, 140 trips as conductor and 6 as brakeman, is that right?

A. That would be about right.

Q. In addition to that the balance was either dead-head trips, three of those, or in work train service?

A. Yes, sir.

Q. You spoke yesterday of the work of replacing journal brasses. Do you recall having had to replace any journal brasses on any trains on which you were conductor in 1940?

A. I don't have that record with me, in fact we don't keep a record of that. I would have to state that by memory.

Q. You make a notation on your time return and delay report, don't you?

A. On the delay report you show so much delay replacing journal brass or whatever the case might be.

Q. That would be a delay as you said yesterday—perhaps you didn't say it, but I think it was indicated—that it would be a delay of at least thirty minutes?

[fol. 4807] A. Well, you would be awful lucky to brass a car in thirty minutes, they would have to be very favorable conditions.

Q. You don't recall having rebrassed any journals last year at all?

A. I couldn't say at this time because I don't have those records with me but I have rebrassed many, many journals.

Q. According to my memorandum taken from your time return and delay reports you had two such occasions during the year 1940, one at Gage on October 24th?

A. I recall that.

Q. That was a 44-car train, wasn't it?

A. I don't remember the train.

Q. The job was done at a station, wasn't it.

A. Yes.

Q. And the other, and the only other, according to the notation on your time return and delay reports, was on November 13, 1940, at Deming?

A. Yes, sir.

Q. In train 982?

A. Yes, that was a car I picked up there.

Q. Your train was a 43-car train?

A. It was a small train, I recall that.

Q. Do you recall now any other occasion during the year [fol. 4808] 1940 on any other train long or short?

A. I do not particularly.

Q. You said I think in your testimony that the principal reason for the replacement of journal brasses is lack of lubrication resulting in friction and in hotboxes?

A. Yes.

Q. That lack of lubrication is associated with the car itself, isn't it?

A. If the car is properly lubricated, it don't develop hotboxes.

Q. The cars are individually lubricated; aren't they?

A. Oh, yes, each box is.

Q. Whether or not they are lubricated has nothing to do with the length of the train in which they are being hauled?

A. No, the only thing the length of the train has to do with it is to increase the percentage of boxes.

Q. Would it increase the percentage of merely the number?

A. The number, the percentage, each car has eight boxes.

Q. Will there be more hotboxes per hundred cars run if those cars are run in hundred-car trains or in fifty-car [fol. 4809] trains?

A. There would be more because the slack action of the train, the jolts and run-in and run-out often develop hotboxes by the jar that causes the brass to grab the waste and drag it under the brass.

Q. Then it is your contention that the run-in and run-out of slack may affect the lubrication in the individual car?

A. It would affect it to the extent of grabbing the packing that is in the box, we find that. That is a well-known fact and the jar of the car is what causes that.

Q. You have handled a good many long trains during 1940, haven't you?

A. Yes, I handled my share of them.

Q. How do you explain the fact that the only replacements of journal brasses that you had during that year were on trains of less than 50 cars?

A. The fact in those particular cases was the lack of lubrication and the car at Deming was handled in a long train and set out there from a long train and we came along with a short one and picked her up and repaired it and took the car to El Paso.

Q. How do you know that this car that you rebrassed at [fol. 4810] Deming was handled in a long train?

A. We made the inquiry, they found that hotbox at Mongola, a distance about 16 miles west of Deming, and brought it down there and set it out to save delay and so forth, being unhandy to brass. I don't know what all the reasons were but it was a very important load and they had them set it out to get that train going.

Q. Was it an eastbound train?

A. Yes, sir.

Q. You don't know how many cars there were?

A. No, I don't. It was conductor Early on whatever train it was.

Q. You don't know whether or not it had more than 70 cars when the hotbox developed?

A. It was quite a long ways, of course I didn't see the train.

Mr. Mason: I should say, for the information of the court, that we have here in the courtroom the time returns and delay reports rendered by Mr. Ash as conductor during the year 1940 and if opposing counsel desire to examine them they are here for examination. I have a memorandum made from them but I have not produced them because it is unhandy to do so, that is in the individual cases I mean. [fol. 4811] Q. Now, can you give us any instances to illustrate your statement that you have more rebrassing of journals to perform on long trains than on short trains?

A. My experience, as I said before, you increase the number of journals as you increase your cars which, naturally, increases the possibility of hotboxes. However, the long trains are often handled, are made up of empty cars, a hundred empty refrigerator cars is the normal

hundred-car trains handled over the district. However, east-bound they do handle hundred-car trains which are often made up of both loads and empties.

Q. Now, does the loading of the car have anything to do with the possibility of developing a hotbox?

A. Why, sure, the weight of the car creates—increases the friction of the journal.

Q. And that again is a characteristic of the individual car, regardless of the length of the train?

A. Yes.

Q. You don't increase the load in any particular car because it is handled in a hundred-car train, do you?

A. No, if a car weighs 100,000 pounds, if it is handled [fol. 4812] alone it weighs 100,000 pounds, or if it is handled in another train.

Q. So far as the weight of the load and the car body is concerned, why, that factor in creating hotboxes is independent of train lengths then?

A. With the exception of slack action, which causes waste grabbing, and that will develop a hotbox or hot journal as quick as any other thing because this waste goes in under that brass, it immediately starts friction that melts the babbitt and causes a hot journal.

Q. You have no instances, as I understand you, specific instances that you can give us where you have rebrassed cars on long trains more frequently than on short trains?

A. No, as I said before, the long trains are principally made up of empty cars.

Q. And the empty cars don't develop hotboxes as readily?

A. Not as readily. However, I had one car not long ago that another man set out of a hundred-car train that was an empty car—in fact, he set two cars out of that train, set one out at Strauss with hotboxes, he set another out at Deming with hotboxes, and that car at Deming, while I was there I put it away for him.

[fol. 4813] Q. When was it?

A. In the last month or six weeks.

Q. You spoke of having had to chain cars; when was the last time that you have had to chain a car?

A. Well, I couldn't tell you any particular date, but I did not so long ago have to switch one out, I got it behind the caboose, that was the easy way. In fact, there was another train came in behind me that switched the car to the rear for me.

Q. Did that happen during 1940?

A. Yes, it was a few months ago.

Q. April 23, 1940? At Luxor?

A. At Luxor, that was it.

Q. A 69-car train?

A. Whatever it was, I don't have that record.

Q. I understood you to say that in your standing inspections you and your crew undertake to inspect the draft gear?

A. Everything that is movable or breakable about the car.

Q. How do you manage to inspect the draft gears?

A. By walking alongside of the train, looking them over, and after that is done the normal procedure would be to [fol. 4814] pull the train by us at a speed not to exceed eight miles an hour, and we would look them over to see if we can determine anything being wrong.

Q. What do you mean by the draft gear?

A. The drawbar that pulls the car couplers.

Q. Is the coupler and the coupler shank part of the draft gear?

A. Yes.

Q. What you really mean, I take it, is the draft rigging at the end of the car which is exposed to vision?

A. What I really mean is the entire drawbar and everything pertaining to the drawbar that holds it to the car that hauls the car.

Q. Are you familiar with that part of the mechanism on the end of the car by which the drawbar is attached to the car body?

A. Yes.

Q. Do you know what that appliance is called?

A. The A. C. key?

Q. No, I mean the entire appliance which attaches the coupler shank to the car body.

A. Well, there are different types of it. It used to be called a yoke, but I think the yoke is about all gone, we have the drawbar keys that fasten them.

[fol. 4815] Q. Does the drawbar key fasten the coupler shank to the car body?

A. Yes; the center sills of the car are upright under the car and the drawbar fits in between, has a slot through the drawbar and through those sills, and this big key goes

through there, and it also has keys in it. I have had occasions where those worked out.

Q. Where the key worked out?

A. Where the key worked out, and the car set out or repaired. I can recall one since you have mentioned it at Mongola, where one worked out and we were able to repair it. We found the key that was lost, we had some help, there was an extra gang working there; we put the drawbar back in the car, replaced the key and used a track spike to hold the key in place. I can't state just when that was, but it has been since I have been working on the El Paso-Lordsburg district.

Q. It was prior to March, 1932, wasn't it?

A. 1932? No.

Q. It wasn't during the year 1940, was it?

A. Well, it wouldn't miss it much. Time is flying pretty fast nowadays, it seem like, but it hasn't been so long ago.

Q. Now, Mr. Ash, you say that the coupler shank is at-
[fol. 4816] tached direct to the car body by means of this yoke?

A. No, this drawbar key to the sill, and then this carrying iron that holds it up in place.

Q. Now, Mr. Ash, isn't there a device to which the coupler shank is actually attached called the draftgear?

A. Yes.

Q. So that the coupler shank is not attached directly to the sills, is it? It is attached to the draft gear by means of the key that you spoke of?

A. Those that have the draft gear.

Q. Is there any car that you have ever seen in the last twenty years that doesn't have a draft gear on each end?

A. No, but still this draw bar which is attached to the draft gear and springs and follow plates, as they were called, are fastened to the car in order to haul the car.

Q. You are not familiar with the present type of friction draft gear in use on these cars?

A. I handle them every day.

Q. Have you ever seen one?

A. Yes.

Q. Have you ever seen the interior of the draft gear?

[fol. 4817] A. Oh, yes. So far as the mechanical terms for them, I might not pick those up.

Q. You referred to springs in there. Is it your understanding that the drawbar or coupler shank is attached to the car body through a series of springs?

A. No, there is no more springs.

Q. There are no springs in the draft gear nowadays, are there?

A. That is one thing that makes them so severe in slack action.

Q. There are no springs in the draft gear, is that your idea?

A. No, there are some springs left.

Q. But the type of draft gear on the newer cars, Mr. Ash——

Mr. Strouss: If the Court please, he wasn't examined on the matter of construction of draft gears. I think this is improper cross-examination.

The Court: No, the objection is overruled.

Mr. Strouss: He has never qualified himself as knowing what the construction is. He has testified only to the operation.

Mr. Mason: He said he could see them. I know he couldn't see the draft gear.

[fol. 4818] Mr. Strouss: He said that on cross-examination.

Mr. Mason: He volunteered it on his direct.

The Court: That is my recollection. The Court will adhere to its ruling. Objection overruled.

Mr. Mason: Now, isn't this true, Mr. Ash, that you cannot inspect the appliance known as the draft gear, by which the coupler shank is attached to the car body, because the draft gear is enclosed and underneath the car body inside the draft yoke?

A. That is true with some types of cars, but not all types of cars. I can take you down here in the yard and show you plenty. If you come down and look at them, I would do that.

Q. In order to inspect the draft gear itself, you have to get in between the rails and underneath the car and look upward, don't you?

A. Yes.

Q. And even then you can see very little of the draft gear?

A. Well, it will depend on your eyes.

Q. It is enclosed, is it not?

A. The later type is enclosed, but the older types are not.

[fol. 4819] Q. Do you know whether or not there are in addition to the springs you mentioned, friction members in there for the purpose of absorbing the push and pull?

A. In the older type cars.

Q. There are friction members on the older type?

A. Yes, sir.

Q. But not on the new type?

A. No, sir.

Q. What you mean by a standing inspection, when you say you rolled the train by at eight miles an hour or less, is the inspection of the coupler and the coupler shank back to the point where the key is inserted, and the knuckle, is it not?

A. Everything that is movable or breakable about the car, we attempt to inspect it to the best of our ability.

Q. But that includes those things which are visible as you walk along or stand at the side?

A. But if there was something inside out of place, then your drawbar is out of place, and that is the way you detect the defect, if there is any.

Q. As a matter of fact, Mr. Ash, so far as the appliance known as the draft gear itself is concerned, you rarely, if [fol. 4820] ever, have a reportable defect in a draft gear, do you?

A. The later type of cars, they are pretty solid. No, we don't have an every-day occurrence. The later type is larger, harder to break; less parts to break, but they still are more solid. We call them "hard drawbars." They create a lot of friction. I have been riding a caboose for quite a while that has one of those hard drawbars. I have it now, caboose No. 427.

[fol. 4821] Q. This carrier iron that you speak of, that is not really a part of the draft gear, is it?

A. It holds it in place.

Q. It holds the coupler shank in place, doesn't it?

A. If the carrier iron comes loose, then your coupler comes down.

Q. It doesn't hold the draft gear in place, does it?

A. It is attached.

Q. The draft gear is bolted to the car, isn't it?

A. Yes.

Q. Let's understand each other. When I speak of the draft gear I mean the appliance to which the coupler shank is attached. Do you mean anything different?

A. I mean the carrier iron is underneath the draw-bar shank that holds the draw bar up in proper place and it is either riveted or bolted to the sills of the car, the center sills to which the entire mechanism is attached.

Q. Mr. Ash, what is your place on the consolidated seniority list of the Tucson district between Yuma and El Paso as conductor?

A. I don't understand just what you mean by "place." [fol. 4822] We are listed in seniority order and each one has a number. That number now is around eighty if that is what you mean.

Q. Yes, that is what I mean. Are there any men senior to you working in freight service out of Tucson or Yuma?

A. Plenty of them, yes, there are men on each district senior to me.

Q. The value of seniority is that it enables you to place yourself in the position you desire if that position is held by a man who is your junior?

A. Yes, we get those positions by bid.

Q. I take it that you don't want to leave El Paso?

Mr. Polley: Your Honor, I submit that was asked and answered yesterday, we have gone through this from one end to the other.

The Court: It was asked him yesterday.

Mr. Mason: I don't think this was asked him yesterday.

The Court: I will overrule the objection, you may answer.

A. No, as I told you yesterday, my personal interest is in El Paso, my home is there and the climatic conditions [fol. 4823] are more favorable to me at El Paso than they are at either Tucson or Yuma and it is my personal reasons that I stay there.

Mr. Mason:

Q. If one of these men who is your senior at either Tucson or Yuma desired your position at El Paso, he could displace you, could he?

A. He could if he lost his position.

Q. You spoke yesterday of a delay which you incurred while making a succession of meets at Akela?

A. Yes.

Q. As a matter of fact, there is a delay to at least one train whenever you make a meet?

A. That is right.

Q. One train or the other must head in and generally wait a little while until the other train goes by?

A. That is correct.

Q. The more meets you have the more delays will follow?

A. Yes, sir.

Q. In an eastward run from Lordsburg to El Paso, Mr. Ash, do you generally have rights over westward trains?

A. No, the westward movement is superior in the direction of trains of the same class.

Q. You would have rights over the westward drag?

[fol. 4824] A. We would have the right he gave you by train order.

Q. As a general thing when you are handling an eastward train with fruit blocks in it, are you given any superiority by train order?

A. There are times you are but there are times you are not. There are times you go in the sidetrack with those fruit blocks for the westward movements.

Q. Particularly for what kind? The westward manifest?

A. Yes.

Q. When you have the westward manifest freight El Paso to Lordsburg, you have generally, then, right of way over everything but passenger trains?

A. Yes, sir, you are given that by the timetable rights if you are running on schedule.

Q. When you have a westward manifest train, then you don't generally need to stop for any meets except passenger train meets, do you?

A. Ordinarily that is the procedure.

Q. You do also have to stop at times to take water?

A. Yes, you have to stop for water and your inspection points.

Q. You run 60 miles between inspection points?

[fol. 4825] A. Yes.

Q. Do you combine a water stop westward from El Paso with an inspection stop at any point within that 60 miles?

A. When we can, for instance, if we take water at Strauss we make our inspection there and if we have another stop between there and Deming, lots of times at Akela, we can combine the water stop with an inspection.

Q. Do you then make another inspection stop between Deming and Lordsburg?

A. Not if we stop at Deming.

Q. Do you generally stop at Deming?

A. Yes, it is very seldom that you are able to run Deming; it has been done a few times.

Q. That is almost invariably a stop?

A. Yes.

Q. I take it that your reason for trying to combine a water and inspection stop is to make as few stops as possible?

A. That is the general thought of operation, to keep going and make as few stops as possible.

Q. It is always desirable to make as few stops as possible, isn't it?

A. Oh, yes.

Q. About how long does it take you to make this westward [fol. 4826] trip from El Paso to Lordsburg with a manifest?

A. From El Paso to Lordsburg it varies, I have made it in five hours up to eight hours.

Q. Would five and a half or six hours or six and a half hours represent a fair average for that westward trip?

A. From my own experience I wouldn't say that anything less than six would be an average. I have no way of showing that unless I checked it over.

Q. Eastward do you make about the same time?

A. No, it is a longer trip. I think I was 10 hours and 45 minutes on my last trip east.

Q. That is rather a long time, isn't it?

A. We had some considerable delay. I am not sure that that is correct, but there was one trip recently that I recall that I was 10 hours and 45 minutes on duty.

Q. In your direct examination yesterday, Mr. Ash, you were asked if you knew what slack action was.

Mr. Polley: What page is that, Mr. Mason?

Mr. Mason: 4754. In the first place, there is such a thing as slack, is there not?

A. Sure.

[fol. 4827] Q. That is always present in every freight car, isn't it?

A. Yes, sir.

Q. Whether the car is standing or moving?
A. Yes, sir.
Q. It is necessarily built there, isn't it?
A. Yes, sir.
Q. Slack action takes place only when a train is moving?
A. In motion.
Q. It would be correct, would it not, to say that slack action is the effect of the slack in the train as may be produced by the motion of the train and the various factors attending the motion of the train?
A. The slack, as I said, each individual car has got its own amount of slack whatever the case may be, and it is developed by the movement of the train. If the train is standing, of course there is no slack action because the car is not in motion.
Q. It is only when the train starts to move or is in motion and various incidents occur that slack action develops, is that correct?
A. Yes.
Q. I am not trying to trick you into anything here nor [fol. 4828] am I trying to put words in your mouth?
A. I would never suspect that anyway.

Mr. Mason: Well, I am not entirely free of having tried to do that with some witnesses but I know better than to try to do it with you.

Q. Among the incidents which may cause slack action to be developed as you explained yesterday is where the train passes over a pinnacle or hump in the track?
A. That is one of them.
Q. Or where the train descends into a sag or hollow?
A. That is another.
Q. There will be, as the train passes along, a run-in followed perhaps by a run-out?
A. Yes.
Q. Another case where slack action may be developed is where there is an emergency application while the train is running, is that correct?
A. Not necessarily an emergency application.
Q. Let's go to the service application later. If there is an emergency application and the slack is out, there will be a run-in toward the point of the emergency, will there?
A. There will be a run-in and in many cases a run-out; [fol. 4829] the next instance is the run-out in lots of cases.

Q. Again, the development of slack action in the train depends upon the weight of the train as well as its length, doesn't it?

A. Well, the weight would carry with it some different conditions but each car itself has the slack in the draw bar, whether it is loaded or empty.

Q. Isn't this so, that slack action will develop in a train and the slack will be stretched or compressed, depending to some extent upon the weight of the load in the individual cars?

A. Yes, the load would have to do with compressing it or stretching it if it was located on the hind end. The weight of the engine on the front end of the train and the load on the hind end have a tendency to stretch the train on a steady pull, but when you go over the pinnacle or the hog-back we have spoken of is when you get that severe run-in with the load or the severe run-out when the engine goes over the next hump.

Q. Isn't this true also, Mr. Ash, that whether or not you will have slack action resulting in a shock to any portion of the train, particularly to the rear end, depends to a considerable extent upon the speed at the time the slack action develops?

[fol. 4830] A. Yes, the speed has a lot to do with it.

Q. Isn't it also true that the extent of the slack action depends to some extent upon the grade on which the train is moving?

A. Yes.

Q. For example, if the entire train is going down grade, the slack will be bunched, will it not, ordinarily?

A. That depends.

Q. But much more so than if it is going uphill?

A. If the engine is shut off and everything, engine and cars are coasting, naturally the cars will coast faster than the engine and it will be bunched, but you know they work a drifting throttle on those engines to keep the train stretched and try to overcome some of that slack and in that case it would not necessarily be bunched.

Q. If the train is proceeding upgrade; all of it, then of course the slack is going to be stretched?

A. That is right.

Q. Whereas if it is proceeding down grade there is a tendency to be bunched or to be running free?

A. To be running free or stretched.

Q. And those conditions would have an effect upon the [fol. 4831] amount and severity of the slack action which would develop?

A. Yes.

Q. At one point in your testimony you spoke of the possibility of the train breaking in two or parting, causing slack action?

A. Yes.

Q. Have you any record or memory of any reportable casualty, I mean disability of more than three days in the case of an employee suffered on any train where you were conductor or brakeman because of a break-in-two of that character causing slack action?

A. No, I have no reportable accidents that I can recall.

Q. Did I understand you to say yesterday that there were various injuries occurring to trainmen which were not reported?

A. Yes, sir.

Q. There are two rules in the rule book which require reports to be made by the conductor in every case of personal injury, are there not?

A. Yes, sir.

Q. Rule 863, you are familiar with that?

A. I am, and I am also familiar with the rule in that [fol. 4832] same book that requires the trespassers to be kept off these trains, too.

Q. Mr. Ash, there is also rule F which requires reporting, is there not?

A. Yes.

Q. It may be impossible for a crew of an engineer and fireman and conductor and two or three brakeman to keep ten or fifteen trespassers off a train.

A. That is true.

Q. But it is not impossible for a conductor to make a written report, is it?

A. No, it is not.

Q. It is possible to comply with rule 863?

A. It is possible, but as Mr. Fail stated yesterday the reason it wasn't done in lots of cases——

Q. You don't mean to tell us that you with your experience and standing in the service would deliberately fail to comply with rule 863?

A. Oh, yes, I have a skinned arm on each side that I made no report on; it is the easier way out.

Q. Wouldn't it be fair to say that you hadn't complied with the rule because you considered the injury of so little consequence?

A. It was not of a three-day nature, that is true.

[fol. 4833] Q. You haven't lost any trips in freight service because of worrying over the possibility of slack action, have you?

A. I can't say I have but I worry a lot about it and I am not of a worrying nature, it is not my disposition but that is one of my worries if I have one, the slack action on those long trains.

Q. I think you testified that the only slack action accidents that you could recall occurred on trains of 70 cars?

A. It is true those were on 70-car trains.

Q. Then I take it that your worry would become greatest if your train consisted of exactly 70 cars?

A. No, I didn't mean to infer that and I think I qualified that statement when I told you that I had never agreed with anybody that a 70-car train was not a long train.

Q. Yes, I remember that, Mr. Ash, but if your worry is based upon experience, your experience with personal injuries from slack action is confined to trains of exactly 70 cars, that is true, isn't it?

A. With my own personal experience, yes, but my experience has taught me that the danger in slack action [fol. 4834] starts just behind 50 cars and the more cars you have the greater the risk is.

Q. The danger from slack action, as I understand your testimony, particularly arises where an unforeseen emergency application takes place?

A. I believe the cases I was implicated in were undesired emergency.

Q. They were either undesired emergencies or emergencies where application was made by the engineer, or in one case by yourself, but unforeseen?

A. That was a desired emergency in the case where I pulled the air and injured the engineer.

Q. The application of the air as a result of a break-in-two causing a parting of the train line is an undesired and unforeseen emergency?

A. That is right.

Q. As I understand it, the application starts at the cars immediately adjacent to the break?

A. Yes, where the air hose parts.

Q. And proceeds each way from the break?

A. That is right.

Q. Then if you have a 70-car train, let us say, and the break occurs at the 50th car, between the 50th and 51st car, there will be 20 cars ahead of the caboose as to which the slack might run in?

A. That is right.

[fol. 4835] Q. That would be exactly the same as if there had been an emergency application of the air at the locomotive of a 20-car train, wouldn't it?

A. Not in all cases, because those 51 cars often stop quicker than your hind end and you will get the run-in.

Q. You will only get 20 cars run in?

A. If those 20 run into the 50, then you have the collision.

Q. That is all you would have?

A. Yes.

Q. You couldn't have anymore run-in than there were cars behind the break, could you?

A. Oh, yes, if those 20 run into the other 50 you have a 70-car run-in and it is really worse than the slack action would have been from an emergency stop with the train intact.

Q. How could that be?

A. It can be just like, for example, a collision with a 20-car train and a 50-car train.

Q. If the break takes place at the 50th car, then the 50th car stops first?

A. The brakes set first, it don't always stop first.

Q. Then the brake setting proceeds to the 49th and the 48th and so on up to the engine from the point of break?

[fol. 4836] A. Yes.

Q. The effect of the setting of the brakes on the 50th car is to stretch the slack in everyone of the cars ahead of the break, isn't it?

A. That is right.

Q. Then of your 20 cars remaining in the train the brakes start to set at the 51st car?

A. Yes.

Q. And they continue on back setting in emergency to the caboose?

A. Yes.

Q. And, by the way, that emergency application takes place very rapidly, doesn't it?

A. Just like that (snapping fingers).

Q. Your effect, where you have a setting of the air 20 cars ahead of the caboose will be the same whether the train consists of 50 cars or 70 cars, won't it? Let me reframe the question and I think it will be clear. If you have a 50-car train and a break-in-two with an emergency application of the air at the 20th car ahead of the caboose, you will still have a 20-car run-in of slack, won't you?

A. If all of the brakes are equal on all cars, yes.

[fol. 4837] Q. All the brakes will set at once, won't they?

A. They all set.

Q. If you have a 70-car train and a break 20 cars ahead of the caboose, you will have a 20-car run-in?

A. In addition to the slack action you have the chance of a collision with your rear portion of your train running into the front portion of your train.

The Court: Has that happened in your experience, Mr. Ash?

A. Yes, sir, that has happened and the old rule is to try to keep the front portion of the train in motion until it is known the rear portion is stopped, to avoid that collision.

Mr. Mason:

Q. That collision effect, such as it is, would be the same whether there are 20 cars ahead of the break or 30 cars ahead of the break or 50 cars ahead of the break, it will be simply a collision with an engine and a number of cars that are stopped dead on the track?

A. Yes.

Q. And the force of the collision will be just the same because you have only 20 cars to run in?

A. You have 20 cars, but the more cars you run in the harder the stop is. If you are going down a street and run [fol. 4838] into a light automobile it wouldn't be as severe as if you ran into a heavy truck or a stone wall.

Q. I understand that these cars ahead of the break are all stopped, aren't they?

A. Yes, so would your stone wall be stopped.

Q. That is like colliding with a stone wall, as I understand it?

A. In lots of cases, yes, sir.

Q. Does it make any difference whether the stone wall is four feet thick or ten feet thick?

A. If it holds you, that is all the difference.

Q. When you run into 50 stopped cars, it is like running into a stone wall fifty feet thick, is it?

A. That is right.

Q. If you run into 20 stopped cars with the emergency set on them, it is like running into a wall twenty feet thick?

A. Yes.

The Court:

Q. If that condition arose and you did have that collision, that would be classed as a collision and not as a run-in of slack, wouldn't it?

A. It would be possible where the slack would come in, your Honor, would be the breaking in two, the break-in-two, [fol. 4839] or in ordinary cases would be called slack action.

The Court: What happened after the break-in-two?

A. Your brakes go on and you don't always have this collision I am talking about but it does happen.

Mr. Mason:

Q. Insofar as the effect on the men in the caboose is concerned that would be classed as a break-in-two with slack action resulting in injury to men in the caboose if they were hurt?

A. Yes.

Mr. Mason: We have some instances on that on both long and short trains in the exhibit, your Honor. That is all I have for Mr. Ash.

The Court: We will take our morning recess at this time.

(Thereupon a short recess was taken after which proceedings were resumed as follows.)

[fol. 4840] The Court: You may proceed.

The Witness A. T. Ash was recalled to the stand, and testified further as follows:

Mr. Mason: Would you mind if I asked the witness two or three more questions?

Mr. Polley: No, go ahead.

Mr. Mason: Mr. Ash, I understand you to say that you have had derailments because of burned off journals?

A. Yes, I had one.

Q. When?

A. It has been quite a few years ago, I would say along in 1926 or '27 at Cazador, Arizona, if that is the one you are referring to. It is the only one I recall.

Q. Have you had any derailments because of a broken flange, broken wheel?

A. Yes, had one at Rita, sixteen miles out of Tucson.

Q. How long ago was that?

A. Well, it was possibly in either one of the two years, 1926 or '27. They weren't very far apart.

Q. Was there any personal injury in either one of those? [fol. 4841] A. No; the case at Cazador, we were dragging upgrade very slowly and this journal broke off and we were stopped all intact, there was no wreck of cars, it was just one pair of wheels off the track.

Q. Both of those were on short trains?

A. Well, they were both within the seventy-car limit, I don't recall the exact number of cars.

Q. Now, have you had any derailment or other reportable accident due to slid, flat wheel on a car?

A. I don't recall one just now. If there was, there might be something that would refresh my memory, I don't recall one.

Q. Have you ever had a derailment due to a dragging brake beam?

A. I believe I had one at Chiricahua some years ago heading into a side-track, there was a derailment of a refrigerator car.

Q. That would be 1926 or '27?

A. Somewhere along there.

Q. At Chiricahua; is that in Arizona?

A. Yes, east of Douglas.

Q. You have had various cases of break-in-twos from drawbars pulling out, have you?

A. Yes, I have had my share of them, I think, I couldn't [fol. 4842] tell you how many without looking at the record, I would usually recognize them or recall them.

Q. Do you remember a break-in-two at Akela on Christmas day of 1936?

A. I do not.

Q. From a drawbar pulling out?

A. Yes, I do. A boxcar broke off.

Q. That was a long train, wasn't it, ninety-nine cars?

A. As far as I remember, it was stopping for water.

Q. There was no casualty to anybody?

A. No, I believe we were on the ground when the final——

Mr. Strouss: I think if the defendant has a record of this, they should produce it. Now, to ask the witness the length of trains and details of that kind, they have a record, now, what the facts are should be brought into the record.

Mr. Mason: Why not test his recollection. He has shown he has a pretty good memory here.

Mr. Strouss: We certainly have a right to have those records so we will know what the facts are.

Mr. Mason: Well, let the witness tell you; he is your [fol. 4843] witness.

Mr. Strouss: This is a matter of record. We are not compelled to rely upon memory in a thing of this sort.

The Court: No. The objection is overruled.

Mr. Strouss: I am now requesting that they be required to produce this record, so that we may have a chance to examine it.

The Court: Which record do you refer to?

Mr. Strouss: As to this train they are talking about, it is a matter of record. There is certainly no reason why they should conceal it from the Court or from the counsel for plaintiff, either one.

Mr. Mason: We are not using it to make any case of our own. I don't see why we have to accede to that demand.

The Court: You may proceed.

Mr. Strouss: The motion that they be required to produce is denied then, I take it?

The Court: You are referring to the particular train?

Mr. Strouss. That he just asked about. He asked him to give the length of train. There is no handicap or burden upon them to produce.

The Court: No, if the record is available, it may be [fol. 4844] produced.

Mr. Mason: If it is available it will be produced. We will submit for the examination of counsel—I don't propose to make it of record myself—a copy of the telegram, this is all that we have, showing the incident from the chief dispatcher addressed to the superintendent and certain other division officials dated at El Paso on December 25, 1936.

The Court: That is your only record?

Mr. Mason: That is the only record we have in the courtroom and I think that is all we have indicating the incident. It does show, as Mr. Strouss will see from reading the telegram, the length of the train, the place, the fact that the train broke in two, and the amount of the delay. Of course, there was no form T report, because, as Mr. Ash has told us, there was no personal injury involved.

The Court: Were you through with your cross-examination?

Mr. Mason: Yes, I just had those few additional questions that I overlooked:

[fol. 4845] Redirect examination.

By Mr. Polley:

Q. Mr. Ash, I believe you testified that in recent years the draft gears had been made heavier and what you called harder. Now, what effect do heavier draft gears and harder draft gears in connection with heavier equipment in use have on the severity of shock on the rear end of the train?

A. It increases the severity of shock in accordance with the increased drawbar, increased weight of the car and the drawbar which doesn't have the spring cushion effect to them which they once had.

Q. Now, yesterday, on page 4795 you were asked this question: "Can you find anything in the rule book as to the placement of livestock at the head end of the train?" And you answered, "No, sir." And you were asked this question, "As a matter of fact, it is permissible to place livestock at any point in the train that the drover or caretaker handling it, desires?" And you answered, "You can place them on the hind end of the train if the caretaker assumes the responsibility and you have to start and make notations on your stop report that they were placed in the rear of the train by request of the caretaker." I want you [fol. 4846] to notice this rule: "Do not divert or reconsign livestock on request of attendant. Such instructions must come from shipper or consignee. In cases where livestock is handled on the rear end of train at the request of caretaker, please make notation to that effect on livestock report form, 2871. This is done so as to give freight claim agent record showing that livestock was handled at rear end of train at specific request of attendant Livestock claim agent will use this information in handling claims. Please watch

this matter closely and see that this notation is shown on all forms 2871 in cases mentioned above. Livestock will be handled at the head end of trains unless instructions are received from the caretaker to handle on the rear end of the train or equipment is rear end equipment." Can you identify that rule?

A. Yes, that is Bulletins Nos. 70 and 71 of the reissue of 1930, under which we are still operating.

Q. Have you ever been notified by the officials of the company that that rule is not in effect now?

A. I have not.

Q. Do you operate under that rule at present?

A. We do, most specifically we do.

[fol. 4847] Q. And what would happen if you did, as a conductor, place shipments of livestock on the rear end of freight trains?

A. I don't know what would happen, but I wouldn't take the responsibility on myself to place livestock on the rear end of the train. I would have to have instruction from proper authority to do so.

Mr. Strouss: I would like to ask a question in connection with this train at Akela.

Q. That record submitted by counsel shows that was a train of seventeen loads and eighty-two empties. It also shows that two trains, C-1010 and CY-1010, were each delayed forty minutes by that. Do you remember the delay?

A. I remember there was a delay, but I wouldn't attempt to say what the delay was, except to my own train as stated by my own record.

Mr. Strouss: I think I correctly stated the record, did I not, Mr. Mason?

Mr. Mason: Well, the telegram doesn't show that C-1010 and CY-1010 were separate trains, only that they were separate blocks, which is true, but they may have been consolidated. You recall that the evidence in this case shows that two blocks are consolidated.

[fol. 4848] Mr. Strouss: If I just might have that to read into the record.

Mr. Mason: The blocks were each delayed about forty minutes.

Mr. Strouss: I will have this copied into the record.

The Court: Suppose you read it, Mr. Strouss.

Mr. Strouss (Reading): "El Paso, December 25, 1936. HSF, JPN, HGM, WGR, AGN." Those are, I take it, stations?

Mr. Mason: They are division officials, starting with H. S. Fairbanks and ending with A. G. Newell.

Mr. Strouss: "Drag West Engine 5019, Conductor A. T. Ash, Engineer, J. McNamee, with 17 loads, 82 empties, while heading in at Akela about 505 A. M. Date to meet first and second 980, pulled drawbar out East end of a Car company ties. Delayed C-1010" and then there are some letters that are blurred out.

Mr. Mason: I presume that was a re-write over. They don't belong in the message.

Mr. Strouss: That is as I read it. Then, "CY-1010 each about forty minutes." Signature, "J-650. HGB 650 AM."

Now, counsel has handed us the delay reports covering the [fol. 4849] period that he was questioning him on in cross-examination, delay reports both on trains in which he was conductor and on trains on which he was brakeman.

Mr. Mason: I think it should be specified that the time returns and delay reports cover the calendar year 1940 in trips of this witness in both freight and passenger service.

Mr. Strouss: Now, in making a computation of the trains on which he operated, that is, with respect to the length of those trains, if counsel will have someone for the company check this after I have made it, probably it could be put in by stipulation.

Mr. Mason: Certainly, we don't need to keep Mr. Ash for that purpose.

Mr. Strouss: Mr. Ash, concerning the possible consolidation of those two trains that were mentioned in this telegram, do you remember whether they were two trains, or a consolidated, C-1010 and CY-1010?

A. According to that message that you read, they were two trains. It said, "First and Second 980," which is two trains.

Q. You don't have any independent recollection yourself? [fol. 4850] A. Not unless I made notations on my delay report.

Mr. Strouss: That is all.

Mr. Polley: That is all.

(Witness excused.)

Louis A. Fail was recalled to the stand and testified further as follows?

Cross-examination.

By Mr. Mason:

Q. Mr. Fail, you were first employed by the Southern Pacific, weren't you?

A. First employed by the Southern Pacific?

Q. Yes, not by the El Paso and Southwestern?

A. Yes, that is right, the Southern Pacific.

Q. And you hold your seniority as a Southern Pacific conductor?

A. Yes, sir.

Q. Your seniority extends all the way from Yuma to El Paso?

A. That is right.

Q. Your home is at El Paso?

A. Yes, sir.

Q. You reside in the state of Texas?

[fol. 4851] A. Yes, sir.

Q. Your seniority is like that of Mr. Ash in that it permits you to work at any point between Yuma and El Paso?

A. That is right under certain conditions, depending upon the merger agreement.

Q. Well, as a Southern Pacific conductor, you have some priority, don't you, over the lines formerly owned by the Southern Pacific?

A. That is right.

Q. You also have some rights——

The Court: Just a minute. You said, "Formerly owned by the Southern Pacific."

Mr. Mason: Yes, I am distinguishing between those and the lines formerly owned by the El Paso and Southwestern.

Q. You also have rights over the lines formerly owned by the El Paso and Southwestern?

A. After a certain number of crews are assigned on these other properties, then the former Tucson division employees come in there on that line.

Q. By the way, this seniority district between Yuma and El Paso is known for the purposes of the trainmen's and

conductors' agreements as the Tucson seniority district, isn't it?

[fol. 4852] A. Tucson-Rio Grande seniority district, yes, sir.

The Court: And what is your seniority, Mr. Fail?

A. You mean my date of employment?

Q. No, I believe you gave us that. But your number.

A. I think it is about thirty on the protected list, and it is about sixty or under on the consolidated, I haven't checked that up lately.

Mr. Mason: As far as the protected list is concerned, there aren't very many men who could displace you at El Paso then, are there?

A. No, not too many any more.

Q. Practically all of them are in passenger service?

A. Well, I haven't had any reason to check up lately, but I think there are only about 16 between myself and passenger service, or thereabouts.

Q. Over the entire district?

A. Yes, sir; well, on the main line.

Q. I mean on the entire seniority district, main line.

A. On the old Southern Pacific district.

Q. The fact that you work out of El Paso is entirely a [fol. 4853] matter of choice with you; you are not forced to work there?

A. Well, in the beginning, I had two choices in the beginning when they hired me; when I asked for a job, they sent me over here at Benson, which was very undesirable at that time, and I stayed over there three months and when I came back in here, they told three other brakemen and myself to catch a certain train and go to El Paso, and I told them I didn't want to go and they said, "Well, you are going to El Paso, or else." So I went to El Paso along with three other fellows by the name of Stump, Cane, and Jackson.

Q. That was prior to 1916?

A. I will say it was. It was when I first hired out here. I went there and kept on and I liked it, I met my wife, we were married, her folks live there, I bought my home, I raised my children and I educated my children there, and they are married now and that is my home.

Q. But, Mr. Fail, you hadn't since you hired up with the Southern Pacific always lived at El Paso, had you? You went over to the Coast division for a while?

A. Yes, sir.

Q. Then you returned to El Paso by choice?

[fol. 48[illegible]] A. More necessity than choice.

Q. Well, in so far as any action of the company was concerned, it didn't force you to return from San Francisco to El Paso?

A. No, there was some health mixed up in that.

Q. And the company doesn't now compel you to stay in El Paso?

A. No, sir.

Q. If you wished, you could exercise your seniority to work out of Tucson or Yuma?

A. That is right.

Q. But you don't want to?

A. No, I don't want to.

Q. You haven't suffered any personal injury resulting in more than three days' disability in a freight or passenger train accident on a moving train in the last eight years, have you, Mr. Fail?

A. Well, I was injured at Deming, New Mexico, in 1938, I think it was, I can't be sure about these records, but I was regulating a car of fruit, pulling up the lid on the ice box and ruptured myself, and I lost the biggest part of three months, I think. I was operated on.

Q. Was the train moving at the time?

A. No, the train was standing still taking water.

[fol. 4855] Q. You wouldn't say that the length of the train had anything to do with the injury?

A. It had nothing to do with it.

Q. As a matter of fact, the train was less than 70 cars?

A. I wouldn't know, I don't have those records. If I had records, understand, for all my service here, this room probably wouldn't hold them. I don't have those records, I don't know. I will state, since you asked the question of being injured, I recall of being injured and having a couple of ribs broken at Columbus, New Mexico. I believe that was along about 1934. I testified yesterday that my glasses were broken. An air hose pulled off near the head end of this train; but I have been injured many a time.

Q. Well, this injury of yours at Columbus, New Mexico, didn't keep you from working for more than three days during the next ten days following the accident, did it?

A. Well, it seems to me like I did, but I wouldn't testify, because I don't recall; it has been six or seven or eight years ago, I don't know, I can't remember those things.

Q. You have never, other than this incident at Columbus, the extent of which you don't recall, been injured in a slack [fol. 4856] action casualty on a long train, have you?

A. Yes, sir.

Q. When?

A. Not a reportable accident, I don't suppose, but I have been injured so many times and slammed around so much that we don't report those things.

Q. You recall Rule 863, don't you?

A. Oh, I am familiar with that, yes sir.

Q. Also Rule F in the Rule Book?

A. Yes, sir.

Q. You are not going to tell us here that as a conductor with your long service you don't undertake to comply with those rules?

A. I will tell you yes, if you will listen, I don't comply with them and there are others that don't comply with them, and the fellow that testifies here that he does comply with that book in toto, he is making a false statement.

Q. Is there anything that renders compliance with Rule 863 impossible?

A. No, sir, nothing impossible.

Q. Then your reason for failing to report these cases where you say you suffered injury, or others in your car suffered injuries, is because the injuries are of insufficient [fol. 4857] consequence to justify a report?

A. That is right; that is getting more to it. You get a bad blow, you get bumped around, but I would think you would be a jelly if you had to report every little slam or scratch you got when you know it isn't going to cause you to lose any time.

Q. Then you agree that you have never had a reportable slack action casualty on a long train or short train?

A. No, I wouldn't say that, because I have had nothing to refresh my memory from the records, I wouldn't say that.

Q. You have experienced break-in-twos on trains on which you were conductor?

A. Yes, sir.

Q. On both long and short trains?

A. Yes, sir.

Q. And confining your answer to the period since and including March, 1933, do you recall any reportable injury to a member of the crew, including yourself, occurring in connection with a break-in-two on a train of any length?

A. Well, I recall Brakeman D. Kurtz being knocked from the top of the caboose at Campbell Street in El Paso, Texas. [fol. 4858] Q. Did he lose any time?

A. Oh, I think 21 days.

Q. When did that take place?

A. Well, I would say it has been eight years ago, or seven or six, I don't know.

Q. What was the length of the train?

A. I wouldn't be able to even guess.

Q. In what direction was it moving?

A. Eastbound.

Q. You were just about to come to a stop in the El Paso yard?

A. Yes, sir, and it appeared that when the passengers were getting off the train that someone stepped on a cutting lever and we stopped before he expected it.

Q. This happened on a passenger train, did it?

A. No, on a freight train.

Q. You said passengers were getting off the train.

A. Hoboes, trespassers, whatever you might want to term them.

Q. This wouldn't be an accident that happened on November 16, 1933, is that your recollection?

A. No, I think it was later than that. That would be nine years ago. No, this fellow has been braking for me eight years, I think, or maybe possibly he was—does it [fol. 4859] state there that he was braking with me at that time?

Q. I haven't any record, I have a mere summary that there was an accident to Brakeman D. Kurtz, spelled the same way you spell it, that took place at El Paso, Texas.

A. Well, he was injured twice there, but I don't recall whether that was the time with me or with someone else, but he got a finger broke. Does it say anything about a finger?

Q. "Third finger on left hand dislocated, and fourth finger of left hand bruised."

A. I think that is the time, I can't state for sure.

Q. This doesn't agree with your recollection as to the direction of movement. This indicates an Extra west.

A. No, this was an eastbound I have reference to.

Q. You don't recall any accident on a westbound Extra to Brakeman Kurtz?

A. I recall the train parting when we were being shoved out of the yard by a switch engine and I had gone in to sit down to the desk to begin my clerical work, and this was what we call a soft belly caboose, a wooden underframe [fol. 4860] caboose, and I don't remember what happened to this fellow Kurtz that time, but I clearly remember what happened to me, that the trespasser had stepped on a cutting lever, and I had my knees underneath the desk like this, we broke in two, and that switch engine kept shoving ahead, and my knees were pinned underneath this desk, and I didn't think I was going to get away. I didn't get away until the tension was taken off.

Q. Did you lose any time?

A. Oh, no, but I was scared out of years of longevity, I think. I don't know whether I lost time or not over it. If you see a locomotive coming at you at the back door, I don't know whether you would lose any time or something else.

Q. How long ago was that, Mr. Fail?

A. Oh, I don't know; it has been quite a little while ago, seven or eight years.

Q. Considerably longer ago that that wasn't it?

A. I don't know.

Q. Haven't all of those soft belly cabooses been replaced and retired quite a long time ago?

A. Yes, but there is one in service out of Lordsburg, New Mexico, No. 118, which is an emergency caboose there in [fol. 4861] service, and there is a regularly assigned caboose Sam Allen has, 115, out of El Paso, on the New Mexico end.

The Court: You are assigned a regular caboose and you keep that caboose whenever you are on the road?

A. Yes.

Mr. Mason: Your assigned caboose is a steel underframe?

A. Yes, sir, I will say it is.

[fol. 4862] Q. You spoke of and read into the record rule 99, flagging rule. That is a rule which is practically universal all over the United States, isn't it?

A. Yes, sir, just very minor changes on different railroads but anyone who understands rule 99 would be able to perform his duties on any of the railroads in the United States or Canada, I think.

Q. It is essentially for the purpose of preventing head-end and rear-end collisions while trains are standing?

A. More rear-end collisions. There is another rule that pertains to the head end. That is more so for the rear end.

Q. Is it any more difficult to comply with rule 99 so far as the protecting of the rear end is concerned with a train consisting of more than 70 cars?

A. I wouldn't say that it would be, no.

Q. You don't use retainers in any part of your territory, do you?

A. No, sir.

Q. When it comes to setting hand brakes on cars that are set out on sidings or when the train is tied up with the engine detached, that duty is not affected by the length [fol. 4863] of the train, is it?

A. That would depend on where the car was located in the train set out. Yes, that would have some effect on it, but not on the setting of the hand brake, no. The hand brakes could be set regardless of where the car was located in the train after it was placed on the siding. That wouldn't have anything to do with it, the length of the train might interfere in the difficulty of setting the car from the train. If it was a long ways back from the engine, it would take a longer time to set it out.

Q. But the job of setting the hand brakes on a car is a job associated with the individual car, isn't it?

A. That is right.

Q. It is wholly independent of train length?

A. That is right.

Q. Have you ever had a derailment as the result of a brake beam coming down?

A. Yes, sir.

Q. When and where?

A. That would be pretty hard to say. I remember having a derailment at Tacna, Arizona, due to something dragging. Do you have that before you?

Q. That was quite a long while ago, wasn't it?

[fol. 4864] A. I don't know.

Q. It is a long while since you have worked on the west end, isn't it?

A. Yes, I was down at Yuma—in 1916 when I was promoted, you spoke heretofore of having my choice where I could work, I was you might say drafted with seven or eight other conductors and we went to Yuma about the first of June. When I say "drafted," that is just about what it takes to get you to go to Yuma on the first of June.

Q. I appreciate it.

A. I worked there in 1916 and 1917 and I also worked there by my own choice during the construction of the new railroad through Phoenix. I went over on the construction train March 10, 1925, and I remained over there about seventeen months and part of the period was down at Yuma.

Q. Then this derailment at Tacna took place either in 1916 or 1917 or while you were at Yuma in 1925?

A. Around 1925.

Q. That is the one you recall, is it?

A. It was a carload of glassware that was derailed at Tacna. Then I had a derailment recently due to what we call the AC key that goes through the steel underframe of the car and the draft gear. They have slots in this steel [fol. 4865] draft gear that goes underneath this car here. They are long slots, probably eight or ten inches long, and these follower plates are on the inside of this steel center sill so that this slot on the center sill of course is stationary but your draft rigging will move and this key goes through here, through the butt of the shank of the draw bar to hold this draw bar, the end that pulls the car and that key lost out west of the west switch at Anapra, New Mexico, allowing the draw bar to fall in the center of the track, parting the train and derailing one pair of wheels.

Q. That derailment was not due to a brake beam coming down, which was my question, but due to the losing of the AC key, was it?

A. I think so.

Q. Did that take place recently?

A. Within the past six months.

Q. That was a train of 70 cars, wasn't it?

A. I wouldn't know.

Q. Does that agree with your recollection?

A. No, because I have no record. I can't agree with anything I don't know. If I had my record here or something to refresh my memory from your records I would go along with you on it but I don't have anything. I remember [fol. 4866] losing an AC key or a carrying iron out of a reefer train at Myndus, New Mexico. That allowed the draw bar to fall down and we turned over two refrigerator cars and derailed one or two.

Q. When did that take place?

A. It has been a long time ago, may be ten years maybe less.

Q. Was anyone injured in this derailment at Anapra that you recall?

A. No.

Q. Was anyone injured in this Myndus derailment?

A. I don't recall, it seems to me like the flagman, I don't remember who he was, but it seems to me that the flagman was slammed around but I don't recall.

Q. You don't recall, do you, what the weight of the chain is that you use in emergency when the couplings fail?

A. I stated here yesterday it would weigh from three to six hundred pounds, I think, and I will still stick with the weight.

Q. Do you know how long it is?

A. No—I know how long it is necessary to be to go around the coupler shank and fasten to either the other draw bar [fol. 4867] or the transom of the next car and it would have to be at least six feet, maybe eight.

Q. You would not agree that this chain actually weighs on the scales, 128 pounds?

A. I would bet my life that it will weigh more than 128 pounds and I will say further to you or to any other man in this room he cannot pick up that chain and carry it 50 car lengths without resting and I will also say I can carry 128 pounds a long way but I can't carry that chain.

Q. I think you gave us some expression of the average length of a car. Didn't you say that they run from 30 feet to 65½ feet in length?

A. To 66 feet, 6 inches.

Q. Freight cars?

A. Yes, sir.

Q. Those very long cars, 66-foot cars are mostly flatcars, aren't they?

A. They are gondola cars.

Q. Would you say that a fair average of the length of the cars you will get in the general run of freight trains would be about 45 feet from coupler face to coupler face?

A. That is pretty hard for me to state. If you will eliminate the refrigerator cars—no, I wouldn't care to make [fol. 4868] a statement on that because I don't know.

Q. Have you ever had a reportable casualty take place on a train on which you were employed either as conductor or brakeman by reason of the use of the conductor's valve?

A. I can't tell you from memory. I have pulled the conductor's valve many and many a time and as I stated before I have nothing before me to refresh my memory from these records you are reading from.

Q. I am not reading from any record, I am asking you. You remember that you have pulled the conductor's valve many times and you remember what the results are but you don't remember whether you caused any casualty by doing so?

A. I can remember that I have made out many a 2611, that is our accident report, for myself or other members of the crew that were injured.

Q. But not in connection with the use of the conductor's valve?

A. That I don't know, maybe, possibly so.

Q. Have you ever had a reportable casualty—you understand what I mean by reportable casualty, one reportable to the Interstate Commerce Commission?

[fol. 4869] A. Three days' time lost.

Q. More than three days' time lost in the ten days following the accident?

A. Yes.

Q. Have you ever had a reportable casualty on a train on which you were employed as a result of failure to see or understand a hand signal?

A. Yes, sir.

Q. When?

A. You mean a reportable casualty of one of the employees injured?

Q. Yes, where an employee was injured or killed as the result of failure to see or understand a hand signal?

A. I recall one time at Deming in a sand storm, the sand storm was so bad that the dispatcher tied two trains up. I was the conductor on one train, the first one to arrive there and conductor E. L. Geary was the conductor on the second train to arrive there and one of the other brakemen and myself were assisting conductor Geary to set out a car of merchandise to the house track, freight house, assisting him in passing signals and we injured a freight house employee there. I recall an instance where there was no personal injury——

Q. (Interrupting:) Just a moment, I want to ask you [fol. 4870] about this incident at Deming. You say you injured this freight house employee. Was he concerned in the movement there?

A. He was concerned in the unloading of the cars there?

Q. This accident occurred while you were switching a single car to the freight house?

A. We were switching a car from the train to the freight house.

Q. The train itself was standing at the time while the engine was moving with one or more cars?

A. Yes.

Q. Did you undertake to signal to this freight house employee?

A. No, he was in the car.

Q. Were you undertaking to pass signals to the engineer?

A. That is right.

Q. During a sand storm?

A. Yes, sir.

Q. You have never had, then, an accident occurring in connection with the movement of a train where failure to see or understand signals contributed to the accident?

A. Accident of the train?

Q. In connection with the movement of a train. This I [fol. 4871] understand was purely a switching movement.

A. You mean where personal injury was involved?

Q. Where a reportable personal injury was involved, yes.

A. I can't make a statement like that.

Q. You don't recall any?

A. July 4, 1940, was no different to July 4, 1920, to me, and I have nothing before me to refresh my memory on these things. If it wasn't something that materially affected me, I don't know why I would have any reason to recall all that stuff.

Q. The only thing that prompts my question is your having spoken about the difficulties in passing signals and I want to know what particular casualty you have in mind, if any, occurring as a result of the difficulty of passing or understanding signals on long trains. If you don't recall any, that is all my questions.

A. Just a moment——

Mr. Mason (Interrupting): There is no question before you, your Honor, I object——

The Court: Are you starting to answer this question?

A. Yes, sir.

[fol. 4872] Mr. Polley: Counsel answered the question himself.

Mr. Mason: I asked no question. Read the record.

(The record was read by the reporter as follows: "Mr. Mason: The only thing that prompts my question is your having spoken about the difficulties in passing signals and I want to know what particular casualty you have in mind, if any, occurring as a result of the difficulty of passing or understanding signals on long trains. If you don't recall any, that is all my questions.")

The Court: Do I understand that you recall one?

A. Yes, sir, that is what I am trying to tell him.

The Court: Go ahead.

A. This happened at Malpais, New Mexico, where signals were misunderstood. The thing that throwed me off my guard was the fact, whether this was a reportable injury I can't remember, but I do recall plainly that due to the misunderstood signals the caboose and two cars on the rear ahead of it were turned over and I ran down a 30-foot embankment and fell into a cat-claw bush and I don't recall whether I lost any time or not but I clearly remember [fol. 4873] it. That was probably about 1927.

Mr. Mason:

Q. Wasn't it December 9, 1928?

A. It could have been.

Q. That was backing a train out of a siding?

A. That is right. It was dark. The one brakeman was giving a violent stop sign and swinging his lantern trying to stop him. The head man completed the signal which meant to come on back. One was trying to stop by giving

the signal this way and the head man took it for a back-up sign and he gave it to the engineer. He completed the circle and we backed over the derail.

The Court: The court will be at recess until 2 P. M.

(Thereupon the court stood at recess until 2 P. M., April 16, 1941.)

[fol. 4874] April 16, 1941, two o'clock P. M.

Proceedings were resumed at this time as follows:

The Court: You may proceed with your cross-examination.

The Witness, Louis A. Fail was recalled to the stand and testified further as follows:

Mr. Mason: Mr. Fail, this derailment at Malpais that we were talking about was the subject of an investigation at which you were present, was it not?

A. Yes, sir.

Q. And you made various statements at the investigation in answer to questions from the investigating officers?

A. Yes, sir.

Q. One of those statements was to the effect that the train was 54 cars?

A. Yes, it wasn't too long a train.

Q. Another statement was that you admitted at the investigation that you didn't know what signals were given on the train, you didn't see them.

A. I was unable to see them until after it was brought out, after I talked to the brakeman, what actually happened.

[fol. 4875] Q. You yourself didn't see any signals given?

A. No, sir.

Q. Now, there were no reportable personal injuries to any of the members of the crew, were there?

A. No; I only brought up that case to show that signals can be confused.

Q. You have no case in mind, have you, where reportable casualty has occurred as a result of failure to see or understand a hand or lantern signal given while the train was in motion running forward?

A. Oh, I am sure that it has happened many times, but I don't have any records.

Q. Any train that you have seen or been on?

A. I have in mind one train that one of the trespassers came back over the top to the caboose to tell me that a one-legged man and a one-armed man had had his other arm cut off, and this happened at Separ, New Mexico.

Q. Was this one-legged man, or rather the one-armed man that had lost his arm a trespasser?

A. Yes, sir.

Q. I am asking you about members of the crew, of course, or other persons lawfully upon the train, not trespassers. [fol. 4876] A. Well, I don't have any records to refresh my memory, but with the service that I have had, I feel safe in stating that there has been many, but I am unable to state from memory.

Q. You spoke of having to rebrass journals. It is a fact, is it not, Mr. Fail, that during the year 1940 you didn't have any occasion, when you had to rebrass a journal?

A. Oh, I am positive that I did rebrass journals in 1940.

Q. Last year. Do you remember the date and the place and the train?

A. No, that is pretty hard for me to keep all of that in my mind. I would call your attention to Lizard, New Mexico. Do you have one there at Lizard on a car of meat or beer?

Q. I have a reference to a 57-car train at Lizard on July 10, 1940, first 981, would that be it?

A. That sounds like it if it was on a Sunday morning. That would be, as I recall it, one Sunday morning we had to stop at Lizard and brass a car of meat, and Lizard is eleven miles out of the terminal.

Q. July 10, 1940, wasn't a Sunday.

[fol. 4877] A. Well, I wouldn't say, but anyway I know that I brassed a car at Lizard, New Mexico.

Q. In 1940?

A. Well, I think that I did.

Q. It would appear on your time return and delay reports, would it not?

A. Yes, sir.

Q. Now, this reference that I have shows you had a hot box on July 10, 1940 at Lizard, but contains no reference to rebrassing. By the way, do you know how many hot boxes you had on all of your trips in 1940?

A. That is just out of the question. I have no way without refreshing my memory from your records and I don't

keep records of these trifling matters that are so routine in my daily performance of my duties.

Q. They would however appear on the time returns and delay reports?

A. Yes, sir; they wouldn't appear on the ones that were not reportable or caused delay.

Q. If a hotbox was of sufficient consequence to cause a delay to your freight train, it would appear on your time return and delay report?

A. If it caused delay, yes, sir.

Q. And if it wasn't of sufficient consequence to cause a [fol. 4878] delay, it would be exceedingly unimportant, wouldn't it?

A. No, because we have brassed cars at Deming by the flagman while we were doing other work that was necessary at that station, like setting out and picking up cars, that was sufficiently close to the caboose that there was no delay charged against that car.

Q. Did the flagman do it by himself?

A. Yes, sir.

Q. Then the rebrassing of a car is something that one man can do by himself?

A. Yes, one man can do it after he gets the tools there.

Q. While the remainder of the crew are doing some other work?

A. Yes, sir.

Q. Then it isn't always the exacting operation that you described in your direct testimony?

A. Yes, sir, it is, because we will run that engine down by the caboose and load our tools on the engine and haul it up and dump it off there and maybe go do something else while one man brasses the car.

Q. As a matter of fact, the use of the engine in order to save steps carrying the tools and appliances is quite [fol. 4879] common, isn't it?

A. That is where you have sid- rack, where you have a track, but there are so many times that you stop between stations with hot boxes, they don't have any particular place or any particular minute, or hour, to break out on you.

Q. Or have any particular train length, do they?

A. No, sir.

Q. They are just a defect of the individual car?

A. That is right.

[fol. 4880] Q. You have been a conductor in passenger service according to your direct testimony?

A. Yes, sir.

Q. You made six trips last year, did you?

A. I said that I thought I had made that many, possibly I made more.

Q. You made 297 trips in freight service last year as a conductor?

A. I wouldn't know.

Q. You worked pretty steady all the twelve months, didn't you?

A. Yes, sir.

Q. Your time returns and delay reports would show the total number of trips that you made?

A. Yes, sir.

Q. You don't know whether your total number of trips was approximately three hundred then?

A. No, sir, I could check it from my records at home as to my earnings but I don't have those records with me.

Q. Did you say in your direct testimony that you had two occasions when journals were burned off?

A. Yes, sir.

Q. When were those?

A. I think that one was about July 3d or 4th or 5th or something like that, 1922, along in there I think when I [fol. 4881] dropped a journal at Lordsburg, one milepost.

Q. I have a reference to that in your testimony. Do you recall the date of the other?

A. I think the next one was the following fall of 1923 between Chappel and Aden.

Q. Those two are the only burned off journals that you recall?

A. The company said they were burned off. I thought maybe one of them was broken off.

Q. This case at Lordsburg, one milepost, is the case that you described at considerable length as having occurred on a car with a heavy load of cement?

A. That is right.

Q. According to your testimony that was a train of 25 cars?

A. Oh, no, that was a train in the neighborhood of 70 cars.

Q. You don't recall whether it was more than 70?

A. I hardly think it was.

Q. Was it a westbound manifest?

A. No, it wouldn't be classed as a westbound manifest I don't think. I think we had empty refrigerator cars and [fol. 4882] these 18 or 20 cars of cement for some contractor at Phoenix on highway construction. We had fought that hotbox hard all the way in order to take it in.

Q. That hotbox resulting in a burned off journal was due to the heavy loading of the car, wasn't it?

A. I wouldn't say that because there were other journals underneath the car. There were three more underneath that car that didn't burn off and that one did so I wouldn't lay it to the load in the car. I think there was something faulty in that journal; but the management didn't.

Q. Heavy loading of the car may cause a hotbox?

A. That is right.

Q. As a conductor in passenger service you have occasion to pass signals to the engineer, do you not?

A. Yes, sir.

Q. That is by the use of the air signal in each car?

A. That is right.

Q. That is according to the code contained in rule 16 of the transportation book of rules?

A. That is right.

Q. You spoke of broken knuckles, Mr. Fail. Did you have any cases of broken knuckles causing actual break-in- [fol. 4883] two of the train in 1940?

A. Yes, I am sure that we did.

Q. Will you tell me the place and date?

A. No, I don't recall right now. It seems to me like you might find one there at Deming and you might find one at Rutter.

Q. Those would be in 1940, would they?

A. I don't know.

Q. They would show up on the time returns and delay reports?

A. That is right. I remember the one in Rutter that we delayed the morning passenger train about twenty minutes getting this knuckle replaced.

Q. That, you are satisfied, was in the year 1940?

A. I just think that, but it could have been 1939 and could have been 1938. Those things are more or less like meeting someone you know on the street and two weeks later you

don't know what day you met him but you remember seeing him up here on the street. It is just part of our daily routine. I don't have any reason to remember those things. I remember that journal that I dropped mighty clearly because they fired me for eleven days and those are kind of little reminders and they told me there wouldn't be [fol. 4884] any more of those. That is one reason why I am pretty particular about a hot-box because the company told me there wouldn't be any more of those. In other words, they would run me off so I am trying not to drop any more.

Q. All of the cases where you had broken knuckles causing a parting of the train will show up in your time returns and delay reports?

A. That is right—no, I will take that back, I won't testify to that because there isn't an official in the company's employ that I have worked with in actual service that hasn't stole knuckles from other cars to hide and cover up and I won't make that statement.

Q. Suppose you have a ten-minute delay replacing a broken knuckle, that is possible, isn't it?

A. Yes, sir.

Q. Won't you have to show that on the time return and delay report?

A. That depends. No, you wouldn't have to because that is part of the cover-up. We don't want to go to the office and tell the train master how we broke in two and that involves the engineer and maybe the conductor and brakemen, maybe all of us and that is part of the cover-up. No, [fol. 4885] I wouldn't say that.

Q. Did you you have any occasion during the year 1940 when you had to chain your train together after it had broken in two?

A. Yes, sir, I remember one more recently.

Q. During the year 1940, will you tell us about that?

A. I just don't know whether that was in 1940 or 1941, it hasn't been very long ago. I don't remember whether it was before the first of the year or since, but it is the clearest in my mind. It happened at Anapra, New Mexico, and the AC key dropped out of a car possibly 25 cars from the caboose and derailed the train. That is the AC key that holds the draw bar in place.

Q. That is that large rather heavy flat piece of metal like a slab of metal?

A. That is right.

Q. That inserts in the slot in the draw bar and also in the draft yoke?

A. Yes.

The Court: Might that be otherwise designated and known as the coupler yoke key?

A. Well, in that type yoke, your Honor, they don't refer to that as a yoke but that is right at what we mean. This [fol. 4886] is the AC key, I don't know what they term as the AC key because I am not required to familiarize myself with the names of that draft gear or those parts, but it is the key that goes in there that holds the draft gear that holds the draw bar in the car. I recall another——

Mr. Mason (Interrupting): Just a moment could that have been on October 26, 1940, this Anapra incident?

A. Yes, it could have been.

Q. Do you recall the length of the train?

A. I am reasonably sure that it was a 70-car train or under or somewhere thereabouts, I don't know.

Q. That is the only occasion which you had to use the chain during 1940, is that correct?

A. No.

Q. That chaining took place at Anapra, did it?

A. Yes, sir, west of the west switch at Anapra.

Q. Were you able to use the engine to transport the chain to the place of use?

A. We used the car that was next to this—no, I will correct that, we pulled the head end of the train down and came back to the bad order car through the sidetrack.

The Court: Mr. Fail, would you be permitted to use the chain midway of the train if it broke if you had occasion to [fol. 4887] use it or would you take that car out and put it at the rear of your caboose like was testified here this morning?

A. That would depend on what the emergency was. If I was crowded for time ahead of passenger trains and I could make a good enough tie, I would take the train on to the next sidetrack.

The Court: In other words, if the chain is strong enough that it would stand the pull of the train?

A. Yes, sir, it will do that but that would depend on conditions as to how many trains I was sewing up or, in other

words, delaying as to just how I would try to handle that. I would try to expedite the movement of the train but the chain is strong enough to handle the entire train if you can make a good tight tie together.

Mr. Mason:

Q. You had no casualty or personal injury reportable to the Interstate Commerce Commission occurring on any of these cases where you had a broken knuckle, had you excepting casualties possibly to trespassers?

A. I have made out different accident reports I think for different employees who were braking on the crew for me but I just don't have the recollection of the individual [fol. 4888] cases or what could — been. If you would allow me to refresh my memory from your reports, I expect I could tell you some good stories about what has happened because I have been in a lot of stuff but I can't remember offhand, I don't have anything to refresh it.

Mr. Mason: I will refrain from offering the obvious comment at this point.

Q. Do you contend or assert that you are unable to make a standing inspection of a train of more than 70 cars, an adequate standing inspection of a train of more than 70 cars?

A. At certain places it cannot be done.

Q. A standing inspection?

A. That is right, it cannot be done.

[fol. 4889] Q. Now, it is your assertion that the failure or inability to make an adequate standing inspection of a freight train would result in defects going undiscovered?

A. Well, I wouldn't say that. As I understand you to mean that the air brake would be set again after I had pulled the train by or allowed the train to pull by me, the air would be set by the engineer in order to slow the train slow enough for myself or members of the crew to get on the caboose.

Q. Mr. Fail, I guess you misunderstood. I am talking about standing inspections and not rolling inspections. There is an inspection, is there not, Mr. Fail, covered by the rules, where the conductor and the brakemen walk alongside of the standing train to inspect for defects in the draft gear, running gear, and running appliances?

A. There are certain side tracks where we can only inspect one side of the train at a time.

Q. Answer my question, please, whether such standing inspections are required by the rules?

A. From one side of the train.

Q. Now, is it your position and contention that you cannot make this inspection while the train is standing, ade-
[fol. 4890] quately, upon trains of more than 70 cars?

A. Well, the inspection can be made, understand, but under the conditions that we have——

Q. Those conditions that exist with trains of 70 cars, aren't they?

A. The point I would like to bring out to you——

Mr. Mason: Will you answer my question?

The Witness: Between the switches——

Mr. Mason: Just a moment. May I have the question read?

The Witness: It would be hard to inspect your train.

Mr. Mason: May that be stricken?

The Court: It may be stricken.

Mr. Mason: Read the question, please.

(The following question was read by the reporter: "Now, is it your position and contention that you cannot make this inspection while the train is standing, adequately, upon trains of more than 70 cars?")

A. Upon trains of more than 70 cars, the rear thirty stick out beyond the side-track, while between the switches it is a good place to walk, but where the rear thirty is sticking out beyond the switch, it is not a good place to walk. You can inspect seventy cars, but with more than
[fol. 4891] seventy cars, they are hard to inspect, due to the shoulder on the track, the absence of the shoulder along the track, or rough ground or fill.

The Court: Well, that is assuming that you are stopped at a siding that won't accommodate your train?

A. That is true, but he didn't specify, your Honor, where the stop was going to be made, and that was the point I was trying to bring out, that with more than seventy cars, yes, it would be hard to inspect them.

Mr. Mason: Don't you have a station at which there is a siding with more than a hundred cars capacity, ap-

proximately every twenty-one miles between El Paso and Lordsburg?

A. I would have to figure that up.

Q. There are seven of them, including Deming, aren't there?

A. Yes, sir, seven.

Q. 148 miles.

A. Yes, sir.

Q. Are you in pretty good health, Mr. Fail?

A. Not too good in the last three or four years.

Q. Do you ascribe your ill health to the fear of slack action?

[fol. 4892] A. A lot of it: At times—— Now, let me explain that, please, and I will try to make a comparison so that you will get the feeling. When you drive an automobile five or six hundred miles a day and at the end of the run you step out and just kind of relax, that is the way you feel on a trip where you have been continually on the alert, and I think when you are driving an automobile, if you are not on the alert you should be on the alert, and when you are riding behind 100 cars you don't know where you are going, you don't know what the engineer is going to encounter, you don't know anything about it, only that the first thing you can think of is to get hold of something to protect yourself.

Q. You haven't missed any trips in 1940 on account of ill health, have you?

A. Yes, sir, yes ma'am.

Q. 308 trips.

A. In 1940?

Q. That is an average of 25 trips a months, isn't it, Mr. Fail?

A. I don't know; I can't take your record for it.

Mr. Strouss: He hasn't testified yet that he made any such trips. There is nothing in the record to show that. [fol. 4893] The Court: That is true.

Mr. Mason: Mr. Fail, do you agree or disagree with my suggestion that you made 308 trips during the year 1940, 297 of them as a conductor in freight service?

A. I don't know if that is accurate, I haven't seen the report, I haven't checked it and I am not testifying to anything I don't know to be true.

Q. Mr. Fail, if you have averaged approximately 25 trips per month as a conductor in freight service—and I assure you that we will prove it from your own time returns and delay reports—would you say or would you not say that that is a pretty fair average of work for a freight conductor?

Mr. Strouss: I object to that as immaterial.

The Court: Well, I will overrule the objection on that ground.

A. I will refer you—you say I didn't lose any time in 1940?

Mr. Mason: No, the question I asked you was whether you would say that 25 trips a month on an average was a pretty fair average month?

Mr. Polley: Isn't that assuming something not in evidence?

[fol. 4894] The Court: On that ground I will sustain the objection.

Mr. Mason: Mr. Fail, is there a monthly mileage limitation applicable to your services as conductor?

A. It is in one respect, but not enforced in any respect.

Q. What is the monthly mileage limitation?

A. 3800 miles, and it couldn't be applied now the way business is, with the number of men they have, if they made it 4400 miles it couldn't be applied, because the business is greater than the number of men to move the business.

Q. But your agreement, your conductor's agreement under which you work contains a limitation of a freight conductor's mileage to 3800 miles, or its equivalent?

A. It is, but I cannot see any relevancy of the conductor's agreement mixed up with the Train Limit law of Arizona.

Mr. Mason: I will ask that all that statement about the relevancy be stricken as volunteered.

The Court: Yes, that may be stricken.

Mr. Mason: Now, Mr. Fail, I think you said that it was reasons of health that impelled you to go to El Paso when [fol. 4895] you made your change from the Coast division?

A. Yes, pertaining to my wife's health.

Q. Now, if your health is affected by fear of slack action on long trains, you have it in your power by the exercise of seniority to go to short train districts, haven't you?

A. That is right.

Mr. Mason: That is all.
Mr. Polley: That is all.
The Court: You are excused, Mr. Fail.

(Witness excused.)

Mr. Strouss: At the close of Mr. Ash's testimony, I had this count made. Mr. Sines has checked it. Now, I find that he made, the report shows, a total of 142 trains, with 22 of those trains over 70 cars.

Mr. Booth: That was Mr. Ash.
Mr. Strouss: That was Mr. Ash.

Edward B. Shaw was called as a witness in rebuttal and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Polley:

Q. Will you state your name, please?
[fol. 4896] A. Edward B. Shaw.
Q. And address?
A. Yuma, Arizona.
Q. And whom do you work for?
A. The Southern Pacific Company.
Q. And in what capacity?
A. Conductor at the present time, freight conductor.
Q. Will you state briefly your railroading experience?
A. I have had about 38 years as brakeman, switchman, and conductor, and with something over 24 years of it with the Southern Pacific.
Q. And what other railroads?
A. Chicago and Northwestern from 1903 until approximately 1915, and then with the Southern Pacific from 1916, with the exception of two years in the army during the war up to the present time.
Q. Have you a regular run as conductor now?
A. Yes, sir.
Q. And how long have you had it?
A. Well, this particular run you mean?
Q. Yes.
A. This particular run that I have now, I have only
[fol. 4897] had somewhere about five or six months I think.

I have been assigned, an assigned regular conductor for most of the past fourteen years.

The Court: And where is your assigned run now?

A. Between Yuma and Gila.

Mr. Polley: Over what other territory of the Southern Pacific have you worked?

A. Well, practically all of it between Yuma and El Paso.

Q. Have you worked from Yuma to Tucson?

A. Very little. Very little from Gila to Tucson, but a good deal from Yuma to Gila.

Q. Have you worked from Tucson to Lordsburg?

A. Very little; I would say only about four months altogether.

Q. But you have made the run?

A. Yes.

Q. And you are familiar with the territory?

A. Yes, sir.

Q. And from Lordsburg to El Paso?

A. Yes, I worked there on that end for approximately ten years just after the War.

Q. Have you ever worked from Tucson to Douglas?

A. No, not from Tucson to Douglas, that is one district I haven't covered.

Q. And not from Douglas to El Paso?

[fol. 4898] A. Yes; from El Paso to Hachita, and from Hachita to Douglas.

Q. And most of that has been in freight service?

A. Yes, sir.

Q. Have you had any passenger experience at all?

A. Well, I have had, I don't suppose, over three or four passenger runs since I have been in service, I mean extra-passenger trains.

Q. Are you familiar with the rules of the company relative to the duties of brakemen and conductors?

A. Yes, sir.

Q. And are you required to take an examination upon them?

A. Yes, sir.

Q. And from a practical standpoint, are you familiar with the duties of brakeman and conductors?

A. I believe so, yes, sir.

Q. Were you in the courtroom yesterday when Mr. Fail testified and described the duties of a freight brakeman?

A. Yes, sir, most of the time; I believe I was in when he was describing all of that.

[fol. 4899] Q. When he recounted his experiences as to just exactly what a brakeman has to do?

A. Yes, sir.

Q. Have you had similar experiences?

A. Yes, sir, very similar.

Q. Would you state whether or not his description was true, fair and correct?

A. I think so. It possibly didn't cover quite all.

Q. Have you anything you would like to add? I will ask you, do you know of any duties that he didn't mention?

A. Well, of course, there are many things that come up which necessitates our action. I might give, as an example, that one time I saw a boxcar burning up on a siding, I pulled the air on the train and put out the fire. That was my duty to do that, things of that kind it would be hard to include in the regular duties. Nevertheless, they are duties of the train crew.

Q. Have you ever rebrassed a journal?

A. Many times.

Q. Did you hear Mr. Fail testify as to the method of rebrassing a journal?

A. Yes, sir.

Q. The difficulties encountered?

[fol. 4900] A. Yes, sir.

Q. And the hazards encountered?

A. Yes, sir.

Q. Have you had the same experience?

A. Yes, sir.

Q. Would you state that his description was true and correct?

A. I would.

Q. What causes or brings about the necessity for rebrassing journals?

A. Well, the principal reason for rebrassing a journal is to get a worn-out journal out of there and get a new one in, one that has become hot and burned off the babbitt.

Q. Are hot boxes common causes of damaged journals?

A. Yes, sir they get hot and sometimes cut the journal, sometimes overheat the journal until it breaks off.

Q. A hotbox is something that develops instantly, or does it develop gradually?

A. They develop more or less gradually, owing somewhat to the load and to the speed and to the condition, of course, of the brass.

Q. Well, is it possible to detect a hotbox before it results [fol. 4901] in a damaged journal; is it possible for a trainman to detect it, I should say.

A. Under certain conditions, it is very possible; under other conditions it is not so possible.

[fol. 4902] Q. I will ask you this, what effect does the number of cars in the train have upon the ability of the trainmen to detect hotboxes?

A. It lessens the opportunity to vision the car, the hotbox itself. Of course it puts you further away, if you are in the caboose and the hotbox is in the middle of the train it puts you further away from it and a train is always throwing up more or less dust, naturally there would be more with more cars than a short train. In other words, with a short train say of 50 cars you can at most times see all of your train and the danger of accidents through hotboxes is not nearly so great as it would be with twice that number when you couldn't see all of your train or possibly not more than half of it.

Q. Have you ever had occasion to chain two cars together in a train as the result of a broken knuckle or damaged draft gear or some other cause of a break-in-two?

A. Yes, sir.

Q. Did you hear Mr. Fail describe the procedure of chaining cars together?

A. I don't believe I heard that. Yesterday?

Q. Yes.

A. No, I didn't hear that.

[fol. 4903] Q. In the case of a broken knuckle, is it always possible to replace that knuckle on the road?

A. No, not always. It depends on whether you have that type of knuckle or whether you have an emergency knuckle that would fit in that car or whether the draw bar itself is damaged to where you might not be able to use the knuckle.

Q. In that case what do you do?

A. Chain them up. Usually we try to switch them next to the caboose or behind the caboose, depending on which end is out. If an eye is broken out of a knuckle, you must

then chain them up, take them ahead of the caboose or chain them up behind the caboose.

Q. Have you had trouble with the sticking of triple valves?

A. Very common trouble, yes, sir.

Q. Do you still have that trouble?

A. Yes, sir.

Q. What is the effect of a sticking triple valve?

A. Well, it depends on how much the brake is sticking.

Q. First, what does it do?

A. It heats the wheels in the first place and perhaps [fol. 4904] slides the wheels.

Q. Is that caused by the application of the brakes?

A. It is caused partly by the application and partly by not properly releasing the brakes.

Q. And that results in what?

A. In overheating wheels or possibly a broken flange or possibly a broken wheel; possibly flat wheel.

Q. What is the danger in a broken wheel?

A. Usually it results in derailment or wreck.

Q. What is the usual result of a flat wheel?

A. It depends on how flat it is. If it is much over two and a half inches I would say it becomes dangerous to the rail itself. It may break the rail, especially in cold weather or it may break the wheel.

Q. Are you familiar with the inspection of trains by the crew?

A. Yes, sir.

Q. A standing inspection and a running inspection?

A. Yes, sir.

Q. In your opinion does the length of the train have any effect upon the inspection of the train by the crew?

[fol. 4905] A. Well, of course it takes much longer to inspect a long train than it does a short train. It is more difficult to inspect a long train than it is a short train and in some cases it is not nearly as practicable to inspect a long train. I say that because if you are in a short siding and part of your train was out on the main line and you had to saw by another train at least two members of the crew, well, particularly three of them are flagging. One of the crew is flagging at the fouling point, one is flagging ahead and one is flagging to the rear so you haven't anyone left but the conductor to inspect the train and it is his

duty to see that the brakemen are in proper position so that he is really not available.

Q. It is possible to make an inspection on a 100-car train as fast as on a 70-car train or in the same length of time?

A. No, you can't even walk 100 cars as quick as you can 70.

Q. While the train is moving, do the trainmen have any duties relative to watching and observing the train?

A. Yes, sir.

Q. What are those duties?

A. The head brakeman watches out from the gangway [fol. 4906] of the engine, watches both sides of the train at short periods, he takes a look. The swing brakeman and the rear brakeman in our state of Arizona both watch, one on each side of the cupola in the caboose, watch the train. The conductor, my experience has been many times steps out on the rear platform to look at the track from the rear to see if anything might be dragging and leave marks on the ties or he looks out the side windows there to see that everything is all right.

Q. What defects do you look for especially?

A. Principally at night for fire. If a brake beam is down, it usually throws fire; if a hotbox is hot, it blazes. If brakes are sticking, they throw fire. In the daytime brake beams down would throw dust, a cloud of dust; you could see smoke from a box and possibly fire.

Q. What effect does the length or the number of cars in a train have upon your ability to detect those various things?

A. With a short train, I say a short train, an average train of 50 cars you can see from the cupola in the daytime on an ordinary clear day every car in the train. I would say you could see every car in the train to the engine.

[fol. 4907] Q. Is that possible on a 100-car train?

A. No, sir.

Q. Do you you know what slack action is?

A. I know what it is, I don't know whether I could give a very good definition of it but it is the run-in and run-out of a train caused by one part slowing up and the other part catching up to it or vice versa.

Q. In your experience have you observed slack action in a train?

A. Yes, sir.

Q. Have you been on trains?

A. Yes, sir.

Q. Is slack action more severe in some territory than in others?

A. Yes, sir.

Q. For instance, in what territory is it more severe, or what type of territory?

A. You might say what we call hogbacks create slack action in running. You mean, I suppose, in ordinary running over the road? You are not speaking of stops?

Q. Ordinary running, yes.

A. Going over hogbacks or sharp hills or uneven track would cause run-ins and run-outs and very active slack action.

[fol. 4908] Q. Is slack action usually prevalent on level territory?

A. No, sir, I wouldn't say so except in stopping or starting.

Q. You have testified I believe that you have operated over the territory between El Paso and Lordsburg?

A. Yes, sir.

Q. What type of territory is that?

A. I would say that is more or less rolling and level. I don't think there are very many what we term hogbacks in that territory although there may be one or two places where the slack action is quite severe.

Q. Is it necessary for the engineer to apply the automatic air between El Paso and Lordsburg?

A. Well, when I worked out of El Paso with the long trains—you mean with long trains?

Q. Yes.

A. When I worked out of El Paso with the long trains we used to ask the engineers not to use the automatic air under any conditions.

Q. Why was that?

Mr. Mason: I would like to have the record clear. By the automatic you mean the train brakes?

A. The train brakes as distinguished from the engine [fol. 4909] brakes.

Mr. Mason: That is all.

The Witness: We agreed that if he needed to use the automatic air at that time that rather than have him use

it we would prefer to set some of the hand brakes and help him hold it with the engine brakes to save ourselves injury or perhaps save chaining up of the cars.

Mr. Polley:

Q. Have you also operated over the territory between Lordsburg and Tucson?

A. Yes, sir.

Q. What type of territory is that with reference to the possibility of slack action?

A. There are more heavy grades in that territory and of course much more braking power is needed to cover that territory. In other words, they have to use the automatic brakes there. You cannot run a train, in other words, a long or short train over that territory without using automatic air.

Q. Does that increase the possibility of slack action?

A. Yes, every time the automatic air is used I would say that the slack action increases, the danger of damage is increased.

Q. Between Yuma and Gila what type of territory is [fol. 4910] that?

A. Between Dome and Wellton we have about three places there where we get a run-in and run-out of slack action, quite severe at a place called Ligurta, both ways. Then we get quite an active slack action about a mile east of Smurr and one other place in between those we get quite a slack action, at or near Stoval and one or two other spots to a lesser degree.

Q. Back when you first began as a brakeman or conductor with the Southern Pacific was slack action experienced then?

A. Yes, sir.

Q. Since that time have you noticed any improvement in the equipment used by the company?

A. What kind of equipment?

Q. Rolling equipment.

A. Yes, I think there has been quite a noticeable improvement in equipment since that time.

Q. Can you state whether or not slack action has been decreased by the use of this improved equipment?

A. From my experience I would say that it was unchanged.

Q. It is just as bad now as it was then?

A. Yes, sir, I can't see any difference in it or that it [fol. 4911] has been overcome in any way.

Q. How do you as a trainman protect yourself against slack action?

A. We just tie ourselves down, get hold of something and lay down. I usually, if I have any indication of it, I get on the cushion and hold on.

Q. Between Dome and Wellton if you anticipate slack action just explain to the court what you do?

A. That is a regular procedure through there, we know those spots and know they are there and take steps to protect ourselves. In other words, I can't do any work between those points successfully so I usually just sit down on the cushion and hang on until we get over those points. That is in the regular running movement of the train at those points. Sometimes they are more severe than others, pending of course on the train and the length of the train and perhaps on where the loads are placed in the train and somewhat on the engineer.

Q. Have you in your railroading ever experienced a reportable injury as the result of slack action, let us confine it to the Southern Pacific?

A. I don't just recollect offhand of having myself any reportable accident. I never distinguished a reportable [fol. 4912] accident from any other accident until this hearing and I never had given it any thought but I don't just remember any reportable accident I have had that was directly owing to slack action of a long train. I can't recall it. However, I may have had, I couldn't say that I have or I haven't.

Q. Have you ever experienced bruises or been shaken up as a result of slack action?

A. Yes, many times.

Q. Is that something to be on the watch for continually?

A. Yes, sir, naturally.

Q. Have you ever seen other members of the crew shaken up or bruised?

A. Yes, sir, it is an everyday occurrence for me in the performance of my duties to call the attention of the members of my crew to sit down and watch themselves, especially if we hear the air go on.

Q. Would you have to be injured fairly seriously before you would lay off more than three days?

A. Yes, sir.

Q. Have you ever seen objects in the caboose dislocated?

A. Many times, yes, sir. Many times I have had the stove turn over, torn loose and turned over and the water [fol. 4913] cans turned over and had the caboose knocked off center, I have had those things happen many times since I have been railroading.

Q. Take the stove, is that fastened to the caboose in some manner?

A. It is fastened to the floor with bolts, possibly half-inch bolts or quarter-inch bolts.

Q. Would you say it requires quite a shock to dislocate that stove?

A. Yes, it takes quite a shock, yes, sir.

Q. Does the expectancy of slack action worry you in any way? Does it affect your nervous system in any way?

A. Well, naturally it does. I might say that I don't think it worries me as much now as it did when I was in Texas and I don't think it worries me as much as it does these fellows in California. I have seen them come into register——

Mr. Mason: (Interrupting) I object to that as hearsay and an opinion and conclusion of the witness as to other unnamed individuals. That is obviously incompetent.

Mr. Polley: He has stated he saw them come in.

The Court: He may describe what he has personally seen but not attempt to testify as to what any of these trainmen [fol. 4914] have told him, that would be hearsay.

Mr. Mason: Or as to how they felt.

The Court: Yes, you may state what you personally observed.

A. I was going to state, your Honor, that I have seen conductors come into the Yuma yard from California when I would be registering out and they would be so nervous they couldn't register and would ask somebody to register them in. I have seen that occur several times when they came in with cars chained up behind the caboose and had been having serious difficulty with slack action in the train. I have seen that occur several times.

Mr. Polley:

Q. Has the length of the train or the number of cars in the train any relation to slack action?

A. Yes, of course. The more cars naturally the more slack action there will be in the train.

The Court: We will take our mid-afternoon recess at this time.

(Thereupon a short recess was taken after which proceedings were resumed as follows;)

[fol. 4915] The Witness, Edward B. Shaw, was recalled to the stand, and proceedings were resumed as follows:

The Court: You may proceed.

Mr. Polley: No further questions.

Cross-examination.

By Mr. Mason:

Q. Mr. Shaw, you have been putting in most of your time the last ten years out of Yuma, haven't you?

A. Yes, sir.

Q. Running between Yuma and Gila and between Yuma and Phoenix?

A. That is correct.

Q. Do you make your home at Yuma?

A. Yes, sir.

Q. Now, during the year 1940 you put in a pretty full year, didn't you?

A. Last year, yes, sir; I think with the exception of perhaps, oh, I would say, roughly, forty days off, something like that.

Q. You gave yourself a little vacation in July and August, didn't you?

A. Yes, sir.

Q. After the heavy work of the month of June had [fol. 4916] passed by?

A. Well, I was a delegate to the National Democratic Convention, I went to that in Chicago.

Q. But after you came back, you were on pretty full time during the latter part of the year, weren't you?

A. Yes, sir.

Q. The memorandum I have indicates that you made 254 trips altogether, of which 236 were in freight service

and 18 were dead-head trips. Is that about in agreement with your recollection?

A. I couldn't say, but I wouldn't disagree with that, I would say that it very likely is correct.

Q. By the way, what is your seniority date as a conductor on the Tucson-Rio Grande seniority district?

A. 1924, but I just forget the month.

Q. That is as conductor?

A. Yes, sir.

Q. Of course, you continue to hold your seniority as brakeman from 1915?

A. Yes, from 1917 on this division.

Q. 1917 on this division?

A. Yes, sir.

Q. And that seniority from 1924 enables you to hold a [fol. 4917] regular run as a conductor in pool freight service?

A. Yes, sir.

Q. How long is it since you worked on the east end seniority district out of El Paso?

A. I think I left there the last time in 1928.

Q. Then, you really haven't made any runs in long-train territory since 1928?

A. No, sir.

Q. And your statements as to what happens or may happen, to long trains, is, in so far as it is based on actual experience, based on experience prior to 1928 then, isn't it?

A. Yes, sir.

Q. By the way, you recall, do you not, that during April of 1940, you handled one train consisting of more than seventy cars?

A. Yes, sir.

Q. That was the regular freight out of Phoenix to Yuma on April 20th, wasn't it? Do you recall?

A. I can't recall the date exactly.

Q. That is approximately correct?

A. It was near that time.

Q. And you had, do you recall, eighty-seven cars in that train; is that in accordance with your recollection?

[fol. 4918] A. I just can't recall that. I think there were two or three times that I had more than seventy.

Q. Two or three times?

A. I think so, yes, sir.

Q. Two or three different occasions?

A. I think so, yes, sir.

Q. Well, you do recall a train of approximately 87 cars on April 20th?

A. Yes, I believe I recall that train.

Q. And do you recall that your trip was without any particular incident at all?

A. I don't recollect anything unusual on the trip.

Q. Do you recall whether, during the year 1940, you had occasion to rebrass a car?

A. I know that we did rebrass cars in 1940, but I don't recollect the instances.

Q. Do you recall more than one such instance?

A. I think I could state positively that there was more than one.

Q. Your time returns and delay reports would indicate all the instances where you had to rebrass a car?

A. Not necessarily, no, sir. We might brass a car in a siding when we were waiting for a train, and make no [fol. 4919] report of it on the time slip, on the delay report.

Q. If you were in a siding to rebrass a car, you would be able to use the engine to transport the materials to the point if it was very far from the engine or the caboose, could you not?

A. Well, that would depend upon where the other train was. In other words, we couldn't get out on the main line on the other fellow's time.

Q. You always use the engine when you can, of course?

A. Well, when it is convenient and we can do so. It saves delay, of course, saves a lot of hard lifting and carrying.

Q. Now, you have never had in your experience, Mr. Shaw, a casualty to yourself or to any member of your crew involving more than three days' disability occurring in connection with a burned-off journal, have you?

A. I have never had a burned-off journal.

Q. Did I understand you to say that when the train is running along, it is ordinarily possible to observe all of the cars of a fifty-car train from the caboose?

A. In clear weather, yes, sir.

Q. Well, the weather between Yuma and Gila, and be- [fol. 4920] tween Gila and Phoenix particularly, is almost always clear?

A. Yes, sir.

Q. Isn't Yuma the place where they boast there is never a day without sunshine?

A. Yes, they give free meals over there when the sun doesn't shine.

Q. As a matter of fact, you can observe practically all of the cars with a seventy-car train from the caboose in the good weather that you have between Yuma and Gila, can't you?

A. Well, not as you can fifty. I would say that you can't observe seventy from one end of the train, from either the caboose or the engine, to feel safe with that many. Of course, with an observer on each end of the train, you can take care of it pretty well.

Q. You do have an observer on each end of the train, don't you?

A. Yes, sir.

Q. It is the duty of the head brakeman to ride the engine or the first car of the train for the purpose of observing the train?

A. Yes, sir.

Q. As well as for his other duties?

A. Yes, sir.

[fol. 4921] Q. Did you, during 1940, have occasion to use the chain in order to fasten your train together after a break-in-two?

A. I believe so; but I can't recall the times. I have a very poor memory for dates.

Q. By the way, you have had occasion to lift that chain and carry it, haven't you?

A. Yes, sir, many times.

Q. That is the chain that is 16 feet long, isn't it?

A. Well, I don't know exactly how long it is, but I know that two men can walk four or five feet apart and it will hang over both of their shoulders. I would say the average chain we used to have is around ten to twelve feet, possibly longer.

Q. And do you know how much it weighs?

A. Oh, I know that it weighs an awful lot when you carry it forty or fifty car lengths. I can't say what it weighs actually, no, sir.

Q. It weighs a lot if the sun is overhead.

A. Yes, sir, and if the ground is rough where you are walking.

Q. Would you be surprised if it weighed about 130 pounds?

A. Yes, sir, I would be surprised that it didn't weigh [fol. 4922] more than that. I have no idea what they weigh.

Q. Now, I think you indicated in your testimony that a sticking triple valve is sometimes encountered?

A. Yes, sir.

Q. You discovered that by observation at the standing or running inspections, do you?

A. Standing inspections, we notice by observation.

Q. You can see the brake that has failed to release from the wheel, can't you?

A. Yes, you can see that, or you can see the triple itself if it is on the side you are on.

Q. If you are running, will a sticking triple valve show up by causing the grease to heat and the wheel to smoke?

A. Yes, if there is any grease on the wheel.

Q. There usually is, isn't there?

A. Not necessarily. Lots of times, on new wheels there wouldn't be any grease on them, we have many new wheels.

Q. By the way, the new wheels you are getting on practically all cars are the new type of single plate wheel instead of the old type double plate, aren't they?

[fol. 4923] A. Yes, sir.

Q. And that leads to a uniform expansion and the avoidance of cracking and breakage under heating, doesn't it?

A. I don't know about that, I haven't heard of that feature.

Q. Have you ever had a reportable casualty to yourself or to any member of your crew causing more than three days' disability, and which resulted from an overheated or broken wheel, and the derailment which would result from that?

A. I couldn't say positively, but I have no recollection of it. As I said a while ago, I have never heard what is called a reportable accident explained until today, that a reportable accident is one which caused a man to lose three days' time or more.

Q. I think the rules of the Interstate Commerce Commission, which are in evidence, say that it is more than three days in the ten days next following the accident, and that is the type of casualty to which I refer in my question. Have you ever had a derailment due to a flat

wheel, resulting in a reportable casualty of the kind I have described?

A. It seems to me that I have, but I just can't recollect [fol. 4924] when it was. Usually, when we have wheels flat, if they are over two-and-a-half or three inches flat, we set them out regardless of the contents of the car.

Q. This inspection which you spoke of taking place at stops, that is the standing inspection, and the rolling inspection as well, are for the primary purpose of detecting any defects in the freight-car equipment which would be likely to lead to derailment or a break-in-two; aren't they?

A. Yes, sir.

Q. And I take it, then, that an incomplete or inadequate inspection might lead to a failure to detect some of these defects?

A. That is true, yes, sir.

Q. Do I understand you to say, that with a longer train it is more difficult to make an adequate inspection than if the train consists of less than seventy cars?

A. Well, under certain conditions it would be more difficult, yes, sir.

Q. Well, standing inspections, of course, are made at stations usually, aren't they?

A. We make them wherever we stop, wherever we have an opportunity to make the inspection.

[fol. 4925] Q. And your stops for inspection are normally at stations?

A. Well, I wouldn't say that. We seldom make what we might term normal inspections. In other words, take on our end down there, we go from Yuma to Wellton, take water, we make an inspection while we are taking water; we may meet a train between there and Mohawk, we make another inspection meeting that train; we may then go to Aztec and take water again and make another inspection; go to Sentinel, and take water and make another inspection. Our regular inspection, that is the maximum point, is Kim, to make inspection.

Q. You never reach that because you take water before you get there?

A. We don't need to stop there because we have made inspections before we get there.

The Court: Those inspections that you speak of that you make at these designated points, are those standing inspections or rolling inspections?

A. They are both, your Honor; we walk up the sides of the train, both sides of the train, then when the train pulls out we make the rolling inspection as it pulls out, so that we have both standing and rolling inspection.

Mr. Mason: These inspections, then, are made in all of [fol. 4926] the cases you mention, on eastbound trains at station stops?

A. Well, no, not necessarily—well, you say, "Station stops"; at siding stops?

Q. Yes.

A. Yes, sir, those particular inspections are, yes, sir.

Q. I think that you said that one of the difficulties of inspecting a long train was that there wasn't sufficient room to walk alongside of the train because part of it would hang out over the end of the siding and on to the main line.

A. I don't think I made that statement.

The Court: That was the previous witness, Mr. Mason.

Mr. Mason: Very well.

Q. Then you don't undertake to say that there is any difficulty in making an inspection of a hundred-car train as compared to a seventy-car train?

A. Yes, sir, I made the statement that with a hundred-car train and entering to meet a train, a seventy-car siding, for instance, that the head brakeman would have to flag that train you are meeting, the rear brakeman would have to flag behind the caboose which is still on the main line, [fol. 4927] the swing brakeman would have to make the short flag at the follow point, and nobody would be left to make the inspection.

The Court: You are not confronted with that situation in your territory, are you?

A. Yes, very much so.

Q. You mean in Arizona?

A. Yes, sir.

Q. Where you have a hundred-car train?

A. No, we have 70 cars, but our cars are so much longer than they used to be, that when we get 70 cars now we cannot get them in the 70-car sidings.

Mr. Mason: There are some cases where your 70-car trains will hang out over these sidings?

A. Yes, most all of them do.

Q. There is no difficulty in the situation you have described of inspecting a long train which would not be entirely obviated by having the sidings extended?

A. If the sidings would hold the train, then the crews could walk up and inspect the train, they wouldn't have the other duties to perform.

Q. If long-train operation were undertaken, it would be necessary, would it not, to have long sidings in any event to permit trains to meet and pass?

A. I would think so, yes, sir.

[fol. 4928] Q. Your experience with slack action at least since 1928, Mr. Shaw, is confined to trains of 70 cars or less, isn't it?

A. Yes, sir, and minor bruises.

Q. You have never in all of your service experienced personally a casualty due to slack action which caused you to lose more than three days?

A. In all my experience?

Q. Yourself I am taking about.

A. I would say I don't recall it on the Southern Pacific.

Q. That is what I mean.

A. No, sir, I don't recall it on the Southern Pacific.

Q. That includes all of your active service since 1915?

A. Since 1916.

Q. You have not, at least since 1920, Mr. Shaw, been a member of a crew or a conductor on a train in which a member of the crew suffered a reportable injury on account of slack action, have you?

A. Yes, sir, I think I have but I cannot recall. I feel sure that I have but I can't recall the times or the cases.

Q. Referring to casualties which you have suffered when [fol. 4929] you were working in the long train territory east of Lordsburg, do you recall a disability which you suffered at Separ in 1924?

A. No, sir, I don't recall it.

Q. Perhaps I can refresh your recollection. Do you recall having been struck by a rock thrown by a trespasser when you were a brakeman?

A. Yes, sir.

Q. You lost three days?

A. Yes, sir.

Q. The train consisted of 61 cars?

Mr. Polley: We object to that, what difference does it make in the length of the train if he was hit by a rock.

Mr. Mason: It goes to show there are other casualties than slack action casualties which these men may suffer.

The Court: Objection overruled.

Mr. Strouss: I think the witness should testify as to what the length of the train is and not counsel for the defendant, however.

The Court: He is on cross-examination. If the witness disagrees with him, he may indicate it.

Mr. Strouss: If he doesn't know or remember this record certainly that is not material evidence.

[fol. 4930] The Court: Well, you made your objection and the Court has ruled on it.

Mr. Mason:

Q. Do you recall the length of that train?

A. No, sir.

Q. Do you recall whether or not it was more or less than 70 cars?

A. No, sir, I do not.

Q. Do you recall an accident when you were a brakeman on the train at Palo Verde in which you suffered seven days' disability, the accident occurring in 1932?

A. No, sir, I don't recall that.

Q. Do you recall an accident happening on March 7, 1937, at Montezuma when you were conductor of the train?

A. Yes, sir.

Q. Do you recall whether or not the train consisted of 57 cars?

A. No, sir, I don't. I got that finger split.

Q. The accident occurred while the train was standing, didn't it?

A. Yes, sir, unloading freight.

Q. You don't recall this accident at Palo Verde in which according to the memorandum before me you were a brakeman getting off moving car and slipped and fell on the [fol. 4931] ground?

A. No, sir, I don't recall that.

Q. There is a hazard of accidents to brakemen or to conductors getting off or getting on a moving car or train, is there not?

A. Naturally, yes, sir.

Q. You have seen that accident happen to members of your crew from time to time?

A. Yes, sir, I had one man killed that way.

Q. A member of your crew?

A. Yes, sir.

Q. When was that?

A. That was on the east end, in the '20's, Frank Carmichael, a member of the crew. I was a brakeman on the crew.

Q. Was this when the man was getting off the train to get a switch or running after the train after he had closed the switch?

A. No, sir, he was making a drop of some cars to the train.

Q. It was a switching accident while the balance of the train was standing?

A. Yes, sir.

Q. This getting on or off a moving car or train happens practically every time you head into a siding to make a meet, doesn't it?

[fol. 4932] A. They get off and on?

Q. Yes.

A. Yes, sir.

Q. Usually the train is in motion while the man gets off to get the switch ahead of the engine and after the train runs by the man runs to the train to get on after leaving the siding?

A. Yes, sir.

The Court: Do I understand in those operations the engineer must not proceed at a speed in excess of eight miles an hour?

A. Yes, sir, I believe that is the rule—no, I don't believe that is the rule either.

The Court: That is the rule for the rolling inspection?

A. Yes, sir, for the rolling inspection.

The Court: What we want to know is, are you as a conductor or brakeman required to catch that caboose at a speed in excess of eight miles an hour?

A. No, sir, we are not required to.

The Court: You customarily catch it at a speed in excess of that?

A. Quite often, yes, sir. We get the switch lined up as quickly as possible and take after the caboose. It may

[fol. 4933] be going faster than that and it may be going slower. It depends a lot on the grade and the ability possibly of the engineer to hold the train.

The Court: If you consider it is going at a speed that would be unsafe to attempt to board the car, I presume you could just stay on the ground and let the man in the caboose give the signal or throw the air on the engineer?

A. Yes, sir.

The Court: Does that occasionally happen?

A. Yes, sir, it occasionally happens we have to stop them and wait for the rear man to get on and once in a while we pull the air when he thinks everything is all right and goes ahead.

The Court: In the beginning of your examination you made reference to some three or four points on your run from Yuma to Gila where I believe you stated there always occurred this undesirable slack action, is that true?

A. Yes, sir.

The Court: You also spoke of the fact that some engineers were more skillful than others in the controlling of this slack. I believe you made that statement or indicated it at least?

A. Yes, sir, I believe I did indicate it to some extent. I [fol. 4934] think there is some difference in the way some handle it over others.

The Court: In the territory in which you are now operating, can even the most skillful engineer control that slack so that you do not have undersirable slack action?

A. No, sir, I don't think they can. There is very little difference in any of them.

Mr. Mason:

Q. You have never suffered any personal injuries as the result of this supposed failure to control slack at any of these points?

A. Not at these points because I know where they are and I take care of myself, that is ordinary running. They come down in the hole and the slack runs in and they come over the hump and the slack stretches out.

The Court: Being familiar with that territory you know where to expect that action?

A. Yes, sir, if I am where I can observe where I am I know where to expect it. If I am busy with my work it sometimes catches me when I don't realize we are there.

The Court: Supposing this train didn't have, we will say, to exceed 50 cars, would there still be this run-in and run-out at these points?

A. Not to any extent I don't think. Not to the extent [fol. 4935] there would be with 70 cars and I know not to the extent that there would be over that or under 100.

Mr. Mason:

Q. You do agree that the 70-car limitation has not prevented and does not prevent slack action at these points?

A. It hasn't prevented it altogether, no sir; it has helped it a lot.

Q. It has not prevented it at all, has it?

A. It has prevented such a run-in as we would have with more cars, of course.

Q. I think you said in answer to questions by opposing counsel that there have been substantial improvements in the rolling equipment since you first took employment?

A. Yes, sir.

Q. That includes, I take it, improvements in the air brakes?

A. Well, I would say some improvement, yes, sir, some improvement in the triples. I think they have put in heavier springs that we don't have perhaps quite the trouble we used to have in getting brakes released.

Q. There has been an improvement in the draft gear and draft rigging?

A. Yes, sir, they are heavier. There are improved to [fol. 4936] the extent they are heavier and not so apt to pull out as they used to be.

Q. There has been an improvement by reason of the elimination of the archbar truck, hasn't there?

A. Yes, I think so.

Q. You don't have derailments due to archbar failures?

A. Not so much as we used to have. We still have them once in a while but not so much as we used to have.

Mr. Mason: That is all, thank you.

Redirect examination.

By Mr. Polley:

Q. Mr. Shaw, along with the increase in the weight of the draft gears, has the weight of the cars increased in the same proportion?

A. Yes, sir.

Mr. Mason: I object to that on the ground that the witness is not qualified. He doesn't know what proportion the increase in the weight of the draft gears has been.

The Court: I will sustain the objection until you qualify him.

Mr. Polley:

Q. Have the cars become larger?

A. Yes, sir, much larger.

Q. And heavier?

[fol. 4937] A. Yes, sir, heavier.

Q. Did I understand you to say that prior to the improvement in equipment that the draft gears did pull out?

A. Yes, sir.

Q. And that has been eliminated to a certain extent?

A. I think, possibly, to a certain extent. I wouldn't say how much, but possibly to some extent.

Q. In other words, the draft gears are able to withstand the shock now?

A. Yes, sir, they are built much heavier and are able to withstand the shock I think better than they used to.

Mr. Polley: That is all.

(Witness excused.)

The Court: It is so near the closing hour I don't presume it would be advisable to start with another witness.

Mr. Strouss: I might take the time to put in some exhibits I have here that do not require putting a witness on the stand. With exhibit No. 152, the green book, it was my understanding with counsel that we would indicate the parts of that we wanted to use in evidence and as far as the plaintiff is concerned we have gotten those up.

[fol. 4938] The Court: That is the Santa Fe rules?

Mr. Strouss: That is the Santa Fe rules and we have also with the Southern Pacific air brake rules so it will eliminate the necessity of the whole book being used.

(Discussion off the record.)

The Court: I think this should be marked for identification.

The Clerk: Plaintiff's exhibit No. 327 for identification.

Mr. Strouss: I will offer that in evidence. I am putting this in with the understanding we had when Mr. Mahoney was the witness.

The Court: Is there any objection to it, Mr. Mason?

Mr. Mason: There is no objection.

The Court: It may be admitted in evidence as plaintiff's exhibit No. 327.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 327.")

Mr. Booth: We have the right to introduce such additional parts as we desire.

Mr. Strouss: Yes, that is understood. Now we offer an exhibit of six sheets entitled, "Southern Pacific Company, Pacific Lines, Air Brake Rules and Regulations." [fol. 4939] That is exhibit No. 319 in evidence.

Mr. Mason: The entire book is in evidence already, isn't it?

Mr. Strouss: Yes, the entire book is in evidence.

Mr. Mason: You are simply calling attention to excerpts?

Mr. Strouss: Yes, to reduce the record.

Mr. Mason: We have no objection to it.

The Court: It may be admitted in evidence.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 328.")

Mr. Polley: The Court will remember when defendant's witness Mr. Browning was on the stand that certain volumes entitled "Proceedings of the American Railway Association, Division V, Mechanical" were marked for identification and since that time we have agreed, or counsel has agreed, we might take certain excerpts from those volumes and have a representative of the defendant check the correctness of those excerpts and then introduce the mimeographed copies in evidence. Mr. Sines and I have agreed that the copies which I now desire to offer are correct. Is that correct?

Mr. Sines: That is correct.

[fol. 4940] Mr. Mason: I want to state right here that these may not be introduced in evidence as we have serious objection to them and I am prepared to argue those objections but not prepared to argue them tonight. As far as the correctness of these excerpts are concerned as being correctly transcribed from the volumes marked for identification the statement of counsel is correct, but there has been no agreement and I want that to appear emphatically in the record that they may be introduced.

Mr. Strouss: I don't think Mr. Polley meant that you had agreed or waived objection to the introduction of them as far as the legal objection is concerned.

Mr. Polley: Did I understand you are not prepared to argue it tonight?

Mr. Mason: Yes, it is quite a lengthy argument and I have a number of citations on each.

The Court: They may be marked for identification.

Mr. Booth: Those books were only turned over as foundational material.

Mr. Polley: This is an excerpt from the volume entitled "Proceedings of the American Railway Association, Divi-
[fol. 4941] sion V, Mechanical, 1929," and contains 32 sheets.

The Clerk: Plaintiff's exhibit No. 329 for identification.

Mr. Polley: We next ask that a document be marked for identification entitled "Excerpt from Volume Entitled 'Proceedings of the American Railway Association, Division V, Mechanical, 1930,'" containing 12 sheets.

The Court: It may be marked for identification.

The Clerk: Plaintiff's exhibit No. 330 for identification.

Mr. Polley: We now desire to have marked for identification a document entitled "Excerpt from Volume Entitled 'Proceedings of the American Railway Association, Division V, Mechanical, 1931,'" containing 4 sheets.

The Court: It may be marked.

The Clerk: Plaintiff's exhibit No. 331 for identification.

Mr. Polley: The next document entitled "Excerpt from Volume Entitled 'Proceedings of the American Railway Association, Division V, Mechanical, 1932,'" containing 2 sheets and we ask that that be marked for identification.

The Court: It may be marked.

The Clerk: Plaintiff's exhibit No. 332 for identifica-
[fol. 4942] tion.

Mr. Polley: I now ask to have marked for identification a document entitled "Excerpt from Volume Entitled 'Proceedings of the Association of American Railway, Mechanical Division, 1938 and 1939,'" containing 5 sheets.

The Court: It may be marked.

The Clerk: Plaintiff's exhibit No. 333 for identification.

Mr. Strouss: Now we offer in evidence plaintiff's exhibit for identification No. 206 which has on the title page, "American Railway Association, Division V, Mechanical, Power Brakes and Appliances for Operating Power Brake Systems, An Abstract of the Report of Results of Tests Conducted by the American Railway Association to Determine What If Any Improvements or Changes in the Present Standard of Brake Equipment for Freight Trains Are Necessary or Desirable."

The Court: Where did this come from?

Mr. Strouss: This is the volume which was identified by the witness Browning as the report made by Mr. Johnson, Director of Safety of the Mechanical Division of the Association of American Railway, following tests in conjunction with the Interstate Commerce Commission to [fol. 4943] determine the efficiency of air brakes.

The Court: This has already been marked for identification?

Mr. Strouss: Yes.

The Court: You are now offering the entire book in evidence?

Mr. Strouss: I am offering the entire book in evidence in order to avoid any question of excerpts being offered. I have excerpts of the parts which we are interested in but in order to avoid the objection that the whole book is not offered I am offering the whole book at the present time.

Mr. Mason: I have an objection to the book as I say and I am prepared to argue that but I haven't my memorandum of argument here.

The Court: Does this complete your offer?

Mr. Strouss: Of this type of evidence, yes.

The Court: The court will be at recess until 10 A. M., tomorrow morning.

(Thereupon the court stood at recess until 10 A. M., April 17, 1941.)

[fol. 4944] 10 A. M., April 17, 1941

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed.

W. A. KIDD was called as a witness in behalf of the plaintiff and being first duly sworn testified as follows:

Direct examination.

By Mr. Polley:

Q. Will you state your name, please?
A. W. A. Kidd.
Q. Your address?
A. 1222 East Chandler Boulevard, El Paso, Texas.
Q. Are you employed by the Southern Pacific?
A. I am.
Q. How long have you been so employed?
A. Since May 1, 1924.
Q. In what capacity?
A. Switchman, brakeman, and conductor.
Q. Will you briefly state your experience in railroading?
A. It has been approximately thirty-five years of service on various railroads throughout the United States and Mexico.

[fol. 4945] Q. In what class of service?
A. Train service, switchman, brakeman, and conductor.
Q. Have you operated on both freight and passenger trains?
A. Yes, sir.
Q. What territory do you work on now?
A. El Paso to Tucson via Douglas, Bisbee Junction over the south line.
Q. Are you familiar with what is described as slack action?
A. Yes, sir.
Q. Were you in the courtroom and heard Mr. Fail testify?
A. Yes, sir.
Q. Do you agree with his definition of slack action?
A. I do.

Q. In your railroading experience have you ever experienced injuries as the result of slack action?

A. I have.

Q. Will you describe that, please?

A. My first injury that I recall as the result of slack action I believe was in 1925, if I am not mistaken, April 26, 1925.

[fol. 4946] Q. Where was that?

A. At the crossing of the old south line and the Nogales branch just south of town here.

Q. Which way was the train proceeding?

A. To the old south line yard.

Q. Explain to the court what happened?

A. It was a rule of the company before this double track was put in effect that on our arrival off of the south line at this junction point and crossing that the head end would call up over the phone, call the yardmaster at Tucson yard and find out where they wanted our train. The head man did call up, got the information that they wanted the train in the south line yard which made it necessary for us to cross over the Nogales branch line. They had a gate there over this line and the head brakeman threw this gate around and gave the engineer the proceed signal, he had stopped, that is, our engineer, he had stopped probably thirty car lengths prior to reaching this crossing. He proceeded toward this crossing and another brakeman coming in off the Nogales branch appeared and threw the gate around in front of him.

Q. Threw it shut?

A. Yes, sir, and he applied the air and went into emergency.

[fol. 4947] Q. That is the engineer on your train?

A. Yes, sir, he applied the air and went into emergency, the train making about six to eight miles an hour.

Q. Was there a run-in of slack?

A. There certainly was, a terrific one.

Q. Were you in the caboose?

A. I was.

Q. Who else was in the caboose?

A. G. B. Pray, the conductor, and G. R. Lester, another brakeman.

Q. What was the effect of that run-in of slack?

A. It knocked the draw bars down in two P. F. E. cars just directly ahead of the caboose and practically demolished the caboose.

Q. Did any injuries result?

A. It knocked the front trucks of the rear car clear back against the rear trucks of the same car.

Q. What happened to the men in the caboose?

A. We were all pretty badly bruised and shook up; nothing very serious.

Q. Was it what is termed a reportable accident?

A. I think it should have been if nothing more than on account of the damage done to equipment.

Q. Were any of the other men given medical treatment? [fol. 4948] A. We were all taken to the clinic by yardmaster Shudder in his car or somebody's car on our arrival at the yard office, and bruises and wounds dressed, painted up, but what extent the injuries were I don't recall.

Q. Have you experienced any other injury as the result of slack action?

A. I have.

Q. Where was that?

A. Entering the Lordsburg yard.

Q. When?

A. April 10, 1940, at 2:05 A. M.

Q. On the first accident that you testified to, do you recall how many cars were in that train?

A. 70.

Q. Will you go ahead with the second accident now, just how did that occur?

A. On our arrival at Lordsburg with this train, I was braking behind, on the rear end. They headed into the yard at east switch, headed up to the No. 1 track. Those tracks hold approximately 80 or 85 cars, that is, the No. 1 track. Just prior to the time that the caboose would enter the yard, I had gotten down out of the cupola and gone to the back platform preparatory to lining up the main [fol. 4949] line switch and derail. Just as I got out on the platform and stepped down on the lower step of the caboose to see where we were and how close we were to the switch, this slack came and threw me violently against the back end corner of the caboose and it shook me up

and hurt me so bad that I don't even recall falling, but when I did come to I was out eight or ten feet down the bank and couldn't get up.

Q. Did you receive medical treatment as the result of that?

A. I did, I went to the hospital after arrival in El Paso the following day. The doctor in Lordsburg gave me medical treatment that night and the next day returned me to El Paso on train No. 6, on the following day. That night I went home, I didn't think I was injured really as bad as I was and at 1 A. M. or approximately one o'clock my wife called the doctor and he came and sent me to the hospital.

Q. How many cars were in that train?

A. 100.

Q. How long were you disabled?

A. If my memory serves me right, it was 34 or 35 days.

[fol. 4950] Q. Do you recall any other reportable accidents that resulted in injury to you as a result of slack action?

A. No, I don't believe I do, not to my memory.

Q. Have you seen objects in the caboose dislocated?

A. Yes, sir.

Q. As a result of slack action?

A. This last incident where I was injured, practically everything inside the caboose was torn loose, the stove was demolished, and some of it broken up in pieces no bigger than your two hands.

Q. Of what material is that stove composed?

A. Cast iron, bolted to the floor with two long rods that run through the flange of the top of the stove and also through the flange at the bottom of the stove, one on either side, and bolted to the floor of the caboose. Water cans were knocked down, they are also bolted up in the corner of the caboose with bands of, well, I might say, sheet steel.

Mr. Polley: That is all.

Mr. Mason: No questions.

Mr. Strouss: May Mr. Kidd now be excused?

The Court: I take it that he may now be excused.

[fol. 4951] (Witness excused.)

J. S. HARDWICKE was called as a witness in rebuttal and, being first duly sworn, testified as follows:

Direct examination.

By Mr. Strouss:

Q. State your name please, Mr. Hardwicke.
A. J. S. Hardwicke.
Q. Where do you reside?
A. 1030 East McKinley, Phoenix, Arizona.
Q. What is your business?
A. I am a railroad employee, conductor and trainman, brakeman.
Q. During the past five or six years, you have been employed some by the State?
A. I was employed from about January first, 1935, until some time in 1939, by the state of Arizona in the State labor department as labor inspector for the Industrial Commission.

The Court: 1935 to what year?
A. To 1939. However, during th. time I was on leave of absence or furlough from the railroad company.

[fol. 4952] Mr. Strouss: May this document entitled, "Highway Grade Crossing Accidents Where Auto Involved," be marked for identification?
The Court: It may be marked.
The Clerk: Plaintiff's Exhibit No. 334 for identification.

Mr. Strouss: Mr. Hardwicke, I hand you plaintiff's Exhibit 334 for identification, and ask you if that document was prepared by you?
A. Yes, sir, it was.
Q. What was the source of the information contained in the document?
A. The I. C. C. accident bulletins, Table No. 24, for the years 1929 to 1939, inclusive.

Mr. Booth: Did he say this was prepared by him?

Mr. Strouss: By you or under your supervision, Mr. Hardwicke?
A. This was prepared by me myself.

Mr. Booth: You did the work yourself?
A. Yes, sir.

Q. What experience have you had in compiling accident statistics?

A. This is an exhibit that is compiled from the figures taken from Table 24 of the I. C. C. bulletins.

[fol. 4953] Q. What experience have you personally had in compiling accident statistics?

A. I have had this experience, that I can read and write and take figures and add them together, and that is about the experience I have had. I took it right from the writing that is contained in the report and the figures contained in the report.

Q. Are you familiar with the rules of the Interstate Commerce Commission requiring the report of accidents?

A. To some extent, yes.

Mr. Strouss: Now, we object to that. There hasn't been anything to show yet what the nature of this work was that was done.

The Court: I think it is a little premature.

Mr. Booth: I think it is probably.

Mr. Strouss: Now, the matter shown on this exhibit, is it merely a copying of figures which appear in Table 24?

A. That is correct.

Q. The figures which would here appear under the column "Accidents" appears under that column in the Table, does it, Mr. Hardwicke?

A. Yes, sir.

Q. And the casualties appear?

[fol. 4954] A. That is the same.

Q. And autos registered?

A. That is a figure taken from the I. C. C. bulletin, report.

Q. Just a copying of the figure that appears there?

A. That is right.

Q. That is true as to each——

A. —each of the three states, including New Mexico and Nevada.

Q. Now, at the bottom of the document appears some figures. Are those figures which were calculated by yourself?

A. Yes, sir.

Q. And is that a calculation that is made from the figures appearing above?

A. That is correct.

Q. Arithmetical calculation?

A. That is correct.

Q. You have compared this against the Table from which it was taken?

A. I have.

Q. And are the figures which appear on the exhibit a correct re-statement of the figures as they appear in the Table in the bulletin?

A. Yes, they are.

[fol. 4955] Q. And the computation at the bottom, do you believe that to be correct?

A. I believe that to be correct.

Mr. Strouss: We offer the exhibit 334 for identification in evidence.

Mr. Mason: Mr. Hardwicke, did you just add up the number of automobiles registered year after year to get your totals at the foot of the sheet?

A. No, sir, I took the number of registered automobiles for each year and added them together and arrived at the figures at the bottom.

Q. This figure, for example, for the State of Nevada, 379,329, is the aggregation of all those different years, isn't it?

A. Yes, sir.

Q. You got your rate by dividing 379,329 by 70, did you?

A. We took the figures this way, the total number of automobiles registered by the year, and divided by 10,000; and the figure arrived at, we took the total number of accidents and then divided it by that figure and arrived at the figure set out at the bottom.

Q. Does the Interstate Commerce Commission accident bulletin contain any over-all figure for a succession of years [fol. 4956] such as you show here on this exhibit?

A. No, they don't, they show it for each year.

Q. What is your authority for aggregating the total number of automobiles registered year after year to get a rate for an eleven-year period like this?

A. The exhibit would be what it purports to show for the ten-year period rather than by the year.

Q. Now, this is in addition to the same automobiles year after year, isn't it?

A. Well, it is the total number of automobiles that was registered by the year, then to a total for ten years.

Q. Let us take the year 1938, for example. Did you own an automobile in 1938, Mr. Hardwicke?

A. Yes, sir.

Q. Did you own the same one in 1939?

A. Yes, sir.

Q. That automobile appears in here twice, doesn't it, two automobiles?

A. Well, under this kind of computation, it could be considered.

Q. And that is true that the same automobiles appear here twice or three or four times, perhaps, in your computations?

[fol. 4957] A. Mine would.

Q. Yours would, and as far as you know, a great many others would.

A. That may be so.

Q. And you don't know how many, of course?

A. No.

Mr. Mason: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 334.")

The Court: The exhibit which has now been tendered to the Court may be marked "Plaintiff's Exhibit 335 for identification."

The Clerk: Plaintiff's Exhibit 335 for identification.

Mr. Strouss: Mr. Hardwicke, I hand you plaintiff's Exhibit 335 for identification, a document entitled, "Highway Grade Crossing Accidents, Table 24, Interstate Commerce Commission Accident Bulletin." Now, was this exhibit prepared in a similar manner?

A. Exactly the same manner.

Q. And the source of information is the same?

A. I received this information in the same way.

Q. The matters set forth under the column "Accidents," [fol. 4958] is merely a tabulation of the figures which appeared in the bulletin?

A. That is correct.

Q. And the same is true of the figures appearing under "Casualties"?

A. That is correct.

Q. And under "Autos Registered?"

A. Yes, sir.

Q. And the figures appearing at the bottom are the additions of those columns?

A. That is right.

Q. And the item appearing at the bottom is the same arithmetical computation?

A. The same method was used.

Mr. Strouss: May we offer Exhibit 335?

The Court: What is the difference between these two exhibits, Mr. Hardwicke?

A. Well, one is Highway Grade Crossing Accidents where automobiles, casualties to automobiles were involved, and the other where all automobiles, accidents whether a casualty occurred or not.

Mr. Strouss: Doesn't Exhibit 334 include only accidents where an automobile was involved?

A. Yes, and this one included all highway grade crossing accidents.

The Court: In other words, if they hit a team and wagon [fol. 4959] or pedestrian, it would be included on 335, whereas, on 334, it is limited to accidents wherein an automobile was involved?

A. That is right.

Mr. Mason: I take it, you have related, at the foot of the sheet of Exhibit 335, accidents involving other vehicles than automobiles, and involving pedestrians against the number of automobiles registered?

A. Well, that is correct.

The Court: Now, Mr. Hardwicke, may I inquire also if all of the accidents and casualties shown on Exhibit 334 are also included in 335?

A. That is right, and these others added.

[fol. 4960] Mr. Mason: In presenting this exhibit, Mr. Hardwicke, do you take the position that the number of automobiles registered has some relation to accidents to horse-drawn vehicles or to pedestrians?

A. Only to highway grade crossing accidents, that is what the exhibit applies to.

Q. Yes, this applies to all classes of highway grade crossing accidents including, for example, in the state of Arizona 13 accidents and 13 casualties in which automobiles were not involved?

A. That is correct.

Q. Although you relate those accidents and casualties to your registration of automobiles, don't you?

A. That is what the exhibit purports to show.

The Court: May I ask this question, does the Interstate Commerce Commission table 24 from which these figures were taken, as I understand, relate, these accidents and casualties, to the number of automobiles registered in the state that particular year?

A. Yes, sir, it does. There are two separate computations made into a report for each, one includes all highway grade crossing accidents, the first exhibit No. 334 as I stated before.

[fol. 4961] Mr. Mason: Does the Interstate Commerce Commission Accident Bulletin contain a rate each year of accidents and casualties per ten thousand automobiles registered?

A. For each year, yes, sir.

Q. For all accidents and casualties as well as those involving only automobiles?

A. Yes, sir.

Mr. Strouss: We will put that table in so there will be no question about it to show just what does appear here. I will get a bulletin and offer it in evidence and we can eliminate any question.

The Court: The exhibit has been offered.

Mr. Mason: No objection.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 335.")

Mr. Strouss: It is being put in for the purpose of showing what the bulletins actually show.

The Court: The exhibit now being handed to the clerk may be marked No. 336 for identification.

Mr. Strouss:

Q. Mr. Hardwicke, I hand you plaintiff's exhibit No. 336 for identification, a document entitled, "Grade Cross-

ing Accidents Classified as to Trains Striking Autos and [fol. 4962] Autos Running into Trains. I.C.C. Accident Bulletin, Table 50, Years 1935 to 1939 Inclusive." Was this prepared by you or under your supervision?

A. Yes, sir, it was.

Q. It is merely a tabulation of figures which appear in table 50 of the Interstate Commerce Commission Accident Bulletins for the year indicated?

A. Yes, sir.

Q. Are the accidents classified in that table under "struck by train" and "ran into side of train"?

A. Yes, sir.

The Court: Do I understand that these figures shown on exhibit No. 336 cover the entire United States?

A. That is correct.

Mr. Strouss:

Q. It includes both train accidents and train service accidents?

A. Yes.

Q. To that extent you have added the two figures shown together on the table?

A. That is right.

Q. So this is not exactly a tabulation but is a tabulation of the two figures shown on the table?

A. That is right.

Q. Is this a correct statement of those figures as they [fol. 4963] appear in the table?

A. It is.

Mr. Strouss: We offer this exhibit in evidence.

Mr. Mason: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 336.")

The Court: The exhibit now being handed to the clerk by counsel may be marked for identification as exhibit No. 337.

Mr. Strouss: Mr. Hardwicke, I hand you plaintiff's exhibit No. 337 for identification entitled, "Casualties to Non-Trespassers, Table 51, Interstate Commerce Commis-

sion Accident Bulletins." Was this document prepared by you or under your supervision?

A. It was.

Q. The figures which appear under the columns, "killed, injured, total casualties," are they tabulations of figures which appear in the Accident Bulletins?

A. They are.

Q. That is true for both the states of Arizona and Nevada?

A. Yes, sir.

[fol. 4964] The Court: This includes all casualties in both states covering all railroads in both states?

A. That is right.

The Court: It is not limited to the Southern Pacific?

A. No.

Mr. Strouss:

Q. At the bottom appears a statement regarding an accident on the Santa Fe. What is the source of that information?

A. That was taken from a form T accident report rendered by the Santa Fe Railroad to the Interstate Commerce Commission.

Q. And the statement concerning an accident on the Southern Pacific at Harney, Nevada, where was that taken from?

A. That was taken from a form T accident report rendered by the Southern Pacific Railroad in Nevada to the Interstate Commerce Commission.

Mr. Strouss: We offer this exhibit in evidence.

Mr. Mason: I would like to ask a little about it. Mr. Hardwicke, does this include under the heading "Killed" all persons who were killed in all classes of accidents in the two states?

A. Well, no, not all types of accidents, but train service and some nontrain.

Q. It includes train accidents?

[fol. 4965] A. Yes.

Q. And train service accidents?

A. Yes.

Q. And nontrain accidents?

A. I am not sure about the nontrain.

Q. Other than trespassers?

A. Yes, that is right.

Q. It includes everybody who was killed in connection with railroad operations of which a report was made to the Interstate Commerce Commission?

A. That is right.

Q. It includes train, train service, and nontrain accidents?

A. That is right.

Q. As to injuries, it includes all reportable casualties to all classes of persons?

A. Yes, sir.

Q. In the same classes of accidents?

A. Yes, sir.

Q. That includes passengers?

A. It includes passengers also.

Q. Includes persons on station platforms?

A. Yes, where it was directly reported as a train service accident.

Q. Or a train accident?

[fol. 4966] A. Yes.

Q. It includes signal men and maintainers and track laborers on the right of way who may have been struck and run down?

A. I wouldn't know unless I had the heading of the report as to whether it would include those or not but it was taken from the table 51 figures.

The Court: In preparing this particular exhibit No. 337, did you merely copy the figures shown on this table 51 or did you make some compilation?

A. No, I took the figures contained in table 51.

Mr. Mason: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Plaintiff's exhibit No. 337.")

Mr. Strouss: Mr. Hardwicke, I have handed you Accident Bulletin No. 108 of the Interstate Commerce Commission covering the year 1939. Will you refer to table 51 and refreshing your memory state what accidents that exhibit covers?

A. Train and train service accidents.

Q. It does not include nontrain accidents?
A. No, it does not.

The Court: The exhibit now being handed to the clerk [fol. 4967] and counsel may be marked exhibit No. 338 for identification.

The Clerk: Plaintiff's exhibit No. 338 for identification.

Mr. Strouss:

Q. Mr. Hardwicke, I hand you plaintiff's exhibit No. 338 for identification and ask you if that is a document of seven sheets. Was that document prepared by you or under your supervision?

A. It was.

Q. Was it the source of the information set forth?

A. The information is taken from the form T accident reports rendered to the Interstate Commerce Commission in the state of New Mexico for the years 1930 to 1939, inclusive.

Mr. Booth: Rendered by the Southern Pacific Company?

A. Yes, sir.

Mr. Strouss:

Q. Accidents occurring in the state of New Mexico?

A. Yes, sir.

Q. The information which is set forth here, is that merely a restatement of the information as it appears in the form T reports?

A. As it is taken from the reports.

[fol. 4968] The Court: Do I understand these are the reports to the New Mexico Corporation Commission or to the Interstate Commerce Commission?

A. To the Interstate Commerce Commission.

Mr. Strouss:

Q. The dates are as shown on the form T reports?

A. That is right.

Q. And the location?

A. That is the same.

Q. Train number and number of cars in train?

A. That is correct.

Q. Speed and miles per hour?

A. Yes.

Q. That is as appears on the form T's?

A. That is right.

Q. Days disabled?

A. The letter P appearing in that column represents the probable loss of injury at the time of accident and the letter A which is used in the exhibit would show the actual loss of time.

Q. That is the way it appears on the form T's?

A. That is exactly correct.

The Court: I take it from this exhibit this only covers the casualties to employees of the Southern Pacific Company in the state of New Mexico?

A. That is right.

[fol. 4969] Q. And the class of person is here shown as was shown on the form T's?

A. That is correct, either conductor, brakeman, fireman, or engineer. The first letter is used in each of those.

Mr. Strouss:

Q. And the name of the person is as shown on the form T's?

A. The name of the person is the same.

Q. And the Interstate Commerce Commission classification?

A. That is contained in the form T reports.

Q. And the description of accident?

A. That is the cause stated briefly as the cause of the accident.

Q. That is as it is stated on the form T's?

A. That is correct.

Mr. Booth: May I ask a question. At the bottom of sheet 7 you have a star and the words "slack action" and then you have a number of these accidents starred which evidently refers to that note. Do you mean to say in any of these reports the words "slack action" were used? That is your conclusion, isn't it?

A. Not altogether my conclusion as to slack action. Some of these accidents have a statement which relates to slack action accidents.

[fol. 4970] Q. You say it relates to them. That is your opinion whether it relates to them or not, isn't it? They don't say "slack action"?

A. This is the detailed report. For instance, the first one on page 1 of the exhibit——

Q. I am asking you whether you used your own personal individual judgment in determining whether any of these accidents were slack action accidents and, if so, which they are. You are introducing this as purporting to be a transcript of the form T's. How much of this is form T and how much of this is your judgment?

A. Only just in some cases the question of slack action, all of it came from the form T reports as it was worded with the exception of the slack action which after reading the detailed report on some of them—

Q. (Interrupting) Is this an abstract of the form T's or is this the opinion of Mr. Hardwicke?

Mr. Strouss: I hadn't questioned him on that. He hasn't said anything about that part of the exhibit.

The Court: I will sustain the objection.

Mr. Booth: All right.

Mr. Strouss:

Q. Mr. Hardwicke, the star which appears at the bottom of the page, that would not appear on the form T?

[fol. 4971] A. No.

Q. That is to indicate as the words appear there "slack action accident"?

A. That is correct, to call attention to that particular accident.

Q. That didn't appear on the form T?

A. No, it did not.

Q. Are you familiar with the classification of the Interstate Commerce Commission as to slack action accident?

A. I am to this extent, that I have made quite a study of it for the past ten or twelve years in that respect, examining Interstate Commerce Commission reports of that nature and the Interstate Commerce Commission has a form or symbol which classifies train and train service accidents, nontrain accidents and so forth and so on, but the information as to the classification of this particular exhibit, that has been classified by the railroads themselves

and reported to be S-J or S-D or S-C or whatever the I.C.C. class might be.

Q. In placing the stars, did you give consideration to that S-J classification?

A. I did, under code 7007 which would be sudden stops, lurch or jerk or slack action as it is set up by the Interstate [fol. 4972] Commerce Commission.

The Court: May I ask, I didn't catch that, what does the S-J stand for?

A. That is the Interstate Commerce Commission class that is required in the report. In other words, if you had one type of an accident that is used to show how it should be classified in the proper report.

Mr. Strouss: We offer the exhibit.

Mr. Mason: I would like to inquire.

Mr. Booth: I have a few questions, if you please.

Mr. Strouss: We might save a little time, I will ask that they produce their form T reports for this period and we can save time by putting those form T reports in and they will speak for themselves?

Mr. Booth: You might have asked for them a while ago. It is very convenient for you to put a witness on who is obviously not qualified as a statistician.

The Court: The matter before the court is that this exhibit No. 338 has been offered in evidence. Is there objection to it?

Mr. Mason: I think you said the classification S-J was your guide in putting your little notation on here, was it? [fol. 4973] A. No, the code number which is used under train service accidents in the book set up by the Interstate Commerce Commission governing——

Mr. Mason: Will you answer my question, please?

Mr. Strouss: I think he is trying to answer it.

Mr. Mason: I will ask him another question and see if he can answer it. Mr. Hardwicke, did you use the form T reports in preparing this exhibit?

A. Yes, sir, I did.

Q. Where did you get them?

A. I got them from the Interstate Commerce Commission in Washington, photostatic copies.

Q. Is there a code number on those form T reports as rendered by the carrier?

A. No, sir.

Q. I understand you to say that this S.J classification is your guide, that is what you stated in your testimony in answer to question from your counsel here?

A. No; I said that is the Interstate Commerce Commission class furnished the Interstate Commerce Commission by the railroad company in the form T report as the railroad classified it under the rules of reporting accidents.

[fol. 4974] Q. The railroad classifies the accident as the S.J accident, do they?

A. They do.

Q. On the form T report and you took that as your guide in determining whether you would put a star opposite the accident, did you?

A. No, I did not.

Q. What did you take as your guide?

A. The guide would be under the symbol number which is required to be set up in those reports as to the classification of the accident between train and nontrain accidents and sudden stops or starts or lurch or jerk or slack action under a certain number.

Q. Are the words "slack action" mentioned in the rules anywhere as a classification of accident?

A. No, it is not. It says "lurch, sudden stops, emergency stops, undesired emergencies, or lurch or jerk."

Q. You understand what I am trying to get at, don't you?

A. I do.

Q. I want to know how you form your opinion that you would place a star opposite certain of these accidents; how did you do that?

[fol. 4975] A. Merely from the cause briefly stated in the report and the detail contained at the bottom of the form T report.

Q. Of the form T report?

A. Yes.

Q. You resorted to nothing but the form T report and the detail and cause as stated on the face of the form T report?

A. And the information as furnished in the detail.

Q. Then this is your opinion and version of the nature of the accident?

A. As far as the star is concerned, it is?

Q. As far as this exhibit is concerned. Let's look at this exhibit just a moment. You show here on the very first page an accident to a train of 70 cars at Mongola, New Mexico, on February 15, 1930, and the only thing that you show in the description of the accident is broken air pipe. Is there anything there in that description to indicate that slack action was in any way involved?

A. There wasn't in this broken air pipe notation, which is a separate number in the Interstate Commerce Commission report. I am not so sure, it says, "Cause briefly"— at the top of the form T report. For instance, here is a form T report and up above here is "Cause briefly" and [fol. 4976] down below under item 26 "Detail of cause, nature and circumstances of accident, responsibility and experience of employees responsible." Sometimes you will find two or three pages of that attached to the report but I only took the information on this report and added to it. That says "Cause briefly," that is item 17 on the form T report.

[fol. 4977] Q. There is nothing on the face of your exhibit here to indicate that slack action was involved at all in that case?

A. There must have been in the detail below.

Q. Then this is just your information from the Form T report?

A. That is right, so far as that accident is concerned, from the information I received from the report.

Q. Now, here is an accident at Alamagordo, New Mexico, on June 17, 1936. You put a star opposite the notation under description of accident, "Lost his balance and fell from train."

A. 1936?

Q. Yes, June 17, 1936, at Alamagordo. Have you found it?

A. Yes.

Q. And that is an S.J. classification according to your notation there, isn't it?

A. Yes, sir.

Q. Now, on January 29, 1937, just a few lines down the sheet, you show an accident at Simmons.

Mr. Strouss: What year is this?

Mr. Mason: January 29, 1937, just seven months later, "Lost balance and jumped from running board of engine," [fol. 4978] and you didn't put a star opposite that.

A. Well, the detail in the report must not have been sufficient to class that as a slack action accident.

Q. Then, what you have done here, in placing the star on, is to give us your opinion of the cause of the accident, and particularly whether slack action was involved?

A. That is correct, and taking into consideration the detail at the bottom of the report.

Q. You have over on the last sheet, sheet 7, two more S.J. accidents, one of them at Baughn, on June 7, 1939, a 47-car train, "Lost balance and fell when descending from cupola." You put no star there, did you?

A. No, I didn't put any star there.

Q. And yet the description here is substantially the same as the accident for which you used a star that happened at Alamagordo on a hundred-car train?

A. On the same page?

Q. No, the other one is the one I previously referred you to on Sheet 5.

A. Oh, yes; the reason for not starring this last one mentioned at Baughn, New Mexico, I am quite sure there [fol. 4979] was nothing in the report to indicate that there was slack action at that particular accident.

Q. It is your opinion that Conductor Dolan didn't have slack action involved?

A. I did that from the report.

Q. Here is another one. The last one on the sheet, October 18th, at Tularosa, a sixty-seven car train; there is another, "Lost Balance and fell," which is almost identical with the description of the accident on June 17th to the 100-car train, and yet you didn't put a star there?

A. No doubt there was no indication that slack action caused him to fall.

Mr. Mason: We object to the exhibit on the ground that in so far as the starred notation is concerned, it is obviously the opinion and conclusion of the witness and doesn't purport to refer to any classification appearing upon the face of the underlying documents; the witness hasn't shown any qualification, or necessary qualification, to enable him to express any opinion as to the manner in which

these accidents should be classified, and, particularly, as to whether they should be classified as he has undertaken here to classify them.

Mr. Strouss: I would like to ask Mr. Hardwicke a ques-[fol. 4980] tion.

Q. Mr. Hardwicke, when an accident occurs, is any report made by members of the crew?

A. Well, yes.

Q. Is that what is known as Form 2611?

A. 2611 on the Southern Pacific, I believe.

Q. And that report is given, that description is given to the company by the employees involved?

A. The employees involved.

Q. These Form T's are signed by whom?

A. They are signed by the superintendent of the railroad company on the Southern Pacific.

The Court: The objection will be overruled and it may be admitted in evidence. The witness frankly admits that he, and he alone, is responsible for placing the star on the exhibit. It may be received for what it is worth.

Mr. Booth: We would like to be furnished with certified copies of the Form T reports which this witness said he used.

Mr. Strouss: I don't think that is required of me. I was about to say to the Court that I am going to introduce the certified copies of all the form T's, we will have them in the record here.

Mr. Booth: I don't know that it is necessary to put [fol. 4981] them in evidence.

Mr. Strouss: Well, they will be put in evidence. Now, if the Court please, in view of what has developed, and the testimony of the witness as to the reports which are made by employees at the time of the accident, I ask that the defendant be required to furnish us with forms 2611, the employees' reports of these accidents.

The Court: You are referring now to operations in the State of New Mexico?

Mr. Strouss: Operations in the state of New Mexico at this time. As the other exhibits come up, we will ask for those.

Mr. Mason: Of course, if that is a motion to produce, it is subject to certain rules.

The Court: That is true.

Mr. Mason: And I have numerous authorities, which I prepared in anticipation of just such a motion, to the effect that under the rules of practice under which this Court operates, which are the same, of course, as the Federal rules, documents, such as have been demanded, need not be produced. I have many authorities on the subject, some of them squarely in point, applying particularly to reports made by employees in connection with accidents in which [fol. 4982] the party, the employer, is involved.

Mr. Strouss: I would like to see the authority. I don't think there are any authorities which would permit a party to come into court and conceal from the Court evidence which would be pertinent to the matter before the Court, which would be the effect of such a rule.

The Court: Well, the Court has overruled the objection. I have admitted this exhibit in evidence for what it is worth, and your oral demand now to produce is the only matter before the Court.

Mr. Strouss: That is right, that is the only matter. Now, I asked for all. A lot of accidents, of course, I know have nothing to do with slack action. I do not intend to impose any unnecessary or unreasonable request here, but I ask that all forms 2611, those reports with respect to the accidents that are indicated by a star on Exhibit 338, that the defendant be required to produce those reports.

The Court: Only those items that are shown by the stars on Exhibit 338?

Mr. Strouss: That is right.

(Thereupon, the matter was discussed between Court and counsel.)

[fol. 4983] The Court: Well, I might say, Mr. Strouss, I have no intention to sit here and determine in each of these accidents whether it was or was not caused by slack action. We would be here from now on. The Court is inclined to deny your request to produce. I won't rule on it at the moment, but you may proceed with your other exhibits.

Mr. Strouss: I want to put in evidence the Form T's; they are not here as yet.

The Court: All right.

(Further discussion between Court and counsel.)

The Court: The record may show that the plaintiff's demand to produce these Forms, 2611, covering casualties

in the state of New Mexico, is denied. We will take a five-minute recess.

(Thereupon, a short recess was taken, after which the witness was recalled to the stand, and proceedings were resumed as follows:)

The Court: You may proceed.

Mr. Strouss: Now, we offer in evidence plaintiff's exhibit 339, a certified copy of Form T report filed with the Corporation Commission, covering an accident on the Santa Fe.

Mr. Booth: Would you mind identifying that in the record?

Mr. Strouss: Exhibit 339 for identification.

[fol. 4984] The Court: Being an accident report of the Santa Fe occurring on the Albuquerque division on July 27, 1939. Any objection.

Mr. Booth: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 339.")

Mr. Strouss: We ask that certified copies of Form T's covering the year 1930, accidents on the Southern Pacific lines in New Mexico, be marked for identification.

The Court: It may be marked.

The Clerk: Plaintiff's Exhibit No. 340 for identification.

Mr. Strouss: We offer Exhibit No. 340 for identification in evidence.

Mr. Booth: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 340.")

Mr. Strouss: We ask that certified, photostatic copies of Form T reports, covering the year 1931, accidents on Southern Pacific Company's lines in New Mexico, be marked for identification.

The Court: It may be marked.

The Clerk: Plaintiff's Exhibit No. 341 for identifica-

[fol. 4985] tion.

Mr. Strouss: We offer Plaintiff's Exhibit No. 341 in evidence.

Mr. Booth: No objection.

The Court: It may be admitted.

(Thereupon, the document referred to was received in evidence and marked "Plaintiff's Exhibit No. 341.")

Mr. Strouss: We ask that certified, photostatic copies of Southern Pacific Company's lines in New Mexico, Form T reports, filed with the Interstate Commerce Commission for the year 1932 be marked for identification.

The Court: They may be marked.

The Clerk: Plaintiff's Exhibit No. 342 for identification.

Mr. Strouss: We offer Plaintiff's Exhibit No. 342 for identification in evidence.

Mr. Booth: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 342.")

Mr. Strouss: We ask that certified, photostatic copies of Form T reports, filed with the Interstate Commerce Commission by the Southern Pacific Company for the year 1933, [fol. 4986] covering accidents in the State of New Mexico, be marked for identification.

The Court: They may be marked.

The Clerk: Plaintiff's Exhibit No. 343 for identification.

Mr. Booth: We have no objection.

The Court: There is no objection. It may be admitted.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 343.")

Mr. Strouss: We ask that certified, photostatic copies of Form T reports filed by the Southern Pacific Company with the Interstate Commerce Commission, covering accidents in the state of New Mexico for the year 1934, be marked for identification.

The Court: They may be marked.

The Clerk: Plaintiff's Exhibit No. 344 for identification.

Mr. Strouss: We offer No. 344 for identification in evidence.

The Court: No objection, I presume?

Mr. Booth: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 344.")

[fol. 4987] Mr. Mason: Those may all be put in in a group, with successive numbers.

Mr. Strouss: The same things covering the years 1935, '36, '37 and '38 and '39.

The Court: Then the record may show that, there being no objection, that the Form T reports for the years 1935 to 1939, inclusive, be admitted in evidence and be given their proper number.

(The documents referred to were received in evidence and marked, respectively, as Plaintiff's Exhibits, Nos. 345 to 349, inclusive.)

Mr. Booth: We would like permission to borrow those from the Clerk for checking.

The Court: The Court will grant you that permission, Mr. Booth.

Mr. Strouss: I hand counsel Plaintiff's Exhibit 350 for identification, "Preliminary Revised Population Estimates for Continental United States" issued by the United States Department of Commerce.

Mr. Booth: No objection.

Mr. Mason: I would appreciate counsel advising us as to the materiality of this.

Mr. Strouss: Well, it is offered in connection with the grade crossing exhibits.

[fol. 4988] Mr. Mason: The foundation for some calculation of grade crossings as to population, or something of that kind.

Mr. Strouss: I want to show the population in New Mexico and Arizona.

The Court: Everything else is in the record, I think that should be. There is no objection, it may be admitted.

(The document referred to was received in evidence and marked "Plaintiff's exhibit 350.")

The Court: The exhibit just handed to the clerk may be marked "Plaintiff's Exhibit 351 for identification."

Mr. Strouss: Mr. Hardwicke, I hand you plaintiff's Exhibit 351 for identification, a document entitled, "Southern Pacific Company, Pacific Lines, Casualties to Employees, Los Angeles Division, Freight Service Train and Enginemen." Was that document prepared by you or under your supervision?

A. Under my supervision.

Q. And the source of the information was the Form T reports?

A. That is correct.

Q. Copies of which are furnished by the Southern Pacific Company?

[fol. 4989] A. Yes, sir.

Q. And the same information is contained in this——

A. As contained in the Form T reports.

Q. As in Exhibit 338?

A. That is correct.

Q. Except that this is the Los Angeles Division, and that was the State of New Mexico?

A. That is correct.

The Court: And all answers that you made to questions propounded to you with reference to Exhibit 338 would apply to this exhibit?

A. Would apply to this exhibit, that is right.

Mr. Strouss: We offer this exhibit in evidence.

Mr. Booth: With this single exception, I think that the note on Sheet 21, SJ, Star, "undesired emergency application of airbrake causing sevgre slack action on rear of train," is not on Exhibit 338.

The Court: That is true. If you care to examine him on that, you may do so.

Mr. Booth: Is that your conclusion, or do you find that in the rules of the Interstate Commerce Commission?

A. That is my conclusion, that particular accident. That is at Bassett, California?

[fol. 4990] Q. Yes.

A. That is correct.

Q. I see you also have the note, "slack action" on the opposite side of the page with a star.

A. Yes.

Q. The star "slack action" refers to all of the starred accidents except the one at Bassett, California, November 9, 1939, sheet 21, is that correct?

A. That information of the starring of that slack action was by the ICC report, Form T, in which the cause briefly was stated, "Unbalanced by slack action on rear end of the train."

Mr. Booth: That is all.

The Court: Any objection to the exhibit?

Mr. Booth: The same objection as to the other.

Mr. Mason: No objection to the body of the exhibit as founded on Form T reports, but to the witness undertaking to make his conclusion.

The Court: The objection is overruled. It may be admitted in evidence.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit 351.")

Mr. Strouss: Now, I have copies of Form T reports which were furnished to me by counsel for the Southern [fol. 4991] Pacific Company, true copies of the Form T Reports filed by the Southern Pacific Company with the Interstate Commerce Commission for the years 1930 to 1939, inclusive, covering accidents on the Los Angeles division.

Mr. Mason: Do you have those Form T reports bound up by years?

Mr. Strouss: By years, yes.

Mr. Mason: And you wish to introduce them in evidence, commencing with 352?

Mr. Strouss: Yes.

Mr. Mason: We have no objection to their being received in evidence with the successive numbers given them for the successive years, being Nos. 352 to 361 inclusive.

The Court: They may be received in evidence and the proper numbers given to them.

Mr. Mason: In the same way that the Form T reports for accidents occurring in New Mexico were received a few moments ago.

The Clerk: Plaintiff's Exhibits 352 to 361, inclusive, in evidence.

The Court: Covering the years 1930 to 1939. The exhibit now being handed to the Clerk may be marked for identification as Plaintiff's Exhibit 362.

The Clerk: Plaintiff's Exhibit 362 for Identification.

[fol. 4992] Q. Mr. Hardwicke, do you have before you a copy of plaintiff's exhibit No. 362 for identification, a document entitled, "Southern Pacific Company, Pacific Lines, Casualties to Passengers and Passenger Employees, Train and Train Service Accidents, State of New Mexico"?

A. Yes, sir.

Q. This document was compiled from the same source as exhibit No. 338?

A. Yes, sir.

Q. The only difference is it is limited to Passengers?

A. Passengers and Passenger employees.

Q. The questions that were asked there would apply here?

A. Yes, sir, no trespassers just casualties to passengers and passenger employees.

Mr. Strouss: We offer this exhibit.

Mr. Booth: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 362.")

The Court: Just a question on that last exhibit, there are no stars representing any purported slack action shown in this exhibit?

A. No, there are not. It is passenger train operation [fol. 4993] solely, either passengers getting on or off or on board and employees injured.

The Court: The exhibit just handed to the clerk may be marked for identification as plaintiff's exhibit No. 363.

Mr. Strouss:

Q. Do you have before you a copy of plaintiff's exhibit No. 363 for identification entitled, "Southern Pacific Company, Pacific Lines, Los Angeles Division, Injuries to Passengers and Passenger Employees"?

A. Yes, sir.

Q. Covering the years 1930 to 1939?

A. Yes, sir.

Q. A document of 10 sheets?

A. That is right.

Q. This is similar to the exhibit No. 362 except that this is for the Los Angeles division?

A. Los Angeles division.

Q. Where the stars appear, that is the same situation as on exhibit No. 338?

A. Yes, but there are no stars appearing on this exhibit.

The Court: There are no stars on exhibit No. 362 or exhibit No. 363.

Mr. Mason: There is one on No. 363.

The Witness: The same thing would be the answer as [fol. 4994] to the stars.

Mr. Mason: I have a question or two before the exhibit is received.

Mr. Strouss: We offer the exhibit.

Mr. Mason:

Q. Mr. Hardwicke, this purports to be confined to passengers and passenger train employees in passenger train accidents?

A. Any employees working upon passenger trains or passengers riding upon the train.

Q. It purports to be confined to passenger trains.

A. Yes.

Q. I want to call your attention to sheet 3, the first item, March 3, 1932, at Indio, extra 5006 west. That was not a passenger train, was it?

A. No, it was not.

Q. That item should be stricken from the exhibit?

A. It should be stricken from the exhibit.

The Court: Then the top item on sheet 3 of exhibit No. 363 appearing on March 3, 1932, at Indio, California, may be stricken from the exhibit.

Mr. Mason: No objections otherwise to the exhibit, your Honor.

The Witness: I would like to explain this at this time. This item was copied into this report as a result of the [fol. 4995] notation made upon the work sheets which had "Los Angeles division, passenger injuries" on it. It was copied through mistake.

The Court: It may be admitted in evidence.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 363.")

Mr. Strouss: I hand the clerk a document entitled, "Southern Pacific Company, Pacific Lines in New Mexico, Casualties to Train and Engine Service Employees."

The Court: It may be marked for identification.

The Clerk: Plaintiff's exhibit No. 364 for identification.

Mr. Strouss:

Q. Have you before you a copy of plaintiff's exhibit No. 364, Mr. Hardwicke?

A. I have.

Q. This was prepared in similar manner as exhibit No. 338 except that this is limited to the year 1940?

A. It was.

Q. All the questions which were asked there, your answers would be the same here?

A. That is correct.

Mr. Strouss: We offer this in evidence.

Mr. Mason: Subject only to our prior objection as to the witness having classified certain of these accidents as slack [fol. 4996] action accidents we have no objection to the exhibit. Insofar as it purports to be a reproduction of the volume it reports it is not objected to.

The Court: The reserved objection is overruled and it may be admitted in evidence.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 364.")

Mr. Strouss: This exhibit was made from the form T reports which were furnished to us and I returned yesterday and I think we certainly should have those produced. That is the form T for the year 1940 covering the states of New Mexico, Arizona, and Nevada and the Los Angeles division in California, and I am going to put in further exhibits covering those other three states.

The Court: It would seem that those form T reports should be produced. I will hear you on it if you care to be heard.

Mr. Booth: Those are the reports we furnished you, aren't they?

Mr. Strouss: Which I just returned.

Mr. Booth: We will produce them but I prefer to do it after recess, I want to check these exhibits.

Mr. Strouss: I have no objection to that but I will want [fol. 4997] the opportunity to offer them in evidence.

Mr. Booth: It is obviously impossible to cross-examine this witness today.

Mr. Strouss: I have no objection to that. I am not trying to get the form T reports away from you so you won't have them to use.

The Court: They are not here at the present time.

Mr. Strouss: It is agreeable to me that they be put in after the recess.

Mr. Booth: We only have one set and we would like to use them in preparation for the cross-examination of this witness.

The Court: The Court will permit you to withdraw any of these exhibits, particularly those introduced and admitted in evidence today for your examination in order that you might properly cross-examine the witness.

Mr. Mason: I think the situation is a little more complicated than that. In the previous cases as to the Los Angeles division for the ten-year period, we furnished copies, we employed a typist especially, for which Mr. Strouss paid, to make those copies from our retained filed copies. As to the New Mexico form T reports, Mr. Strouss [fol. 4998] obtained certified copies from Washington so we had no agency there, but now the copies of the form T reports from which this last exhibit was prepared are our own retained file copies, we have no spare copies. They are simply the company's own retained file copies and the only copies that there are. If they are to be placed of record, then copies should be prepared by the party who proposes to introduce them rather than rob our files.

Mr. Booth: Not only that but the rules of the Interstate Commerce Commission require us to retain these permanently in our own files, but if you want to take these and have copies made of them or have copies made of them at your expense we will do it.

Mr. Strouss: I am not objecting to that, but it is the way they go about getting it. I will have the copies made but I want to have them made myself.

The Court: Then as to exhibit No. 364, has that been admitted?

The Clerk: Yes.

The Court: Then you may proceed.

Mr. Strouss: It is understood I will have the use of your copies to have them made?

[fol. 4999] Mr. Mason: Certainly.

Mr. Strouss: We ask that document entitled, "Southern Pacific Company, Pacific Lines, Los Angeles Division, Casualties to Train and Engine Service Employees, Year 1940," be marked for identification.

The Court: It may be marked.

The Clerk: Plaintiff's exhibit No. 365 for identification.

Mr. Strouss:

Q. Do you have before you, Mr. Hardwicke, copy of plaintiff's exhibit No. 365 for identification?
A. Yes, sir.
Q. This is similar to exhibi. No. 338?
A. That is correct.
Q. It covers what?
A. Train and engine service employees.
Q. If similar questions were asked you, like answers would be given as were given to the others?
A. The same answers.

Mr. Strouss: Do you have any questions, Mr. Mason?

Mr. Mason:

Q. You placed this star opposite the notation of certain of these accidents yourself?
A. Yes, sir.
Q. That is your opinion, is it?
[fol. 5000] A. Yes, sir.

Mr. Mason: Subject to our previously stated objection which was argued in connection with exhibit No. 338, your Honor, we have no other objection.
The Court: The objection is overruled. It may be admitted in evidence.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 365.")

The Court: The exhibit just handed to the clerk may be marked plaintiff's exhibit No. 366 for identification.
The Clerk: Plaintiff's exhibit no 366 for identification.

Mr. Strouss:

Q. Mr. Hardwicke, do you have before you a copy of plaintiff's exhibit No. 366 for identification?
A. Yes, sir.
Q. This was prepared by you or under your supervision.
A. Under my supervision, yes, sir.
Q. This document is entitled, "Southern Pacific Company, Pacific Lines in Arizona, Casualties to Train and Engine Service Employees, 1940"?
A. Yes, sir.

Q. If like questions were asked you which were asked [fol. 5001] concerning exhibit No. 338 would your answers be the same?

A. My answers would be the same.

Mr. Strouss: Any questions, Mr. Mason?

Mr. Mason: The same objection.

The Court: Objection overruled, it may be admitted in evidence.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 366.")

The Court: The exhibit just handed to the clerk may be marked plaintiff's exhibit No. 367 for identification.

The Clerk: Plaintiff's exhibit No. 367 for identification.

Mr. Strouss:

Q. Do you have before you a copy of plaintiff's exhibit No. 367 for identification?

A. Yes, sir.

Q. Entitled "Southern Pacific Company, Pacific Lines, Salt Lake Division, Casualties to Employees in Train and Engine Service, 1940"?

A. That is correct.

Q. This exhibit does in fact include casualties to employees and passengers on passenger trains for the year 1940 for the Salt Lake division, does it not?

[fol. 5002] A. That is right.

Q. It was prepared in like manner as exhibit No. 338?

A. That is right.

Q. If the same questions were asked you concerning that as applied to this exhibit, would your answers be the same?

A. They would be the same.

Mr. Strouss: Any questions?

Mr. Mason: The same objection.

The Court: Objection overruled, it may be admitted in evidence.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 367.")

The Court: The exhibit just handed to the clerk consisting of one sheet may be marked plaintiff's exhibit No. 368 for identification.

The Clerk: Plaintiff's exhibit No. 368 for identification.

Mr. Strouss:

Q. Mr. Hardwicke, do you have before you plaintiff's exhibit No. 368 for identification entitled, "Southern Pacific Company, Pacific Lines in New Mexico, Casualties to Passengers and Passenger Employees, 1940"?

A. I have.

Q. This was prepared by you or under your super-[fol. 5003] vision?

A. Yes, sir.

Q. If like questions were asked you concerning this exhibit as were asked concerning exhibit No. 338, would your answers be the same?

A. My answers would be the same.

Mr. Strouss: We offer this in evidence.

Mr. Mason: No objection.

The Court: It may be admitted in evidence.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 368.")

The Court: The exhibit just handed the clerk consisting of two sheets may be marked plaintiff's exhibit No. 369 for identification.

The Clerk: Plaintiff's exhibit No. 369 for identification.

Mr. Strouss:

Q. Mr. Hardwicke, do you have before you a copy of plaintiff's exhibt No. 369 for identification.

A. Yes, sir.

Q. Entitled, "Southern Pacific Company, Pacific Lines in Arizona, Casualties to Passengers and Passenger Employees, 1940"?

A. I have.

Q. This was prepared by you or under your supervision? [fol. 5004] A. It was.

Q. If the same questions were asked you as were asked concerning exhibit No. 338, your answers would be the same?

A. Yes, sir.

Mr. Strouss: I offer this in evidence?

Mr. Mason: The same objection, your Honor.

The Court: The same ruling. It may be admitted in evidence.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 369.")

The Court: The exhibit just handed the clerk consisting of one sheet may be marked plaintiff's exhibit No. 370 for identification.

The Clerk: Plaintiff's exhibit No. 370 for identification.

Mr. Strouss:

Q. Mr. Hardwicke, do you have before you a copy of plaintiff's exhibit No. 370 for identification entitled, "Southern Pacific Company, Pacific Lines, Los Angeles Division, 1940, Casualties to Passengers and Passenger Employees"?

A. Yes, sir.

Q. This exhibit was prepared by you or under your supervision?

A. Yes, sir.

Q. If similar questions were asked concerning this ex- [fol. 5005] hibit as were asked concerning exhibit No. 338, would your answers be the same?

A. Yes, sir.

Mr. Mason: May I ask you why you didn't put a star opposite the last item here?

A. There must not have been enough detail in the report, on the slack action report to be made.

Mr. Mason: There is no objection to this exhibit.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 370.")

Mr. Strouss: I have a statement in bulletin No. 108, Interstate Commerce Commission Accident Bulletin No. 108, calendar year 1939, which I would like to have read into the record rather than put it in by way of an exhibit.

The Court: It is just a short statement, is it?

Mr. Strouss: About a paragraph.

The Court: If you will show it counsel.

Mr. Mason: How much of this do you want to put in?

Mr. Strouss: The first paragraph.

Mr. Mason: Down to the words "reportable accident"? [fol. 5006] Mr. Strouss: Yes.

Mr. Booth: There may be other parts of that bulletin that we desire to read in and I presume you will have no objection?

Mr. Mason: It is an ex parte statement of the Interstate Commerce Commission. It is not statistics compiled from

reports but is simply an explanatory statement made by the Interstate Commerce Commission.

Mr. Strouss: My recollection is that some of those explanatory statements went in on the part of the defendant.

Mr. Mason: We read some of those to Mr. Sullivan and they went in without objection.

The Court: I take it there is no objection?

Mr. Mason: No, there is no objection.

The Court: Will you read it into the record and identify what you are reading.

Mr. Strouss: I am reading—counsel will not require that it be read by the witness?

Mr. Mason: No, and it doesn't need to be read by counsel if the copy may be given to the reporter.

Mr. Strouss: I am reading from page 4, Accident Bulletin No. 108, calendar year 1939, of the Interstate Commerce [fol. 5007] Commission under the heading, "C. Casualties to Employees. Notable progress has been achieved by railway managements in making work less hazardous for their employees. To stimulate effort in this direction, safety contests have been instituted among the various railways and among the operating divisions of individual railways. Casualty rates per million man-hours are closely watched. This has led reporting officers to exercise great care in distinguishing the injuries which are reportable to the Interstate Commerce Commission from those which are not reportable. Thus, the reduction in employee injuries from 26.67 per million man-hours in 1925 to 7.03 in 1939 is in part the result of the prevention of accidents and in part of greater caution in reporting. There is still sufficient difference in the rates of carriers of about the same size to raise a doubt as to whether the difference in the casualty rates reflects the relative safety of the respective railways or is the result of a difference in the standard of reporting due to varying interest among the carriers as to what constitutes a reportable accident."

Mr. Strouss: You may take the witness.

Mr. Mason: I wonder if we couldn't defer the cross-examination of this witness until we resume. If we start [fol. 5008] now, it will only mean that we take two bites at the cherry.

The Court: I think that would be the advisable thing to do.

Mr. Mason: Now, your Honor, it is clearly out of the question I think to argue and obtain a ruling upon the admissibility of certain material which was offered in evidence last night because it will require an analysis of the record and also certain authorities.

The Court: I might say to you that the Court reread the testimony of the witness Browning and has examined, not in detail, but at least hurriedly these exhibits which were marked for identification at yesterday's session. I understand that you prefer to defer your argument on the law matter until next week.

Mr. Mason: I am prepared to indicate the character of our objections but I don't desire in view——

The Court: We still have an hour.

Mr. Mason: You have to be there at one o'clock, your Honor, and have to have sufficient time to get lunch.

The Court: I don't want to rush you on it, but I will say this in fairness to counsel for the State so you will know [fol. 5009] what the Court has in mind. I was somewhat astounded in counsel asking this court to admit a document such as exhibit No. 333, part of which at least contains an address given by some distinguished gentleman, Mr. Patterson, I believe, to a group of workers——

Mr. Strouss (interrupting): A group of which?

The Court: I said "workers," a group——

Mr. Strouss: It was an address given at the annual meeting of the Association of American Railroads.

The Court: I admit that that is true, but I still cannot see how any address given by any gentleman, be he ever so distinguished, would ever be admissible in a court of record.

Mr. Mason: Your Honor, I will indicate so that counsel for the State may know exactly our objections, how we consider these particular exhibits objectionable. There are two classes of exhibits tendered, one is the report of Harley Johnson to the mechanical division of the American Railway Association which was marked for identification as plaintiff's exhibit No. 206, that is this bulky document here. The other consists of these excerpts from certain of the annual reports or bound volumes containing the annual reports of the Proceedings of the Mechanical Di- [fol. 5010] vision of the American Railway Association commencing with the year 1929 and including the year

1930 and certain other years, but no year prior to 1929. Now, as to the report of Director Harley A. Johnson, that is clearly hearsay. Mr. Johnson is not offered here as a witness to identify this document. It is true that it was identified in the testimony as having been rendered by Mr. Johnson to the American Railway Association but as to this defendant it is clearly hearsay. There is no showing that the defendant ever employed Mr. Johnson, ever asked him to make an investigation, ever asked him to make a report, ever adopted the report when it was made or ever approved it. There is no showing that the American Railway Association ever adopted the report. There is no showing that the American Railway Association has any authority to bind the defendant although it is a member of the association to any action which it might take in either adopting or approving a report; for all that the record here before us shows the defendant may have objected vigorously to this report and may still be objecting to it. This is the same situation as if the Tucson Chamber of Commerce had appointed a committee which then had [fol. 5011] employed an engineer to investigate and determine whether another underpass should be opened in the city of Tucson. Now the Southern Pacific Company is a member of the Tucson Chamber of Commerce, but it would be ridiculous in the extreme to say that the Southern Pacific Company would be bound by the report of the engineer to this committee. After all the mechanical division is nothing but a division of the Association to which the Southern Pacific belongs. Now as to the other material that is receivable, if at all, only on the theory——

The Court (interrupting): You are speaking now of the tests?

Mr. Mason: I am speaking not of this document which I have finished with for the moment, but I am speaking of these excerpts from the bound copies of the annual reports of the Proceedings of the Mechanical Division. I say that is receivable, if at all, under either one of two theories. In the first place, it may be argued that it was a report made by Mr. Johnson to the division in his capacity as an employee of the division and that the defendant is in some way bound because it is a member of the Association. The argument just made as to the receivability in evidence of exhibit No. 206 for identification, the bulky

report by Mr. Johnson, applies equally to the reports which [fol. 5012] are offered as excerpts from the proceedings of the division, but there may be the other theory that under the theory of documentary or verbal completeness, as it is phrased by Dean Wigmore, where a part of a document has been produced and used in evidence, where it is part of the record, then the balance of the document may be used. Your Honor will recall that that rule is subject first to the qualification that a part of the document must be used before the balance is receivable. The defendant has not or did not in its case use any part or introduce in evidence any part of the reports of the annual proceedings of the division. Our exhibit No. 204, in connection with which these reports were mentioned, consists of excerpts from the annual issues of the book of rules. Those books of rules were offered here for the inspection of the opposition, one of them is marked Exhibit No. 203 for Identification; but there are no excerpts from the reports of the annual proceedings of the mechanical division which appear in exhibit No. 204 except for the year 1915, I think it is, when the book corresponding to exhibit No. 203 for identification was missing, but that does not appear to be [fol. 5013] material here because there is no offer of the balance of the report for the year 1915. I was careful to specify in opening my remarks that only portions of the reports for the year 1929 and following are offered. Those, as I see it, are the excuses or conditions or theories upon which these exhibits might be offered, and those are, of course, the objections that we have. Now, the fact of the agency, the fact that Mr. Johnson is or is not an agent of the defendant cannot be shown by Mr. Johnson's declaration. It must be shown otherwise than by evidence already of record unless Mr. Johnson is here called, and he is not. Jones on Evidence at page 486 says: "The declarations of the alleged agent are not competent to prove the existence of the relation of principal and agent."

The Court: What volume and page is that?

Mr. Mason: I have before me Jones on Evidence, Volume I, page 486, which is the latest edition, I take it, from the county library.

The Court: Go ahead.

Mr. Mason: Again on page 484-85 (reading): "A condition to the introduction of the declarations of one who is

alleged to have been an agent is that the agency must be proved aliunde and not by the declarations themselves." Of course, otherwise we would have the spectacle of lift-
[fol. 5014] ing one's self by one's bootstraps.

The Court: Let's hear from the State on it.

Mr. Mason: I should have added here a statement from Wigmore, the fourth volume, 1923 edition of Wigmore on evidence as to the rule of verbal completeness where part of a document is offered, pages 508 and following. However, I have not discussed the matter from that standpoint because it is our position that the rule of verbal completeness cannot apply because no part of the document, a part of which is now offered, was in fact offered by the defendant.

The Court: Let me ask a question and get this clear as to the volume and what is the number of the exhibit that you had a moment ago?

Mr. Mason: No. 206 for identification.

[fol. 5015] The Court: Now, Mr. Strouss, are all of the excerpts which you have now offered in evidence yesterday, are they taken from this exhibit 206?

Mr. Strouss: No, none of those were. I was just about, in order to complete the record, to make my offer. For these marked for identification, the excerpts from them that we will want to use, and then——

The Court: Then let the argument go to both the exhibits you offered yesterday, and the ones you are about to offer now.

Mr. Strouss: This is just an excerpt from Exhibit 206. I mean the parts. I offered the whole report, because I don't want any question raised about a part of it being offered. These are the parts we put in, we think it is shown that the matter is pertinent and material to the matter. Of course, if the exhibit goes in, why, the defendant would have the right to indicate such additional parts as they wanted.

Mr. Mason: That would be what I have referred to as the rule of verbal completeness.

The Court: Go ahead and complete your record, make your offers. The exhibit just handed the Clerk may be marked "Plaintiff's Exhibit No. 371 for identification," that being an excerpt from a volume entitled, "American
[fol. 5016] Railway Association, Division 5, Mechanical."

Mr. Mason: Well, these are excerpts from Exhibit 206 for identification?

Mr. Strouss: Yes.

Mr. Mason: And it refers to the page of the original document?

Mr. Strouss: That is right.

The Court: Then the Clerk may mark these exhibits and call them in the order in which they are presented.

The Clerk: Plaintiff's Exhibit No. 372 for identification, consisting of 16 sheets, pages 8 to 17; Plaintiff's Exhibit 373 for identification, consisting of two sheets; and 374 for identification, consisting of one sheet only; Plaintiff's Exhibit 375, consisting of one sheet.

Mr. Mason: That is the excerpt from page 56, is it?

The Clerk: That is right. Plaintiff's — 376 for identification, pages 151 to 165.

The Court: Containing 21 sheets.

The Clerk: Plaintiff's Exhibit 377 for identification, consisting of four sheets, from pages 166 to 168; Plaintiff's Exhibit 378, one sheet, Table 293; Plaintiff's Exhibit 379 for identification, one sheet, Table 291; Plaintiff's Exhibit [fol. 5017] 380 for identification, Table 292; Plaintiff's Exhibit 381, one sheet, Table 290.

Mr. Strouss: On the objection, I expect to take it up more in detail after the recess.

The Court: Does this complete them, Mr. Strouss?

Mr. Strouss: Yes, this completes them.

The Court: Do I understand that the State has now offered, at least for identification, all of the exhibits you intend to offer in this case?

Mr. Strouss: Except, as I said this morning, there is some question as to the exactness of our exhibits relating to Tables 2450 and 2451 of the Accident Bulletin. I now intend to have those Tables copied and put in exhibits showing what those Tables are.

The Court: These constitute all of your presently prepared exhibits?

Mr. Strouss: I understand you don't question them?

Mr. Mason: No.

Mr. Strouss: Beg pardon?

The Court: The exhibits which have been marked constitutes all of your presently prepared exhibits?

[fol. 5018] Mr. Strouss: That is right. Now, on the objection, I will just very briefly state my views. On the matter which was taken from the annual reports, I am not prepared to speak, because Mr. Polley prepared those exhibits.

The Court: Before I hear you, may I interrupt, because I am not just clear, the exhibits introduced yesterday and marked for identification, to which objection was made and argument advanced a few moments ago, where were those excerpts taken from?

Mr. Strouss: Those excerpts were taken from the annual report.

The Court: Produced by Mr. Browning?

Mr. Strouss: They were produced, but you remember he had a bunch of books.

The Court: From his trunk at the hotel.

Mr. Strouss: Yes, dark-colored books about that long and about that thick (indicating).

The Court: In other words, Mr. Strouss, having had access to these books, records, and reports that Mr. Browning brought with him, you went through them and made excerpts from those different records you have now had marked for identification?

Mr. Strouss: Those were the ones marked yesterday.

[fol. 5019] The Court: Those were the ones marked yesterday. Now, the ones marked this morning all came from Exhibit 206?

Mr. Strouss: 206. The volume of reports by Mr. Johnson, Director of Safety, I believe his title was Director of Research.

The Court: You are directing your remarks to the exhibits marked for identification today or yesterday?

Mr. Strouss: I am directing my remarks to Exhibit 206, the volume itself, and that would also go to the excerpts which I have just now offered, which are excerpts taken from Exhibit No. 206.

The Court: Do you propose to offer in evidence the entire volume 206, which has already been marked for identification?

Mr. Strouss: Yes, it has been already offered in evidence. It was offered yesterday.

The Court: I will hear you now.

Mr. Strouss: Of course, with the understanding that each party, if admitted in evidence, each party, will indicate that part of the exhibit which they desire—

The Court: You have already indicated your part by [fol. 5020] offering these excerpts, Mr. Strouss.

Mr. Strouss: That is right.

The Court: Go ahead.

Mr. Strouss: Now, the Court will remember that Mr. Browning testified—well, first we will go back to the beginning of this case. Defendant called first Dr. Parmalee, and we were told a great deal about his learning and the reasons why we should take whatever he said concerning railroad operation as the facts, and his statements should be placed in evidence, and they were; then they called Mr. Otterback, and they both testified as to the Association of American Railways and the activities, that it represented the different roads, the different member roads in its activities, then Mr. Browning testified, and he testified concerning the rules of interchange.

The Court: Incidentally, he came here and his testimony was limited, except on your cross-examination, to the interchange rules.

Mr. Strouss: That is right, and particularly or including that covering airbrakes and explaining how those rules were developed. He also stated that the Association was the representative of the different member railroads and acted for them in making these investigations and developing the different rules, and that in developing the [fol. 5021] rule of interchange as to airbrakes, that it was done by tests and investigations. He said that they had this investigation under an order of the Interstate Commerce Commission, which was begun somewhere around 1924 and continued to about 1932, when Mr. Johnson made his report. There is, in the annual proceedings, in the excerpts offered yesterday, only what parts of the proceedings which shows that he did make his report in, I think it was 1932, to the Association. Then, in 1933, Mr. Browning testified that specifications were adopted as of September, 1933, I think the rules of interchange show, adopted specifications for airbrakes which are required upon all cars in interchange, effective January 1, 1945, and applying, as I believe the testimony showed, to cars, newly constructed cars, after, I don't remember whether it was

1933 or 1937. And he identified Exhibit 206 as the report. He stated that Mr. Johnson was in charge for the Association of American Railways of the investigation under the order of the Interstate Commerce Commission, and that this Exhibit 206 is the report of Mr. Johnson of that investigation, and the exhibit which was offered yesterday, one of them will show that at the annual meeting it was [fol. 5022] ordered that that report be printed and circulated, so certainly it became the action of the Association itself. And it is a little hard to see how the Southern Pacific can say in face of the evidence that the Association was not—

The Court: Are you relying upon an agency there?

Mr. Strouss: Well, there is an agency. I am relying upon two things: First, there is an investigation which the witness stated was made under the order of the Interstate Commerce Commission to determine the specifications of airbrakes which would be efficient to handle trains, and that it was made by the Association of American Railways, pursuant to that order; then there is the agency here, as the witness shows, all of those things are handled, as this witness testified, by the Association for the member railways, they don't do it themselves, and, certainly, in acting for the members, the Association is the agent, the representative, as Mr. Browning testified, of the member railways; and that when those tests are made, and the specification adopted and the rule adopted, by the Association, the member railways became bound by it, as they have themselves shown by the rules of interchange de- [fol. 5023] veloped from those investigations.

The Court: It seems to me, Mr. Strouss, there is this difficulty in your position, that as far as the defendant is concerned, they have brought here these witnesses, Browning, Otterback, and Dr. Parmalee, they have submitted themselves for cross-examination, and their knowledge, training, background and experience were all fully gone into. Now, I take it, a good part of these exhibits that were offered yesterday involve matters that this man Harley Johnson, that were peculiarly within his knowledge, he prepared the report, he participated in these tests.

Mr. Strouss: He was in charge of them, as the record shows.

The Court: Yes. Well, now the State is asking this Court to admit in evidence excerpts from these reports without having the man whose name is signed to them, the man who prepared them, present and sworn and an opportunity to cross-examine. That is, if they were admitted, then the defendant is precluded from any cross-examination, they just have to take the record as-is.

Mr. Polley: He works for the Southern Pacific Company in effect; they can get him here if they so desire. [fol. 5024] The Court: That is not their burden in the first instance.

Mr. Strouss: There is more than that, here is an association of which they are a member. This is a record made by them, and every other member of that association. If the rule were otherwise, the easiest way in the world for them to cover up is to have everything done by the association, which, as a matter of fact, the record shows, is what is done whenever there are any tests to be done with respect to railway equipment.

The Court: Well, it is something that all the railroads are interested in, and only a few places in America, such as Purdue University, have the necessary equipment and facilities to make those tests.

Mr. Strouss: This involves more than the rack test made by the Purdue University, this included the rack test made by the Purdue University and the road tests made on the Southern Pacific Lines in California and Oregon, the tests made on the lines of the Southern Pacific, and they were made by the Association acting for its members.

[fol. 5025] Mr. Booth: But we don't concur in that report and never have.

Mr. Mason: The report has never been adopted. The action of the Association is shown of record already, it is the adoption of these rules—we showed all that, that is the only action the Association took, was the adoption of these rules. There is no showing, and there is nothing in the evidence to show that this report of Harley Johnson was ever adopted. These excerpts which were printed here, were merely printed for the information of members. I am satisfied they never were adopted. Aside from that, there is nothing to show that the Association has any more power to bind its members than the Tucson Chamber of Commerce. We are a member of that too. It acts for us

and other members in Tucson, but we have dissented from them in matters.

Mr. Strouss: There is considerable difference with an agent acting for one who reports as to what he has actually done; certainly, it is admissible in evidence against the parties he represents whether they agree with his statement of not, the statement of his conclusions, anything of that sort, what he has done, is admissible against him.

[fol. 5026] The Court: Well, Mr. Polley wants to be heard, and there isn't time now on his phase of it, so the Court will make no ruling at this time with reference to these exhibits which have been marked for identification, to which objection is made to their introduction in evidence. Now, Gentlemen, there is just one other matter. Do I understand, Mr. Strouss, that so far as your witnesses are concerned, that the State has completed its rebuttal?

Mr. Strouss: Yes, that is true.

The Court: And you indicated, Mr. Mason, that you were going to want to cross-examine this last witness, Mr. Hardwicke, after the recess, and then how long do you anticipate it will take you to complete the cross-examination of this witness, and present your surrebuttal testimony?

Mr. Mason: May we have the case go over until April 29th? Will that suit your Honor just as well? There has been a lot put in here today that we did not anticipate, and it will take us some time to check it.

The Court: Then the record may show the Court will be at recess in this case until April 29, at ten A.M.

(Thereupon, the court stood at recess until April 29, 1941, at ten o'clock A.M.)

[fol. 5027] April 29, 1941, Ten o'clock A. M.

All parties being represented as heretofore noted, proceedings were resumed at this time as follows:

The Court: You may proceed.

Mr. Strouss: We have a little more to offer, if the Court please. Of course, the Court will remember that at that last session, we stated we would procure photostatic copies of certain pages. We have those. Then we are having copies made of the 1940 Form T's, which will not be ready, I understand, until some time tomorrow. There is one item that I

think counsel for the defendant has stated that they would present here, that is the 1933 specification for air brakes.

Mr. Mason: The current specification.

Mr. Strouss: The testimony shows that that is the current specification, but the transcript was the specification set out in the rules of interchange.

Mr. Mason: I understand that it is not set out in the rules of interchange.

Mr. Strouss: I mean referred to, I misspoke, I mean, referred to in the rules of interchange. Now, then, we have Exhibit 367. At the time it was put in I explained that [fol. 5028] through error the casualties to freight employees and the passenger-train casualties on the Salt Lake Division were put on one exhibit. Now, we have made separate exhibits of those, and if counsel is agreeable we would like to substitute the separate exhibits for the one, that is, separating the passenger from the freight.

The Court: It is the one carrying the No. 367. Will you give a new number to the other one?

Mr. Strouss: My suggestion is that it would be 367 and 367A.

The Court: Any objection to that?

Mr. Mason: No, none at all, your Honor.

The Court: Then the substitution may be made.

Mr. Strouss: I suggest that the casualties to employees in train and engine service be marked as 367 and the casualties to passengers and passenger employees be marked 367A.

The Court: They may be so marked.

J. S. Hardwicke was recalled to the stand and testified further as follows:

Direct examination (Continued).

By Mr. Strouss:

Q. Mr. Hardwicke, I hand you a document entitled, "Inter- [fol. 5029] state Commerce Commission, Bureau of Statistics, Accident Bulletin 105, Calendar Year 1936." Did you cause photostatic copies to be made of Tables 24, 50 and 51 in this?

A. I did.

Mr. Mason: Three Tables, is that, Nos. 24, 50 and 51?

Mr. Strouss: Yes. I ask that this document entitled.

"Interstate Commerce Commission, Summary No. 24," be marked for identification.

The Court: It may be marked.

The Clerk: Plaintiff's Exhibit No. 382 for identification.

Mr. Strouss: Mr. Hardwicke, I hand you Plaintiff's Exhibit No. 382 for identification. Is that a true photostatic copy of Summary 24 appearing on Page 16 of Bulletin 105.

A. It is.

Mr. Strouss: We offer this in evidence.

Mr. Mason: No objection.

The Court: It may be admitted.

(Thereupon, the document referred to was received in evidence, and marked "Plaintiff's Exhibit No. 382.")

Mr. Strouss: We ask that Table 50, photostatic copy of [fol. 5030] Table 50 be marked for identification.

The Court: It may be marked.

The Clerk: Plaintiff's Exhibit No. 383 for identification.

Mr. Strouss: And a photostatic copy of Table 51.

The Court: It may be marked.

The Clerk: Plaintiff's Exhibit No. 384 for identification.

Mr. Strouss: Mr. Hardwicke, I hand you plaintiff's Exhibit 383 for identification, and ask you if that is a true photostatic copy of Table 50 appearing at page 18 of Accident Bulletin 105 of the Interstate Commerce Commission?

A. It is.

Mr. Strouss: We offer this in evidence.

Mr. Mason: No objection.

The Court: It may be admitted.

(Thereupon the document referred to was received in evidence and marked, "Plaintiff's Exhibit No. 383.")

Mr. Strouss: Mr. Hardwicke, I hand you Plaintiff's Exhibit 384 for identification, and ask you if that is a true photostatic copy of Table 51, page 19, Accident Bulletin, 105, of the Interstate Commerce Commission?

[fol. 5031] A. It is.

Mr. Strouss: We offer this in evidence.

Mr. Mason: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked, "Plaintiff's Exhibit No. 384.")

Mr. Strouss: Now, we offer in evidence a certified copy of the Report of the Interstate Commerce Commission in Cause No. 13528, decided July 8, 1924, Power Brakes.

Mr. Mason: We have no objection, your Honor, and the certification, of course, is not necessary. This is the published pamphlet copy of a decision of the Interstate Commerce Commission, of which the courts under Section 14 of Part 1 of the Interstate Commerce Act are required to take judicial notice when they are called to their attention. I have no objection to its being offered as an exhibit.

The Court: It may be admitted.

(The document referred to was received in evidence, and marked, "Plaintiff's Exhibit No. 385.")

The Court: Mr. Strouss, referring back to Exhibit No. 367, as originally admitted in evidence on April 17th, it [fol. 5032] is my understanding now, that by the substitution of these two other sheets, that this original exhibit is to be destroyed?

Mr. Strouss: Withdrawn, yes.

[fol. 5033] Mr. Polley: The court will remember when we introduced exhibit No. 338 entitled, "Casualties to Employees, Train and Train Service Accidents, Freight Service in the State of New Mexico," we inadvertently omitted the year 1933. I have just handed the clerk an exhibit entitled, "Casualties to Employees, Train and Train Service Accidents, Freight Service in the State of New Mexico." Mr. Hardwicke, did you prepare that exhibit?

A. Yes, sir.

Mr. Polley: May we have this marked for identification?

The Court: It may be marked.

The Clerk: Plaintiff's exhibit No. 386 for identification.

Mr. Polley:

Q. Was it prepared in the same manner as exhibit No. 338?

A. Yes, sir.

Q. Is it true and correct in all respects?

A. All with the exception of a typographical error, a word misspelled at the bottom. The word "derailed" is spelled "detrailed."

Q. With the exception of that, it is correct?

A. It is correct.

Mr. Polley: We offer the exhibit in evidence.

Mr. Strouss: May the letter "t" be stricken so it reads [fol. 5034] "derailed" instead of "detrailed"?

Mr. Mason: This designation "slack accident," Mr. Hardwicke, with the star, that is your own interpretation of what is revealed by the form T reports?

A. Yes, sir.

Q. Is this showing under the column "Description of Accident" a complete statement of what appears as the cause of accident on the form T report or merely your abbreviation?

A. It is stated in the cause above, I think it is item 17 of the form T report which says "Cause Briefly."

Q. You have shown in detail what appears on item 17 on each of these form T reports?

A. Yes, sir.

Q. You used nothing else but the form T reports in preparing exhibit No. 386?

A. That is right.

Mr. Mason: Your Honor will recall an objection to exhibit No. 338 on the ground that as to the star and the notation "slack action" we made an objection on the ground that that part of the showing represented the opinion of the witness and was incompetent because he had not shown any proper qualification. That is the only [fol. 5035] objection we have to exhibit No. 386.

The Court: That objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 386.")

Mr. Strouss: Exhibit No. 203 which is the rules of interchange, it was understood such parts of that as either party desired could be read into the record. On page 275 appears a form of interchange agreement which we ask be written into the record.

The Court: You just want to have that copied?

Mr. Strouss: Yes.

Mr. Mason: That includes only page 275 and no other page?

Mr. Strouss: That is all I have asked for so far.

Mr. Mason: As to the item just mentioned there is no objection.

The Court: It may be copied into the record then.

[fol. 5036] Form of Interchange Agreement

The subscriber hereto adopts and agrees, jointly and severally, with each and all other parties, (whether corporations, partnerships or individuals) owning or possessing railroad cars used for the transportation of commodities, which parties have respectively entered into agreements in effect similar to this instrument, that the Subscriber will abide by the Code of Rules governing the condition of, repairs to and settlements for freight cars for the interchange of traffic, as formulated and promulgated by the former Master Car Builders' Association and by the Association of American Railroads (Division V—Mechanical), or by either thereof (which rules are designated on the minutes of said Association's proceedings and are commonly known as "Interchange Rules"), and by each of said rules, and as well will abide by each and all decisions and interpretations of the Arbitration Committee provided for by said Code of Rules, until this agreement on the part of the Subscriber shall be terminated by three months' notice in writing, filed with the Secretary (or such other officer as from time to time shall be acting as Secretary) of said Railroad Association, or of such body as [fol. 5037] shall at the time have succeeded thereto.

Dated, signed and sealed this day of , A. D. 19

By

President.

Attest:

Secretary.

Witnesses to Execution by Subscriber:

(Seal)

(Seal)

(Seal)

Mr. Strouss: On page 277 appears the heading "List of Railroads and Car Owners Which Have Executed the Freight Car Interchange Rules Agreement." On page 301 as a part of that list appears the defendant company and I would like to have—I don't want to put that whole list in because it takes about——

[fol. 5038] Mr. Booth: I think it could be broadened to stipulate that all of the railroads and officials of railroads who have appeared in this case are parties to that agreement.

Mr. Strouss: Including the defendant.

Mr. Booth: Yes.

Mr. Strouss: That is all right.

The Court: Then the record may show the stipulation.

Mr. Strouss: I have one or two questions I want to ask concerning these exhibits. Mr. Hardwicke, exhibit No. 384, "Highway Grade Crossing Accidents Where Auto Involved," it appears from that exhibit that the information contained therein was taken from table 24 of the Interstate Commerce Commission Accident Bulletins for the years shown, is that correct?

A. Yes, sir.

Q. Plaintiff's exhibit No. 382 you have testified is table 24 for the year 1936 in the Interstate Commerce Commission Accident Bulletin for that year, is that correct?

A. Yes, sir.

Q. Is that typical of the pages appearing in the bulletins for each of the other years?

Mr. Mason: I object to the question, the pages of the [fol. 5039] bulletin are themselves the best evidence and the statements of the witness as to whether or not they are typical are obviously incompetent.

The Court: I will hear you on that, Mr. Strouss, I am inclined to sustain the objection.

Mr. Strouss: If counsel insists upon me putting all those in I will put the bulletins in but I was trying to get away from building up the record here. I can put the best evidence in.

Mr. Mason: It seems to me, your Honor, that the bulletins themselves are available and copies are readily made by the photostatic process. If it is desired to put in corresponding pages, it can be easily done.

The Court: Just what do you have reference to, Mr. Strouss? Will you read the question, Mr. Reporter?

(The record was read by the reporter.)

The Court: Technically the objection is good, but rather than build up the record I am going to overrule it.

Mr. Mason: I would like to have the witness specify what other years.

Mr. Strouss: I haven't had a chance to finsh my questions when I was interrupted. I was about to ask him the years [fol. 5040] which are indicated on the exhibit No. 334.

A. 1929 to 1939, inclusive.

Mr. Strouss:

Q. Referring to exhibit No. 334, the year 1936 under the column headed "Arizona Accidents" appears the figure 13?

A. That is the total number of accidents.

Q. Where did you get that figure 13?

A. I got that in the first column under the heading "Number of Accidents."

Q. There are two columns headed "Number of Accidents"?

A. In the casualties resulting from accidents in which automobiles were involved.

Q. Referring to exhibit No. 382, is that the fifth column of figures appearing on exhibit No. 382?

A. Of table 24?

Q. Yes.

A. That is correct.

Q. Under the heading "Casualties" appears the figure 20 for the year 1936. Where did you get that figure?

A. That is for Arizona?

Q. For Arizona.

A. Five killed and 15 injured, the total is 20.

[fol. 5041] Q. Those figures appear in columns——

A. (Interrupting) Three and four.

Q. No, this exhibit refers only to accidents where automobiles were involved, columns 7 and 8?

A. That is right, 5 killed and 15 injured.

Q. I hand you plaintiff's exhibit No. 383, photostatic copy of table No. 50 appearing in the Accident Bulletin for the year 1936 and ask you if that is in form typical of the tables

appearing in the Accident Bulletins for each of the other years?

A. That is correct.

Mr. Mason: I ask that the answer be stricken.

Mr. Strouss: Wait until I finish the question, on exhibit No. 336.

Mr. Mason: If the question is intended to elicit from the witness a statement that there is a similar table for each of the years 1929 to 1939 corresponding to the table represented on exhibit No. 383 or a series of similar tables, because there are actually several under the heading, I have no objection to it. If it is intended to elicit from the witness his conclusion that this table is typical, I have the same objection as to the question which was asked in connection with exhibit No. 382. I assume there is a similar table No. 50 in each of the Accident Bulletins for the several [fol. 5042] years last past.

The Court: Is that what you desire to establish?

Mr. Strouss: Yes, I was asking if it was typical in form.

The Court: You are not going into the contents of those other schedules?

Mr. Strouss: No, of course not.

The Court: The record may show the stipulation which obviates the necessity of your referring to each of these other years.

Mr. Booth: It is the same form but different figures.

Mr. Mason: I have no objection to that type of question at all.

Mr. Strouss: That would be true of table 51, which is exhibit No. 384.

Mr. Mason: Yes.

Mr. Strouss:

Q. You testified concerning exhibit No. 335, Mr. Hardwicke, "Highway Grade Crossing Accidents," all accidents at highway grade crossings. Under column "Arizona Accidents, 1936," appears the figure 13. Where did you get that figure?

A. That is in the first column under "Number of Accidents."

[fol. 5043] Q. And the total casualties?

A. Twenty, five and fifteen.

Q. That is the total of columns 3 and 4?

A. Yes, sir.

Q. In the third column of exhibit No. 335 as well as in the third column of exhibit No. 334 under "Arizona" appears under the heading "Autos Registered" the figure 115,035 for the year 1936 Where did you get that figure?

A. I got that under the number of total automobiles registered in Arizona for the year 1936.

Q. That is column 9 of exhibit No. 382 of table 24?

A. That is correct.

Q. The figures appearing under the headings in New Mexico and Nevada for these two exhibits were taken from table 24 in the same manner?

A. In the same manner.

[fol. 5044] Q. Now, referring to Table No. 50 in Exhibit No. 336, grade crossing accidents classified as to Trains striking autos and autos running into trains, ICC Accident Bulletin Table 50, years 1935, 1939, appear two columns, one "Struck by Train" and the other "Ran into side of train." Under the column "Struck by train," for the year 1936 appear the figures 2680. Where did you get those figures from, Mr. Hardwicke?

A. I got that from the number of accidents in the first column, which was 2594, the first item, Train Service Accidents; in addition to that I took in that same column below "Train Accidents" 86, and added the two together to make a total as shown by the exhibit for the year 1936.

Q. In other words, you took the total accidents appearing under the heading, "Struck by Train?"

A. Struck by train.

Q. In both train and train service accidents?

A. That is right.

Q. And under the column "Ran into side of train," in exhibit 336, for the year 1936, appear the figures 1441. Where did you get that figure?

A. That is the total in the same column of 1393 and 48 added together for the year 1936.

Q. In other words, that is the total of train and train [fol. 5045] service accidents?

A. That is correct.

Q. Under heading "Ran Into Side of Train?"

A. That is correct.

Q. Were the figures for the other years arrived at in the same way?

A. In the same manner.

Q. Now, in Exhibit 337, Plaintiff's Exhibit 337, Casualties to Non-Trespassers, Table 51, under the heading "Arizona," appear columns headed "Killed," "Injured," "Total Casualties." For the year 1936 appears under the column "Killed" the figure "11." Where did you get that figure?

A. I got that in the fourth column near the top of the page and in the fifth column, 11, 99, and a total of 110 casualties to non-trespassers.

Q. That is the fourth and fifth columns of table No. 51?

A. 51.

Q. Under the heading "Nevada" under the column "Killed and Injured," appears the figures 9 and 36?

A. That is correct.

Q. Where is that taken from?

A. That was taken from the same columns opposite the State of Nevada.

[Vol. 5046] Q. And the total is the total of the killed and injured?

A. That is right.

Mr. Strouss: That is all.

Mr. Mason: Mr. Strouss; perhaps this will obviate some questions of the witness. I take it, the purpose of the exhibits 382, 383 and 384 in your discussion is to lay the foundation for exhibits 334, 335, 336 and 337, and show that they were traceable back to the Accident Bulletin?

Mr. Strouss: That is correct.

Mr. Mason: And in your questioning of the witness as to whether these exhibits were typical I take it you didn't mean to infer that they were other than similar in form, not that the figures didn't vary from year to year?

Mr. Strouss: No, just similar in form.

Cross-examination

By Mr. Mason:

Q. Now, Mr. Hardwicke, I would like to have you turn if you will to your Exhibit No. 338. First, of all, I would like to ask you, having in mind the exhibit just introduced covering the 1933 New Mexico casualties, if this Exhibit

No. 386 doesn't show the same items and with the same dates, [fol. 5047] the year only being omitted, as are shown in the third, fourth, fifth and sixth items at the top of page 3 of Exhibit 338?

A. For what year?

Q. Well, will you look at Sheet 3 of Exhibit 338?

A. That is correct, the year has been omitted. The same four accidents that are in this exhibit you speak of now, these four accidents are contained under the year of 1932.

Q. Then it would be correct if, on sheet 3 of Exhibit 338, you were to insert the year 1933 in words and figures immediately after the second, and immediately prior to the third line, wouldn't it?

A. That is right.

Q. And to that extent, Exhibit 386 is a duplication of 338?

A. Yes, sir.

Mr. Strouss: I might say that my reason for having that made up was counsel's statement the other day that 1933 was left out of here. I didn't myself check the exhibit to find out. I don't want to have this duplication in there. If aggreeable, I would like to withdraw the one put in this morning.

[fol. 5048] Mr. Mason: I have no objection.

Mr. Strouss: And the original exhibit corrected to show the year 1933 between the second and third lines on page 3 of Exhibit 338?

Mr. Mason: Yes. Then Exhibit 386 will be withdrawn.

Mr. Strouss: Exhibit No. 386 will be withdrawn.

The Court: The correction may be made on Exhibit 338 and Exhibit 386 is withdrawn.

Mr. Mason: Now, going to Sheet 1, Mr. Hardwicke, will you refer to the item showing an accident on April 28, 1930, at VeVay, New Mexico?

A. Yes, sir.

Q. You show there as casualties Conductor Prickett and Brakeman East with a notation "None." It is a fact, is it not, that those men were not reportable casualties?

A. No, sir, they were not reportable casualties. They were added to the report, their names were shown on the original Form T report.

Q. Weren't their names stricken out?

A. No, none stricken out, they were on the report at that time, and hadn't been stricken from it at the time we checked it, the photostatic copy.

Q. You know, of course, Mr. Hardwicke, that a casualty, [fol. 5049] so-called, in which an employee suffers no loss of time because of disability, is not a reportable casualty?

A. I do.

Q. Didn't this exhibit purport to be a showing of reportable casualties?

A. Yes, sir, it is, but where the word "none" was used, those names were added to the Form T report and I intended to have a true copy of the report by adding those names, and the word "none" had been added to the report.

Q. The word "none" appears on the original form T report?

A. Yes

Q. Showing these were not reportable casualties?

A. Yes, sir, that is right. They were in the train crew at that time.

Mr. Mason: Those Form T's are in evidence, aren't they?

Mr. Strouss: Yes.

The Witness: Yes. That is, for the year 1930, that was on April 28th.

Mr. Mason: Mr. Hardwicke, the photostatic copy of the Form T report that I have before me here indicates that the names of Mr. Prickett and Mr. East and the description of their injuries were scratched through, and I assume [fol. 5050] that is a counterpart copy of the original on file with the Interstate Commerce Commission?

A. Well, in other words, Mr. Prickett's name has also been scratched through at some time.

Q. Both East and Prickett are scratched through, and Province was not?

A. In the photostatic copy we took that, myself and another man checked it, it was a blur on the photostatic copy.

Mr. Strouss: I think that the Form T in evidence will speak for itself. Part of it there, it is quite questionable whether it has been scratched through or not.

The Court: Well, the record does speak for itself. It shows some line drawn through.

Mr. Strouss: I don't take it we are limited to the proof of what are simply reportable casualties?

Mr. Mason: You are not limited, but the witness himself, in introducing this exhibit, indicated that it was a reportable casualty. I take it that we are not interested in unreportable casualties not resulting in disability.

The Court: I don't think the witness had indicated he has any personal knowledge of it.

[fol. 5051] Mr. Mason: No, it is based on the Form T report.

Q. Now, Mr. Hardwicke, I would like to have you look at the accident on December 24, 1930, at Luna, New Mexico, which shows a seven-day disability to Conductor Sale, and on a seventy-car train, and I will ask you if the Form T report doesn't indicate that this accident was due to an emergency application of the air brakes causing an abrupt stopping of the train, throwing Conductor Sale against the stove in the caboose, causing him bruises and so forth.

Mr. Polley: Wait a minute. Let him see it.

Mr. Mason: I am going to let him see it, certainly. Counsel hasn't furnished us with an extra copy of it.

A. The detail on the bottom of the report and on the back of it is shown here, resulted in an emergency application. However, under Item 17, "Cause briefly," the report says, "Derailed by hatch cover of car on track," and it shows Conductor Sale with a probable loss of time of twenty days.

Q. Well, Mr. Hardwicke, my question of you on this particular accident, is this, where the form T report showed an injury due to an emergency application and an abrupt [fol. 5052] stop, will you explain to me why you didn't use a star and indicate this as being a slack action accident?

A. Well, I don't know hardly how to answer that, except that I used the item at the top of the report to determine briefly whether there was any slack action. Sometimes, on the report, the detail is shown below, would be a part of the report. However, they would carry a notation, "Not admitted by carrier." That one doesn't show that.

Q. Mr. Hardwicke, then you selected what you wanted off the Form T report for the purposes of this Exhibit 338, didn't you?

Mr. Strouss: I object to that. That is not a proper question. He testified that he has taken his statements from the Form T under the item, "Cause briefly." Now,

the heading of the Form T, as your Honor will see by looking at it, has a statement on the form itself, "Cause briefly." Item 17, the witness has testified that that is the matter that he took in preparing this exhibit and used just the words of the exhibit itself.

The Court: No, the objection will be overruled. He may answer.

A. No.

[fol. 5053] Mr. Mason: Well, Mr. Hardwicke, it is not possible, is it, that you failed to include this as a slack action accident or an accident caused by sudden stop-start lurch or jerk of train because it just happened to be seventy-cars?

A. No, it is not.

Q. Did you, throughout your Exhibit 338, confine yourself entirely to the showing in Item 17, and pay no attention to the narrative or detail of cause shown in Item 26?

A. No, I did not.

Q. You paid no attention to Item 26?

A. Sometimes I did if the information above was not sufficient to determine, then we read Item 26 at times, to try to determine as to whether or not the detail showed there was slack action.

Q. So sometimes you used Item 26 and sometimes you didn't read it at all?

A. There was a lot of cases you didn't need to use it, because it was carried in Item 17 that they think the accident was caused from slack action or sudden jerks of the train.

Q. You particularly didn't read Item 26 referring to this accident to Conductor Sale which said that "The engineer made an emergency application of the air brakes, causing [fol. 5054] an abrupt stop, throwing Conductor Sale against stove in caboose, causing bruises about right arm and right side." You didn't read that?

A. I don't remember whether I did or not.

Q. Now, having that called to your attention, Mr. Hardwicke, you have seen it, have you?

A. Yes, sir.

Q. Don't you agree with me that you should star this accident to Conductor Sale and include it among the other accidents as to which you have placed a star on your Exhibit No. 338?

A. I do, yes.

Q. Do you want the exhibit corrected accordingly?

A. Either way you want to.

Mr. Strouss: We will stipulate that it is a slack action accident.

Mr. Mason: All right. Now, let us look at Sheet 3, October 21, 1934, at Deming, New Mexico, First 980, Conductor Carden. You show this, Mr. Hardwicke, as a slack action accident due to the man losing his handhold on the ladder of the car when the slack ran out in a train of 92 cars. I want to call your attention again to the narratives of the accident. I will read this to you, and ask you to [fol. 5055] verify it: "Engine 5034, First 980, was backing up with 18 cars to couple with balance of train preparatory to departing from Deming. Conductor Carden was standing on stirrup step of side ladder S.P.Gondola 47168, second car from engine. As speed of engine and cars was reduced preparatory to making coupling, slack ran out and the jerk caused Conductor Carden to lose handhold and fall to the ground." I will ask you if I haven't read correctly the substance of Item 26?

A. Yes, that is right.

Q. Then, in reality, Mr. Hardwicke, this was an 18-car switching accident, and not a slack action accident on a 92-car train, was it?

A. Well, no. It says, "Kind of train, first 980, 92 cars, Engine 5034, East, four miles per hour."

Q. Yes, Mr. Hardwicke, but the Form T report, the same sheet, the one you supposedly depended upon, shows that there were 18 cars being handled and that this man fell off when the slack ran out of the 18-car cut during the switching?

A. That is right.

Q. Isn't this, then, an 18-car accident and not a 92-car accident?

[fol. 5056] A. Well, it is a switching movement.

Q. Doesn't it show on the face of the Form T that it is a switching movement?

Mr. Strouss: The Form T speakes for itself.

Mr. Mason: The witness tries to speak differently for it here on exhibit 338. I am trying to get him to tell us about it, that is all.

The Court: The objection is overruled. You may answer.

Mr. Mason: Mr. Hardwick, you won't agree, then, that this is an 18-car accident which happened during a switching movement?

A. No; I would say it is a slack-action accident if the slack ran out hard enough to jerk him loose from the car.

Q. On an 18-car movement, however?

A. That is correct.

Q. There were only eighteen cars being handled?

A. That is correct.

Q. It was a short-train slack action accident?

A. Unless he had been coupled into the whole 92-car train.

Q. But the Form T report in evidence as part of Exhibit No. 344 shows that he didn't have hold of the entire 92 cars.

A. It does.

[fol. 5057] Q. Then shouldn't we correct your exhibit to show this as a slack action accident on 18 instead of 92 cars?

Mr. Strouss: May I see that form T, please?

A. It can be shown.

Mr. Mason:

Q. Now, let's refer to sheet 5 of your exhibit No. 338, accident at Mongola, New Mexico, June 30, 1937. Mr. Hardwicke, you show that brakeman Fountaine lost 21 days. I will ask you to refer to the form T report which is part of exhibit No. 347 and state whether or not the form T report does not indicate that Mr. Fountaine lost no time at all?

A. That is correct.

Q. Let's look at the last item on the exhibit, accident October 18, 1939, at Tularosa, conductor Benson, on sheet No. 7. I have before me the form T report being part of exhibit No. 349, and item 26 as I read it shows: "As train brought to stop conductor standing in caboose lost balance and fell to floor of caboose." Shouldn't that properly have been starred as a slack action accident?

A. No; a man could lose his balance and fall from a service stop. There wasn't any detail to show that they made a sudden start or hard stop.

Q. You omitted that as a slack action accident because [fol. 5058] there wasn't anything to indicate a sudden stop. It was simply a case of losing balance and falling in the caboose?

A. No, from a service stop a man could lose his balance in a caboose.

The Court: We will take our mid-morning recess at this time.

(Thereupon the court took a short recess after which proceedings were resumed as follows.)

Mr. Mason: I think at the recess, Mr. Hardwicke, we were talking about this accident to conductor Benson at Tularosa on October 18, 1939?

A. Yes, sir.

Q. I want you to refer, if you will, back to sheet 5 and go down the sheet to June 17 at Alamogordo, an accident to brakeman P. M. Welsh.

The Court: What exhibit is this, please?

Mr. Mason: Exhibit No. 338, the name is misspelled, it should be "Welsh."

Q. Have you the item?

A. Yes, sir.

Q. I notice that you have it starred?

A. Yes, sir.

Q. The description of the accident that you put there, "Lost balance and fell from train," is very little different [fol. 5059] from the description that you show for the accident to conductor Benson on sheet 7, "Lost balance and fell." Why did you star the one and not the other?

A. "Lost balance and fell from train"—I can't remember now just what other detail there was on the Welsh report.

Q. You used the detail?

A. I used the detail.

Q. I have the report before me here and here is what it reads, under item 26—item 17, "Lost balance and fell from train" is what you have on the exhibit but here is what item 26 says, "As stop of train was made, this employee lost his footing or balance and fell from top of car to ground. Stop made by conductor opening valve in caboose

due to having missed train order." Do you find anything in there that indicates slack action?

A. Well, no, with the exception that naturally a train of that length if it was stopped by the conductor's valve it would create more or less slack action in the train.

Q. That is your judgment. There is nothing on the form T to indicate slack action, is there, any more than there is on the form T covering the Benson accident?

A. No, but the Benson accident could have been a slack [fol. 5060] action accident because going three miles an hour with a stop of the train it could have been classed as a slack action accident and might have caused the man to fall to the floor of the caboose. Naturally there was something to fall over that caused him to fall.

Q. So far as the form T reports are concerned, Mr. Hardwicke, the Welsh accident and the Benson accident stand practically on all fours, don't they? There is no indication of slack action in either one?

A. Well, yes, there is indication of slack action in the Welsh report because an application of the air from the rear end at the conductor's valve would naturally cause some slack action on that kind of a train.

Q. Does it show on the form T report?

A. No, it doesn't show it on the form T report but as a matter of knowledge of these types of trains a man knows what happens in that kind of stop.

Q. You used your independent judgment and did not depend on the form T report in assigning slack action as a cause of the Welsh accident?

A. To some extent, yes.

Q. You did likewise, used your independent judgment [fol. 5061] in refusing or failing to assign slack action as a cause of the Benson accident?

A. Well, I just overlooked that portion of it.

Q. I think you agree with me that the form T reports indicate substantially the same character of circumstances, a stop of the train and a man falling from the train or in the caboose?

A. No, it doesn't indicate exactly the same for this reason, that one was made from the brake valve on the locomotive and the other was made from the conductor's valve on the rear end of the train.

Q. Does the form T report, aside from your judgment, indicate a sudden stop in either case?

A. Yes, the fact that the man got hurt, either one would indicate there was not a natural, normal stop.

Q. Have you exhibit No. 366 before you? That is the 1940 train and engine service accidents in Arizona.

A. I have.

Q. Will you note this accident to brakeman Alexander at Dragoon on March 16th. Your description of the accident shows, "Train made rough coupling to caboose." If the jerk which caused conductor Carden to fall and be [fol. 5062] injured at Deming, which you have shown on the New Mexico exhibit, No. 338, if that could be classed as a slack action accident will you explain why this rough coupling and jerk which apparently caused brakeman Alexander to be injured should not equally be classed and starred?

A. I will answer that in this way, that after cutting a helper engine out at Dragoon, I think the detail of that report is in backing up to couple onto the caboose brakeman Alexander was standing on top of the caboose and when the coupling made he was either knocked over the cupola or knocked down on top of the caboose. That was just a coupling into the caboose which may have been a rough coupling.

Q. It was part of the process of remaking the train, really a switching movement?

A. Yes, it was backing up to couple onto the caboose after the helper engine had been cut out ahead of the caboose.

Q. I take it you omitted that because it was an accident occurring in a switching movement?

A. Not necessarily that. It was the way that it happened from a rough coupling rather than from a rough stop of a full train. He was only standing on the caboose [fol. 5063] before the train had coupled into it.

Q. If it was due to rough handling of a part of the train and not of the full train, it does fall into the same classification of the Carden accident at Deming where the move was being made with 18 cars, doesn't it?

A. No, the Carden accident shows they hadn't coupled into the train at that particular time but stopped prior to coupling into the train. This was in the movement and backing up of the caboose to couple on, more or less a

switching movement and it may have been at a too high rate of speed which caused a rough coupling.

The Court: Mr. Hardwicke, on that same page under date of May 3d, does that purport to give an account of an accident or injury which you received personally?

A. Yes, sir.

Mr. Mason:

Q. This accident that you personally received at Wymola on May 3d of last year, were you acting as a brakeman at that time?

A. Yes, sir, I was the rear brakeman on a local freight train between Phoenix and Tucson.

Q. Had you made a meet at Wymola?

A. We were heading in there to meet a passenger train at that time.

[fol. 5064] Q. This was when you detrained to get the switch?

A. No, I had lined up the switch and in an effort to catch the caboose which was moving at probably six or eight miles an hour, running to catch the caboose I stumbled and fell over either rocks or slag and my knee hit the tie, tearing the ligaments loose on the inside of my knee.

Q. That is not an infrequent cause of disability to brakemen, is it?

A. Not in this particular year, no, there were a lot of them about that same time.

Q. Let's look at exhibit No. 351, please, and refer to this accident at Aurant, California, brakeman Davis, page 1, January 28, 1930. Isn't it a fact, Mr. Hardwicke, that the form T report shows that Davis was injured because of the caboose door having closed on his hand on account of run-in of slack which swung the caboose door against him. Do you remember the form T report?

A. No, I don't remember what the detail was but this was stated under "Cause Briefly." It said, "Caboose door closed on hand." They were running ten miles an hour and that could have been caused that way.

Q. You didn't pay any attention to item 26?

[fol. 5065] A. I may have, I don't remember whether I did or not.

Q. At the same page, at the foot of the sheet, April 26, at Aurant, conductor Cooper, you show an injury there, a probable disability of 45 days on account of "Driverless truck and trailer rolled foul of track." Isn't it also true that the form T report shows that the engineer made an emergency stop of the train as a result of which conductor Cooper was injured?

A. It may have, I haven't got the form T report.

Q. If it does so show wouldn't it be proper to indicate this accident to conductor Cooper as a slack action accident?

Mr. Polley: We object to that until it is brought out whether this form shows it or not.

Mr. Mason: This is this man's exhibit. Doesn't he know anything about it?

The Court: Show the exhibit to the witness.

Mr. Strouss: I don't think there is any necessity for counsel to yell at us like that because we make an objection. We have a right to do that.

The Court: You are probably right, Mr. Strouss. Show him the exhibit.

[fol. 5066] The Witness: I can't recall all the detail on the form T at this particular time. A driverless truck and trailer rolled foul of the track may have caused an emergency stop, I can't say without having the form T available.

Mr. Strouss: I have asked the clerk to bring in the form T's which cover this exhibit.

Mr. Mason:

Q. Going to sheet 2 of the same exhibit, No. 351, May 13, 1930—wait a moment, I will pass that one—June 6, 1930, at Alhambra. That was actually a yard accident, wasn't it?

A. I think it was a switching movement of a train. It may have been that they were switching in the yard at Alhambra at that time. I don't think it was a yard injury. I think maybe that is the way it was classified on the report.

Q. Your exhibit shows that the train number was YD-2659E. What does the "YD" mean?

A. That is the abbreviation for "yard."

Q. Doesn't the form T report, copy of which I now show you, indicate that it was a yard accident, it was an item on the form T report which shows the word "yard" at the top of the sheet?

A. That is right, it may have been a yard accident. Not being familiar with the switching movement at that time, [fol. 5067]. it may have been a yard crew working at Alhambra.

Q. The form T report shows that it was a yard accident, doesn't it?

A. Yes.

Q. Let's go back to this accident to brakeman Davis at Aurant on January 28, 1930. Item 26 of the report which is a part of plaintiff's exhibit No. 361 reads as follows: "Davis was standing with his left hand on door jamb of caboose and as engineer released the air the slight slack action on the rear end caused the door to slam shut on his hand, bruising first finger." Isn't that correct?

A. That is correct.

Q. Going to sheet 5, you show on November 19th at Colton an accident in which conductor Breen and brakeman Curley were both injured and indicate that that occurred in 1931?

A. That is correct, it shows here it was in 1931.

Q. I have here exhibit No. 357 which consists of copies of the form T reports for the Los Angeles division for the year 1936 and I am going to show you a sheet for November 19, 1936, showing an accident to an extra train consisting of 52 cars which occurred at Colton and in which conductor [fol. 5068] Breen and brakeman Curley were injured and ask you if that is correct?

A. That is right.

Mr. Strouss: May I see that, please?

Mr. Mason:

Q. This is incorrectly shown as 1931, then?

A. It is shown in the wrong year.

Q. It should be in 1936?

A. That is right.

Q. Isn't that equally true of the balance of the accidents shown between the one on November 19th at Colton and the year 1932 at the foot of the sheet? That those other five there, Ventura, Pomona, Colton, South Fontana, and Cabazon, should all be shown as 1936?

A. Yes, instead of 1931.

Q. Let's look at sheet 12, 1935, an accident on December 23d at Los Angeles, brakeman Richardson. You show in the description of the accident, "Claims knocked off top of

train by sudden stop of train." Isn't that the same type that you have indicated by a star in various other places where a sudden stop is alleged to be the cause?

A. Whether the detail shows "Knocked off top of train by sudden stop of train," there may have been some investi-
[fol. 5069] gation developed that admitted that.

Q. Will you read the detail of the accident as shown in item 26 on the form T report covering that accident?

A. (Reading) "Richardson who was on top of caboose as train pulled into yard claims while standing in back of cupola holding on to hand railing severe run-in of slack action on rear end of Train due to sudden stop caused his hand-hold to be broken and him to be knocked off top of train."

Q. Doesn't that indicate that this was a slack action accident?

A. It would indicate that it was a slack action accident. However, the word "claims" was used and there doesn't seem to be any determination of whether or not his statement was correct.

Q. Let's look at sheet 11, the next item to the bottom. You show a 30-day disability to brakeman Rice, "Claims thrown off balance in cupola of caboose as stop made."

A. What is the date?

Q. September 19th at Mesquite, California. That was in the same year and was designated apparently in the same way, "Claims," and you starred that?

[fol. 5070] A. Yes.

Q. But you didn't star this other one where Richardson claimed he was knocked off by slack action. That is correct, isn't it?

A. That is right

Q. The only difference that I can see, and you can amplify this difference if you desire, the only difference I can see between the accident to brakeman Rice and the accident to brakeman Richardson in the essential cause or the essential circumstances is that brakeman Rice whom you starred was injured on a 97-car train and brakeman Richardson was injured on a 43-car train?

A. No, that is not the difference altogether. There may have been an oversight. I always do these reports; I classify slack action accidents according to the number of cars in a train where I have sufficient information to do it, but this may have been overlooked.

[fol. 5071] Q. Now, sheet 21 of this exhibit—first of all, I want to ask you if this exhibit 351 is not indicated to be a showing of casualties to employees, trainmen and enginemen only, is that correct?

A. Yes, injuries. This livestock caretaker at the bottom, let's see——

Q. He is not an employee?

A. No, he is not an employee, he is a man carried under contract.

Q. He doesn't properly belong in this exhibit then?

A. No, he doesn't belong there.

Q. Let us look at Exhibit 362, sheet 4. This purports to be a showing of casualties to passengers and employees on passenger trains, doesn't it?

A. Yes.

Q. Now, on sheet 4, on April 10th you show an accident to Extra 3699 West, 40 cars, Road Foreman Newell. Was that 40-car train a passenger train?

A. No, it was a freight train.

Q. Exhibit 365 please. You show an accident on December 4th, at Indio, to Brakeman Sickler.

The Court: What page is that?

[fol. 5072] Mr. Mason: That is on the third page, your Honor.

Q. Do you recall the Form T report covering the Stickler accident?

A. Yes, sir.

Q. It is a fact, is it not, that the Form T report doesn't contain any indication of slack action?

A. It says, from investigation it was determined that there was no unusual slack action of the train. It doesn't say just exactly—that is about the words at the bottom of the detail, that they claim there was no unusual slack action of the train.

Q. Doesn't the testimony of the crew indicate that there was no slack action?

Mr. Strouss: Just a moment——

Mr. Mason: You have it.

Mr. Strouss: Now, as I explained this morning, as soon as the typing is completed on those, they will be put in evidence.

The Court: If the witness cares to answer the question, he may do so.

Mr. Strouss: Quoting the statement at the bottom of the form T is not correct. I don't want the witness to be im-
[fol. 5073] posed on by a statement of that sort.

Mr. Mason: If he doesn't want to agree, he doesn't have to.

The Court: Go ahead.

A. Not knowing exactly how the report reads, I couldn't say what it does state.

Mr. Mason: Now, Exhibit 367. First of all, Mr. Hardwicke, isn't the title of 367 a little bit erroneous. You don't include all of the Salt Lake Division, do you?

A. We intended to include all the accidents occurring on the Salt Lake Division in Nevada on the Southern Pacific of which we had form T reports.

The Court: Well, the Salt Lake Division actually extends to Ogden, Utah, doesn't it?

A. Yes.

The Court: So, this should read: "Salt Lake Division operations in the State of Nevada?"

A. Yes.

Mr. Mason: Does it include any accidents on other divisions other than the Salt Lake Division. You know the Sacramento Division runs into Nevada for a short distance?

A. Well, the way we got the information on these acci-
dents, we received photostatic copies of all the Nevada
[fol. 5074] accidents occurring in those years.

Mr. Strouss: I think the witness is confused. This is the year 1940.

The Witness: Oh, 1940. These are the reports that we recently received from Mr. Mason here to check for the year 1940.

The Court: Well, does this include the accidents on the portion of the Sacramento Division which is in the state of Nevada?

A. It should include all occurring within the state of Nevada regardless of what the division was.

Mr. Mason: Then it really should be in the heading, "Southern Pacific Company, Pacific Lines, State of Nevada?"

A. Yes.

Mr. Strouss: Let me interrupt. If that is what the Form T's that counsel tendered to us cover, that is what we have.

The Witness: These were Form T's rendered by the Salt Lake Division in the State of Nevada, that was the reason for that heading.

Mr. Booth: Mr. Sullivan advises me that you were furnished with all Form T's in the state of Nevada regardless of the division. If there were any accidents west of the [fol. 5075] point where the Sacramento Division runs in Nevada, they are in there.

Mr. Strouss: The Form T's that were given to us by counsel for defendant for Nevada were the source of this exhibit.

The Witness: That is right, and it was considered that they were the Salt Lake Division because not knowing the exact location of the Salt Lake Division, with the exception of Sparks to Ogden.

Mr. Strouss: I think probably the exhibit should be changed to show the state of Nevada upon the statement of counsel. I will say this, that my understanding of the Form T's that were given us was that they covered only the Salt Lake Division. I did want to have all covering the state of Nevada, but all we received seemed to be on the Salt Lake Division.

Mr. Booth: There may have been no accidents on the Sacramento Division.

Mr. Mason: There was one on the Sacramento Division of a passenger train.

The Court: You are asking that the title of Exhibit 367 be changed to State of Nevada?

Mr. Strouss: Yes.

Mr. Mason: That will be 367.

[fol. 5076] Mr. Strouss: Yes, and 367A.

Mr. Mason: 367A will be the same way.

The Court: That correction may be made.

Mr. Mason: Now, I notice that again we find the Form T report covering the accident at Valley Pass on December 10th, is that one of those that has been removed from the file for copying?

Mr. Strouss: Yes.

Mr. Mason: Then I will have to defer cross-examination on that and on the other one that I asked about until we can have those here. There is a question I would like to

ask you, though, about Exhibit 367 A. Exhibit 367A is casualties to passengers and passenger employees. It contains only five entries. Have you it there, Mr. Hardwicke?

A. Yes, sir, I have it.

Q. Now, look at that accident on January 14 between Deeth and Elko. Do you know whether or not that was a Western Pacific passenger train?

A. I am pretty sure it is, because of the train number. However, the accident was reported by the Southern Pacific in their Form T's, but train 39, I think, is a Western Pacific train.

Q. That is the westbound Western Pacific train, isn't it? [fol. 5077] A. It is.

Q. This accident was reported by the Southern Pacific Company because it occurred on the Southern Pacific rails on paired track territory?

A. I think that seems to be the system of reporting. We never had any Western Pacific reports, but all accidents of that nature in your reports are signed by the superintendent of the Southern Pacific Company on Salt Lake division, and it may have been on account of the paired-track movement on Southern Pacific rails.

Q. This is not an accident, however, on a Southern Pacific train?

A. Well, in comparing what the train numbers are, I wouldn't take it to be.

Mr. Mason: I will say for the information of counsel, that the accident on February 25th at Verdi apparently occurred on the Sacramento division, because that is west of Lawton.

Mr. Strouss: This passenger train operation, if counsel states that was a Western Pacific train——

Mr. Mason: Yes, Train 39 is a Western Pacific train. The timetable will so show, and show it to be a Western Pacific train on our rails.

Mr. Strouss: If that is the situation, we are willing that [fol. 5078] the record should show it.

Mr. Mason: On Exhibit 369, Mr. Hardwicke, you show there on March 16th two accidents, one to train 43, in which a passenger, Mrs. Richard Sharp, suffered 45 days' disability, alleged sudden stop of train; another one Consolidated 5 and 43, Mrs. Walker, seven days' disability, alleged jerk

of train. Is there any reason why one but not both of those accidents should not be starred?

A. No, I think they should both be starred. However, "alleged" is a funny word. The only thing was, one of them occurred between Bridge 947.11 and Dock, Arizona, No. 43, with 12 cars, and somewhere between Dock and Phoenix after consolidation of No. 5 and 43, with 26 cars, Mrs. Walker alleged jerk of train, complained of severe pain in head, arms, and right leg, so either of them should be starred a slack action accident, and if in any way—sometimes it might not have been admitted there was any rough handling of train, it may have been proved by investigation that there was no rough handling of the train.

Q. You call them slack action accidents, Mr. Hardwicke, but as a matter of fact, there is nothing on the face of the [fol. 5079] report to indicate slack action or anything other than a sudden stop or jerk, is there?

A. Well, a lurch or jerk, sudden stop.

Q. But there is no indication of slack, is there?

A. No, not in the first one, alleged stop of train might have been an emergency stop, and the force of the stop probably would throw somebody down.

Q. Mr. Hardwicke, you have ridden in street cars from time to time, haven't you?

A. A few times, yes.

Q. You have had them stop suddenly, haven't you, to avoid a collision or something of the kind?

A. Not exactly that, but I have had them stop rather abruptly.

Q. And when there is a sudden stop, the passenger, if he happens to be standing, may suffer a severe jerk, may he not?

A. Well, not to the extent that you would from an emergency stop of a passenger train, because if is quite a bit more severe and violent than a streetcar would be, one unit.

Q. It is the same character of stop?

A. Yes, but there is only one unit to be considered. In a [fol. 5080] passenger train there might be from ten to fourteen or fifteen. I imagine that the air brake equipment on a passenger train is much faster and quicker than that on a streetcar.

Q. Virtually simultaneous, isn't it, throughout the train?

A. I wouldn't say it works simultaneously, sometimes it takes hold all at the same time.

Mr. Mason: Well, subject to one or two questions, I think that is all I have, the form T reports being missing.

The Court: Will they be available this afternoon?

Mr. Strouss: We will bring what have been copied over.

The Court: The court will be at recess then until two o'clock.

Mr. Mason: Yesterday afternoon, Mr. Sines was served with a subpoena duces tecum to bring to court certain form 361[illegible] reports in connection with two accidents on the Los Angeles division, both occurring during 1940. Now, the form 2611 reports have been referred to here previously, and your Honor may recall that they are the forms upon which employees make their statements with respect to accidents which have occurred in their presence or of which [fol. 5081] they have some knowledge. These form 2611 reports, which are the subject of the subpoena, if they ever were in Tucson, of which I am not certain, were not in Tucson or in the possession of Mr. Sines when the subpoena was served. They are not in Tucson or the state of Arizona today, consequently, the subpoena cannot be complied with. I am submitting for your information a copy of form 2611, so that the nature of the report will be clear. Now, the authorities are uniform, I haven't found any opposing authority, that a report of that kind cannot be demanded under Rule 34, or its production compelled: that it is not admissible in evidence as an admission of the defendant, that it is not material evidence on behalf of the defendant. Consequently, we believe not only is the subpoena duces tecum ineffective because the documents are not in the state of Arizona and subject to its process, but, furthermore, if they were, we couldn't be compelled by this device to have them in court for the use of the other side, because they are not subject to such an order to produce. I can furnish the authorities. I have quoted them already.

Mr. Strouss: We have Arizona authorities which seem [fol. 5082] to be out of the line of uniformity which Mr. Mason refers to. There is at least one Arizona case which holds that reports of an employee—that happened to be a railroad company in that instance, a foreman, as to cattle injured on the highway, that they are admissible in evidence against the railroad company as an admission, as an exception to the rule of hearsay evidence.

The Court: Is the general rule otherwise, Mr. Strouss?

Mr. Strouss: No, I don't think the general rule is otherwise. I have authority to sustain our position on that. Now, we have subpoenaed this form 2611 and we have in our motion to produce the production of form 2611 in the instance of these two accidents, we have limited it to the two accidents; one of them was referred to by Mr. Mason this morning as the Sickler, to which I objected that the statements were not as shown on the form T. I think when we bring in the form T it will show that the statement by the superintendent was that the statements of members of the crew indicated that there was no unusual handling of the train. In other words, form T on its face shows that it is purely a conclusion of the superintendent as to what the statements of the employees who were on the train [fol. 5083] and there at the time of the accident indicate. Now, these are the statements which we are asking for as to the employees on that train, so that we may have the best evidence as to what the employees did state was the cause of that accident. Now, if the 2611's indicate, as the superintendent has indicated, on the form T, I don't see why counsel should object to them being brought in if they sustain his statement that there is no indication of any unusual handling.

Mr. Mason: We object on several grounds. We object because our forms 2611 are not subject, whether they sustain the point is beside the question, we object that the motion is not properly taken and the subpoena properly issued, first, because they are beyond the jurisdiction of the State, second, because they are immaterial, and third, — and this is because counsel has announced his purpose — because counsel is endeavoring by this means to impeach his own showing. It will be recalled these form T reports are in evidence as Plaintiff's exhibits, form T reports for the Los Angeles division for 1940, and those are the only ones involved in this request, are plaintiff's own exhibits. It is elementary, the plaintiff cannot impeach his own showing.

[fol. 5084] Mr. Strouss: That is rather a strange argument. We have contended at different times during the course of this case that the form T's are merely the statement of the defendant as to their views of these things, and should not be binding on the State, and we have introduced

the evidence here of one witness whom we were able to produce here, and his evidence did show that the matter set up in the Form T did not correctly state the actual facts in connection with this accident, and that was the witness from California, the witness Hausman. Now, his testimony as to his accident and as to the injuries checked against that form T will show that the form T did not give a correct statement of either the nature of the accident or the injuries. The form T, as I remember it, and it is in evidence, shows that his disability was probably thirty or sixty days, when, as a matter of fact, he has never been able to go back to work since he was injured in 1937. Now, we have a right to show the method that they use in making these reports, and your Honor will remember the piece that I read from the accident bulletin of 1939, in which the Interstate Commerce Commission took notice of that very fact, that there was some indications of failures on [fol. 5085] the part of the carriers to correctly report and to report all of these reportable accidents.

The Court: Mr. Strouss, what have you to say as to the first objection that the reports, this form 2611, are not actually within the state?

Mr. Strouss: Well, the parties are before the Court and they can certainly be ordered to bring them in.

Mr. Mason: That is just a motion to produce again, which has already been denied.

Mr. Booth: There is another fundamental objection to bringing in these forms 2611. That is, the counsel makes the demand based on the assumption that the superintendent used those forms in making his form T's. Now, there isn't a word of evidence in here that he uses those. He may use it, it is true, but there may be other surrounding circumstances, there may be other forms of evidence, there may be an investigation which is always had in the case of serious accidents, by way of questions and answers, that he relies on in making his Form T. If the Interstate Commerce Commission intended that the employees should make the form T's and intended the carriers to follow the statements of interested parties, there might be suits against some of them, we are asked to give plaintiff evi- [fol. 5086] dence that might be material to him in that case, evidence of other witnesses; I don't know but what

it will be handed over to this Legal Aid Bureau that the B of R. T. maintain, but aside from that, there is no connection in the record or in the rules of the Interstate Commerce Commission or in the practices of the railroad, no necessary connection between form 2611, which is an ex parte statement by an employee to the superintendent, and the superintendent's own version of the accident. That is the fundamental objection, its lack of causation there.

The Court: If this were a damage action, it might be different. Unless there is an Arizona case squarely in point, I would certainly deny the request to produce form 2611, because I cannot believe that the defendant company would be bound by any such ex parte statement. Of course, this is not a damage action.

Mr. Strouss: If it were a damage action we wouldn't ask for it.

Mr. Mason: If it were a damage action the form T reports couldn't be used.

The Court: The practical effect of this request, the only purpose I can see it would serve, would be to impeach [fol. 5087] the form T reports.

Mr. Strouss: To show the method in which they are made and the underlying data. This form T, and the one we are particularly interested in is the one covering this Sickler accident, Mr. Booth says there is nothing to show that the superintendent did rely on these reports. The form T itself states that the statements of members of the crew indicate that there was no unusual handling of the train. Certainly, that statement shows that they looked to the form 2611 for the statements of the crew as to what was the cause of this accident.

Mr. Booth: Not necessarily. They may have looked to the statements of the crew during an investigation by question and answer before the superintendent.

The Court: Of course, it seems to me that the Court must look as to where this would lead us. The Interstate Commerce Commission requires certain reports. Apparently, those reports are the form T reports with reference to these casualties. Now, is this Court going behind those form T reports from which—that is, all the statistics practically offered by both the State and defendant have been taken [fol. 5088] from the form T reports submitted to the Inter-

state Commerce Commission. I think that is true. Now, are we going into an inquiry here to impeach those reports, and will this Court be required to determine whether those form T reports have been correctly made, whether those were the true facts in connection with a given accident?

Mr. Strouss: That is not what we are asking. We have this right, however, to put in whatever evidence bears upon the question, not for the purpose of the Court determining whether the form T is correct or incorrect, but to give all the evidence upon any factor.

The Court: Wouldn't the best proof on that, Mr. Strouss, if a question arises as to a given accident, to produce, as you did in the case of Hausman, the eye witnesses or one of the train crew, and examine him.

Mr. Strouss: That would be fine, but they are not in the state of Arizona.

Mr. Mason: We will give them free transportation to come to Tucson if you want them.

The Court: Wouldn't opposing counsel be entitled to cross-examine this witness whose ex parte statements you are seeking to offer, seeking to have produced?

[fol. 5089] Mr. Strouss: I think your Honor will find it is an exception to the hearsay rule with respect to reports made by employees.

The Court: Well, if the counsel will furnish me with a memorandum, not a brief on it, but just your authorities on it, I will go into it.

Mr. Strouss: Your Honor has said that our evidence has mostly been based upon Interstate Commerce Commission statistics. That is probably true, but because of this necessity, we don't have access to these; we asked for these form 2611's before this case came to trial, and of course were refused them. We can only put in what we have been given access to.

The Court: If counsel for both sides will submit a little memorandum of your authorities.

Mr. Mason: That is the memorandum I have submitted. I think it covers this point as well, although inferentially and not directly.

(Thereupon, the court stood at recess until April 29, 1941, until two o'clock P. M.)

[fol. 5090] 2 P. M., April 29, 1941.

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: You may proceed. Do you have further cross-examination of this witness?

Mr. Mason: Only when those two form T reports become available.

The Court: Then you may step aside, Mr. Hardwicke.

Mr. Strouss: Aside from the form T's and the questions on these exhibits we are resting.

The Court: In other words, Mr. Strouss, the State has now finished its rebuttal except for the Court's ruling on your demand to produce the forms 2611 and the objections which were made to the introduction of these exhibits Nos. 206, 329 to 333, and 371 to 381?

Mr. Strouss: That is correct, and the placing in evidence of the form T's upon which the 1940 accident exhibits were based.

The Court: Aren't they in evidence as yet?

Mr. Strouss: No, they are the ones which we are having copied.

The Court: You will have those ready by tomorrow morning, I presume?

Mr. Strouss: I am not sure that we can have them ready [fol. 5091] for tomorrow morning. They are being typed but we had to wire Washington for form T's in order to make these so it delayed us in getting started on them.

The Court: You have no objection, Mr. Mason, to proceeding with your surrebuttal?

Mr. Mason: None at all.

The Court: Very well, you may call your first witness.

Defendant's Surrebuttal

JOHN J. SULLIVAN was called as a witness in behalf of the defendant and having been previously sworn testified as follows:

Direct examination.

By Mr. Mason:

Q. Mr. Sullivan, have you prepared certain additional exhibits either supplementing or replacing portions of exhibits already introduced?

A. I have.

Q. I show you a sheet identified as defendant's exhibit No. 274, Witness Sullivan, Sheet 13. Will you state what this sheet purports to be?

[fol. 5092] A. Sheet 13 is a continuation of exhibit No. 274 previously introduced in twelve sheets which ended with the year 1939 and sheet 13 now is the same detail or in similar form for the year 1940.

Q. Was the sheet now before you marked No. 274, sheet 13, prepared from the form T reports?

A. It was.

Q. For the year 1940?

A. Yes, sir.

Q. This is simply a showing of the detail of these particular accidents in the same fashion as on No. 274, the first twelve sheets already introduced?

A. That is correct.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: I notice you have at the bottom of this, "Caused from sudden stopping, starting, lurch, or jerk of car or train." Where did you get your information in indicating that?

A. From the character of the accident as indicated by the detail and the narrative on accident report form T.

Q. This is your opinion?

A. That is correct.

Mr. Mason:

[fol. 5093] Q. This is predicated entirely on the form T, is it?

A. That is correct.

Q. Not on the forms 2611?

A. No, I didn't examine any forms 2611.

Mr. Mason: We offer the sheet which has been identified in the record as sheet 13 of exhibit No. 274, offering it in that fashion in order that the entire story for the state of Arizona may be in one exhibit.

The Court: You are asking that it bear the same number?

Mr. Mason: It is now numbered in the same way.

The Court: Any objection, Mr. Strouss?

Mr. Strouss: I will make the same objection to the slack action being a conclusion to be consistent here.

The Court: The objection is overruled, it may be admitted in evidence as a supplement to exhibit No. 274.

Mr. Mason: May we have it, your Honor, as an integral part of exhibit No. 274?

The Court: As an integral part of exhibit No. 274.

Mr. Strouss: May I ask if this is based upon the same form T reports that were given to us for examination? Do you know, Mr. Sullivan?

[fol. 5094] A. Yes, they were. You will notice in the title of the exhibit it is confined as was exhibit No. 274 originally to employees on duty in road freight train operation. You had many additional form T's not shown on this exhibit because they covered injuries to trespassers, covered non-train accidents, grade crossing accidents, passenger train and other classes of service, but you were furnished with copies of the form T's covering accidents as shown on sheet 13 of exhibit No. 274.

Mr. Mason:

Q. Have you before you a single sheet bearing identification as defendant's exhibit No. 275, sheet 8?

A. I have.

Q. Is this an additional sheet for the year 1940 covering the state of Nevada and bringing down to date exhibit No. 275 for the state of Nevada?

A. It is.

Q. And bears the same relation to exhibit No. 275 already introduced that sheet 13 of exhibit No. 274 does to that exhibit?

A. That is correct.

Q. Was this likewise predicated or based upon form T reports for the state of Nevada?

A. It was.

[fol. 5095] Q. Have those form T reports been supplied to plaintiff's counsel for their examination and use?

A. They have.

Mr. Mason: We offer the sheet in evidence as sheet 8 of exhibit No. 275 asking that it be made an integral part of that exhibit in order to bring it down to date?

The Court: The same objection I presume?

Mr. Strouss: Yes.

The Court: Objection overruled. It may be admitted in evidence as an integral part of exhibit No. 275.

Mr. Strouss: The slack action here is the same, it is your conclusion?

A. That is correct, although I would like to qualify that, I haven't referred to slack action in any of my exhibits.

Q. The jerk and lurch of train and so forth?

A. That is correct.

[fol. 5096] Mr. Mason: Have you before you, Mr. Sullivan, an exhibit in one sheet bearing the title, "Defendant's Exhibit No. 276?"

A. I have.

Q. I call your attention to the fact that there is already in evidence an exhibit 276, which appears to contain a showing for the years 1923 to 1939 inclusive. What is the difference between that and the sheet now before you?

A. The sheet before me for the years 1923 to 1939 is the same as exhibit 276 previously introduced. The exhibit before me now has included therein the figures for the year 1940.

Q. Have you made any recomputations of the totals for the six-year period 1935 to 1940 inclusive?

A. Yes, the total for 1935-1940 has been recalculated, as well as the casualty rates shown in columns J and K.

Q. And line 22 is the total for 18 years instead of 17?

A. Yes, sir, that is correct.

Q. This brings down to date Exhibit No. 276 in evidence?

A. Yes, sir.

Q. Based on the form T's?

[fol. 5097] A. Yes, sir.

Mr. Mason: Your Honor, we would like to substitute the sheet which the witness has just discussed in lieu of Exhibit 276 already in evidence, and ask that the other be withdrawn and destroyed, and that this be substituted in its place.

Mr. Strouss: We do make the same objection as made to the original exhibit.

The Court: The objection is overruled, and there may be substituted the exhibit just offered as No. 276 in lieu of the original exhibit.

Mr. Mason: Your Honor will recall that we did this same thing when the 1939 statistics became available for national and system showing.

Q. Now, have you a sheet, Mr. Sullivan, bearing the title, "Defendant's Exhibit No. 277?"

A. I have.

Q. And I will ask you if this is likewise intended as a substitute for Exhibit 277 in the same way that you have substituted the same sheet for the exhibit previously discussed as Exhibit 276?

A. It is.

Q. Prepared in the same way?

A. Yes, sir.

[fol. 5098] Q. Recalculated in the same manner?

A. Yes, exactly the same.

Q. This includes the year 1940?

A. Yes, sir.

Q. And other years as previously shown?

A. Yes, sir.

Mr. Mason: May we have this sheet accepted in lieu of Exhibit 277 in the same way as we did for No. 276?

Mr. Strouss: The same objections as made to the original.

The Court: The objection is overruled. It may be received in evidence and substituted in lieu of the original Exhibit 277.

Mr. Mason: Have you before you, Mr. Sullivan, an exhibit 279, which contains the showing for the year 1940?

A. Yes.

Q. And bearing the same title as the original exhibit 279 except for the reference to the years 1923 to 1940?

A. That is correct.

Q. Is this an exhibit likewise prepared in the same way as exhibits 276 and 277?

A. It was.

Mr. Mason: Have you any objections?

[fol. 5099] Mr. Strouss: No, the same objections as to the original.

Mr. Mason: We ask that the document marked 279, and carrying the showing down to the year 1940, be substituted for the original exhibit 279?

The Court: The objection is overruled. It may be substituted.

Mr. Mason: Mr. Sullivan, have you a sheet bearing the title, "Exhibit 280?"

A. I have.

Q. Was this prepared in the same fashion as Exhibit 279?

A. It was.

Q. And the same title except for the reference to the year 1940?

A. It is.

Q. I have neglected to ask you, but I will now ask you, have the calculations on this exhibit and on the preceding exhibits to which you have just referred, been checked and determined as to whether they are true and correct?

A. They have been.

Q. Will you state whether or not they are true and correct?

A. They are.

[fol. 5100] Mr. Mason: Your Honor, we ask that this exhibit bearing the number 280 be substituted for the original exhibit 280, and that the other exhibits be regarded as withdrawn, subject, of course, to the original objection.

Mr. Strouss: The same objection that I made to the original.

The Court: The objection is overruled, and the substitution may be made.

Mr. Mason: Have you before you, Mr. Sullivan, a single sheet entitled, "Defendant's Exhibit No. 286"?

A. I have.

Q. Bearing the same title as the exhibit originally introduced as Exhibit 286, except as to the reference to the year 1940?

A. Yes, sir.

Q. Will you say whether this exhibit is likewise a bringing down to date of the information which you attempted originally to show on Exhibit 286?

A. It is.

Q. And have the calculations been checked?

A. They have been.

Q. Will you say whether the exhibit is true and correct?

[fol. 5101] A. It is.

Q. Predicated on the same original sources?

A. Yes, sir.

Mr. Mason: We ask that the sheet be received in place of the original Exhibit No. 286.

Mr. Strouss: The same objections as to the original exhibit.

Mr. Mason: I think there were no objections to this one.

The Court: My record shows no objection to Exhibit 286. The substitution may be made and this new exhibit, including the 1940 figures may be admitted in evidence.

Mr. Mason: Have you exhibit No. 287, Mr. Sullivan, which is similar to Exhibit 286 just received, but relates to the state of Nevada?

A. I have

Q. And replacing the original exhibit 287?

A. It does.

Q. By adding the year 1940?

A. It does.

Q. Has this exhibit been checked to determine its correctness?

A. It has been.

Q. Will you say whether the exhibit is true and correct?

[fol. 5102] A. It is.

Mr. Mason: Subject to whatever objection may have been made to the original exhibit, we offer the sheet in place of the original exhibit 287.

The Court: Subject to the same objections, which were overruled, the substitution may be made.

Mr. Mason: Mr. Sullivan, have you before you a sheet entitled, "Exhibit No. 288," and which bears a title similar to that of the original exhibit 288 except that it refers to 1940?

A. I have.

Q. Is this likewise a bringing down to date of the original exhibit 288?

A. It is.

Q. And is it true and correct?

A. It is.

Mr. Mason: Your Honor will note that this is the comparison of the two states, which was undertaken originally on Exhibit 288 and is otherwise simply a bringing down to date. We offer it in evidence to replace the original exhibit 288.

Mr. Strouss: I am quite sure there were objections. We make the same objections.

The Court: Subject to the same objections, which were overruled, and the substitution may be made, and the ex-
[fol. 5103] hibit is admitted in evidence as No. 288.

Mr. Mason: Mr. Sullivan, have you prepared a single sheet bearing the title, "Exhibit No. 289, Sheet 13," and bearing in the center of the page, "Detail of Train Accidents, Road Freight Train Operation, Reported to the Interstate Commerce Commission, State of Arizona?"

A. I have.

Q. Is this intended as a supplement and continuation of Exhibit No. 289, composed of twelve sheets?

A. It is.

Q. This is simply a showing for 1940 not heretofore presented?

A. Yes.

Q. Based upon the form T reports entirely?

A. Yes, sir.

Mr. Mason: Your Honor, we offer this in evidence as sheet 13 of Exhibit 289, and ask that it be received as an integral part of that exhibit.

Mr. Strouss: No objection. I don't have my exhibit here. This was damage to equipment?

The Witness: Yes, train accidents, and it would include—well, the original exhibit included casualties when there were any, and train accidents.

[fol. 5104] The Court: Damages over $150?

A. That is correct.

The Court: Any objection to this?

Mr. Strouss: No objection.

The Court: It may be admitted as Sheet 13 of Exhibit 289, and become an integral part thereof.

Mr. Mason: Have you before you, Mr. Sullivan, a single sheet entitled, "Defendant's Exhibit No. 290, Sheet 10," being similar to the sheet just received as sheet 13 to exhibit 289, except that it relates to the state of Nevada?

A. Yes, sir.

Q. This being the sheet for the year 1940, is it not?

A. It is.

Mr. Mason: Your Honor, we ask that this sheet be received as sheet 10 of Exhibit 290 and become an integral

part of that exhibit, subject to whatever objection may have been made originally to Exhibit 290.

The Court: Subject to the same objections, which were overruled, this may be admitted as sheet 10 of Exhibit 290, and become an integral part thereof.

Mr. Mason: Mr. Sullivan, I ask you to turn now to an ex-[fol. 5105] hibit consisting of 16 sheets, the title sheet of which bears the following title, "Comparisons of Casualties to Employees on Duty and Non-Trespassers, Road Freight Train Operation, Sustained in Train and Train Service Accidents, reported to the Interstate Commerce Commission, Years 1930 to 1940, Inclusive, Southern Pacific Company (Pacific Lines) Los Angeles Division." Have you that exhibit at hand?

A. I have.

Mr. Mason: May we have this marked for identification, your Honor, with the next number?

The Clerk: Defendant's Exhibit No. 386 for identification.

The Court: Now, just a moment. Exhibit 386 originally offered was withdrawn, so I take it you will use the same number for this exhibit?

Mr. Mason: Yes, I think for all intents and purposes Exhibit 386, offered by the plaintiff, doesn't exist.

The Court: That is right. Very well, it may be marked for identification. You had finished with all the substitutions and additions?

Mr. Mason: Yes, I think these are now all new exhibits. [fol. 5106] Mr. Mason: Mr. Sullivan, before taking up sheets 1, 2, and 3 of exhibit No. 386 for identification I will ask you to turn to sheet 4 and sheets 4 to 16, inclusive. Will you state what those sheets consist of?

A. The sheets show for each year from 1930 to 1940 the detail of all reportable casualties, all classes of persons except trespassers in train and train service accidents in road freight train operation for the Los Angeles division.

Q. Does this exclude all yard accidents?

A. It does.

Q. Does this exclude all passenger train accidents unless a freight train was involved?

A. It does.

Q. Does it specifically include grade crossing accidents where freight trains were involved?

A. It does.

Q. What is the source of the information shown in the detail of sheets 4 to 16, inclusive?

A. The retained file copies of the form T's made to the Interstate Commerce Commission.

Q. Is the information in columns A to J, inclusive, taken from those form T's?

A. All except column C.

Q. From what source do you get that information in [fol. 5107] column C?

A. From the official records of the company as to whether or not the location is on a main line or a branch line of the Los Angeles division.

Q. Where do you get the information in column K, "Description of Accident"?

A. That is a brief description of the accident ordinarily as it appears in the description briefly on the form T and supplemented when necessary by the detail on the form T.

Q. That is item 26 as to the detail where it is not shown on the upper part of the form T?

A. Both items 17 and 26.

Q. I notice that in certain of these cases, for example on line 1 and again in line 11 you do not show the name of the individual?

A. That is correct.

Q. You simply show it as "occupant of a motor car" or whatever it may be?

A. That is correct.

Q. Will you return to sheet 1. What is the source of the information shown in columns B and C on sheet 1?

A. They are from the official records, freight train miles and freight car miles maintained in the Office of the Auditor [fol. 5108] of Equipment Service Accounts of the company.

Q. Has information of this character, if you know, been furnished to opposing counsel?

A. It has been. I don't believe these particular figures have been furnished but the same type of statistics has been furnished.

Q. As to the information in column D, what is the source of that?

A. Those are calculations made by me by dividing the car-miles in column C by the train-miles shown in column B.

Q. Did you make any calculation of the total number of casualties shown to the various classes of persons, employees and others by years and by periods of years?

A. I have.

Q. Where does that appear?

A. On sheet 2 of the exhibit.

Q. These figures, for example in columns B, C, and D on sheet 2 of the exhibit, from what source do you get those?

A. It is a summarization of the detail shown for the respective years on sheets 4 to 16 of the exhibit.

Q. Then summed up by six-year periods?

A. Six-and five-years periods.

[fol. 5109] Q. Have you followed that same method in obtaining each of these yearly totals and totals for periods on all of the columns on sheet 2?

A. I have.

Q. Returning to sheet 1 again, what is the basis of the figures for example in column E on sheet 1?

A. Column E is a calculation by me, using the train-mile figure shown in column B and relating it against the absolute figure shown for the same year on sheet 2 for the particular class of persons.

Q. For example, to get the figure shown in column E opposite the year 1930, you would make a computation of the figure shown in column D of the year 1930 on sheet 2 against the total train-miles?

A. Yes, divide column B, which shows the figure 19 by the train-miles shown on sheet 1 of the exhibit.

Q. Are these various rates shown on each of the other columns E to T, inclusive, calculated in the same way by taking the appropriate divisor and dividend?

A. That is correct. For instance, E to K, I used column B as a basis and columns M to T, inclusive, the car-[fol. 5110] miles shown in column C as the measuring stick.

Q. Have these calculation all been checked?

A. Yes, they have all been checked by me.

Q. Were they made mechanically by a calculating machine?

A. They were.

Q. Turning to sheet 3, will you state what you have done in preparing that?

A. Sheet 3 as in the case of the preceding sheet has for its basis a detail shown on sheets 4 to 16, inclusive, and there has been a segregation of the absolute figure shown on sheet 2 for the various classes of employees and persons as to trains of 70 cars or less and trains of over 70 cars.

Q. Where do you get the information to enable you to classify them as between long trains and short trains?

A. The form T shows the number of cars in the train and you will notice that that information has been inscribed on sheets 4 to 16 in column F of the exhibit.

Q. I take it, then, that the aggregation or summation of these is your own calculation by periods and by years?

A. That is correct.

[fol. 5111] Q. Have all of these calculations been checked and compared to determine their correctness?

A. They have been.

Q. Will you say whether or not the exhibit to the best of your knowledge and belief is true and correct as far as the calculations are concerned?

A. It is.

Q. It is a true and correct reflection of the underlying sources?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: Yes. Mr. Sullivan, these casualties shown on pages 2 and 3, that would include all types of casualties I take it?

A. Except trespassers and involving only road freight train operation.

Q. I mean the nature of the accident would not affect the matter of including the accident?

A. No, if it was a reportable injury it would be included.

Q. If it was a collision or whatever it was?

A. That is correct, train and train service accidents.

Q. Your exhibit nowhere shows the number of trains of over 70 cars which were operated during this period during [fol. 5112] each of these years and the number of trains of 70 cars or less?

A. No, there were no records maintained from which that information could be obtained.

Mr. Booth: What would be necessary to ascertain that fact?

A. A special study.

Mr. Booth: Of what?

A. Of all the available wheel reports.

Mr. Booth: That has not been made?

A. No.

Mr. Mason: Has your Honor any questions?

The Court: I think not.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 386.

Mr. Strouss: We have no objection to pages 4 to 16, inclusive, but we do object to that part of the exhibit, pages 1 to 3, inclusive, as incompetent, irrelevant and immaterial.

Mr. Mason: I will ask you, Mr. Strouss, if you are basing any part of that objection on our failure to supply you with the basic records of the train-miles and car-miles?

Mr. Strouss: No.

Mr. Mason: Because we could make that available.

[fol. 5113] Mr. Strouss: No.

The Court: The objection is overruled, it may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 386.")

Mr. Mason:

Q. Mr. Sullivan, I will ask you to take now an exhibit of nine sheets entitled, "Comparisons of Casualties to Employees and Non-Trespassers, Road Freight Train Operation, Sustained in Train and Train Service Accidents Reported to the Interstate Commerce Commission, Years 1930 to 1940, Inclusive, Southern Pacific Company, Pacific Lines, State of New Mexico." Have you that statement before you?

A. I have.

Mr. Mason: Your Honor, we will ask that this be marked for identification as defendant's exhibit No. 387.

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 387 for identification.

Mr. Mason:

Q. Did you prepare exhibit No. 387, Mr. Sullivan.

A. I did.

Q. Will you state the sources of the underlying informa-
[fol. 5114] tion, excluding the showing of freight train-miles and freight train car-miles?

A. The sources of sheets 5 to 9, inclusive, were the photostatic copies of the form T accident reports that were introduced by the plaintiff as exhibit No. —.

Q. (Interrupting) They are the New Mexico form T reports that were introduced by the plaintiff?

A. That is correct.

Q. You used those same form T reports to obtain the information on sheets 5 to 9, inclusive?

A. Insofar as they pertain to road freight train operation that is correct.

Q. The information on sheets 5 to 9, inclusive, is taken directly from the form T reports?

A. Yes, sir.

Q. What about the description of accidents shown in column J on those sheets?

A. That is a brief description of the accident as shown in item 17 and in item 26 of the narrative of the form T reports.

Q. I notice in some instances you show here instead of the name of the person injured simply "non-trespasser."

A. That is correct, a person injured without disclosing the individual's name. Only the names of employees are
[fol. 5115] shown on the exhibit.

Q. Does this exhibit undertake to show for the state of New Mexico and for the period indicated the same information and the same type of comparisons as are shown on exhibit No. 386?

A. It does.

Q. Was it prepared in the same way?

A. It was.

Q. What is the source of the information of the freight train miles and freight train car miles in columns B and C on sheet 1?

A. That was obtained from the annual reports of the company to the New Mexico Corporation Commission.

Q. Have those annual reports likewise been made available to the plaintiff?

A. I believe they have. They are available in Tucson anyway now.

Mr. Strouss: I don't think they have. I might ask are those reports the same as the reports which were filed—this is 1940?

Mr. Mason: Yes.

Mr. Strouss: Those are the reports which you gave us?

A. Yes, except I don't believe you have had the year 1940 but it is now available. It has just been filed a week or [fol. 5116] so ago.

Mr. Mason:

Q. These calculations were made in the same way that you explained in connection with exhibit No. 386?

A. They were.

Q. What about the showing on sheet 3 where you segregate between trains of 70 cars and less and trains of over 70 cars? Was that taken directly from an examination of column F or from the form T reports which are the sources of information shown in column F?

A. In column E of this exhibit.

Q. I notice on this exhibit you have a showing of the casualties to road freight conductors, brakemen and flagmen aggregated by years and by periods caused by sudden stopping, starting, lurch, or jerk of train. Will you refer to sheet 4, please?

A. I have it before me.

Q. Just what was done in preparation of sheet 4?

A. Before we discuss that I would like to call attention to item 116 on sheet 8 where I inadvertently showed the accident as due to sudden stopping, starting, lurch, or jerk of car or train.

Q. That is the accident at Vaughn, New Mexico?

[fol. 5117] A. The double cross should be eliminated.

Q. The accident to conductor Dolan was not as you understand it a slack action accident?

A. The form T does not indicate that it was. Returning to sheet 4——

Mr. Mason: (Interrupting) Your Honor, may we have it understood that the exhibit, if received, will be corrected by eliminating the indication of sudden stopping, starting, and so forth, as to item 116 on sheet 8?

The Court: Yes, the record may show the change.

The Witness: Sheet 4 of the exhibit has been prepared by examining the detail sheets both as to trains of 70 cars

and less and over 70 cars and preparing a table for years of the number of casualties which reports indicate were due to sudden stopping, starting, lurch, or jerk of train. Then comparisons of the rates based on train-miles and car-miles have been calculated as shown in columns E and F. Totals and average casualty rates have been calculated and shown for the six years, 1930 to 1935, likewise for the five years, 1936 to 1940, and then comparisons one period with the other and one period with the average for the eleven years shown at the bottom of the exhibit.

[fol. 5118] Mr. Mason:

Q. I notice that you show the number of casualties per milllion train-miles and per hundred million car-miles. Were those casualty rates shown in columns E and F obtained by dividing the total as shown in column D by the train-miles and car-miles?

A. The figures shown in columns E and F, respectively, on sheet 4 have been calculated by dividing the total shown in column D on sheet 4 by the train-miles in column B and car-miles in column C on sheet 1, respectively.

Q. You obtained these rates in the same way that you obtained rates elsewhere in the exhibit?

A. Yes, sir.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: The same questions that were asked concerning exhibit No. 386 if asked of you, Mr. Sullivan, as applied to this exhibit, your answers would be the same?

A. I don't just recall what those questions were.

Mr. Strouss: I just asked you two, I think, the accidents which are included here are not segregated as to character, they include all accidents of whatever character?

[fol. 5119] A. They include all train and train service accidents, that is correct.

Q. There is nothing in this exhibit to show the number of trains of over 70 cars or the number of trains of 70 cars or under which were operated over the entire period or at any time during the period?

A. No.

Q. These form T's, just as a matter of information, I think we have the form T's for 1940 and I take it those are the ones filed with the New Mexico Corporation Commission?

A. No, they were the ones filed with the Interstate Commerce Commission, the form T's. The annual reports covering the train-miles and car-miles were filed with the New Mexico Corporation Commission.

Q. May I ask a question on the previous exhibit, the form T's which were furnished us by the Southern Pacific Company covering the years 1930 to 1939 and which are now in evidence as exhibits No. 352 to No. 361, those are the form T's from which your exhibit No. 386 was prepared?

A. No, it is not my recollection that we furnished you any New Mexico reports.

Mr. Strouss: I mean Los Angeles.

[fol. 5120] A. I beg your pardon, yes, they were the same ones, that is insofar as they pertain to road freight train operation.

The Court: Mr. Sullivan, supplementing Mr. Strouss's question with reference to sheet 3, I believe you stated there was nothing in this exhibit to disclose what percentage of the trains had more than 70 cars or what percentage had less than 70?

A. Your Honor, I understood his question to be whether or not there was any place in this exhibit that showed the total number of trains operated with 70 cars or less and those of over 70 cars and I said that information was not available.

The Court: I notice on page 1 of this same exhibit that in column D it does give the average cars per train over this period from 1930 to 1940, inclusive, making the grand over-all average of 55.13. I take it from that figure that the bulk of the train operations in the state of New Mexico were under 70 cars?

A. I understand that to be a fact, yes, sir.

The Court: In other words, the state of New Mexico is not a typical long-train-operation state?

A. It is not.

The Court: But the state of Nevada, I believe from the [fol. 5121] previous testimony, is a typical long-train-operation state?

A. It is a predominantly long-train-operation state, yes, sir, that is correct.

Mr. Mason: Your Honor will recall there is in evidence an exhibit containing a train count made in New Mexico

during 1939, I think four typical months, and indicating the percentage of trains of more than 70 cars and less.

The Court: I don't recall what the exhibit number is, but Mr. Sines can find it for us.

Mr. Mason:

Q. Will you state again what is the source of the figures in column D on sheet 1?

A. Column D is a calculated average obtained by dividing the total car-miles shown in column C by the train-miles shown in column B.

Q. That is all of the car-miles made in all lengths of trains?

A. Of freight trains regardless of their length.

Q. The divisor is all train-miles made by all trains whether long or short?

A. That is right, that is in freight trains.

Q. This is then merely a statistical average or quotient of the two?

A. That is correct, and you will notice that it fluctuates [fol. 5122] from year to year on that account.

Mr. Mason: Has your Honor any further questions?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as defendant's exhibit No. 387.

Mr. Strouss: We have no objection to sheets 5 to 9 of the exhibit but we do object to sheets 1 to 4, inclusive, as incompetent, irrelevant, and immaterial.

The Court: The objection is overruled, it may be admitted in evidence.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 387.")

Mr. Strouss: For the record I will say that the objection as based on incompetency is not because the basic records are not here.

Mr. Mason: Your Honor, the exhibit which shows the train count for New Mexico and elsewhere on the system is exhibit No. 185.

The Court: Thank you.

Mr. Mason:

Q. Referring back to this average cars per train as shown on exhibit No. 387, is there any particular part of that showing in column D that you wish to call attention to?

A. Nothing except it will be noticed by an examination of [fol. 5123] the figures in the column that the average length per train in 1930 has increased from 52.11 cars per train to an average of 65.38 in the year 1940. The average for the eleven years is 55.19, practically ten cars less than it was for the year 1940.

Q. Is that all that you have on exhibit No. 387?

A. Yes.

Q. Will you take up, please, an exhibit in 7 sheets entitled, "Train Accidents Reported to the Interstate Commerce Commission, Years 1930 to 1940, Inclusive, Southern Pacific Company, Pacific Lines, State of New Mexico." May we have this marked for identification as defendant's exhibit No. 388?

The Court: It may be marked.

The Clerk: Defendant's exhibit No. 388 for identification.

Mr. Mason:

Q. Turning first to sheet 1, columns B and C, will you state whether or not the source of the information of train-miles and car-miles in those columns is the same as on exhibit No. 387?

A. It is.

Q. They are the same figures here reproduced, are they? [fol. 5124] A. Yes, sir.

Q. As to sheets 4, 5, 6, and 7, from what source did you take the information shown on those?

A. The source was the photostatic copies of the Southern Pacific form T's which were introduced by the plaintiff for the years 1930 to 1939 and the retained file copies of the company of the form T's to the Interstate Commerce Commission for the year 1940.

Q. Do you show in sheets 4 to 7, inclusive, every case in which a person was injured in a train accident in the state of New Mexico as covered by the exhibit?

A. If there were any.

Q. Will you state whether or not there were any?

A. There was one casualty and that was sustained by a brakeman, referring to item 111, sheet 7 of the exhibit, on June 7, 1940, in a derailment in New Mexico just east of Cavot, Arizona, at milepost 1127, involving a 60-car train when eight cars were derailed on account of broken flange, the 18th car from the engine, the injured brakeman riding the 19th car at the time of the accident.

Q. Was the information as to the various classes of accidents which are shown on sheet 1, columns D to R, [fol. 5125] inclusive, taken from the information shown on sheets 4 to 7, inclusive?

A. Yes.

Q. You made the classification according to the class in which each of the accidents fell as indicated by the detail, did you?

A. Yes, and that detail is specifically shown by the same classification on the form T. In other words, if it is a derailment it is indicated on the form T as a derailment, likewise a collision, a locomotive accident, or a miscellaneous train accident, respectively.

Q. Those are the four major classes?

A. Yes, sir.

Q. You have made the summation and obtained these rates by division, have you?

A. I have.

Q. The mathematical processes being as you have previously described?

A. That is correct.

Q. Turning to sheet 2, how did you make the classification shown there?

A. That is a summarization from the detail shown on sheets 4 to 7, inclusive, selecting for each class of accident those that occurred on trains of 70 cars or less and those [fol. 5126] on trains of over 70 cars and at the foot of sheet 2 is a further summarization as to the causes of the various accidents as shown in column L of the various sheets from sheet 4 to 7.

Q. Is this segregation in the lower block on sheet 2 predicated directly on what appears in the detail on sheets 4 to 7?

A. That is correct.

Q. This represents simply a summation?

A. That is correct.

Q. What as to sheet 3, what have you done in preparing that?

A. Sheet 3 is a summary by lengths of trains of that type of train accident classified as a derailment and those which were due to defects in or failures of freight car equipment shown for trains of 70 cars or less and those for trains of over 70 cars.

Q. Is this detail all available in sheets 4 to 7, inclusive?

A. It is.

Q. It is a further breakdown of derailments which are shown to be due to defects in or failures of freight car equipment?

A. That is correct.

Q. And excludes derailments due to defects in roadbed [fol. 5127] or locomotive failures?

A. That is correct.

Q. The calculations are correct?

A. Yes, sir.

Q. Will you say whether or not the computations and the balance of the showing on the exhibit are correct to the best of your knowledge and belief?

A. They are.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: It is a rather lengthy exhibit and difficult to run over in a minute. How does the material which appears on pages 4 to 7 differ from that on the previous exhibit, sheets 4 to 7?

A. Possibly I can make this clear by stating that this showing is exactly the same as the exhibit reflecting the train accidents occurring in the state of Nevada and another exhibit showing the detail of the train accidents in the state of Arizona.

Mr. Mason: Those are exhibit Nos. 286 and 287, I think, which were supplemented this morning.

The Witness: My recollection is they are exhibits Nos. 289 and 290.

Mr. Mason: Yes, that is correct, Nos. 289 and 290.

[fol. 5128] Mr. Strouss: No. 387, sheets 5 to 9, gives a detailed description of accidents in New Mexico?

A. No. 387 is confined entirely to casualties and whether they are train service accidents or train accidents. Exhibit No. 388 for identification is confined entirely to train

accidents and necessarily does not involve casualties. In other words, exhibit No. 387 is a casualty showing and No. 388 is a train accident showing.

The Court: You might well have a train accident without the necessity of a casualty?

A. That is correct, your Honor. As will be observed, there are 120 items representing 120 train accidents in New Mexico and in only one was there a reportable casualty.

The Court: We will take our mid-afternoon recess at this time.

(Thereupon the court took a short recess after which proceedings were resumed as follows:)

[fol. 5129] The Court: You may proceed.

The Witness Sullivan was recalled to the stand, and proceedings were resumed as follows:

Mr. Mason: Your Honor, I was just about to offer in evidence, subject to any questions which you may have, the exhibit previously identified as No. 388.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 388.")

Mr. Mason: Mr. Sullivan, have you before you a statement in a single sheet, entitled "Comparison of Number and Accident Rate per Million Freight-train Miles and Per One Hundred Million Freight Train Car-Miles, Derailments Due to Defects in or Failures of Freight-car Equipment, New Mexico, Arizona, and Nevada, 1930 to 1940, Inclusive," and so forth?

A. Yes, sir.

Mr. Mason: May we have this statement marked No. 389 for identification?

The Court: It may be marked.

[fol. 5130] The Clerk: Defendant's Exhibit No. 389 for identification.

Mr. Mason: Mr. Sullivan, there are certain blanks both in the title and in the headlines in the various blocks. Will you indicate how those should be filled?

A. In the title, the second line from the bottom, there should be inserted the figure 388, so that it will read "As reflected in Exhibit No. 388 covering New Mexico," and in the table in column B over the name of the state of New Mexico, in each of the three subdivisions the figures 388 should be inserted so that columns B, E and H will indicate information appearing on Exhibit 388.

Q. Mr. Sullivan, how did you prepare No. 389?

A. The figures as to the number of derailments, the absolute number in B, C, and D, was abstracted from Exhibits 388, 286, and 287, for the respective years. The number of derailments due to defects and failures of equipment, as shown by those exhibits, likewise the accident rate on a train-mile basis, columns E, F, G, were abstracted from Exhibits 388, 286 and 287, respectively, likewise the accident rate on a car-mile basis was abstracted from ex-
[fol. 5131] hibits 388, 286 and 287, showing that information.

Q. I take it, then, you have simply brought together here in one place figures which already appear of record in the three several exhibits shown in the title?

A. That is correct, except for the totals for 1930 to 1935, and the totals 1936 to 1940, and the grand total 1930 to 1940, have been calculated because Exhibits 286 and 287 also included the years 1923 to 1929 inclusive, and those figures were not available on Exhibit 388.

Q. This relates only to the last eleven years, 1930 to 1940 inclusive?

A. That is correct.

Q. All of the underlying totals for each year will be found on the other exhibits?

A. That is correct.

Q. You simply brought together then, in one place, and then totaled up the necessary information?

A. Yes, and made some calculations where it was necessary.

Q. For example, as to the New Mexico showing, is that the showing which will be found on sheet 3 of Exhibit 388 in columns R, S and T?

A. That is correct.

Q. Now you say train-mile basis and car-mile basis. Do
[fol. 5132] I understand by that that these are the rates

per million train-miles or hundred million car-miles, as the case may be?

A. That is correct, as indicated in the title of the exhibit.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Your Honor?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as Exhibit No. 389.

Mr. Strouss: Objected to as irrelevant and immaterial.

The Court: Objection overruled. It may be admitted.

(The document referred to was received in evidence and marked, "Defendant's Exhibit 389.")

Mr. Mason: Mr. Sullivan, have you before you a statement in one sheet bearing the title, "Train Accidents, Showing Classes and Causes, Class One Railroads of the United States, Reflected by Statistics of the Interstate Commerce Commission, Years 1923 to 1939 Inclusive"?

A. I have.

Mr. Mason: May we have this marked for identification, [fol. 5133] your Honor, No. 390?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 390 for identification.

Mr. Mason: Did you prepare Exhibit No. 390, Mr. Sullivan?

A. I did.

Q. And I take it the sources are as shown in the note at the foot of the large sheet?

A. They are.

Q. You refer to the various tables of the Accident Bulletins in detail there?

A. I have.

Q. Is all this information taken directly from or calculated from figures which appear in the annual Accident Bulletins for the years shown?

A. The basic figures are shown in the Accident Bulletins, the calculations are shown and computed by myself.

Q. Are these various headings as to cause the headings of the Interstate Commerce Commission or of yourself?

A. They are the headings of the Interstate Commerce Commission.

Q. For example, let us look at column E, does this figure for the year 1923 under column E reproduce a figure al-[fol. 5134] ready set forth by the Interstate Commerce Commission in an Accident Bulletin?

A. It does.

Q. And is the same true as to these other segregations as to cause?

A. That is correct, for each type of train accidents.

The Court: I notice that the year 1940 is not included here. I take it that is because the data is not available.

A. That is correct: 1939 just became available a few months ago.

The Court: The 1940 figures which have been reproduced here heretofore in evidence, have been the figures of the Southern Pacific Company alone?

A. That is true, and then of the various states.

Mr. Mason: Have you made any prior national showing similar to Exhibit 390, Mr. Sullivan?

A. There has been a train accident showing on the basis of all railroads in the United States, but there has been no comparison or relative comparisons of one type of accident with another, or one cause of accident with another.

Q. And, as I understand it, your prior showing is not [fol. 5135] inclusive of 1939?

A. That is correct, it stopped with 1938.

Q. This was prepared since the 1939 figures became available?

A. That is correct.

Q. Will you say whether or not the calculations have been checked to determine whether they are true and correct?

A. They have been.

Q. Have the original figures, the duplication of the figures appearing in the I. C. C. reports, and likewise appearing in the underlying Accident Bulletin tables been checked?

A. They have been.

Q. Is the exhibit true to the best of your knowledge?

A. It is.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No.

Mr. Mason: Your Honor?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as No. 390.

Mr. Strouss: It is objected to, first, as not proper surrebuttal. There was no evidence of this sort introduced [fol. 5136] on rebuttal; and, second, it is incompetent, irrelevant and immaterial.

The Court: As to the last ground, it is overruled. I will hear you on the first objection.

Mr. Mason: Surrebuttal, your Honor?

The Court: Yes.

Mr. Mason: Well, I can think of several reasons why this should be received. In the first place, there has been considerable testimony here by the opposition as to the possibilities of accidents due to various kinds of defects, particularly train accidents, and other types of accidents due to defects in or failures of equipment, or defects in or improper maintenance of way and structures. It was mostly oral testimony and not related to any known basis. This exhibit shows throughout the years the importance of the various causes of those types of train accidents in relation to all the causes to which they may be assigned. It is explanatory on a statistical basis of what the witnesses testified to, limiting their own testimony, I realize, to a relatively local situation, but this shows a national picture of that kind. It is explanatory, in other words, of testimony as to which only statistical information will suffice. In the second place, it must be realized that our defense [fol. 5137] is to some extent equitable in character. Our affirmative defense asks for a declaration that the law is unconstitutional and therefore unenforceable, and where an equitable defense is presented, it is incumbent upon the Court, it seems to us, to have before it such relevant information as became available while the case is in progress. The comparison for the year 1939 was certainly not available when we presented our case previously; is that correct, Mr. Sullivan?

A. That is correct.

Mr. Mason: As to the material prior to 1939, this could have been presented at that time, but we would have been presented with the necessity of bringing this information down to date of 1939. Your Honor will recall particularly,

returning to the first branch of this discussion, that the witness Cooper testified rather generally not only as to what happened in Arizona, but he indicated a general familiarity with train operation, and it was, I presume, intended to relate that general familiarity to the particular issues in this case, although Mr. Cooper had never operated on the Southern Pacific in Arizona.

Mr. Strouss: Mr. Cooper's testimony was limited, of [fol. 5138] course, to brake equipment. There was nothing of this type testified to by Mr. Cooper, and no other witness that I know of on behalf of the State. So far as being an equitable proceeding, this is a case at law, and, of course, upon that theory they might save their whole case in chief for surrebuttal, and we would have no chance to answer at all. There is certainly nothing to such a proposition as that.

The Court: I think this is on the borderline, but I am going to overrule the objection.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 390.")

Mr. Mason: Have you before you, Mr. Sullivan, a statement in a single sheet entitled, "Southern Pacific Company (Pacific Lines), All Train Accidents," and so forth, years, 1923 to 1939, inclusive, state of Arizona?

A. I have.

Q. Is this exhibit similar in form to No. 390?

A. It is.

Q. Will you state from what sources this exhibit was prepared, Mr. Sullivan?

A. It is a summarization of the detailed data shown on Exhibit 289.

[fol. 5139] Q. Is it simply a bringing together in one place of the detail shown in Exhibit 289?

A. It is, except for the year 1940, which had not been collected and gathered together when Exhibit 391 for identification was compiled.

Q. What as to the calculation of rates? Is that based on figures already in evidence?

A. They are.

Q. Do I understand then that this is simply a bringing together in one place and a calculation of rates based upon testimony already of record?

A. That is correct.

Q. Is there any new material on exhibit 391 that is not already of record or capable of calculation?

A. Only the calculated rates are new. All the basic material is already in evidence.

Q. The calculation could have been made by counsel in writing a brief, if necessary, couldn't it?

A. That is correct.

Q. Have you checked these calculations to determine whether they are correct?

A. I have.

Q. Will you say whether the exhibit is true and correct to the best of your knowledge?

[fol. 5140] A. It is.

Mr. Mason: Has your Honor any questions?

The Court: No.

Mr. Mason: We offer the exhibit in evidence as No. 391.

Mr. Strouss: The same objections as to the previous exhibits.

The Court: The objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 391.")

The Court: Mr. Sullivan, you say that this data as shown on Exhibit 391 is merely bringing down to date the data already in evidence. You referred to a certain exhibit. What was the number of that?

A. 289 as to the basic data. 289, however, did not include, your Honor, the freight train locomotive-miles or total freight train-miles and freight train car-miles, but included the basic figures from which the number of accidents in the absolute was obtained.

The Court: But all the data herein contained except 1940 is already in evidence in some exhibit or other?

A. That is correct.

[fol. 5141] Mr. Mason: Your Honor, I call your attention to the fact that 391 does not include 1940. It is a calculation for the years preceding 1940.

Q. Have you before you, Mr. Sullivan, a statement in one sheet similar in form and title to 391, but related to the state of Nevada?

A. I have.

Mr. Mason: May we have this statement marked No. 392 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 392 for identification.

Mr. Mason: Did you prepare No. 392, Mr. Sullivan?

A. I did.

Q. Will you state the sources from which it was prepared?

A. The sources as to the number of accidents by classes in their absolute number was obtained from Exhibit 290 already in evidence.

Q. What is the source of the freight train locomotive-miles, train-miles, and car-miles in columns B, C and D?

A. They were obtained from exhibits already in evidence.

Q. There are a number of exhibits showing the car-miles, [fol. 5142] locomotive miles, and train-miles in the state of Nevada as well as in Arizona. 276, for example, shows the locomotive-miles.

A. In each case, columns B, C and D, although shown on exhibits, were obtained from the annual reports of the company to the Corporation Commission—the Nevada Public Service Commission.

Q. Then, do I understand that this exhibit is simply a bringing together in one place of figures which already appear of record?

A. That is correct.

Q. And represents a summation and calculation of rates?

A. That is right.

Q. Have you checked the calculations?

A. Yes, sir.

Q. Have you checked the exhibits against the underlying sources?

A. I have.

Q. Will you say whether or not it is true and correct?

A. It is.

Mr. Mason: We offer this in evidence. Subject to questions by opposing counsel and Court, we offer this in evidence.

Mr. Strouss: I have no questions. It is objected to as not [fol. 5143] proper surrebuttal, incompetent, irrelevant and immaterial.

The Court: Objection is overruled. It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 392.")

Mr. Mason: Mr. Sullivan, you recall the testimony of the witness Ash to the effect that on September 7, 1925, he had used the conductor's valve in order to stop a train which was backing into the Tucson terminal?

A. I recall that testimony.

Q. It will be found at page 4760 of the record. Did you make any investigation to determine whether Engineer F. E. Riley, to whom Mr. Ash referred, was shown by the records of the company as having lost any time following September 7, 1925?

A. I did.

Q. Will you state of what your investigation consisted?

Mr. Strouss: Objected to as incompetent, irrelevant and immaterial, hearsay, and not the best evidence.

The Court: Well, no, I will overrule the objection to this question. If he is going to refer to any documents, of course, he will have to do so, but this was as to the investigation [fol. 5144] that he made. Overrule the objection.

A. I have in the courtroom the original time records which show the services performed by Engineer Riley during the period immediately following the accident. I also have in my possession an original document signed by the superintendent whose signature I know personally, which was prepared at the time, and indicates that Engineer Riley lost no time on account of the accident.

Mr. Strouss: I move that that be stricken.

The Court: The last portion, which indicates what the report shows, may be stricken.

Mr. Mason: I will show you, Mr. Sullivan, and also to opposing counsel, form 5513, Southern Pacific Company, Pacific Lines, Superintendent's Statement of accident to employees. Is that one of the original records to which you refer?

A. Yes, sir.

Q. Do you know the signature on that form?

A. Yes, sir.

Q. Whose signature appears on that form?

A. L. U. Morris, Superintendent.

Q. Was Mr. Morris superintendent of the Tucson Division in 1925?

A. Of the Rio Grande division.

[fol. 5145] Q. What does the report show as to whether Mr. Riley lost any time?

Mr. Strouss: Now, I object to that. If they want to put the report in, I have no objection.

The Court: I will sustain the objection to the question.

Mr. Strouss: I don't object to having it copied in.

Mr. Mason: Do I understand that counsel say they have no objection to having the report copied in?

Mr. Strouss: No. No objection. We think your record is good evidence.

Mr. Mason: There is considerable difference, I take it, in our using our own records as evidence and being compelled to bring in something as a demand against interest.

The Court: This is not form 2611?

Mr. Mason: No, decidely not. There is a vast difference between this and form 2611. It is not a form T report either.

The Court: Go ahead.

Mr. Strouss: We have no objection to it being read into the record, or copied in.

Mr. Mason: Have you made an investigation of the original time records, Mr. Sullivan?

[fol. 5146] A. I have.

Q. Do you know whether the time records are permanent records which the company keeps?

A. The engineer's individual time return is not, but the time record of enginemen and trainmen is.

Q. Is that a permanent record required under order of the Interstate Commerce Commission?

A. I don't recall as to the specific requirement of that order. This is a time book for 1925, and it is now available.

Q. Will you show it to opposing counsel, please?

(The witness hands the time book to Mr. Strouss.)

Q. In your experience with the company, Mr. Sullivan are you familiar with the time records?

A. Yes, at one time I was a timekeeper.

Q. Can you state, from an examination of the time record of a particular individual, whether or not he has served on particular days?

A. Yes, his time return is maintained according to the data on which the service was performed.

Q. And will the time return as transcribed into the time record indicate the various days during the particular month in which he served?

A. It will, and the miles of service that he performed.

[fol. 5147] Q. Now, is the record which you have shown to opposing counsel the permanent record of Engineer F. E. Riley's service during 1925?

A. I opened the page that carries the time of Engineer Riley.

Q. Does it carry the time of Engineer Riley during the month of September, 1925.

A. It does.

Q. And referring to the time record, which you have shown to opposing counsel, will you say whether or not Engineer Riley is indicated as having been in active employment during the days immediately following September 7, 1925?

Mr. Strouss: Now, I object to that as incompetent, irrelevant and immaterial, and calling for a conclusion and not the best evidence. Now, if the Court please, this report, apparently counsel is not going to put it in. I want to ask the Court that counsel be directed to have that report here for cross-examination, because we will ask to have it read into the record if counsel does not. We have no objection to the showing—I don't think it is material. My recollection of Mr. Ash's testimony is that he made no statement as to whether this man was disabled so that he was off duty or [fol. 5148] not. He said he lost some teeth, but I don't remember if testifying to the fact that the man lost any time. For that matter, I think the time record is immaterial, but I think now certainly that this report has been brought in here, we have a right to have that for use on cross-examination of this witness, who was questioned concerning it.

The Court: Well, we will cross that bridge when we get to it.

Mr. Strouss: I don't want it now sent back to California and then have them come in and say it is beyond the jurisdiction of this Court.

Mr. Mason: Here is what Mr. Ash said— —

The Court: It is my recollection that he said, when pinned down, whatever party was injured, implied that he did lose time, that he must have lost time on account of losing his teeth.

Mr. Mason: He said here, page 4785, "I couldn't say how long he was off, but he was off several days."

Mr. Strouss: You didn't make this record, did you, Mr. Sullivan?

A. No, I did not.

Q. And anything you testified to from this is your conclusion of what you see on the page?

A. It would be what I would read from the record, that is correct.

[fol. 5149] Mr. Mason: The objection was made that this is incompetent. Of course the original record was produced and the witness has shown his familiarity as a timekeeper with this character of record and is competent to testify from it.

The Court: The objection is overruled.

Mr. Mason: I think the question is whether the witness can say from the record whether the engineer Riley was on duty during the ten days immediately following September 7, 1925?

A. Time return on enginemen and trainmen, form 1973, for the month of September, 1925, shows that on the seventh day of the month engineer Riley performed service on engine 3691 from Tucson to Douglas, 124 miles; on the tenth on engine 1011 he rendered service from Douglas to Bisbee Junction and return to Douglas for which he was allowed 100 miles; on the twelfth of the month he rendered service on engine 4301 from Douglas to Tucson, 124 miles; on September 13th, on engine 3300 from Tucson to Douglas, 124 miles; on the fifteenth on engine 3314 from Douglas to Tucson, 124 miles; on the sixteenth on engine 3693 from Tucson to Douglas, 124 miles. All as an engineer and those were the ten days immediately following the date of the accident.

[fol. 5150] Q. Mr. Sullivan, you were a division officer on the Tucson division at one time?

A. Yes, I was trainmaster.

Q. Also on the Shasta division?

A. Yes, sir, I was trainmaster and assistant superintendent on the Shasta division.

Q. On the Salt Lake division?

A. Assistant superintendent on the Salt Lake division.

Q. On the Western division?

A. Assistant superintendent on the Western division.

Q. Did you ever ride on freight trains while you were a division officer on those divisions?

A. Yes, sir.

Q. Where did you ride?

A. Usually in the caboose; occasionally on the engine or out on the train.

Q. Did you pick those trains which you would ride according to the length?

A. No.

Q. Was it possible to make any selection according to length on the Salt Lake division, for example?

Mr. Strouss: I object to that as immaterial, whether he [fol. 5151] selected these trains according to length.

Mr. Mason: Mr. Fail testified to that——

Mr. Strouss (Interrupting): These men never testified whether these men selected the trains.

The Court: The witness made the general broad statement that these division officers kept off these long freight trains.

Mr. Strouss: On the trains where he was working, that is all he testified to.

Mr. Mason: I take it counsel are willing to stipulate except on the Lordsburg-El Paso district that division officers do ride on all kinds of trains.

Mr. Strouss: I won't stipulate any such thing. They put their evidence on in the case in chief as to these other places where they wanted to have testimony as to whether they rode on the rear or middle.

The Court: Yes, that is true.

Mr. Strouss: The only thing that was testified to by the witnesses for the State was as to officials on the division where these men work, whether they rode on the rear end of the train on these divisions.

The Court: Now that you have refreshed the Court's mind as to that testimony, I am inclined to agree with you. [fol. 5152] Mr. Strouss. Unless you limit the direct exami-

nation here to matters that would directly contradict the evidence heretofore offered by the State, the objection will be sustained.

Mr. Strouss: I move to strike the answer to the question.

The Court: It may be stricken as to what occurred on these other divisions.

Mr. Mason: Your Honor, I take it it is all right to pursue this line of inquiry as to the Tucson division or does your objection go to the Tucson division?

Mr. Polley: Mr. Fail's testimony was confined by counsel to his own experience and that is all he testified to, that the officials hadn't ridden his trains.

The Court: No, I think it went further than that. The Court will permit you to examine this witness as to the Tucson-Rio Grande division because my recollection is that the witnesses for the State did cover those two territories.

Mr. Mason:

Q. Have you ever ridden freight trains on the Rio Grande division, Mr. Sullivan?

A. I have not.

Q. Have you ridden them on the Tucson division?

A. I have.

[fol. 5153] Q. What part of the division?

A. Between Tucson and Yuma.

Q. Did you make any selection of those trains according to length?

A. I did not.

Q. Were you present in the courtroom when reference was made to various humps or hogbacks or sags in the alignment of the right of way between Yuma and El Paso by various witnesses?

A. I was.

Q. Do you recall that one or two witnesses referred to a hump at Pronto, New Mexico?

A. I recall that.

Q. Also at Ligurta?

A. Yes, sir.

Q. At Chamiso, Arizona?

A. Yes, sir.

Q. And at Smurr, Arizona?

A. Yes, sir.

Q. Do you recall testimony somewhat to the effect that at those places there were run-ins or run-outs of the train on account of slack action?

A. That is correct.

Q. Have you made an investigation of the reported and reportable casualties to trainmen on freight trains in the [fol. 5154] States of New Mexico and Arizona?

A. I have examined the exhibits which are already in evidence showing casualties to trainmen in those states.

Q. From that examination will you say whether or not there appears to have been any casualty due to slack action or assigned to that cause occurring at Ligurta?

A. I could locate none.

Q. At Chamiso?

A. None.

Q. At Smurr?

A. None.

Q. At Pronto?

A. None.

Mr. Mason: I think that is all.

Cross-examination.

By Mr. Strouss:

Q. Mr. Sullivan, in connection with the testimony of Mr. Ash as to the injury to engineer Riley there was a report, or this report by the superintendent covers that accident?

A. It is a report making a recommendation for an allowance; yes, sir.

Q. It explains the injuries that occurred to Mr. Riley, [fol. 5155] doesn't it?

A. I don't think it covers all of the details of the accident except it indicates that he was injured.

Mr. Strouss: I ask that this report be put into the record. I would like to show the nature of it and I think the Court will remember there was testimony concerning an injury to Mr. Riley and whatever the testimony was concerning the time lost, Mr. Mason read it. I think this report of the superintendent should be permitted to be read into the record.

Mr. Booth: It can be copied in.

The Court: You may proceed with it.

Mr. Strouss: It is five minutes of four and I would like to have the evening; I don't know as I will have many questions from Mr. Sullivan.

The Court: The Court will give you that right, there have been a lot of exhibits offered here. You are asking that the sheet which you have just handed to the Court——

Mr. Strouss: Which is form 5513——

The Court (Continuing): Be copied into the record.

Mr. Strouss: Covering the superintendent's statement of accident to employe F. E. Riley on September 7, 1925, [fol. 5156] that that be copied into the record.

The Court: It is so ordered.

Form 5513

Southern Pacific Company—Pacific System

Superintendent's Statement of Accident to Employe

(This form to be used in all cases in which a superintendent refers to the claims attorney an injured employe's claim, or appeal, for assistance from the Southern Pacific.)

Name (in full)—F. E. Riley (Engineer).

Place of Injury—Tucson Yard, Arizona.

Date of Injury—September 7, 1925.

Cause of Injury to Employe: Whose fault:—Extra 3655 West was backing into yard at Tucson, when Conductor opened emergency valve causing sudden stop which threw Engineer F. E. Riley against cab of engine, knocking out three front teeth.

Nature and Extent of Injury—Three front teeth knocked out.

Present Physical Condition—Good.

Length of Disability—None.

Total Loss in Wages—None.

Daily Wage—$7.70.

[fol. 5157] Number of Working Days per Week—7.

Financial Condition, Pecuniary Resources, Insurance, Etc.—No income other than salary. Group insurance only.

Those Dependent Upon Him—Wife.

Number of Years in Service—18 years.

Character of Service and Record—Good.

Superintendent's Recommendations as to what should be done—Recommend that Engineer F. E. Riley be allowed

$60.00 to cover cost of dental work necessary account of this accident, as no signals were passed and he had no warning that Conductor was going to open emergency valve. Bill of Dr. Lewis R. Brown, Douglas, Ariz., attached.

L. U. Morris, Superintendent.

Mr. Strouss: We will reserve further cross-examination until morning.

Mr. Mason: We have been served with a hand written memorandum of certain authorities upon which counsel proposes to rely in connection with exhibit No. 206 and forms 2611.

The Court: Would counsel like to be heard on that matter now? I intend to go into the library with your authorities here.

[fol. 5158] Mr. Strouss: I am a little tired but I can do that.

The Court: We might save time if it won't be an imposition to have you do that. If you prefer to wait, I will not insist upon it.

Mr. Strouss: I did not intend to argue it in detail in any event but I think I can give the Court in brief our points as to the law upon these exhibits and our citations and I don't see any point in taking half an hour or an hour to argue it anyhow. On this exhibit No. 206 which is the report of Johnson on the air brake test, our belief and contention is that that exhibit is admissible first as independent evidence and an exception to the hearsay rule and, second, as an an admission of a representative of the defendant and therefore an exception to the hearsay rule.

Now upon the first ground that the evidence is admissible as independent evidence. I think the Court will find from the authorities that it is quite generally held that tests made by a disinterested party and not for the purpose of trial and not influenced by any party to the trial are admissible in evidence. A case very much in point upon this question and particularly with respect to the evidence which is before [fol. 5159] the Court or which is offered is the case of Lyons vs. Northern Pacific Company, a Montana case, reported in 117 Pacific at page 81. That was a case in which an engineer brought an action against the company for personal injury, and part of the defense was that the accident was due to the negligence of the engineer, that with the brake equipment

on the engine and train he could have stopped the train before it collided with another train which caused the accident. As part of the evidence, tables of the Westinghouse Air Brake Company, a test made of this type of brake equipment, was offered in evidence and the same objection here made was made in that case, and the Court there, in sustaining the admission as an exception to the hearsay rule, pointed out the admissibility of this type of evidence. There is in the case quite a lengthy discussion of the theory.

Another case is Western Assurance Company vs. J. H. Mohlman Company, 83 Federal, 811, where the tables of the Bureau of Forestry and similar tables of Kent's Mechanical Engineer's Pocketbook and Johnson's Strains in Frame Structures, or tables taken from these different books, were offered and received in evidence to show the crushing [fol. 5160] strength of certain timbers and the Circuit Court of Appeals in that case gives quite a lengthy discussion of the admissibility of evidence of this sort.

In the case of McLaughlin vs. Terrell Bros., a Texas case, 179 Southwestern, 932, the American Railway Equipment Register was admitted in evidence to show the capacity of freight cars.

In Leas vs. Continental Fruit Express, 99 Southwestern, 859, the rules of the Master Car Builders of America were held admissible to show the proper construction of handirons.

I do not have the title of this case, 46 Northeastern, at page 61, but records of a horsemen's association were held admissible to show the speed of a race-horse.

In 2 Southwestern Second, at 505, the Standard Baseball Guide was held admissible to show the opening days of the baseball season.

In 20 Northwestern, at 860, a Catechism of a Locomotive, that is a textbook, was held admissible in a case where the safety and repair of a locomotive was involved.

In this case we have this situation so far as the record here is concerned and the showing of the tests that were [fol. 5161] made, first, that the Master Car Builders in 1911 was succeeded by the American Railway Association in 1919, I believe it was, and that in turn by the American Association of Railways in 1934. In each instance these, or in the last two instances they have been organized by the Class I railways. Among its functions and purposes was

that of prescribing the specifications of air brakes. That was true not only with respect to the A. R. A. but with its predecessor, the Master Car Builders, and with its present successor, the A. A. R. The testimony shows that in prescribing those specifications and arriving at what those specifications would be, it was the function and purpose of both the A. R. A. and the A. A. R. to make tests and investigations to determine what the specifications should be. Those tests and investigations were made as a basis of arriving at specifications which would govern the interchange of cars and the brake equipment on those cars. The evidence shows that these tests were made beginning with the year 1924 under an order of the Interstate Commerce Commission in this instance and were terminated in 1932 when this report was made. In 1933, the following year, the specifications were prescribed by the then American Rail- [fol. 5162] way Association, which are the same specifications now a part of the rules of interchange. In other words, at all times it has been one of the functions and purposes, representing the Class I railways, to carry out these tests in order to prescribe the specifications. There cannot be any question but that the evidence shows that these tests were not in any way made for the purpose of this trial, and there couldn't be any evidence that the plaintiff, State of Arizona, in any way influenced the tests, so it meets all the requirements of the rule which these cases I have cited lay down. Then, of course, we further say that aside from the matter of independent evidence, the record here does show that the A. R. A. and the A. A. R. is the representative of this defendant, as well as all other member railroads of the Association. Upon this ground we have to confess a little bit of surprise when the objection was made by counsel in view of the statement of counsel at the time this evidence was identified, when the exhibit was given to Mr. Browning. Reading from page 2928 of the transcript, I handed the exhibit to Mr. Browning, and asked him this question: "Mr. Browning, I hand you Plaintiff's Exhibit [fol. 5163] No. 206 and ask you if that is a true and correct copy of the report made by Mr. Johnson and printed and published by the Association of American Railways. Mr. Booth: Just a moment, I don't want to put any obstacle in the way of counsel bringing any publication of the A. A. R. or any of its committees, and for that reason I don't object

to this question, but I certainly will object to any attempt on cross-examination to offer this report or any portion of it."

That statement having been made, we accepted it and made no offer at the time and permitted the witness to leave. Counsel stated the only objection they were making was as to its offer on cross-examination. But aside from that, we cite the evidence, which we have reviewed in the short time since yesterday afternoon when this matter of the agency so far as the A. A. R.—which the memo handed to us yesterday afternoon raises—that the A. A. R. and the A. R. A. are two different organizations. In reading the memorandum, I take it from the argument there made that counsel admits and certainly must admit in making this sort of argument, that the A. A. R., the present Association of American Railways, that the Southern Pacific Company is [fol. 5164] a member and that that company does represent the Southern Pacific as well as all other member railroads, but says there is no showing that that was true with respect to the American Railways Association, which was the predecessor of the Association of American Railways. Your Honor will remember that Mr. Parmelee in his testimony testified that the Association of American Railways was an amalgamation of the American Railway Association, the Bureau of Railway Economics, and a few other affiliated railway associations, and he also testified when he was testifying concerning what he, in his lecture that he gave, stated as his opinion of the reason that certain things were being done by the railroads following the war of 1914 to 1918, which was prior to the amalgamation in 1934 of the different companies into the A. A. R. He was then testifying about the period following 1918, and it was in response to my objection that he had not identified the railroads, he said it meant these railroads which were members of the Association and of the Bureau, which could only mean the American Railway Association and the Bureau of Economics, and he testified the Southern Pacific was one and had been from the beginning.

[fol. 5165] Of course your Honor will remember that the record here has shown that these rules of interchange, which is the function of the Association and any of these associations which have to do with the question of air brakes and the tests and investigations leading up to the adoption of

specifications, that their history was shown by the defendant as part of the rules which they had been governed by during all of this period from 1911 on and the testimony of Mr. Browning showed how these investigations were made as a part of the method of arriving at what the specifications would be. It is not a question, as your Honor will see from reading the decisions, as to whether the report is adopted by the principal or not if the agent makes a report in the course of his duty and I think it is clear from the record that one of the functions of these different associations from the Master Car Builders on was to make the tests and make the investigations and from that to arrive at the specifications which should govern in the rules of interchange so far as air brakes are concerned. In support of that the cases which we have cited with reference to the matter of agency, those cases are in point on that and I think [fol. 5166] I will probably have a few more that I can take off and hand to your Honor and counsel some time before dinner; I don't have them taken off now.

[fol. 5167] The Court: You are relying primarily on two things, first, it is your contention that this exhibit 206 from which all of these other exhibits were taken, I mean the excerpts from 206 were taken and are included in these Nos. 329 to 333 inclusive, and 371 to 381 inclusive, they all spring or grow out of the contents of 206, I believe.

Mr. Strouss: Yes, and no. A part of the last group are all excerpts from 206. The first group are excerpts from the Annual Report of the Association which from 1929—and that is another point—to show that the A. R. A. and the A. A. R. are practically one and the same thing because the reports which were given to us as the backlog for these exhibits that Mr. Browning put in were the annual reports right straight down through from 1929 down. Those are the excerpts from the annual reports, and I will state frankly that speech of Mr. Patterson's to 1939——

The Court: I am glad to have you confess that.

Mr. Strouss: I am not going to try to defend the admissibility of that.

The Court: What the Court started to say was, that you are relying first upon the proposition that the excerpts [fol. 5168] which are offered in evidence are independent evidence and an exception to the hearsay rule and secondly, you are relying upon this principal and agent.

Mr. Strouss: And again one of the exceptions to the hearsay rule.

The Court: Very well. The Court will hear you gentlemen.

Mr. Mason: Perhaps it would be better if we made our argument tomorrow after we have an examination of these authorities. Of course, in order to render this report independent evidence the author must be first qualified and there has been nothing here to indicate what Mr. Johnson was beyond the fact that he was director of research. The report itself may not be relied upon for that purpose even if it shows who Mr. Johnson was, which I doubt. We haven't anything here to indicate Mr. Johnson was competent to make that report as independent evidence so far as independent evidence is concerned. As the outset, there is the objection—considering the report as independent evidence that Mr. Johnson has not been qualified as being the kind of a man who could make a mortality table or a report of a baseball schedule or a report of a horse breeder asso-
[fol. 5169] ciation, or something like that. As to the agency question, counsel persistently confuses reports made by the association and transmitted after being made to their members with the action of the members, but the record shows that the rules are not binding upon the members until submitted to a vote and adopted, so that the agency fails right then and there. There isn't any necessary connection between the report on the one hand and the action taken by the association which binds the members. The action must be taken by the association in order to produce these interchange rules which are then binding, but until that time there is no action by the association except the investigation which is printed for their information apparently and submitted to them for decision. The necessary connecting link between the authorization of the agent and the binding effect upon the principal is entirely absent upon the face of the record. Mr. Strouss supplies it very easily by going outside the record, but there Mr. Wigmore says, he merely begs the question, and as I said the other day lifts himself by his own bootstraps. You cannot bind the agent or prove its binding effect by the purported admission itself. I would like to discuss these cases after I have had an oppor-
[fol. 5170] tunity to examine them.

The Court: The court will be at recess until ten o'clock tomorrow morning.

(Thereupon, the court stood at recess until April 30, 1941, at ten o'clock A. M.).

[fol. 5171] April 30, 1941, ten o'clock A. M.

Proceedings were resumed at this time as follows:

The Court: Gentlemen, before proceeding with the testimony, may I inquire if form 2611, being the employees' report of accidents, is required to be made by employees in connection with every accident that occurs, whether there is any rule or regulation that makes such requirement of an employee of the defendant company?

Mr. Strouss: I think Mr. Hardwicke so testified.

Mr. Mason: The witness Fail testified that they frequently failed to make report of accidents, they simply forget about them. Apparently, whether there is any understanding of not, it is honored as much in the breach as in the observance. I don't know of any rule which specifically refers to form 2611, and says there must be a report on that form or in that form.

Mr. Strouss: Of course, counsel is sort of begging the question, is it the requirement? I think the testimony shows already that a report made of the accident on the form provided by the company for that report is form 2611, which the evidence also shows.

[fol. 5172] Mr. Booth: Yes, but there is no evidence that the superintendent is required or does use that form in making up his form T. It is there, he may use it or not as he pleases. If other facts and circumstances convince him that the employee is mistaken or has not accurately stated the facts of the accident on form 2611, he is at complete liberty to disregard it.

Mr. Mason: The only rule I know of in the rule book says: "In case of personal injury, loss of life, or damage to property, conductors must furnish wire reports of facts, with the name and address, and written statement when possible to obtain it, of each person who witnessed or has information concerning the accident." That is the requirement of a wire report from the conductor. The form 2611, of course, is not a wire report.

Mr. Strouss: There are other rules besides those that are in this rule book, there are bulletins that supplement the rule book.

The Court: Well, the purpose that the Court had in mind in asking this question is this, that it does seem from a reading of some of the authorities cited by the State that if there is any statutory requirement, which I presume [fol. 5173] there is not in this case, but any requirement on the part of the employees of the defendant to submit such report, that then under certain circumstances that report might be admissible in evidence. Well, the Court has not completed its examination of the authorities. I shall make no ruling at this time. You gave me so many cases, I haven't been able to wade through all of them as yet. You may proceed.

Mr. Strouss: I have no cross-examination of Mr. Sullivan. There is one thing I mentioned yesterday, and I again want to refer to, and that is the specifications of brakes adopted in 1933, which were to be made part of the record. Now, I think there should be at the present time those specifications. I believe they were sent to counsel by Mr. Browning immediately upon his return to Chicago, at least he sent me copies of them at that time and advised that he was sending copies to counsel for the defendant. I think the record should be completed in that respect.

The Court: Well, are you offering them, Mr. Strouss?

Mr. Strouss: Well, I will put them in. The record shows that they agreed to furnish those and make them a part of the record. If counsel don't want to keep their agree- [fol. 5174] ment on it, we will put them in.

Mr. Mason: The record isn't closed yet. We will put them in. We have a witness to call and we will put them in. Just let us develop our case.

Mr. Strouss: Now, before the matter of the admission of 206 is completed, these bear upon the matter of the admissibility of that too; they have some bearing there, and I want them in the record for that purpose.

The Court: You may proceed.

[fol. 5175] W. G. FIFIELD was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you please state your name and residence, Mr. Fifield?

A. W. G. Fifield, San Francisco, California.

Q. What is your present occupation, Mr. Fifield?

A. Road foreman of engines, Coast division, Southern Pacific Company.

Q. How long have you been employed by the Southern Pacific Company?

A. It will be forty-two years in August.

Q. What was your first employment?

A. Fireman.

Q. You became a fireman for the Southern Pacific Company in 1899?

A. August, 1899.

Q. Were you promoted to engineer?

A. Yes, sir.

Q. When?

A. September, 1902, to switch engineer and to road engineer in May, 1903.

[fol. 5176] Q. Where were you first employed?

A. On the Coast division.

Q. Do you hold seniority as fireman and engineer on the Coast division at the present time?

A. I hold seniority as an engineer but not as a fireman.

Q. Seniority as a fireman isn't of much importance to you at the present time, is it?

A. Well, the seniority as a fireman was lost to men of any seniority by certain rules that went into effect. Men later on have a fireman seniority date but I have none and of course have no use for it.

Q. What is the date of your seniority as an engineer, 1902 as to switching and 1903 as to road?

A. That is correct.

Q. Were you promoted from engineer to road foreman of engines?

A. Yes, in 1923, November.

Q. Where did you then serve as road foreman of engines?

A. On the Coast division until November, 1930. From November, 1930, to May, 1931, on the Portland division. Then I returned to the Coast division and assumed my seniority as an engineer for four months. Then I went to the Salt Lake division in September, 1931, until May, 1936, [fol. 5177] as road foreman of engines, when I returned to the Coast division in that same capacity and I am still in that same position.

Q. Except for four months you have been road foreman of engines on three of the company's divisions since 1923?

A. That is correct.

Q. Will you describe the nature of your duties as road foreman of engines?

A. Well, road foreman of engines has general supervision of all employees in the transportation department, more particularly engineers and firemen. His duties are to instruct the men in the proper handling of their work. He makes certain tests, efficiency tests, also makes tests on the locomotives. He assists the master mechanic in the maintenance of his power and checks the work reports made by engineers on form 2323. He investigates accidents where train handling is involved. He examines men for promotion and of course numerous other duties.

Q. Does the road foreman of engines exercise any supersion over the use of the locomotives on his division?

A. Yes, to some extent he assists in the assignment of [fol. 5178] power and so forth.

Q. Do you as road foreman ride on locomotives?

A. Yes, indeed.

Q. To what extent in the course of a month?

A. I think it would average about 23 days.

Q. Would that be in the neighborhood of 3,000 miles?

A. It would run in excess of 4,000 miles.

Q. Is that a regular monthly experience of yours as road foreman of engines?

A. Yes, it frequently runs much higher than that.

Q. Does the road foreman of engines actually ride in the locomotive with the engine crew?

A. Yes.

Q. Does he ever undertake to operate the locomotive?

A. I do.

Q. Have you as road foreman of engines become familiar with the handling of trains, both freight and passenger, upon the various divisions where you have served in that capacity?

A. Yes, I think I am very familiar.

Q. Have you as engineer become familiar with the handling of trains on your division?

A. I was at the time I was engineer, yes.

[fol. 5179] Q. If I understand correctly the duties of a road foreman of engines, he is virtually a supervisor of the engineers and firemen in the conduct of day to day duty?

A. That is his most important duty, yes.

The Court: I didn't understand, Mr. Fifield, just what territory you have jurisdiction over?

A. San Francisco to Santa Barbara, California, with the intervening branches.

Mr. Mason:

Q. When you were road foreman of engines on the Salt Lake division, did your jurisdiction extend over the entire division?

A. Yes, sir.

Q. From Sparks, Nevada, to Ogden?

A. Sparks to Ogden and Fernley to Alturas; also the westward branch which branches off at Wendel and the line from Hazen to Mina.

Q. On the Portland division did your jurisdiction extend from Portland to Ashland and from Ashland to Crescent Lake?

A. No, sir, it extended from Albany south, I didn't have the district north of Albany.

Q. You had the district from Albany to Ashland?

A. Albany to Ashland and on the Cascade line to Crescent Lake including the branches, Marshfield branch.

[fol. 5180] Q. Is there any grade territory on the Coast division?

A. Yes, sir, we have a mountain grade between Santa Margarita and San Luis Obispo, 2.2 per cent.

Q. Is that the ruling or actual grade in that territory?

A. It is my understanding that that is the grade.

Q. What grade do you have between Santa Barbara and San Luis Obispo?

A. In that territory we have a ruling grade of one per cent. That is a very rolling territory between Santa Barbara and San Luis Obispo, up and down, with one per cent grade.

Q. Does it have any of these dips and ridges sometimes referred to as hogbacks?

A. It hasn't much of anything else.

Q. Are you familiar with the grade territory on the Salt Lake division?

A. Yes, sir.

Q. Have you operated trains over it?

A. Yes, sir.

Q. What are the longest trains that you have yourself handled in freight service?

A. I have a recollection of handling 137 cars at one time on the Salt Lake division. I know I handled several [fol. 5181] 125-car trains. The trains usually consist of around 104 cars on the Salt Lake division for the reason that that was the length of the sidings.

Q. What are the longest passenger trains you have ever handled?

A. I have handled as many as 31 cars but that was only in case of an engine failure on some train ahead and they doubled up two trains and made 31 cars. The usual train on the Coast and also on the Salt Lake division is 16 cars but frequently we have 17.

Q. Have you handled those trains?

A. Oh, yes.

Q. Do you regularly operate 16- and 17-car trains on the Coast division at the present time?

A. Yes, sir, that is, passenger trains.

Q. What is the usual length of the freight trains being handled on the Coast division?

Mr. Strouss: I am going to make an objection to that. I don't see that that is proper surrebuttal. We haven't gone into any matter on the Coast division in our case.

Mr. Mason: We are qualifying the witness merely to rebut the testimony of Mr. Stevenson, Mr. Kennedy, to the extent necessary, and Mr. Cooper, all of whom testified [fol. 5182] as to train handling.

The Court: The objection is overruled.

Mr. Mason: Will you read the question?

(The last question was read by the reporter.)

A. The length of freight trains on the Coast division is governed by two main factors, I would say, one of course would be the number of cars available for movement; the other factor would be the number of brakemen available to handle a certain number of cars under the California full crew law. It is sometimes necessary that we cut down a train due to the fact that we haven't the brakemen available. The usual length of the train is 99 cars although we frequently handle up to 124.

Q. Is that over the grade between San Luis Obispo and Santa Margarita?

A. Between San Luis Obispo and Santa Margarita we handle 99 cars.

Q. And between Santa Barbara and San Luis Obispo?

A. We handle 99 in that territory.

Q. Do you yourself handle those trains?

A. Yes, I have handled them.

[fol. 5183] Q. What types of engines have you operated, Mr. Fifield?

A. I think every type that the company owns.

Q. Have you operated the F type?

A. Yes, sir.

Q. In the various series?

A. Yes, sir.

Q. Has that been in use on the divisions where you have served?

A. It has been in use on all of the divisions that I have served on.

Q. Have you operated the 5000 class or S. P. type?

A. Yes, I have; not so frequently, though, as the other type. I have had those engines less than any engines that the company owns, although I have handled them.

Q. Have you handled the AC class of power in the various series?

A. Yes, particularly the AC-8.

Q. You were present in the court room, were you not, when the witnesses Cooper and Stevenson testified?

A. Yes, sir.

Q. Also when the witness Cheek testified?

A. Yes.

[fol. 5184] Q. I call your attention to a question which was asked of Mr. Stevenson, appearing at page 4554 of the transcript: "Can you always control the slack in a train?" And a portion of Mr. Stevenson's answer was,

"No, not with the long trains, we are unable to control it." I will ask you the same question, can you always control the slack in a train?

A. Not always, but there is not much difference in the length of a train, as far as that is concerned, except in the amount of slack there is in the train. It is largely a matter of an engineer becoming accustomed to handling a certain train. He is very well acquainted, as a rule, with the territory over which he operates, and when he becomes accustomed to handling a hundred-car train, he learns the particular action of that train over the district, and if he continues to handle a hundred cars long enough, he will be able to handle a hundred cars better than he will seventy. That will work exactly the other way, a man who is accustomed to handle 70 cars would be able to handle 70 cars better than he would a hundred, but it is just a matter of education.

Q. Does the ability of the engineer enter into the picture at all?

[fol. 5185] A. Oh, yes, there is no question about that.

Q. Now, at line 18, counsel read to the witness Stevenson from the air book, "The heavier the engine and the longer the train, the greater is the care required." And said, "You have found that to be true?" This is line 18, and following on page 4554. Have you any comment upon that question and the witness's affirmative answer?

A. Well, I agree that you have to use more care with heavier power, but the heavier power has a very distinct advantage in train handling.

Q. Will you explain why that is?

A. Well, with the lighter power it would be necessary to jerk the train, I would say, in order to get the train started, whereas, with the heavier power you can start the train easily, and, of course, we must understand that in starting a train the momentum of the cars already started is a large factor in assisting you in starting the whole train. Therefore, with the larger power it is not necessary to exert so much energy, I would say, and not jerk the train so far back in the train in order to get it started.

Q. Now, at line 22, on page 4554, reference was made to the first sentence on top of page 9 of the air book, [fol. 5186] which was read to the witness as follows: "With high pressures and large main reservoirs, it is very easy

to overcharge the head end of the train; many detrimental effects result, such as stuck brakes, flat and broken wheels," and the witness was asked, "Have you found that to be true?" And the witness answered, page 4555, "I have found that to be the case, more particularly on the long trains than on the shorter trains." I will ask you, Mr. Fifield, if in the line of your duties as road foreman of engines you will draw upon your experience and comment upon the question and answer of the witness Stevenson?

A. You read only the first part of that subject, Mr. Mason. I think if you had gone to the second paragraph or the third, I believe it is the second, however, you would find that the statement is made that the above conditions varied to such an extent, or something to that effect, that it was impossible to make any set rule. That may not be the exact reading.

Q. I will hand you the air book and ask you to point out the passage that you have in mind.

A. Well, I will refer first to the question where it comes, "With high pressures and large main reservoirs, it is [fol. 5187] very easy to overcharge the head end of the train." The paragraph that I refer to states——

Mr. Strouss: What page is that?

The Witness: Page 9. "The length of time to leave the handle in release position to effect a release of all brakes and yet avoid overcharging depends to such an extent on the conditions just explained, the length of the brake pipe and the main reservoir volume, that no fixed rule can be established." That makes the rule flexible to the extent that it is the duty of the road foreman of engines to instruct his men on the proper manner in which to recharge and charge, or release brakes.

Mr. Mason: And is that a duty that you undertake in your capacity as road foreman of engines?

A. Yes, sir.

Q. Now, further, on page 4555, a large part of the balance of the first paragraph on page 9 of the air book was read to the witness as follows: "Many are of the impression that because the brake-pipe gauge shows higher than the auxiliary reservoir pressure is intended to be, that all brakes are released; as a matter of fact, this is a condition that exists only on the first few cars in the train,

[fol. 5188] the pressure at the rear not having sufficiently increased to release the brakes. In fact, 25 cars back from the engine it cannot be determined whether the brake-valve handle is in release or running position," and the witness was asked, "Have you found that to be true in your experience?" And he answered, "Yes." What have you to say in that connection?

A. In the first place, I believe that the very phraseology of the statement is open for debate. As I remember your reading, it said that, "Many are of the opinion." I believe that a statement of that kind is debatable, and I further believe that if that refers to engineers, who are most vitally interested in the handling of air, that the statement is not true.

Mr. Strouss: Now, I move that be stricken as hearsay, and opinion evidence, when the witness is testifying as to what the opinion of other engineers may be, and that is apparently what he is doing at the present time.

The Court: I didn't so understand him, Mr. Strouss.

Mr. Strouss: I wish you would read the answer of the witness, please.

(Thereupon, the last answer of the witness was read by [fol. 5189] the reporter.)

The Court: Yes, I will sustain the objection.

Mr. Strouss: I move that the answer be stricken.

The Court: And that portion of the answer may be stricken.

Mr. Mason: Now, on line 16, page 4555, a portion of page 11 of the air book was read to the witness as follows: "An automatic brake application will cause the brake pipe pressure to reduce faster at the head end of train than at rear. This results in the head brakes applying in advance of those at the rear, and tends to bunch the train and compress the draft gears." The witness was asked, "Have you found that to be true?" and said, "Yes." Will you say, Mr. Fifield, whether or not the engineer in the engine is able to control the results which are indicated by the excerpt which was read to the witness Stevenson?

A. I will say first that the statement, the brakes begin to apply on the head end of the train, is correct. In reference to what the engineer can do, he has control of that to a large extent in that he can limit his brake pipe reductions. The

[fol. 5190] lighter the reduction, the less likelihood of setting up any severe slack action in the train.

Q. Now, at the bottom of page 4555, there was read a portion of the last paragraph on page 11, reading: "In releasing, the head brakes commence so much before those at the rear that, as far as holding power is concerned, they are practically off before the real ones start to release, causing the slack to run out rapidly. Just how serious the result may be largely depends on how heavily they are applied, the amount the draft gears are compressed and how slowly the train is moving." In this connection, is the engineer able to exercise control?

A. Yes, he is, in that he can use what we call a bridging method of braking, which amounts to a gradual release of the brakes on the head end of the train, and overcomes the objectionable running out of slack. Now, I want to explain, if I may, that there is no authority for the term "bridge braking."

Q. It is not defined in the air book, is it?

A. No, sir; it is a term that has been used by engineers to describe a method of handling different from the orthodox method of the long and short cycle. I was present [fol. 5191] when Mr. Cooper testified, and I make this statement to show that the term is not authorized and, furthermore, is subject to the interpretation of the individual, and, as I remember Mr. Cooper's testimony in reference to the description of bridge-braking on the Santa Fe, he stated that the thing to do was to get hold of the train with about the right amount of air to hold it, and then place the handle of the brake valve in such a position that a certain amount of air would flow to the brake pipe to compensate for any leakage which might be taking place, and, as I remember, he stated that the best train to bridge would be one that had about four-pound leakage.

Q. You mean four pounds per minute?

A. Four pounds per minute. Now, that was Mr. Cooper's interpretation of bridge-braking. I will give you my interpretation of bridge-braking. We take hold of the train, as Mr. Cooper stated, with what we think is the proper amount of air to hold the train, but we don't attempt to find the place on the brake valve that will feed up the leakage which is taking place. There is too much guesswork in that kind of operation. Therefore, we, in bridging, operate our brake

valve between the lap and the holding position, and feed [fol. 5192] the train up to exactly what we want.

Mr. Strouss: Now, just a moment. The witness is saying "we." If he is trying to testify as to somebody else's method of operating a train, I object to the testimony. If he is testifying as to the way he operates——

Mr. Mason: I think the word "we" was used quite a little by Mr. Cooper, or he used the second person and said "you."

The Court: I don't know whether it was objected to or not. It is objected to now. I will sustain the objection. The witness may testify from his former experience as to how he handled it, observations that he may have made, having seen others handle it, but I think the use of the plural there is objectionable.

Mr. Mason: Is what you are describing the method you have yourself used, Mr. Fifield?

A. That is the method that I have used myself, and it is the method that I have observed engineers using, when I have been riding the engine.

Q. Is it a method that you teach to engineers?

A. It is.

[fol. 5193] Q. Now if a train is moving slowly, Mr. Fifield, under circumstances concerning which Mr. Stevenson was questioned, would any attempt to release be made?

A. There shouldn't be any attempt to release if the train was moving too slowly.

Q. On page 4547 Mr. Stevenson was asked if there was anything peculiar to the controlling of slack on mountains and grades, "Is there any peculiar difficulty there?" I will ask you the same question that Mr. Strouss asked of Mr. Stevenson, if there is anything peculiar?

A. I have had no peculiar difficulty nor has any come to my attention through reports or otherwise. Mountain braking, of course, differs from light grade braking or level territory in that in the mountain grade braking we use retainers.

Q. What is the purpose of the retainers?

A. The retainer has only one purpose and that is to assist an engineer in holding the train during the time he is recharging his brake system.

Q. Mr. Stevenson in his answer said that he was unable to —he used the second person plural, "You are unable to

apply those brakes on the rear end of a long train because of the insufficient time between reductions." I take it he was [fol. 5194] not referring to Mr. Strouss at the time. What have you to say as to that particular comment of Mr. Stevenson?

A. Well, if such a condition existed then they should be using retainers on the train.

Q. If the retainers are in use is there any such thing as insufficient time to recharge between applications?

A. There shouldn't be any such thing if the proper number of retainers were used for the weight of the train on a particular grade.

Q. Is there anything as to the engine equipment which enables the train to be recharged?

A. On all of our engines we have two 8½-inch cross-compound compressors with large main reservoir volume which enables us to get the air back there fast.

Q. If there is any such condition as inability to recharge between applications, what would you as engineer do?

A. I would stop.

Q. At line 17 on page 4557——

The Court: (Interrupting) Pardon me, you say you would stop and insist upon the use of retainers?

A. If I thought it was necessary.

[fol. 5195] The Court: You heard the testimony of these engineers that retainers were not in use either on the Tucson or Rio Grande divisions as I recall it?

A. Yes, I heard that testimony but I take it if they were not using retainers that it was not necessary to use retainers and the condition had never arisen where it was necessary for them to stop and charge the train.

Mr. Strouss: I move that last be stricken, that is certainly a conclusion.

Mr. Mason: It is a conclusion of a man who is fully qualified.

The Court: The motion to strike will be denied.

Mr. Strouss: He is testifying here there has never been any occasion to stop the train.

The Court: He is basing that upon the testimony which he says he heard.

Mr. Strouss: There wasn't any testimony as to whether they had or had not.

The Court: The Court will adhere to its ruling.

Mr. Mason:

Q. Line 17, page 4557, Mr. Stevenson testified in answer to a question as to the effect of increase in train length upon ability to recharge the brake pipe line, "Well, as the brake pipe increases in length, it takes that much longer [fol. 5196] to recharge those brakes at the rear end." Have you any comment on that statement?

A. It would take a little longer to charge 100 cars than it would 70 cars but I can't remember now—did you say that was mountain territory or is it valley territory or light grade braking?

Q. He spoke of the effect of the time required to recharge the brake pipe. What is the effect of the increase in the length of a train upon your ability to recharge your brake pipe line? The preceding question referred to mountain or grade operation but there was nothing in this question to indicate which it was. You might consider both.

A. If it was mountain operation the retainers would take care of it because you would have that many more retainers to take care of that much weight and there would be no difference in the operation. While it would take a little longer the retainers would give you that interval of time.

Q. If it were not in mountain but in level or light grade?

A. It might take a little longer to charge the train but certainly that train could be handled without depleting the brake pipe. If not, I will have to go back to my original statement that if such a condition existed the thing to do [fol. 5197] would be to stop the train

Q. On page 4558 reference was made in the question to paragraphs 18 and 19 on pages 29 and 30 of the air brake book, paragraph 18 referring to light grade braking and paragraph 19 to heavy grade braking. I will ask you to have those two paragraphs before you. Mr. Stevenson was asked after those paragraphs were read to him, "Is that the method of braking that you use?" And he answered, "Yes, sir." Is it not a fact that there are two methods of braking involved in the question, one in paragraph 18 and the other in paragraph 19?

A. Yes, they are different propositions entirely. One is light grade braking and the other is heavy grade braking.

Q. Which is the heavy grade braking? Is that the long cycle or short cycle?

A. We use the short cycle method in heavy grade braking.

Q. In light grade braking what is the method described?

A. I will have to go back to the bridge braking again because while it is more or less a long cycle type of braking, the releasing of the train is done under a little different con-
[fol. 5198] ditions. By that I mean the preasure is gradually built up on the head end of the train which releases a number of brakes on the head end and overcomes the slack action which would take place if we immediately went to release position as contemplated by the long cycle method. By the long cycle method, if we went to release position the head brakes would all kick off and then the slack would run out in the train due to the fact we were not able to get the brakes off as quickly on the rear as the brakes were releasing on the head end. That is why we use the bridge system in order to get the slack out of the train before the brakes even start to release on the rear end of the train or in any particular part, just gradually release on the head end.

Q. Does a knowledge of the road assist the engineer in that handling?

A. Yes, that is very important. He will pick out his places on the road to make the release of the brakes at probably some little let-up in the grade or possibly a sharp curvature in various places where wheel friction would assist in holding the train during the time he was releasing.

Q. I think you said you had actually operated trains over hogback territory. Have you in mind any particular
[fol. 5199] territory?

A. I believe I previously referred to the Monterey branch on the Coast division particularly as being entirely hogback territory. No, pardon me, that allusion was to the railroad between San Luis Obispo and Santa Barbara.

Q. Is that a territory where you use light grade braking by the bridge method you have described?

A. Yes.

Q. Have you used that system in that territory?

A. Yes, we use it all the time, I do. I use it all the time.

Q. Do the engineers on the engines where you are present as road foreman use it?

A. Yes, they showed me the trick in the first place.

Q. Will you say whether or not it has any effect and, if so, what effect upon the control of the train?

A. It is the only method I know of that you can use to control the slack in a train in that particular type of territory.

Q. Reference was made at page 4561 and 4562 to territory between Planeport and El Paso which I understand to be in Texas immediately north or east of El Paso and [fol. 5200] a rule reading, "Sufficient retainers will be used on westward trains between Planeport and El Paso to adjust slack." The question was then asked the witness, "Retainers are sometimes used to adjust slack?" Do you have any territory where you use retainers for the purpose of adjusting slack in the speed of the train in the operation of trains of 99 cars as you have described?

A. Yes, going into Santa Barbara eastward for about four miles we are going down a one per cent descending grade. In that four miles a little over two miles of it is in the thickly populated Santa Barbara city. We are required to keep the speed of the train down to 20 miles per hour. In order to do this we set up fifteen retainers solidly on the head end of the train on trains up to 75 cars. Above 75 cars we use twenty retainers. Then we operate the train with light reductions and the braking is practically done by the head brakes in the train. By that method we are able to comply with the 20-mile speed restriction, the braking being done by light reductions with retainers on the head end of the train, the brakes on the rear end of the train do not set and the slack stays in against the engine [fol. 5201] all the way down to the yard. I believe that is a similar condition that you referred to. However, that is subject to objection I presume.

Q. I was going to ask you, are these retainers placed in operative position while trains are moving or while they are stopped before you go down to Santa Barbara?

A. While the trains are moving.

The Court: That is done by your brakemen?

A. Yes, sir.

The Court: Is every car equipped with a retainer that can be used if necessary?

A. I believe every car is equipped with a retainer. I have never seen one that was not equipped. You refer to freight cars?

The Court: Yes.

A. If it was passenger cars, I would say that some passenger cars are not equipped with them but I wanted to be clear that you referred to freight cars.

The Court: Yes, I had reference to freight cars.

Mr. Mason:

Q. Returning to pages 4568 and 4569, the witness Stevenson stated that in rolling territory it was more difficult to control slack action than in other territory. Have you any [fol. 5202] comment upon that answer?

A. Yes, I will agree with engineer Stevenson that it is more difficult. However, it is one of the things that an engineer has to master in his vocation.

Q. What as to the difference between 100 cars and 70 car trains in that type of territory? Is there a possibility of less slack action on the longer trains?

A. Slack action of course just simply means a change of speed in certain parts of the train. It is possible that in a train of 100 cars or more the slack action would be absorbed before it got to the end of the train, where with a shorter train it would extend the full length of the train. It is just one of those contdions, mechanical operated conditions.

Q. What factors would tend to cause the slack action to be absorbed before reaching the rear end?

A. Your draft gear will absorb a certain amount of it. In fact the tendency of a draft gear is to absorb slack.

Q. Do physical characteristics of hogback territory sometimes tend to cause the slack to be absorbed?

A. Yes, they do.

[fol. 5203] Q. Have you any particular case in your own recent experience which will exemplify your testimony as to the control of slack in hogback territory?

A. I had one most particular movement last August. We were required to handle troop movements from Monterey located on the Monterey branch. This Monterey branch I would say is beyond the hogback category, it is almost scenic railway. It is up and down, every foot of it. A train of any length is on at least two hogbacks at one time. In making this movement I handled one particular train with a double-header, 11 Pullmans, 2 baggage cars on the rear and 39 boxcars on the head end.

The Court: That is what you call a mixed train?

A. Yes, it was mixed. However, it was just as mixed before I started as when I got through with it. We had no trouble in handling this train over this branch at all. It did require care and it got it.

Mr. Mason: Q. Did you personally handle the train?

A. Yes, I handled that train myself.

The Court: We will take our mid-morning recess at this time.

(Thereupon a short recess was taken after which proceedings were resumed as follows.)

[fol. 5204] The witness FIFIELD was recalled to the stand, and proceedings were resumed as follows:

The Court: You may proceed.

Mr. Mason: On pages 4569 to 4570, commencing on the last line on page 4569, Mr. Fifield, the question was asked of the witness Stevenson, "Is your ability to start a train affected by the length?" And he answered, "Yes, with the longer trains we have to use extreme caution in starting them. There is more weight involved, and more slack. We have to use extreme caution in starting those trains to avoid pulling them in two." He also said, "It takes a longer time to start them, and a longer time to stop them." Have you any comments on those answers of the witness Stevenson?

A. Only that with the heavy power that we have we have to use more care. So far as taking longer to start the train, it would take a little longer, you take the difference in time between the time—well, it would just take as much difference as the difference in the length of the train in starting, but it would only require more care, not necessarily entail any rough handling.

Q. What about the stopping, is that any more difficult, or does it take any longer with a long train than a short [fol. 5205] one, if you have the proper kind of engine?

A. It would take a little more time to do it, not very much. I mean by that, you use more care in the handling of the train; necessarily it would entail a little more preparation for the stop.

Q. By the way, you referred to what you would do in case the air pressure became depleted or you were not

able to recharge the train line. You said you would stop the train and recharge. How long has it been, in your own personal experience, since you have had to stop a train in those circumstances?

A. I think, as I remember, I stated that the thing to do would be to stop the train. I have no recollection of ever having stopped for that purpose.

Q. You don't recall that you as an engineer have ever had to do it?

A. No, I never did.

Q. Have you as the road foreman, in accompanying an engineer, ever seen an engineer do that?

A. I don't recollect of any.

Q. Now, in Mr. Copper's testimony, at page 4291, there [fol. 5206] was quite a long reference to the overcharge method of breaking a train. Do you yourself use the overcharge method, as described by the witness Cooper?

A. I do not, and I will say, further, that the overcharge of a train is one of the most dangerous things or dangerous practices that an engineman can get into in reference to train handling.

Q. Do you permit engineers under your supervision on divisions where you are serving as road foreman to use the overcharge method?

A. No, I do not.

Q. Do you instruct against it?

A. Yes, always. I might explain that overcharging simply means placing the brake valve in the release position and putting a higher pressure in the brake pipe than the setting of the feed valve. Now, as soon as you commence to operate the brakes, the feed valve takes control of the action, therefore, unless you follow the overcharge system, which you must do after you have started it once, or if you don't it is going to result in hot wheels, and in some cases, it may result in an undesired emergency, emergency application of the brakes.

[fol. 5207] Q. You recall Mr. Cooper describing the air brake equipment on Santa Fe locomotives as consisting of only a single compressor?

A. Yes, that is my recollection.

Q. Are the locomotives in general use on the Southern Pacific, with which you are familiar, so equipped, or are they equipped with two compressors?

A. They are equipped with two compressors.

Q. That is on, well, all the series later than the Consolidation type?

A. Well, there are a few Mountain types yet that have only one compressor, but most of them have two compressors on.

Q. Mr. Cooper, in his testimony at page 4332, also referred to the more difficult task, he says it takes longer to stop a longer train than it does a shorter train because you have to take care of the slack and control it. When you handle longer trains, Mr. Fifield, do you or do you not have a size and type of locomotive appropriate to the size of the train you are handling?

A. Yes, we have sufficient power to handle the train.

Q. And to control it?

A. Oh, yes.

[fol. 5208] Q. Does the use of the locomotive with that power enable you to stop the train as well as to start it?

A. Yes, the locomotive has nothing to do with stopping the train outside of providing the air pressure to operate the brakes.

Q. Do the larger engines have larger compressors and reservoirs to give you more air?

A. Well, we have a standard eight-and-a-half-inch cross compound compressor on all of our engines, large and small. The larger engines, however, have a larger main reservoir capacity, and, of course, they all have the two compressors.

Q. I think you spoke at the outset of your testimony, Mr. Fifield, as having had experience in passenger train operation. Have you run regularly as a passenger train engineer?

A. Yes.

Q. Do you ride passenger trains regularly as well as freight trains now?

A. Yes, sir.

Q. Have you as a passenger train engineer, or as road foreman on the engine of a passenger train, had experience with emergency stops of passenger trains?

A. Yes.

[fol. 5209] Q. What occasions emergency stops of passenger trains most frequently?

A. Most frequently is the grade-crossing accident. In fact, that is the very great percentage of the stops. Other emergency stops are very infrequent.

The Court: Would an emergency stop be required if a single head of livestock were on the track?

A. I wouldn't consider it advisable.

Mr. Mason: Now, when you make an emergency application of the brakes on a passenger train, what is the result as to the application of the brakes on various cars?

A. Well, it is almost simultaneous. The train is short, of course, and the period of time between the operation of the brake on the head end and that on the rear, I don't know what it would be in seconds, but it would be so close that you wouldn't be able to determine, I think, from observation.

Q. Is there any substantial interval of time between the application of the brakes on, let us say, the thirteenth car of a passenger train in emergency, and the sixteenth car?

A. No, I think not.

Q. Does the length of the passenger train within the limits [fol. 5210] of the trains which you have regularly operated have any substantial effect upon the length of time that the application will take place throughout the train?

A. No.

Q. Do you ever ride in the cabooses of freight trains?

A. Oh, once in a while; not very often, though. My business is on the head end. I have ridden in a few cabooses.

Q. Did you ever ride in the caboose without the engineer of the train knowing about it?

A. Well, I have.

Q. Do you ever make any selection of trains according to length, when you undertake to ride in the caboose?

A. No.

Q. Mr. Cooper referred at page 4263 to a quick service feature of the K type triple valve. Are you familiar with that feature?

A. Yes. I heard Mr. Cooper's definition of it, and I will say that his definition was correct.

Q. He said also, I think, that it was an improvement, and resulted in smoother handling and got the air to the rear of the train, and released the rear brakes and held the [fol. 5211] head end applied and created a smoother handling of the train, that it would apply the brakes quicker throughout a long train more uniformly. Do you agree with his characterization?

A. Yes, that is correct.

Q. Has there been any other substantial improvement of the K type triple valve within the last few years?

A. Well, of course, they began—I don't know just what year it was but they began to put in stronger spring, a graduated spring in the triple valve to overcome undesired emergency.

Q. In your experience, did the installation of these stronger graduating springs result in cutting down the frequency of undesired emergencies?

A. Yes, it did, materially.

Q. Now, at page 4279, and again at page 4285, reference was made to the Air Book, and Mr. Cooper was asked this question, "The further statement appears, the heavier the engine and the longer the train, the greater is the care required." Mr. Cooper answered that he had found that to be true in his experience, "The longer the train the more slack." I think you have commented upon a somewhat [fol. 5212] similar answer by Mr. Stevenson, but I will ask you whether it is harder to control the long train than if it were a short train because of the factors mentioned by Mr. Cooper, or whether it is simply a case of using greater care?

A. It is a case of using greater care.

The Court: Does it require more skill and experience in handling that type of train?

A. I would say that it requires more skill with that particular type of train. That is to say, that a man must become accustomed to handling that type of a train.

Mr. Mason: Is that the character of the skill you mean and experience in that particular handling and on the district where it is to be handled?

A. Surely, those are factors that must be considered.

Q. And when experience has been obtained, and where proper instruction by the road foreman is available, is it any more difficult for engineers, from your experience and as you have observed them, to handle trains of 100 cars or 99 cars, than if they were trains of 69 cars?

A. I don't know whether you refer, when you speak of difficulty, I don't know whether you refer to physical exer- [fol. 5213] tion or what you mean exactly, but there is no more physical exertion. It does require a little more care in the handling of the engine.

Q. Does it approach the impossible in the case of the long trains any more than it does in the case of the short trains?

A. Oh, no, we are handling those trains every day.

Q. Now, on pages 4283 and 4284, Mr. Cooper said if you were operating a train—first of all, he said, "Your ability to control slack in a train rests solely on your ability to apply and release the brakes throughout the train. If you are operating a train where you are unable to keep it fully charged down the grade and you fail to operate your brakes on the rear or fail to release them, you are liable to run into a serious slack action." Will you say whether or not that is correct, in your experience?

A. I think I explained that when I explained our system of what we term bridge-braking.

Q. May I remind you also of your explanation of handling a train into Santa Barbara. Would that method apply to Mr. Cooper's general statement?

[fol. 5214] A. If the territory warranted the use of retainers for the purpose of controlling the slack, that is the way to do it.

Q. Is it always necessary to apply and release the brakes on the rear end of the train in order to avoid serious slack action at the rear end?

A. No, not always; sometimes it is not even advisable to have the brakes set on the rear end of the train.

The Court: Pardon me. Unless you use retainers, if you set the brakes at all, it would set them on the rear as well as on the front, wouldn't it? You cannot elect to say just how far back you are going to set them?

A. You can to some extent. Let me explain that. All of the air that goes into the train comes from the engine. The pressure on the head end of the train may be up to the setting of the feed valve, but in the transmission of the air to the rear of the train, there is what we term a brake pipe gradient, meaning that the pressure on the rear of the train is lightly lower than it is on the head end. Now, to answer your question, we will say that we have 74 pounds of air in the caboose and 90 pounds on the engine; the engineer [fol. 5215] makes a six-pound brake pipe reduction. That means that he draws the pressure down on the head end of that train to 74 pounds and results only in a leveling up of the brake pipe from the engine to the caboose and makes no set of the brake on the rear of the train. However, the

six-pound reduction is effective on the head end to the extent of two-and-a-half pounds for each pound taken up, represented in brake cylinder pressure. Now, that is how the brakes can be set on the head end of the train and no brake having yet become effective on the rear. Any further brake pipe reduction, of course, would then become effective on the brakes on the rear and the brake would become set. That is why it is sometimes advisable for an engineer to use slight reductions in order to avoid any run of slack. That is its good features. If we were to charge the rear of the train to the full 80 pounds, and we made a six-pound reduction on the head end, that six-pound reduction would become effective on the rear. The air from the rear would flow to the head end, making the brakes effective on the rear end. At the same time the passage of air from the rear toward the head end might possibly be absorbed by the triple valve as [fol. 5216] it passed there and cause a release of some brakes toward the head end of the train, which would set up a bad condition. In other words, it is preferable to have the brake pipe gradient for that reason.

The Court: Well, would it be possible, under your short cycle system of braking, to apply the brakes and have them being applied on the front end of your train and then releasing it quick enough before that could go clear on back through?

A. Yes, it could be done, but of course I don't advocate the short cycle of braking except in mountain-grade braking where retainers are used, because the short cycle method wouldn't work on light grade braking; it would work, but I mean it wouldn't be the proper method to handle it in order to avoid slack action in the train.

Mr. Mason: At pages 4304 to 4306, Mr. Cooper indicated that on his trains he had difficulty in releasing and recharging because of train length, and he said particularly at page 4306, "Before we can get that pressure back to the rear end after making a brake application, our train is gaining in momentum to such an extent that we have to go after them again, and after about the second application that way we don't operate the brakes on that train of that length, we [fol. 5217] are just helpless," and it was specified in the question and answer that this was in mountain operation where he was working the brakes continuously down the

grade. Now, I will ask you in the mountain-grade operation with which you are familiar on Southern Pacific train, Mr. Fifield, do you have any trouble in releasing and recharging because of train length?

A. I don't, because if I went against the condition cited by Mr. Cooper, I would be using retainers.

Q. Now, his statement here, particularly as to his helplessness, are you helpless in the handling of long trains on mountain grades?

A. I am not afraid of them, I can handle any of them.

Q. Have you ever seen any of your engineers helpless in the handling of their trains?

A. No, I never have.

Q. Have you ever heard of an engineer confessing helplessness?

Mr. Strouss: I object to that.

The Court: Yes, the objection will be sustained as to the last question.

Mr. Mason: At page 4333 and following, Mr. Cooper spoke [fol. 5218] about emergency stops in order to avoid grade-crossing collisions, at which time he was referring to freight trains entirely, not to passenger-train operation.

Q. In your operation of freight trains, Mr. Fifield have you made many intended emergency stops by application of the air from the locomotive?

A. I have no recollection of ever having made one myself. As road foreman of engines, in about eighteen years I have investigated two cases of that character.

Q. Is that all?

A. That is all. One was on the Salt Lake division, and that was a train, I think——

Mr. Strouss: I object to hearsay testimony as to what he investigated.

The Court: I don't know as I fully get the import of your objection.

Mr. Strouss: Well, I object. He is about to testify as to the results of his investigation of accidents, not that he was in but he has investigated. I object to it as hearsay.

The Court: What he saw?

Mr. Strouss: No, not what he saw, because he wasn't there at the time of the accident.

[fol. 5219] Mr. Mason: Did you make an investigation?

A. Yes.

Q. What was the length of the train?

Mr. Strouss: Wait a minute. I want to ask the witness a question or two.

Q. What was the character of the investigation?

A. The investigation was in reference to the cause of a break-in-two.

Q. Were you there when it happened?

A. No.

Q. The investigation you made was subsequent to the happening of the accident?

A. Yes.

Q. And what you learned was what was told to you by persons who were there?

A. Yes, what I developed from testimony from the crew.

Mr. Strouss: I object to it as hearsay.

Mr. Mason: Did it include the reading of the forms 2611, Mr. Fifield?

A. I can't give it to you from memory at the present time.

The Court: I will sustain the objection.

Mr. Mason: Reference was made at page 4560, I think, in the Stevenson testimony, to the braking of trains in Arizona [fol. 5220] on the grades out of Steine, New Mexico, and Dragoon and Mescal, Arizona. Now, it is already in evidence, Mr. Fifield, that the ruling grade between Steins, New Mexico, and San Simon, Arizona, is 1.4 per cent, between Dragoon and Benson, Arizona, 1.4 per cent, and between Mescal and Benson, 1.4 per cent, and also that retainers are not in use on that territory except where the engineer or the conductor demands. Have you any experience in train handling upon grades of 1.4 per cent, or approximately that figure?

A. Yes, on the Salt Lake division between Cobre and Montello, also between Moor and Wells.

Q. I think the grades on those portions of the line are also in evidence as being 1.5 per cent, or approximately that. Have you handled trains of 100 cars down those grades?

A. Yes, I have handled more than a hundred cars.

Q. And I will ask you, if your testimony this morning is based in part on your experience gained in handling such trains in that territory?

A. Yes, that was part of my experience.

Q. Mr. Stevenson also referred to the use of the retainer on the tender of the locomotive. Have you had any experience with that type of operation?

[fol. 5221] A. Yes, we can use it the same as any other retainer can be used, but it results in the heating of the wheels on the tank, and engineers as a rule try to avoid the use of it.

[fol. 5222] Q. In the handling of passenger trains of more than 14 cars do you notice any difference in the starting or stopping as between such trains and trains of less than 14 cars?

A. Not any more than you have to use care in starting.

Q. Does the length of passenger trains up to 16 or 18 cars present any greater difficulty to the engineer in starting and stopping?

A. No, I don't believe it is more difficult. We handle those trains right along, 16 cars is the regular train on the division I work on and I handle those trains myself. I wouldn't know how many cars I had unless someone told me or I looked back and counted them as far as the operation is concerned.

Q. Does the starting and stopping of these longer passenger trains take any longer time particularly?

A. No, each car is equipped with its own brakes.

Q. As you increase the train length, you increase the braking power?

A. Yes, sir.

Mr. Mason: That is all, you may cross-examine.

[fol. 5223] Cross-examination.

By Mr. Strouss:

Q. Mr. Fifield, you spoke about the improvement of the K triple valve. The improvement I believe you mentioned was the stronger graduating spring?

A. That is right.

Q. That was about 1924 or 1925, wasn't it?

A. It may have started about that time but if my recollection serves me it was a little later than that when we

began to adopt them on the Southern Pacific. I may be wrong about that, however.

Q. How long is this grade between Cobre and Montello?

A. 18 miles.

Q. And between Moor and Wells?

A. Slightly in excess of 9 miles.

Q. Did I understand you to say in your direct testimony that the method of braking prescribed in the Southern Pacific air brake rules which is exhibit No. 319 in evidence here is what you call the bridge method?

A. No.

Q. What is this method which is set forth in paragraph [fol. 5224] 18 entitled "Light grade braking" page 29?

A. That would be the long cycle.

Q. This is the long cycle?

A. Yes.

Q. How did you say the long cycle differs from the bridge method?

A. As I interpret bridge method it differs this way, Mr. Strouss, that in light grade braking we use a sufficient brake pipe reduction to brake the train down to the proper speed and we must have the speed of the train high enough in order to release those brakes, otherwise we would have to stop the train if the speed got down too low. With the light grade braking when we intend to release the brakes on the train we simply put the brake valve over into full release position and recharge the entire train. The system of bridging as I interpret it on the Southern Pacific, we operate the brake valve between the lap and holding positions which has the effect of gradually recharging the brakes on the head end of the train and releasing a certain number of them. The driving brake is kept off during this operation, the engine is working the slack, drifting the throttle and the slack is kept out of the head end of the train. That is the [fol. 5225] difference between the bridge braking as we interpret it and the light grade braking.

Q. Of course you are familiar with the Southern Pacific Company air brake rules and regulations, are you not, which are in evidence as exhibit No. 319?

A. I believe so.

Q. Those are issued by the Southern Pacific Company?

A. That is right.

Q. They are given to all enginemen, firemen, and engineers?

A. Yes, sir.

Q. And they are expected to read and understand and know those rules?

A. That is right.

Q. Are they to be guided by those rules in the operation of trains?

A. Yes, as far as they are applicable to the particular movement.

Q. That is the purpose, is it not, in the issuance of these rules?

A. To give them something that they can conform to.

Q. If an engineman were operating a train in a manner [fol. 5226] different than that which is set forth in the rule book and an accident happened and it was shown that he was operating his engine differently than the rule book prescribes, he would be subject to discipline, wouldn't he?

A. No, the rules are flexible enough to permit of the bridge braking that I explained. It states very clearly on page 9 that the operation depends to such an extent on various conditions that were explained in the previous paragraph, that no fixed rule could be established.

Q. That has to do with the time in which the engineer's valve handle should remain in release position, doesn't it?

A. It has to some extent but there are other factors in there as well.

Q. That rule that you referred to reads, "The length of time to leave the handle in release position to effect a release of all brakes and yet avoid overcharging, depends to such an extent on the conditions just explained, the length of the brake pipe and the main reservoir volume, that no fixed rule can be established." That is referring to the length of time that the handle should be left in release position, is it not?

A. Yes, but I would suggest that we don't lose sight of [fol. 5227] the fact that we have to release brakes while trains are in operation. We release brakes while trains are running as well as standing.

Q. And the time that you must leave that handle in release position is affected by the length of the train, isn't it? In other words, as this rule says, by the length of the brake pipe?

A. Yes, that is what it says.

Q. That is true, isn't it?

A. In operation there always becomes the question of whether you want to recharge your train or whether you want to release brakes.

Q. Coming back to my question——

A. Perhaps I didn't get the question.

Mr. Strouss: I will restate it.

Q. The length of time the handle of the engineer's brake valve is to be left in release position is affected by the length of the train, or in other words, the length of the brake pipe as the rule there states?

A. Yes, if you want to recharge the train.

Q. These rules — no place set forth the bridge method of braking as you have described it, do they?

A. No, they do not, nor do they object to it.

Q. There is no place in the rules where that method is described?

[fol. 5228] A. Or that term is used, no.

Q. Nor the method of braking without using the term "bridge method"?

A. No, it is not described in the rules.

Q. In your bulletins which are issued as a part of the timetables, do you know of any bulletin with respect to the operation of air brakes where that method of braking either by name or by description of method is set forth?

A. No, but let's go back——

Q. (Interrupting:) I am just asking you whether that is the situation?

A. I will answer, no.

Mr. Strouss: That is all.

Redirect examination.

By Mr. Mason:

Q. Do you know of any bulletins or instructions issued otherwise forbidding the use of the bridge method as you have described it?

A. Absolutely none.

Q. You were about to refer in the course of your answer to counsel's question when you were interrupted to something in the air brake book which you had in mind, perhaps contemplating the use of some other methods besides those

[fol. 5229] specifically described. Have you some part of the air brake book in mind?

A. I had in mind the permission to handle the brakes as I have described as bridging. It appears in the first paragraph on page 9 of the air brake book, "With a large capacity feed valve the brake valve handle should be held in release position not to exceed 25 seconds when releasing brakes only is the object." The object is not to release the brakes, the object is to build up a little pressure on the head end and permit the operation of the release of the brakes on the head end of the train and less than 25 seconds can be used under that rule, and that is what we do, we use less than 25 seconds.

Q. That is why it reads "not to exceed 25 seconds"?

A. That is why that rule was put in there and I will not say that second hand because I made that rule.

Q. Will you say whether or not as road foreman of engines you have a duty and responsibility to instruct engineers how to handle their trains in your territory?

A. Yes, that is my business.

Q. Is this bridge method as you have described it in com-[fol. 5230] mon use by engineers under your supervision on the Coast division?

A. It is in the territory where bridge braking is advisable.

Q. Was it in common use on the Salt Lake division when you were there?

A. No, it was not. We didn't have that particular type of territory to handle the trains over.

Mr. Mason: That is all.

Recross-examination.

By Mr. Strouss:

Q. This 25 seconds' provision that you referred to, I believe that reads, "With a large capacity feed valve the brake valve handle should be held in release position not to exceed 25 seconds when releasing brakes only is the object." Then there is an exception. The exception is, "The exceptions to this rule are when charging the brake system and braking on grades under all conditions."

A. Yes.

Q. These rules are given to the enginemen, are they not, as a guide to be used in their work?

A. Yes, subject to interpretation.

Q. Yet neither in the rule book itself nor in any rule or [fol. 5231] bulletin is the bridge method set forth?

A. No; yet there is no objection to its use. The rule is made flexible so it can be used.

Mr. Strouss: That is all.

Mr. Mason: It is your duty as road foreman to interpret and apply these rules to the conditions that confront you on your division, is it not?

A. Yes, sir.

Mr. Mason: That is all.

(Witness excused.)

The Court: The Court will stand at recess until 2 P. M.

(Thereupon the Court stood at recess until 2 P. M., April 30, 1941.)

[fol. 5232] 2 P. M., April 30, 1941.

All parties being present as heretofore noted, proceedings were resumed as follows:

The Court: Before you start, gentlemen, may I ask the attorneys for the State if the exhibits Nos. 378, 379, 380, and 381, being the compilation of tables purporting to show the results of tests which illustrate the brake equipment, were those all taken from exhibit No. 206?

Mr. Strouss: Yes.

The Court: In that connection was exhibit No. 377 which purports to be a tentative order of the Interstate Commerce Commission as to the specifications and requirements for brake equipment also taken from the same volume?

Mr. Strouss: Yes.

The Court: The word "tentative" is used there. Ultimately was an order issued that was identical with this that is included in No. 377?

Mr. Strouss: No, I don't think so. I think what happened, and I think counsel will agree, that the Association of American Railways adopted the specifications in 1933 which became the rules of interchange and that specifica-

tion having been adopted the Interstate Commerce Commission has never issued any order fixing any specifications.

[fol. 5233] Mr. Booth: It may be somewhat outside the record but there were a great many tests and experiments made between the time the making of this report by Harley Johnson and the adoption of those specifications in 1933, but there is no connection between the specifications in 1933 and that report. The specifications of 1933 so far as anything before the Court is concerned are not based on that report.

The Court: Counsel furnished the information the Court desired. I just wanted to be sure I understood what the exhibits purported to be. You may proceed.

JOHN H. MENZIES was called as a witness in behalf of the defendant and being first duly sworn testified as follows:

Direct examination.

By Mr. Mason:

Q. Will you state your name, please?

A. John H. Menzies.

Q. What is your residence?

A. Tucson.

Q. Are you employed by the Southern Pacific Company?

[fol. 5234] A. Yes, sir, road foreman of engines, Tucson division.

Q. How long have you been road foreman of engines on the Tucson division?

A. Since July 1, 1940.

Q. Between what points does your jurisdiction as road foreman extend?

A. From Lordsburg, El Paso, to Yuma, Arizona, and branch lines between those points.

Q. You mean Lordsburg, New Mexico?

A. Lordsburg, New Mexico, and Yuma, Arizona.

Q. Does it include all the lines of the Tucson division?

A. The north line, Lordsburg to Tucson, and all lines west of Tucson to Yuma.

Q. It does not include the line between Tucson and Douglas?

A. No, sir.

Q. What was your position prior to being appointed road foreman of engines?

A. I was fireman on the Tucson division from October, 1909, promoted to engineer in December, 1916.

Q. Had you served as engineer from December, 1916, until you were appointed road foreman of engines last year?

[fol. 5235] A. Practically all of that time, yes, sir.

Q. Or as fireman and engineer?

A. Fireman and engineer all the time.

Q. Do you hold seniority as fireman and engineer or both on the Tucson-Rio Grande seniority district?

A. Yes, sir.

Q. Dating as engineer from 1916?

A. Yes, sir.

Q. You were present in the courtroom this morning when Mr. Fifield testified?

A. Yes, sir.

Q. You heard his description of the general duties of a road foreman of engines?

A. Yes, sir.

Q. Do you perform generally the same duties with respect to the engineers and enginemen generally and the motive power on the Tucson division?

A. Yes, sir, they are the same duties practically.

Q. Do you as road foreman of engines ride in freight and passenger trains?

A. Yes, sir.

Q. Where do you ride?

A. Mostly on the engines.

Q. Do you ever ride in the caboose?

[fol. 5236] A. Occasionally I ride on the caboose.

Q. When you ride in the engine do you ever operate the engine?

A. Yes, sir.

Q. In the same way that you formerly did as engineer?

A. Yes, sir.

Q. Can you state whether or not in the course of your duties as road foreman of engines the mileage that you make in the average month is greater or less than that which you made on the average as engineer?

A. I don't keep time slips as I did when I was running an engine but I know that I put in as much or more mileage on this job as I did formerly.

Q. You recall that Mr. Fifield said he was out on the road riding trains about 23 days out of a month. Does that correspond to your experience?

A. It is very close to that.

Q. You have stated that you hold seniority over the Tucson-Rio Grande seniority district. Have you worked as an engineman, engineer, or fireman in all parts of that territory?

A. Yes, sir.

Q. Does that include the district between Lordsburg and El Paso?

[fol. 5237] A. Yes, sir.

Q. And between Yuma and Gila as well as Gila and Tucson?

A. Yes, sir.

Q. Have you also worked between Tucson and Lordsburg?

A. Yes, sir.

Q. As both engineer and fireman?

A. Yes, sir.

Q. Where did you work most recently as an engineer prior to your promotion as road foreman?

A. Between Yuma and Gila in the last six or seven years and regularly out of Yuma, between Yuma and Gila.

Q. In what character of service?

A. Freight service.

Q. In your service on this district have you handled trains of more than 70 cars as well as shorter trains?

A. Yes, sir.

Q. Have you handled so-called long trains in New Mexico?

A. Yes, sir.

Q. Did you handle any trains of more than 70 cars in Arizona during April, 1940?

A. Four trains between Gila and Yuma.

[fol. 5238] Q. Do you recall what the length of those trains was?

A. As I recall, April 12, 91 cars; April 14, 91; April 21, 91; April 28, I think was 94.

Q. Which direction were those trains handled?

A. Westward.

Q. Do you recall what sort of time you made with them, whether it was better or worse or different than the time that you generally make with 70 cars or less?

A. As I recall it was about the average time for westward trains.

[fol. 5239] Q. What in your experience has been about the normal time for westward trains of between 65 and 70 cars between Gila and Yuma?

A. Four hours and a half to five hours and a half, ordinarily.

Q. I think, Mr. Menzies, you were incorrect as to the date of your first 91-car train. You said it was the 12th; I think it was actually the 14th.

A. The 14th.

Q. And one on the 16th?

A. And one on the 16th.

Q. And what were the times from terminal to terminal of those trains, according to your own time return and delay reports?

A. On the 14th, four hours and forty-five minutes, on the 16th, five hours and thirty minutes, four hours and ten minutes on the 21st, and four hours and thirty-five minutes, I think it is, on the 28th.

Q. Mr. Menzies, do you recall whether, in the handling of these trains, there was any incident of any kind out of the ordinary, what you would regard as the ordinary course as an engineer?

A. No, sir.

Q. Will you say whether or not the handling was in any [fol. 5240] respect different from the handling of trains of seventy cars or less either before or after?

A. It was very much the same as any trip west with any train.

Q. Are you familiar with the type of air brake equipment on the locomotives in use in freight service in Arizona?

A. Yes, sir.

Q. Will you say whether or not such locomotives are equipped with the double compressors and double air reservoirs?

A. All our freight engines are equipped with double compressors excepting the small C type that are not used much in freight service any more.

Q. Are the C type used as the road engines?

A. In switching.

Q. They are used only in switching?

A. Yes.

Q. They are not used in main line service?

A. Very seldom.

Q. Have you had any experience in the control of freight trains on the grades in Arizona, to which reference has been made by plaintiff's witnesses, for example, the grade [fol. 5241] from Steins down to San Simon, or from Mescal or Dragoon down to Benson in either direction?

A. Yes, sir.

Q. Have you handled trains down those grades?

A. Yes, sir.

Q. Have you had any difficulty in your experience in handling such trains?

A. I have never had any difficulty in handling a train over that territory.

Q. Do you ride in the engine with engineers handling trains down those grades?

A. Yes, sir, quite often.

Q. Have you in such experience observed any difficulty on the part of the engineers handling them?

A. No, sir.

Q. You probably recall, Mr. Menzies, that the witnesses, particularly Mr. Stevenson, described the method of braking used in handling trains down these 1.4 per cent grades as the short cycle method. Now, in the handling, according to that method, down these grades, is the air in the train line all exhausted?

A. No, sir.

Q. Or should it be if the train is properly handled?

[fol. 5242] A. No, sir, that is right, it should not be.

Q. Are these grades, in your experience, sufficiently heavy to create this condition or bring it about?

A. No, sir.

Q. Now, in handling freight trains down these grades, which is the essential factor of the problem, the number of the cars in the train or the amount of tonnage in proportion to the number of operative brakes?

A. The tonnage per operative brake.

Q. Is there any device on the cars which enables you to secure additional control in the use of the short cycle method of grade braking?

A. Yes, sir, we have retainers on all freight cars.
Q. Does that assist you in the control of the train?
A. Yes, it adjusts and helps retain control.

The Court: Are those in use on any of the territory you have been operating in, these retainers?
A. We haven't used them because it hasn't been necessary to use them, but they are there if they need them.
The Court: Have you had occasion to use them in your [fol. 5243] territory?
A. Not in late years.

Mr. Mason: The engineer has a right to use retainers if he thinks he needs them for the purpose of controlling his train, does he?
A. Yes, sir.
Q. Now, in your experience, Mr. Menzies, does the adding of cars to the train let us say up to 100 cars make the control of the train impossible or impracticable upon any part of the main line in Arizona?
A. No, sir, it does not make it impossible.
Q. Does it create any condition differing from that which exists with the handling of trains, let us say of from sixty to seventy cars other than perhaps requiring the use of somewhat greater care by the engineer?
A. The engineer must use more care and it takes probably a little longer to start the train and also to stop it.
Q. From your standpoint and your experience, particularly your experience of last year, can you say whether or not the operation of long trains on Arizona's main lines is practical from the standpoint of the engineer in the engine?
A. Yes, sir.
[fol. 5244] Q. You heard the testimony of the opposing witnesses as to the control of trains leaving stops at certain points in grade territory where a rolling inspection at eight miles per hour is undertaken. Have you as an engineer or as road foreman of engines been present when such inspections were undertaken at points in grade territory?
A. Yes, sir, I have been out at all their sidings here.
Q. Will you state whether or not you have yourself experienced or seen any difficulties in connection with these inspections?
A. No, sir.

Q. That is your interpretation of the bridge method?

A. Yes, sir, the same as Mr. Fifield described to you earlier today.

Q. That is the method that you have instructed the engineers?

A. No, sir, they use that method. I do instruct them in the proper way of handling the air.

Q. What method do you instruct?

A. The long hold where the grade is not severe.

Q. As set out in the rules?

A. Yes, sir.

[fol. 5253] Q. And the short cycle method as set out in the rules?

A. We really haven't any heavy grade braking here.

Q. You instruct them as to the long hold as set out in rule 18?

A. Yes, sir.

Q. That is rule 18, is it not (handing document to witness)?

A. That is right, light grade braking.

Q. You say that your enginemen do use the bridge method but you don't instruct them in that method.

A. I instruct them in not allowing themselves to get in trouble.

Q. Do you instruct——

Mr. Mason: (Interrupting) Let him finish, Mr. Strouss. You keep interrupting him. He has had three answers now cut off because you are so enthusiastic.

Mr. Strouss: Had you finished with your answer?

Mr. Mason: Let's have the prior question read.

(The record was read by the reporter.)

Mr. Strouss: I hadn't intended to cut the witness off.

[fol. 5254] The Court: Go ahead, Mr. Strouss.

Mr. Strouss:

Q. Had you finished your answer?

A. Yes.

Q. Do you instruct in the bridge method?

A. I instruct them in the long hold where they are doing light braking.

Q. That is the method that is set up in rule 18?
A. That is light grade braking.
Q. Light grade braking as set out in rule 18?
A. Yes, sir.

Mr. Strouss: That is all.

Redirect examination.

By Mr. Mason:

Q. I take it when you instruct them in the use of light grade braking under rule 18 you instruct them how to use that method in confronting the conditions they were actually confronted with?

A. Yes, sir, to keep the train stretched to avoid any slack action.

Q. Do I understand that your definition of the so-called bridge or modified long hold method involves any departure from rule 18?

A. No, sir, it is just a modification of that rule.

[fol. 5255] Q. Is there anything in any rules of instructions, written or unwritten, that you know of which tells you that you may not use this modification or adaptation of rule 18?

A. No, sir.

Mr. Mason: That is all.

Recross-examination.

By Mr. Strouss:

Q. These rules I take it are given to the men to be followed, isn't that true?

A. As Mr. Fifield explained they are flexible. Judgment and care must be taken into consideration in the handling of a train.

Q. Of course the engineman or the trainman as the case might be is at liberty to use his own judgment in any case whether that particular rule might be followed?

A. If a man does not show judgment before he is promoted, he very seldom becomes an engineer.

Q. After he has shown that judgment and becomes an engineer then he is promoted and can use his own judgment?

A. Within the rules, yes.

Q. Of course you have to have the brakes off to make a proper inspection, don't you?

A. That would only be on brakes applied. The rolling inspection could be made except the brakes released on [fol. 5249] certain cars.

Q. A proper inspection which would include an inspection to determine whether any of the brakes were sticking could not be made if you had the brakes applied, could it?

A. No, but that is braking territory and they would be braking all the way down there anyhow.

Q. If you were attempting to hold a train with the engine brakes of course that might be possible if the weight of the train were not too heavy?

A. Yes, if it wasn't too heavy.

Q. And the length of the train would affect the weight of the train?

A. The weight of the train would affect it.

Q. Where you are not using the train brakes, the more cars you have on behind that engine the more weight you put on the engine brakes?

A. That is right.

Q. You of course are familiar with the air brake rules and regulations?

A. Yes, sir.

Q. You are required to acquaint yourself with these and to pass an examination on these rules?

A. Yes, sir.

Q. That is true of all enginemen?

A. Yes, sir.

[fol. 5250] Q. These rules are your guide or the guide of the enginemen in operating a train?

A. Those are clear instructions.

Q. What is said in here concerning smooth train handling, has that been in accord——

A. There is a lot in there about train handling.

Q. I will read you some of it: (Reading) "Smooth train handling depends on the ability to control the slack and how to prevent it from running in or out harshly. Where so controlled, no draft gear in fair to good condition will be damaged. Slack action cannot be prevented, but by acquiring knowledge of the various causes for it, and exercising forethought in the use of steam, train brakes, independent engine brake and sand, it can be controlled, even to the

extent of avoiding further injury to damaged draft gear. The heavier the engine and the longer the train the greater is the care required." Do you subscribe to that?

A. Yes, sir.

Q. On page 11, "An automatic brake application will cause the brake pipe pressure to reduce faster at the head end of the train than at rear. This results in the head brakes applying in advance of those at the rear, and tends [fol. 5251] to bunch the train and compress the draft gears. In releasing, the head brakes commence so much before those at the rear that, as far as holding power is concerned, they are practically off before the rear ones start to release, causing the slack to run out rapidly." Has that been your experience?

A. Not the slack running out rapidly, no, because the way they brake the trains now they overcome a lot of that.

Q. How is that overcome now?

A. The long hold or the modified long hold or bridging as Mr. Fifield described it.

Q. Do you find in your rules any rule which covers the bridging method?

A. No, but there it a rule for the long hold and the bridge is really a modification of that, that is all.

Q. There isn't anything in your bulletins covering that method of braking either, is there?

A. No, but we do instruct our men to handle them that way.

Q. You do on this division?

A. They handle them that way and have very good results.

Q. Do you instruct your men on this division to handle them that way?

[fol. 5252] A. That is part of my duty, to instruct them in the proper manner.

Q. What enginemen on this division have you instructed to handle their trains with the bridge method of braking?

A. It is not a bridge method. It is a bridge modified long hold is what I would say, the releasing of the head brakes and allowing the train to be stretched where there is no slack. The releasing of the brakes on the head end, keeping the train stretched to avoid this run-out of slack because we work a little steam drifting throttle.

Q. That is the method that you have instructed?

A. That is the method we use.

Q. Is it possible for the engineer to hold the train to the speed necessary to permit the inspection to be made?

A. Yes, he can hold it to that speed.

Q. Now, referring to the matter of emergency stops of freight trains, have you yourself experienced occasions where you made an intended emergency stop of a freight train which you were operating?

A. Yes, I recall one time of making an emergency stop on a freight train.

Q. Do you remember when that was?

[fol. 5245] A. No, I can't tell the exact time, the date, but it was between Phoenix and Yuma, a station called Tolleson.

Q. Now, you have been an engineer since 1916. Is that the only occasion where you made an intended emergency stop with a freight train?

A. That is the only one I recall.

Q. Have you been on the engine with other engineers when intended emergency stops of freight trains were made?

A. No, sir.

Q. Reference was made in the testimony of the opposing witnesses also to the duties of the engineer to look back along the train in order to keep it under observation as the train was running. Have you performed that duty when you were running, as engineer?

A. Yes, sir.

Q. Will you say, approximately, what the limit of vision is, in your experience, from the engine back along the train?

A. Well, I would say that I could watch a train fairly good sixty cars from the engine. It wouldn't be a very accurate observation, but at least, you could see any real emergency.

Q. Do you have any bad weather conditions in Arizona [fol. 5246] that interferes to a large extent with observation of this kind?

A. No, sir; occasional sandstorms would be about all.

Q. You were present when certain of the witnesses testified as to slack action?

A. Yes, sir.

Q. And to some extent as to casualties. In your experience as fireman and engineer, have you ever been on a train

where a reportable casualty was occasioned by reason of slack action?

A. I don't recall any.

Q. You recall also testimony with reference to the use of conductor's valve at the caboose. Have you ever had the conductor's valve used while you were operating the train as engineer?

A. I think so, but I can't recall the times.

Q. Has the use of the conductor's valve on the trains that you were operating resulted in any injury to any member of the engine crew?

A. No, sir.

Q. Or any person on the engine?

A. No, sir.

Q. Mr. Menzies, from the engineer's standpoint in making a good run with the least trouble and delay and the least fuel consumption, which would be better, a run with [fol. 5247] a number of stops for meets and passes and inspections or a run with comparatively few stops and few meets?

A. The fewer stops the better the engineer likes it, and the less stops the less brake application, the less chance for brakes to be sticking, hot wheels and so forth.

Mr. Mason: That is all. Thank you, Mr. Menzies.

[fol. 5248] Cross-examination.

By Mr. Strouss:

Q. Mr. Menzies, these trains that you were on on the 14th, 16th, 21st, and 28th of April I think the time return and delay reports show those trains to be consisted as follows: 1 load and 90 empties, is that right?

A. I think that is correct, yes, sir.

Q. The one on the 16th was 1 load and 90 empties?

A. Yes, sir.

Q. The one on the 21st was 1 load and 90 empties?

A. Yes, sir.

Q. The one on the 28th was 2 loads and 92 empties?

A. Yes, sir.

Q. I believe you said you never had any difficulty in holding a train for inspection on grades. The grade around Sibyl is about 1.4?

A. From Sibyl down to Benson westbound is about 1.4.

Q. If he used his own judgment and adopted a method which is different from the rules and it resulted in an acci-
[fol. 5256] dent of course he would not be disciplined because he had used his own judgment?

Mr. Mason: I object to the question, it assumes facts not in evidence and is based upon a distortion or misunderstanding of what the witness has testified to. It is obviously not proper cross-examination.

The Court: Objection overruled.

Mr. Strouss: Will you read the question, please?

(The question was read by the reporter.)

A. If his judgment got him into trouble he would probably be disciplined.

Mr. Strouss:

Q. Then it would be a matter of his superiors determining whether his judgment was good judgment?

A. He has the rules that he must live up to. He cannot just ignore the rules.

Mr. Strouss: That is all.

(Witness excused.)

[fol. 5257] B. S. Sines was called as a witness in behalf of the defendant and having been previously sworn testified as follows:

Direct examination.

By Mr. Mason:

Q. Mr. Sines, you will recall that during the testimony of Mr. Cheek reference was made to his having handled two passenger trains of more than 14 cars during April, 1940?

A. That is right.

Q. Have you prepared photostatic copies of the conductors' time returns and delay reports covering those two trains which are to be submitted in lieu of the original time returns and delay reports, exhibits Nos. 321 and 322?

A. I have.

Mr. Mason: We offer these photostatic copies in lieu of the documents previously received as exhibits Nos. 321 and 322.

The Court: If there is no objection, they may be received and the original exhibits released and these substituted in lieu thereof.

Mr. Strouss: I have no objection to the substitution. I don't remember whether I objected——

[fol. 5258] Mr. Mason: You insisted on them being here.

Mr. Strouss: Then I hardly object to it.

Mr. Mason:

Q. Mr. Sines, I show you a document entitled, "Consist Train No. 3 Departing Tucson April 12, 1940, Conductor G. Shaw, Engineer B. Cheek." Have you that before you?

A. I have.

Q. Did you have this exhibit prepared?

A. I prepared it.

Q. From what sources and what is it?

A. This is a photostatic reproduction of the passenger conductor's car report, form CS-1213, covering the operation of train No. 3 on April 12th with conductor Shaw and engineer Cheek.

Q. Is this the same train that is covered by exhibit No. 321?

A. Yes.

Mr. Strouss: Pardon me, I wonder if I have the right copy here. Mine says "train No. 44."

Mr. Mason: You have the wrong one then. That comes next.

Q. You have added certain notations on this exhibit, have you, Mr. Sines?

A. That is right. The figures appearing at the bottom are derived from the information which the conductor placed on the form in the columns which are headed "Ini-[fol. 5259] tial," "Number," "Engineer," "From," "To," "Miles." By analyzing the particular territory over which each of those cars operated it will be found that the number of cars in the train arriving and departing at El Paso, Tucson, Phoenix, Arlington, Yuma, and Los Angeles are as shown on the bottom of the exhibit.

Q. Is this form CS-1213 a record of the run of this train from El Paso to Los Angeles?

A. It is the record regularly made by the conductor of every passenger train operated and it is the particular

[fol. 5267] Q. Now, is this furnished in response to the suggestion of opposing counsel and the undertaking by defendant's counsel?

A. Yes. We have also checked these against the specifications which Mr. Strouss mentioned as having been furnished by Mr. Browning.

Q. And does this agree with those specifications furnished by Mr. Browning to Mr. Strouss?

A. Yes, sir.

Mr. Mason: Have you any questions?

Mr. Strouss: No.

The Court: Mr. Sines, is this exhibit which has been marked for identification comparable to Exhibit 377 on the part of the State? I mean by that, is the previous exhibit 377, did that ultimately ripen into this order that appears here, the specifications in this exhibit?

A. I don't think I could answer that.

Mr. Strouss: One is the order of the Interstate Commerce Commission, this is the Rule of the American Railway Association.

Mr. Mason: This, your Honor, is what was actually adopted by the Association by a letter ballot and the approving vote of its members in 1933. The Interstate Commerce Commission's tentative order was issued in 1924.

[fol. 5268] The Court: I see.

Mr. Mason: And there were intervening proceedings, some of which have been mentioned and some of which have not been mentioned by opposing counsel and ourselves.

The Court: I see.

Mr. Mason: Do you understand that as being correct, Mr. Sines?

A. I confirm what you say as to their having been adopted by the A. A. R. in 1933. I am not familiar with No. 377.

Mr. Mason: No. 377 is an excerpt from the Harley-Johnson report, which reproduces the Interstate Commerce Commission's tentative order of 1924 in the case entitled "Power Brake Investigation."

The Court: That is correct, according to the original exhibit which I have here.

Mr. Mason: The tentative order, as I understand it, is already in evidence without objection as a part of the

pamphlet copy of the Interstate Commerce Commission's decision in the power brake investigation. You remember that a pamphlet copy was offered in evidence by Mr. Strouss. I have forgotten the number of the exhibit—385, I think.

[fol. 5269] Mr. Strouss: It is right along in there, it is after this 377, I know that.

Mr. Polley: 385, that is right.

Mr. Booth: To avoid any misunderstanding, I would like to have it in the record that there is absolutely no connection, so far as the record is concerned, between this exhibit the witness has just identified and anything in the Harley-Johnson report.

Mr. Strouss: I am not stipulating to anything of the sort.

Mr. Booth: That is a fact. A comparison will show it.

Mr. Strouss: We will argue the record when we get to it.

Mr. Mason: Now, Mr. Sines, I think you said this was adopted by the A.A.R. Wasn't it adopted by the members of the American Railway Association by a special vote of the membership?

A. That is right.

Q. And submitted to them for their approval by the Mechanical Division?

A. Yes.

Q. As a proposal for adoption?

A. Yes.

Mr. Mason: I don't know that the exhibit has been offered [fol. 5270] but it is now offered as No. 396.

Mr. Strouss: I would like to ask Mr. Sines a question.

Q. Are you a member of the American Railway Association, or were you and are you now a member of the Association, the Association of American Railways?

A. No.

Q. Or of any committee?

A. No.

Q. Or any division?

A. No.

Q. How do you know how this was adopted?

A. In introducing this exhibit, I explained that I had received these specifications from our mechanical department, and my inquiry to them was to furnish us specifications which are mentioned in the A.A.R. code of interchange rules

Q. Have you the original time returns and delay reports and the time registers available in the courtroom?

A. Yes, also the time book. Did you ask me if I had the register?

Q. Yes.

A. Yes.

Q. And you have the time book as well?

A. Yes.

Q. I notice you show here a heading "Miles or Equivalent Miles." What is the meaning of "equivalent miles"?

A. In computing miles operated by employees who are in mixed service, that is, freight and passenger both, the miles operated in passenger service are reduced by one-[fol. 5264] third to equate them to miles operated in freight service, then the two figures are added together to produce one mileage figure.

Q. Then the figure, for example in line one, column C, will represent the miles that Mr. Ash had run if all the service had been in freight service, equating the passenger-miles to freight-miles at the one-and-a-half to one basis?

A. That is right.

Q. Is the same explanation true as to all of the other equivalent miles here?

A. Yes. There is the further feature also that deadheading is paid for, I think it is 100 miles per trip.

Q. Well, the deadheading is paid for on a basis less than your full mileage bears?

A. Yes.

Q. And if there are run-arounds, they are paid for on the full basis of miles?

A. Yes, sir.

Q. Are the payments included in here on the basis of the miles to show their equivalent?

A. Yes, sir.

Q. This is taken from the timebooks and time register? [fol. 5265] A. That is right.

Q. Do you know, and, if so, will you state whether the conductors register their individual miles?

A. I don't know whether they are following that practice right now or not, I know that they did not very long ago, and they did it for several years, particularly during the depression years.

Q. Do you recall the testimony of Mr. Fail to the effect that there was a monthly mileage limitation on conductors, 3800 miles, or their equivalent.

A. He mentioned 3800 miles, yes.

Mr. Mason: Have you any questions, Mr. Strouss?

Mr. Strouss: No questions.

Mr. Mason: Has your Honor any question?

The Court: No questions.

Mr. Mason: We offer the exhibit as defendant's Exhibit No. 395.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked, "Defendant's Exhibit No. 395.")

The Court: Mr. Mason, just what is the purpose of this particular exhibit?

Mr. Mason: Well, you remember that I asked Mr. Ash [fol. 5266] and Mr. Fail and I think Mr. Shaw, about the extent of the service that they had rendered. Mr. Fail was willing to say that he worked pretty nearly full time, but he didn't know how much, and I also asked him if it hadn't all been in long-train territory. I want to show by this that these star witnesses for the opposition, worked several thousand miles apiece in this supposedly dangerous territory.

The Court: I see.

Mr. Mason: Mr. Sines, have you before you a statement, apparently a photostatic copy, in six pages, the initial page of which is entitled, "American Railway Association, Mechanical Division. Specifications for Freight Brakes, Standard, Adopted 1933."

A. Yes.

Q. Consisting of six sheets which are numbered at the foot E-55, E-56, E-57, E-58, E-59 and E-60?

A. That is right.

Q. From what source did you prepare this exhibit?

A. These are from specifications which were furnished us by our mechanical department which specifications are the ones referred to in the A. A. R. Book of Interchange Rules.

report of conductor Shaw for the operation of train No. 3 on that date.

Q. Does this correspond to the form 1216 for freight trains?

A. It does.

Q. This is one of a group of original records which you have for this particular period, is it?

A. That is right.

Q. Do I understand that this is an actual photostatic reproduction of the original?

A. It is.

Q. Will you state the purpose of this exhibit, having in mind exhibit No. 321?

A. Exhibit No. 321 indicates there were 16 cars out of Tucson and 15 cars out of Phoenix. The exhibit we are [fol. 5260] offering indicates the same information for the same territories but in greater detail.

Mr. Mason: We have not yet had the exhibit marked and I should like to have it marked with the number next in order.

The Court: It may be marked for identification.

The Clerk: Defendant's exhibit No. 393 for identification.

Mr. Mason: I will now offer it in evidence.

Mr. Strouss: No objection.

The Court: It may be admitted.

(The document referred to was received in evidence and marked "Defendant's Exhibit No. 393.")

[fol. 5261] Mr. Mason: Now, will you take up, please, the statement entitled "Consist Train No. 44, Departing Yuma, April 13, 1940." Have you that before you?

A. I have.

Mr. Mason: May we have this exhibit marked No. 394 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 394 for identification.

Mr. Mason: Did you prepare No. 394, Mr. Sines?

A. I did.

Q. Was this prepared in the same manner as No. 393?

A. The same.

Q. And from the corresponding original form 1213?

A. Yes, sir.

Q. And the notations at the foot of the sheet, are those your own?

A. They are.

Q. Is this a companion of Exhibit 322?

A. It is.

Q. And has a purpose similar to that of No. 393?

[fol. 5262] A. That is right. I want to call attention to the fact that Exhibit 322, containing a reproduction of the conductor's time return and delay report does not show the number of cars in the train departing Phoenix and arriving Tucson, it merely shows the number of cars, 13 departing from Yuma. The train, however, had 15 cars between Phoenix and Tucson, as shown at the bottom of Exhibit 394.

Mr. Mason: We offer No. 394 for identification in evidence, with that number.

Mr. Strouss: It may be admitted.

(The document, referred to was received in evidence and marked, "Defendant's Exhibit No. 394.")

Mr. Mason: Now, Mr. Sines, have you before you a statement in one sheet entitled, "1940 Service Records of Conductors A. T. Ash, L. A. Fail, and E. V. Shaw?"

A. I have.

Mr. Mason: May we have this statement marked Defendant's Exhibit No. 395 for identification?

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 395 for identification.

Mr. Mason: Did you prepare No. 395, Mr. Sines?

[fol. 5263] A. I directed its preparation and have checked it.

Q. From what sources was it prepared?

A. This exhibit was prepared from the conductors' time return and delay reports for the year 1940 covering all of the service of the three conductors named, checking the time with the individual time return and delay reports against the time register for those same conductors to make sure that we had all of the service in both instances.

as being the specifications of 1933. They furnished me the same documents that Mr. Browning furnished you, and looking at the face of the exhibit here, the printing on the original document, it says, "Adopted 1933."

Q. It doesn't say how it was adopted?

A. I have also seen a publication of the A. A. R. My [fol. 5271] recollection is hazy at the moment, mentioning——

Q. You say A. A. R. Do you mean the A. A. R. or A. R. A.

A. In 1933 it would be the A. R. A. Now, my exact knowledge as to how this thing would be adopted is my familiarity with the working of the A. A. R. and the A. R. A., and I know when such things are adopted it is done by letter ballot.

Q. How did you happen to be familiar with the workings of those organizations?

A. Well, the A. R. A. and the A. A. R. published annuals of accepted practice, which are, I suppose, to the engineering profession what the legal handbooks are to lawyers, particularly to the railway engineers. They have recommendations in there as to sizes of spikes, and ties, and rails, and tie-plates, and when I went to work for the railroad and before I went to work for the railroads in 1920 and '21, when I was in the university taking civil engineering, the A. R. A.'s accepted standards were a reference work in our library, and I found out at that time by reading through those books and pamphlets how those things are adopted, and since then, of course, I have checked them a number of times.

Mr. Mason: No doubt your Honor has in mind the testi- [fol. 5272] mony of the witness Browning to the effect that where a change is to be made, it is submitted to the membership for a vote, and must be adopted by vote.

Mr. Strouss: And their standards are accepted as standards, their recommendations are accepted as standards?

A. Well, it is always with this understanding, that a group of men have gotten together and have agreed that such and such a practice is a good common standard, but it doesn't bind any member to follow that standard. As an engineer, when I was working in the Engineering offices in El Paso, and a new problem came up I would always refer to the handbook to find out what the A. A. R. recommended practice

was, and then make up my mind what I was going to do. I might follow their recommendations or I might not.

Mr. Strouss: That is all. No objection.

The Court: It may be admitted.

(Thereupon, the document referred to was received in evidence and marked, "Defendant's Exhibit No. 396.")

Mr. Mason: Now, Mr. Sines, have you before you a statement in one sheet entitled, "Delays to Freight and Passen-
[fol. 5273] ger Trains Associated with Equipment or Defects therein,"——

A. I have.

Q. —"as Reported by Conductors on Time Returns and Delay Reports, January 1, to June 30, 1940, Lordsburg, New Mexico, to El Paso, Texas."

A. Yes.

Mr. Mason: May we have this statement marked No. 397 for identification.

The Court: It may be marked.

The Clerk: Defendant's Exhibit No. 397 for identification.

Mr. Mason: Did you prepare No. 397, Mr. Sines?

A. I directed its preparation, have checked it, and have done about half the work myself, yes, sir.

Q. Now, lines 1 to 24, inclusive, from what sources were they prepared?

A. From an examination of the conductors' time return and delay report, particularly the delay report section on the back of the report where the conductors note occurrences or unusual occurrences causing delay to their trains.

Q. Now, did you use the language or substantially the language of the conductors themselves in setting up these
[fol. 5274] items 1 to 24 inclusive?

A. Generally, that is a fact. In establishing a classification in the first instance, I was guided by the code causes issued by the Interstate Commerce Commission in connection with classification of equipment defects, and wherever possible, I fitted the conductor's notation of occurrences into those code causes of equipment defects. In many cases, however, the conductor's notations were not specific enough, or they were too brief, to identify accurately with anyone of those code causes, and in that event I used the words of the conductors. I refer particularly to Item 13 and Item 12.

Q. Those are what the conductors said about the situation?

A. That is right. Now, Items 21 and 22 may not be the exact words of the conductor, but I found no difficulty in translating the conductor's language into the items which I have noted here as 21 and 22.

Q. Now, as to Items 26 to 30, inclusive, from what source were they taken?

A. They are taken from information supplied by our auditor of equipment service accounts for the six months' [fol. 5275] period as a result of a special request which I made upon him.

Q. Was this a special check of the wheel reports for the freight and passenger trains operated in that territory during that period?

A. That is right, it requires an inspection of every individual wheel report in order to produce the figures which I have in this exhibit.

Q. Did you yourself make a special check of the underlying sources to determine the number of freight trains of seventy cars and less, and over seventy cars, and the number of short passenger trains?

A. Yes, I made a count off the dispatcher's train sheets which I used to check the information which I received from the auditor of equipment service accounts.

Q. In segregating these occurrences in lines 1 to 25 inclusive, as between short and long freight and passenger trains, how did you make that segregation?

A. By the information appearing on the face of the conductor's time return.

Q. I take it that the addition in line 25 is your own?

A. That is right.

Q. What as to the computation which appears in lines [fol. 5276] 29 and 30?

A. Those are my computations also. The information in line 29 is obtained by dividing the figures in line 28 by the totals in line 25. The information in line 30 is determined by dividing the figures in line 28 by the figures in line 27.

Q. Have you checked the exhibit to determine whether or not it is true and correct?

A. I have.

Q. Will you state whether it is true and correct and in accordance with the underlying sources?

A. It is.

Q. Are the time returns and delay reports and the train dispatcher's train sheets available in Tucson?

A. They are in Tucson, yes.

Q. And I think you stated that the data as to car-miles and train-miles was a special study at San Francisco?

A. That is right.

Mr. Mason: Will you require that to be verified, Mr. Strouss?

Mr. Strouss: No, I have no objection.

Mr. Mason: Have you any questions?

Mr. Strouss: No.

[fol. 5277] Mr. Mason: We offer the exhibit in evidence as No. 397.

Mr. Strouss: No objection.

The Court: It may be admitted.

(Thereupon, the document referred to was received in evidence, and marked "Defendant's Exhibit No. 397.")

Mr. Mason: That is all we have now, your Honor.

The Court: Well, we will take our mid-afternoon recess.

(Thereupon, a short recess was taken, after which proceedings were resumed as follows:)

[fol. 5278] The witness Sines resumed the witness stand.

The Court: I understood you to say, Mr. Sines, that amongst the engineering profession that the reports and publications of the American Railway Association or its successor, the A. A. R., were considered standard publications?

A. The Manual of Recommended Practices.

The Court: Referring particularly to plaintiff's exhibit No. 206, being this volume here, is that considered a standard publication amongst the engineering profession?

A. No, sir, that is in an entirely different category.

The Court: That is all.

Mr. Mason: Do you have any questions of the witness on these exhibits?

Mr. Strouss: No, I have no questions.

(Witness excused.)

Mr. Polley: Your Honor, I have in my hand a document entitled, "Interstate Commerce Commission, Report of Di-

rector of Bureau of Safety to the Interstate Commerce Commission for the Fiscal Year Ending June 30, 1940," and it bears on its face the imprint of the seal of the Interstate Commerce Commission and carries the notation, "United States Government Printing Office, Washington, 1940." I [fol. 5279] would like to have it marked for identification.

The Court: It may be marked.

The Clerk: Plaintiff's exhibit No. 398 for identification.

Mr. Polley: This exhibit should have been offered in our rebuttal but we didn't receive it until last night.

The Court: Permission will be granted to reopen.

Mr. Polley: We would like to offer in evidence that portion of the report beginning with the first paragraph on page 2 and extending through page 2 to the end of the third paragraph on page 4.

Mr. Mason: We object to the receipt of the report in evidence on the ground it is mere hearsay. It is not an official publication of the Interstate Commerce Commission. It is a report of the Director of the Bureau of Safety to the Commission. In other words, a report within the Commission by one of its staff to the Commission itself.

Mr. Booth: It is not shown that the Commission has adopted the report or acted on the recommendations.

Mr. Strouss: It is printed for publication.

[fol. 5280] Mr. Mason: It is no more than a newspaper article.

The Court: May I ask counsel for the State if there is any differentiation between this exhibit No. 398 which you now offer and the exhibits to which objection was made and which the Court has under advisement in connection with the excerpts from exhibit No. 206?

Mr. Strouss: There is quite a bit of difference. One is by the Director of the Bureau of Safety of the Interstate Commerce Commission, a report made by him to the Commission in his official capacity which is published by the Interstate Commerce Commission and distributed and it shows on its face it is a report which the Commission has authorized to be published and printed, and is printed. The thing is to show that it reports the action of his division during the year ending June 30, 1940. The parts we have referred to are the results of inspections made by the Interstate Commerce Commission inspectors under the jurisdiction of the Bureau of Safety and the other has to do with the report

of the number of cars which are equipped with this new type brake.

The Court: You mean this exhibit covers that feature? [fol. 5281] Mr. Strouss: Covers that feature. Your Honor will remember that under the rule of interchange it is required by the different carriers and private car owners that they file with the Interstate Commerce Commission, I have forgotten whether it is semiannually, but at different periods during the year a statement of their equipment equipped with the brake.

The Court: Mr. Strouss, having in mind the objection made, what the Court is concerned with is this, there has been accepted without question throughout this trial all of the orders, rules, regulations, and what not of the Interstate Commerce Commission, both sides have offered them and they have gone in sometimes with objection and usually without objection. Here is a report apparently—I haven't examined it—of one of their employees or officers, to wit, the Director of Safety, which they have seen fit to put out as an official publication of the Commission. However, from your statements I take it that it only purports to be the report of the Director of Safety and no order of the Commission has been entered adopting this.

Mr. Strouss: I don't know, I haven't looked at it myself [fol. 5282] carefully, but if your Honor will look at it you will see it is published under the authority of the Interstate Commerce Commission for public distribution.

The Court: It seems to me you have to have more than that. Supposing that they published an address such as is included in one of these exhibits, you would not contend that a court of record would have to admit it merely because it was put out under the official seal or authority of the Commission. I haven't examined it, I want to, but I just wanted to get your idea.

Mr. Strouss: It is the same as any other report. Of course the Commission acts through its agents the same as any other organization.

The Court: Have counsel examined it? Maybe they have no objection to it.

Mr. Mason: On the contrary, we have very serious objection to it. This is not a report of the Commission, it shows on its face that it is not. Reports of the Commission are distinct and can be readily identified. The statute requiring their reception in evidence where the seal of the

Commission appears upon them is specific in identifying the document so receivable as a report of the Commission. The documents which have been used without objection or have [fol. 5283] been received over objection have been reports of the Commission or excerpts therefrom. Exhibit No. 385 which was introduced is a report of a decision of the Commission. The document now before you identified as exhibit No. 398 for identification is merely a report submitted by Director Mills of the Bureau of Safety to the Commission. It requires the vote of six of the eleven members of the Commission to adopt something as the act of the Commission or the vote of two of the three members of a division where a division may act. There is no record here whether the Commission has ever done anything about Mr. Mill's report. The annual accident bulletins are the bulletins of the Commission and are gotten out by the Commission itself. The decision in the power brake investigation case is an act of the Commission. The orders of the Commission requiring various kinds of reports to be submitted to it are orders of the Commission and usually say on their face, "At a general session of the Interstate Commerce Commission." There is nothing of the kind on the document now before you. The reports of accidents which are summarized in the annual accident bulletins are reports issued by the Commission itself, it is true prepared by the Bureau of Safety, but [fol. 5284] issued by the Commission. This is entirely distinct. It is not issued by the Commission. The fact that it is printed in the Government Printing Office is common to a great many other documents. There are a great many other documents printed in the Government Printing Office which could not be admitted here even though they bear the seal of the United States.

The Court: The Court will take this objection under advisement.

Mr. Mason: Before we close the record and in order that our position may be perfectly clear we file with the Court a formal request for the making of written findings of fact and conclusions of law in the case in accordance with the Arizona law, rules of practice.

The Court: It may be filed. Do I understand that the defendant rests on the surrebuttal?

Mr. Mason: Yes, your Honor, the defendant rests on surrebuttal.

The Court: No further witnesses?

Mr. Mason: No.

The Court: You have no further witnesses, Mr. Strouss?

Mr. Strouss: Mr. Hardwicke is to return to the stand but it should not take long.

Mr. Mason: It will take a very short time.

[fol. 5285] (Discussion off the record.)

Mr. Mason: Mr. Strouss, will you advise me whether or not the form T's that you propose to introduce for 1940 will include the form T's covering the Sorenson accident in Nevada, I think it was in December, 1940, and the Sickler accident at Indio on December 4, 1940?

Mr. Strouss: The Sickler accident I know.

Mr. Mason: The Sorenson accident was a fatal accident to a brakeman which happened at some point in eastern Nevada.

Mr. Strouss: Both of those will be put in.

Mr. Mason: It occurs to me if those form T's are put in evidence that from them we can, in briefing the case, make comments upon Mr. Hardwicke's selection just as readily as we can make the comments in cross-examining him and would probably have as much effect.

Mr. Strouss: They will be put in evidence.

(Discussion off the record.)

Mr. Mason: I think there is one point that has not been mentioned directly in connection with form 2611 that should be mentioned. The forms 2611 are now demanded only in connection with the Sickler accident and the fatality to brakeman Richards.

[fol. 5286] The Court: I wonder if Mr. Sines would be kind enough to loan me his copy of the Sickler report.

Mr. Mason: Yes, I have it here, your Honor. Now as to the Sickler accident, first that involved the loss of a leg by the brakeman who was injured on a train which had I think five or six brakemen besides other employees and Sickler was one of those brakemen. Naturally there were several forms 2611 submitted.

The Court: May I ask at that point is it the practice or custom of the defendant railroad to require a form 2611 from every employee who had any personal knowledge of the accident?

Mr. Mason: Sometimes we get them from employees who do not have any personal knowledge and it will say so

on the 2611. The 2611 is gotten primarily for the benefit of the general claims attorney so that if a suit is filed he will have knowledge of the circumstances and be prepared to defend it. It is obtained for the protection of the interests of the company against a suit arising out of the case. It is not filed merely where personal injuries are incurred by members of the crews or employees generally but in other cases where the company may be liable for a damage action. [fol. 5287] The Sickler case is particularly in point because a suit has been filed. We don't suppose that either Mr. Strouss or Mr. Polley would make any misue of these 2611's but it is possible that they would drift into other hands and they could be used by the representatives of Sickler as the plaintiff in his suit against us and be very damaging to us in defending that suit. The Richards case is a similar case, a brakeman who was killed, and I understand that his widow or next of kin has filed suit under the Federal Employers' Liability Act and if these forms 2611 are taken from our possession they may well be availed of improperly by the opposition to our detriment, but they are obtained by us because we need them in our defense. Where there are several of them gotten, which of those is to be used by the opposition as a purported admission against interest, and if only one—say, the Sickler case is used, can we put in the balance. The authorities seem to indicate they would be merely self-serving declarations if put in by us. Therefore they could select the one they chose as the purported admission and we would be barred from using the others to combat it. The recent authorities dealing with these ad- [fol. 5288] missions for that information where demanded under rule 34 of the Federal rules of practice which is the counterpart of the Arizona rule are very definite in saying——

The Court: These authorities are set forth?

Mr. Mason: I am not sure that I have set forth the language, I have set forth the citation; it is Kenealy vs. Texas Company. This happens to be a particularly good case in point, 29 Federal Supplement, 502, a recent case decided in 1939, in which the demand was for all statements of fellow employees aboard the vessel as to the accident and the court said in discussing it, "This is understood to refer to statements made after the accident by other employees of the defendant regarding their knowledge of the facts relating to the accident. Statements of this kind plainly do not con-

stitute or contain evidence material to any matter involved in the action; they are not evidence but are at most merely memoranda available for use at the trial when the respective persons making the statements are called to testify. The plaintiff says that he should be permitted to have the statements in order that he may properly cross-examine the various witnesses as they are produced. This is substantially the argument advanced and rejected by Chief Judge [fol. 5289] Cardozo in People vs. Supreme Court and I do not think that it is even open under the language of rule 34." The demand was rejected. To the same effect are these other cases which I have cited. I think your Honor will find several other places in the memorandum.

The Court: May I ask counsel for the State this question, I take it it goes without saying that you gentlemen are in no wise interested in any of the actions that may be brought by these injured employees, but may I inquire why you singled out these two in which an action is pending?

Mr. Strouss: I didn't know until counsel just stated that there was an action pending. We singled them out because in the Sickler case—I am not particularly anxious for the 2611 in the other—but it is the Sickler case that I am more interested in because in that, on the form T, as I stated to your Honor yesterday the superintendent states that the statement of members of the crew indicated that there was no unusual handling of the train. I would like to see for myself and for the State what the employees actually did say upon the form 2611. That is why I asked for that form 2611.

The Court: I understand from counsel for the defendant [fol. 5290] that none of these 2611 forms covering these particular accidents are within the state of Arizona?

Mr. Mason: No, we had no anticipation of this demand or I think we would have certainly kept them here but they were sent away some time ago.

Mr. Booth: They are in the hands of our general claim agent who is in the law department, in his hands for the preparation of the case in San Francisco.

The Court: The Court has indicated it will rule on these matters at ten o'clock tomorrow morning. We will then be ready to complete this case providing the form T's are ready.

Mr. Strouss: They will be ready.

The Court: Then the Court will be at recess until 10 A. M. tomorrow morning.

(Thereupon the Court stood at recess until 10 A. M., May 1, 1941.)

[fol. 5291] May 1, 1941, Ten o'clock A. M.

Proceedings were resumed at this time as follows:

The Court: Gentlemen, the Court indicated last evening that at the beginning of court this morning, I would rule on the various matters having to do with the admission of exhibits that I have had under advisement.

Now, with reference to the State's demand on the defendant to produce the forms 2611, described on the subpoena duces tecum served on Mr. Sines, while the authorities are somewhat in conflict on this point, the better-reasoned rule seems to be that such reports are confidential, and that the defendant should not be required to produce same, where, as here, timely objection is made. Furthermore, from the representations of counsel for defendant, it appears that these documents are not within the jurisdiction of the Court, and hence the Court would be without authority to order their production. It is, therefore, ordered that the motion to produce be denied, and the subpoena is ordered quashed, and I return that to you for your file.

Now, as to the excerpts from the report of the Director of the Bureau of Safety to the Interstate Commerce Com-[fol. 5292] mission, which the State has had marked as Exhibit 398 for identification, and it is now offered in evidence, to which an objection has been made, certainly this report doesn't have the dignity or status of an order of the Commission itself. It doesn't appear to have been approved by the Commission, and I do not recall that any such documents have been heretofore admitted in this case, and, deeming the objection well taken, it is ordered that the objection be sustained to Plaintiff's Exhibit No. 398 for identification.

I have read all of the authorities submitted by counsel in connection with these matters, and particularly with reference to Exhibit 206, marked for identification, and the various other exhibits, being excerpts therefrom, which

were offered as separate exhibits and marked for identification. Now, these exhibits were offered under two theories, first, that Harley A. Johnson was an agent of the defendant, and, second, that they were entitled to credit as independent evidence of the facts shown, the latter being an exception to the hearsay rule. Now, the Court is of the opinion that legally no agency has been shown to exist. The fact [fol. 5293] remains that this report was never even adopted by the A. R. A. or the A. A. R. The report is certainly hearsay and secondary evidence. Now, as to the second theory, I have no quarrel with the rule of evidence which permits the introduction of books of science or art or learned treatises, or tables of scientific calculation, and the like, as original independent evidence. The courts universally adopt a liberal view on these matters, but the Court does seriously question whether the contents of Exhibit 206 for identification, which includes these other exhibits, even remotely comes within these classifications. The question might well be, who is Harley A. Johnson? No one has testified that he is a recognized authority, nor has anyone shown that his tests have been universally accepted in the field of railroading. There would be no chance for cross-examination, and it seems to the Court that it would be hearsay. I might illustrate this by a case with which I know Mr. Strouss is familiar, that I once tried in Yavapai county, the Mine Tax Case. There, numerous eminent mining engineers took the stand and testified that the books entitled, "Principles of Mining," written by the Honorable Herbert Hoover was a recognized and authoritative text in that [fol. 5294] field, and this having been established, thereafter the Court permitted that treatise or book to be used throughout the trial; but it seems to the Court in this case that there has been a complete lack of any showing of the authenticity, particularly of the scientific standing of this exhibit. The record may therefore show that the exhibits No. 206, Nos. 329 to 333 inclusive, and Exhibits Nos. 371 to 381 inclusive, which have been heretofore marked for identification, that the objection to the introduction of these exhibits is sustained.

Mr. Strouss: Just that the record may be clear, there were two grounds, of course, that were discussed as a basis for our offer, but I don't want it to be taken that we have waived or abandoned our contention that counsel for the defendant at the time that this exhibit was identified waived

all objections except that it was improper cross-examination. We do contend that, and for the purpose of the record, I want that to be shown.

The Court: Well, the Court had that in mind, Mr. Strouss, in making the ruling.

Mr. Strouss: Of course, I don't want to argue after the Court has ruled. Aside from the matter of whether the [fol. 5295] contents of the reports were admissible, in so far as the statements or tables there; it does seem to me that, having in mind the character of this litigation, and under the law as we see it—and I think the authorities which were cited in the memorandum filed during the recess sustain us—it is a matter of whether there is a rational basis for the law, the fact that tests have been made, evidence that tests have been made, aside from what those tests were, would be admissible to show that the Association of American Railways, or the American Railway Association, did consider the question of air brake efficiency sufficient to require tests to be made.

The Court: Well, I have no doubt, Mr. Strouss, that if the state had produced here the witness as a witness, this Harley A. Johnson, that much of the evidence which you are seeking to have admitted through this Exhibit 206 might be admissible, but it seems to me that the viciousness of it lies in the fact that there is no opportunity to meet it.

Mr. Strouss: Of course, there is one thing I think I owe to the Court to say. I didn't answer Mr. Mason's argument the other day on the point the Court has mentioned [fol. 5296] this morning. As I said at the time, it was at the end of the afternoon and I was pretty tired, but on the matter of who Mr. Johnson is, and what his qualifications are, of course, your Honor will remember in the Lynn case, where the Westinghouse air brake tables were admitted in evidence—Now, any publication by Westinghouse, or any tables compiled by Westinghouse, of necessity would be prepared by some employee. The fact that it is by that company gives to the employees who are working for it the qualifications sufficient to support the books that are put out by the Westinghouse Company under the theory of that case. Now, the same would be true here. The Association of American Railways, or the American Railway Association, as the record does show, has as one of its functions and purposes the making of tests and the prescribing of specifications for air brakes; that was one of

the purposes of the organization. Now, it could only do that through employees, and here, as the record shows, these tests were made under an order of the Interstate Commerce Commission. Certainly, a recognition by that body of the qualifications of the Association to make the tests, and, of course, it could only be made through its employees, it would be, in turn, a recognition of the quali-
[fol. 5297] fications of those employees. I should have replied, I think I should say it to the Court this morning, that those are my views upon that question.

The Court: Well, you have made yourself very clear, Mr. Strouss.

[fol. 5298] Mr. Strouss: I have an exhibit of 15 pages consisting of form T reports of the Salt Lake division for 1940.

Mr. Mason: May I ask, Mr. Strouss, if those are not form T reports for the state of Nevada for 1940 including accidents west of Lawton, Nevada, as well as east, if any happened?

Mr. Strouss: Counsel will have to answer that for me. I think Mr. Sines gave us the reports and he will probably know better than we.

The Court: What are they, Mr. Sines?

Mr. Sines: Reports of accidents occurring within the state of Nevada including accidents on the Salt Lake division and on the Sacramento division.

Mr. Mason: If any happened on the Sacramento division.

Mr. Strouss: And Arizona would be those that happened in the state of Arizona on the Southern Pacific lines.

Mr. Sines: Yes.

Mr. Strouss: Of course the Los Angeles ones are just those of the Los Angeles division.

Mr. Sines: Yes.

The Court: They may be marked. Is there any objection?

[fol. 5299] Mr. Mason: No.

The Court: They may be admitted.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 399.")

Mr. Strouss: The Arizona reports consisting of 32 form T reports for the state of Arizona.

The Court: They may be admitted in evidence, there being no objection, as State's exhibit No. 400.

Mr. Mason: Exhibit No. 399 is Nevada and No. 400 is Arizona.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 400.")

Mr. Strouss: New Mexico consisting of 25 form T's for the state of New Mexico for the year 1940.

The Court: They may be admitted in evidence as State's exhibit No. 401.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 401.")

Mr. Strouss: Forty-eight form T's for the Los Angeles division, year 1940.

The Court: They may be admitted in evidence.

(The document referred to was received in evidence and marked "Plaintiff's Exhibit No. 402.")

J. S. Hardwicke was recalled as a witness in rebuttal.

Direct examination (continued).

By Mr. Strouss:

Q. Mr. Hardwicke, these exhibits, Nos. 399, 400, 401, and 402, do those include all of the form T reports for the states of Arizona, Nevada, New Mexico, and the Los Angeles division for the year 1940 which in any way relate to casualties to trainmen and engineimen on freight service and passengers and employees in pasenger service?

A. Yes, sir.

Q. These are all such form T's for the year 1940?

A. That is correct.

Mr. Strouss: That is all.

Cross-examination.

By Mr. Mason:

Q. Mr. Hardwicke, you recall that your exhibits listing casualties in certain territory covered by this series of exhibits but for earlier years included yard accidents. Do you include any yard accidents where trainmen or engineimen are involved in any of these exhibits?

[fol. 5301] A. Not in these, no.

Q. Do I understand that these form T reports cover the accidents which are listed upon your several exhibits listing accidents for the year 1940 for these three states in this division?

A. Yes, sir.

Q. You have only included the form T's as to which you made specific reference on the preceding exhibits which contained the list?

A. That is correct.

Q. Where passenger trains are involved, you included reported accidents to passengers as well as to passenger train employees?

A. That is right.

Q. And your accidents to passenger train employees included non-operating employees such as dining car waiters, Pullman porters, and so forth?

A. That is right.

Q. Have you undertaken in the documents submitted to the court as the exhibits to reproduce the carbon copies of the form T's which were furnished to you exactly?

A. Yes, we compared them and with the exception that there may be a misspelled word or something like that, but most of the corrections were made, just reproduced the form as it is.

[fol. 5302] Mr. Strouss: I think we might have an understanding in that respect that errors which may have occurred in copying when discovered may be corrected. We have checked these pretty carefully and I think we have gotten all of them but there may be some.

Mr. Mason: If they are mere misprints or misstrikes by the typist, the errors would be obvious and I don't think we need to worry about those.

The Court: Any necessary corrections may be made.

Mr. Mason: I don't think we have anything further.

Mr. Strouss: That is all. You may step aside, Mr. Hardwicke.

(Witness excused.)

Mr. Strouss: We rest. I want to thank the Court and express my appreciation for your patience in this case. It has been long and tiring and I want to thank counsel for their courtesy during the course of the trial. I appreciate the many things they have done and their kindness in letting

me have the different records I have asked for and I want the Court and counsel to know I appreciate it.

The Court: Thank you, Mr. Strouss.

Mr. Mason: Your Honor, I think that opposing counsel [fol. 5303] and ourselves are to be congratulated upon the character of tribunal before which we have appeared these past forty-six days. I think counsel for the State can join me in expressing our deep appreciation of the close attention that the judge has paid to everything that has gone in, and I am not saying this because I think you have done it but I know you have paid faithful attention and taken everything in because your memory as to what has transpired, without the record before you, has been frequently more accurate than ours with the record before us. Also I want to express my appreciation for the courtesy of opposing counsel indicated many times when the case was in progress and many times probably when I didn't deserve any courtesy at all because I know sometimes I am inclined to be a little more enthusiastic than due decorum dictates and if I have in the course of the case made some remarks which were not of the most courteous character I sincerely apologize to the Court and to opposing counsel. Mr. Strouss has shown very kindly forbearance and I am sure he does not bear in his heart any feeling of unfriendliness or anything remotely approaching that on that account and I know I do not toward him. We have gotten on very well together and I [fol. 5304] think the case has been conducted in an atmosphere of the utmost friendliness insofar as it could be consistent with the trial of issues which we both regard of great importance.

The Court: I think that is true, Mr. Mason, and the Court appreciates the expressions of counsel. Now that the evidence in this lengthy case is complete and that phase of the case closed, this trial having lasted from November 19th to May 1st, taking up some forty-six court days in the trial, we are running into our thirteenth week, the Court desires to commend counsel for the State and the defendant company on the skill exhibited and the clear, clean-cut manner in which the various issues in this important case have been presented. Thorough preparation has been shown and the courtesies manifested by both sides have made the task much easier. The efficiency of the deputy clerk and the court reporters and their staff has contributed greatly to

the smooth operation of this case and for all of this the Court expresses its appreciation.

Now, gentlemen, there just remains one question and that is how this matter is to be finally submitted. You have indicated previously that you desired to submit it on briefs. Just how long a time do you want? I take it that the de-
[fol. 5305] fendant in this case will probably file the opening brief, but what is your pleasure?

Mr. Mason: The defendant is prepared to proceed to file the opening brief with the understanding it may have the closing, if that is satisfactory to the Court and to the plaintiff?

The Court: What is your pleasure, Mr. Strouss?

Mr. Strouss: That is agreeable with me. Mr. Mason and I were talking yesterday about it. I believe you said you would like until the fifteenth of July.

Mr. Mason: Yes. We have in mind, your Honor, that the transcript will remain here in Tucson for correction by the reporters and will probably be available in San Francisco about the fifteenth of May and it will take us about sixty days to prepare and print the briefs that we desire to file. If we may file our opening brief by July 15th, and I would like to ask here the possibility of an extension even of that time because I may have to go to the hospital for a small operation and it may take longer.

The Court: For your answering brief, Mr. Strouss?

[fol. 5306] Mr. Strouss: I think we should have sixty days. I will have this advantage over Mr. Mason, that during his sixty days I will try to have the transcript digested.

The Court: And your reply brief, Mr. Mason?

Mr. Mason: We ought to have thirty days I should say for that but if you can enter that time tentatively with the understanding it may be cut short or extended if we ask for it. It may be that your Honor may desire oral argument after the briefs are filed and I should like to have that thought before you and opposing counsel, so if oral argument may be desired it may be had at the request of either party or at the instance of the Court following the filing of the final brief.

Mr. Strouss: If oral argument should be desired, I wonder if we couldn't have it in Phoenix rather than down here.

The Court: That is entirely satisfactory.

Mr. Mason: It would be satisfactory to me to have it at Phoenix and I am sure it would be to Judge Booth.

The Court: Then the record may show that the evidence being closed the case will be submitted upon briefs, the defendant, Southern Pacific Company, assuming the burden of filing the opening brief by July 15, 1941; the State to [fol. 5307] file its answering brief by September 15th, and a reply brief by the defendant by October 15th. Then if oral argument is deemed advisable it may be had at a convenient date after all of which the matter will be deemed submitted. The Court is at recess.

[fol. 5308] Reporter's Certificate to foregoing transcript omitted in printing.

[fol. 5309] IN THE SUPERIOR COURT OF THE STATE OF ARIZONA IN AND FOR THE COUNTY OF PIMA

[Title omitted]

JUDGE'S CERTIFICATE

The foregoing transcript of the shorthand reporters' notes having been duly filed in this cause in the office of the Clerk of the Superior Court of the State of Arizona, in and for the County of Pima, and notice of said filing having been given to the parties in said cause, and no statement having been filed or served agreeing to the correctness and sufficiency of the said transcript, or suggesting amendments thereof, within the time provided by law, and the transcript having been duly presented to me by the Clerk of the Superior Court of the State of Arizona, in and for the County of Pima, on this 29th day of April, 1942, and finding said transcript correct,

I hereby certify that the said transcript is correct.

Wm. W. Hall, Judge.

Defendant's Exhibit No.1 (Witness Sines)
Nov.19 1940

SOUTHERN PACIFIC COMPANY

PACIFIC LINES

SCALE IN MILES
0 10 20 40 60 80 100

OREGON
NEVADA
UTAH

PORTLAND
SALEM
EUGENE
CRESCENT LAKE
CHEMULT
KLAMATH FALLS
ASHLAND
BLACK BUTTE
DUNSMUIR
ALTURAS YARD
CLARENDON
EUREKA
GERBER
TEHAMA
DAVIS
ROSEVILLE
SACRAMENTO
STOCKTON
OAKLAND
SAN FRANCISCO
SAN JOSE
MERCED
FRESNO
BAKERSFIELD
SAN LUIS OBISPO
SOUTHERN PACIFIC–
WESTERN PACIFIC
PAIRED TRACK TERRITORY
173 MILES EASTWARD
183 MILES WESTWARD
WESO
WINNEMUCCA
ROSE CREEK
CARLIN
PALISADE
ALAZON
WELLS
TECOMA
COBRE
LUCIN
CORRINE JCT
BRIGHAM
OGDEN
SALT LAKE CITY
LOVELOCK
PERTH
HAZEN
RENO
SPARKS
VERDI
TRUCKEE
WENDEL
TONOPAH JCT
KEELER
PRAIRIE CANYON
DAWSON
FRENCH
TUCUMCARI
SANTA ROSA

MILEAGE TABLE

	EASTWARD	WESTWARD
LOS ANGELES - COLTON	59	
COLTON - INDIO	72	
INDIO - YUMA	122	
INDIO - NILAND	57	
NILAND - CALEXICO	41	
CALEXICO - YUMA	81	
YUMA - WELLTON	37	
WELLTON - GILA	86	
GILA - PICACHO	82	
WELLTON - PHOENIX	136	
PHOENIX - PICACHO	75	
PICACHO - TUCSON	46	
TUCSON - MESCAL	40	39
MESCAL - ARIZONA - NEW MEXICO STATE LINE	101	
ARIZONA - NEW MEXICO STATE LINE - LORDSBURG	23	
LORDSBURG - EL PASO	148	149
MESCAL - DOUGLAS	85	
DOUGLAS - ARIZONA - NEW MEXICO STATE LINE	50	
ARIZONA - NEW MEXICO STATE LINE - EL PASO	167	168
EL PASO - CARRIZOZO	143	
CARRIZOZO - TUCUMCARI	188	

UNLESS OTHERWISE NOTED EASTWARD MILEAGE WILL APPLY IN BOTH DIRECTIONS

SOUTHERN PACIFIC - WESTERN PACIFIC PAIRED TRACK TERRITORY.
173 MILES EASTWARD
183 MILES WESTWARD

NILAND - CALEXICO	41	
CALEXICO - YUMA	61	
YUMA - WELLTON	37	
WELLTON - GILA	88	
GILA - PICACHO	82	
WELLTON - PHOENIX	136	
PHOENIX - PICACHO	75	
PICACHO - TUCSON	46	
TUCSON - MESCAL	40	39
MESCAL - ARIZONA-NEW MEXICO STATE LINE	101	
ARIZONA-NEW MEXICO STATE LINE - LORDSBURG	23	
LORDSBURG - EL PASO	148	149
MESCAL - DOUGLAS	85	
DOUGLAS - ARIZONA-NEW MEXICO STATE LINE	50	
ARIZONA-NEW MEXICO STATE LINE - EL PASO	167	168
EL PASO - CARRIZOZO	143	
CARRIZOZO - TUCUMCARI	188	

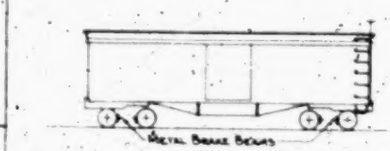
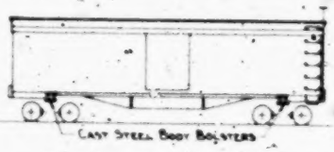
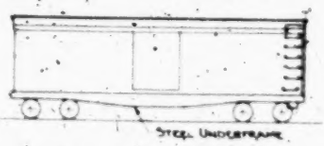
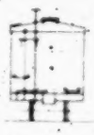
UNLESS OTHERWISE NOTED EASTWARD MILEAGE WILL APPLY IN BOTH DIRECTIONS

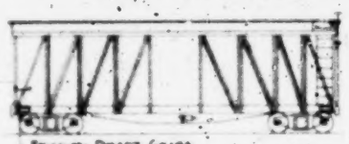
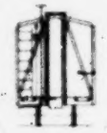
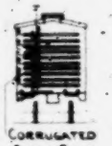
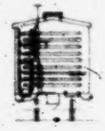
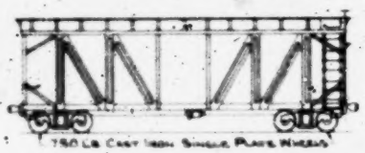
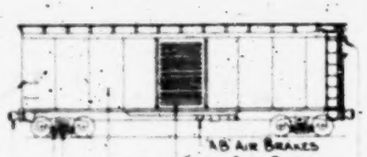
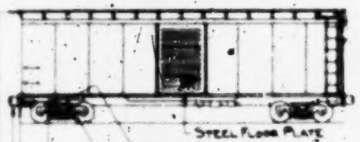
5310

Defendant's Exhibit No.2 (Witness Leriche)
Nov.19 1940

SOUTHERN PACIFIC COMPANY
PACIFIC LINES

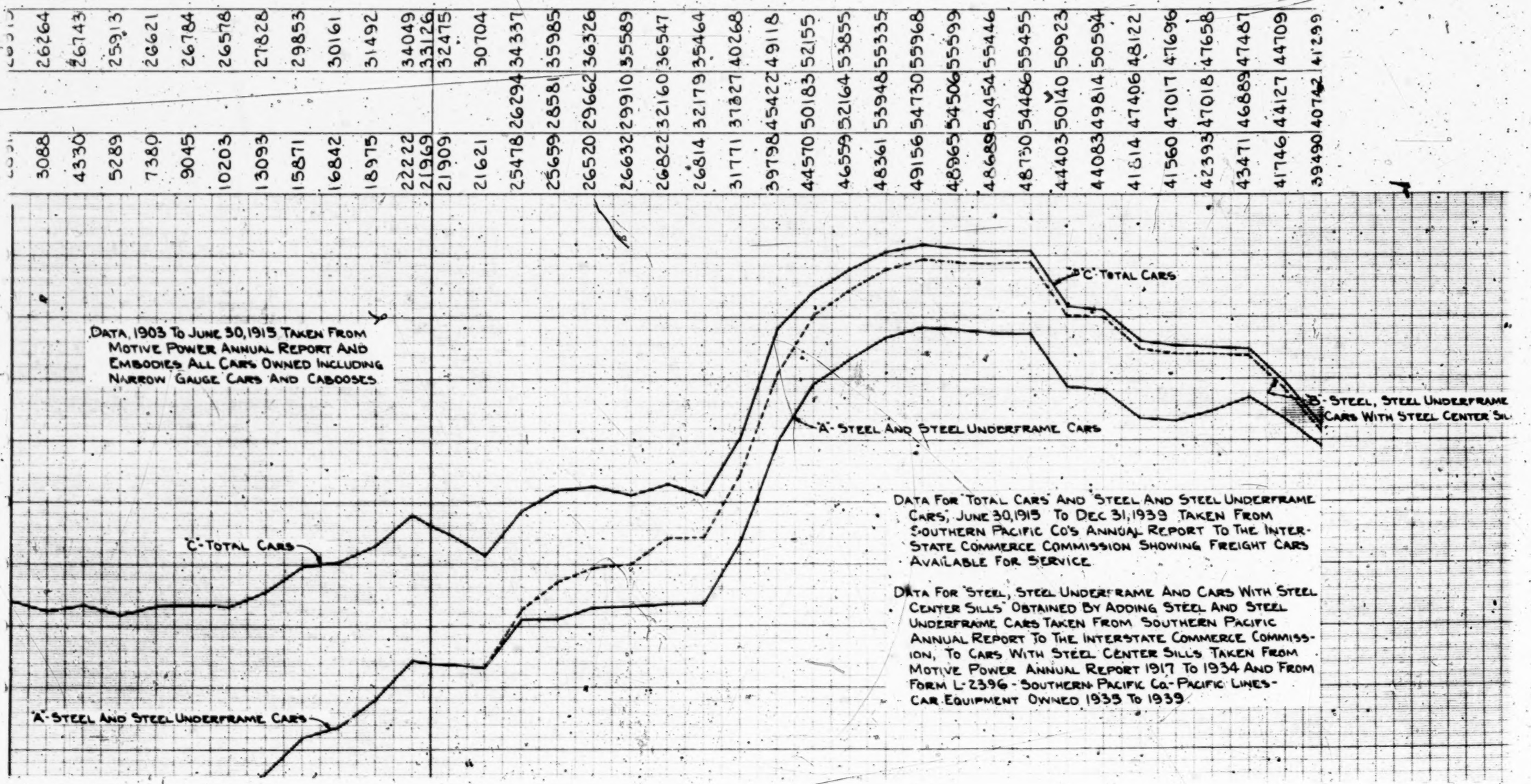
CHRONOLOGY OF FREIGHT BOX CARS · YEAR 1900 TO 1940
SHOWING DESIGN AND CAPACITY CHARACTERISTICS

Year	Side Elevation A	End Elevation B	New Features C	Carrying Capacity & Weight Lbs D	Cubical Capacity - Cu Ft E	Cross Sectional Area (Center Sills) Sq Inches F
1900	 Metal Brake Beams		Metal Brake Beams	80 000 / 50 000	1946	
1901	 Cast Steel Body Bolsters		Cast Steel Body Bolsters	80 000 / 55 000	2526	
1905	 Steel Underframe		Steel Underframe	80 000 / 56 000	2448	
1904	10 Air Brake Cylinder		10 Air Brake Cylinder	126 000 / 45 000	2750	
1909	725 Lb Cast Iron Wheels Cast Steel Truck Side Frames Heavy Draft Springs		725 Lb Cast Iron Wheels Heavy Draft Springs Cast Steel Truck Side Frames	126 000 / 45 000	2750	
1913	Increased Cubical Capacity		Increased Cubical Capacity	125 000 / 44 000	3570	
	K-E Triple Valve Steel Superstructure Framing		Single Sheathed Steel Superstructure Framing K-E Triple Valve	121 000 / 42 000	3558	

1915			Single Sheathed - Steel Superstructure Framing K-E Triple Valve	161,000	46,000	3595
1916			Friction Draft Gears	127,000	45,000	3558
1919			Type 'D' Couplers Cast Steel Coupler Yokes Corrugated Steel Ends	125,000	46,000	5100
1924			750 Lb Cast Iron Wheels Steel Roof	126,000	45,000	5435
1929			Heavy Graduating Springs Auxiliary Hand Brake Lever	125,000	44,900	5138
1927			750 Lb Cast Iron Single Plate Wheels	125,000	44,000	5138
1936 1937			All Steel, Wood Lined Steel Side Doors Additional Hand Holds Power Hand Brake AB Air Brakes Type 'E' Couplers Snubber Springs No 15 Brake Beam, 1936 No 9 Brake Beam, 1937 Brake Beam Safety Guards Bottom Rod Supports	124,000	45,000	3712
1940			Swivel Shank Couplers Coupler Centering Device Metal Running Boards Metal Brake Step 'W' Section Corner Posts Steel Floor Plate Wine Brake Balancer Brake Hanger Wearing Plates Brake Pipe Anchors	124,000	45,000	3712

SOUTHERN PACIFIC CO. PACIFIC LINES
COMPARISON OF FREIGHT CARS
ALL STEEL, STEEL UNDERFRAME AND OF OTHER CONSTRUCTION
YEARS 1903 TO 1939

Defendant's Exhibit No. 3 (Witness Leriche)
Nov. 19, 1940



2891 3088 4330 5289 7380 9045 10203 13093 15871 16842 18975 22222 21969 21909 21621 25478 26 25659 26 26520 25 26632 2 26822 3 26814 3 31771 3 39798 4 44570 5 46559 5 48361 5 49156 5 48965 5 48669 5 48730 5 44403 5 44083 4 41814 4 41560 4 42393 4 43471 4 41746 4 39490 4

DATA, 1903 TO JUNE 30, 1915 TAKEN FROM MOTIVE POWER ANNUAL REPORT AND EMBODIES ALL CARS OWNED INCLUDING NARROW GAUGE CARS AND CABOOSES

"C" TOTAL CARS

"A" STEEL AND STEEL UNDERFRAME CARS

"C" TOTAL CARS

"B" STEEL, STEEL UNDERFRAME AND CARS WITH STEEL CENTER SILLS

"A" STEEL AND STEEL UNDERFRAME CARS

DATA FOR "TOTAL CARS" AND "STEEL AND STEEL UNDERFRAME CARS", JUNE 30, 1915 TO DEC 31, 1939 TAKEN FROM SOUTHERN PACIFIC CO'S ANNUAL REPORT TO THE INTERSTATE COMMERCE COMMISSION SHOWING FREIGHT CARS AVAILABLE FOR SERVICE.

DATA FOR "STEEL, STEEL UNDERFRAME AND CARS WITH STEEL CENTER SILLS" OBTAINED BY ADDING STEEL AND STEEL UNDERFRAME CARS TAKEN FROM SOUTHERN PACIFIC ANNUAL REPORT TO THE INTERSTATE COMMERCE COMMISSION, TO CARS WITH STEEL CENTER SILLS TAKEN FROM MOTIVE POWER ANNUAL REPORT 1917 TO 1934 AND FROM FORM L-2396 - SOUTHERN PACIFIC CO-PACIFIC LINES - CAR EQUIPMENT OWNED 1935 TO 1939.

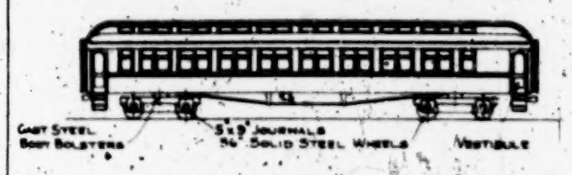
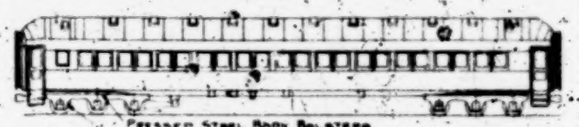
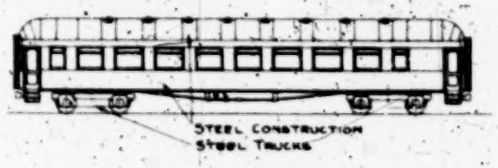
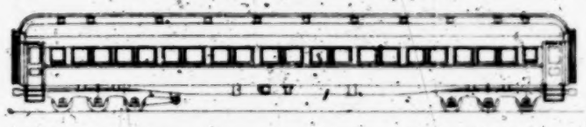
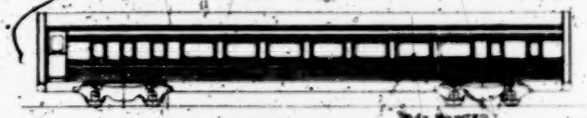
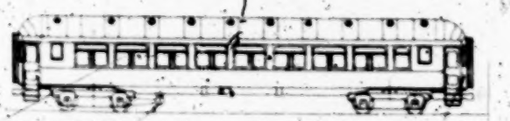
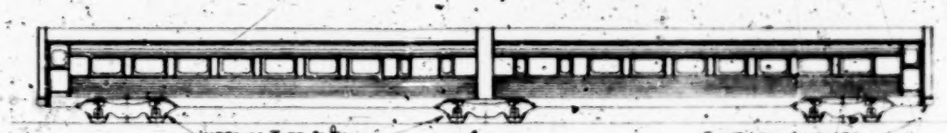
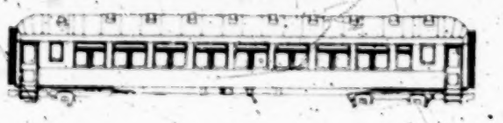
JUNE 30
DEC. 31

0 00 00 00 00 00 00 00 00

1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 1915 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939

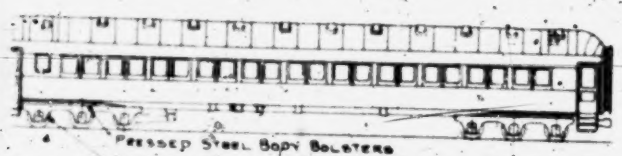
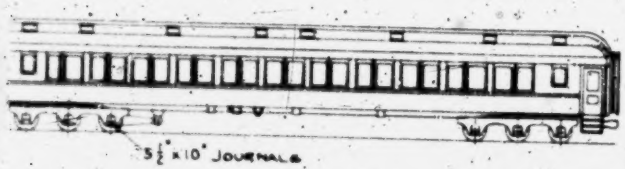
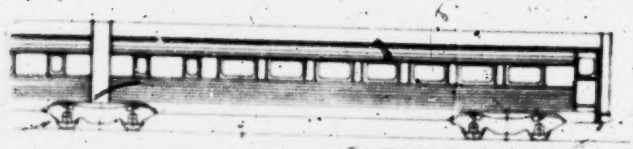
YEARS

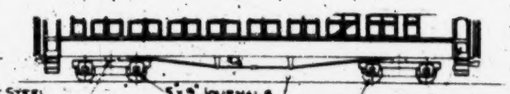
SOUTHERN PACIFIC COMPANY
PACIFIC LINES
CHRONOLOGY OF PASSENGER COACH AND CHAIR CAR YEAR 1900 TO 1940
SHOWING DESIGN AND IMPROVEMENTS

Side Elevation	Year	New Features	Length Over Platforms Coupled	Seating Capacity	Average Weight Lbs	Side Elevation
	1900 1901 1902 1903 1905	Length Increased Seating Capacity Increased Vestibuled Air Signal Steam Heat Braking Ratio Increased To 80% Gas Lights 5"x9" Journals 36" Solid Steel Wheels Trussed Steel Brake Beams Cast Steel Body Bolsters Braking Ratio Increased To 90%	67'-8½"	70	89100	
	1906	First Steel Car Built In America Was Constructed In SP Co. Shops At Sacramento Calif All Steel Construction Except Inside Finish Which Is Wood Steel Trucks	67'-8½"	70	107000	
	1909	All Steel Construction Including Inside Finish Friction Draft Gear Vapor Steam Heat 2 Steam Train Line	67'-8½"	72	85000	
	1913	Size Of Center Sills Increased From 10"-25# I Beams To 15"-40# I Beams Sharon Couplers Applied In Place Of Janney Couplers L and N. Brake Equipment - Type L Triple Valve and Type N Brake Cylinder Size Of Brake Cylinder Increased From 14"x12" To 16"x12" Coach Gas And Electric Lighting	67'-8¾"	72	102000	
	1914	End Construction Strengthened Straight Electric Lighting Axle Generator	68'-6⅛"	72	107000	
	1921	Improved Brake Equipment - U-1-2 Universal Valve Pullman Vestibules	68'-6⅛"	72	107800	

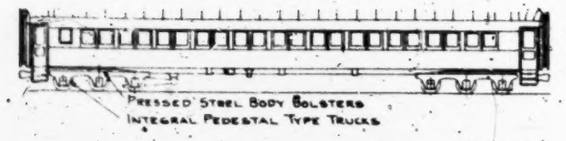
Y

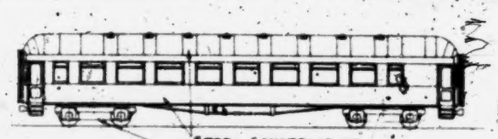
AR YEAR 1900 TO 1940
IENTS

Side Elevation	Year	New Features	Length Over Platforms Coupled	Seating Capacity	Average Weight Lbs.
 Pressed Steel Body Bolsters Integral Pedestal Type Trucks	1927	Pressed Steel Body Bolsters Integral Pedestal Type Trucks Locking Center Pins Thermostatic Heat Control Double Deck Spring Seats	80'-5½"	80	140300
 5½"x10" Journals	1928	Mens and Womens Wash Rooms Separate From Toilet Porcelain Wash Basins 5½"x10" Journals 2-2" End Train Line Valves	82'-2⅞"	88	150300
	1929	Mens and Womens Lounge Double Pan Hoppers	82'-5½"	Body of Car 56 Womens Lounge 4 Mens Smoking Room 4 Total 64	163900
Outer Sash Tightly Sealed Truck Mounted Brake Cylinders Single Unit	1937	Streamlined Construction Material-High Tensile and Stainless Steels Air Conditioned Outer Sash Tightly Sealed Tight Lock Couplers Improved Draft Gear Pressure Water System Indirect Lighting Seat Lights Individually Controlled Radio Rotating-Reclining Chairs with Sponge Rubber Seats Aluminum Floor Plates Cork Flooring Inlaid Linoleum Floor Covering Insulated Against Noise Compartments For Hand Luggage Electro-Pneumatic High Speed Brake Equipment Improved Type of Trucks Provides Easier Riding Spring Pad Lubricators-Journals Truck Mounted Brake Cylinders Steam Train Line Connection of 2" Flexible Metallic Conduit	79'-2"	Body of Car 48 Womens Lounge 2 Mens Smoking Room 6 Total 56	104300
 Tight Lock Couplers and Improved Draft Gear Articulated Unit			132'-2"	Body of Car 100 Womens Lounge 4 Mens Smoking Room 5 Total 109	170800

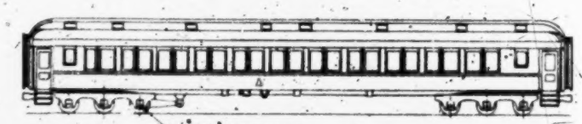


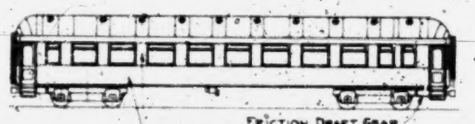
1901	Braking Ratio Increased To 80% Gas Lights	67'-8½"	70	89100
1902	5"x9" Journals & 36" Solid Steel Wheels			
1903	Trussed Steel Brake Beams			
1905	Cast Steel Body Bolsters Braking Ratio Increased To 90%			





1906	First Steel Car Built In America Was Constructed In SP Gos Shops At Sacramento, Calif. All Steel Construction Except Inside Finish Which Is Wood Steel Trucks	67'-8½"	70	107000





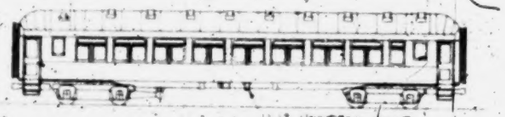
1909	All Steel Construction Including Inside Finish. Friction Draft Gear Vapor Steam Heat 2 Steam Train Line	67'-8½"	72	89000

1913	Size Of Center Sills Increased From 10"-25# I Beams To 15"-60# I Beams Sharon Couplers Applied In Place Of Janney Couplers L and N Brake Equipment - Type "L" Triple Valve And Type "N" Brake Cylinder Size Of Brake Cylinder Increased From 14"x12" To 16"x12" Comb Gas And Electric Lighting	67'-8½"	72	104000

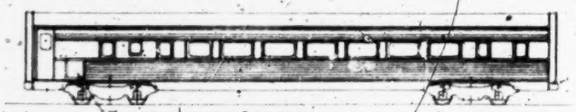
SINGLE UNIT

1914	End Construction Strengthened Straight Electric Lighting Axle Generator	68'-6⅜"	72	107000

ARTICULATED UNIT

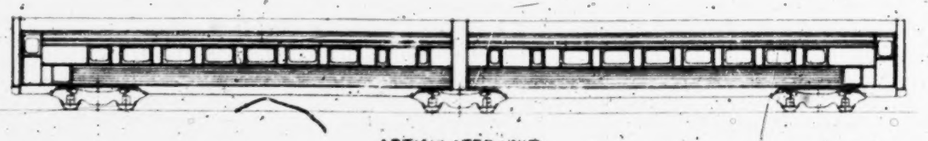


1921	Improved Brake Equipment - U-12 Universal Valve Flush Hoppers Electric Ceiling Fans	68'-6⅜"	72	107800

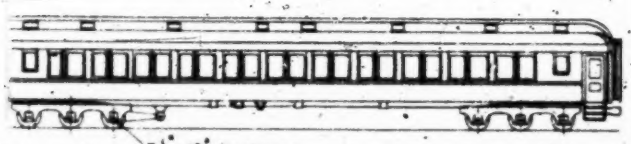
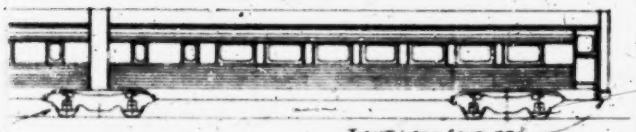


SINGLE UNIT

1925	Length Increased Seating Capacity Increased Six Wheel Trucks With Clasp Brake A.A.R. "D" Coupler & Quadruple Shear Yokes	80'-5½"	90	138600



ARTICULATED UNIT

PRESSED STEEL BODY BOLSTERS INTEGRAL PEDESTAL TYPE TRUCKS		DOUBLE DECK SPRING SEATS			
 5½"x10" JOURNALS	1928	MENS AND WOMENS WASH ROOMS SEPARATE FROM TOILET PORCELAIN WASH BASINS 5½"x10" JOURNALS 2-2" END TRAIN LINE VALVES	82'-2⅞"	88	150800
	1929	MENS AND WOMENS LOUNGE DOUBLE PAN HOPPERS	82'-5½"	BODY OF CAR 56 WOMENS LOUNGE 4 MENS SMOKING ROOM 4 TOTAL 64	163500
 OUTER SASH TIGHTLY SEALED TRUCK MOUNTED BRAKE CYLINDERS SINGLE UNIT	1937	STREAMLINED CONSTRUCTION MATERIAL-HIGH TENSILE AND STAINLESS STEELS AIR CONDITIONED OUTER SASH TIGHTLY SEALED TIGHT LOCK COUPLERS IMPROVED DRAFT GEAR PRESSURE WATER SYSTEM INDIRECT LIGHTING SEAT LIGHTS INDIVIDUALLY CONTROLLED RADIO ROTATING-RECLINING CHAIRS WITH SPONGE RUBBER SEATS ALUMINUM FLOOR PLATES, CORK FLOORING INLAID LINOLEUM FLOOR COVERING INSULATED AGAINST NOISE COMPARTMENTS FOR HAND LUGGAGE ELECTRO-PNEUMATIC HIGH SPEED BRAKE EQUIPMENT IMPROVED TYPE OF TRUCKS PROVIDES EASIER RIDING SPRING PAD LUBRICATORS-JOURNALS TRUCK MOUNTED BRAKE CYLINDERS STEAM TRAIN LINE CONNECTION OF 2" FLEXIBLE METALLIC CONDUIT	79'-2"	BODY OF CAR 48 WOMENS LOUNGE 2 MENS SMOKING LOUNGE 4 TOTAL 54	104500
 TIGHT LOCK COUPLERS AND IMPROVED DRAFT GEAR RTICULATED UNIT			132'-2"	BODY OF CAR 100 WOMENS LOUNGE 4 MENS SMOKING ROOM 5 TOTAL 109	170800
 ELECTRIC LUGGAGE ELEVATORS SINGLE UNIT	1939	FLUORESCENT LIGHTING ELECTRIC LUGGAGE ELEVATORS CENTER SILLS AND END FRAMING MEMBERS MADE OF SPECIAL CENTER SILL STEEL AND DESIGNED TO MEET A.A.R. COMMITTEE RECOMMENDATIONS OF FEB 24, 1939 INLAID RUBBER FLOOR COVERING PUBLIC ADDRESS SYSTEM	81'-0"	BODY OF CAR 44 WOMENS LOUNGE 2 MENS SMOKING ROOM 4 TOTAL 50	117800
 RTICULATED UNIT			136'-0"	BODY OF CAR 92 WOMENS LOUNGE 2 MENS SMOKING ROOM 4 TOTAL 98	194500

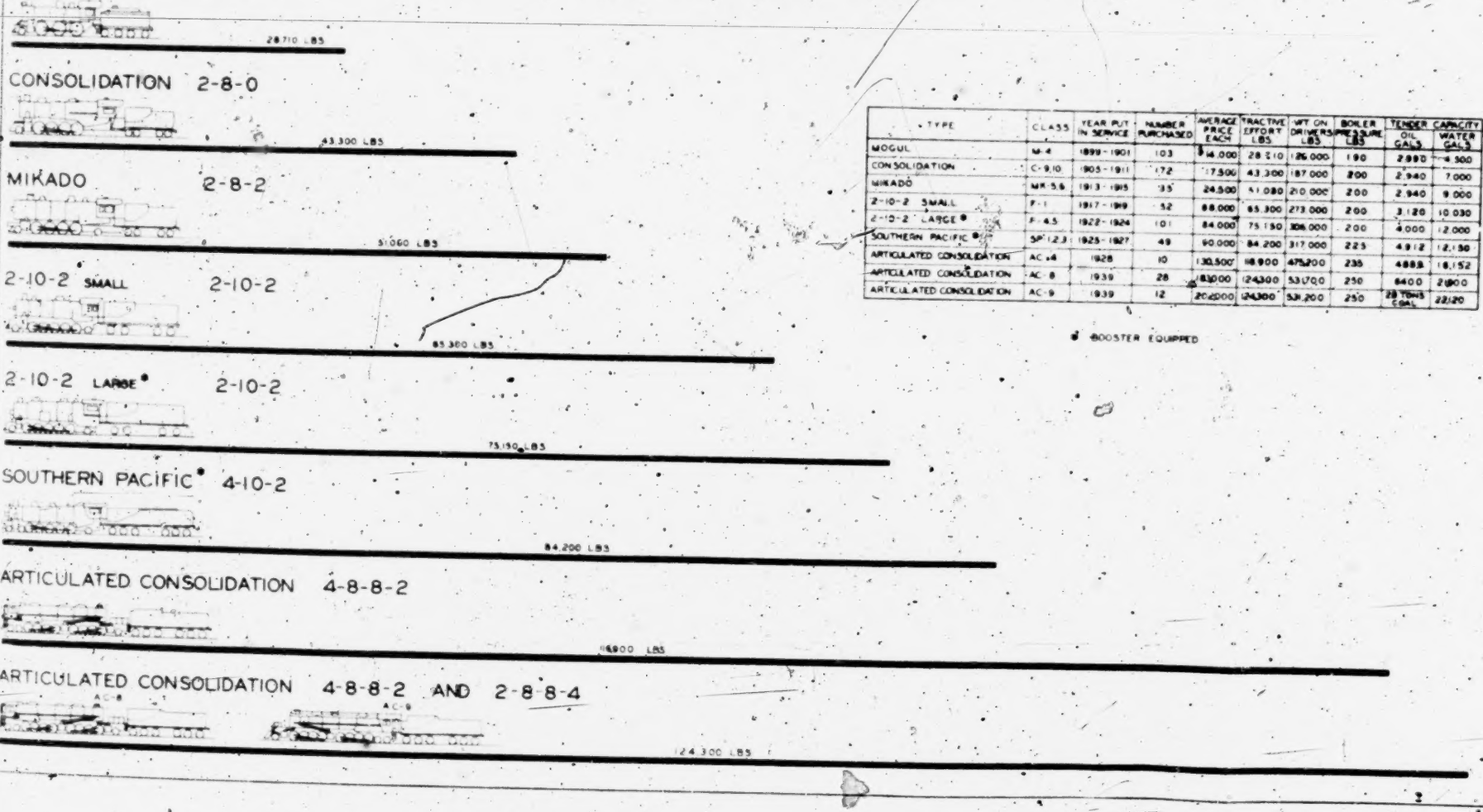
5313

5313

Defendant's Exhibit No. 5 (Witness F.E. Russell)
Nov. 19, 1940

SOUTHERN PACIFIC COMPANY
PACIFIC LINES
CHRONOLOGY OF FREIGHT LOCOMOTIVES PACIFIC LINES
YEARS 1899 TO 1940
SHOWING IMPROVED DESIGN AND INCREASED TRACTIVE EFFORT

TYPE	WHEEL ARRANGEMENT (WHYTE SYSTEM)
MOGUL	2-6-0
CONSOLIDATION	2-8-0
MIKADO	2-8-2
2-10-2 SMALL	2-10-2
2-10-2 LARGE*	2-10-2
SOUTHERN PACIFIC*	4-10-2
ARTICULATED CONSOLIDATION	4-8-8-2
ARTICULATED CONSOLIDATION	4-8-8-2 AND 2-8-8-4



TYPE	CLASS	YEAR PUT IN SERVICE	NUMBER PURCHASED	AVERAGE PRICE EACH	TRACTIVE EFFORT LBS	WT ON DRIVERS LBS	BOILER PRESSURE LBS	TENDER CAPACITY OIL GALS	TENDER CAPACITY WATER GALS
MOGUL	M-4	1899-1901	103	$14,000	28,710	126,000	190	2,880	4,500
CONSOLIDATION	C-9,10	1905-1911	172	17,500	43,300	187,000	200	2,940	7,000
MIKADO	MK-5,6	1913-1915	35	24,500	51,080	210,000	200	2,940	9,000
2-10-2 SMALL	F-1	1917-1919	52	68,000	85,300	273,000	200	3,120	10,030
2-10-2 LARGE*	F-4,5	1922-1924	101	84,000	75,150	306,000	200	4,000	12,000
SOUTHERN PACIFIC*	SP-1,2,3	1925-1927	49	90,000	84,200	317,000	225	4,912	12,150
ARTICULATED CONSOLIDATION	AC-4	1928	10	130,500	118,900	475,200	235	4888	16,152
ARTICULATED CONSOLIDATION	AC-8	1939	28	183,000	124,300	531,700	250	6400	21800
ARTICULATED CONSOLIDATION	AC-9	1939	12	202,000	124,300	531,200	250	28 TONS COAL	22120

* BOOSTER EQUIPPED

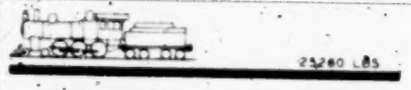
Defendant's Exhibit No. 6 (Witness F.E.Russell)
Nov. 19, 1940

SOUTHERN PACIFIC COMPANY
PACIFIC LINES

CHRONOLOGY OF PASSENGER LOCOMOTIVES PACIFIC LINES
YEARS 1895 TO 1940
SHOWING IMPROVED DESIGN AND INCREASED TRACTIVE EFFORT

TYPE — WHEEL ARRANGEMENT (WHYTE SYSTEM)

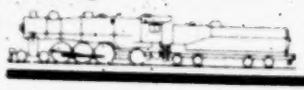
TEN WHEEL 4-6-0



TEN WHEEL 4-6-0

PACIFIC 4-6-2

PACIFIC 4-6-2



MOUNTAIN * 4-8-2

GOLDEN STATE * 4-8-4

GOLDEN STATE * 4-8-4

TYPE	CLASS	YEAR PUT IN SERVICE	NUMBER PURCHASED	AVERAGE PRICE EACH	TRACTIVE EFFORT LBS	WT ON DRIVERS LBS	BOILER PRESSURE LBS	TENDER CAPACITY OIL GALS	TENDER CAPACITY WATER GALS
TEN WHEEL	T-1	1895-1897	39	11,500	25,260	112,000	180	15 TONS COAL	4000
TEN WHEEL	T-25	1901	8	14,000	27,590	134,000	200	25 TONS COAL	6000
PACIFIC	P-5	1912	15	22,500	28920	141,000	200	2,940	7,000
PACIFIC	P-8	1921	15	72,500	43,660	180,000	200	4,000	12,000
MOUNTAIN *	MT-1	1923-1924	28	82,000	57,510	248,000	210	4,000	12,000
GOLDEN STATE *	GS-1	1930	10	115,000	62,200	262,000	250	4,912	18,152
GOLDEN STATE **	GS-4	1940	20	173,000	64,800	276,000	300	6,275	23,500

* BOOSTER EQUIPPED
◆ PRICE AND WEIGHT OF THESE LOCOMOTIVES ESTIMATED BUT ADDED HERE FOR COMPARATIVE PURPOSES

Defendant's Exhibit No. 7 (Witness F.E.Russell)
Nov. 19, 1940

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

LOCOMOTIVES PURCHASED OR BUILT IN COMPANY SHOPS
YEARS 1922 TO 1940

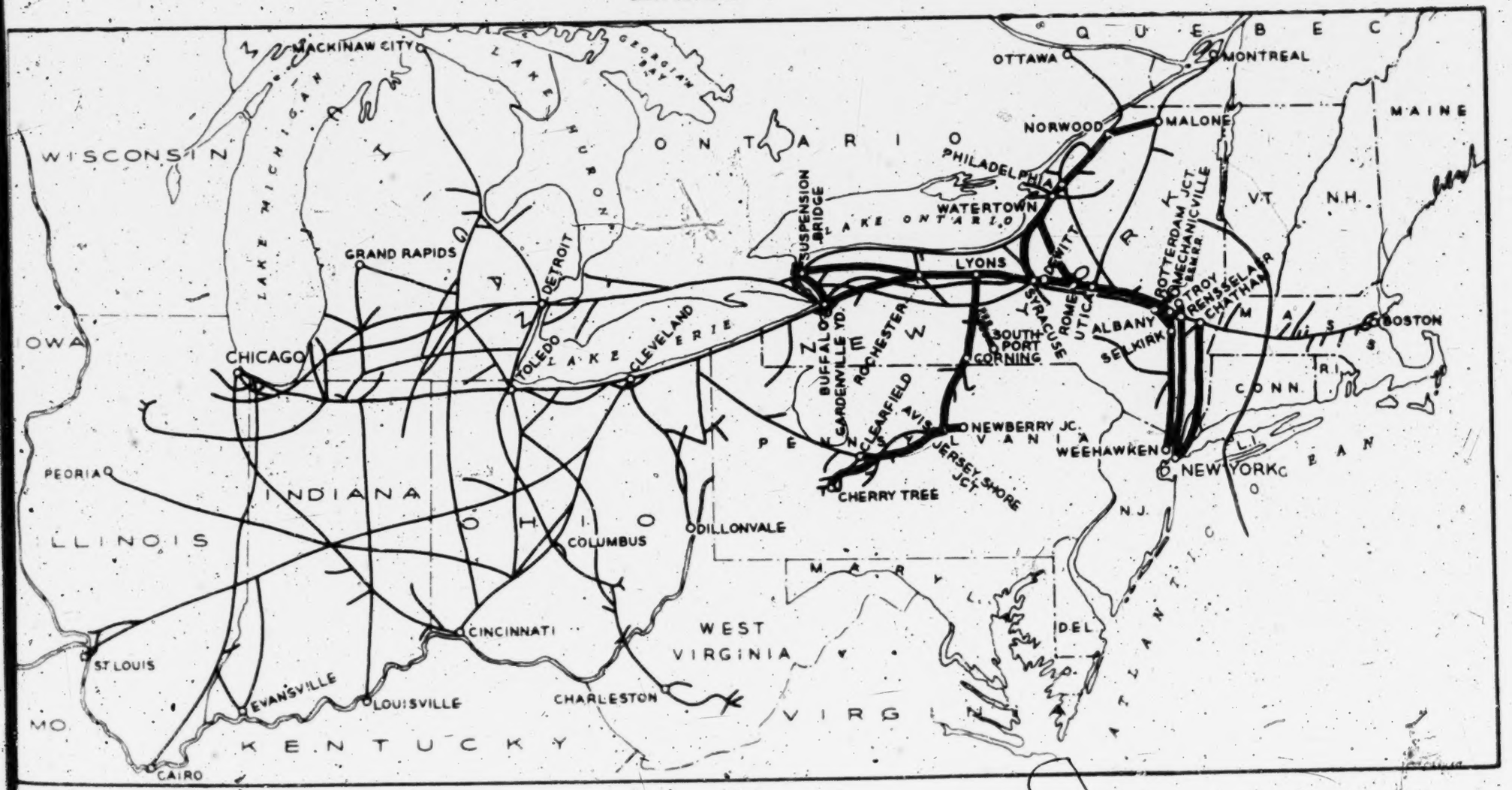
LINE NO. (a)	YEAR (b)	SERVICE (c)	TYPE (d)	ENGINE NUMBERS (e)	NUMBER OF UNITS (f)	TRACTIVE POWER PER UNIT (Pounds) (g)	TOTAL TRACTIVE POWER (Pounds) (h)	COST PER UNIT (i)	TOTAL COST (j)	TRUST SERIES (k)
1	1922	Freight	2-10-2	3668-3717	50	75,150	3,757,500	$ 82,296	$4,114,816	F
2	1923	Passenger	4-6-2	2478-2483	6	43,660	261,960	64,763	388,577	F
3	1923	Frt. & Pasgr.	4-8-2	4300-4309	10	57,510	575,100	80,336	803,356	F
4		TOTAL			16		837,060		1,191,933	
5	1924	Passenger	4-6-2	2484-2491	8	43,660	349,280	74,933	599,467	G
6	1924	Freight	2-10-2	3718-3751	34	75,150	2,555,100	84,504	2,873,152	F
7	1924	Freight	2-10-2	3752-3763	12	75,150	901,800	87,314	1,047,769	G
8	1924	Freight	2-10-2	3764-3768	5	75,150	375,750	89,930	449,648	G
9	1924	Frt. & Pasgr.	4-8-2	4310-4327	18	57,510	1,035,180	82,893	1,492,080	G
10		TOTAL			77		5,217,110		6,462,196	
11	1925	Freight	2-10-2	3769	1	75,150	75,150	87,413	87,413	F
12	1925	Frt. & Pasgr.	4-8-2	4328-4333	6	57,510	345,060	82,180	493,080	H
13	1925	Freight	4-10-2	5000	1	84,200	84,200	85,977	85,977	F
14	1925	Freight	4-10-2	5001-5015	15	84,200	1,263,000	86,801	1,302,014	H
15		TOTAL			23		1,767,410		1,968,484	
16	1926	Frt. & Pasgr.	4-8-2	4334-4345	12	57,510	690,120	80,947	971,363	H
17	1926	Frt. & Pasgr.	4-8-2	4346-4350	5	57,510	287,550	86,064	430,321	I
18	1926	Freight	4-10-2	5016-5038	23	84,200	1,936,600	89,137	2,050,151	I
19		TOTAL			40		2,914,270		3,451,835	
20	1927	Frt. & Pasgr.	4-8-2	4351-4356	6	57,510	345,060	82,614	495,685	H
21	1927	Frt. & Pasgr.	4-8-2	4357-4358	2	57,510	115,020	83,526	167,053	J
22	1927	Freight	4-10-2	5039-5048	10	84,200	842,000	96,236	962,362	J
23		TOTAL			18		1,302,080		1,625,100	
24	1928	Frt. & Pasgr.	4-8-8-2	4100-4108	9	112,760	1,014,840	130,740	1,176,664	K
25	1928	Frt. & Pasgr.	4-8-2	4359-4360	2	57,510	115,020	80,042	160,084	K
26		TOTAL			11		1,129,860		1,336,748	
27	1929	Frt. & Pasgr.	4-8-8-2	4109	1	112,760	112,760	130,740	130,740	K
28	1929	Frt. & Pasgr.	4-8-8-2	4110-4125	16	112,760	1,804,160	132,823	2,125,169	L
29	1929	Frt. & Pasgr.	4-8-2	4361-4366	6	57,510	345,060	80,042	480,253	K
30	1929	Frt. & Pasgr.	4-8-2	4367-4370	4	57,510	230,040	81,325	325,299	L
31		TOTAL			27		2,492,020		3,061,461	
32	1930	Frt. & Pasgr.	4-8-8-2	4126-4148	23	124,300	2,858,900	139,496	3,208,411	M
33	1930	Frt. & Pasgr.	4-8-2	4371-4376	6	57,510	345,060	81,325	487,949	L
34	1930	Frt. & Pasgr.	4-8-4	4400-4409	10	62,200	622,000	115,020	1,150,197	M
35		TOTAL			39		3,825,960		4,846,557	
36	1931	Frt. & Pasgr.	4-8-8-2	4149-4150	2	124,300	248,600	139,496	278,992	M

LINE NO. (a)	YEAR (b)	SERVICE (c)	TYPE (d)	ENGINE NUMBERS (e)	OF UNITS (f)	PER UNIT (Pounds) (g)	POWER (Pounds) (h)	COST PER UNIT (i)	TOTAL COST (j)	TRUST SERIES (k)
1	1922	Freight	2-10-2	3668-3717	50	75,150	3,757,500	$ 82,296	$4,114,816	F
2	1923	Passenger	4-6-2	2478-2483	6	43,660	261,960	64,763	388,577	F
3	1923	Frt. & Pasgr.	4-8-2	4300-4309	10	57,510	575,100	80,336	803,356	F
4		TOTAL			16		837,060		1,191,933	
5	1924	Passenger	4-6-2	2484-2491	8	43,660	349,280	74,933	599,467	G
6	1924	Freight	2-10-2	3718-3751	34	75,150	2,555,100	84,504	2,873,152	F
7	1924	Freight	2-10-2	3752-3763	12	75,150	901,800	87,314	1,047,769	G
8	1924	Freight	2-10-2	3764-3768	5	75,150	375,750	89,930	449,648	G
9	1924	Frt. & Pasgr.	4-8-2	4310-4327	18	57,510	1,035,180	82,893	1,492,080	G
10		TOTAL			77		5,217,110		6,462,116	
11	1925	Freight	2-10-2	3769	1	75,150	75,150	87,413	87,413	F
12	1925	Frt. & Pasgr.	4-8-2	4328-4333	6	57,510	345,060	82,180	493,080	H
13	1925	Freight	4-10-2	5000	1	84,200	84,200	85,977	85,977	F
14	1925	Freight	4-10-2	5001-5015	15	84,200	1,263,000	86,801	1,302,014	H
15		TOTAL			23		1,767,410		1,968,484	
16	1926	Frt. & Pasgr.	4-8-2	4334-4345	12	57,510	690,120	80,947	971,363	H
17	1926	Frt. & Pasgr.	4-8-2	4346-4350	5	57,510	287,550	86,064	430,321	I
18	1926	Freight	4-10-2	5016-5038	23	84,200	1,936,600	89,137	2,050,151	I
19		TOTAL			40		2,914,270		3,451,835	
20	1927	Frt. & Pasgr.	4-8-2	4351-4356	6	57,510	345,060	82,614	495,685	H
21	1927	Frt. & Pasgr.	4-8-2	4357-4358	2	57,510	115,020	83,526	167,053	J
22	1927	Freight	4-10-2	5039-5048	10	84,200	842,000	96,236	962,362	J
23		TOTAL			18		1,302,080		1,625,100	
24	1928	Frt. & Pasgr.	4-8-8-2	4100-4108	9	112,760	1,014,840	130,740	1,176,664	K
25	1928	Frt. & Pasgr.	4-8-2	4359-4360	2	57,510	115,020	80,042	160,084	K
26		TOTAL			11		1,129,860		1,336,748	
27	1929	Frt. & Pasgr.	4-8-8-2	4109	1	112,760	112,760	130,740	130,740	K
28	1929	Frt. & Pasgr.	4-8-8-2	4110-4125	16	112,760	1,804,160	132,823	2,125,169	L
29	1929	Frt. & Pasgr.	4-8-2	4361-4366	6	57,510	345,060	80,042	480,253	K
30	1929	Frt. & Pasgr.	4-8-2	4367-4370	4	57,510	230,040	81,325	325,299	L
31		TOTAL			27		2,492,020		3,061,461	
32	1930	Frt. & Pasgr.	4-8-8-2	4126-4148	23	124,300	2,858,900	139,496	3,208,411	M
33	1930	Frt. & Pasgr.	4-8-2	4371-4376	6	57,510	345,060	81,325	487,949	L
34	1930	Frt. & Pasgr.	4-8-4	4400-4409	10	62,200	622,000	115,020	1,150,197	M
35		TOTAL			39		3,825,960		4,846,557	
36	1931	Frt. & Pasgr.	4-8-8-2	4149-4150	2	124,300	248,600	139,496	278,992	M
37	1937	Frt. & Pasgr.	4-8-8-2	4151-4162	12	124,300	1,491,600	156,236	1,874,831	M
38	1937	Frt. & Pasgr.	4-8-8-2	4163-4176	14	124,300	1,740,200	162,537	2,275,514	O
39	1937	Frt. & Pasgr.	4-8-4	4410-4415	6	62,200	373,200	131,532	789,194	M
40	1937	Frt. & Pasgr.	4-8-4	4416-4429	14	62,800	879,200	137,869	1,930,165	O
41		TOTAL			46		4,484,200		6,869,704	
42	1939	Frt. & Pasgr.	2-8-8-4	3800-3811	12	124,300	1,491,600	201,917	2,423,000	P
43	1939	Frt. & Pasgr.	4-8-8-2	4177-4204	28	124,300	3,480,400	183,119	5,127,327	P
44		TOTAL			40		4,972,000		7,550,327	
45	*1940	Frt. & Pasgr.	4-8-4	4430-4449	20	64,800	1,296,000	172,891	3,457,825	Q
46		GRAND TOTAL			409		34,244,070		46,215,898	

* - Ordered during 1940. Delivery to commence in December, 1940.
Cost estimated.

2353

Defendant's Exhibit No. 10 (Witness LeRoy B. Porter)
Nov. 25. 1940



NEW YORK CENTRAL RAILROAD CO.

HEAVY LINE INDICATES TERRITORY COVERED BY TYPICAL FREIGHT TRAIN EXHIBIT.

5317

Defendant's Exhibit No. 11 (Witness Porter)

THE NEW YORK CENTRAL RAILROAD COMPANY
(Including All Leased Lines)

FREIGHT OPERATING AND
FREIGHT TRANSPORTATION EXPENSES
RELATED TO TRAFFIC
CALENDAR YEARS 1922 TO 1939 INCLUSIVE

YEAR	REVENUE TON MILES	FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES	AVERAGE PER 1,000 REVENUE TON MILES	
				FREIGHT OPERATING EXPENSES	FREIGHT TRANSP. EXPENSES
(a)	(b)	(c)	(d)	(e)	(f)
1939	26,029,141,762	$168,817,327	$ 85,653,520	$ 6.49	$ 3.29
1938	21,981,707,210	153,903,955	80,548,917	7.00	3.66
1937	28,206,471,339	192,406,637	96,279,263	6.82	3.41
1936	27,370,143,347	181,701,786	90,420,058	6.64	3.30
1935	22,935,043,493	155,480,664	79,304,364	6.78	3.46
1934	21,973,818,783	146,421,570	73,876,599	6.66	3.36
1933	20,691,649,978	138,067,671	68,712,560	6.67	3.32
1932	19,776,624,043	148,951,858	73,460,480	7.53	3.71
1931	24,902,953,692	201,905,274	97,999,065	8.11	3.94
1930	30,483,123,158	253,792,942	122,001,216	8.33	4.00
1929	36,803,277,839	307,283,040	146,132,742	8.35	3.97
1928	35,674,706,558	294,331,503	142,396,567	8.25	3.99
1927	36,000,453,150	303,655,210	145,310,213	8.43	4.04
1926	37,734,640,122	313,454,767	148,314,922	8.31	3.93
1925	35,929,489,417	306,647,925	146,988,731	8.53	4.09
1924	33,839,679,365	299,538,769	147,945,775	8.85	4.37
1923	40,016,478,299	354,692,697	165,023,950	8.86	4.12
1922	31,201,314,561	308,114,086	147,416,562	9.88	4.72
TOTAL 1936-1939	103,587,463,658	696,829,705	352,901,758	6.73	3.41
TOTAL 1922-1925	140,986,961,642	1,268,993,477	607,375,018	9.00	4.31

YEAR	REVENUE TON MILES	FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES	Average per 1,000 REVENUE TON MILES: FREIGHT OPERATING EXPENSES	Average per 1,000 REVENUE TON MILES: FREIGHT TRANSP. EXPENSES
(a)	(b)	(c)	(d)	(e)	(f)
1939	26,029,141,762	$168,817,327	$ 85,653,520	$ 6.49	$ 3.29
1938	21,981,707,210	153,903,955	80,548,917	7.00	3.66
1937	28,206,471,339	192,406,637	96,279,263	6.82	3.41
1936	27,370,143,347	181,701,786	90,420,058	6.64	3.30
1935	22,935,043,493	155,480,664	79,304,364	6.78	3.46
1934	21,973,818,783	146,421,570	73,876,599	6.66	3.36
1933	20,691,649,978	138,067,671	68,712,560	6.67	3.32
1932	19,776,624,043	148,951,858	73,460,480	7.53	3.71
1931	24,902,953,692	201,905,274	97,999,065	8.11	3.94
1930	30,483,123,158	253,792,942	122,001,216	8.33	4.00
1929	36,803,277,839	307,283,040	146,132,742	8.35	3.97
1928	35,674,706,558	294,331,503	142,396,567	8.25	3.99
1927	36,000,453,150	303,655,210	145,310,213	8.43	4.04
1926	37,734,640,122	313,454,767	148,314,922	8.31	3.93
1925	35,929,489,417	306,647,925	146,988,731	8.53	4.09
1924	33,839,679,365	299,538,769	147,945,775	8.85	4.37
1923	40,016,478,299	354,692,697	165,023,950	8.86	4.12
1922	31,201,314,561	308,114,086	147,416,562	9.88	4.72
TOTAL 1936-1939	103,587,463,658	696,829,705	352,901,758	6.73	3.41
TOTAL 1922-1925	140,986,961,642	1,268,993,477	607,375,018	9.00	4.31
PER CENT OF IMPROVEMENT 4 YEARS 1936 - 1939 COMPARED WITH 4 YEARS 1922 - 1925				25.2	20.9

SOURCE: Revenue ton-miles - Annual Reports to Interstate Commerce Commission.

Freight operating and transportation expenses - Annual Reports to Interstate Commerce Commission.

Defendant's Exhibit No. 12 (Witness LeRoy B. Porter)
Nov. 25, 1940

THE NEW YORK CENTRAL RAILROAD COMPANY (Including all leased lines)

FREIGHT SERVICE OPERATING AVERAGES
CALENDAR YEARS 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 AND 1939

LINE NO. (a)	ITEM (b)	1922 (c)	1924 (d)	1926 (e)	1928 (f)	1930 (g)	1932 (h)	1934 (i)	1936 (j)	1938 (k)	1939 (l)	PERCENT INCREASE 1939 OVER 1922 (m)
1	Miles of line operated in freight service,.....	11,361.75	11,357.74	11,381.87	11,364.82	11,315.66	11,379.51	11,321.00	11,154.09	11,004.52	10,939.95	Dec. 3.7
2	Freight train miles,.....	41,529,769	43,850,503	45,878,779	43,172,767	38,194,118	28,586,187	29,987,993	34,719,037	29,109,782	31,946,779	Dec. 23.1
3	Freight cars per freight train,.....	49.0	51.3	54.3	57.9	57.4	53.6	54.3	54.4	54.0	55.2	12.7
4	Net tons per freight train,.....	787	839	893	895	886	783	825	880	856	913	16.0
5	Average tractive power per locomotive (pounds),.....	38,378	41,378	43,608	45,285	44,712	45,884	47,324	47,584	47,692	47,726	24.4
6	Average capacity per freight carrying car (tons),.....	43.6	46.6	47.4	48.0	48.7	48.9	50.1	51.3	52.0	53.2	22.0
7	Freight train speed (miles per hour)	11.1	11.7	12.2	13.5	14.5	16.2	16.5	16.4	16.9	16.9	52.3
8	Gross ton-miles per freight train-hour,.....	20,321	22,471	25,219	29,159	31,155	32,099	34,052	34,514	35,806	37,184	83.0
9	Net ton-miles per freight train-hour	8,713	9,779	10,924	12,118	12,854	12,644	13,651	14,407	14,282	15,299	75.6
10	Gross ton-miles (exclusive of locomotives and tenders) per ton of fuel,.....	13,391	13,749	14,619	15,929	16,537	16,191	16,265	16,267	16,884	17,304	29.2

SOURCE: Item 1 - Mileage as reported in Interstate Commerce Commission Annual Reports, with inter-company duplications eliminated.

Items 2, 3, 4, 7 and 8 - Reports of Freight Train Performance, Form OS-A, filed with Interstate Commerce Commission.

Item 5 - Total tractive effort ÷ total steam locomotives available for service at close of each year as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 6 - Aggregate capacity of all freight carrying cars ÷ total number of such cars avilable for service at close of year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 9 - Net ton miles ÷ train hours as reported on Form OS-A to Interstate Commerce Commission.

Item 10- Gross ton miles (cars, contents and cabooses) ÷ equated net tons of fuel consumed as reported to Interstate Commerce Commission in years 1922 to 1934, inclusive, on Form OS-A and as reported in years 1936, 1938 and 1939 on Forms OS-A and OS-E respectively.

Defendant's Exhibit No. 13 (Witness Alfred H. Wright)
Nov. 25, 1940

EXPLANATION OF SYMBOLS USED BELOW UNDER HEADING "AVERAGE CONSIST"

A - Perishable loads
B - Other loads
C - Empty cars and includes caboose
D - Total all cars

NEW YORK CENTRAL RAILROAD

TYPICAL EXAMPLES OF FREIGHT TRAINS HANDLED

NAME OF RAILROAD	FROM	TO	DISTANCE (Miles)	TEN DAY PERIOD STUDIED (Mo. & Yr.)	RULING GRADE	70 CARS OR LESS						71 CARS TO 100 CARS						101 CARS TO 125 CARS AVERAGE					
						NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	A	B
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)
New York Central	Malone, N.Y.	Watertown, N.Y.	112	Sept. 1940	.76	3	Mikado	-	14	33	47	1,467	6	Mikado	1	21	59	81	2,448	1	Mikado	3	34
	Watertown, N.Y.	Malone, N.Y.	112	Sept. 1940	.73	8	Mikado	-	37	18	55	2,735	2	Mikado	-	40	31	71	2,900	-	-	-	-
	Watertown, N.Y.	Utica, N.Y.	88	Sept. 1940	.67	8	Mikado	-	31	19	50	2,038	1	Mikado	2	47	28	77	3,240	1	Mikado	2	66
	Utica, N.Y.	Watertown, N.Y.	88	Sept. 1940	.83	4	Mikado	-	27	35	62	1,978	6	Mikado	-	32	52	84	2,666	-	-	-	-
	Norwood, N.Y.	Watertown, N.Y.	75	Sept. 1940	.76	4	Mikado	2	27	28	57	1,899	4	Mikado	1	33	42	76	2,446	1	Mikado	1	55
	Watertown, N.Y.	Norwood, N.Y.	75	Sept. 1940	.67	7	Mikado	2	43	8	53	2,473	2	Mikado	7	64	10	81	3,650	1	Mikado	1	64
	Watertown, N.Y.	DeWitt, N.Y.	77	Sept. 1940	.67	3	Mohawk	3	49	13	65	3,033	12	Mohawk	1	49	29	79	3,046	3	Mohawk	-	36
	DeWitt, N.Y.	Watertown, N.Y.	77	Sept. 1940	.80	12	Mohawk	2	51	4	57	2,656	7	Mohawk	3	74	4	81	2,478	1	Mohawk	-	96
	Susp. Bridge, N.Y.	Lyons, N.Y.	127	Sept. 1940	.48	9	Mohawk	2	54	7	63	2,786	9	Mohawk	1	44	32	77	3,131	-	-	-	-
	Lyons, N.Y.	Susp. Bridge, N.Y.	127	Sept. 1940	.59	13	Mohawk	-	49	8	57	2,946	6	Mohawk	-	50	30	80	4,103	-	-	-	-
	Lyons, N.Y.	Susp. Bridge, N.Y.	127	Sept. 1940	.59	4	Hudson	1	46	13	60	3,314	1	Hudson	-	69	15	84	4,370	-	-	-	-
	Lyons, N.Y.	Susp. Bridge, N.Y.	111	Sept. 1940	.70	2	Mohawk	-	52	8	60	3,669	6	Mohawk	-	64	17	81	4,399	1	Mohawk	-	27
	Gardenville, N.Y.	DeWitt, N.Y.	149	Sept. 1940	.48	-	-	-	-	-	-	-	16	Mohawk	34	53	3	90	4,010	3	Mohawk	31	65
	DeWitt, N.Y.	Gardenville, N.Y.	149	Sept. 1940	.59	24	Mohawk	-	51	13	64	2,330	12	Mohawk	1	44	42	87	2,830	2	Mohawk	1	45
	DeWitt, N.Y.	Gardenville, N.Y.	149	Sept. 1940	.59	4	Hudson	-	51	9	60	2,346	2	Hudson	1	62	18	81	2,951	-	-	-	-
	DeWitt, N.Y.	Gardenville, N.Y.	149	Sept. 1940	.63	-	-	-	-	-	-	-	5	Mohawk	1	58	34	93	3,192	30	Mohawk	-	19
	Buffalo, N.Y.	DeWitt, N.Y.	154	Sept. 1940	.48	23	Mohawk	16	45	4	65	3,283	87	Mohawk	19	61	2	82	4,016	4	Mohawk	4	95
	DeWitt, N.Y.	Buffalo, N.Y.	151	Sept. 1940	.59	6	Mohawk	1	26	37	64	2,018	3	Mohawk	2	29	43	74	2,292	-	-	-	-
	DeWitt, N.Y.	Buffalo, N.Y.	151	Sept. 1940	.59	1	Hudson	-	25	44	69	2,026	-	-	-	-	-	-	-	-	-	-	-
	DeWitt, N.Y.	Buffalo, N.Y.	151	Sept. 1940	.63	-	-	-	-	-	-	-	1	Mohawk	-	42	44	86	3,240	-	-	-	-
	Rochester, N.Y.	DeWitt, N.Y.	86	Sept. 1940	.48	-	-	-	-	-	-	-	7	Mohawk	18	58	14	90	3,705	2	Mohawk	8	76
	DeWitt, N.Y.	Rochester, N.Y	86	Sept. 1940	.59	1	Mohawk	-	31	11	42	2,020	-	-	-	-	-	-	-	-	-	-	-
	Buffalo, N.Y.	Lyons, N.Y.	101	Sept. 1940	.48	1	Mohawk	-	51	15	66	3,190	9	Mohawk	3	57	25	85	3,843	-	-	-	-
	Lyons, N.Y.	Buffalo, N.Y.	101	Sept. 1940	.63	1	Mohawk	-	50	5	55	3,000	-	-	-	-	-	-	-	-	-	-	-
	Susp. Bridge, N.Y.	Syracuse, N.Y.	162	Sept. 1940	.48	5	Hudson	-	15	1	16	1,210	-	-	-	-	-	-	-	-	-	-	-
	Susp. Bridge, N.Y.	Syracuse, N.Y.	162	Sept. 1940	.48	1	Mohawk	-	19	1	20	1,120	-	-	-	-	-	-	-	-	-	-	-
	Susp. Bridge, N.Y.	Syracuse, N.Y.	162	Sept. 1940	.38	2	Hudson	-	17	1	18	1,233	-	-	-	-	-	-	-	-	-	-	-
	Syracuse, N.Y.	Susp. Bridge, N.Y.	162	Sept. 1940	.59	7	Hudson	-	24	1	25	1,245	-	-	-	-	-	-	-	-	-	-	-
	Syracuse, N.Y.	Susp. Bridge, N.Y.	162	Sept. 1940	.59	2	Mohawk	-	26	1	27	1,792	-	-	-	-	-	-	-	-	-	-	-
	Susp. Bridge, N.Y.	DeWitt, N.Y.	163	Sept. 1940	.48	7	Mohawk	13	47	4	64	2,557	23	Mohawk	17	62	4	83	3,299	2	Mohawk	18	91
	Susp. Bridge, N.Y.	DeWitt, N.Y.	179	Sept. 1940	.48	6	Mohawk	4	57	2	63	3,155	5	Mohawk	2	75	2	79	4,253	-	-	-	-
	DeWitt, N.Y.	Susp. Bridge, N.Y.	163	Sept. 1940	.70	20	Mohawk	-	44	16	60	2,039	9	Mohawk	1	45	32	78	2,519	6	Mohawk	-	3
	DeWitt, N.Y.	Susp. Bridge, N.Y.	179	Sept. 1940	.59	8	Mohawk	6	30	9	45	1,539	5	Mohawk	-	48	36	84	3,821	-	-	-	-
	DeWitt, N.Y.	Susp. Bridge, N.Y.	179	Sept. 1940	.63	-	-	-	-	-	-	-	2	Mohawk	-	52	36	88	3,048	-	-	-	-
	DeWitt, N.Y.	Susp. Bridge, N.Y.	163	Sept. 1940	.70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	Hudson	-	-
	DeWitt, N.Y.	Susp. Bridge, N.Y.	179	Sept. 1940	.59	1	Hudson	-	26	1	27	895	-	-	-	-	-	-	-	-	-	-	-
	Rochester, N.Y.	Lyons, N.Y.	35	Sept. 1940	.48	8	Mohawk	6	44	6	56	2,311	1	Mohawk	12	67	1	80	3,640	-	-	-	-
	Lyons, N.Y.	Gardenville, N.Y.	98	Sept. 1940	.59	-	-	-	-	-	-	-	5	Mohawk	-	31	63	94	3,380	4	Mohawk	-	18
	Lyons, N.Y.	Gardenville, N.Y.	98	Sept. 1940	.59	-	-	-	-	-	-	-	1	Hudson	-	12	84	96	2,532	-	-	-	-
	Lyons, N.Y.	Gardenville, N.Y.	98	Sept. 1940	.63	-	-	-	-	-	-	-	1	Mohawk	-	13	81	94	2,780	-	-	-	-
	Rochester, N.Y.	Gardenville, N.Y.	64	Sept. 1940	.59	2	Mohawk	-	8	57	65	1,644	-	-	-	-	-	-	-	-	-	-	-
	Rochester, N.Y.	Buffalo, N.Y.	66	Sept. 1940	.59	10	Mohawk	-	24	25	49	1,777	2	Moha	-	7	71	78	1,877	-	-	-	-
	Rochester, N.Y.	Buffalo, N.Y.	66	Sept. 1940	.59	2	Hudson	-	32	33	65	2,407	1	Hudson	-	10	76	86	2,234	-	-	-	-
	Buffalo, N.Y.	Rochester, N.Y.	66	Sept. 1940	.38	8	Mohawk	1	46	2	49	2,523	-	-	-	-	-	-	-	-	-	-	-
	Buffalo, N.Y.	Syracuse, N.Y	154	Sept. 1940	.48	-	-	-	-	-	-	-	4	Mohawk	7	77	9	93	4,483	-	-	-	-
	Buffalo, N.Y.	Lyons, N.Y.	101	Sept. 1940	.48	-	-	-	-	-	-	-	1	Mohawk	4	58	38	100	4,060	-	-	-	-
	Gardenville, N.Y.	Susp. Bridge, N.Y.	34	Sept. 1940	.90	6	Mohawk	-	10	41	51	1,223	4	Mohawk	-	2	80	82	1,660	5	Mohawk	-	43
	Gardenville, N.Y.	Susp. Bridge, N.Y.	34	Sept. 1940	.90	1	Mikado	-	49	13	62	1,760	3	Mikado	-	1	76	77	1,647	-	-	-	-

AVERAGE CONSIST C	AVERAGE CONSIST D	AVERAGE CONSIST TONS	101 CARS TO 125 CARS NO. OF TRAINS	101 CARS TO 125 CARS TYPE OF LOCOMOTIVE	101 CARS TO 125 CARS AVERAGE CONSIST A	B	C	D	TONS	126 CARS AND OVER NO. OF TRAINS	126 CARS AND OVER TYPE OF LOCOMOTIVE	126 CARS AND OVER AVERAGE CONSIST A	B	C	D	TONS	MAXIMUM CARS PER TRAIN
(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(bb)	(cc)	(dd)	(ee)	(ff)	(gg)	(hh)	(ii)
9	81	2,448	1	Mikado	3	34	68	105	3,375	-	-	-	-	-	-	-	105
1	71	2,900	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71
8	77	3,240	1	Mikado	2	66	49	117	4,520	-	-	-	-	-	-	-	117
2	84	2,666	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96
2	76	2,446	1	Mikado	1	55	47	103	3,705	-	-	-	-	-	-	-	103
0	81	3,650	1	Mikado	1	64	37	102	4,600	-	-	-	-	-	-	-	102
9	79	3,046	3	Mohawk	-	36	84	120	3,473	-	-	-	-	-	-	-	122
4	81	2,478	1	Mohawk	-	96	6	102	5,369	-	-	-	-	-	-	-	102
2	77	3,131	-	-	-	-	-	-	-	-	-	-	-	-	-	-	94
0	80	4,103	-	-	-	-	-	-	-	-	-	-	-	-	-	-	87
5	84	4,370	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84
7	81	4,399	1	Mohawk	-	27	77	104	3,160	-	-	-	-	-	-	-	104
3	90	4,010	3	Mohawk	31	68	5	104	4,331	-	-	-	-	-	-	-	109
2	87	2,830	2	Mohawk	1	45	57	103	3,154	1	Mohawk	-	-	130	130	3,405	130
8	81	2,951	-	-	-	-	-	-	-	2	Hudson	-	-	128	128	2,823	128
4	93	3,192	30	Mohawk	-	19	99	118	3,036	31	Mohawk	-	3	125	128	3,086	131
2	82	4,016	4	Mohawk	4	95	4	103	5,096	-	-	-	-	-	-	-	104
3	74	2,292	-	-	-	-	-	-	-	-	-	-	-	-	-	-	77
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	86
4	86	3,240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	107
4	90	3,705	2	Mohawk	8	76	20	104	4,405	1	Mohawk	-	9	134	143	3,272	143
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
5	85	3,843	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27
4	83	3,299	2	Mohawk	18	81	3	112	4,405	-	-	-	-	-	-	-	119
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	89
2	79	4,253	-	-	-	-	-	-	-	-	-	-	-	-	-	-	115
2	78	2,519	6	Mohawk	-	3	112	117	2,895	-	-	-	-	-	-	-	88
6	84	3,321	-	-	-	-	-	-	-	-	-	-	-	-	-	-	93
6	88	3,048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	115
-	-	-	1	Hudson	-	-	115	115	2,760	-	-	-	-	-	-	-	27
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80
1	80	3,640	-	-	-	-	-	-	-	-	-	-	-	-	-	-	117
3	94	3,380	4	Mohawk	-	18	92	110	3,091	-	-	-	-	-	-	-	95
4	96	2,532	-	-	-	-	-	-	-	-	-	-	-	-	-	-	94
1	94	2,780	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84
1	78	1,877	-	-	-	-	-	-	-	-	-	-	-	-	-	-	86
6	86	2,234	-	-	-	-	-	-	-	-	-	-	-	-	-	-	67
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	99
9	93	4,483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
8	100	4,060	-	-	-	-	-	-	-	-	-	-	-	-	-	-	122
0	82	1,660	5	Mohawk	-	43	71	114	3,128	-	-	-	-	-	-	-	85
6	77	1,647	-	-	-	-	-	-	-	-	-	-	-	-	-	-	131
3	78	2,427	6	Mohawk	-	17	95	112	3,503	1	Mohawk	2	20	109	131	3,060	131
-	-	-	3	Mikado	-	22	81	103	2,513	-	-	-	-	-	-	-	106
3	83	3,635	9	Mohawk	-	85	26	111	6,182	2	Mohawk	-	105	22	127	8,075	128
1	84	2,486	6	Mohawk	-	1	117	118	2,605	1	Mohawk	-	-	126	126	2,520	126
5	89	6,979	1	Mohawk	-	114	11	125	9,040	2	Mohawk	-	124	2	126	10,085	125
8	79	1,726	3	Mohawk	-	-	119	119	2,591	-	-	-	-	-	-	-	71
1	71	1,420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55
2	87	5,898	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	83	2,738	9	Mohawk	-	1	118	119	2,630	5	Mohawk	-	-	130	130	2,839	131
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36
8	86	4,317	2	Mohawk	-	30	86	116	4,120	-	-	-	-	-	-	-	119
9	81	3,015	4	Mohawk	-	25	88	113	3,248	-	-	-	-	-	-	-	120
5	75	1,635	1	Mohawk	-	-	103	103	2,200	-	-	-	-	-	-	-	103
5	75	1,591	-	-	-	-	-	-	-	-	-	-	-	-	-	-	77

FROM	TO	DISTANCE (Miles)	TEN DAY PERIOD STUDIED (Mo. & Yr.)	RULING GRADE	70 CARS OR LESS							71 CARS TO 100 CARS								101 CARS TO 125 CARS							
					NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST					NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST						NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST					
							A	B	C	D	TONS			A	B	C	D	TONS				A	B	C	D	TONS	
(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)		(u)	(v)	(w)	(x)	(y)	(z)	(aa)	
Malone, N.Y.	Watertown, N.Y.	112	Sept. 1940	.76	3	Mikado	-	14	33	47	1,467	6	Mikado	1	20	59	81	2,448		1	Mikado	3	34	68	105	3,375	
Watertown, N.Y.	Malone, N.Y.	112	Sept. 1940	.73	6	Mikado	-	37	18	55	2,735	2	Mikado	-	40	31	71	2,900		-	-	-	-	-	-	-	
Watertown, N.Y.	Utica, N.Y.	88	Sept. 1940	.67	5	Mikado	-	31	19	50	2,038	1	Mikado	2	47	28	77	3,240		1	Mikado	2	66	49	117	4,520	
Utica, N.Y.	Watertown, N.Y.	88	Sept. 1940	.83	4	Mikado	-	27	35	62	1,978	6	Mikado	-	32	52	84	2,666		-	-	-	-	-	-	-	
Norwood, N.Y.	Watertown, N.Y.	75	Sept. 1940	.76	4	Mikado	2	27	28	57	1,899	4	Mikado	1	33	42	76	2,446		1	Mikado	1	55	47	103	3,705	
Watertown, N.Y.	Norwood, N.Y.	75	Sept. 1940	.67	7	Mikado	2	43	8	53	2,473	2	Mikado	7	64	10	81	3,650		1	Mikado	1	64	37	102	4,600	
Watertown, N.Y.	DeWitt, N.Y.	77	Sept. 1940	.67	3	Mohawk	3	49	13	65	3,033	12	Mohawk	1	49	29	79	3,046		3	Mohawk	-	36	84	120	3,473	
DeWitt, N.Y.	Watertown, N.Y.	77	Sept. 1940	.80	12	Mohawk	2	51	4	57	2,656	7	Mohawk	3	74	4	81	2,478		1	Mohawk	2	96	6	102	5,369	
Susp. Bridge, N.Y.	Lyons, N.Y.	127	Sept. 1940	.48	9	Mohawk	2	54	7	63	2,786	9	Mohawk	1	44	32	77	3,131		-	-	-	-	-	-	-	
Lyons, N.Y.	Susp. Bridge, N.Y.	127	Sept. 1940	.59	13	Mohawk	-	49	8	57	2,946	6	Mohawk	-	50	30	80	4,103		-	-	-	-	-	-	-	
Lyons, N.Y.	Susp. Bridge, N.Y.	127	Sept. 1940	.59	4	Hudson	1	46	13	60	3,148	1	Hudson	-	69	15	84	4,370		-	-	-	-	-	-	-	
Lyons, N.Y.	Susp. Bridge, N.Y.	111	Sept. 1940	.70	2	Mohawk	-	52	8	60	3,569	6	Mohawk	-	64	17	81	4,399		1	Mohawk	-	27	77	104	3,160	
Gardenville, N.Y.	DeWitt, N.Y.	149	Sept. 1940	.48	-	-	-	-	-	-	-	16	Mohawk	34	53	3	90	4,010		3	Mohawk	31	68	5	104	4,351	
DeWitt, N.Y.	Gardenville, N.Y.	149	Sept. 1940	.59	24	Mohawk	-	51	13	64	2,330	12	Mohawk	1	44	42	87	2,830		2	Mohawk	1	45	57	103	3,154	
DeWitt, N.Y.	Gardenville, N.Y.	149	Sept. 1940	.59	4	Hudson	-	51	9	60	2,346	2	Hudson	1	62	18	81	2,951		-	-	-	-	-	-	-	
DeWitt, N.Y.	Gardenville, N.Y.	149	Sept. 1940	.63	-	-	-	-	-	-	-	5	Mohawk	1	58	34	93	3,192		30	Mohawk	-	19	99	118	3,036	
Buffalo, N.Y.	DeWitt, N.Y.	154	Sept. 1940	.48	23	Mohawk	16	45	4	65	3,283	87	Mohawk	19	61	2	82	4,016		4	Mohawk	4	95	4	103	5,096	
DeWitt, N.Y.	Buffalo, N.Y.	151	Sept. 1940	.59	6	Mohawk	1	26	37	64	2,018	3	Mohawk	2	29	43	74	2,292		-	-	-	-	-	-	-	
DeWitt, N.Y.	Buffalo, N.Y.	151	Sept. 1940	.59	1	Hudson	-	25	44	69	2,026	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
DeWitt, N.Y.	Buffalo, N.Y.	151	Sept. 1940	.63	-	-	-	-	-	-	-	1	Mohawk	-	42	44	86	3,240		-	-	-	-	-	-	-	
Rochester, N.Y.	DeWitt, N.Y.	86	Sept. 1940	.48	-	-	-	-	-	-	-	7	Mohawk	18	58	14	90	3,705		2	Mohawk	6	76	20	104	4,405	
DeWitt, N.Y.	Rochester, N.Y	86	Sept. 1940	.59	1	Mohawk	-	31	11	42	2,020	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
Buffalo, N.Y.	Lyons, N.Y.	101	Sept. 1940	.48	1	Mohawk	-	51	15	66	3,190	9	Mohawk	3	57	25	85	3,843		-	-	-	-	-	-	-	
Lyons, N.Y.	Buffalo, N.Y.	101	Sept. 1940	.63	1	Mohawk	-	50	5	55	3,000	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
Susp. Bridge, N.Y.	Syracuse, N.Y.	162	Sept. 1940	.48	5	Hudson	-	15	1	16	1,210	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
Susp. Bridge, N.Y.	Syracuse, N.Y.	162	Sept. 1940	.48	1	Mohawk	-	19	1	20	1,120	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
Susp. Bridge, N.Y.	Syracuse, N.Y.	162	Sept. 1940	.38	2	Hudson	-	17	1	18	1,233	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
Syracuse, N.Y.	Susp. Bridge, N.Y.	162	Sept. 1940	.59	7	Hudson	-	24	1	25	1,245	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
Syracuse, N.Y.	Susp. Bridge, N.Y.	162	Sept. 1940	.59	2	Mohawk	-	26	1	27	1,792	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
Susp. Bridge, N.Y.	DeWitt, N.Y.	163	Sept. 1940	.48	7	Mohawk	13	47	4	64	2,557	23	Mohawk	17	62	4	83	3,299		2	Mohawk	18	91	3	112	4,405	
Susp. Bridge, N.Y.	DeWitt, N.Y.	179	Sept. 1940	.48	6	Mohawk	4	57	2	63	3,155	5	Mohawk	2	75	2	79	4,253		-	-	-	-	-	-	-	
DeWitt, N.Y.	Susp. Bridge, N.Y.	163	Sept. 1940	.70	20	Mohawk	-	44	16	60	2,039	9	Mohawk	1	45	32	78	2,519		6	Mohawk	-	3	112	117	2,895	
DeWitt, N.Y.	Susp. Bridge, N.Y.	179	Sept. 1940	.59	8	Mohawk	6	30	9	45	1,539	5	Mohawk	-	48	36	84	3,821		-	-	-	-	-	-	-	
DeWitt, N.Y.	Susp. Bridge, N.Y.	179	Sept. 1940	.63	-	-	-	-	-	-	-	2	Mohawk	-	52	36	88	3,048		-	-	-	-	-	-	-	
DeWitt, N.Y.	Susp. Bridge, N.Y.	163	Sept. 1940	.70	-	-	-	-	-	-	-	-	-	-	-	-	-	-		1	Hudson	-	-	115	115	2,750	
DeWitt, N.Y.	Susp. Bridge, N.Y.	179	Sept. 1940	.59	1	Hudson	-	26	1	27	895	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
Rochester, N.Y.	Lyons, N.Y.	35	Sept. 1940	.48	8	Mohawk	6	44	6	56	2,311	1	Mohawk	12	67	1	80	3,640		-	-	-	-	-	-	-	
Lyons, N.Y.	Gardenville, N.Y.	98	Sept. 1940	.59	-	-	-	-	-	-	-	5	Mohawk	-	31	63	94	3,380		4	Mohawk	-	18	92	110	3,091	
Lyons, N.Y.	Gardenville, N.Y.	98	Sept. 1940	.59	-	-	-	-	-	-	-	1	Hudson	-	12	84	96	2,532		-	-	-	-	-	-	-	
Lyons, N.Y.	Gardenville, N.Y.	98	Sept. 1940	.63	-	-	-	-	-	-	-	1	Mohawk	-	13	81	94	2,780		-	-	-	-	-	-	-	
Rochester, N.Y.	Gardenville, N.Y.	84	Sept. 1940	.59	2	Mohawk	-	8	57	65	1,644	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
Rochester, N.Y.	Buffalo, N.Y.	66	Sept. 1940	.59	10	Mohawk	-	24	25	49	1,777	2	Moha	-	7	71	78	1,877		-	-	-	-	-	-	-	
Rochester, N.Y.	Buffalo, N.Y.	66	Sept. 1940	.59	2	Hudson	-	32	33	65	2,407	1	Hudson	-	10	76	86	2,234		-	-	-	-	-	-	-	
Buffalo, N.Y.	Rochester, N.Y.	66	Sept. 1940	.38	8	Mohawk	1	46	2	49	2,523	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
Buffalo, N.Y.	Syracuse, N.Y	154	Sept. 1940	.48	-	-	-	-	-	-	-	4	Mohawk	7	77	9	93	4,483		-	-	-	-	-	-	-	
Buffalo, N.Y.	Lyons, N.Y.	101	Sept. 1940	.48	-	-	-	-	-	-	-	1	Mohawk	4	58	38	100	4,060		-	-	-	-	-	-	-	
Gardenville, N.Y.	Susp. Bridge, N.Y.	34	Sept. 1940	.90	6	Mohawk	-	10	41	51	1,223	4	Mohawk	-	2	80	82	1,660		5	Mohawk	-	43	71	114	3,128	
Gardenville, N.Y.	Susp. Bridge, N.Y.	34	Sept. 1940	.90	1	Mikado	-	49	13	62	1,760	3	Mikado	-	1	76	77	1,647		-	-	-	-	-	-	-	
Susp. Bridge, N.Y.	Gardenville, N.Y.	34	Sept. 1940	.66	5	Mohawk	-	33	19	52	1,700	3	Mohawk	1	44	33	78	2,427		6	Mohawk	7	17	95	112	3,503	
Susp. Bridge, N.Y.	Gardenville, N.Y.	34	Sept. 1940	.66	-	-	-	-	-	-	-	-	-	-	-	-	-	-		3	Mikado	-	22	81	103	2,513	
Newberry Jct., Pa.	Corning, N.Y.	112	Sept. 1940	.5	41	Mohawk	-	40	15	55	2,635	18	Mohawk	-	40	43	83	3,635		9	Mohawk	-	85	26	111	6,182	
Corning, N.Y.	Newberry Jct., Pa.	112	Sept. 1940	.5	45	Mohawk	2	35	15	52	2,185	21	Mohawk	-	23	61	84	2,486		6	Mohawk	1	117	118	2,605	
Avis, Pa.	Corning, N.Y.	100	Sept. 1940	.5	2	Mohawk	-	41	1	42	3,225	9	Mohawk	-	84	5	89	6,979		1	Mohawk	-	114	11	125	9,040	
Corning, N.Y.	Avis, Pa.	100	Sept. 1940	.5	2	Mohawk	-	8	33	41	1,245	3	Mohawk	-	1	78	79	1,726		3	Mohawk	-	-	119	119	2,593	
Corning, N.Y.	Avis, Pa.	100	Sept. 1940	.5	-	-	-	-	-	-	-	1	Mikado	-	-	71	71	1,420		-	-	-	-	-	-	-	
Corning, N.Y.	DeWitt, N.Y.	122	Sept. 1940	.7	10	Mohawk	1	42	10	53	3,103	31	Mohawk	-	75	12	87	5,898		-	-	-	-	-	-	-	
DeWitt, N.Y.	Corning, N.Y.	122	Sept. 1940	1.0	14	Mohawk	-	28	22	50	2,200	10	Mohawk	-	40	43	83	2,738		9	Mohawk	-	1	118	119	2,630	
DeWitt, N.Y.	Corning, N.Y.	122	Sept. 1940	1.0	1	Mikado	-	5	31	36	1,066	-	-	-	-	-	-	-		-	-	-	-	-	-	-	
Corning, N.Y.	Lyons, N.Y.	71	Sept. 1940	.7	15	Mohawk	-	43	14	57	2,785	27	Mohawk	-	48	38	86	4,317		2	Mohawk	-	30	86	116	4,120	
Lyons, N.Y.	Corning, N.Y.	71	Sept. 1940	1.0	20	Mohawk	4	36	17	57	2,167	19	Mohawk	-	42	39	81	3,015		4	Mohawk	-	25	88	113	3,248	
DeWitt, N.Y.	Southport, N.Y.	122	Sept. 1940	.2	2	Mohawk	-	-	24	24	526	2	Mohawk	-	-	75	75	1,635		-	Mohawk	-	-	103	103	2,200	
DeWitt, N.Y.	Southport, N.Y.	122	Sept. 1940	.2	4	P.R.R.	-	-	40	40	907	3	P.R.R.	-	-	75	75	1,691		-	-	-	-	-	-	-	

NAME OF RAILROAD (a)	FROM (b)	TO (c)	DISTANCE (Miles) (d)	TEN DAY PERIOD STUDIED (Mo. & Yr.) (e)	RULING GRADE (f)	70 CARS OR LESS							71 CARS TO 100 CARS								101 CARS TO 125 CARS							
						NO. TRAINS (g)	TYPE OF LOCOMOTIVE (h)	AVERAGE CONSIST A (i)	B (j)	C (k)	D (l)	TONS (m)	NO. OF TRAINS (n)	TYPE OF LOCOMOTIVE (o)	AVERAGE CONSIST A (p)	B (q)	C (r)	D (s)	TONS (t)	NO. OF TRAINS (u)	TYPE OF LOCOMOTIVE (v)	AVERAGE CONSIST A (w)	B (x)	C (y)	D (z)	TONS (aa)	
New York Central	Southport, N.Y.	DeWitt, N.Y.	122	Sept. 1940	.3	2	Mohawk	-	52	1	53	3,745	3	Mohawk	-	80	1	81	5,777	-	-	-	-	-	-	-	
	Southport, N.Y.	DeWitt, N.Y.	122	Sept. 1940	.3	2	P.R.R.	-	47	1	48	3,470	5	P.R.R.	-	79	1	80	5,601	-	-	-	-	-	-	-	
	Avis, Pa.	Cherry Tree, Pa.	145	Sept. 1940	1.05	-	-	-	-	-	-	-	7	Mikado	-	2	78	80	1,805	1	Mikado	-	1	111	112	2,5	
	Avis, Pa.	Sherry Tree, Pa.	145	Sept. 1940	1.05	-	-	-	-	-	-	-	5	Mohawk	-	1	96	97	2,072	-	-	-	-	-	-	-	
	Cherry Tree, Pa.	Avis, Pa.	145	Sept. 1940	.3	1	Mohawk	-	39	2	41	2,649	3	Mohawk	-	84	1	85	5,832	3	Mohawk	-	119	1	120	9,7	
	Cherry Tree, Pa.	Avis, Pa.	145	Sept. 1940	.3	2	Mikado	-	31	5	36	2,530	3	Mikado	-	87	1	88	6,707	2	Mikado	-	109	1	110	8,5	
	Newberry Jct., Pa.	Cherry Tree, Pa.	161	Sept. 1940	1.05	1	Mohawk	-	2	66	68	1,490	8	Mohawk	-	10	79	89	2,409	4	Mohawk	-	2	106	108	2,3	
	Cherry Tree, Pa.	Newberry Jct., Pa.	161	Sept. 1940	.65	-	-	-	-	-	-	-	6	Mohawk	-	84	2	86	6,338	5	Mohawk	-	114	4	118	8,9	
	Newberry Jct., Pa.	Clearfield, Pa.	117	Sept. 1940	1.05	12	Mohawk	-	32	28	60	2,118	7	Mohawk	-	12	80	92	2,353	1	Mohawk	-	40	70	110	4,4	
	Newberry Jct., Pa.	Clearfield, Pa.	117	Sept. 1940	1.05	1	Mikado	-	34	28	62	2,460	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Clearfield, Pa.	Newberry Jct., Pa.	117	Sept. 1940	.65	8	Mohawk	2	37	13	52	2,391	9	Mohawk	1	72	12	85	5,150	1	Mohawk	-	107	8	115	8,9	
	Clearfield, Pa.	Newberry Jct., Pa.	117	Sept. 1940	.65	-	-	-	-	-	-	-	2	Mikado	-	73	15	88	4,889	-	-	-	-	-	-	-	
	Avis, Pa.	Clearfield, Pa.	102	Sept. 1940	1.05	-	-	-	-	-	-	-	7	Mikado	-	-	79	79	1,767	-	-	-	-	-	-	-	
	Clearfield, Pa.	Avis, Pa.	102	Sept. 1940	.3	2	Mikado	-	22	11	33	1,700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Clearfield, Pa.	Avis, Pa.	102	Sept. 1940	.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	Mohawk	-	111	1	112	9,1	
	Selkirk, N.Y.	DeWitt, N.Y.	142	Sept. 1940	.58	21	Mohawk	5	36	11	52	1,891	45	Mohawk	1	49	34	84	2,733	19	Mohawk	-	15	99	114	2,8	
	DeWitt, N.Y.	Selkirk, N.Y.	142	Sept. 1940	.51	19	Mohawk	1	58	2	61	4,569	101	Mohawk	3	97	4	84	4,200	23	Mohawk	16	93	6	109	4,9	
	Mechanicville, N.Y.	DeWitt, N.Y.	142	Sept. 1940	.98	1	Mohawk	-	5	65	70	1,817	7	Mohawk	-	27	67	94	3,604	13	Mohawk	-	24	80	104	2,7	
	DeWitt, N.Y.	Mechanicville, N.Y.	142	Sept. 1940	.54	3	Mohawk	2	55	1	58	2,778	13	Mohawk	6	81	2	89	4,227	3	Mohawk	6	99	3	108	5,1	
	Rensselaer, N.Y.	DeWitt, N.Y.	142	Sept. 1940	1.63	2	Mohawk	-	40	26	66	1,941	6	Mohawk	-	44	36	80	2,670	-	-	-	-	-	-	-	
	DeWitt, N.Y.	Rensselaer, N.Y.	142	Sept. 1940	.86	1	Mohawk	3	41	15	59	2,178	17	Mohawk	4	76	9	89	4,410	1	Mohawk	3	85	22	110	5,4	
	Rensselaer, N.Y.	Syracuse, N.Y.	147	Sept. 1940	1.63	2	Mohawk	-	34	2	36	1,459	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Rensselaer, N.Y.	Syracuse, N.Y.	147	Sept. 1940	1.63	6	Hudson	-	32	2	34	1,660	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Syracuse, N.Y.	Rensselaer, N.Y.	147	Sept. 1940	.86	8	Hudson	-	29	2	31	1,611	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	West Albany, N.Y.	DeWitt, N.Y.	139	Sept. 1940	.61	-	-	-	-	-	-	-	3	Mohawk	-	25	57	82	2,332	5	Mohawk	-	45	66	111	3,5	
	Utica, N.Y.	Selkirk, N.Y.	95	Sept. 1940	.39	6	Mohawk	-	52	7	59	2,116	3	Mohawk	-	78	6	84	3,013	1	Mohawk	-	93	12	105	3,3	
	Selkirk, N.Y.	Utica, N.Y.	95	Sept. 1940	.56	3	Mohawk	-	34	13	47	1,973	2	Mohawk	-	38	43	81	2,367	2	Mohawk	-	82	28	110	3,9	
	Albany, N.Y.	Weehawken, N.J.	142	Sept. 1940	.59	4	Mikado	-	37	24	61	1,950	2	Mikado	-	53	28	81	2,590	-	-	-	-	-	-	-	
	Weehawken, N.J.	Albany, N.Y.	142	Sept. 1940	1.04	6	Mikado	20	18	1	39	1,662	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Selkirk Jct., N.Y.	Weehawken, N.J.	133	Sept. 1940	.59	26	Mikado	1	41	14	56	2,430	27	Mikado	2	61	19	82	3,731	3	Mikado	7	77	27	111	4,7	
	Weehawken, N.J.	Selkirk Jct., N.Y.	133	Sept. 1940	1.04	41	Mikado	1	39	14	54	2,345	13	Mikado	-	38	46	84	3,300	15	Mikado	-	11	96	107	3,2	
	Rensselaer, N.Y.	33rd Street, N.Y.	142	Sept. 1940	.83	9	Hudson	-	28	1	29	1,426	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	33rd Street, N.Y.	Rensselaer, N.Y.	142	Sept. 1940	1.29	2	Mohawk	-	34	1	35	1,860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	33rd Street, N.Y.	Rensselaer, N.Y.	142	Sept. 1940	1.39	6	Hudson	-	30	1	31	1,836	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Selkirk, N.Y.	72nd Street, N.Y.	136	Sept. 1940	.85	25	Mohawk	2	51	5	58	2,444	24	Mohawk	4	73	6	83	3,827	8	Mohawk	9	94	2	105	4,5	
	72nd Street, N.Y.	Selkirk, N.Y.	136	Sept. 1940	1.00	-	-	-	-	-	-	-	26	Mohawk	-	38	48	86	2,748	10	Mohawk	-	16	100	116	3,0	
	Troy, N.Y.	72nd Street, N.Y.	146	Sept. 1940	.65	8	Mohawk	-	43	10	53	2,308	1	Mohawk	1	46	31	78	2,802	-	-	-	-	-	-	-	
	Troy, N.Y.	72nd Street, N.Y.	146	Sept. 1940	.65	-	-	-	-	-	-	-	1	Hudson	1	51	23	75	3,352	-	-	-	-	-	-	-	
	72nd Street, N.Y.	Troy, N.Y.	146	Sept. 1940	.74	3	Mohawk	-	44	19	63	2,587	5	Mohawk	1	65	18	84	3,256	-	-	-	-	-	-	-	
	Selkirk, N.Y.	Westchester Ave., N.Y.	133	Sept. 1940	.35	1	Mohawk	-	49	1	50	2,449	1	Mohawk	6	78	1	85	3,712	-	-	-	-	-	-	-	
	Westchester Ave., N.Y.	Selkirk, N.Y.	133	Sept. 1940	1.00	-	-	-	-	-	-	-	1	Mohawk	-	15	76	91	2,100	8	Mohawk	-	18	88	106	2,7	
	Tarrytown, N.Y.	Selkirk, N.Y.	136	Sept. 1940	1.00	-	-	-	-	-	-	-	6	Mohawk	-	35	52	87	2,522	-	-	-	-	-	-	-	
	Chatham, N.Y.	60th Street, N.Y.	135	Sept. 1940	.75	10	Pacific	13	4	2	19	1,109															
	60th Street, N.Y.	Chatham, N.Y.	135	Sept. 1940	.80	10	Pacific	-	4	19	23	903															
	Chatham, N.Y.	30th Street, N.Y.	137	Sept. 1940	.75	18	Pacific	4	16	5	25	1,015															
	30th Street, N.Y.	Chatham, N.Y.	137	Sept. 1940	.80	18	Pacific	-	17	12	29	1,185															

TOTAL TRAINS	1,810	685	Trains 70 cars or less	787	Trains 71 cars to 100 cars	242	Trains 101 cars to 125 cars
PER CENT OF ALL TRAINS	100	37.8		43.5		13.4	
AVERAGE CARS PER TRAIN	78	51		84		112	

CONSIST D (s)	CONSIST TONS (t)	101 CARS TO 125 CARS: NO. OF TRAINS (u)	TYPE OF LOCOMOTIVE (v)	AVERAGE CONSIST A (w)	B (x)	C (y)	D (z)	TONS (aa)	126 CARS AND OVER: NO. OF TRAINS (bb)	TYPE OF LOCOMOTIVE (cc)	AVERAGE CONSIST A (dd)	B (ee)	C (ff)	D (gg)	TONS (hh)	MAXIMUM CARS PER TRAINS (ii)
81	5,777	-	-	-	-	-	-	-	-	-	-	-	-	-	-	83
80	5,601	-	-	-	-	-	-	-	-	-	-	-	-	-	-	85
80	1,805	1	Mikado	-	1	111	112	2,520	1	Mikado	-	2	124	126	2,630	126
97	2,072	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
85	6,832	3	Mohawk	-	119	1	120	9,733	-	-	-	-	-	-	-	124
78	6,767	3	Mikado	-	109	1	110	8,538	-	-	-	-	-	-	-	112
89	2,409	4	Mohawk	-	2	106	108	2,392	-	-	-	-	-	-	-	123
86	6,338	5	Mohawk	-	114	1	115	8,993	5	Mohawk	-	125	1	126	9,928	126
92	2,353	1	Mohawk	-	40	70	110	4,495	-	-	-	-	-	-	-	110
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	62
85	5,150	1	Mohawk	-	107	8	115	8,968	1	Mohawk	-	113	13	126	10,040	126
88	4,889	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95
79	1,767	-	-	-	-	-	-	-	-	-	-	-	-	-	-	89
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44
-	-	1	Mohawk	-	111	1	112	9,196	-	-	-	-	-	-	-	112
84	2,733	19	Mohawk	-	15	99	114	2,661	36	Mohawk	-	2	127	129	2,618	131
84	4,200	23	Mohawk	10	93	6	109	4,977	-	-	-	-	-	-	-	125
94	2,604	13	Mohawk	-	24	80	104	2,763	-	-	-	-	-	-	-	113
89	4,217	3	Mohawk	6	99	3	108	5,115	1	Mohawk	1	124	1	126	5,511	126
80	2,670	-	-	-	-	-	-	-	-	-	-	-	-	-	-	85
89	4,410	1	Mohawk	3	85	22	110	5,442	-	-	-	-	-	-	-	110
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40
82	2,332	5	Mohawk	-	46	66	111	3,524	1	Mohawk	-	47	83	130	4,195	130
84	3,019	1	Mohawk	-	93	12	105	3,328	-	-	-	-	-	-	-	105
81	2,367	2	Mohawk	-	82	28	110	3,902	-	-	-	-	-	-	-	116
81	2,490	-	-	-	-	-	-	-	-	-	-	-	-	-	-	89
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66
82	3,731	3	Mikado	7	77	27	111	4,761	-	-	-	-	-	-	-	119
84	3,300	15	Mikado	-	11	96	107	3,285	2	Mikado	-	28	103	131	4,183	135
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33
83	3,827	8	Mohawk	9	94	2	105	4,502	-	-	-	-	-	-	-	113
86	2,748	10	Mohawk	-	16	100	116	3,028	3	Mohawk	-	12	115	127	2,936	127
78	2,802	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78
75	3,052	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75
84	3,256	-	-	-	-	-	-	-	-	-	-	-	-	-	-	97
85	3,712	-	-	-	-	-	-	-	-	-	-	-	-	-	-	85
91	2,100	8	Mohawk	-	18	88	106	2,716	-	-	-	-	-	-	-	121
87	2,522	-	-	-	-	-	-	-	-	-	-	-	-	-	-	99

		242	Trains 101 cars to 125 cars						96	Trains 126 cars and over						
		13.4							5.3							
		112							128							

Defendant's Exhibit No. 15 (Witness J.H. Parmelee)
Nov. 26, 1940

GROSS EXPENDITURES FOR ADDITIONS AND BETTERMENTS TO RAILWAY PROPERTY

Railways of Class I* in the United States

Year (a)	Equipment (b)	Roadway and Structures (c)	General (d)	Total (e)
1922	$247 938 857	$222 722 260	$3 361 652	$474 022 769
1923	675 867 927	359 835 381	2 710 290	1 038 413 598
1924	513 812 571	382 393 559	6 551 694	902 757 824
1925	361 766 402	389 118 732	2 709 900	753 595 034
1926	379 617 126	448 975 693	2 775 858	831 368 677
1927	307 592 075	449 460 655	6 947 635	764 000 365
1928	243 762 380	418 497 065	6 085 998	668 345 443
1929	325 558 388	499 840 689	4 023 532	829 422 609
1930	335 321 987	459 955 274	5 936 679	801 213 940
Total 1922-30	$3 391 237 713	$3 630 799 308	$41 103 238	$7 063 140 259
1931	$80 427 490	$227 753 692	$3 617 919	$311 799 101
1932	46 072 570	112 911 101	3 758 497	162 742 168
1933	18 778 389	87 024 597	Cr. 255 841	105 547 145
1934	69 510 527	106 820 589	2 951 173	179 282 289
1935	82 788 441	106 507 359	755 338	190 051 138
1936	189 046 650	113 183 041	505 125	302 734 816
1937	365 798 535	170 754 214	1 360 069	537 912 818
1938	132 329 072	126 367 579	228 609	258 925 260
1939	143 227 607	107 446 549	617 859	251 292 015
Total 1931-39	$1 127 979 281	$1 158 768 721	$13 538 748	$2 300 286 750
Grand total	$4 519 216 994	$4 789 568 029	$54 641 986	$9 363 427 009

* Including lessor companies.

SOURCE: "Statistics of Railways in the United States," published by the Interstate Commerce Commission. Table 138 (old 47) and Table 139 (old 47-A), pages S-122-24, year 1938 and corresponding tables for prior years. Data for 1939 compiled by and on file in Bureau of Statistics, Interstate Commerce Commission.

Defendant's Exhibit No. 16 (Witness J.H. Parmelee)
Nov. 26, 1940

Defts. Ex. No.

AVERAGE REVENUE PER TON-MILE AND PER PASSENGER-MILE

Railways of Class I in the United States

Year	Average revenue per ton-mile (cents)	Average revenue per passenger-mile (cents)
(a)	(b)	(c)
1939	0.973	1.849
1938	0.983	1.870
1937	0.935	1.790
1936	0.974	1.840
1935	0.988	1.930
1934	0.978	1.920
1933	0.999	2.010
1932	1.046	2.220
1931	1.051	2.510
1930	1.063	2.717
1929	1.076	2.808
1928	1.081	2.850
1927	1.080	2.896
1926	1.081	2.936
1925	1.097	2.938
1924	1.116	2.978
1923	1.116	3.018
1922	1.177	3.027

SOURCE: Annual issues of "Statistics of Railways in the United States," published by the Interstate Commerce Commission. Table 44 (old 25), pp. 8-40-41, year 1938, and corresponding tables for prior years. Data for 1939 compiled by and on file in Bureau of Statistics, Interstate Commerce Commission.

Defendant's Exhibit No. 17 (Witness J.H.Parmelee)
Nov. 26, 1940

NUMBER, MAN-HOURS AND EARNINGS OF EMPLOYEES

Railways of Class I in the United States

Year (a)	Average number (b)	Man-hours paid for (*) (c)	Total compensation (d)	Average earnings per employee: Per hour (cents) (e)	Average earnings per employee: Per Year (f)
1939	987 675	2 488 634 605	$1 863 333 736	74.9	$1 887
1938	939 171	2 329 606 268	1 746 140 636	75.0	1 859
1937	1.114 663	2 799 538 883	1·985 446 718	70.9	1 781
1936	1 065 624	2 675 345 058	1 848 635 804	69.1	1 735
1935	994 371	2 397 352 876	1 643 878 510	68.6	1 653
1934	1 007 702	2 393 898 745	1 519 351 725	63.5	1 508
1933	971 196	2 233 044 895	1 403 840 833	62.9	1 445
1932	1 031 703	2 378 205 722	1 512 816 147	63.6	1 466
1931	1 258 719	3 039 110 118	2 094 994 379	68.9	1 664
1930	1 487 839	3 759 772 082	2 550 788 519	67.8	1 714
1929	1 660 850	4 346 821 546	2 896 566 351	66.6	1 744
1928	1 656 411	4 313 574 214	2 826 590 471	65.5	1 706
1927	1 735 105	4 519 281 339	2 910 182 848	64.4	1 677
1926	1 779 275	4 671 735 589	2 946 114 354	63.1	1 656
1925	1 744 311	4 531 361 471	2 860 599 920	63.1	1 640
1924	1 751 362	4 534 878 818	2 825 775 181	62.3	1 613
1923	1 857 674	4 928 651 132	3 004 071 882	61.0	1 617
1922	1 626 834	4 311 097 145	2 640 817 005	61.3	1 623

(*) Days worked by employees paid on a daily basis converted to hours at 8 hours per day.

SOURCE: Annual issues of "Statistics of Railways in the United States," published by the Interstate Commerce Commission. Table 67 (old 16), page 3-56, year 1938, and corresponding tables for prior years. Data for 1939 compiled by and on file in Bureau of Statistics, Interstate Commerce Commission.

Deferdant's Exhibit No. 18 (Witness J.H. Parmelee)
Nov. 26, 1940

NUMBER, MAN-HOURS AND EARNINGS OF TRAIN AND ENGINE SERVICE EMPLOYEES

Railways of Class I in the United States

Year	Average number	Man-hours paid for	Total compensation	Average earnings per employee	
				Per hour (cents)	Per year
(a)	(b)	(c)	(d)	(e)	(f)
1939	209 749	574 960 356	$529 858 642	92.2	$2 526
1938	202 684	536 863 220	495 753 927	92.3	2 446
1937	236 231	639 028 323	561 927 671	87.9	2 379
1936	225 167	613 413 876	531 553 734	86.7	2 361
1935	206 995	537 884 384	458 646 256	85.3	2 216
1934	208 739	529 756 480	417 052 685	78.7	1 998
1933	199 312	501 123 177	389 512 357	77.7	1 954
1932	198 209	515 751 740	404 768 405	78.5	2 042
1931	238 831	643 183 321	554 079 025	86.1	2 320
1930	277 241	777 503 508	671 482 494	86.4	2 422
1929	306 566	895 867 619	775 977 397	86.6	2 531
1928	303 986	878 313 125	755 075 792	86.0	2 484
1927	315 143	910 815 553	765 392 961	84.0	2 429
1926	324 788	954 699 942	776 673 546	81.4	2 391
1925	315 344	892 238 616	747 863 011	83.8	2 372
1924	313 646	882 181 017	722 332 331	81.9	2 303
1923	337 228	974 237 926	768 287 069	78.9	2 278
1922	297 084	835 988 624	661 418 560	79.1	2 226

SOURCE: Annual issues of "Statistics of Railways in the United States," published by the Interstate Commerce Commission. Table 67 (old 16) page S-5[illegible], year 1938, and corresponding tables for prior years. Data for 1939 compiled by and on file in Bureau of Statistics, Interstate Commerce Commission.

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Defendant's Exhibit No. 19 (Witness J.H. Parmelee)
Nov. 26, 1940

INCOME ACCOUNT - RAILWAYS OF CLASS I IN THE UNITED STATES

Calendar Years 1929 to 1939

(Figures in millions of dollars)

ITEM (b)	1929 (c)	1930 (d)	1931 (e)	1932 (f)	1933 (g)	1934 (h)	1935 (i)	1936 (j)	1937 (k)	1938 (l)	1939 (m)
Total operating revenues	$6,279.5	$5,281.2	$4,188.3	$3,120.7	$3,095.4	$3,271.6	$3,451.9	$4,052.7	$4,166.1	$3,565.5	$3,995.0
Total operating expenses	4,506.0	3,930.9	3,223.6	2,403.4	2,249.2	2,441.8	2,592.7	2,931.4	3,119.1	2,722.2	2,918.2
Operating ratio - per cent	71.76	74.43	76.98	76.87	72.66	74.64	75.11	72.33	74.87	76.35	73.05
Net operating revenue	1,773.5	1,350.3	964.7	723.3	846.2	829.8	859.2	1,121.3	1,047.0	843.3	1,076.8
Railway tax accruals	396.7	348.6	303.5	275.1	249.6	239.6	236.9	319.8	325.7	340.8	355.7
Uncollectible railway revenues	1.2	1.0	0.9	1.0	1.2	1.2	1.2	-	-	-	-
Equipment rents - net debit	95.4	99.8	99.2	85.1	85.0	89.8	85.7	94.5	95.0	94.9	96.5
Joint facility rents - net debit	28.5	32.0	35.5	35.8	36.1	36.5	35.6	39.7	36.1	34.7	35.8
Net railway operating income	1,251.7	868.9	525.6	326.3	474.3	462.7	499.8	667.3	590.2	372.9	588.8
Return on property investment - per cent	4.81	3.28	1.99	1.24	1.82	1.78	1.93	2.57	2.27	1.43	2.25
Other income	359.7	358.9	305.6	224.5	211.0	203.2	187.7	184.5	174.6	155.3	161.0
Total income	1,611.4	1,227.8	831.2	550.8	685.3	665.9	687.5	851.8	764.8	528.2	749.8
Interest on funded debt	498.6	496.3	500.1	500.0	498.3	481.9	476.5	458.9	454.0	447.2	438.3
Interest on unfunded debt	12.7	12.5	17.8	24.6	26.2	29.1	32.5	34.8	37.2	41.5	48.0
Rent for leased roads	177.4	170.6	150.7	138.0	150.2	151.2	149.3	149.7	147.8	136.1	143.7
Other deductions	25.9	24.5	27.8	27.4	16.5	20.6	21.7	23.8	27.7	26.9	26.6
Total deductions	714.6	703.9	696.4	690.0	691.2	682.8	680.0	687.2	666.7	651.7	656.6
Net income	$896.8	$523.9	$134.8	Def $139.2	Def $5.9	Def $16.9	$7.5	$164.6	$98.1	Def $123.5	$93.2

SOURCE: Annual issues of "Statistics of Railways in the United States, published by the Interstate Commerce Commission, Table 113 (old 33), pp. S-95-97, Year 1938, and corresponding tables for prior years. Data for 1939 compiled by and on file in Bureau of Statistics, Interstate Commerce Commission. Rate of return on property investment (item 10) computed, based on investment in road and equipment, including materials and supplies and cash.

Defendant's Exhibit No. 20 (Witness J.H. Parmelee)
Nov. 26, 1940

RAILWAYS OF CLASS I IN THE UNITED STATES

FREIGHT OPERATING AND FREIGHT TRANSPORTATION EXPENSES

Calendar years 1922 to 1939, inclusive

Year	Revenue ton-miles	Freight operating expenses	Freight transportation expenses	Averages per 1,000 revenue ton-miles	
				Freight operating expenses	Freight transportation expenses
(a)	(b)	(c)	(d)	(e)	(f)
1939	333 438 412 000	$2 142 978 114	$1 047 799 482	$6.43	$3.14
1938	290 084 371 000	1 967 626 335	987 483 307	6.78	3.40
1937	360 620 269 000	2 310 115 609	1 127 384 755	6.41	3.13
1936	339 245 826 000	2 171 315 564	1 047 174 407	6.40	3.09
1935	282 036 932 000	1 870 813 674	908 540 097	6.63	3.22
1934	268 710 507 000	1 766 073 788	843 496 586	6.57	3.14
1933	249 223 180 000	1 615 745 153	771 729 804	6.48	3.10
1932	233 977 009 000	1 693 926 052	813 456 213	7.24	3.48
1931	309 224 879 000	2 302 772 090	1 104 347 131	7.45	3.57
1930	383 449 588 000	2 848 168 947	1 348 598 585	7.43	3.52
1929	447 321 561 000	3 330 206 865	1 551 218 301	7.44	3.47
1928	432 915 185 000	3 254 038 603	1 533 152 191	7.52	3.54
1927	428 736 962 000	3 362 723 443	1 581 934 179	7.84	3.69
1926	443 746 487 000	3 455 818 287	1 625 378 810	7.79	3.66
1925	413 814 261 000	3 339 486 272	1 580 688 257	8.07	3.82
1924	388 415 312 000	3 312 213 685	1 585 555 112	8.53	4.08
1923	412 727 228 000	3 666 250 197	1 739 945 455	8.88	4.22
1922	339 285 348 000	3 224 809 492	1 566 744 960	9.50	4.62
Total 1936-1939	1 323 388 878 000	8 592 035 622	4 209 841 951	Average 6.49	3.18
Total 1922-1925	1 554 242 149 000	13 542 759 646	6 472 933 784	Average 8.71	4.16
Percent of improvement 4 years 1936-1939 compared with					

Year	Revenue ton-miles	Freight operating expenses	Freight transportation expenses	Average per 1,000 revenue ton-miles	
				Freight operating expenses	Freight transportation expenses
(a)	(b)	(c)	(d)	(e)	(f)
1939	333 438 412 000	$2 142 978 114	$1 047 799 482	$6.43	$3.14
1938	290 084 371 000	1 967 626 335	987 483 307	6.78	3.40
1937	360 620 269 000	2 310 115 609	1 127 384 755	6.41	3.13
1936	339 245 826 000	2 171 315 564	1 047 174 407	6.40	3.09
1935	282 036 932 000	1 870 813 674	908 540 097	6.63	3.22
1934	268 710 507 000	1 766 073 788	843 496 586	6.57	3.14
1933	249 223 180 000	1 615 745 153	771 729 804	6.48	3.10
1932	233 977 009 000	1 693 926 052	813 456 213	7.24	3.48
1931	309 224 879 000	2 302 772 090	1 104 347 131	7.45	3.57
1930	383 449 588 000	2 848 168 947	1 348 598 585	7.43	3.52
1929	447 321 561 000	3 330 206 865	1 551 218 301	7.44	3.47
1928	432 915 185 000	3 254 038 603	1 533 152 191	7.52	3.54
1927	428 736 962 000	3 362 723 443	1 581 934 179	7.84	3.69
1926	443 746 487 000	3 455 818 287	1 625 378 810	7.79	3.66
1925	413 814 261 000	3 339 486 272	1 580 688 257	8.07	3.82
1924	388 415 312 000	3 312 213 685	1 585 555 112	8.53	4.08
1923	412 727 228 000	3 666 250 197	1 739 945 455	8.88	4.22
1922	339 285 348 000	3 224 809 492	1 566 744 960	9.50	4.62
Total 1936-1939	1 323 388 878 000	8 592 035 622	4 209 841 951	Average 6.49	3.18
Total 1922-1925	1 554 242 149 000	13 542 759 646	6 472 933 784	Average 8.71	4.16
Percent of improvement 4 years 1936-1939 compared with 4 years 1922-1925				25.5	23.6

SOURCE: Annual issues of "Statistics of Railways in the United States," published by the Interstate Commerce Commission as follows:

1. Revenue ton-miles from Table 44 (old 25), page S-41, year 1938, and corresponding tables for prior years.
2. Freight operating expenses and freight transportation expenses from Table 86 (old 36), page S-79, year 1938, and corresponding tables for prior years.
3. Data for 1939 compiled by and on file in Bureau of Statistics, Interstate Commerce Commission.
4. Averages per 1,000 revenue ton-miles computed from basic data shown in adjoining columns.

Defendant s Exhibit No. 21 (Witness J.H. Parmelee)
Nov. 26, 1940

RAILWAYS OF CLASS I IN THE UNITED STATES

PASSENGER OPERATING AND PASSENGER TRANSPORTATION EXPENSES

Calendar years 1922 to 1939, inclusive

Year	Passenger-train car-miles	Passenger operating expenses	Passenger transportation expenses	Averages per passenger-train car-mile	
				Passenger operating expenses (cents)	Passenger transportation expenses (cents)
(a)	(b)	(c)	(d)	(e)	(f)
1939	2 976 512 696	$764 661 373	$364 807 341	25.69	12.26
1938	2 923 626 926	744 038 543	369 285 079	25.45	12.63
1937	3 080 215 178	796 541 559	377 247 512	25.86	12.25
1936	2 919 219 824	749 450 897	354 004 065	25.67	12.13
1935	2 710 574 105	717 492 334	340 848 348	26.47	12.57
1934	2 648 136 019	671 758 390	317 085 754	25.37	11.97
1933	2 566 306 365	629 944 862	303 202 286	24.55	11.81
1932	2 799 941 979	706 932 389	340 861 474	25.25	12.17
1931	3 317 937 177	917 088 041	434 122 087	27.64	13.08
1930	3 726 888 177	1 078 652 206	493 129 386	28.94	13.23
1929	3 906 232 674	1 170 509 864	520 793 967	29.97	13.33
1928	3 849 185 627	1 167 823 870	528 056 716	30.34	13.72
1927	3 881 058 706	1 205 133 234	545 543 942	31.05	14.06
1926	3 885 700 975	1 207 148 205	546 508 002	31.07	14.06
1925	3 795 046 896	1 189 739 221	547 769 127	31.35	14.43
1924	3 696 048 994	1 188 675 319	555 885 343	32.16	15.04
1923	3 634 920 429	1 222 826 322	569 666 172	33.64	15.67
1922	3 465 765 684	1 184 875 220	574 210 592	34.19	16.57
Total 1936-1939	11 899 574 624	3 054 692 372	1 465 343 997	Average 25.67	12.31
Total 1922-1925	14 591 782 003	4 786 116 082	2 247 531 234	Average 32.80	15.40
Percent of improvement 4 years 1936-1939 compared with 4 years 1922-1925				21.74	20.06

SOURCE: Annual issues of "Statistics of Railways in the United States," published by the Interstate Commerce Commission, as follows:

1. Passenger-train car-miles from Table 55 (old 31), page S-49, year 1938, and corresponding tables for prior years.
2. Passenger operating expenses and passenger transportation expenses from Table 86 (old 36), page S-79, year 1938, and corresponding

PASSENGER OPERATING AND PASSENGER TRANSPORTATION EXPENSES

Calendar years 1922 to 1939, inclusive

Year	Passenger-train car-miles	Passenger operating expenses	Passenger transportation expenses	Averages per passenger-train car-mile	
				Passenger operating expenses (cents)	Passenger transportation expenses (cents)
(a)	(b)	(c)	(d)	(e)	(f)
1939	2 976 512 696	$764 661 373	$364 807 341	25.69	12.26
1938	2 923 626 926	744 038 543	369 285 079	25.45	12.63
1937	3 080 215 178	796 541 559	377 247 512	25.86	12.25
1936	2 919 219 824	749 450 897	354 004 065	25.67	12.13
1935	2 710 574 105	717 492 334	340 848 348	26.47	12.57
1934	2 648 136 019	671 758 390	317 085 754	25.37	11.97
1933	2 566 306 365	629 944 862	303 202 286	24.55	11.81
1932	2 799 941 979	706 932 389	340 861 474	25.25	12.17
1931	3 317 937 177	917 088 041	434 122 087	27.64	13.08
1930	3 726 888 177	1 078 652 206	493 129 386	28.94	13.23
1929	3 906 232 674	1 170 509 864	520 793 967	29.97	13.33
1928	3 849 185 627	1 167 823 870	528 056 716	30.34	13.72
1927	3 881 058 706	1 205 133 234	545 543 942	31.05	14.06
1926	3 885 700 975	1 207 148 205	546 508 002	31.07	14.06
1925	3 795 046 896	1 189 739 221	547 769 127	31.35	14.43
1924	3 696 048 994	1 188 675 319	555 885 343	32.16	15.04
1923	3 634 920 429	1 222 826 322	569 666 172	33.64	15.67
1922	3 465 765 684	1 184 875 220	574 210 592	34.19	16.57
Total 1936-1939	11 899 574 624	3 054 692 372	1 465 343 997	Average 25.67	12.31
Total 1922-1925	14 591 782 003	4 786 116 082	2 247 531 234	Average 32.80	15.40
Percent of improvement 4 years 1936-1939 compared with 4 years 1922-1925				21.74	20.06

SOURCE: Annual issues of "Statistics of Railways in the United States," published by the Interstate Commerce Commission, as follows:

1. Passenger-train car-miles from Table 55 (old 31), page S-49, year 1938, and corresponding tables for prior years.
2. Passenger operating expenses and passenger transportation expenses from Table 86 (old 36), page S-79, year 1938, and corresponding tables for prior years.
3. Data for 1939 compiled by and on file in Bureau of Statistics, Interstate Commerce Commission.
4. Averages per passenger-train car-mile computed from basic data shown in adjoining columns.

Defendant's Exhibit No. 22 (Witness J.H. Parmelee)
Nov. 26, 1940

RAILWAYS OF CLASS I IN THE UNITED STATES

FREIGHT SERVICE OPERATING AVERAGES
Calendar years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 and 1939

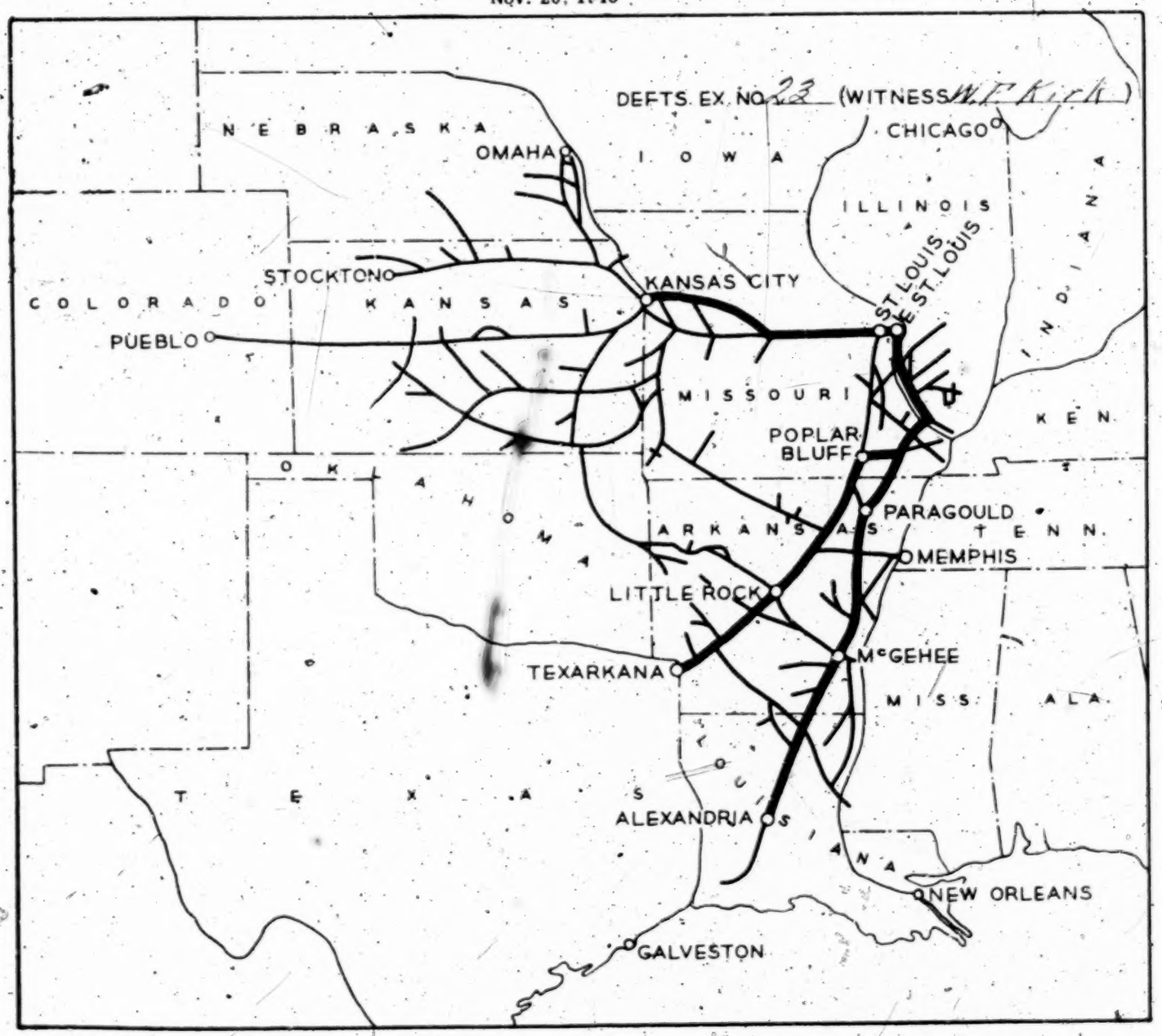
ITEM (b)	1922 (c)	1924 (d)	1926 (e)	1928 (f)	1930 (g)	1932 (h)	1934 (i)	1936 (j)	1938 (k)	1939 (l)	PERCENT INCREASE 1939 OVER 1922 (m)
Miles of line operated in freight service ...	234 517	234 592	235 594	239 006	240 195	240 208	237 146	234 687	232 967	232 026	d 1.1
Freight train-miles	555 789 000	600 682 000	632 927 000	602 433 000	538 169 000	390 839 000	421 384 000	486 255 000	422 676 000	452 277 000	d 18.6
Freight cars per freight train	38.4	41.7	45.2	48.1	48.9	44.8	46.2	46.4	47.7	49.1	27.9
Net tons per freight train	676	715	772	792	784	663	706	774	759	813	20.3
Average tractive power per locomotive(pounds)	37 441	39 891	41 886	43 838	45 225	46 299	47 712	48 972	49 803	50 395	34.6
Average capacity per freight-carrying car (tons)	43.1	44.3	45.1	45.8	46.6	47.0	48.0	48.8	49.4	49.7	15.3
Freight train speed (m.p.h.)	11.1	11.5	11.9	12.9	13.8	15.5	15.9	15.8	16.6	16.7	50.5
Gross ton-miles per freight train-hour	16 188	18 257	20 692	23 600	25 837	26 042	28 040	29 200	31 141	32 808	102.7
Net ton-miles per freight train-hour	7 479	8 222	9 201	10 183	10 836	10 265	11 225	12 146	12 473	13 449	79.8
Gross ton-miles (exclusive of locomotives and tenders) per ton of fuel	10 750	11 775	12 915	13 943	14 528	14 086	14 297	14 592	15 207	15 528	44.4

d - Decrease

SOURCE: Items 1, 2, 3, 4, 7, 8, 9 and 10, from Interstate Commerce Commission's summary of "Freight Train Performance of Class I Steam Railways in the United States," Statement No. M-211 (OS-A), December, 1939, and prior issues; summary of "Fuel and Power for Locomotives and Rail Motor Cars of Class I Steam Railways in the United States," Statement No. M-230 (OS-E), December, 1939, and prior issues.

Items 5 and 6, from Interstate Commerce Commission's "Statistics of Railways in the United States," Table 18 (old 8), page S-16, and Table 27 (old 9), page S-22, for year 1938, and corresponding tables for prior years; figures for 1939 compiled by and on file in Bureau of Statistics, Interstate Commerce Commission.

Defendant s Exhibit No. 23 (Witness W.F. Kirk)
Nov. 26, 1940



MISSOURI PACIFIC RAILROAD CO.

HEAVY LINE INDICATES TERRITORY COVERED BY TYPICAL FREIGHT TRAIN EXHIBIT.

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MISSOURI PACIFIC RAILROAD COMPANY

FREIGHT OPERATING AND FREIGHT TRANSPORTATION EXPENSES RELATED TO TRAFFIC

Calendar Years 1922 to 1939, Inclusive

Year	Revenue ton-miles	Freight operating expenses	Freight transportation expenses	Averages per 1,000 revenue ton-miles	
				Freight operating expenses	Freight transportation expenses
(a)	(b)	(c)	(d)	(e)	(f)
1939	7,671,841,720	$51,042,259	$23,739,113	$6.65	$3.09
1938	7,457,231,356	49,577,354	23,589,584	6.65	3.16
1937	9,029,169,796	55,710,460	26,736,377	6.17	2.96
1936	8,492,874,166	53,724,006	25,347,853	6.33	2.98
1935	6,737,978,069	45,753,873	21,709,358	6.79	3.22
1934	6,761,819,795	44,683,953	20,621,995	6.61	3.05
1933	6,070,963,102	39,773,213	18,966,796	6.55	3.12
1932	5,855,608,791	40,503,373	20,595,141	6.92	3.52
1931	8,212,029,322	53,748,916	27,262,818	6.55	3.32
1930	10,363,948,532	68,130,796	33,382,257	6.57	3.22
1929	11,051,806,038	79,142,337	37,242,365	7.16	3.37
1928	10,312,288,840	75,856,299	35,264,595	7.36	3.42
1927	9,386,122,064	75,602,620	35,792,025	8.05	3.81
1926	10,132,034,120	78,421,454	36,936,516	7.74	3.65
1925	9,564,442,764	78,751,567	37,743,462	8.23	3.95
1924	8,773,081,103	74,149,942	36,157,790	8.45	4.12
1923	7,416,475,588	72,816,835	34,020,808	9.82	4.59
1922	5,995,683,688	62,772,131	30,093,150	10.47	5.02
Total 1936-1939	32,651,117,038	210,054,079	99,412,927	6.43	3.04
Total 1922-1925	31,749,683,143	288,490,475	138,015,210	9.09	4.35
Percent of improvement 4 years 1936-1939 compared with 4 years 1922-1925				29.3	30.1

SOURCE: Revenue ton-miles - Annual reports to Interstate Commerce Commission.
Freight operating and transportation expenses - Annual reports to Interstate Commerce Commission.

Defendant's Exhibit No. 25 (Witness W. F. Kirk).
Nov. 27, 1940

MISSOURI PACIFIC RAILROAD COMPANY

FREIGHT SERVICE OPERATING AVERAGES

Calendar Years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 and 1939

Item (b)	1922 (c)	1924 (d)	1926 (e)	1928 (f)	1930 (g)	1932 (h)	1934 (i)	1936 (j)	1938 (k)	1939 (l)	Per Cent of Increase 1939 over 1922 (m)
Miles of line operated in freight service ..	7 224.37	7 300.20	7 309.67	7 416.99	7 423.43	7 406.61	7 321.33	7 192.14	7 146.00	7 146.00	Dec. 1.08
Freight train miles	12 051 416	15 599 959	16 707 916	16 651 369	16 655 025	12 666 580	13 357 272	14 928 958	12 738 176	12 885 134	6.92
Freight cars per freight train	35.2	39.6	44.8	46.3	47.9	41.9	45.0	44.7	46.0	46.6	32.4
Net tons per freight train	616	667	717	729	824	557	611	673	696	711	15.4
Average tractive power per locomotive (Lbs.)	33 083	37 542	39 510	42 519	42 926	43 280	44 435	46 505	46 530	46 787	41.4
Average capacity per freight carrying car (Tons)	37.2	40.2	40.0	40.7	42.7	42.5	46.0	46.8	47.8	47.4	27.4
Freight train speed (m.p.h.)	11.7	11.3	12.6	13.7	14.8	17.2	17.9	17.5	17.9	18.0	53.9
Gross ton miles per freight train hour	15 597	16 714	20 934	23 803	26 722	26 403	29 944	30 780	32 611	33 356	113.9
Net ton miles per freight train hour	7 185	7 507	9 029	10 002	10 713	9 583	10 924	11 730	12 412	12 726	77.1
Gross ton miles (Exclusive of locomotives and tenders) per ton of fuel	11 329	12 714	14 123	14 640	15 198	14 004	14 731	14 268	15 008	15 229	34.4

SOURCE: Items 1-4, 7 and 8 - Reports of Freight Train Performance, Form OS-A, filed with Interstate Commerce Commission.

Item 5 - Total tractive effort - total steam locomotives available for service at close of each year as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 6 - Aggregate capacity of all freight carrying cars - total number of such cars available for service at close of year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 9 - Net ton miles - train hours as reported on Form OS-A to Interstate Commerce Commission.

Item 10 - Gross ton miles (cars, contents and cabooses) - equated net tons of fuel consumed as reported in years 1922, 1930, 1932 and 1934 on Form OS-A to Interstate Commerce Commission and as reported in years 1936, 1938, and 1939 in Schedule 531 and 571 respectively, of Annual Report to Interstate Commerce Commission.

Defendant's Exhibit No. 26 (Witness W.F. Kirk)
Nov. 27. 1940

EXPLANATION OF SYMBOLS USED BELOW UNDER HEADING "AVERAGE CONSIST"

A - Perishable loads
B - Other loads
C - Empty cars and includes caboose
D - Total all cars

MISSOURI PACIFIC RAILROAD COMPANY

TYPICAL EXAMPLES OF FREIGHT TRAINS HANDLED BETWEEN CERTAIN TERMINALS, APRIL 1ST - 10TH INCLUSIVE 1939

NAME OF RAILROAD	FROM	TO	DISTANCE (Miles)	TEN DAY PERIOD STUDIED (Mo. & Yr.)	RULING GRADE	70 CARS OR LESS							71 CARS TO 100 CARS							NO. OF TRAINS
						NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	
Missouri Pacific	St. Louis, Mo.	Kansas City, Mo.	284	April 1939	1.00	10	Berkshire	2	54	7	63	2,251	15	Berkshire	3	60	17	80	3,287	12
	Kansas City, Mo.	St. Louis, Mo.	284	April 1939	1.00	8	Berkshire	8	42	14	64	2,669	15	Berkshire	17	42	27	86	3,703	17
	Dupo, Ill.	Paragould, Ark.	228	April 1939	.50	8	Mikado	0	44	15	59	2,248	2	Mikado	0	50	21	71	2,823	10
	Paragould, Ark.	Dupo, Ill.	228	April 1939	.50	1	Mikado	13	45	7	65	3,035	17	Mikado	49	27	10	86	4,002	2
	Paragould, Ark.	McGehee, Ark.	188	April 1939	1.10	-	-	-	-	-	-	-	10	Mikado	0	60	28	88	3,448	7
	McGehee, Ark.	Paragould, Ark.	188	April 1939	.35	-	-	-	-	-	-	-	17	Mikado	49	33	10	92	4,359	1
	McGehee, Ark.	Alexandria, La.	191	April 1939	.64	8	Mikado	0	61	5	66	2,933	10	Mikado	0	41	45	86	3,064	12
	Alexandria, La.	McGehee, Ark.	191	April 1939	.58	9	Mikado	0	56	7	63	3,040	10	Mikado	30	44	17	91	4,302	10
	Dupo, Ill.	Poplar Bluff, Mo.	191	April 1939	.88	4	Mikado	0	34	32	66	2,627	23	Mikado	0	40	41	81	2,805	3
	Poplar Bluff, Mo.	Dupo, Ill.	191	April 1939	.30	6	Mikado	14	33	12	59	2,567	9	Mikado	8	46	35	89	3,685	15
	Poplar Bluff, Mo.	Little Rock, Ark.	179	April 1939	.45	15	Mikado	0	42	21	63	2,332	19	Mikado	0	48	38	86	3,116	3
	Little Rock, Ark.	Poplar Bluff, Mo.	179	April 1939	.35	14	Mikado	6	40	12	58	2,264	11	Mikado	8	56	20	84	3,422	10
	Little Rock, Ark.	Texarkana, Ark.	146	April 1939	1.12	13	Mikado	0	49	13	62	2,292	25	Mikado	0	30	50	80	2,480	-
	Texarkana, Ark.	Little Rock, Ark.	146	April 1939	.80	21	Mikado	13	35	10	58	2,481	14	Mikado	14	36	33	83	2,947	2
	TOTAL TRAINS		418			117	Trains 70 cars or less						197	Trains 71 cars to 100 cars.						104
	PER CENT OF ALL TRAINS		100			28							47.1							24.9
	AVERAGE CARS PER TRAIN		86			61							85							116

ess W.F. Kirk)

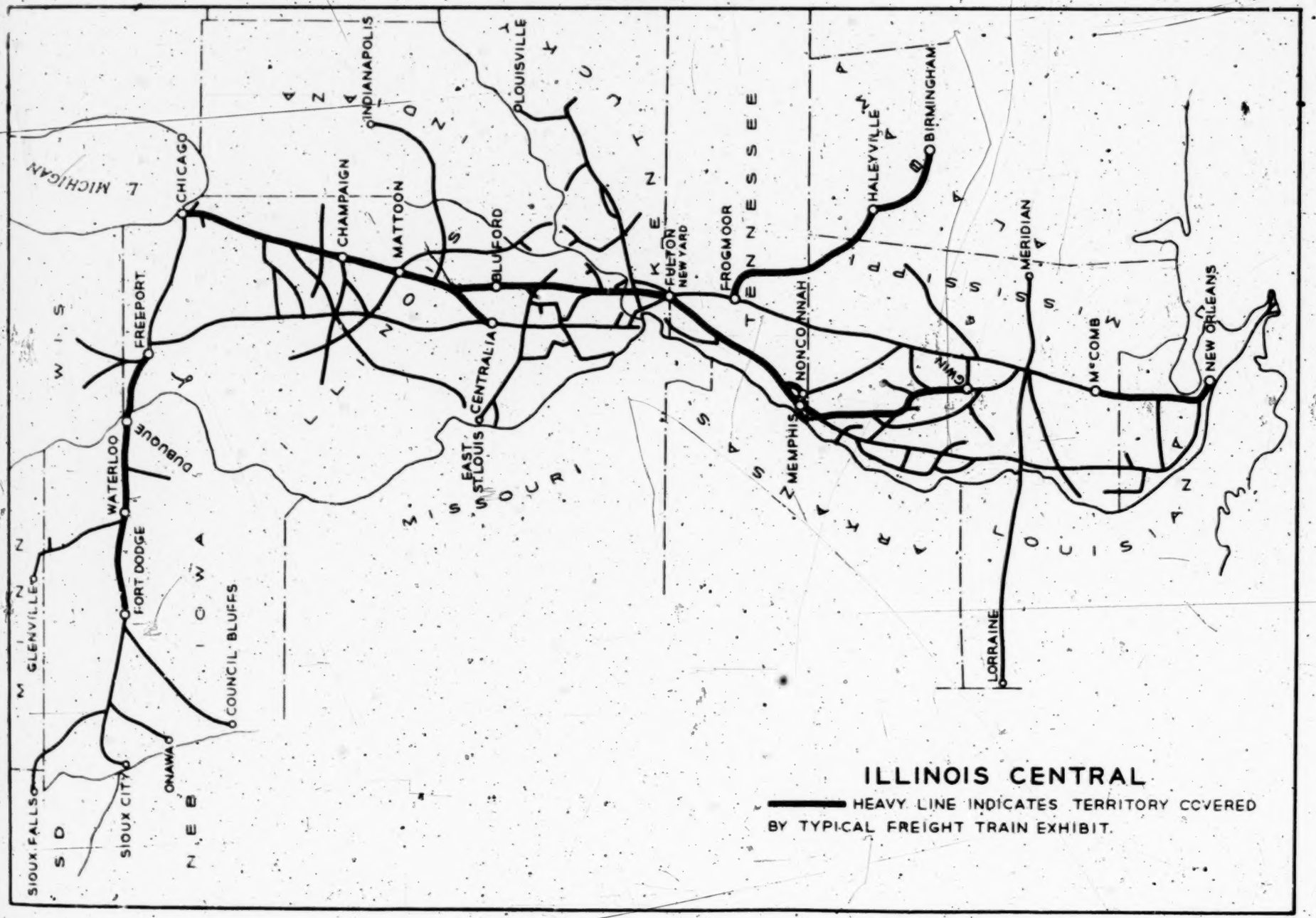
PANY

INS HANDLED
10TH INCLUSIVE 1939

	71 CARS TO 100 CARS							101 CARS AND OVER							MAXIMUM CARS PER TRAIN
S	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	
1	15	Berkshire	3	60	17	80	3,287	12	Berkshire	3	48	67	118	3,961	126
9	15	Berkshire	17	42	27	86	3,703	17	Berkshire	20	42	46	108	4,005	124
8	2	Mikado	0	50	21	71	2,823	10	Mikado	0	17	104	121	3,749	125
5	17	Mikado	49	27	10	86	4,002	2	Mikado	0	67	39	106	6,178	110
	10	Mikado	0	60	28	88	3,448	7	Mikado	0	11	113	124	3,598	134
	17	Mikado	49	33	10	92	4,359	1	Mikado	21	62	19	102	4,319	102
3	10	Mikado	0	41	45	86	3,064	12	Mikado	0	31	85	116	3,685	119
0	10	Mikado	30	44	17	91	4,302	10	Mikado	44	30	36	110	4,557	126
7	23	Mikado	0	40	41	81	2,805	3	Mikado	0	2	123	125	3,379	125
7	9	Mikado	8	46	35	89	3,685	15	Mikado	5	60	52	117	4,731	127
2	19	Mikado	0	48	38	86	3,116	3	Mikado	0	10	106	116	4,128	125
4	11	Mikado	8	56	20	84	3,422	10	Mikado	0	69	49	118	4,671	125
2	25	Mikado	0	30	50	80	2,480	-	-	-	-	-	-	-	95
1	14	Mikado	14	36	33	83	2,947	2	Mikado	0	69	56	125	4,621	126
	197	Trains 71 cars to 100.cars.						104	Trains 101.cars.and over						
	47.1 85							24.9 116							

5333

Defendant's Exhibit No. 27 (Witness C.R. Young)
Nov. 27, 1940



5334

Defendant's Exhibit No. 28 (Witness C.R. Young)
Dec. 11, 1940

ILLINOIS CENTRAL SYSTEM
(INCLUDING THE YAZOO AND MISSISSIPPI VALLEY RAILROAD COMPANY)
FREIGHT OPERATING AND FREIGHT TRANSPORTATION EXPENSES
RELATED TO TRAFFIC
CALENDAR YEARS 1922 TO 1939, INCLUSIVE

YEAR	REVENUE TON MILES	FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES	AVERAGE PER 1000 REVENUE TON MILES	
				FREIGHT OPERATING EXPENSES	FREIGHT TRANSP. EXPENSES
(a)	(b)	(c)	(d)	(e)	(f)
1939	10,245,927,314	$ 63,019,224	$32,271,076	$ 6.15	$ 3.15
1938	9,412,956,488	58,178,545	31,065,729	6.18	3.30
1937	10,921,959,567	65,270,407	34,229,555	5.98	3.13
1936	10,628,958,308	63,963,170	31,950,478	6.02	3.01
1935	9,108,478,713	60,992,601	28,187,299	6.70	3.09
1934	8,323,717,830	50,446,461	25,953,702	6.06	3.12
1933	7,711,204,376	45,928,942	23,544,928	5.96	3.05
1932	7,981,707,973	49,089,721	25,245,785	6.15	3.16
1931	9,752,447,820	69,854,167	34,480,376	7.16	3.54
1930	12,568,231,120	84,629,043	41,657,036	6.73	3.31
1929	15,467,369,973	105,590,773	49,084,217	6.83	3.17
1928	15,494,819,712	102,883,420	48,318,892	6.64	3.12
1927	16,121,240,173	107,105,893	49,629,463	6.64	3.08
1926	15,779,569,491	106,089,273	48,797,913	6.72	3.09
1925	14,891,944,844	99,646,954	46,779,571	6.69	3.14
1924	14,284,712,470	99,387,562	47,139,760	6.96	3.30
1923	16,151,798,440	115,136,234	54,100,398	7.13	3.35
1922	15,085,299,196	103,656,063	48,694,895	6.87	3.23
TOTAL 1936-1939	41,209,801,677	250,431,346	129,516,838	6.08	3.14
TOTAL 1922-1925	60,413,754,950	417,826,813	196,714,624	6.92	3.28
PER CENT OF IMPROVEMENT 4 YEARS 1936 - 1939 COMPARED WITH 4 YEARS 1922 - 1925				12.1	3.7

Defendant's Exhibit No. 29 (Witness C. R. Young)
Dec. 11 1940

ILLINOIS CENTRAL SYSTEM

(INCLUDING THE YAZOO AND MISSISSIPPI VALLEY RAILROAD COMPANY)

FREIGHT SERVICE OPERATING AVERAGES

Calendar Years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 and 1939

Item	1922	1924	1926	1928	1930	1932	1934	1936	1938	1939		Per Cent Increase 1939 over 1922
Miles of line operated in freight service	6135.86	6199.94	6555.10	6680.37	6692.99	6661.41	6608.44	6563.04	6540.00	6537.00		6.5
Freight train miles	22091007	21205151	23714774	23301474	20294076	14754491	16317685	19237099	15149807	15270787	Dec.	30.5
Freight cars per freight train	42.7	44.7	44.4	45.0	44.6	40.0	39.1	38.0	43.9	46.1		8.0
Net tons per freight train	761	747	754	739	698	605	584	636	707	761		-
Average tractive power per locomotive (lbs.)	37 390	39 168	41 363	43 730	44 834	44 875	44 789	48 131	49 672	51 079		36.6
Average capacity per freight carrying car (tons)	43.3	42.8	43.5	44.0	44.4	44.5	44.4	45.1	45.2	45.1		6.6
Freight train speed (m. p. h.)	11.3	11.8	12.8	13.6	14.4	16.0	15.9	16.7	16.2	16.3		44.2
Gross ton-miles per freight train-hour	18 812	20 319	22 239	24 009	24 963	24 411	25 070	25 453	28 162	29 934		59.1
Net ton-miles per freight train-hour	8 611	8 813	9 626	10 054	10 029	9 662	9 883	10 811	11 382	12 297		42.8
Gross ton-miles (exclusive of locomotives and tenders) per ton of fuel	12 216	12 848	13 411	13 637	13 495	12 794	12 634	13 038	13 527	13 512		10.6

Items 1, 2, 3, 4, 7 and 8 - Reports of Freight Train Performance, Form 03-1, filed with Interstate Commerce Commission.

Item 5 - Total tractive effort ÷ total steam locomotives available for service at close of each year as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 6 - Aggregate capacity of all freight carrying cars ÷ total number of such cars available for service at close of year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 9 - Net ton miles ÷ train hours as reported on Form 03-A to Interstate Commerce Commission.

Item 10 - Gross ton miles (cars, contents and cabooses) ÷ equated net tons of fuel consumed as reported to Interstate Commerce Commission in years 1922 to 1934, inclusive, on form 03-A and as reported in years 1936, 1938 and 1939 on Forms 03-A and 03-B respectively.

5336

Defendant's Exhibit No. 30 (Witness C.R. Young)
xxxx Nov. 28, 1940

LANATION OF SYMBOLS USED BELOW
N HEADING "AVERAGE CONSIST"

Perishable
Other Loads
Empty Cars - Including Cabooses
Total Cars

ILLINOIS CENTRAL SYSTEM

TYPICAL EXAMPLES OF THROUGH FREIGHT TRAINS HANDLED
BETWEEN CERTAIN TERMINALS, APRIL 10th - 19th (INCLUSIVE), 1939

FROM	TO	DISTANCE (Miles)	RULING GRADE	70 CARS OR LESS: NO. OF TRAINS	70 CARS OR LESS: TYPE OF LOCOMOTIVE	70 CARS OR LESS: AVERAGE CONSIST A	B	C	D	TONS	71 CARS TO 100 CARS: NO. OF TRAINS	71 CARS TO 100 CARS: TYPE OF LOCOMOTIVE	71 CARS TO 100 CARS: AVERAGE CONSIST A	B	C	D	TONS	101 to 125 CARS: NO. OF TRAINS	101 to 125 CARS: TYPE OF LOCOMOTIVE	101 to 125 CARS: AVERAGE CONSIST A	B	C	D	TONS	126 CARS AND OVER: NO. OF TRAINS	126 CARS AND OVER: TYPE OF LOCOMOTIVE	126 CARS AND OVER: AVERAGE CONSIST A	B	C	D	TONS	MAXIMUM CARS PER TRAIN
[illegible], Ill.	Champaign, Ill.	128	.55	12	Mikado	0	30	24	54	2,300	5	Mikado	0	11	80	91	3,572														100
[illegible], Ill.	Champaign, Ill.	128	.55	39	Mountain	0	42	11	53	2,570	6	Mountain	0	17	70	87	4,300	3	Mountain	0	17	95	112	4,553	10	Mountain	0	1	132	133	4,771	140
[illegible]paign, Ill.	Chicago, Ill.	128	.55	7	Mikado	18	28	8	54	3,863	5	Mikado	1	67	9	77	5,018														91
[illegible]paign, Ill.	Chicago, Ill.	128	.55	17	Mountain	24	27	5	56	3,330	38	Mountain	3	70	9	82	6,105	3	Mountain	0	90	16	106	7,883								107
[illegible]on, Ill.	Bluford, Ill.	127	.50	5	Mikado	0	36	9	45	2,012	4	Mikado	0	12	83	95	3,907	1	Mikado	0	35	78	113	5,859								113
[illegible]paign, Ill.	Bluford, Ill.	127	.50	24	Mountain	8	44	6	50	2,314	9	Mountain	0	52	32	84	4,036	5	Mountain	0	5	115	120	4,441	7	Mountain	0	3	133	136	5,007	140
[illegible], Ill.	Champaign, Ill.	127	.30	4	Mikado	25	14	15	54	2,965																					86
[illegible], Ill.	Champaign, Ill.	127	.30	15	Mountain	30	19	9	58	3,210	25	Mountain	7	64	14	85	5,624	3	Mountain	0	66	38	104	5,960								105
[illegible], Ill.	Mattoon, Ill.	82	.30	3	Mikado	0	47	11	58	3,393	2	Mikado	3	39	38	80	3,864														88
[illegible], Ill.	Mattoon, Ill.	82	.30	5	Mountain	4	34	7	45	3,481	3	Mountain	2	65	16	83	5,155														97
[illegible]on, Ill.	Bluford, Ill.	82	.50								2	Mikado	0	12	80	92	3,830	1	Mikado	0	0	114	114	4,292							114
[illegible]on, Ill.	Bluford, Ill.	82	.50								1	Mountain	0	2	96	98	3,678	3	Mountain	0	3	110	113	4,276	1	Mountain	0	2	135	137	5,321	137
[illegible]paign, Ill.	Centralia, Ill.	124	.50	5	Mikado	0	8	33	41	1,889	7	Mikado	0	21	73	94	3,927	1	Mikado	0	0	101	101	3,499								101
[illegible]alia, Ill.	Centralia, Ill.	124	.50	6	Mountain	0	18	42	60	2,809	5	Mountain	0	10	73	83	3,409	4	Mountain	0	2	109	111	3,871	2	Mountain	0	10	122	132	4,746	137
[illegible]alia, Ill.	Champaign, Ill.	124	.30	5	Mikado	0	61	7	68	3,430	7	Mikado	0	67	11	78	5,861	1	Mikado	10	53	42	105	5,974								108
[illegible]alia, Ill.	Champaign, Ill.	124	.30								16	Mountain	0	77	8	85	7,043														93
[illegible]rd, Ill.	New Yard, Ky.	127	.30	14	Lima	0	33	12	45	2,444	19	Lima	0	19	73	92	4,294	2	Lima	0	1	101	102	4,348								104
[illegible]rd, Ill.	New Yard, Ky.	127	.30	2	Mountain	0	45	5	50	3,027	6	Mountain	0	46	49	95	4,937														100
[illegible]rd, Ill.	New Yard, Ky.	127	.30	5	Mikado	0	43	16	59	2,974																					66
[illegible]ard, Ky.	Bluford, Ill.	127	.30	17	Lima	24	19	16	59	3,281	15	Lima	22	35	22	79	4,388														98
[illegible]ard, Ky.	Bluford, Ill.	127	.30	8	Mountain	13	47	5	65	3,867	5	Mountain	7	64	8	79	4,699														88
[illegible]ard, Ky.	Bluford, Ill.	127	.30	8	Mikado	13	54	1	68	3,868	1	Mikado	0	62	11	73	4,049														73
[illegible]ard, Ky.	Nonconnah, Tenn.	125	.49	10	Mikado	0	32	7	39	1,774																					64
[illegible]ard, Ky.	Nonconnah, Tenn.	125	.49	2	Mountain	0	50	11	61	3,578	5	Mountain	0	50	39	89	3,798	3	Mountain	0	33	81	114	4,582								126
[illegible]ard, Ky.	Nonconnah, Tenn.	125	.49	16	Lima	0	46	13	59	3,544	15	Lima	0	42	40	82	4,173	12	Lima	0	23	88	111	4,227								125
[illegible]nnah, Tenn.	New Yard, Ky.	125	.51	18	Mikado	0	38	19	57	2,623	4	Mikado	0	35	39	74	3,024														80
[illegible]nnah, Tenn.	New Yard, Ky.	125	.51	7	Mountain	0	60	3	63	3,228	2	Mountain	0	73	5	78	4,251														81
[illegible]nnah, Tenn.	New Yard, Ky.	125	.51	31	Lima	19	23	15	57	2,677	6	Lima	0	38	42	80	3,508	1	Lima	0	32	77	109	3,998								109
[illegible]oor, Tenn.	Haleyville, Ala.	134	.50	7	Central	0	33	19	52	2,240																					66
[illegible]oor, Tenn.	Haleyville, Ala.	134	.50	14	Mikado	0	29	14	43	1,841	1	Mikado	0	16	59	75	3,177														78
[illegible]ville, Ala.	Bromoor, Tenn.	134	.50	4	Central	0	27	17	44	2,270	2	Central	0	22	66	88	4,465														93
[illegible]ville, Ala.	Bromoor, Tenn.	134	.50	15	Mikado	0	33	14	47	2,517																					65
[illegible]ville, Ala.	Birmingham, Ala.	83	1.25	27	Central	0	21	16	37	1,544																					61
[illegible]gham, Ala.	Haleyville, Ala.	83	1.21	37	Central	0	25	14	39	1,786																					64
[illegible]s, Tenn.	Delta, Miss.	148	.50	10	Mikado	0	48	16	64	3,578	24	Mikado	0	44	39	83	4,490														98
Miss.	Memphis, Tenn.	148	1.58	12	Mikado	17	33	15	65	3,741	19	Mikado	18	46	13	76	4,419														94
[illegible], Miss.	New Orleans, La.	108	1.40	18	Mikado	0	22	34	56	3,703	26	Mikado	0	34	56	90	5,241	1	Mikado	0	81	27	108	6,149								108
[illegible]rleans, La.	McComb, Miss.	108	.45	30	Mikado	20	27	8	55	3,889	9	Mikado	8	43	26	77	3,773	2	Mikado	0	48	56	104	4,108								106
[illegible]ort, Ill.	Waterloo, Iowa	169	.89	42	Mountain	2	21	26	49	2,099	2	Mountain	0	4	73	77	2,671														78
[illegible]ort, Ill.	Waterloo, Iowa	169	.89	11	Mikado	2	19	27	48	2,346	1	Mikado	0	20	53	73	2,990														78
[illegible]ort, Ill.	Waterloo, Iowa	169	.89	5	Hudson	0	31	25	56	2,681																					80
[illegible]loo, Iowa	Freeport, Ill.	189	1.40	42	Mountain	23	11	11	45	2,220	1	Mountain	0	8	69	77	3,670														77
[illegible]loo, Iowa	Freeport, Ill.	189	1.40	11	Mikado	2	29	19	50	2,252																					49
[illegible]loo, Iowa	Freeport, Ill.	189	1.40	4	Hudson	30	14	4	48	2,459																					80
[illegible]loo, Iowa	Ft. Dodge, Iowa	100	.50	37	Mikado	1	16	32	49	1,652	8	Mikado	1	15	64	80	2,460														90
[illegible]dge, Iowa	Waterloo, Iowa	100	1.00	42	Mikado	21	19	12	52	2,529	2	Mikado	0	11	76	87	3,088														87
[illegible]oo, Iowa	Dubuque, Iowa	93	1.40	4	Mountain	4	26	12	42	2,061																					86
[illegible]oo, Iowa	Dubuque, Iowa	93	1.40								1	Mikado	0	11	64	75	2,540														78
[illegible]e, Iowa	Waterloo, Iowa	93	.89	2	Mountain	0	20	10	30	1,864																					54
[illegible]e, Iowa	Waterloo, Iowa	93	.89	3	Mikado	0	20	25	45	2,144																					60
[illegible]e, Iowa	Freeport, Ill.	66	.87	5	Mountain	3	23	15	41	1,972																					85
[illegible]rt, Ill.	Dubuque, Iowa	66	.74	4	Mountain	12	6	19	37	1,718	1	Mountain	6	9	70	79	2,330														79

[illegible]tal trains	1,025	650 Trains 70 cars or less	309 Trains 71 cars to 100 cars	46 Trains 101 cars to 125 cars	20 Trains 126 cars and over
[illegible] cent of all trains	100%	63.41%	30.15%	4.49%	1.95%
[illegible]erage cars per train	65	51	84	111	134

Defendant's Exhibit No. 31 (Witness C.R. Young)
Nov. 28, 1940

ILLINOIS CENTRAL SYSTEM

MAXIMUM NUMBER OF CARS HANDLED
IN VARIOUS MAIN LINE PASSENGER TRAINS

APRIL 10TH TO 19TH, INCLUSIVE, 1939

LINE NO. (a)	TRAIN NO. (b)	NAME (c)	ROUTE (d)	MILES (e)	NUMBER OF CARS 7 (f)	8 (g)	9 (h)	10 (i)	11 (j)	12 (k)	13 (l)	14 (m)	15 (n)	16 (o)	17 & OVER (p)	TOTAL (q)
			SOUTH													
1	1	Creole	Chicago-New Orleans	912	-	-	-	-	-	-	-	1	2	3	4	10
2	3	Louisiana	Chicago-New Orleans	912	-	-	-	-	-	1	-	1	6	2	-	10
3	5	Panama Limited	Chicago-New Orleans	912	1	2	4	-	1	1	1	-	-	-	-	10
			NORTH													
4	2	Creole	New Orleans-Chicago	912	-	-	-	-	-	-	-	-	2	6	2	10
5	4	Louisiana	New Orleans-Chicago	912	-	-	-	-	-	-	1	4	5	-	-	10
6	6	Panama Limited	New Orleans-Chicago	912	1	2	4	1	1	1	-	-	-	-	-	10
7		TOTAL			2	4	8	1	2	3	2	6	15	11	6	60
8		PER CENT OF TOTAL			3.3	6.8	13.3	1.6	3.3	5.0	3.3	10.0	25.0	18.4	10.0	
		TOTAL TRAINS OVER 14 CARS							32 or 53.4%							
		TOTAL TRAINS 14 CARS OR UNDER							28 or 46.6%							
		TOTAL TRAINS							60 or 100.0%							
			SOUTH													
9	9	Seminole	Chicago-Birmingham	690	-	-	-	-	3	5	1	1	-	-	-	10
			NORTH													
10	10	Seminole	Birmingham-Chicago	690	-	-	-	-	-	1	2	5	2	-	-	10
11		TOTAL			-	-	-	-	3	6	3	6	2	-	-	20
12		PER CENT OF TOTAL			-	-	-	-	15.0	30.0	15.0	30.0	10.0	-	-	
		TOTAL TRAINS OVER 14 CARS							2 or 10.0%							
		TOTAL TRAINS 14 CARS OR UNDER							18 or 90.0%							
		TOTAL TRAINS							20 or 100.0%							
			SOUTH													
13	15	Chickasaw	St. Louis-Memphis	316	-	-	-	1	2	1	4	2	-	-	-	10
			NORTH													
14	16	Chickasaw	Memphis-St. Louis	316	-	1	5	2	1	1	-	-	-	-	-	10
15		TOTAL			-	1	5	3	3	2	4	2	-	-	-	20
16		PER CENT OF TOTAL			-	5.0	25.0	15.0	15.0	10.0	20.0	10.0	-	-	-	
		TOTAL TRAINS OVER 14 CARS							None							
		TOTAL TRAINS 14 CARS OR UNDER							20 or 100.0%							
		TOTAL TRAINS							20 or 100.0%							
			WEST													
17	11	Hawkeye	Chicago-Omaha	516	-	1	7	2	-	-	-	-	-	-	-	10
			EAST													
18	12	Hawkeye	Omaha-Chicago	516	-	1	9	-	-	-	-	-	-	-	-	10
19		TOTAL			-	2	16	2	-	-	-	-	-	-	-	20
20		PER CENT OF TOTAL			-	10.0	80.0	10.0	-	-	-	-	-	-	-	
		TOTAL TRAINS OVER 14 CARS							None							
		TOTAL TRAINS 14 CARS OR UNDER							20 or 100.0%							
		TOTAL TRAINS							20 or 100.0%							

[fols. 5339-5340] DEFENDANTS EXHIBIT No. 32 (Witness P. G. Otterback) Nov. 28, 1940

Total Number of Locomotives and Total Number of Freight-Train Cars, Excluding Caboose Cars

All Railways, United States, 1890-1910

Year ended	Locomotives	Freight-train cars *
June 30, 1890	30,140	918,491
1891	32,139	947,300
1892	33,136	966,998
1893	34,788	1,013,307
1894	35,492	1,205,169
1895	35,699	1,196,119
1896	35,950	1,221,887
1897	35,986	1,221,730
1898	36,234	1,248,826
1899	36,703	1,295,510
1900	37,663	1,365,531
1901	39,584	1,464,328
1902	41,225	1,546,101
1903	43,871	1,653,782
1904	46,743	1,692,194
1905	48,357	1,731,409
1906	51,672	1,837,914
1907	55,388	1,991,557
1908	57,698	2,100,784
1909	58,219	2,086,835
1910	60,019	2,148,478

* Caboose cars excluded.

Source: Statistics of Railways in the United States, Interstate Commerce Commission.

[fols. 5341–5342] DEFENDANT'S EXHIBIT No. 33

(Witness P. G. Otterback) Nov. 28, 1940

Total Number of Locomotives and Total Number of Freight-Train Cars, Excluding Caboose Cars

Class I Railways, United States, 1911–1939

Year ended	Locomotives			Freight-train cars *a*
	Steam	Other	Total	
June 30, 1911	*b*	*b*	58,071	2,117,644
1912	*b*	*b*	59,010	2,140,687
1913	*b*	*b*	61,172	2,209,533
1914	*b*	*b*	62,533	2,263,015
1915	61,883	243	62,126	2,258,855
1916	60,790	267	61,057	2,236,379
Dec. 31, 1916	61,013	319	61,332	2,253,233
1917	61,548	342	61,890	2,302,059
1918	63,546	343	63,889	2,325,673
1919	64,633	350	64,983	2,361,102
1920	64,382	364	64,746	2,322,122
1921	64,585	364	64,949	2,315,692
1922	64,140	372	64,512	2,293,392
1923	64,948	379	65,327	2,315,612
1924	65,006	352	65,358	2,348,725
1925	63,612	362	63,974	2,357,234
1926	62,342	434	62,776	2,348,679
1927	60,895	468	61,363	2,324,834
1928	58,845	625	59,470	2,297,589
1929	56,936	635	57,571	2,277,505
1930	55,875	707	56,582	2,276,877
1931	54,385	764	55,149	2,201,510
1932	52,492	824	53,316	2,144,730
1933	50,064	839	50,903	2,034,886
1934	47,436	868	48,304	1,938,362
1935	45,614	980	46,594	1,835,736
1936	44,162	984	45,146	1,758,192
1937	43,624	1,059	44,683	1,743,834
1938	42,637	1,173	43,810	1,699,689
1939	41,117	1,394	42,511	1,650,031

a Caboose cars excluded.
b Not available.

Source: 1911–1938, Statistics of Railways in the United States, Interstate Commerce Commission: 1939, Preliminary Abstract of Railway Statistics, Interstate Commerce Commission.

[fol. 5343]

Number Of Steam Locomotives For Which Tractive Power Was Reported, Aggregate Tractive Power Reported, and Average Tractive Power Per Steam Locomotive

All Railways, United States, 1903–1910

Class I Railways, United States, 1911–1939

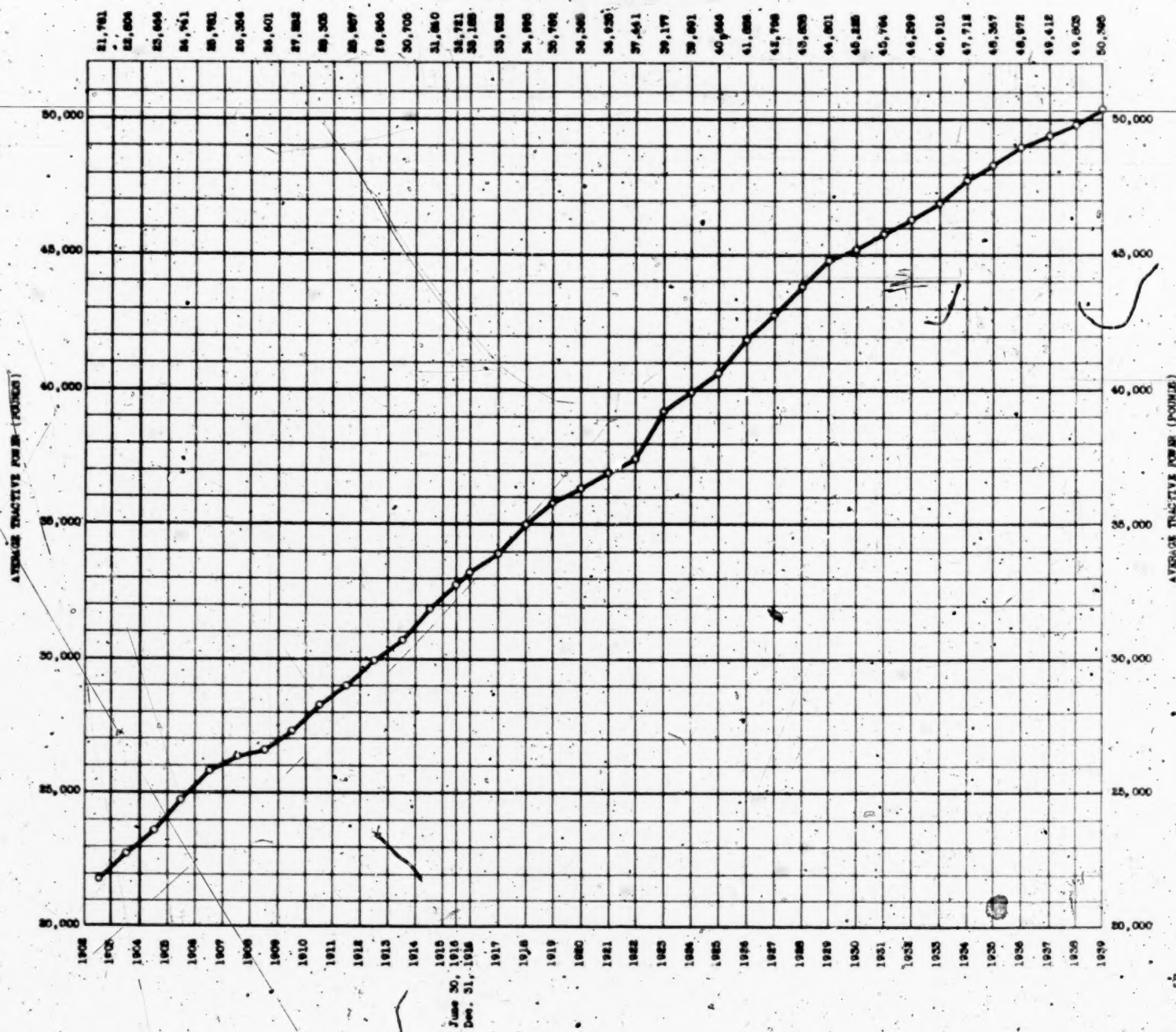
Year ended	Number of steam locos.	Agg. tract. power (lbs.)	Aver. tract. power (lbs.)	% increase over Pre. year	% increase over 1903
June 30, 1903	43,245	941,915,540	21,781	.....	.....
1904	46,146	1,052,307,261	22,804	4.7	4.7
1905	47,696	1,128,771,082	23,666	3.8	8.7
1906	50,954	1,260,633,673	24,741	4.5	13.6
1907	54,563	1,409,006,658	25,781	4.2	18.4
1908	56,867	1,498,793,551	26,356	2.2	21.0
1909	57,400	1,526,888,970	26,601	0.9	22.1
1910	58,240	1,588,894,480	27,282	2.6	25.3
1911	57,409	1,624,933,414	28,305	3.7	30.0
1912	58,216	1,687,511,260	28,987	2.4	33.1
1913	60,177	1,802,662,961	29,956	3.3	37.5
1914	61,442	1,886,549,588	30,705	2.5	41.0
1915	61,882	1,970,295,300	31,840	3.7	46.2
1916	60,790	1,989,132,700	32,721	2.8	50.2
Dec. 31, 1916	60,990	2,024,118,700	33,188	1.4	52.4
1917	61,533	2,087,949,700	33,932	2.2	55.8
1918	63,531	2,223,246,296	34,995	3.1	60.7
1919	64,618	2,312,633,581	35,789	2.3	64.3
1920	64,368	2,340,761,196	36,365	1.6	67.0
1921	64,585	2,385,469,940	36,935	1.6	69.6
1922	64,140	2,401,451,501	37,441	1.4	71.9
1923	64,939	2,544,114,827	39,177	4.6	79.9
1924	65,006	2,593,178,015	39,891	1.8	83.1
1925	63,612	2,586,868,120	40,666	1.9	86.7
1926	62,342	2,611,237,975	41,886	3.0	92.3
1927	60,895	2,606,171,030	42,798	2.2	96.5
1928	58,845	2,579,643,450	43,838	2.4	101.3
1929	56,936	2,550,812,775	44,801	2.2	105.7
1930	55,875	2,526,939,860	45,225	0.9	107.6
1931	54,385	2,488,860,920	45,764	1.2	110.1
1932	52,492	2,430,328,270	46,299	1.2	112.6
1933	50,064	2,348,821,480	46,916	1.3	115.4
1934	47,436	2,263,267,070	47,712	1.7	119.1
1935	45,614	2,206,200,838	48,367	1.4	122.1
1936	44,162	2,162,704,768	48,972	1.3	124.8
1937	43,624	2,155,555,000	49,412	0.9	126.9
1938	42,637	2,123,464,000	49,803	0.8	128.7
1939	41,117	2,072,110,000	50,395	1.2	131.4

Source: 1903–1938, Statistics of Railways in the United States, Interstate Commerce Commission: 1939, Preliminary Abstract of Railway Statistics, Interstate Commerce Commission.

(Here follows 1 photolithograph, side folio 5344:)

Defendant's Exhibit No. 34 (Witness Otterback)
Nov. 28, 1940

AVERAGE TRACTIVE POWER PER STEAM LOCOMOTIVE
ALL RAILROADS, UNITED STATES, 1903-1910
CLASS I RAILROADS, UNITED STATES, 1911-1939



[fols. 5345-5346] DEFENDANT'S EXHIBIT No. 35

(Witness P. G. Otterback) Nov. 28, 1940

Average Tractive Power By Types Of Locomotive

Class I Railways, United States

Year ended	Freight locos. a (lbs.)	Passenger locos. b (lbs.)	Frt. or pass. locos. (lbs.)	Switching locos. (lbs.)
June 30, 1915	33,200	27,811	c	27,164
1916	34,234	28,075	c	27,867
Dec. 31, 1916	34,792	28,331	c	28,067
1924	46,060	28,702	29,747	33,045
1925	46,932	29,234	32,705	33,792
1926	48,222	30,432	36,192	34,488
1927	49,186	31,469	36,533	35,544
1928	50,314	32,469	36,865	36,321
1929	51,368	33,328	37,321	37,230
1930	51,672	32,945	44,198	37,767
1931	52,219	33,438	44,579	38,190
1932	52,693	34,087	43,954	38,451
1933	53,314	34,512	44,332	38,880
1934	54,074	35,378	45,913	39,241
1935	54,657	36,255	47,221	39,693
1936	55,249	36,777	48,112	40,139
1937	55,592	37,192	50,079	40,152
1938	55,943	37,793	51,943	40,327

a For years 1915 and 1916, includes road service locomotives with drivers 69 inches or less in diameter.

b For years 1915 and 1916, includes road service locomotives with drivers more than 69 inches in diameter.

c Not reported separately.

Source: Statistics of Railways in the United States, Interstate Commerce Commission.

[fols. 5347-5348] DEFENDANT'S EXHIBIT No. 36

(Witness P. G. Otterback) Nov. 28, 1940

Oil-Burning Steam Locomotives And Steam Locomotives Equipped With Mechanical Stokers, With Superheaters, And With Boosters, By Types Of Locomotive

Class I Railways, United States.

1. Oil-Burning Steam Locomotives

Year ended	Total steam locomotives	Oil-burning steam locomotives Number	% of total
Dec. 31, 1924	65,006	7,326	11.3
1925	63,612	7,201	11.3
1926	62,342	7,302	11.7
1927	60,895	7,415	12.2
1928	58,845	7,500	12.7
1929	56,936	7,565	13.3
1930	55,875	7,472	13.4
1931	54,385	7,466	13.7
1932	52,492	7,268	13.8
1933	50,064	7,163	14.3
1934	47,436	6,792	14.3
1935	45,614	6,632	14.5
1936	44,162	6,551	14.8
1937	43,624	6,548	15.0
1938	42,637	6,459	15.1

2. Total Steam Locomotives, By Types

Year ended	Freight	Pass.	Frt. or pass.	Switch.	Total
Dec. 31, 1930	32,900	10,868	1,808	10,299	55,875
1931	32,063	9,430	1,824	10,068	54,385
1932	31,197	9,786	1,880	9,629	52,492
1933	29,935	9,107	1,838	9,184	50,064
1934	28,520	8,444	1,710	8,762	47,436
1935	27,462	7,983	1,612	8,557	45,614
1936	26,695	7,655	1,563	8,249	44,162
1937	26,517	7,522	1,692	7,893	43,624
1938	25,956	7,486	1,523	7,672	42,637

3. Oil-Burning Steam Locomotives, By Types

Year ended	Freight	Pass.	Frt. or pass.	Switch.	Total
Dec. 31, 1932	4,308	1,559	399	1,002	7,268
1933	4,253	1,526	385	999	7,163
1934	4,086	1,404	352	950	6,792
1935	3,982	1,382	333	935	6,632
1936	3,971	1,309	317	954	6,551
1937	3,947	1,338	335	928	6,548
1938	3,882	1,368	297	912	6,459

4. Percentage Relationship, By Types, Of Oil-Burning Steam Locomotives To Total Steam Locomotives

Year ended	Freight	Pass.	Frt. or pass.	Switch.	Total
Dec. 31, 1932	13.8	15.9	21.2	10.4	13.8
1933	14.2	16.8	20.9	10.9	14.3

[fol. 5349]

4. Percentage Relationship, By Types, Of Oil-Burning Steam Locomotives To Total Steam Locomotives (continued)

Year ended	Freight	Pass.	Frt. or pass.	Switch.	Total
Dec. 31, 1934	14.3	16.6	20.6	10.8	14.3
1935	14.5	17.3	20.7	10.9	14.5
1936	14.9	17.1	20.3	11.6	14.8
1937	14.9	17.8	19.8	11.8	15.0
1938	15.0	18.3	19.5	11.9	15.1

5. Steam Locomotives Equipped With Mechanical Stokers, By Types

Year ended	Freight	Pass.	Frt. or pass.	Switch.	Total
Dec. 31, 1932	10,298	1,075	145	78	11,596
1933	10,282	1,078	146	77	11,583
1934	10,230	1,092	153	82	11,557
1935	10,141	1,139	161	82	11,523
1936	10,097	1,210	152	87	11,546
1937	10,290	1,401	235	77	12,023
1938	10,329	1,574	237	61	12,201

6. Percentage Relationship, By Types, Of Steam Locomotives Equipped With Mechanical Stokers To Total Steam Locomotives

Year ended	Freight	Pass.	Frt. or pass.	Switch.	Total
Dec. 31, 1932	33.0	11.0	7.7	0.8	22.1
1933	34.3	11.8	7.9	0.8	23.1
1934	35.9	12.9	8.9	0.9	24.4
1935	36.9	14.3	10.0	1.0	25.3
1936	37.8	15.8	9.7	1.1	26.1
1937	38.8	18.9	13.9	1.0	27.6
1938	39.8	21.0	15.6	0.8	28.6

7. Oil-Burning Steam Locomotives And Steam Locomotives Equipped With Mechanical Stokers, Combined, By Types

Year ended	Freight	Pass.	Frt. or pass.	Switch.	Total
Dec. 31, 1932	14,606	2,634	544	1,089	18,864
1933	14,535	2,604	531	1,076	18,746
1934	14,316	2,496	505	1,032	18,349
1935	14,123	2,521	494	1,017	18,155
1936	14,068	2,519	469	1,041	18,097
1937	14,237	2,759	570	1,005	18,571
1938	14,211	2,942	534	973	18,660

[fol. 5350]

8. Percentage Relationship, By Types, Of Oil-Burning Steam Locomotives And Steam Locomotives Equipped With Mechanical Stokers, Combined, To Total Steam Locomotives

Year ended	Freight	Pass.	Frt. or pass.	Switch.	Total
Dec. 31, 1932	46.8	26.9	28.9	11.2	35.9
1933	48.6	28.6	28.9	11.7	37.4
1934	50.2	29.6	29.5	11.8	38.7
1935	51.4	31.6	30.6	11.9	39.8
1936	52.7	32.9	30.0	12.6	41.0
1937	53.7	36.7	33.7	12.7	42.6
1938	54.8	39.3	35.1	12.7	43.8

9. Steam Locomotives Equipped With Superheaters, By Types

Year ended	Freight	Pass.	Frt. or pass.	Switch.	Total
Dec. 31, 1932	25,753	8,215	1,552	5,214	40,734
1933	25,297	7,940	1,538	5,099	39,874
1934	24,786	7,594	1,510	5,050	38,940
1935	24,391	7,399	1,517	5,098	38,405
1936	24,115	7,085	1,514	5,035	37,749
1937	24,143	7,124	1,633	4,864	37,764
1938	23,748	7,151	1,492	4,844	37,235

10. Percentage Relationship, By Types, Of Steam Locomotives Equipped With Superheaters To Total Steam Locomotives

Year ended	Freight	Pass.	Frt. or pass.	Switch.	Total
Dec. 31, 1932	82.5	83.9	82.6	54.1	77.6
1933	84.5	87.2	83.7	55.5	79.6
1934	86.9	89.9	88.3	57.6	82.1
1935	88.8	92.7	94.1	59.6	84.2
1936	90.3	92.6	96.9	61.0	85.5
1937	91.0	94.7	96.5	61.6	86.6
1938	91.5	95.5	98.0	63.1	87.3

11. Steam Locomotives Equipped With Boosters, By Types

Year ended	Freight	Pass.	Frt. or pass.	Switch.	Total
Dec. 31, 1930	3,049	731	177	22	3,979
1931	3,103	772	180	20	4,075
1932	3,071	733	177	19	4,000
1933	3,124	707	177	19	4,027
1934	3,022	690	176	20	3,908
1935	3,016	706	176	18	3,916
1936	2,967	696	179	18	3,860
1937	2,962	734	196	17	3,909
1938	2,918	734	194	15	3,861

[fol. 5351]

12. Percentage Relationship, By Types, Of Steam Locomotives Equipped With Boosters To Total Steam Locomotives

Year ended	Freight	Pass.	Frt. or pass.	Switch.	Total
Dec. 31, 1930	9.3	6.7	9.8	0.2	7.1
1931	9.7	7.4	9.9	0.2	7.5
1932	9.8	7.5	9.4	0.2	7.6
1933	10.4	7.8	9.6	0.2	8.0
1934	10.6	8.2	10.3	0.2	8.2
1935	11.0	8.8	10.9	0.2	8.6
1936	11.1	9.1	11.5	0.2	8.7
1937	11.2	9.8	11.6	0.2	9.0
1938	11.2	9.8	12.7	0.2	9.1

13. Average Tractive Power Per Booster, By Types Of Locomotive

Year ended	Freight (lbs.)	Pass. (lbs.)	Frt. or pass. (lbs.)	Switch. (lbs.)	Total (lbs.)
Dec. 31, 1930	11,552	10,335	11,128	19,405	11,353
1931	11,188	10,337	11,227	20,110	11,072
1932	11,287	10,164	11,128	20,521	11,118
1933	11,506	10,453	11,128	19,816	11,344
1934	11,512	10,479	11,143	19,260	11,353
1935	11,501	10,513	11,143	20,244	11,347
1936	11,485	10,539	11,134	19,278	11,331
1937	11,471	10,977	11,224	19,765	11,402
1938	11,408	10,729	11,227	20,800	11,307

Source: Basic data from Statistics of Railways in the United States, Interstate Commerce Commission.

[fols. 5352-5353]

DEFENDANT'S EXHIBIT No. 37

(Witness P. G. Otterback) Nov. 28, 1940

Number Of Freight-Carrying Cars For Which Capacity Was Reported, Aggregate Car Capacity Reported, And Average Capacity Per Freight-Carrying Car

All Railways, United States, 1903-1910

Class I Railways, United States, 1911-1939

Year ended	Number of cars	Agg. cap. (tons)	Aver. cap. (tons)	% increase over Pre. year	% increase over 1903
June 30, 1903	1,650,615	48,530,281	29.4		
1904	1,688,341	50,759,133	30.1	2.4	2.4
1905	1,727,620	53,255,083	30.8	2.3	4.8
1906	1,833,635	59,059,302	32.2	4.5	9.5
1907	1,986,017	67,033,324	33.8	5.0	15.0
1908	2,096,234	73,086,522	34.9	3.3	18.7
1909	2,071,338	73,137,546	35.3	1.1	20.1
1910	2,133,531	76,578,735	35.9	1.7	22.1
1911	2,117,644	78,100,000	36.9	2.8	25.5
1912	2,140,687	80,200,000	37.5	1.6	27.6
1913	2,209,533	84,600,000	38.3	2.1	30.3
1914	2,263,015	88,400,000	39.1	2.1	33.0
1915	2,258,855	89,837,847	39.8	1.8	35.4
1916	2,236,312	90,766,094	40.6	2.0	38.1
Dec. 31, 1916	2,253,111	92,280,335	41.0	1.0	39.5
1917	2,301,947	95,467,054	41.5	1.2	41.2
1918	2,325,562	96,766,585	41.6	0.2	41.5
1919	2,361,002	99,001,041	41.9	0.7	42.5
1920	2,322,025	98,342,666	42.4	1.2	44.2
1921	2,315,595	98,504,017	42.5	0.2	44.6
1922	2,293,389	98,846,836	43.1	1.4	46.6
1923	2,315,609	101,318,213	43.8	1.6	49.0
1924	2,348,722	104,149,381	44.3	1.1	50.7
1925	2,357,221	105,569,670	44.8	1.1	52.4
1926	2,348,643	105,952,818	45.1	0.7	53.4
1927	2,324,799	105,845,568	45.5	0.9	54.8
1928	2,297,549	105,321,832	45.8	0.7	55.8
1929	2,277,464	105,416,586	46.3	1.1	57.5
1930	2,276,793	106,179,768	46.6	0.6	58.5
1931	2,201,407	103,421,700	47.0	0.9	59.9
1932	2,144,631	100,901,484	47.0		59.9
1933	2,034,788	96,734,269	47.5	1.1	61.6
1934	1,938,277	92,968,503	48.0	1.1	63.3
1935	1,835,654	88,677,106	48.3	0.6	64.3
1936	1,758,093	85,721,064	48.8	1.0	66.0
1937	1,743,743	85,808,067	49.2	0.8	67.3
1938	1,699,597	84,032,035	49.4	0.4	68.0
1939	1,650,031	82,001,557	49.7	0.6	69.0

Source: 1903-1938, Statistics of Railways in the United States, Interstate Commerce Commission; 1939, Preliminary Abstract of Railway Statistics, Interstate Commerce Commission.

[fols. 5354–5355]

DEFENDANT'S EXHIBIT No. 38

(Witness P. G. Otterback) Nov. 28, 1940

Total Freight-Train Cars, Steel Freight-Train Cars, Steel Underframe Freight-Train Cars And Other Freight-Train Cars: Cabooses Cars Excluded

Class I Railways, United States

Year ended	Total cars	Steel cars	Steel und. cars	Steel & steel und. cars	Other cars
June 30, 1915	2,258,855	501,309	676,176	1,177,485	1,081,370
1916	2,236,379	537,237	729,859	1,267,096	969,283
Dec. 31, 1916	2,253,233	561,770	763,066	1,324,836	928,397
1917	2,302,059	595,536	802,431	1,397,967	904,092
1918	2,325,673	612,255	832,472	1,444,727	880,946
1919	2,361,102	637,445	868,262	1,505,707	855,395
1920	2,322,122	630,150	886,296	1,516,446	805,676
1921	2,315,692	640,891	903,240	1,544,131	771,561
1922	2,293,392	668,107	910,608	1,578,710	714,682
1923	2,315,612	680,685	992,212	1,672,897	642,715
1924	2,348,725	720,934	1,028,506	1,749,460	599,265
1925	2,337,234	757,065	1,056,125	1,813,190	544,044
1926	2,348,679	784,191	1,076,606	1,860,797	487,882
1927	2,324,834	799,820	1,086,982	1,886,802	438,032
1928	2,297,589	803,587	1,099,016	1,902,603	394,986
1929	2,277,505	829,154	1,103,121	1,932,275	345,230
1930	2,276,867	854,864	1,118,257	1,973,121	303,746
1931	2,201,510	843,542	1,101,565	1,945,107	256,403
1932	2,144,730	834,924	1,078,353	1,913,277	231,453
1933	2,034,886	816,548	1,038,276	1,854,824	180,062
1934	1,938,362	819,673	974,920	1,794,593	143,769
1935	1,835,736	809,612	908,252	1,717,864	117,872
1936	1,758,192	825,081	831,885	1,656,966	101,226
1937	1,743,834	890,612	768,776	1,659,388	84,446
1938	1,699,689	891,498	730,218	1,621,716	77,973

Source: Statistics of Railways in the United States, Interstate Commerce Commission.

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Percentage Relationship to Total Freight-Train Cars Of Steel, Steel Underframe and Other Freight-Train Cars

Class I Railways, United States

Year ended	Steel cars	Steel und. cars	Steel & steel und. cars	Other cars
30, 1915	22.2%	29.9%	52.1%	47.9%
1916	24.0	32.6	56.6	43.4
31, 1916	24.9	33.9	58.8	41.2
1917	25.9	34.9	60.8	39.2
1918	26.3	35.8	62.1	37.9
1919	27.0	36.8	63.8	36.2
1920	27.1	38.2	65.3	34.7
1921	27.7	39.0	66.7	33.3
1922	29.1	39.7	68.8	31.2
1923	29.4	42.8	72.2	27.8
1924	30.7	43.8	74.5	25.5
1925	32.1	44.8	76.9	23.1
1926	33.4	45.8	79.2	20.8
1927	34.4	46.8	81.2	18.8
1928	35.0	47.8	82.8	17.2
1929	36.4	48.4	84.8	15.2
1930	37.5	49.1	86.6	13.4
1931	38.3	50.0	88.3	11.7
1932	38.9	50.3	89.2	10.8
1933	40.1	51.0	91.1	8.9
1934	42.3	50.3	92.6	7.4
1935	44.1	49.5	93.6	6.4
1936	46.9	47.3	94.2	5.8
1937	51.1	44.1	95.2	4.8
1938	52.5	43.0	95.5	4.5

ource: Calculated from basic figures on preceding page.

[fols. 5357–5358]

DEFENDANT'S EXHIBIT No. 39

(Witness P. G. Otterback) Nov. 28, 1940

Freight Operating Revenues, Freight Operating Expenses, And Freight Operating Ratio

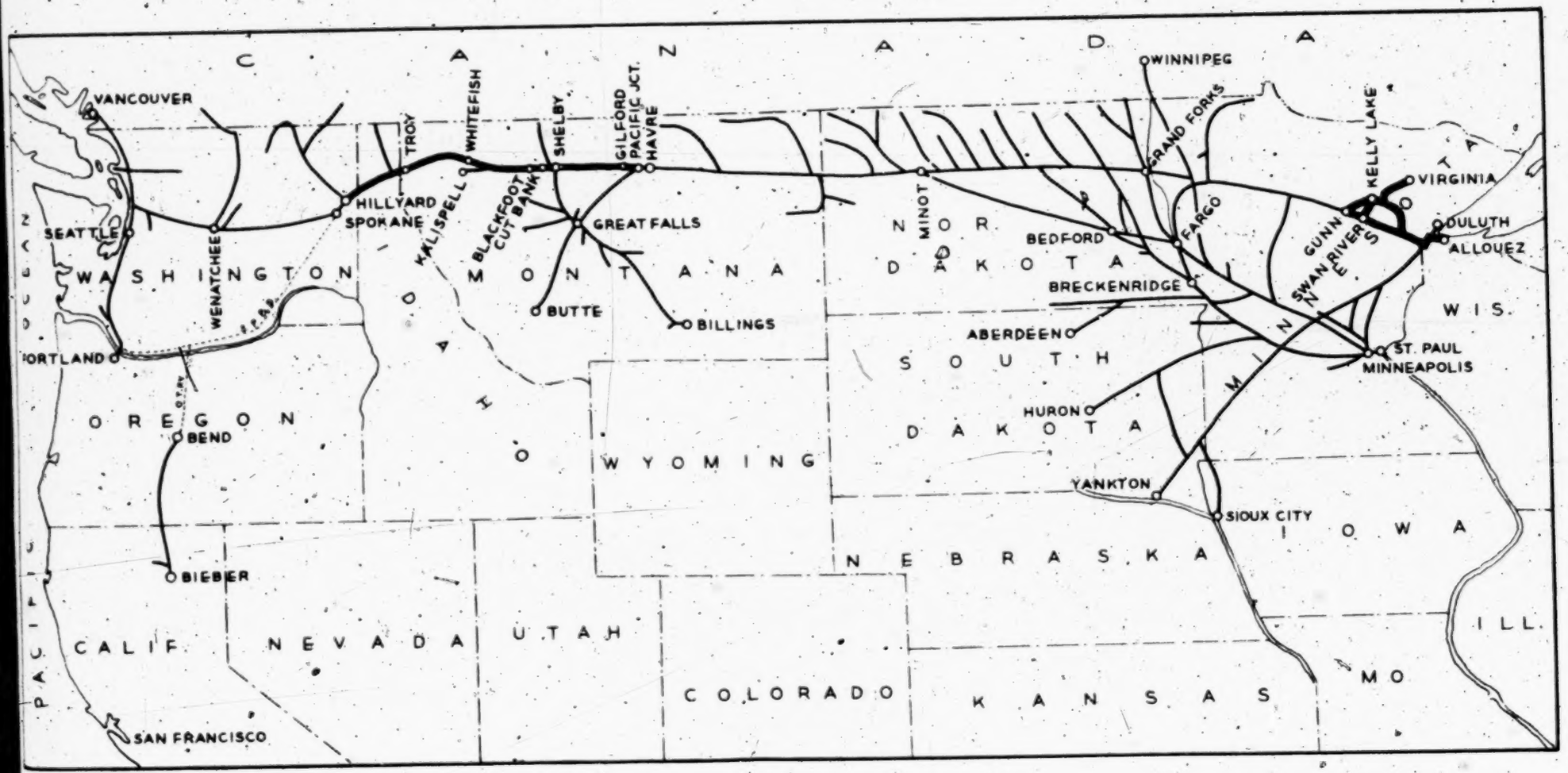
Class I Railways, United States

Cal. year	Freight operating revenues	Freight operating expenses	Freight operating ratio
1921	$3,924,119,819	$3,308,017,824	84.3%
1922	4,005,558,722	3,224,809,492	80.5
1923	4,622,364,989	3,666,250,197	79.3
1924	4,345,538,231	3,312,213,685	76.2
1925	4,552,756,017	3,339,486,272	73.4
1926	4,809,640,798	3,455,818,287	71.9
1927	4,643,517,011	3,362,723,443	72.4
1928	4,691,147,326	3,254,038,603	69.4
1929	4,825,622,121	3,330,206,865	69.0
1930	4,083,241,558	2,848,168,947	69.8
1931	3,254,667,938	2,302,772,090	70.8
1932	2,450,829,130	1,693,926,052	69.1
1933	2,492,678,146	1,615,745,153	64.8
1934	2,633,399,103	1,766,073,788	67.1
1935	2,790,551,400	1,870,813,674	67.0
1936	3,308,540,696	2,171,315,564	65.6
1937	3,377,908,424	2,310,115,609	68.4
1938	2,858,077,292	1,967,626,335	68.8
1939	3,251,096,182	2,142,978,114	65.9

Cal. year	Rev. per ton-mile (cents)	Revenue ton-miles (thousands)	Adjusted frt. oper. revenues	Adjusted frt. oper. ratio
1921	1.275	306,840,204	$3,924,119,819	84.3%
1922	1.177	339,285,348	4,325,888,000	74.5
1923	1.116	412,727,228	5,262,272,000	69.7
1924	1.116	388,415,312	4,952,295,000	66.9
1925	1.097	413,814,261	5,276,132,000	63.3
1926	1.081	443,746,487	5,657,768,000	61.1
1927	1.080	428,736,962	5,466,396,000	61.5
1928	1.081	432,915,185	5,519,669,000	59.0
1929	1.076	447,321,561	5,703,350,000	58.4
1930	1.063	383,449,588	4,888,982,000	58.3
1931	1.051	309,224,879	3,942,617,000	58.4
1932	1.046	233,977,009	2,983,207,000	56.8
1933	0.999	249,223,180	3,177,596,000	50.8
1934	0.978	268,710,507	3,426,059,000	51.5
1935	0.988	282,036,932	3,595,971,000	52.0
1936	0.974	339,245,826	4,325,384,000	50.2
1937	0.935	360,620,269	4,597,908,000	50.2
1938	0.983	290,084,371	3,698,576,000	53.2
1939	0.973	333,438,412	4,251,340,000	50.4

Source: 1921–1938, inclusive, Statistics of Railways in the United States, Interstate Commerce Commission. 1939, Preliminary Abstract of Railway Statistics, Interstate Commerce Commission.

Defendant s Exhibit No. 42 ~~for~~ (Witness C.L. LaFountaine
Nov. 28, 1940



GREAT NORTHERN RAILWAY CO.

HEAVY LINE INDICATES TERRITORY COVERED BY TYPICAL FREIGHT TRAIN EXHIBITS.

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Defendant's Exhibit No. 43 (Witness LaFountaine.
~~Nx~~ Dec. 3, 1940

GREAT NORTHERN RAILWAY COMPANY

FREIGHT TRAINS OPERATED ON KALISPELL DIVISION
DURING TEN-DAY PERIOD, AUGUST 15TH TO 24TH, INCLUSIVE, 1939

LINE NO.	FROM	TO	DISTANCE (Miles)	RULING GRADE	70 CARS OR LESS							71 CARS TO 100 CARS							101 CARS TO 125 CARS								
					NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST				TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST				TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST				TONS	NO. OF TRAINS	TY LOC
							A	B	C	D				A	B	C	D				A	B	C	D			
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	
1	Havre	Fresno	15	1.00	1	Mikado	-	25	-	25	1,750	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	Fresno	Havre	15	0.80	1	Mikado	-	-	17	17	374	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	Havre	Gildford	29	1.00	1	Mikado	-	21	15	36	1,715	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Gildford	Havre	29	0.80	1	Mikado	-	28	16	44	2,350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	Havre	Shelby	105	1.00	5	Mikado	-	20	16	36	1,625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	Shelby	Havre	105	0.80	5	Mikado	-	34	15	49	2,646	1	Mikado	-	42	38	80	3,235	-	-	-	-	-	-	-	-	
7	Havre	Blackfoot	155	1.00	2	2-8-8-2	1	59	8	68	3,600	14	2-8-8-2	2	46	40	88	3,496	6	2-8-8-2	-	18	98	116	3,746	-	
8	Blackfoot	Havre	155	0.80	1	2-8-8-2	36	32	-	68	2,755	14	2-8-8-2	9	83	1	93	4,885	6	2-8-8-2	5	84	15	104	5,332	-	
9	Shelby	Cut Bank	24	1.00	9	Mikado	-	3	28	31	798	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10	Cut Bank	Shelby	24	0.80	8	Mikado	-	21	2	23	1,227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
11	Shelby	Blackfoot	51	1.00	5	Mikado	-	16	7	23	1,037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
12	Blackfoot	Shelby	51	0.80	5	Mikado	-	10	14	24	697	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
13	Shelby	Blackfoot	51	1.00	1	2-8-8-2	1	45	21	67	3,400	3	2-8-8-2	1	43	39	83	3,588	-	-	-	-	-	-	-	-	
14	Blackfoot	Shelby	51	0.80	3	2-8-8-2	2	28	19	49	1,992	1	2-8-8-2	1	51	22	73	3,100	1	2-8-8-2	-	39	63	102	3,550	-	
15	Blackfoot	Whitefish	101	1.00	5	Mikado	-	24	21	45	1,678	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
16	Whitefish	Blackfoot	101	1.80	4	Mikado	-	24	5	29	964	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
17	Blackfoot	Whitefish	101	1.00	5	2-8-8-2	1	54	11	66	3,436	15	2-8-8-2	2	41	45	88	3,306	5	2-8-8-2	-	16	98	114	3,606	-	
18	Whitefish	Blackfoot	101	1.80	6	2-8-8-2	11	37	9	57	2,515	13	2-8-8-2	9	81	1	91	4,800	6	2-8-8-2	5	70	31	106	4,623	-	
19	Whitefish	Kalispell	22	0.60	9	Consolid'n	1	17	12	30	1,097	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
20	Kalispell	Whitefish	22	0.80	9	Consolid'n	-	19	12	31	1,216	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
21	Whitefish	Troy	135	0.25	10	Mikado	-	20	20	40	1,554	6	Mikado	-	44	37	81	3,480	4	Mikado	-	9	111	120	3,394	1	Mik
22	Troy	Whitefish	135	0.70	15	Mikado	4	28	5	37	1,736	3	Mikado	8	79	6	93	4,688	2	Mikado	5	97	7	109	5,025	1	Mik
23	Whitefish	Troy	135	0.25	1	4-8-4	-	57	5	62	3,400	7	4-8-4	2	55	18	75	3,335	2	4-8-4	-	2	120	122	3,323	-	
24	Troy	Whitefish	135	0.70	1	4-8-4	5	47	14	66	3,030	5	4-8-4	11	80	1	92	4,849	4	4-8-4	10	89	9	108	5,081	-	
25	Troy	Whitefish	135	0.70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2-8-8-2	4	99	7	110	5,160	-	
26	Troy	Hillyard	135	0.60	10	Mikado	-	28	17	45	1,951	6	Mikado	-	33	48	81	3,232	3	Mikado	-	9	106	115	3,350	2	Mik
27	Hillyard	Troy	135	0.60	16	Mikado	4	22	6	32	1,403	3	Mikado	9	84	2	95	4,841	2	Mikado	4	92	12	108	4,820	-	
28	Troy	Hillyard	135	0.60	1	4-8-4	-	57	5	62	3,400	7	4-8-4	2	54	18	74	3,306	2	4-8-4	-	1	112	113	3,300	-	
29	Hillyard	Troy	135	0.60	1	4-8-4	5	41	12	58	2,586	5	4-8-4	11	80	1	92	4,846	4	4-8-4	10	89	9	108	5,100	-	
30	Troy	Hillyard	135	0.60	1	Pacific	-	14	18	32	1,150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
31	Hillyard	Troy	135	0.60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2-8-8-2	4	99	7	110	5,160	-	
32	TOTAL TRAINS		298		142							103							49							4	
33	PER CENT OF ALL TRAINS.		100		47.7							34.6							16.4							1.3	
34	AVERAGE CARS PER TRAIN		68		38							87							111							129	

101 CARS TO 125 CARS							126 CARS AND OVER							MAXIMUM CARS PER TRAIN
OF. AINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	
(t)	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(bb)	(cc)	(dd)	(ff)	(gg)	(hh)	(ii)
-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
-	-	-	-	-	-	-	-	-	-	-	-	-	-	17
-	-	-	-	-	-	-	-	-	-	-	-	-	-	36
-	-	-	-	-	-	-	-	-	-	-	-	-	-	44
-	-	-	-	-	-	-	-	-	-	-	-	-	-	47
-	-	-	-	-	-	-	-	-	-	-	-	-	-	80
6	2-8-8-2	-	18	98	116	3,746	-	-	-	-	-	-	-	124
6	2-8-8-2	5	84	15	104	5,332	-	-	-	-	-	-	-	114
-	-	-	-	-	-	-	-	-	-	-	-	-	-	53
-	-	-	-	-	-	-	-	-	-	-	-	-	-	29
-	-	-	-	-	-	-	-	-	-	-	-	-	-	29
-	-	-	-	-	-	-	-	-	-	-	-	-	-	34
-	-	-	-	-	-	-	-	-	-	-	-	-	-	96
1	2-8-8-2	-	39	63	102	3,550	-	-	-	-	-	-	-	102
-	-	-	-	-	-	-	-	-	-	-	-	-	-	54
-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
5	2-8-8-2	-	16	98	114	3,606	-	-	-	-	-	-	-	123
6	2-8-8-2	5	70	31	106	4,623	-	-	-	-	-	-	-	116
-	-	-	-	-	-	-	-	-	-	-	-	-	-	44
-	-	-	-	-	-	-	-	-	-	-	-	-	-	45
4	Mikado	-	9	111	120	3,394	1	Mikado	-	-	129	129	3,050	129
2	Mikado	5	97	7	109	5,025	1	Mikado	3	100	27	130	5,640	130
2	4-8-4	-	2	120	122	3,323	-	-	-	-	-	-	-	124
4	4-8-4	10	89	9	108	5,081	-	-	-	-	-	-	-	114
1	2-8-8-2	4	99	7	110	5,160	-	-	-	-	-	-	-	110
3	Mikado	-	9	106	115	3,350	2	Mikado	-	4	124	128	3,175	129
2	Mikado	4	92	12	108	4,820	-	-	-	-	-	-	-	115
2	4-8-4	-	1	112	113	3,300	-	-	-	-	-	-	-	119
4	4-8-4	10	89	9	108	5,100	-	-	-	-	-	-	-	115
-	-	-	-	-	-	-	-	-	-	-	-	-	-	32
1	2-8-8-2	4	99	7	110	5,160	-	-	-	-	-	-	-	110
49							4							
4.4							1.3							
111							129							

Defendant's Exhibit No. 44 (Witness C.L; LaFountaine)
Dec. 3, 1940

PLANATION OF SYMBOLS USED BELOW
DER HEADING "AVERAGE CONSIST"

- Perishable loads
- Other loads
- Empty cars, not including caboose
- Total all cars

GREAT NORTHERN RAILWAY COMPANY

ORE TRAINS OPERATED ON MESABI DIVISION
AUGUST 15TH TO AUGUST 24TH, INCLUSIVE, 1939

NE O. (a)	FROM (b)	TO (c)	DIS- TANCE (Miles) (d)	RULING GRADE (e)	70 CARS OR LESS							71 CARS TO 100 CARS							101 CARS TO 125 CARS						
					NO. OF TRAINS (f)	TYPE OF LOCOMOTIVE (g)	AVERAGE CONSIST A (h)	B (i)	C (j)	D (k)	TONS (l)	NO. OF TRAINS (m)	TYPE OF LOCOMOTIVE (n)	AVERAGE CONSIST A (o)	B (p)	C (q)	D (r)	TONS (s)	NO. OF TRAINS (t)	TYPE OF LOCOMOTIVE (u)	AVERAGE CONSIST A (v)	B (w)	C (x)	D (y)	T
1	Kelly Lake	Allouez via Casco	100.00	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
2	Nashwauk	Allouez	122.00	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
3	Calumet	Allouez	115.00	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4	Gunn	Allouez	100.00	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	Allouez	Kelly Lake via Casco	100.00	0.6*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	Allouez	Kelly Lake via Swan River	109.00	1.0*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	Allouez	Gunn	100.00	0.4*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	TOTAL NUMBER OF TRAINS				-							-							-						
	PER CENT OF TOTAL																								
	AVERAGE CARS PER TRAIN																								

* - Except about .5 miles of 1.16% grade at State Line Tower

aFountaine)

ION
, 1939

		101 CARS TO 125 CARS							126 CARS AND OVER							MAXIMUM CARS PER TRAIN
SIST		NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST					NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST					
D	TONS			A	B	C	D	TONS			A	B	C	D	TONS	
(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(bb)	(cc)	(dd)	(ee)	(ff)	(gg)	(hh)
-	-	-	-	-	-	-	-	-	32	Mallet	-	182	-	182	15437	185
-	-	-	-	-	-	-	-	-	9	Mallet	-	182	-	182	15676	185
-	-	-	-	-	-	-	-	-	2	Mallet	-	182	-	182	15771	186
-	-	-	-	-	-	-	-	-	4	Mallet	-	182	-	182	15431	185
-	-	-	-	-	-	-	-	-	19	Mallet	-	-	180	180	3632	180
-	-	-	-	-	-	-	-	-	44	Mallet	-	-	178	178	3582	180
-	-	-	-	-	-	-	-	-	4	Mallet	-	-	180	180	3595	180
		-							133							
									100							
									180.3							

r

Defendant's Exhibit No. 45 (Witness L.A. LaFountaine)
Dec. 3, 1940

GREAT NORTHERN RAILWAY COMPANY

MAXIMUM NUMBER OF CARS HANDLED
IN MAIN LINE PASSENGER TRAINS NOS. 1 AND 2
TOTAL FOR THE TEN DAY PERIOD: JUNE 1ST TO 10TH, INCLUSIVE, 1939

LINE NO. (a)	TRAIN NO. (b)	ROUTE & TRAIN NAME (c)	MILES (d)	NUMBER OF CARS: 10 CARS OR LESS (e)	11 (f)	12 (g)	13 (h)	14 (i)	15 (j)	16 (k)	17 (l)	18 (m)	OVER 18 (n)	TOTAL (o)
		ST. PAUL - FARGO												
1	1	WEST Empire Builder	262	-	-	1	4	3	2	-	-	-	-	10
2	2	EAST Empire Builder	262	-	-	-	-	-	4	1	3	2	-	10
3		TOTAL		-	-	1	4	3	6	1	3	2	-	20
4		PER CENT OF TOTAL		-	-	5.00	20.00	15.00	30.00	5.00	15.00	10.00	-	
		TOTAL TRAINS OVER 14 CARS							12	or	60.00%			
		TOTAL TRAINS 14 CARS OR UNDER							8	or	40.00%			
		TOTAL TRAINS							20	or	100.00%			
		FARGO - HAVRE												
5	1	WEST Empire Builder	715	-	-	1	4	3	2	-	-	-	-	10
6	2	EAST Empire Builder	663	-	-	-	-	3	3	2	2	-	-	10
7		TOTAL		-	-	1	4	6	5	2	2	-	-	20
8		PER CENT OF TOTAL		-	-	5.00	20.00	30.00	25.00	10.00	10.00	-	-	
		TOTAL TRAINS OVER 14 CARS							9	or	45.00%			
		TOTAL TRAINS 14 CARS OR UNDER							11	or	55.00%			
		TOTAL TRAINS							20	or	100.00%			
		HAVRE - SPOKANE												
9	1	WEST Empire Builder	530	-	1	3	5	-	1	-	-	-	-	10
10	2	EAST Empire Builder	530	-	-	1	3	4	1	1	-	-	-	10
11		TOTAL		-	1	4	8	4	2	1	-	-	-	20
12		PER CENT OF TOTAL		-	5.00	20.00	40.00	20.00	10.00	5.00	-	-	-	
		TOTAL TRAINS OVER 14 CARS							3	or	15.00%			
		TOTAL TRAINS 14 CARS OR UNDER							17	or	85.00%			
		TOTAL TRAINS							20	or	100.00%			
		SPOKANE - SEATTLE												
13	1	WEST Empire Builder	330	-	-	1	7	-	2	-	-	-	-	10
14	2	EAST Empire Builder	330	-	-	-	-	3	5	1	1	-	-	10
15		TOTAL		-	-	1	7	3	7	1	1	-	-	20
16		PER CENT OF TOTAL		-	-	5.00	35.00	15.00	35.00	5.00	5.00	-	-	
		TOTAL TRAINS OVER 14 CARS							9	or	45.00%			
		TOTAL TRAINS 14 CARS OR UNDER							11	or	55.00%			

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)
		ST. PAUL - FARGO												
1	1	WEST Empire Builder	262	-	-	1	4	3	2	-	-	-	-	10
2	2	EAST Empire Builder	262	-	-	-	-	-	4	1	3	2	-	10
3		TOTAL		-	-	1	4	3	6	1	3	2	-	20
4		PER CENT OF TOTAL		-	-	5.00	20.00	15.00	30.00	5.00	15.00	10.00	-	
		TOTAL TRAINS OVER 14 CARS						12	or	60.00%				
		TOTAL TRAINS 14 CARS OR UNDER						8	or	40.00%				
		TOTAL TRAINS						20	or	100.00%				
		FARGO - HAVRE												
5	1	WEST Empire Builder	715	-	-	1	4	3	2	-	-	-	-	10
6	2	EAST Empire Builder	663	-	-	-	-	3	3	2	2	-	-	10
7		TOTAL		-	-	1	4	6	5	2	2	-	-	20
8		PER CENT OF TOTAL		-	-	5.00	20.00	30.00	25.00	10.00	10.00	-	-	
		TOTAL TRAINS OVER 14 CARS						9	or	45.00%				
		TOTAL TRAINS 14 CARS OR UNDER						11	or	55.00%				
		TOTAL TRAINS						20	or	100.00%				
		HAVRE - SPOKANE												
9	1	WEST Empire Builder	530	-	1	3	5	-	1	-	-	-	-	10
10	2	EAST Empire Builder	530	-	-	1	3	4	1	1	-	-	-	10
11		TOTAL		-	1	4	8	4	2	1	-	-	-	20
12		PER CENT OF TOTAL		-	5.00	20.00	40.00	20.00	10.00	5.00	-	-	-	
		TOTAL TRAINS OVER 14 CARS						3	or	15.00%				
		TOTAL TRAINS 14 CARS OR UNDER						17	or	85.00%				
		TOTAL TRAINS						20	or	100.00%				
		SPOKANE - SEATTLE												
13	1	WEST Empire Builder	330	-	-	1	7	-	2	-	-	-	-	10
14	2	EAST Empire Builder	330	-	-	-	-	3	5	1	1	-	-	10
15		TOTAL		-	-	1	7	3	7	1	1	-	-	20
16		PER CENT OF TOTAL		-	-	5.00	35.00	15.00	35.00	5.00	5.00	-	-	
		TOTAL TRAINS OVER 14 CARS						9	or	45.00%				
		TOTAL TRAINS 14 CARS OR UNDER						11	or	55.00%				
		TOTAL TRAINS						20	or	100.00%				

RECAPITULATION

	TOTAL TRAINS (p)	TOTAL OVER 14 (q)	PER CENT OF TOTAL (r)
St. Paul - Fargo	20	12	60.00
Fargo - Havre	20	9	45.00
Havre - Spokane	20	3	15.00
Spokane - Seattle	20	9	45.00
TOTAL	80	33	41.25

Defendant's Exhibit No. 46 (Witness W.M. Burn)
Dec. 3, 1940

Defts. Ex. No._____(Witness

GREAT NORTHERN RAILWAY COMPANY
FREIGHT OPERATING AND
FREIGHT TRANSPORTATION EXPENSES
RELATED TO TRAFFIC
CALENDAR YEARS 1922 TO 1939, INCLUSIVE

DEC 3

YEAR	REVENUE TON MILES	FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES	AVERAGE PER 1000 REVENUE TON MILES	
				FREIGHT OPERATING EXPENSES	FREIGHT TRANSP. EXPENSES
(a)	(b)	(c)	(d)	(e)	(f)
1939	8,681,459,839	$46,396,286	$22,054,786	$ 5.34	$ 2.54
1938	6,987,359,811	40,519,070	20,659,287	5.80	2.96
1937	9,441,838,978	46,373,342	23,832,234	4.91	2.52
1936	8,632,783,579	42,986,641	22,564,021	4.98	2.61
1935	7,372,079,484	37,075,813	19,492,794	5.03	2.64
1934	6,137,693,978	35,723,655	17,251,655	5.82	2.81
1933	5,431,602,934	30,100,622	14,876,161	5.54	2.74
1932	4,324,700,394	32,238,303	14,485,404	7.45	3.35
1931	6,151,063,399	39,320,203	18,433,440	6.39	3.00
1930	8,720,583,904	52,239,786	24,851,019	5.99	2.85
1929	10,150,709,921	61,386,902	29,006,204	6.05	2.86
1928	10,127,253,509	61,787,409	30,089,001	6.10	2.97
1927	8,958,349,961	57,495,372	28,042,083	6.42	3.13
1926	8,902,970,446	54,847,699	27,930,544	6.16	3.14
1925	8,517,913,981	53,896,566	28,208,086	6.33	3.31
1924	8,093,136,444	54,103,649	28,844,572	6.69	3.56
1923	8,754,272,702	64,170,783	33,988,661	7.33	3.88
1922	6,882,464,797	57,943,015	30,859,010	8.42	4.48
TOTAL 1936-1939	33,743,442,207	176,275,339	89,110,328	5.22	2.64
TOTAL 1922-1925	32,247,787,924	230,114,013	121,900,329	7.14	3.78
PER CENT OF IMPROVEMENT 4 YEARS 1936 - 1939 COMPARED WITH 4 YEARS 1922 - 1925				26.9	30.2

YEAR	REVENUE TON MILES	FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES	AVERAGE PER 1000 REVENUE TON MILES	
				FREIGHT OPERATING EXPENSES	FREIGHT TRANSP. EXPENSES
(a)	(b)	(c)	(d)	(e)	(f)
1939	8,681,459,839	$46,396,286	$22,054,786	$ 5.34	$ 2.54
1938	6,987,359,811	40,519,070	20,659,287	5.80	2.96
1937	9,441,838,978	46,373,342	23,832,234	4.91	2.52
1936	8,632,783,579	42,986,641	22,564,021	4.98	2.61
1935	7,372,079,484	37,075,813	19,492,794	5.03	2.64
1934	6,137,693,978	35,723,655	17,251,655	5.82	2.81
1933	5,431,602,934	30,100,622	14,876,161	5.54	2.74
1932	4,324,700,394	32,238,303	14,485,404	7.45	3.35
1931	6,151,063,399	39,320,203	18,433,440	6.39	3.00
1930	8,720,583,904	52,239,786	24,851,019	5.99	2.85
1929	10,150,709,921	61,386,902	29,006,204	6.05	2.86
1928	10,127,253,509	61,787,409	30,089,001	6.10	2.97
1927	8,958,349,961	57,495,372	28,042,083	6.42	3.13
1926	8,902,970,446	54,847,699	27,930,544	6.16	3.14
1925	8,517,913,981	53,896,566	28,208,086	6.33	3.31
1924	8,093,136,444	54,103,649	28,844,572	6.69	3.56
1923	8,754,272,702	64,170,783	33,988,661	7.33	3.88
1922	6,882,464,797	57,943,015	30,859,010	8.42	4.48
TOTAL 1936–1939	33,743,442,207	176,275,339	89,110,328	5.22	2.64
TOTAL 1922–1925	32,247,787,924	230,114,013	121,900,329	7.14	3.78
PER CENT OF IMPROVEMENT 4 YEARS 1936 - 1939 COMPARED WITH 4 YEARS 1922 - 1925				26.9	30.2

SOURCE: Annual Reports to Interstate Commerce Commission

Defendant's Exhibit No. 47 (Witness W.M. Burn)
Dec. 3, 1940

GREAT NORTHERN RAILWAY COMPANY

FREIGHT SERVICE OPERATING AVERAGES

Calendar Years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 and 1939

Line No. (a)	Item (b)	1922 (c)	1924 (d)	1926 (e)	1928 (f)	1930 (g)	1932 (h)	1934 (i)	1936 (j)	1938 (k)	1939 (l)	Percent increase 1939 over 1922 (m)
1	Miles of line operated in freight service	8 261	8 251	8 188	8 260	8 339	8 381	8 319	8 077	7 976	7 976	Dec. 3.4
2	Freight train miles	10 497 563	10 492 605	10 198 263	10 844 505	9 569 378	7 017 674	8 315 358	9 797,070	8 675 572	9 389 952	Dec.10.5
3	Freight cars per freight train	41.0	47.6	54.6	55.2	53.4	42.4	49.5	53.9	50.9	56.0	36.6
4	Net tons per freight train	781	893	980	1 046	997	689	820	957	885	1 017	30.2
5	Average tractive power per locomotive (lbs.) - Steam locomotives only	39 169	41 104	44 447	48 418	50 149	52 436	53 060	53 600	55 317	56 886	45.2
6	Average capacity per freight carrying car (tons)	39.1	42.1	44.0	44.3	45.0	45.1	45.2	45.7	46.9	47.6	21.7
7	Freight train speed (m.p.h.)	10.3	11.1	11.6	11.8	13.0	14.9	14.9	14.9	14.9	14.9	44.7
8	Gross ton-miles per freight train-hour (Exclusive of locomotives and tenders).	16 494	20 748	24 654	26 256	28 021	24 991	29 294	32 574	31 526	35 462	115.0
9	Net ton-miles per freight train-hour	8 029	9 901	11 339	12 334	12 933	10 285	12 208	14 115	13 084	15 102	88.1
10	Gross ton-miles (Exclusive of locomotives and tenders) per ton of fuel	11 161	12 889	14 148	14 129	14 862	13 285	14 281	15 463	15 296	16 874	51.2

SOURCE: Items 1, 2, 3, 4, 7 and 8 - Reports of Freight Train Performance, Form OS-A, filed with Interstate Commerce Commission.

Item 5 - Total tractive effort ÷ total steam locomotives available for service at close of each year as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 6 - Aggregate capacity of all freight carrying cars ÷ total number of such cars available for service at close of year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 9 - Net ton miles ÷ train hours as reported on Form OS-A to Interstate Commerce Commission.

Item 10 - Gross ton miles (cars, contents and cabooses) ÷ equated net tons of fuel consumed as reported to Interstate Commerce Commission in years 1922 to 1934, inclusive, on Form OS-A and as reported in years 1936, 1938 and 1939 on Forms OS-A and OS-E respectively.

S364

Defendant's Exhibit No. 49 (Witness C.G. Gregory)
Dec. 3 1940

NORTHERN PACIFIC RAILWAY COMPANY

FREIGHT OPERATING AND FREIGHT TRANSPORTATION EXPENSES
RELATED TO TRAFFIC

CALENDAR YEARS 1922 TO 1939, INCLUSIVE

YEAR	REVENUE TON-MILES	FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES	AVERAGES PER 1000 REVENUE TON-MILES	
				FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES
(a)	(b)	(c)	(d)	(e)	(f)
1939	5,621,295,168	$36,934,950	$17,511,549	$6.57	$3.12
1938	4,712,217,960	33,854,352	16,535,729	7.18	3.51
1937	5,776,545,781	39,086,490	18,880,700	6.77	3.27
1936	5,277,964,003	36,154,035	17,713,572	6.85	3.36
1935	4,382,753,092	31,863,295	15,348,737	7.27	3.50
1934	3,939,247,066	29,746,890	14,312,500	7.55	3.63
1933	3,568,371,982	27,699,437	12,775,735	7.76	3.58
1932	3,087,635,028	29,196,122	13,096,879	9.46	4.24
1931	4,074,528,222	36,670,058	16,994,029	9.00	4.17
1930	5,420,866,297	43,752,571	20,430,943	8.07	3.77
1929	6,594,488,825	50,487,835	23,764,442	7.66	3.60
1928	7,052,061,971	51,155,773	24,230,696	7.25	3.44
1927	6,571,474,798	48,080,101	23,003,749	7.32	3.50
1926	6,639,159,517	48,169,899	23,296,155	7.26	3.51
1925	6,751,142,456	49,229,743	24,089,199	7.29	3.57
1924	6,548,671,158	50,332,344	24,600,548	7.69	3.76
1923	6,854,336,779	58,164,840	28,087,219	8.49	4.10
1922	6,021,158,972	50,604,691	26,245,365	8.40	4.36
TOTAL 1936-1939	21,388,022,912	146,029,827	70,641,550	6.83	3.30
TOTAL 1922-1925	26,175,309,365	208,331,618	103,022,331	7.96	3.94

CALENDAR YEARS 1922 TO 1939, INCLUSIVE

YEAR (a)	REVENUE TON-MILES (b)	FREIGHT OPERATING EXPENSES (c)	FREIGHT TRANSPORTATION EXPENSES (d)	AVERAGES PER 1000 REVENUE TON-MILES: FREIGHT OPERATING EXPENSES (e)	AVERAGES PER 1000 REVENUE TON-MILES: FREIGHT TRANSPORTATION EXPENSES (f)
1939	5,621,295,168	$36,934,950	$17,511,549	$6.57	$3.12
1938	4,712,217,960	33,854,352	16,535,729	7.18	3.51
1937	5,776,545,781	39,086,490	18,880,700	6.77	3.27
1936	5,277,964,003	36,154,035	17,713,572	6.85	3.36
1935	4,382,753,092	31,863,295	15,348,737	7.27	3.50
1934	3,939,247,066	29,746,890	14,312,500	7.55	3.63
1933	3,568,371,982	27,699,437	12,775,735	7.76	3.58
1932	3,087,635,028	29,196,122	13,096,879	9.46	4.24
1931	4,074,528,222	36,670,058	16,994,029	9.00	4.17
1930	5,420,866,297	43,752,571	20,430,943	8.07	3.77
1929	6,594,488,825	50,487,835	23,764,442	7.66	3.60
1928	7,052,061,971	51,155,773	24,230,696	7.25	3.44
1927	6,571,474,798	48,080,101	23,003,749	7.32	3.50
1926	6,639,159,517	48,169,899	23,296,155	7.26	3.51
1925	6,751,142,456	49,229,743	24,089,199	7.29	3.57
1924	6,548,671,158	50,332,344	24,600,548	7.69	3.76
1923	6,854,336,779	58,164,840	28,087,219	8.49	4.10
1922	6,021,158,972	50,604,691	26,245,365	8.40	4.36
TOTAL 1936-1939	21,388,422,912	146,029,827	70,641,550	6.83	3.30
TOTAL 1922-1925	26,175,309,365	208,331,618	103,022,331	7.96	3.94
PER CENT OF IMPROVEMENT 4 YEARS 1936 - 1939 COMPARED WITH 4 YEARS 1922 - 1925				14.2	16.2

SOURCE: Annual Reports to Interstate Commerce Commission

2960

Defendant's Exhibit No. 48 (Witness Gregory)
Dec. 3, 1940

NORTHERN PACIFIC RAILWAY COMPANY

FREIGHT SERVICE OPERATING AVERAGES
CALENDAR YEARS 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 AND 1939

LINE NO. (a)	ITEM (b)	1922 (c)	1924 (d)	1926 (e)	1928 (f)	1930 (g)	1932 (h)	1934 (i)	1936 (j)	1938 (k)	1939 (l)	PERCENT INCREASE 1939 OVER 1922 (m)
1	Miles of line operated in freight service,.....	6,398	6,426	6,510	6,435	6,474	6,397	6,410	6,428	6,423	6,423	.4
2	Freight train miles,.....	10,109,782	9,943,098	10,036,695	10,139,395	8,421,621	6,000,916	7,060,112	8,575,733	7,297,121	7,829,099	22.6 *
3	Freight cars per freight train,.....	39.5	43.4	47.9	49.5	46.9	42.1	46.5	45.8	46.7	49.9	26.3
4	Net tons per freight train,.....	711	765	789	830	769	631	702	753	794	873	22.8
5	Average tractive power per locomotive (pounds),.....	36,600	38,110	39,829	42,415	44,793	45,282	46,136	47,634	48,860	49,843	36.2
6	Average capacity per freight car (tons),.....	38.7	39.8	40.3	40.4	41.1	41.2	41.7	42.1	42.8	42.8	10.6
7	Freight train speed (miles per hour)	12.5	12.6	12.7	13.0	13.8	15.2	15.4	15.4	15.8	15.7	25.6
8	Gross ton-miles per freight train-hour,.....	18,813	20,961	22,950	24,498	24,848	24,311	27,133	28,049	30,168	32,408	72.3
9	Net ton-miles per freight train-hour	8,863	9,599	10,062	10,759	10,618	9,563	10,815	11,531	12,469	13,642	53.9
10	Gross ton-miles (exclusive of locomotives and tenders) per ton of fuel,.....	12,763	13,826	12,433	12,186	11,844	11,565	11,191	11,531	12,300	12,967	1.6

* = Decrease

SOURCE: Items 1, 2, 3, 4, 7 and 8 - Reports of freight train performance, Form OS-A, filed with Interstate Commerce Commission.

Item 5 - Total tractive effort divided by total steam locomotives available for service at close of each year as reported in Schedule 417 of annual report to Interstate Commerce Commission.

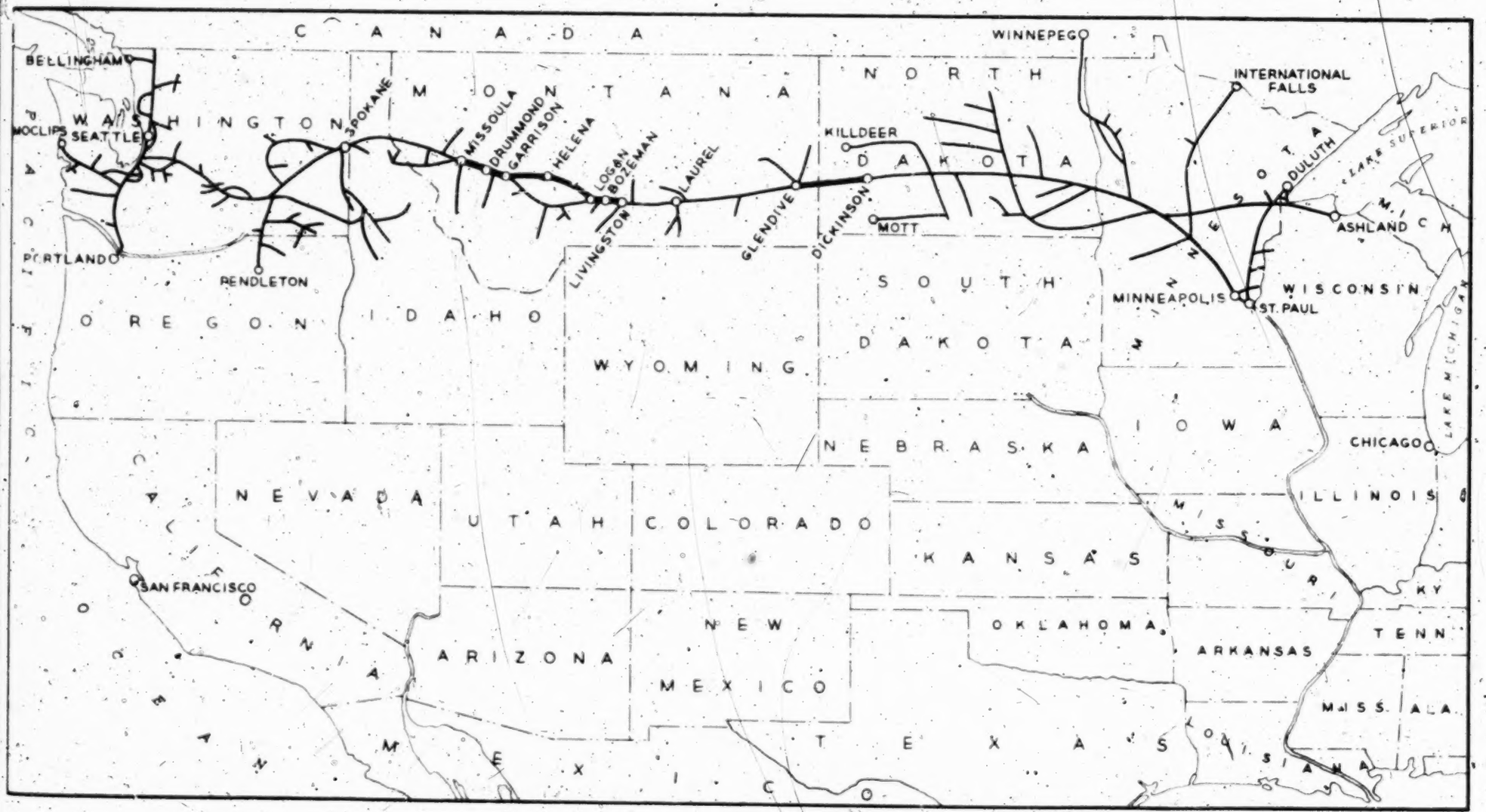
Item 6 - Aggregate capacity of all freight carrying cars divided by total number of such cars available for service at close of year, as reported in Schedule 417 of annual report to the Interstate Commerce Commission.

Item 9 - Net ton miles divided by train-hours as reported on Form OS-A to Interstate Commerce Commission.

Item 10- Gross ton miles (cars, contents and cabooses) divided by equated net tons of fuel consumed as reported to Interstate Commerce Commission in years 1922 to 1934, inclusive, on Form OS-A and as reported in years 1935, 1938 and 1939 on Forms OS-A and OS-E, respectively.

5366

Defendant's Exhibit No. 50 (Witness Dutton)
Jan. 24, 1941.



NORTHERN PACIFIC RAILWAY COMPANY

HEAVY LINE INDICATES TERRITORY COVERED BY TYPICAL FREIGHT TRAIN EXHIBIT

5367

Defendant's Exhibit No. 51 (Witness H T. Siddeall)
Dec. 3, 1940

ROCK ISLAND LINES
(The Chicago, Rock Island and Pacific Railway Company)
(The Chicago, Rock Island Gulf Railway Company)

FREIGHT OPERATING AND FREIGHT TRANSPORTATION EXPENSES RELATED TO TRAFFIC

Calendar Years 1922 to 1939, Inclusive

Year	Revenue ton-miles	Freight operating expenses	Freight transportation expenses	Averages per 1,000 revenue ton-miles	
				Freight operating expenses	Freight transportation expenses
(a)	(b)	(c)	(d)	(e)	(f)
1939	6,642,392,916	$45,581,292	$21,512,545	$6.86	$3.24
1938	6,493,304,479	46,321,846	22,627,050	7.13	3.48
1937	7,183,994,544	49,316,242	24,483,374	6.86	3.41
1936	6,495,333,736	48,389,130	23,439,872	7.45	3.61
1935	5,336,307,383	42,216,573	20,785,214	7.91	3.90
1934	5,430,071,821	40,165,202	19,260,991	7.40	3.55
1933	5,094,596,849	37,196,478	18,007,166	7.30	3.53
1932	5,204,739,845	39,274,312	20,099,251	7.55	3.86
1931	7,131,311,627	52,700,067	26,668,416	7.39	3.74
1930	8,481,810,873	65,025,985	33,092,997	7.67	3.90
1929	9,917,562,335	78,642,499	38,612,713	7.93	3.89
1928	9,178,453,177	74,759,670	36,731,003	8.15	4.00
1927	8,589,546,367	74,002,917	36,785,056	8.62	4.28
1926	8,316,601,546	73,382,224	36,093,127	8.82	4.34
1925	7,912,863,362	72,129,796	36,055,436	9.12	4.56
1924	7,853,201,011	71,948,368	37,379,733	9.16	4.76
1923	7,475,438,808	76,129,104	39,343,037	10.18	5.26
1922	6,650,444,419	70,994,026	37,533,740	10.68	5.64
Total 1936-1939	26,815,025,675	189,608,510	92,062,841	7.07	3.43
Total 1922-1925	29,891,947,600	291,201,294	150,311,946	9.74	5.03
Percent of improvement 4 years 1936-1939 compared with 4 years 1922-1925				27.4	31.8

SOURCE: Annual reports to the Interstate Commerce Commission.

Defendant's Exhibit No. 52 (Witness H.E. Siddall)
Dec. 3, 1940

ROCK ISLAND LINES

(The Chicago, Rock Island and Pacific Railway Company)
(The Chicago, Rock Island and Gulf Railway Company)

FREIGHT SERVICE OPERATING AVERAGES
Calendar years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 and 1939

LINE NO. (a)	ITEM (b)	1922 (c)	1924 (d)	1926 (e)	1928 (f)	1930 (g)	1932 (h)	1934 (i)	1936 (j)	1938 (k)	1939 (l)	PER CENT INCREASE 1939 OVER 1922 (m)
1	Miles of line operated in freight service,....	8,116	8,073	8,024	8,082	8,183	8,340	8,318	8,165	8,010	7,841	Dec. 3.4
2	Freight train miles operated,.....	16,137,256	17,663,927	17,383,909	17,953,705	16,292,149	12,038,785	12,283,671	14,041,648	13,233,715	13,037,107	Dec. 19.2
3	Freight cars per freight train,.....	32.4	35.7	39.1	41.3	41.8	37.8	37.3	35.2	38.1	39.9	23.1
4	Net tons per freight train,.....	503	524	553	584	584	477	485	510	528	553	9.9
5	Average tractive power per locomotive (pounds)	37,198	39,076	41,711	44,000	47,200	49,056	48,575	50,237	51,594	53,293	43.3
6	Average capacity per freight car (tons),.....	38.0	40.4	39.1	40.4	42.5	42.7	43.4	44.1	44.9	45.1	18.7
7	Freight train speed (miles per hour).....	11.9	12.5	12.8	13.3	14.5	16.5	17.4	17.6	18.3	18.5	55.5
8	Gross ton-miles per freight train-hour,.....	13,821	15,813	17,802	19,750	22,052	22,049	23,289	23,755	26,583	28,131	103.5
9	Net ton-miles per freight train-hour,.....	5,987	6,535	7,092	7,792	8,490	7,868	8,415	8,934	9,654	10,229	70.9
10	Gross ton-miles (exclusive of locomotives and tenders) per ton of fuel,.....	9,764	10,380	11,763	12,425	12,792	12,063	12,316	12,379	13,253	14,049	43.9

SOURCE: Items 1, 2, 3, 4, 7 and 8 -- Reports of Freight Train Performance, Form OS-A, filed with Interstate Commerce Commission.

Item 5 - Total tractive effort ÷ total steam locomotives available for service at close of each year as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

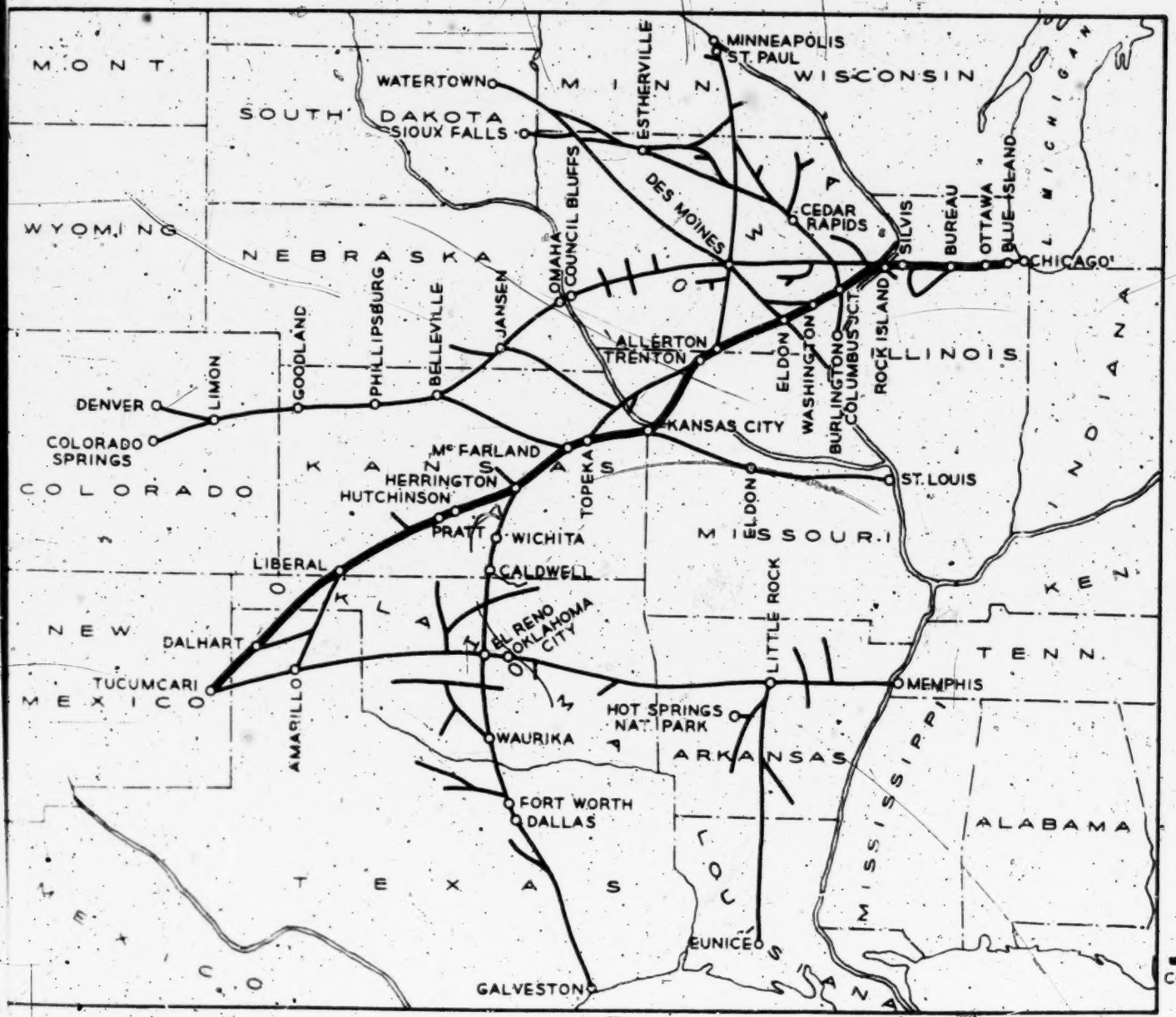
Item 6 - Aggregate capacity of all freight carrying cars ÷ total number of such cars available for service at close of year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 9 - Net ton miles ÷ train hours as reported on Form OS-A to Interstate Commerce Commission.

Item 10 - Gross ton miles (cars, contents and cabooses) ÷ equated net tons of fuel consumed as reported in years 1922, 1924, 1926, 1928, 1930, 1932 and 1934 on Form OS-A to Interstate Commerce Commission and as reported in years 1936, 1938 and 1939 in Schedule 531 and 571 respectively, of Annual Report to Interstate Commerce Commission.

5369

Defendant's Exhibit No. 53 (Witness H.E. Siddall)
Dec. 3, 1940



CHICAGO, ROCK ISLAND AND
PACIFIC RAILWAY CO.

HEAVY LINE INDICATES TERRITORY
COVERED BY TYPICAL FREIGHT TRAIN EXHIBIT.

5370

Defendant's Exhibit No. 54 (Witness G. W. Oakley)
Dec. 3, 1940

ERIE RAILROAD COMPANY
(Robert E. Woodruff and John A. Hadden, Trustees)
and Chicago and Erie Railroad Company

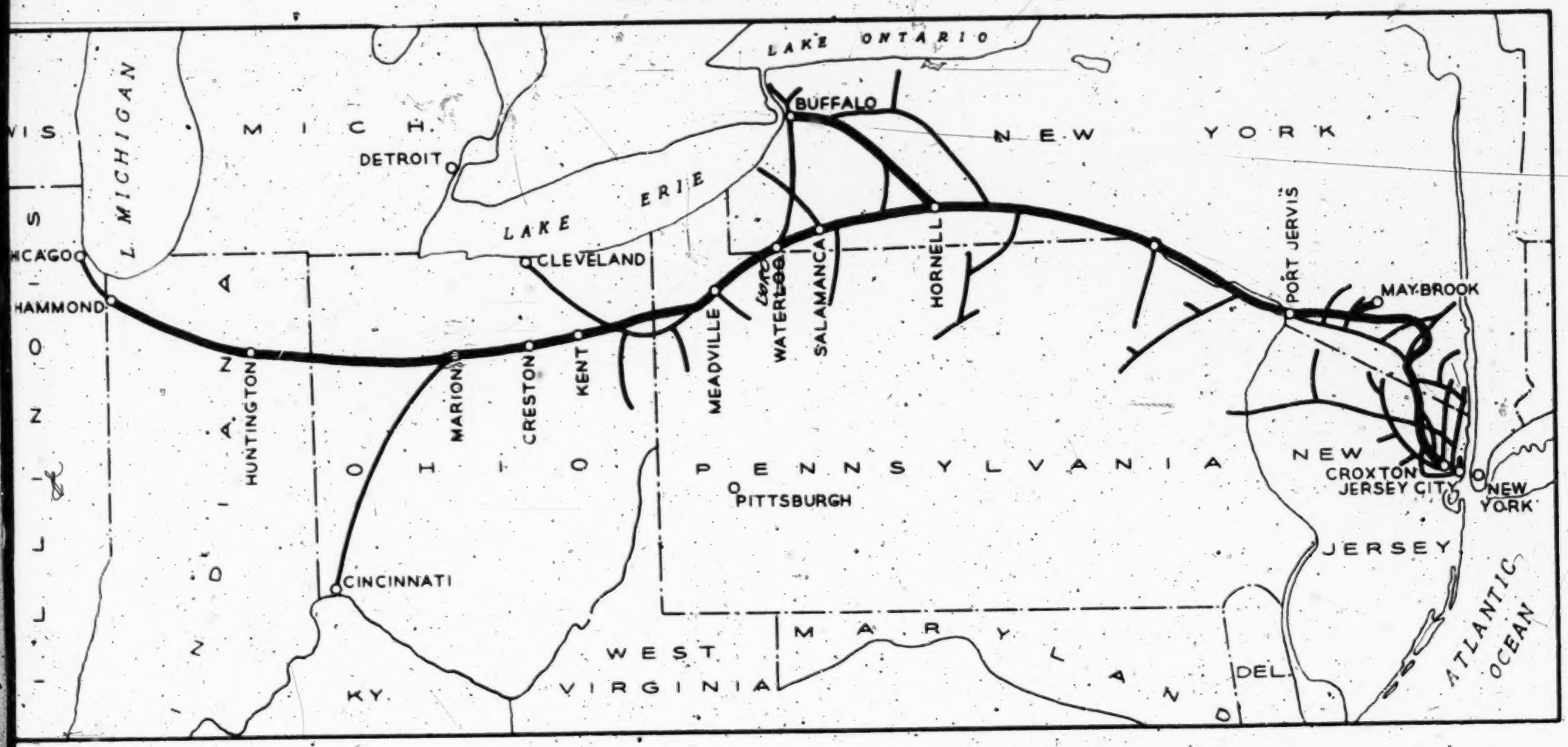
FREIGHT OPERATING AND FREIGHT TRANSPORTATION EXPENSES RELATED TO TRAFFIC,

Calendar Years 1922 to 1939, inclusive

Year	Revenue ton-miles	Freight operating expenses	Freight transportation expenses	Averages per 1,000 revenue ton-miles	
				Freight operating expenses	Freight transportation expenses
(a)	(b)	(c)	(d)	(e)	(f)
1939	7,320,888,085	$47,888,238	$24,573,972	$6.54	$3.36
1938	6,239,901,688	44,529,333	22,464,504	7.14	3.60
1937	7,878,247,067	49,306,880	25,379,237	6.26	3.22
1936	7,660,833,886	47,208,453	24,313,497	6.16	3.17
1935	6,760,035,292	43,004,080	22,146,340	6.36	3.28
1934	6,761,789,667	42,325,349	20,928,894	6.26	3.10
1933	6,315,780,730	39,529,891	19,214,616	6.26	3.04
1932	6,199,480,478	41,711,363	20,217,603	6.73	3.26
1931	7,639,912,264	53,105,209	26,291,620	6.95	3.44
1930	9,130,633,042	64,969,930	32,147,930	7.12	3.52
1929	10,770,648,870	76,933,771	37,965,030	7.14	3.52
1928	10,506,738,211	75,375,184	37,697,060	7.17	3.59
1927	10,161,506,219	79,046,757	38,733,206	7.78	3.81
1926	10,407,367,882	78,954,882	38,559,761	7.59	3.71
1925	9,469,280,360	72,861,763	36,133,982	7.69	3.82
1924	9,880,512,589	75,024,968	36,594,514	7.59	3.70
1923	11,363,376,567	86,988,536	41,767,411	7.66	3.68
1922	8,277,801,171	78,557,002	38,721,959	9.49	4.68
Total 1936-1939	29,099,870,726	188,932,904	96,731,210	6.49	3.32
Total 1922-1925	38,990,970,687	313,432,269	153,217,866	8.04	3.93
Percent of improvement 4 years 1936-1939 compared with 4 years 1922-1925				19.3	15.5

SOURCE: Annual reports to the Interstate Commerce Commission.

Defendant's Exhibit No. 55 (Witness G.W. Oakley)
Dec. 5, 1940



ERIE RAILROAD COMPANY

5372

HEAVY LINE INDICATES TERRITORY COVERED BY TYPICAL FREIGHT TRAIN EXHIBIT.

Defendant's Exhibit No. 56 (Witness G.W. Oakley)
Dec. 3. 1940

ERIE RAILROAD COMPANY
Robert E. Woodruff and John A. Hadden, Trustees
Chicago and Erie Railroad Company

FREIGHT SERVICE OPERATING AVERAGES

CALENDAR YEARS 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 AND 1939

LINE NO. (a)	ITEM (b)	1922 (c)	1924 (d)	1926 (e)	1928 (f)	1930 (g)	1932 (h)	1934 (i)	1936 (j)	1938 (k)	1939 (l)	PER CENT INCREASE 1939 OVER 1922 (m)
1	Miles of road operated,.....	2,309	2,325	2,321	2,317	2,316	2,316	2,311	2,296	2,277	2,289	Dec. .87
2	Train miles (locomotive propelled and motor car trains),.....	10,646,372	11,536,703	12,034,606	10,944,726	9,669,279	7,539,993	7,927,264	8,425,735	7,205,002	7,734,792	Dec. 27.35
3	Freight cars per freight train,.....	49.8	55.0	57.4	68.0	71.9	67.4	66.4	64.8	66.7	67.4	35.3
4	Net tons per freight train,.....	878	955	965	1,043	1,034	903	935	993	973	1,030	17.3
5	Average tractive power per locomotive (pounds),.....	40,971	44,820	46,903	52,615	53,764	54,578	55,213	55,839	55,928	54,724	33.6
6	Average capacity per freight car (tons),.....	41.8	41.7	43.6	44.7	46.8	47.1	48.0	50.8	51.6	51.4	23.0
7	Freight train speed (miles per hour).	10.4	11.4	11.5	12.5	13.9	15.5	16.3	16.4	16.8	17.0	63.5
8	Gross ton-miles per freight train-hour,.....	20,031	24,239	25,483	31,570	36,906	38,730	41,013	41,975	44,140	45,742	128.4
9	Net ton-miles per freight train-hour.	9,161	10,853	11,125	12,999	14,387	14,031	15,206	16,146	16,233	17,418	90.1
10	Gross ton-miles (exclusive of locomotives and tenders) per ton of fuel.	11,469	13,225	13,710	14,643	16,372	16,840	17,043	17,460	18,274	18,127	58.1

SOURCE: Items 1, 2, 3, 4, 7 and 8 - Reports of Freight Train Performance, Form OS-A, filed with Interstate Commerce Commission.

Item 5 - Total tractive effort ÷ total steam locomotives available for service at close of each year as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 6 - Aggregate capacity of all freight carrying cars ÷ total number of such cars available for service at close of year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 9 - Net ton miles ÷ train hours as reported on Form OS-A to Interstate Commerce Commission.

Item 10- Gross ton miles (cars, contents and cabooses) ÷ equated net tons of fuel consumed as reported in years 1922, 1924, 1926, 1928, 1930, 1932 and 1934 on Form OS-A to Interstate Commerce Commission and as reported in years 1936, 1938 and 1939, in Schedules 531 and 571, respectively, of Annual Report to Interstate Commerce Commission.

5373

Defendant's Exhibit No. 57 (Witness Cakley)
Dec. 4, 1940

ERIE RAILROAD COMPANY
(Robert E. Woodruff and John A. Hadden, Trustees
CHICAGO AND ERIE RAILROAD COMPANY

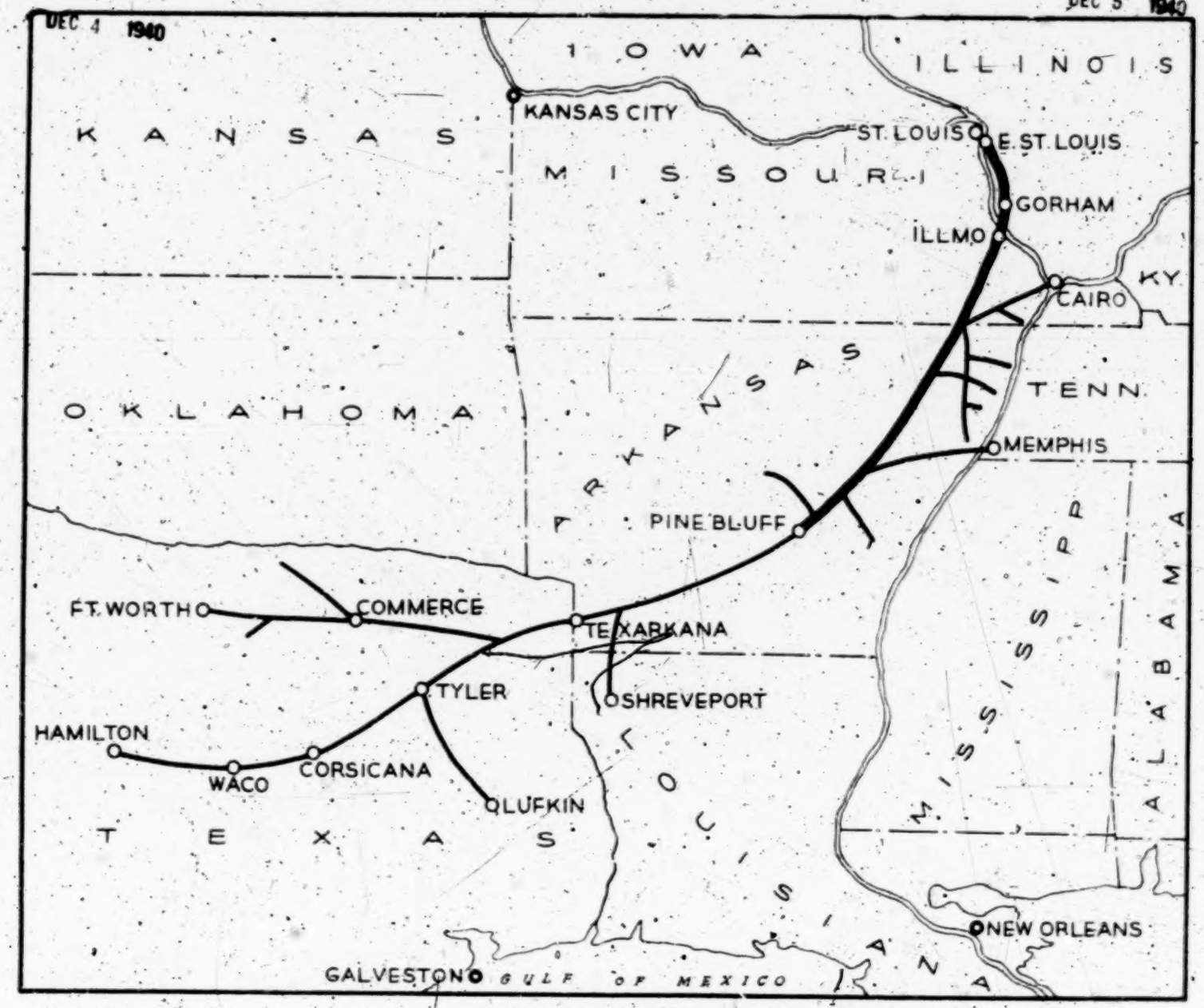
REVENUE FREIGHT CARRIED DURING THE YEAR 1939

Class No.	Commodity Group or Class	Revenue Freight Originating On Respondent's Road: Terminating On Line Carloads	Revenue Freight Originating On Respondent's Road: Delivered to Connecting Carriers Carloads	Revenue Freight Received From Connecting Carriers: Terminating On Line Carloads	Revenue Freight Received From Connecting Carriers: Delivered to Connecting Carriers Carloads	Total Revenue Freight Carried Carloads
	Products of Agriculture					
110	Oranges and Grapefruit	-	-	6,803	1,137	7,940
111	Lemons, Limes and citrus fruits N. O. S.	-	-	2,535	244	2,779
120	Apples, fresh	53	80	2,870	348	3,351
121	Bananas	602	1,281	77	7	1,967
122	Berries, fresh	-	6	65	25	96
123	Cantaloupes and melons N. O. S.	-	-	3,836	1,291	5,127
124	Grapes, fresh	522	74	5,464	3,890	9,950
125	Peaches, fresh	3	-	347	47	397
126	Watermelons	-	-	95	-	95
127	Fruits, fresh, domestic N. O. S.	126	25	5,257	923	6,331
128	Fruits, fresh, tropical N. O. S.	-	-	182	90	272
130	Potatoes other than sweet	75	500	1,129	588	2,290
140	Cabbage	11	117	129	281	538
141	Onions	51	247	158	314	770
142	Tomatoes	30	53	105	714	900
143	Vegetables, fresh N. O. S.	24	34	1,869	4,606	6,553

Class No.	Commodity Group or Class	On Respondent's Road: Terminating On Line Carloads	On Respondent's Road: Delivered to Connecting Carriers Carloads	From Connecting Carriers: Terminating On Line Carloads	From Connecting Carriers: Delivered to Connecting Carriers Carloads	Total Freight Carried Carloads
	Products of Agriculture					
110	Oranges and Grapefruit	-	-	6,803	1,137	7,940
111	Lemons, Limes and citrus fruits N. O. S.	-	-	2,535	244	2,779
120	Apples, fresh	53	80	2,870	348	3,351
121	Bananas	602	1,281	77	7	1,967
122	Berries, fresh	-	6	65	25	96
123	Cantaloupes and melons N. O. S.	-	-	3,836	1,291	5,127
124	Grapes, fresh	522	74	5,464	3,890	9,950
125	Peaches, fresh	5	-	347	47	397
126	Watermelons	-	-	95	-	95
127	Fruits, fresh, domestic N. O. S.	126	25	5,257	923	6,331
128	Fruits, fresh, tropical N. O. S.	-	-	182	90	272
130	Potatoes other than sweet	73	500	1,129	588	2,290
140	Cabbage	11	117	139	231	538
141	Onions	51	247	158	314	770
142	Tomatoes	30	53	105	714	900
143	Vegetables, fresh N. O. S.	24	34	1,889	4,603	6,553
	Total Classes 110 to 143, Inc.	1,485	2,417	30,939	14,505	49,356
	Total Products of Agriculture	15,134	16,678	49,997	25,029	106,818
	Grand Total, Carload Traffic	157,088	241,695	347,255	191,117	957,125

SUPERIOR COURT, PIMA CO., ARIZONA
STATE v S.P.CO. NO 20887

Defendant's Exhibit No. 58 (Witness F.H. Millard) WITNESS
Dec. 5, 1940



ST. LOUIS SOUTHWESTERN RAILWAY LINES
BERRYMAN HENWOOD, TRUSTEE
HEAVY LINE INDICATES TERRITORY COVERED BY TYPICAL FREIGHT TRAIN EXHIBIT.

5375

ST. LOUIS SOUTHWESTERN RAILWAY LINES
BERRYMAN HENWOOD, TRUSTEE

FREIGHT OPERATING AND FREIGHT TRANSPORTATION EXPENSES RELATED TO TRAFFIC CALENDAR YEARS 1922 TO 1939, INCLUSIVE

YEAR	REVENUE TON MILES	FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES	AVERAGES PER 1000 REVENUE TON MILES	
				FREIGHT OPERATING EXPENSES	FREIGHT TRANSP. EXPENSES
(a)	(b)	(c)	(d)	(e)	(f)
1939	1,642,737,108	$13,130,970	$5,306,340	$ 7.99	$ 3.23
1938	1,611,238,798	11,459,267	5,481,426	7.11	3.40
1937	1,957,399,303	13,663,548	6,126,364	6.98	3.13
1936	1,671,162,217	11,419,589	5,113,962	6.83	3.06
1935	1,318,251,621	9,261,986	4,448,974	7.03	3.37
1934	1,177,451,598	8,376,679	3,971,790	7.11	3.37
1933	1,048,663,798	7,522,571	3,389,435	7.17	3.23
1932	912,910,121	8,619,779	3,608,847	9.44	3.95
1931	1,287,512,343	10,277,710	4,759,892	7.98	3.70
1930	1,639,949,428	13,680,941	6,207,457	8.34	3.79
1929	1,686,142,397	16,129,633	6,397,945	9.57	3.79
1928	1,644,534,997	15,035,188	6,010,479	9.14	3.65
1927	1,395,902,590	13,820,203	5,501,716	9.90	3.94
1926	1,479,328,300	14,612,541	5,594,077	9.88	3.78
1925	1,474,751,588	15,280,103	5,642,807	10.36	3.83
1924	1,423,436,363	15,633,403	5,857,469	10.98	4.12
1923	1,697,769,155	17,576,406	7,070,855	10.35	4.16
1922	1,535,404,954	15,988,494	7,143,670	10.41	4.65
TOTAL 1936-1939	6,882,537,426	49,673,374	22,028,092	7.22	3.20
TOTAL 1922-1925	6,131,362,060	64,478,406	25,714,801	10.52	4.19

Defendant's Exhibit No. 60 (Witness F. H. Millard)
Dec. 4, 1940

ST. LOUIS SOUTHWESTERN RAILWAY LINES
BERRYMAN HENWOOD - TRUSTEE

FREIGHT SERVICE OPERATING AVERAGES
CALENDAR YEARS 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 AND 1939

LINE NO. (a)	ITEM (b)	1922 (c)	1924 (d)	1926 (e)	1928 (f)	1930 (g)	1932 (h)	1934 (i)	1936 (j)	1938 (k)	1939 (l)	PERCENT INCREASE 1939 OVER 1922 (m)
1	Miles of line operated in freight service,	1,765	1,766	1,737	1,736	1,832	1,902	1,815	1,750	1,689	1,678	4.9 dec.
2	Freight train miles,	3,006,820	2,796,576	2,698,889	3,217,095	3,349,365	2,242,974	2,644,438	3,258,037	3,040,960	3,053,800	1.6
3	Freight cars per freight train,	36.9	38.2	43.4	43.8	43.4	39.5	41.6	43.7	45.1	45.1	22.2
4	Net tons per freight train,	584	579	601	574	536	439	482	560	567	593	1.5
5	Average tractive power per locomotive (pounds),	36,095	37,305	37,580	41,056	43,396	43,411	45,306	45,382	46,172	46,738	29.5
6	Average capacity per freight carrying car (tons),	32.6	34.7	36.0	37.1	37.6	39.8	40.2	40.3	40.3	40.5	24.2
7	Freight train speed (miles per hour)	10.7	12.4	12.9	14.1	15.9	17.6	18.1	18.1	18.8	19.7	84.1
8	Gross ton-miles per freight train-hour,	14,306	16,968	19,541	21,621	24,614	24,227	26,571	28,834	30,760	32,745	128.9
9	Net ton-miles per freight train-hour	6,237	7,161	7,726	8,067	8,552	7,712	8,726	10,127	10,638	11,664	87.0
10	Gross ton-miles (exclusive of locomotives and tenders) per ton of fuel,	12,664	13,302	15,312	16,216	16,618	15,680	18,799	17,991	18,282	19,163	51.3

SOURCE: Items 1, 2, 3, 4, 7 and 8 - Reports of Freight Train Performance, Form OS-A, filed with Interstate Commerce Commission.

Item 5 - Total tractive effort ÷ total steam locomotives available for service at close of each year as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 6 - Aggregate capacity of all freight carrying cars ÷ total number of such cars available for service at close of year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 9 - Net ton miles ÷ train hours as reported on Form OS-A to Interstate Commerce Commission.

Item 10- Gross ton miles (cars, contents and cabooses) ÷ equated net tons of fuel consumed as reported in years 1922, 1924, 1926, 1928, 1930, 1932 and 1934 on Form OS-A to Interstate Commerce Commission and as reported in years 1936, 1938 and 1939 in Schedule 531 and 571, respectively, of Annual Report to Interstate Commerce Commission.

5377

Defendant's Exhibit No. 61 (Witness Millard)
Dec. 4, 1940

ST. LOUIS SOUTHWESTERN RY. LINES

PERISHABLE CARLOADS, AGRICULTURAL CARLOADS AND TOTAL CARLOADS

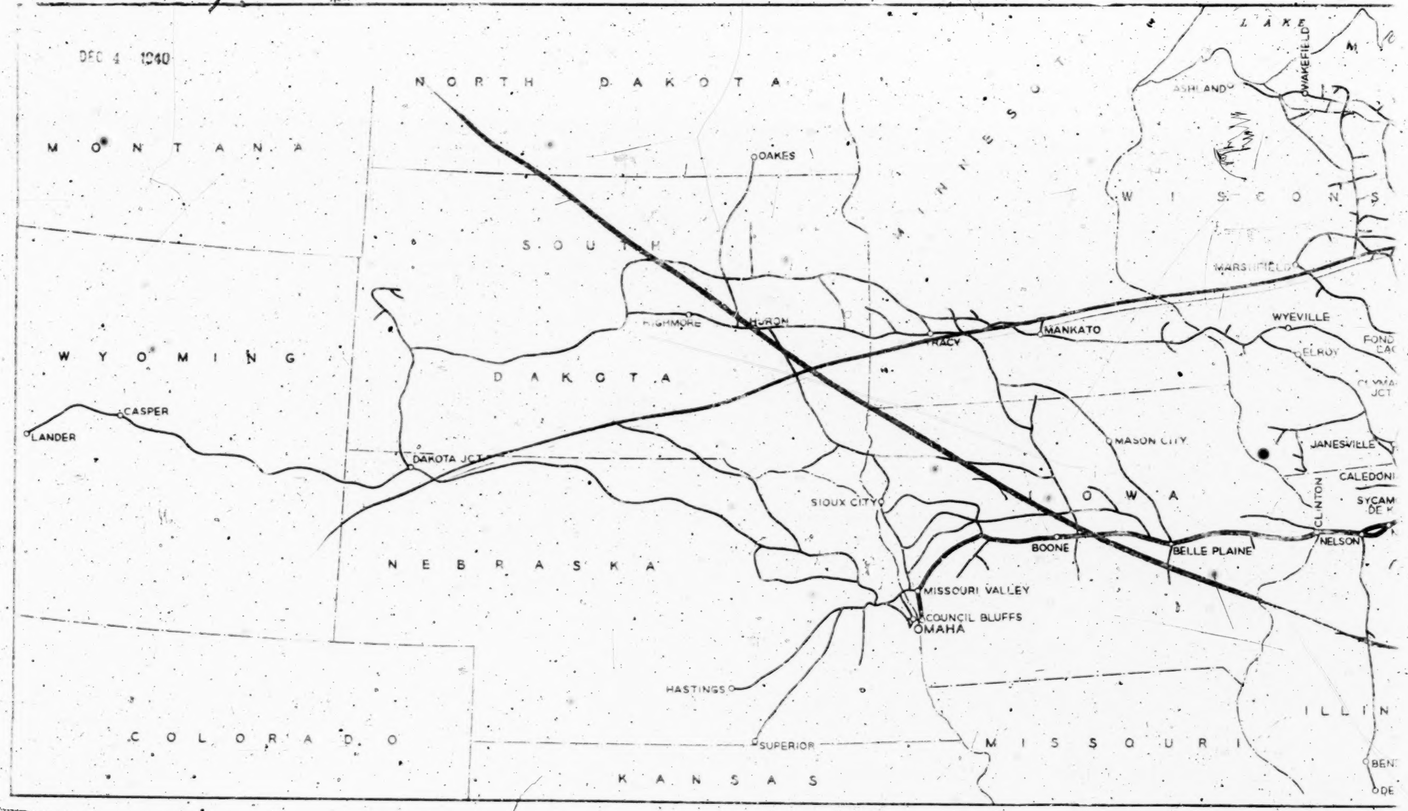
Year 1939

		ORIGINATING ON LINE		RECEIVED FROM CONNECTIONS		TOTAL
Line	Commodity	Terminating On Line	Delivered to Connections	Terminating On Line	Delivered to Connections	
110	Oranges & Grapefruit	-	-	167	2,161	2,328
111	Lemons, Limes & Citrus	-	-	11	488	499
120	Apples, fresh	-	-	187	55	242
121	Bananas	-	-	23	-	23
122	Berries, fresh	-	5	-	-	5
123	Cantaloupes and melons N. O. S.	-	6	37	1,587	1,630
124	Grapes, fresh	-	-	16	98	114
125	Peaches, fresh	8	41	1	2	52
126	Watermelons	5	161	-	21	187
127	Fruits, fresh domestic N.O.S.	-	1	6	41	48
128	Fruits, fresh tropical N. O. S.	-	-	-	1	1
130	Potatoes other than sweet	51	118	462	412	1,043
140	Cabbage	-	-	48	617	665
141	Onions	8	279	84	1,156	1,527
142	Tomatoes	20	835	66	1,449	2,370
143	Vegetables, fresh N. O. S.	4	37	270	6,857	7,168

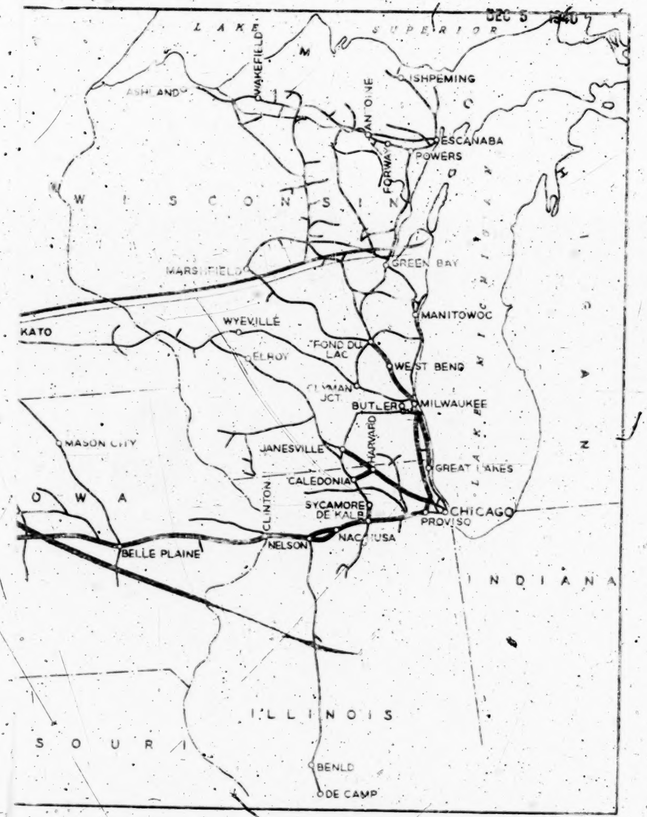
Year 1939

Line	Commodity	ORIGINATING ON LINE: Terminating On Line	ORIGINATING ON LINE: Delivered to Connections	RECEIVED FROM CONNECTIONS: Terminating On Line	RECEIVED FROM CONNECTIONS: Delivered to Connections	TOTAL
110	Oranges & Grapefruit	-	-	197	2,161	2,358
111	Lemons, Limes & Citrus	-	-	11	488	499
120	Apples, fresh	-	-	187	55	242
121	Bananas	-	-	23	-	23
122	Berries, fresh	-	5	-	-	5
123	Cantaloupes and melons N. O. S.	-	6	37	1,587	1,630
124	Grapes, fresh	-	-	16	98	114
125	Peaches, fresh	8	41	1	2	52
126	Watermelons	5	161	-	21	187
127	Fruits, fresh domestic N.O.S.	-	1	6	41	48
128	Fruits, fresh tropical N. O. S.	-	-	-	1	1
130	Potatoes other than sweet	51	118	462	412	1,043
140	Cabbage	-	-	48	617	665
141	Onions	8	279	84	1,156	1,527
142	Tomatoes	20	835	66	1,449	2,370
143	Vegetables, fresh N. O. S.	4	37	270	6,857	7,168
	Total Perishables	96	1,485	1,378	14,945	17,902
800	Total Products of Agriculture	3,617	14,561	7,528	20,350	46,054
850	Grand Total Carloads	21,814	63,096	38,606	73,674	197,188

Defendant's Exhibit No. 62 (Witness B.M. Snell)
Dec. 5, 1940



CHICAGO AND NORTH WES



CHICAGO AND NORTH WESTERN RAILWAY COMPANY

HEAVY LINE INDICATES TERRITORY COVERED BY TYPICAL FREIGHT TRAIN EXHIBIT

5379

\Defendant's Exhibit No. 63 (Witness B.M. Sneli)
Dec. 4, 1940

CHICAGO AND NORTH WESTERN RAILWAY COMPANY

FREIGHT OPERATING AND
FREIGHT TRANSPORTATION EXPENSES
RELATED TO TRAFFIC
CALENDAR YEARS 1922 TO 1939, INCLUSIVE

YEAR	REVENUE TON MILES	FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES	AVERAGE PER 1000 REVENUE TON MILES	
				FREIGHT OPERATING EXPENSES	FREIGHT TRANSP. EXPENSES
(a)	(b)	(c)	(d)	(e)	(f)
1939	5,793,766,394	$49,403,955	$23,445,283	$ 8.53	$ 4.05
1938	5,200,389,890	48,043,559	22,779,877	9.24	4.38
1937	6,223,789,247	55,699,868	25,520,496	8.95	4.10
1936	6,171,145,711	53,944,863	24,904,527	8.74	4.04
1935	4,995,873,153	44,668,631	21,055,918	8.94	4.22
1934	4,989,316,625	42,986,519	20,455,448	8.62	4.10
1933	4,581,113,465	39,504,890	19,305,202	8.62	4.21
1932	4,113,578,033	40,929,176	20,434,801	9.95	4.97
1931	5,896,291,065	57,761,627	27,954,897	9.80	4.74
1930	7,570,472,873	69,249,035	34,202,935	9.15	4.52
1929	8,902,539,812	80,329,652	40,102,216	9.02	4.51
1928	8,794,028,562	80,411,293	40,103,002	9.14	4.56
1927	8,590,153,514	80,597,035	40,654,013	9.38	4.73
1926	8,687,781,924	84,433,171	40,995,180	9.72	4.72
1925	8,286,548,010	80,973,947	39,793,188	9.77	4.80
1924	8,290,312,710	85,207,997	42,401,670	10.28	5.12
1923	9,248,615,383	94,503,161	47,258,320	10.22	5.11
1922	7,579,553,676	82,581,674	43,443,870	10.90	5.73
TOTAL 1936-1939	23,389,091,242	207,092,245	96,650,183	8.85	4.13
YEAR 1922-1925	33,405,029,779	343,266,779	172,897,048	10.28	5.18
PER CENT OF IMPROVEMENT 4 YEARS 1936 - 1939					

CALENDAR YEARS 1922 TO 1939, INCLUSIVE

YEAR (a)	REVENUE TON MILES (b)	FREIGHT OPERATING EXPENSES (c)	FREIGHT TRANSPORTATION EXPENSES (d)	AVERAGE PER 1000 REVENUE TON MILES: FREIGHT OPERATING EXPENSES (e)	AVERAGE PER 1000 REVENUE TON MILES: FREIGHT TRANSP. EXPENSES (f)
1939	5,793,766,394	$49,403,955	$23,445,283	$ 8.53	$ 4.05
1938	5,200,389,890	48,043,559	22,779,877	9.24	4.38
1937	6,223,789,247	55,699,868	25,520,496	8.95	4.10
1936	6,171,145,711	53,944,863	24,904,527	8.74	4.04
1935	4,995,873,153	44,668,631	21,055,918	8.94	4.22
1934	4,989,316,625	42,986,519	20,455,448	8.62	4.10
1933	4,581,113,465	39,504,890	19,305,202	8.62	4.21
1932	4,113,578,033	40,929,176	20,434,801	9.95	4.97
1931	5,896,291,065	57,761,627	27,954,897	9.80	4.74
1930	7,570,472,873	69,249,035	34,202,935	9.15	4.52
1929	8,902,539,812	80,329,652	40,102,216	9.02	4.51
1928	8,794,028,562	80,411,293	40,103,002	9.14	4.56
1927	8,590,153,514	80,597,035	40,654,013	9.38	4.73
1926	8,687,781,924	84,433,171	40,995,180	9.72	4.72
1925	8,286,548,010	80,973,947	39,793,188	9.77	4.80
1924	8,290,312,710	85,207,997	42,401,670	10.28	5.12
1923	9,248,615,383	94,503,161	47,258,320	10.22	5.11
1922	7,579,553,676	82,581,674	43,443,870	10.90	5.73
TOTAL 1936-1939	23,389,091,242	207,092,245	96,650,183	8.85	4.13
YEAR 1922-1925	33,405,029,779	343,266,779	172,897,048	10.28	5.18
PER CENT OF IMPROVEMENT 4 YEARS 1936 - 1939 COMPARED WITH 4 YEARS 1922 - 1925				13.9	20.3

SOURCE: Revenue ton miles - Annual Reports to Interstate Commerce Commission. Freight operating and transportation expenses - Accounting records of the Company to and including year 1935; thereafter Annual Reports to Interstate Commerce Commission.

Re
Defendant's Exhibit No. 64 (Witness B.M. Snell)
Dec. 5. 1940

CHICAGO AND NORTH WESTERN RAILWAY COMPANY

FREIGHT SERVICE OPERATING AVERAGES

Calendar Years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 & 1939

Line No. (a)	Item (b)	1922 (c)	1924 (d)	1926 (e)	1928 (f)	1930 (g)	1932 (h)	1934 (i)	1936 (j)	1938 (k)	1939 (l)	Percent of Increase 1939 over 1922 (m)
1	Miles of line operated in freight service ...	8 395.81	8 462.83	8 458.91	8 463.21	8 458.52	8 442.61	8 441.27	8 353.34	8 388.13	8 346.00	Dec. 0.59
2	Freight train miles	17 621 842	18 654 692	18 122 839	17 433 997	15 290 767	10 629 389	11 382 715	12 340 658	9 799 574	9 928 769	Dec.43.66
3	Freight cars per freight train	33.4	36.7	40.0	41.8	42.6	39.0	41.9	41.5	45.8	47.5	42.2
4	Net tons per freight train	512	532	580	597	591	458	527	602	660	723	41.2
5	Average tractive power per locomotive (lbs) .	38 615	41 043	42 249	43 573	44 593	45 611	43 611	47 169	47 730	48 045	24.4
6	Average capacity per freight carrying car (tons)	40.9	41.7	42.0	43.0	43.9	45.3	45.4	45.7	46.1	46.1	12.7
7	Freight train speed (m.p.h.)	11.8	12.0	12.4	13.1	13.4	14.9	15.4	15.1	16.0	16.1	36.4
8	Gross ton-miles per freight train hour	14 032	15 502	17 728	19 821	20 775	20 772	23 513	24 457	27 865	29 642	111.2
9	Net ton-miles per freight train hour	6 025	6 364	7 195	7 794	7 925	6 810	8 116	9 018	10 172	11 291	87.4
10	Gross ton-miles (exclusive of locomotives and tenders) per ton of fuel	9 860	11 219	12 650	13 662	13 456	13 103	13 486	13 864	15 034	15 372	55.9

SOURCE: Items 1,2,3,4,7 & 8 - Reports of Freight Train Performance, Form OS-A, filed with Interstate Commerce Commission.

Item 5 - Total tractive effort ÷ total steam locomotives available for service at close of each year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission, except for year 1922 which is taken from Accounting records.

Item 6 - Aggregate capacity of all freight carrying cars ÷ total number of such cars available for service at close of year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 9 - Net ton miles ÷ train hours as reported on Form OS-A to Interstate Commerce Commission.

Item 10- Gross ton miles (cars, contents and cabooses) ÷ equated tons of fuel consumed as reported in years 1922, 1924, 1926, 1928, 1930, 1932 and 1934 on Form OS-A to Interstate Commerce Commission, and as reported in years 1936, 1938, 1939 in Schedule 531 and 571 respectively, of Annual Report to Interstate Commerce Commission.

Defendant's Exhibit No. 65 (Witness Snell)
Dec. 4, 1940

CHICAGO & NORTH WESTERN RAILWAY CO
(Charles M. Thomson, Trustee)

REVENUE FREIGHT CARRIED DURING THE YEAR 1939

Class No.	Commodity Group or Class	Revenue Freight Originating On Respondent's Road: Terminating On Line Carloads	Revenue Freight Originating On Respondent's Road: Delivered to Connecting Carriers Carloads	Revenue Freight Received From Connecting Carriers: Terminating On Line Carloads	Revenue Freight Received From Connecting Carriers: Delivered to Connecting Carriers Carloads	Total Revenue Freight Carried Carloads
110	Oranges & Grapefruit	1	5	1,988	2,015	4,008
111	Lemons, Limes & Citrus Fruits N.O.S.	-	1	159	172	332
120	Apples, fresh	34	6	1,535	1,661	3,236
121	Bananas	-	-	2,461	182	2,643
122	Berries, fresh	-	3	191	257	451
123	Cantaloupes & melons N. O. S.	-	-	295	374	669
124	Grapes, fresh	1	9	652	3,183	3,845
125	Peaches, fresh	1	-	445	253	699
126	Watermelons	-	-	496	106	602
127	Fruits, fresh domestic N. O. S.	7	17	834	2,733	3,591
128	Fruits, fresh tropical, N. O. S.	-	-	64	45	109
130	Potatoes other than sweet	950	1,533	6,978	4,552	14,003
140	Cabbage	111	567	327	138	1,143
141	Onions	155	157	713	509	1,534
142	Tomatoes	1	6	251	207	465
143	Vegetables N. O. S.	85	48	2,909	5,321	8,361

Total 110 to 143

Class No.	Commodity Group or Class	Terminating On Line Carloads	Delivered to Connecting Carriers Carloads	Terminating On Line Carloads	Delivered to Connecting Carriers Carloads	Freight Carried Carloads
110	Oranges & Grapefruit	1	5	1,988	2,015	4,008
111	Lemons, Limes & Citrus Fruits N.O.S.	-	1	159	172	332
120	Apples, fresh	34	6	1,535	1,661	3,236
121	Bananas	-	-	2,461	182	2,643
122	Berries, fresh	-	3	191	257	451
123	Cantaloupes & melons N. O. S.	-	-	295	374	669
124	Grapes, fresh	1	9	652	3,185	3,845
125	Peaches, fresh	1	-	445	253	699
126	Watermelons	-	-	498	106	604
127	Fruits, fresh domestic N. O. S.	7	17	834	2,733	3,581
128	Fruits, fresh tropical, N. O. S.	-	-	64	45	109
130	Potatoes other than sweet	950	1,522	6,978	4,552	14,002
140	Cabbage	111	567	327	138	1,143
141	Onions	155	157	715	509	1,536
142	Tomatoes	1	6	251	207	465
143	Vegetables N. O. S.	85	48	2,909	5,321	8,361
Total 110 to 143, Inclusive		1,344	2,539	20,288	21,709	45,880
800	Total Products of Agriculture	42,726	43,367	62,050	30,509	178,632
850	Total Carload Traffic	271,550	331,687	375,601	126,421	1,105,259

Vol. V

TRANSCRIPT OF RECORD

(Pages 2917 to 3015)

Supreme Court of the United States

OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY, APPELLANT,

vs.

STATE OF ARIZONA, EX REL. JOE CONWAY, ATTORNEY GENERAL OF THE STATE OF ARIZONA

APPEAL FROM THE SUPERIOR COURT OF THE STATE OF ARIZONA, COUNTY OF PIMA

FILED APRIL 12, 1944.

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY, APPELLANT,

vs.

STATE OF ARIZONA, EX REL. JOE CONWAY, ATTORNEY GENERAL OF THE STATE OF ARIZONA

APPEAL FROM THE SUPERIOR COURT OF THE STATE OF ARIZONA, COUNTY OF PIMA

VOL. V

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JUDD & DETWEILER (INC.), PRINTERS, WASHINGTON, D. C., JULY 20, 1944.

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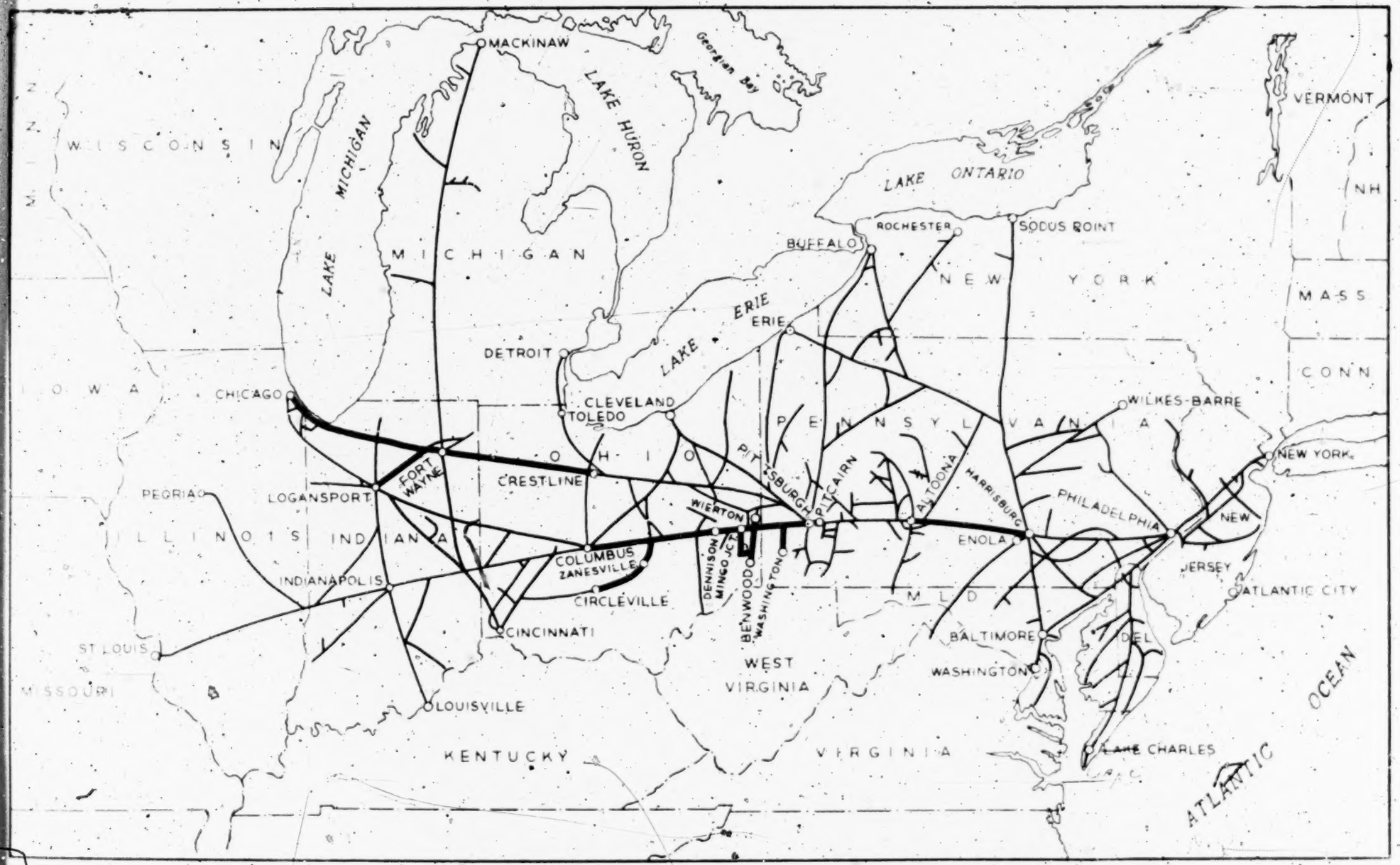
Defendant's Exhibit No. 66 (Witness F.N.Albert)
Dec. 6, 1940



THE PENNSYLVANIA RAILROAD

HEAVY LINE INDICATES TERRITORY COVERED BY TYPICAL FREIGHT TRAIN EXHIBIT

5383

Defendant's Exhibit No. 67 (Witness E.N. Albert)
Dec. 4, 1940

THE PENNSYLVANIA RAILROAD

FREIGHT OPERATING AND FREIGHT TRANSPORTATION EXPENSES RELATED TO TRAFFIC

Calendar Years 1922 to 1939, Inclusive

Year (a)	Revenue ton-miles (b)	Freight operating expenses (c)	Freight transportation expenses (d)	Averages per 1,000 revenue ton-miles: Freight operating expenses (e)	Averages per 1,000 revenue ton-miles: Freight transportation expenses (f)
1939	34,745,746,000	$207,172,203	$107,438,451	$5.96	$3.09
1938	27,638,941,000	167,602,178	92,452,870	6.06	3.35
1937	38,049,998,000	234,460,969	117,086,740	6.16	3.08
1936	35,706,781,000	217,285,461	107,860,603	6.09	3.02
1935	29,757,235,318	173,114,228	89,928,287	5.82	3.02
1934	28,326,533,959	162,692,297	82,590,555	5.74	2.92
1933	26,818,384,686	147,458,976	75,402,285	5.50	2.81
1932	25,222,172,080	155,475,404	81,196,618	6.16	3.22
1931	33,153,777,105	234,850,724	119,830,982	7.08	3.61
1930	40,935,975,379	293,214,141	148,515,150	7.16	3.63
1929	48,991,172,739	350,853,378	172,014,316	7.16	3.51
1928	44,989,625,491	338,901,266	164,357,993	7.53	3.65
1927	45,167,610,352	359,028,432	177,481,914	7.95	3.93
1926	48,912,108,728	397,197,769	191,564,721	8.12	3.92
1925	44,842,971,253	378,181,064	178,592,405	8.43	3.98
1924	41,587,072,190	370,156,323	183,713,115	8.90	4.42
1923	48,444,210,243	433,296,974	213,003,256	8.94	4.40
1922	40,346,569,722	379,342,295	186,750,219	9.40	4.63
Total 1936-1939	136,141,466,000	826,520,811	424,838,664	6.07	3.12
Total 1922-1925	175,220,823,408	1,560,976,656	762,058,995	8.91	4.35
Percent of improvement 4 years 1936-1939 compared with 4 years 1922-1925				31.9	28.3

SOURCE: Annual reports to the Interstate Commerce Commission

5384

Defendant's Exhibit No. 68 (Witness E.N. Albert)
Dec. 4, 1940

THE PENNSYLVANIA RAILROAD

FREIGHT SERVICE OPERATING AVERAGES

CALENDAR YEARS 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 AND 1939

LINE NO. (a)	ITEM (b)	1922 (c)	1924 (d)	1926 (e)	1928 (f)	1930 (g)	1932 (h)	1934 (i)	1936 (j)	1938 (k)	1939 (l)	PER CENT INCREASE 1939 OVER 1922 (m)
1	Miles of line operated in freight service,	10,894.36	10,934.80	10,882.36	10,783.48	10,688.14	10,533.35	10,045.86	10,033.91	10,016.00	9,990.00	Dec. 8.3
2	Freight train miles,	52,208,314	53,382,924	59,616,286	47,900,091	42,317,768	29,520,545	30,383,888	35,914,784*	27,527,109*	31,808,060*	Dec. 39.1
3	Freight cars per freight train,	40.8	43.5	45.9	54.8	58.0	55.4	56.5	56.0	61.7	63.5	55.6
4	Net tons per freight train,	837	857	897	1,028	1,051	929	1,006	1,074	1,077	1,164	39.1
5	Average tractive power per locomotive (pounds),	41,922	46,067	48,142	49,719	51,598	53,319	54,404	55,366	56,090	56,566	34.9
6	Average capacity per freight car (tons),	54.3	54.2	54.3	54.6	54.7	54.2	54.3	54.9	55.3	55.4	2.0
7	Freight train speed (miles per hour).	10.0	10.2	10.6	11.6	12.6	14.1	14.1	14.0	15.1	15.0	50.0
8	Gross ton-miles per freight train-hour,	16,838	18,150	19,983	25,833	29,661	30,942	32,309	32,865	37,570	39,244	133.1
9	Net ton-miles per freight train-hour.	8,339	8,700	9,467	11,886	13,246	13,130	14,198	14,797	15,973	17,146	105.6
10	Gross ton-miles (exclusive of locomotives and tenders) per ton of fuel,	11,262	12,227	12,856	13,917	14,413	13,655	14,030	14,584	15,478	15,909	41.3

SOURCE: Items 1, 2, 3, 4, 7 and 8 - Reports of Freight Train Performance, Form OS-A, filed with Interstate Commerce Commission.

Item 5 - Total tractive effort ÷ total steam locomotives available for service at close of each year as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 6 - Aggregate capacity of all freight carrying cars ÷ total number of such cars available for service at close of year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 9 - Net ton miles ÷ train hours as reported on Form OS-A to the Interstate Commerce Commission.

Item 10- Gross ton miles (cars, contents and cabooses) ÷ equated net tons of fuel consumed as reported on Forms OS-A and OS-B to the Interstate Commerce Commission.

* - Excludes light train miles.

Defendant's Exhibit No. 69 (Witness Albert)
Dec. 4, 1940

PENNSYLVANIA RAILROAD CO.

Year 1939

	Revenue Freight Originating On Respondent's Road		Revenue Freight Received From Connecting Carriers		Total Revenue Freight Carried
	Terminating On Line Carloads	Delivered to Connecting Carriers Carloads	Terminating On Line Carloads	Delivered to connecting Carriers Carloads	Carloads
110 Oranges & Grapefruit	926	25	25,330	8,186	34,467
111 Lemons, Limes & Citrus Fruits N. O. S.	25	-	1,051	227	1,255
120 Apples, fresh	1,695	1,562	3,619	626	7,502
121 Bananas	6,816	1,824	1,875	120	10,635
122 Berries, fresh	6	1	396	164	567
123 Cantaloupes and Melons N. O. S.	65	21	3,547	647	4,280
124 Grapes, fresh	40	27	3,311	1,019	4,397
125 Peaches, fresh	58	205	4,044	1,340	5,645
126 Watermelons	26	15	3,596	1,922	5,559
127 Fruits, fresh, domestic N. O. S.	65	51	2,060	510	2,686
128 Fruits, fresh tropical N. O. S.	132	4	257	218	591
130 Potatoes, other than sweet	2,984	4,929	19,924	4,854	32,691
140 Cabbage	269	209	5,764	980	7,322
141 Onions	615	537	4,099	267	5,518
142 Tomatoes	845	1,711	8,164	1,875	12,595
143 Vegetables, fresh, N. O. S.	1,422	988	36,440	5,848	44,708

	Revenue Freight Originating On Respondent's Road		Revenue Freight Received From Connecting Carriers		Total Revenue Freight Carried
	Terminating On Line	Delivered to Connecting Carriers	Terminating On Line	Delivered to connecting Carriers	
	Carloads	Carloads	Carloads	Carloads	Carloads
110 Oranges & Grapefruit	926	25	25,330	8,186	34,467
111 Lemons, Limes & Citrus Fruits N. O. S.	25	-	1,031	227	1,283
120 Apples, fresh	1,695	1,562	3,619	626	7,502
121 Bananas	6,816	1,824	1,875	120	10,635
122 Berries, fresh	6	1	398	164	567
123 Cantaloupes and Melons N. O. S.	65	21	3,547	647	4,280
124 Grapes, fresh	40	37	3,311	1,019	4,397
125 Peaches, fresh	58	205	4,044	1,340	5,645
126 Watermelons	26	15	3,595	1,923	5,559
127 Fruits, fresh, domestic N. O. S.	65	51	2,060	510	2,686
128 Fruits, fresh tropical N. O. S.	132	4	257	218	591
130 Potatoes, other than sweet	2,984	4,929	19,924	4,854	32,691
140 Cabbage	269	309	5,764	980	7,322
141 Onions	615	557	4,099	267	5,518
142 Tomatoes	865	1,711	8,164	1,835	12,595
143 Vegetables, fresh, N. O. S.	1,422	968	36,440	5,878	44,708
Total 110 to 143, Inclusive	15,969	12,207	125,457	28,813	180,446
800 Total Products of Agriculture	116,130	55,430	197,140	42,595	411,295
888 Grand Total, Carload Traffic	1,337,025	762,225	1,315,388	433,001	3,848,237

Defendant's Exhibit No. 70 (Witness Gregory)
Dec. 4, 1940

NORTHERN PACIFIC RAILWAY COMPANY

Number of carloads of revenue freight carried of certain selected commodities, total products of agriculture and total carload traffic, as shown on Schedule 541 of the Annual Report to the Interstate Commerce Commission.

Calendar Year 1939

Class No.	Commodity Group or Class	Originating on Respondent's Road: Terminating On Line	Originating on Respondent's Road: Delivered to Connecting Carriers	Received from Connecting Carriers: Terminating On Line	Received from Connecting Carriers: Delivered to Connecting Carriers	Total Carried
110	Oranges & grapefruit	8	-	2,348	856	3,212
111	Lemons, limes & citrus fruits n. o. s.	-	-	218	148	366
120	Apples, fresh	2,173	4,871	276	144	7,464
121	Bananas	200	132	1,015	78	1,425
122	Berries, fresh	24	183	91	167	465
123	Cantaloupes & melons n. o. s.	14	5	278	24	321
124	Grapes, fresh	7	13	354	79	453
125	Peaches, fresh	295	307	121	30	753
126	Watermelons	36	11	535	36	618
127	Fruits, fresh, domestic n. o. s.	1,756	2,107	358	629	4,850
128	Fruits, fresh tropical n. o. s.	-	-	6	2	8
130	Potatoes other than sweet	1,193	4,241	847	87	6,368
140	Cabbage	23	31	207	40	301
141	Onions	169	183	350	64	766
142	Tomatoes	11	51	342	84	488
143	Vegetables, fresh n. o. s.	402	1,601	1,833	512	4,348
	Total	6,311	13,736	9,179	2,980	32,206

Calendar Year 1939

Class No.	Commodity Group or Class	Originating on Respondent's Road: Terminating On Line	Originating on Respondent's Road: Delivered to Connecting Carriers	Received from Connecting Carriers: Terminating On Line	Received from Connecting Carriers: Delivered to Connecting Carriers	Total Carried
110	Oranges & grapefruit	8	-	2,348	856	3,212
111	Lemons, limes & citrus fruits n. o. s.	-	-	218	148	366
120	Apples, fresh	2,173	4,871	276	144	7,464
121	Bananas	200	132	1,015	78	1,425
122	Berries, fresh	24	183	91	167	465
123	Cantaloupes & melons n. o. s.	14	5	278	24	321
124	Grapes, fresh	7	13	354	79	453
125	Peaches, fresh	295	307	121	30	753
126	Watermelons	36	11	535	36	618
127	Fruits, fresh, domestic n. o. s.	1,756	2,107	358	629	4,850
128	Fruits, fresh tropical n. o. s.	-	-	6	2	8
130	Potatoes other than sweet	1,193	4,241	847	87	6,368
140	Cabbage	23	31	207	40	301
141	Onions	169	183	350	64	766
142	Tomatoes	11	51	342	84	488
143	Vegetables, fresh n. o. s.	402	1,601	1,833	512	4,348
	Total	6,311	13,736	9,179	2,980	32,206
	Total Products of Agriculture	66,928	26,746	18,883	4,339	116,896
	Grand Total Carload Traffic	228,041	115,200	128,531	46,685	518,457

Defendant's Exhibit No. 71 (Witness Siddall)
Dec. 4, 1940

THE CHICAGO ROCK ISLAND AND PACIFIC RAILWAY CO.

Statement showing number of carloads of revenue freight carried during the Year 1939 for certain selected commodities, total products of agriculture and total carload traffic, as shown on Schedule 541 of the Annual Report to the Interstate Commerce Commission.

Class No.	Commodity Group or Class	Originating on Respondent's Road		Received from Connecting Carriers		Total Carried
		Terminating On Line	Delivered to Connecting Carriers	Terminating On Line	Delivered to Connecting Carriers	
110	Oranges & Grapefruit	-	3	3,042	13,525	16,570
111	Lemons, Limes & Citrus Fruits N. O. S.	-	-	451	4,455	4,906
120	Apples, fresh	146	80	1,191	949	2,366
121	Bananas	-	-	2,533	1,456	3,989
122	Berries, fresh	1	3	87	129	220
123	Cantaloupes and Melons N. O. S.	19	21	616	6,567	7,223
124	Grapes, fresh	-	-	333	1,315	1,648
125	Peaches, fresh	-	1	370	205	576
126	Watermelons	126	106	188	146	566
127	Fruits, fresh, domestic N. O. S.	6	2	368	820	1,196
128	Fruits, fresh tropical N. O. S.	-	-	35	12	47
130	Potatoes other than sweet	265	559	6,784	4,737	12,345
140	Cabbage	40	124	377	576	1,117
141	Onions	535	591	333	362	1,821
142	Tomatoes	19	34	480	1,162	1,695
145	Vegetables, fresh N. O. S.	124	93	4,645	22,095	26,956

Class No.	Commodity Group or Class	Originating on Respondent's Road: Terminating On Line	Originating on Respondent's Road: Delivered to Connecting Carriers	Received from Connecting Carriers: Terminating On Line	Received from Connecting Carriers: Delivered to Connecting Carriers	Total Carried
110	Oranges & Grapefruit	-	3	3,042	13,535	16,570
111	Lemons, Limes & Citrus Fruits N. O. S.	-	-	451	4,483	4,934
120	Apples, fresh	146	20	1,191	949	2,306
121	Bananas	-	-	2,533	1,456	3,989
122	Berries, fresh	1	3	87	139	230
123	Cantaloupes and Melons N. O. S.	19	21	616	6,567	7,223
124	Grapes, fresh	-	-	333	1,315	1,648
125	Peaches, fresh	-	1	370	205	576
126	Watermelons	126	106	186	146	564
127	Fruits, fresh, domestic N. O. S.	6	2	368	820	1,196
128	Fruits, fresh tropical N. O. S.	-	-	35	12	47
130	Potatoes other than sweet	265	559	6,784	4,737	12,345
140	Cabbage	40	124	377	576	1,117
141	Onions	535	591	535	862	1,551
142	Tomatoes	19	34	480	1,162	1,695
143	Vegetables, fresh N. O. S.	124	93	4,645	22,095	26,956
	Total	1,081	1,557	21,829	58,388	83,855
	Total Products of Agriculture	71,640	52,334	37,154	68,843	229,971
	Grand Total Carl id Traffic	200,142	199,278	205,260	175,376	778,056

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Defendant's Exhibit No. 72 (Witness Burn)
Dec. 4, 1940

GREAT NORTHERN RAILWAY COMPANY

Numbers of Carloads of Revenue Freight Carried For Certain Selected Commodities, Total Products of Agriculture and Total Carload Traffic.
As Reported in Schedule No. 541 of Annual Report (Form A) to the Interstate Commerce Commission

Calendar Year 1939

Class No.	Commodity Group or Class	Originating on G. N.		Received from Connections		Total		TOTAL CARRIED	Per Cent of Total Carried	
		Terminating on Line	Delivered to Connections	Terminating on Line	Delivered to Connections	Terminating on Line	Delivered to Connections		Terminating on Line	Delivered to Connections
110	Oranges & grapefruit	17	17	2,397	559	2,414	576	2,990	-	-
111	Lemons, limes and citrus fruits n. o. s.	-	-	191	20	191	20	211	-	-
120	Apples, fresh	3,302	11,123	524	110	3,826	11,233	15,059	-	-
121	Bananas	53	19	894	93	947	112	1,059	-	-
122	Berries, fresh	3	1	89	1	92	2	94	-	-
123	Cantaloupes & melons n. o. s.	-	-	182	34	182	34	216	-	-
124	Grapes, fresh	-	-	338	60	338	60	398	-	-
125	Peaches, fresh	28	3	380	19	408	22	430	-	-
126	Watermelons	3	-	319	54	322	54	376	-	-
127	Fruits, fresh domestic n. o. s.	703	1,521	396	97	1,099	1,618	2,717	-	-
128	Fruits, fresh tropical n. o. s.	-	-	9	8	9	8	17	-	-
130	Potatoes other than sweet	1,667	15,681	829	447	2,496	16,128	18,624	-	-
140	Cabbage	6	1	131	7	137	8	145	-	-
141	Onions	19	123	161	20	180	143	323	-	-
142	Tomatoes	-	2	289	36	289	38	327	-	-
143	Vegetables, fresh n.o.s.	182	203	1,320	333	1,502	536	2,038	-	-
	Total Fresh Fruits, Etc.	5,983	28,694	8,449	1,898	14,432	30,592	45,024	32.1%	67.9%
800	Total Products of Agriculture	94,081	45,874	16,382	3,607	110,463	49,481	159,944	69.1%	30.9%
850	Grand Total Carload Traffic	237,819	362,809	138,625	44,036	376,444	406,845	783,289	48.1%	51.9%

Defendant's Exhibit No. 73 (Witness H.R. Fertig)
Dec. 4, 1940

THE CHICAGO, ROCK ISLAND AND PACIFIC RAILWAY COMPANY

Typical Examples of Freight Trains Handled

Between Certain Terminals, April 1st to 10th Inclusive, 1939

Name of Railroad	From	To	Distance (Miles)	Ten Day Period Studied (Mo. & Yr.)	Ruling Grade	70 Cars or Less							71 Cars to 100 Cars							101 Cars to 125 C			
						No. of Trains	Type of Locomotive	Average Consist					No. of Trains	Type of Locomotive	Average Consist					No. of Trains	Type of Locomotive	Aver	
								A	B	C	D	Tons			A	B	C	D	Tons			A	B
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)
The Chicago, Rock Island and Pacific Railway Company	Blue Island, Ill.	Silvis, Ill.	159	April, 1939	.46	12	Mikado	0	26	36	62	2,310	7	Mikado	2	58	38	78	3,178	-	-	-	-
	Blue Island, Ill.	Silvis, Ill.	159	April, 1939	.46	1	Mountain	1	26	36	63	2,693	-	-	-	-	-	-	-	-	-	-	-
	Blue Island, Ill.	Silvis, Ill.	159	April, 1939	.46	6	4-8-4	1	36	32	69	2,355	27	4-8-4	1	56	38	95	3,109	2	4-8-4	0	40
	Silvis, Ill.	Blue Island, Ill.	159	April, 1939	.48	10	Mikado	13	23	19	55	2,210	7	Mikado	3	32	50	85	3,185	-	-	-	-
	Silvis, Ill.	Blue Island, Ill.	159	April, 1939	.48	12	4-8-4	19	20	17	56	2,379	19	4-8-4	19	45	21	85	3,322	-	-	-	-
	Silvis, Ill.	Blue Island, Ill.	159	April, 1939	.48	-		-	-	-	-	-	2	Mountain	1	38	47	86	3,525	-	-	-	-
	Blue Island, Ill.	Bureau, Ill.	99	April, 1939	.46	11	Mikado	1	28	27	56	2,166	2	Mikado	0	36	51	87	2,940	1	Mikado	0	51
	Blue Island, Ill.	Bureau, Ill.	99	April, 1939	.46	1	Mountain	0	27	27	54	2,803	1	Mountain	0	33	41	74	2,657	-	-	-	-
	Bureau, Ill.	Blue Island, Ill.	99	April, 1939	.48	14	Mikado	1	38	9	48	2,711	-	-	-	-	-	-	-	-	-	-	-
	Bureau, Ill.	Blue Island, Ill.	99	April, 1939	.48	1	Mountain	1	32	7	40	2,850	-	-	-	-	-	-	-	-	-	-	-
	Bureau, Ill.	Blue Island, Ill.	99	April, 1939	.48	1	Consolidation	0	49	11	60	3,294	-	-	-	-	-	-	-	-	-	-	-
	Blue Island, Ill.	Ottawa, Ill.	70	April, 1939	.46	1	Mikado	0	15	7	22	1,109	-	-	-	-	-	-	-	-	-	-	-
	Ottawa, Ill.	Blue Island, Ill.	70	April, 1939	.48	1	Mikado	0	46	6	52	2,774	-	-	-	-	-	-	-	-	-	-	-
	Bureau, Ill.	Silvis, Ill.	60	April, 1939	.30	16	Mikado	0	45	9	54	3,287	1	Mikado	1	59	11	71	3,770	-	-	-	-
	Silvis, Ill.	Bureau, Ill.	60	April, 1939	.45	16	Mikado	2	18	24	44	1,309	2	Mikado	8	21	57	86	2,680	-	-	-	-
	Silvis, Ill.	Columbus Jct., Ia.	57	April, 1939	1.18	8	Mikado	0	7	18	25	755	-	-	-	-	-	-	-	-	-	-	-
	Columbus Jct., Ia.	Silvis, Ill.	57	April, 1939	1.39	8	Mikado	0	19	12	31	1,471	-	-	-	-	-	-	-	-	-	-	-
	Silvis, Ill.	Eldon, Ia.	120	April, 1939	1.18	3	Mikado	0	19	44	63	2,136	2	Mikado	0	16	68	84	2,748	-	-	-	-
	Silvis, Ill.	Eldon, Ia.	120	April, 1939	1.18	20	4-8-4	0	40	16	56	2,185	12	4-8-4	0	16	60	76	2,729	-	-	-	-
	Eldon, Ia.	Silvis, Ill.	120	April, 1939	1.39	2	Mikado	0	40	15	55	2,493	1	Mikado	0	27	46	73	2,250	1	Mikado	0	11
	Eldon, Ia.	Silvis, Ill.	120	April, 1939	1.39	31	4-8-4	14	29	8	51	2,307	3	4-8-4	0	34	45	79	2,876	-	-	-	-
	Washington, Ia.	Eldon, Ia.	46	April, 1939	1.18	8	Consolidation	0	5	10	15	428	-	-	-	-	-	-	-	-	-	-	-
	Eldon, Ia.	Washington, Ia.	46	April, 1939	1.39	8	Consolidation	0	5	3	8	312	-	-	-	-	-	-	-	-	-	-	-
	Eldon, Ia.	Trenton, Mo.	122	April, 1939	1.00	27	4-8-4	0	31	25	56	1,888	9	4-8-4	0	4	87	91	2,473	2	4-8-4	0	2
	Eldon, Ia.	Trenton, Mo.	122	April, 1939	1.00	2	Mikado	0	7	51	58	1,577	-	-	-	-	-	-	-	-	-	-	-
	Trenton, Mo.	Eldon, Ia.	122	April, 1939	.96	34	4-8-4	13	32	7	52	2,395	2	4-8-4	0	12	66	78	2,217	-	-	-	-
	Trenton, Mo.	Eldon, Ia.	122	April, 1939	.96	3	Mikado	0	29	33	62	2,521	-	-	-	-	-	-	-	-	-	-	-
	Allerton, Ia.	Trenton, Mo.	51	April, 1939	1.00	21	4-8-4	1	8	35	44	1,229	1	4-8-4	1	14	57	72	1,869	-	-	-	-
	Trenton, Mo.	Allerton, Ia.	51	April, 1939	.96	21	4-8-4	14	35	5	54	2,348	1	4-8-4	12	42	18	72	2,988	-	-	-	-
	Trenton, Mo.	Allerton, Ia.	51	April, 1939	.96	1	Mikado	7	53	1	61	2,960	-	-	-	-	-	-	-	-	-	-	-

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ve. 1939

sist		101 Cars to 125 Cars							126 Cars and Over							Maximum Cars per Train
D	Tons	No. of Trains	Type of Locomotive	Average Consist A	B	C	D	Tons	No. of Trains	Type of Locomotive	Average Consist A	B	C	D	Tons	
(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(bb)	(cc)	(dd)	(ee)	(ff)	(gg)	(hh)	(ii)
78	3,178	-	-	-	-	-	-	-	-	-	-	-	-	-	-	92
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	63
95	3,105	2	4-8-4	0	40	61	101	4,376	-	-	-	-	-	-	-	102
85	3,185	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96
95	3,322	-	-	-	-	-	-	-	-	-	-	-	-	-	-	91
86	3,525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	97
97	2,940	1	Mikado	0	51	55	106	3,941	-	-	-	-	-	-	-	106
74	2,657	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	67
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52
71	3,770	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71
86	2,680	-	-	-	-	-	-	-	-	-	-	-	-	-	-	91
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
84	2,748	-	-	-	-	-	-	-	-	-	-	-	-	-	-	87
76	2,729	-	-	-	-	-	-	-	-	-	-	-	-	-	-	99
73	2,250	1	Mikado	0	11	101	112	3,024	-	-	-	-	-	-	-	112
79	2,876	-	-	-	-	-	-	-	-	-	-	-	-	-	-	85
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13
91	2,473	2	4-8-4	0	2	99	101	2,588	-	-	-	-	-	-	-	101
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	59
78	2,217	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	67
72	1,869	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72
72	2,988	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	61

Typical Examples of Freight Trains Handled (Cont'd)

Name of Railroad	From	To	Distance (Miles)	Ten Day Period Studied (Mo. & Yr.)	Ruling Grade	70 Cars or Less								71 Cars to 100 Cars								101 Cars to 125 Car				
						No. of Trains	Type of Locomotive	Average Consist						No. of Trains	Type of Locomotive	Average Consist						No. of Trains	Type of Locomotive	Averag		
								A	B	C	D	Tons				A	B	C	D	Tons				A	B	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)		(n)	(o)	(p)	(q)	(r)	(s)	(t)		(u)	(v)	(w)	(x)	
The Chicago, Rock Island and Pacific Railway Company	Trenton, Mo.	Kansas City, Kan.	96	April, 1939	.50	26	4-8-4	0	29	27	56	1,958		19	4-8-4	1	12	69	82	2,246		3	4-8-4	0	3	1
	Kansas City, Kan.	Trenton, Mo.	95	April, 1939	.50	34	4-8-4	15	30	6	51	2,283		17	4-8-4	9	57	15	81	3,966		-	-	-	-	
	Kansas City, Kan.	Trenton, Mo.	95	April, 1939	.50	1	Mikado	16	28	10	54	2,406		1	Mikado	0	75	2	77	3,834		-	-	-	-	
	Kansas City, Kan.	Herington, Kan.	147	April, 1939	.80	12	4-8-4	2	43	18	63	2,241		30	4-8-4	2	33	44	79	2,556		8	4-8-4	0	1	1
	Kansas City, Kan.	Herington, Kan.	147	April, 1939	.80	-	-	-	-	-	-	-		-	-	-	-	-	-	-		1	Mikado	0	0	1
	Herington, Kan.	Kansas City, Kan.	147	April, 1939	.50	21	4-8-4	27	29	7	63	2,741		34	4-8-4	35	36	14	85	3,566		-	-	-	-	
	Herington, Kan.	Kansas City, Kan.	147	April, 1939	.50	1	Mikado	5	45	19	69	2,900		-	-	-	-	-	-	-		-	-	-	-	
	Kansas City, Kan.	McFarland, Kan.	98	April, 1939	.80	10	Mikado	0	24	31	55	1,690		1	Mikado	1	35	36	72	2,416		-	-	-	-	
	McFarland, Kan.	Kansas City, Kan.	98	April, 1939	.50	11	Mikado	1	23	20	44	1,472		-	-	-	-	-	-	-		-	-	-	-	
	McFarland, Kan.	Herington, Kan.	49	April, 1939	.80	1	Mikado	0	1	45	46	1,115		-	-	-	-	-	-	-		-	-	-	-	
	Herington, Kan.	McFarland, Kan.	49	April, 1939	.50	2	Mikado	0	20	2	22	703		-	-	-	-	-	-	-		-	-	-	-	
	Topeka, Kan.	Herington, Kan.	81	April, 1939	.80	2	Mikado	0	3	57	60	1,911		2	Mikado	0	8	79	87	2,805		-	-	-	-	
	Herington, Kan.	Topeka, Kan.	81	April, 1939	.50	2	Mikado	0	32	6	38	1,920		-	-	-	-	-	-	-		-	-	-	-	
	Herington, Kan.	Topeka, Kan.	81	April, 1939	.50	1	Pacific	0	5	7	12	345		-	-	-	-	-	-	-		-	-	-	-	
	Herington, Kan.	Pratt, Kan.	127	April, 1939	.80	12	4-8-4	1	33	22	56	2,020		7	4-8-4	0	10	75	85	2,515		5	4-8-4	0	0	101
	Herington, Kan.	Pratt, Kan.	127	April, 1939	.80	16	Mikado	0	14	31	45	1,339		5	Mikado	0	0	83	83	2,174		-	-	-	-	
	Pratt, Kan.	Herington, Kan.	127	April, 1939	.80	1	Consolidation	0	0	46	46	1,250		-	-	-	-	-	-	-		-	-	-	-	
	Pratt, Kan.	Herington, Kan.	127	April, 1939	.80	27	4-8-4	41	11	5	57	2,432		3	4-8-4	47	22	7	76	3,407		-	-	-	-	
	Pratt, Kan.	Herington, Kan.	127	April, 1939	.80	22	Mikado	22	18	6	46	1,931		-	-	-	-	-	-	-		-	-	-	-	
	Pratt, Kan.	Herington, Kan.	127	April, 1939	.80	1	Consolidation	0	22	18	40	1,757		-	-	-	-	-	-	-		-	-	-	-	
	Herington, Kan.	Hutchinson, Kan.	74	April, 1939	.80	1	Pacific	0	13	8	21	890		-	-	-	-	-	-	-		-	-	-	-	
	Hutchinson, Kan.	Herington, Kan.	74	April, 1939	.80	2	Mikado	1	8	23	32	414		-	-	-	-	-	-	-		-	-	-	-	
	Pratt, Kan.	Liberal, Kan.	133	April, 1939	.80	2	Mikado	0	23	5	28	1,415		-	-	-	-	-	-	-		-	-	-	-	
	Pratt, Kan.	Liberal, Kan.	133	April, 1939	.80	16	4-8-4	3	29	22	54	1,883		10	4-8-4	0	1	90	91	2,401		1	4-8-4	0	0	101
	Liberal, Kan.	Pratt, Kan.	133	April, 1939	.80	11	Mikado	1	12	30	43	1,295		9	Mikado	0	1	78	79	2,126		-	-	-	-	
	Liberal, Kan.	Pratt, Kan.	133	April, 1939	.80	31	4-8-4	40	8	4	52	2,315		1	4-8-4	58	11	3	72	3,212		-	-	-	-	
	Liberal, Kan.	Pratt, Kan.	133	April, 1939	.80	19	Mikado	22	15	7	44	1,841		-	-	-	-	-	-	-		-	-	-	-	
	Liberal, Kan.	Dalhart, Tex.	111	April, 1939	.80	1	Mountain	25	15	4	44	1,760		-	-	-	-	-	-	-		-	-	-	-	
	Liberal, Kan.	Dalhart, Tex.	111	April, 1939	.80	12	4-8-4	2	35	18	55	2,034		14	4-8-4	0	1	87	88	2,378		1	4-8-4	0	0	101
	Liberal, Kan.	Dalhart, Tex.	111	April, 1939	.80	4	Mikado	0	19	31	50	1,723		9	Mikado	0	1	81	82	2,157		-	-	-	-	
	Dalhart, Tex.	Liberal, Kan.	111	April, 1939	.80	1	Mountain	0	14	53	67	1,840		-	-	-	-	-	-	-		-	-	-	-	
	Dalhart, Tex.	Liberal, Kan.	111	April, 1939	.80	27	4-8-4	44	7	4	55	2,296		2	4-8-4	66	8	4	78	3,096		-	-	-	-	
	Dalhart, Tex.	Liberal, Kan.	111	April, 1939	.80	11	Mikado	42	4	6	52	2,112		-	-	-	-	-	-	-		-	-	-	-	
						1	Mountain	25	12	3	40	1,662		-	-	-	-	-	-	-		-	-	-	-	
	Dalhart, Tex.	Tucumcari, N.M.	93	April, 1939	1.00	16	2-10-2	1	26	25	52	1,818		22	2-10-2	3	2	78	83	2,191		-	-	-	-	
	Dalhart, Tex.	Tucumcari, N.M.	93	April, 1939	1.00	-	-	-	-	-	-	-		2	4-8-4	0	2	79	81	1,972		-	-	-	-	
	Tucumcari, N.M.	Dalhart, Tex.	93	April, 1939	1.00	-	-	-	-	-	-	-		3	Mikado	0	2	73	75	2,058		-	-	-	-	
	Tucumcari, N.M.	Dalhart, Tex.	93	April, 1939	1.00	38	2-10-2	39	9	6	54	2,184		-	-	-	-	-	-	-		-	-	-	-	
	Tucumcari, N.M.	Dalhart, Tex.	93	April, 1939	1.00	2	4-8-4	45	11	5	61	2,370		-	-	-	-	-	-	-		-	-	-	-	
	Tucumcari, N.M.	Dalhart, Tex.	93	April, 1939	1.00	2	Mountain	38	3	2	43	1,789		-	-	-	-	-	-	-		-	-	-	-	
						3	Mikado	34	15	1	50	1,985		-	-	-	-	-	-	-		-	-	-	-	
	Total trains		1,021			704		Trains 70 cars or less						290		Trains 71 cars to 100 cars						25		Trains 101 cars to 1		
	Per cent of all trains		100%			68.95								28.40								2.45				
	Average cars per train		62			51								84								105				

ins Handled (Cont'd)

ge Consist C (r)	ge Consist D (s)	ge Consist Tons (t)	101 Cars to 125 Cars: No. of Trains (u)	101 Cars to 125 Cars: Type of Locomotive (v)	101 Cars to 125 Cars: Average Consist A (w)	B (x)	C (y)	D (z)	Tons (aa)	126 Cars and Over: No. of Trains (bb)	126 Cars and Over: Type of Locomotive (cc)	Average Consist A (dd)	B (ee)	C (ff)	D (gg)	Tons (hh)	Maximum Cars per Train (ii)
59	82	2,246	3	4-8-4	0	3	104	107	2,844	-	-	-	-	-	-	-	107
15	81	3,966	-	-	-	-	-	-	-	-	-	-	-	-	-	-	94
2	77	3,934	-	-	-	-	-	-	-	-	-	-	-	-	-	-	77
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50
44	79	2,566	8	4-8-4	0	1	105	106	2,852	2	4-8-4	0	8	118	126	3,437	126
-	-	-	1	Mikado	0	0	116	116	3,003	-	-	-	-	-	-	-	116
18	85	3,566	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69
36	72	2,416	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30
79	87	2,205	-	-	-	-	-	-	-	-	-	-	-	-	-	-	89
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
75	85	2,515	5	4-8-4	0	0	101	101	2,323	-	-	-	-	-	-	-	102
83	83	2,174	-	-	-	-	-	-	-	-	-	-	-	-	-	-	87
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46
7	76	3,407	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	67
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
90	91	2,401	1	4-8-4	0	0	101	101	2,405	-	-	-	-	-	-	-	101
78	79	2,126	-	-	-	-	-	-	-	-	-	-	-	-	-	-	99
3	72	3,212	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44
87	99	2,378	1	4-8-4	0	0	101	101	2,720	-	-	-	-	-	-	-	101
81	82	2,157	-	-	-	-	-	-	-	-	-	-	-	-	-	-	86
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	67
4	78	3,096	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40
78	85	2,191	-	-	-	-	-	-	-	-	-	-	-	-	-	-	91
79	81	1,972	-	-	-	-	-	-	-	-	-	-	-	-	-	-	85
73	75	2,058	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	61
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34
e 100 cars	-		25	Trains 101 cars to 125 cars						2	Trains 126 cars and over						
			2.45 105							.20 126							

EXPLANATION OF SYMBOLS USED BELOW UNDER HEADING "AVERAGE CONSIST"

A – Perishable loads
B – Other loads
C – Empty cars and includes caboose
D – Total all cars

Defendant's Exhibit No. 74 (Witness F.W. Green)
Dec. 5, ~~1941~~ 1940

ST. LOUIS SOUTHWESTERN RAILWAY LINES
BERRYMAN HENWOOD, TRUSTEE

TYPICAL EXAMPLES OF FREIGHT TRAINS HANDLED
BETWEEN CERTAIN TERMINALS, APRIL 12TH – 21ST INCLUSIVE, 1939

LINE NO.	FROM	TO	DISTANCE (Miles)	RULING GRADE	70 CARS OR LESS							71 CARS TO 100 CARS							101 CARS TO 125 CARS						
					NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)
1	E.St.Louis,Ill.	Illmo, Mo.	125	0.50	10	Consolidation	–	33	13	46	1,293	20	4-8-4	–	45	44	89	3,079	–	–	–	–	–	–	–
2	Illmo, Mo.	E.St.Louis, Ill.	125	0.50	12	(Consolidation 4-8-4)	–	44	14	58	2,412	18	4-8-4	–	63	23	86	3,494	–	–	–	–	–	–	–
3	Illmo, Mo.	Jonesboro, Ark.	131	0.50	10	(Mountain-Consolidation)	–	22	1	23	655	17	4-8-4	–	50	38	88	3,103	3	4-8-4	–	49	53	102	
4	Jonesboro, Ark.	Illmo, Mo.	131	0.50	12	(Consolidation Mountain)	–	42	12	54	2,220	19	(4-8-4 Consolidation)	–	60	24	84	3,447	1	4-8-4	–	52	52	104	
5	Jonesboro, Ark.	Pine Bluff,Ark.	142	0.50	11	(Mountain 10 Wheel Consolidation)	–	21	4	25	743	18	4-8-4	–	47	42	89	3,064	1	4-8-4	–	72	36	108	
6	Pine Bluff,Ark.	Jonesboro, Ark.	142	0.50	16	(Consolidation Mountain 4-8-4)	–	44	13	57	2,414	18	(4-8-4 Consolidation)	–	64	21	85	3,582	–	–	–	–	–	–	–
7	TOTAL TRAINS		186		71							110							5						
8	PER CENT OF ALL TRAINS		100		38.2							59.1							2.7						
9	AVERAGE CARS PER TRAIN		71		45							87							104						

en)

VE, 1939

101 CARS TO 125 CARS							126 CARS AND OVER							MAXIMUM CARS PER TRAIN
NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	
(t)	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(bb)	(cc)	(dd)	(ee)	(ff)	(gg)	(hh)
–	–	–	–	–	–	–	–	–	–	–	–	–	–	99
–	–	–	–	–	–	–	–	–	–	–	–	–	–	100
3	4-8-4	–	49	53	102	3,301	–	–	–	–	–	–	–	102
1	4-8-4	–	52	52	104	3,726	–	–	–	–	–	–	–	104
1	4-8-4	–	72	36	108	3,348	–	–	–	–	–	–	–	108
–	–	–	–	–	–	–	–	–	–	–	–	–	–	95
5							–							
2.7							–							
104							–							

5392

Defendant's Exhibit No. 75 (Witness W.A. Kraemer).
Dec. 5, 1940

CHICAGO AND NORTH WESTERN RAILWAY COMPANY

TYPICAL EXAMPLES OF FREIGHT TRAINS OPERATED ON WISCONSIN - GALENA - IOWA DIVISIONS
AUGUST 1ST TO 30TH, INCLUSIVE, 1940

FROM (b)	TO (c)	DISTANCE (Miles) (d)	RULING GRADE (e)	70 CARS OR LESS: NO. OF TRAINS (f)	TYPE OF LOCOMOTIVE (g)	AVERAGE CONSIST A (h)	B (i)	C (j)	D (k)	TONS (l)	72 CARS TO 100 CARS: NO. OF TRAINS (m)	TYPE OF LOCOMOTIVE (n)	AVERAGE CONSIST A (o)	B (p)	C (q)	D (r)	TONS (s)	101 CARS TO 125 CARS: NO. OF TRAINS (t)	TYPE OF LOCOMOTIVE (u)	AVERAGE CONSIST A (v)	B (w)	C (x)	D (y)	TONS (z)	126 CARS AND OVER: NO. OF TRAINS (aa)	TYPE OF LOCOMOTIVE (bb)	AVERAGE CONSIST A (cc)	B (dd)	C (ee)	D (ff)	TONS (gg)	MAXIMUM CARS PER TRAIN (hh)
Proviso, Ill.	Milwaukee, Wis.	83	.30	38	Hlnde	7	52	6	65	2,695	25	Hlnde	6	48	30	84	3,475	4	Hlnde	6	68	42	108	4,568	-	-	-	-	-	-	-	122
Proviso, Ill.	Milwaukee, Wis.	83	.30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	Northern	6	103	33	142	5,832	130
Proviso, Ill.	Milwaukee, Wis.	83	.30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	Berkshire	9	92	12	113	6,622	2	Berkshire	12	108	23	143	7,733	143
Milwaukee, Wis.	Proviso, Ill.	83	.78	1	Northern	3	19	47	69	2,106	1	Northern	15	73	7	95	3,819	4	Northern	17	77	18	112	4,272	-	-	-	-	-	-	-	136
Milwaukee, Wis.	Proviso, Ill.	83	.78	12	Hlnde	12	42	4	58	2,249	13	Hlnde	5	49	33	87	2,875	6	Hlnde	5	23	83	111	3,220	-	-	-	-	-	-	-	121
Milwaukee, Wis.	Proviso, Ill.	83	.78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	Berkshire	22	69	14	105	4,133	-	-	-	-	-	-	-	105
Proviso, Ill.	Butler, Wis.	95	1.00	9	Hlnde	2	43	6	53	2,325	2	Hlnde	23	56	1	80	3,644	1	Hlnde	-	30	34	104	4,435	-	-	-	-	-	-	-	104
Proviso, Ill.	Butler, Wis.	95	1.00	7	Northern	1	61	6	68	3,217	13	Northern	1	74	7	82	3,261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90
Proviso, Ill.	Butler, Wis.	95	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	Berkshire	-	89	15	104	3,989	-	-	-	-	-	-	-	104
Proviso, Ill.	Butler, Wis.	95	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	Northern	3	62	79	144	6,238	150
Butler, Wis.	Proviso, Ill.	95	1.00	-	-	-	-	-	-	-	16	Hlnde	2	49	28	79	2,622	4	Hlnde	-	48	66	114	3,807	-	-	-	-	-	-	-	119
Butler, Wis.	Proviso, Ill.	95	1.00	1	Northern	6	38	12	56	2,667	18	Northern	8	50	26	84	3,301	3	Northern	4	34	60	118	3,947	4	Northern	1	41	92	134	4,177	138
Butler, Wis.	Proviso, Ill.	95	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	Berkshire	-	97	41	138	4,833	138
Proviso, Ill.	Janesville, Wis.	84	.95	15	Hlnde	2	32	24	59	2,382	1	Hlnde	-	32	43	75	2,698	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75
Janesville, Wis.	Proviso, Ill.	84	.95	9	Hlnde	-	37	24	61	2,754	4	Hlnde	-	36	42	78	3,261	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90
Proviso, Ill.	Caledonia, Ill.	72	.68	5	Hlnde	1	43	10	53	2,496	6	Hlnde	1	40	33	74	2,774	-	-	-	-	-	-	-	-	-	-	-	-	-	-	77
Caledonia, Ill.	Proviso, Ill.	72	.69	9	Hlnde	15	43	11	39	2,098	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	64
Proviso, Ill.	Harvard, Ill.	56	.68	1	Hlnde	-	12	53	65	2,400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65
Harvard, Ill.	Proviso, Ill.	56	.69	4	Hlnde	-	34	5	39	2,712	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55
Great Lakes, Ill.	Butler, Wis.	64	1.60	10	Hlnde	-	50	6	56	3,467	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69
Butler, Wis.	Great Lakes, Ill.	64	1.00	5	Hlnde	2	31	25	58	2,251	4	Hlnde	-	26	53	79	2,756	1	Hlnde	-	41	64	105	3,524	-	-	-	-	-	-	-	105
Milwaukee, Wis.	Fond Du Lac, Wis.	62	1.17	9	Hlnde	8	43	1	51	1,710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	59
Caledonia, Ill.	Harvard, Ill.	16	.69	8	Hlnde	-	30	8	38	2,587	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	68
Harvard, Ill.	Janesville, Wis.	25	.95	1	Hlnde	-	-	17	17	340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17
Proviso, Ill.	Clinton, Ia.	126	.75	9	Northern	1	39	27	67	2,538	29	Northern	-	61	22	83	2,992	18	Northern	-	47	73	120	4,659	3	Northern	-	41	92	133	4,775	140
Proviso, Ill.	Clinton, Ia.	126	.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	Berkshire	-	57	59	116	5,413	-	-	-	-	-	-	-	116
Clinton, Ia.	Proviso, Ill.	125	.73	19	Northern	30	23	9	62	2,668	14	Northern	30	42	11	83	3,874	6	Northern	2	26	92	120	4,043	3	Northern	1	80	111	135	4,110	140
Clinton, Ia.	Proviso, Ill.	125	.73	-	-	-	-	-	-	-	1	Hlnde	-	19	80	99	3,220	1	Hlnde	-	4	116	120	3,100	-	-	-	-	-	-	-	120
Proviso, Ill.	Nelson, Ill.	92	.75	20	Northern	1	41	19	61	2,409	-	-	-	-	-	-	-	2	Northern	-	2	111	113	3,362	-	-	-	-	-	-	-	125
Proviso, Ill.	Nelson, Ill.	92	.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	Berkshire	-	2	123	125	2,884	-	-	-	-	-	-	-	125
Nelson, Ill.	Proviso, Ill.	92	.73	7	Northern	-	63	1	64	4,506	2	Northern	-	41	41	82	4,857	2	Northern	-	33	81	114	4,714	-	-	-	-	-	-	-	113
Nelson, Ill.	Proviso, Ill.	92	.73	1	Berkshire	-	70	-	70	4,436	11	Berkshire	1	76	3	80	4,386	1	Berkshire	-	15	101	116	3,974	-	-	-	-	-	-	-	116
Clinton, Ia.	Nelson, Ill.	34	.49	-	-	-	-	-	-	-	1	Northern	-	53	26	79	4,775	-	-	-	-	-	-	-	-	-	-	-	-	-	-	79
Proviso, Ill.	Sycamore, Ill.	51	.75	6	Hlnde	1	50	5	56	2,851	2	Hlnde	2	53	24	79	3,096	-	-	-	-	-	-	-	-	-	-	-	-	-	-	82
Sycamore, Ill.	Proviso, Ill.	51	.73	5	Hlnde	-	39	15	54	2,586	3	Hlnde	2	45	39	84	3,410	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84
Boone, Ia.	Co. Bluffs, Ia.	143	.70	3	Northern	-	34	23	58	2,685	31	Northern	1	50	36	87	3,354	9	Northern	-	50	59	109	3,366	-	-	-	-	-	-	-	120
Co. Bluffs, Ia.	Boone, Ia.	145	.69	14	Northern	10	50	6	66	2,991	24	Northern	36	38	3	77	3,482	2	Northern	-	16	97	113	3,643	5	Northern	2	8	125	135	3,579	140
Mo. Valley, Ia.	Boone, Ia.	125	.69	6	Hlnde	16	36	10	62	2,427	3	Hlnde	4	39	28	71	3,080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	93
Mo. Valley, Ia.	Boone, Ia.	125	.69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	Northern	-	20	112	132	4,164	132
Clinton, Ia.	Boone, Ia.	198	.77	3	Northern	-	30	32	62	2,659	40	Northern	-	53	31	84	3,236	6	Northern	-	50	57	107	3,568	-	-	-	-	-	-	-	112
Boone, Ia.	Clinton, Ia.	198	.82	16	Northern	13	49	5	67	3,053	30	Northern	15	55	8	78	3,725	-	-	-	-	-	-	-	2	Northern	-	2	124	126	3,213	126
Clinton, Ia.	Belle Plaine, Ia.	113	.74	6	Northern	-	38	20	58	2,939	6	Northern	-	46	35	81	3,686	1	Northern	-	35	76	111	3,444	-	-	-	-	-	-	-	111
Belle Plaine, Ia.	Clinton, Ia.	113	.74	2	Hlnde	-	27	19	46	2,105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	68
Belle Plaine, Ia.	Clinton, Ia.	113	.82	2	Hlnde	8	30	23	51	2,132	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58
				-	-	-	-	-	-	-	12	Northern	6	46	26	78	3,399	7	Northern	2	16	93	111	3,410	1	Northern	2	13	111	126	3,600	126
Belle Plaine, Ia.	Boone, Ia.	85	.77	7	Hlnde	-	15	38	53	1,755	1	Hlnde	-	24	63	87	3,030	-	-	-	-	-	-	-	-	-	-	-	-	-	-	87
Belle Plaine, Ia.	Boone, Ia.	85	.77	-	-	-	-	-	-	-	1	Northern	-	-	72	72	1,795	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72
Boone, Ia.	Belle Plaine, Ia.	85	.72	8	Hlnde	3	39	9	51	2,703	7	Hlnde	1	15	68	84	2,524	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100
Boone, Ia.	Belle Plaine, Ia.	85	.72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	Northern	6	14	96	116	3,287	-	-	-	-	-	-	-	125
TOTAL NUMBER OF TRAINS		727		260							345							87							35							
PER CENT OF ALL TRAINS		100		35.7							47.5							12.0							4.8							
AVERAGE CARS PER TRAIN		80		58							82							114							138							

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Defendant's Exhibit No. 76 (Witness W.A. Kraemer)
Dec. 5, 1940

CHICAGO AND NORTH WESTERN RAILWAY COMPANY

MAXIMUM NUMBER OF CARS HANDLED IN VARIOUS MAIN LINE PASSENGER TRAINS BETWEEN CHICAGO AND OMAHA DURING PERIOD AUGUST 1ST TO 10TH, INCLUSIVE, 1940

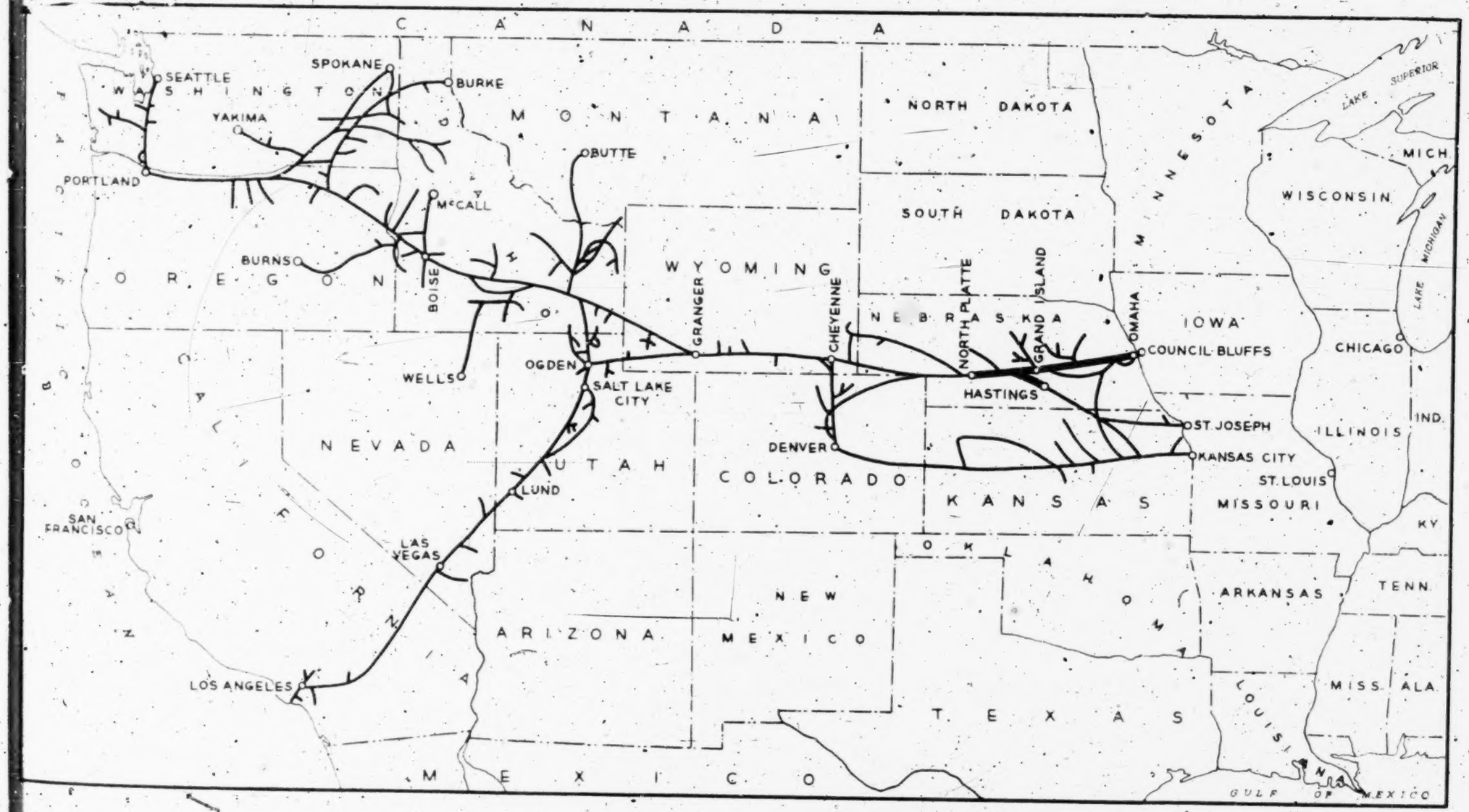
LINE NO. (a)	TRAIN NO. (b)	TRAIN NAME (c)	MILES (d)	NUMBER OF CARS: 5 CARS OR LESS (e)	6 (f)	7 (g)	8 (h)	9 (i)	10 (j)	11 (k)	12 (l)	13 (m)	14 (n)	15 (o)	16 (p)	17 AND OVER (q)	TOTAL (r)
		WESTBOUND															
1	49	Forty-Niner	488	-	-	-	4	-	-	-	-	-	-	-	-	-	4
2	21	Pacific Limited	488	-	-	-	-	-	-	-	-	1	1	4	3	1	10
3	19	Natl. Parks Special	488	-	-	-	5	2	2	-	-	-	1	-	-	-	10
4	1	City of Portland	488	-	-	-	2	-	-	-	-	-	-	-	-	-	2
5	103	City of Los Angeles	488	-	-	-	-	-	-	2	-	-	1	-	-	-	3
6	111	City of Denver	488	-	-	-	-	-	-	10	-	-	-	-	-	-	10
7	11	Corn King	488	-	-	-	-	4	4	2	-	-	-	-	-	-	10
8	101	City of San Francisco	488	-	-	-	-	-	-	-	1	-	-	-	-	-	1
9	5	Fast Mail	488	-	-	1	1	1	5	2	-	-	-	-	-	-	10
10	717	Challenger	488	-	-	-	-	-	-	-	-	-	7	1	1	1	10
11	27	Overland Limited	488	-	-	-	-	-	-	-	-	-	1	3	4	2	10
12	87	Challenger	488	-	-	-	-	-	-	-	-	-	3	2	3	2	10
13	15	Columbine	488	-	2	6	1	1	-	-	-	-	-	-	-	-	10
14		TOTAL		-	2	7	13	8	11	16	1	1	14	10	11	6	100
		EASTBOUND															
15	48	Forty-Niner	488	-	-	-	3	-	-	-	-	-	-	-	-	-	3
16	14	Pacific Limited	488	-	-	-	-	-	-	-	-	3	6	1	-	-	10
17	20	Natl. Parks Special	488	-	-	4	1	2	3	-	-	-	-	-	-	-	10
18	2	City of Portland	488	-	-	-	2	-	-	-	-	-	-	-	-	-	2
19	104	City of Los Angeles	488	-	-	-	-	-	-	2	-	-	1	-	-	-	3
20	112	City of Denver	488	-	-	-	-	-	-	10	-	-	-	-	-	-	10
21	22	Corn King	488	-	-	-	-	2	7	1	-	-	-	-	-	-	10
22	102	City of San Francisco	488	-	-	-	-	-	-	-	2	-	-	-	-	-	2
23	6	Mail and Express	488	-	-	1	1	-	2	2	3	1	-	-	-	-	10
24	818	Challenger	488	-	-	-	-	-	-	-	-	-	4	1	2	3	10

LINE NO. (a)	TRAIN NO. (b)	TRAIN NAME (c)	MILES (d)	NUMBER OF CARS 5 OR LESS (e)	6 (f)	7 (g)	8 (h)	9 (i)	10 (j)	11 (k)	12 (l)	13 (m)	14 (n)	15 (o)	16 (p)	17 AND OVER (q)	TOTAL (r)
		WESTBOUND															
1	49	Forty-Niner	488	-	-	-	4	-	-	-	-	7	-	-	-	-	4
2	21	Pacific Limited	488	-	-	-	-	-	-	-	-	1	1	4	3	1	10
3	19	Natl. Parks Special	488	-	-	-	5	2	2	-	-	-	1	-	-	-	10
4	1	City of Portland	488	-	-	-	2	-	-	-	-	-	-	-	-	-	2
5	103	City of Los Angeles	488	-	-	-	-	-	-	2	-	-	1	-	-	-	3
6	111	City of Denver	480	-	-	-	-	-	-	10	-	-	-	-	-	-	10
7	11	Corn King	488	-	-	-	-	4	4	2	-	-	-	-	-	-	10
8	101	City of San Francisco	488	-	-	-	-	-	-	-	1	-	-	-	-	-	1
9	5	Fast Mail	488	-	-	1	1	1	3	2	-	-	-	-	-	-	10
10	717	Challenger	488	-	-	-	-	-	-	-	-	-	7	1	1	1	10
11	27	Overland Limited	488	-	-	-	-	-	-	-	-	-	1	3	4	2	10
12	87	Challenger	488	-	-	-	-	-	-	-	-	-	3	2	3	2	10
13	15	Columbine.	488	-	2	6	1	1	-	-	-	-	-	-	-	-	10
14		TOTAL		-	2	7	13	8	11	16	1	1	14	10	11	6	100
		EASTBOUND															
15	48	Forty-Niner	488	-	-	-	3	-	-	-	-	-	-	-	-	-	3
16	14	Pacific Limited	488	-	-	-	-	-	-	-	-	3	6	1	-	-	10
17	20	Natl. Parks Special	488	-	-	4	1	2	3	-	-	-	-	-	-	-	10
18	2	City of Portland	488	-	-	-	2	-	-	-	-	-	-	-	-	-	2
19	104	City of Los Angeles	488	-	-	-	-	-	-	2	-	-	1	-	-	-	3
20	112	City of Denver	488	-	-	-	-	-	-	10	-	-	-	-	-	-	10
21	22	Corn King	488	-	-	-	-	2	7	1	-	-	-	-	-	-	10
22	102	City of San Francisco	488	-	-	-	-	-	-	-	2	-	-	-	-	-	2
23	6	Mail and Express	488	-	-	1	1	-	2	2	3	1	-	-	-	-	10
24	818	Challenger	488	-	-	-	-	-	-	-	-	-	4	1	2	3	10
25	28	Overland Limited	488	-	-	-	-	-	-	-	-	-	-	1	7	2	10
26	88	Challenger	488	-	-	-	-	-	-	-	-	-	-	6	2	2	10
27	12	Columbine	488	-	1	1	3	3	2	-	-	-	-	-	-	-	10
28		TOTAL		-	1	6	10	7	14	15	5	4	11	9	11	7	100

RECAPITULATION	
TOTAL TRAINS OVER 14 CARS	54 or 27%
TOTAL TRAINS 14 CARS OR UNDER	146 or 73%
TOTAL CARS	200 or 100%

5394

Defendant's Exhibit No. 77 (Witness A.E. Callin)
Dec. 5, 1940



UNION PACIFIC RAILROAD COMPANY

HEAVY LINE INDICATES TERRITORY COVERED BY TYPICAL FREIGHT TRAIN EXHIBIT.

5395

Defendant's Exhibit No. 78 (Witness A.E. Callin)
Dec. 5, 1940

UNION PACIFIC RAILROAD COMPANY (*)

FREIGHT OPERATING AND
FREIGHT TRANSPORTATION EXPENSES
RELATED TO TRAFFIC
CALENDAR YEARS 1922 TO 1939, INCLUSIVE

YEAR	REVENUE TON MILES	FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES	AVERAGES PER 1000 REVENUE TON MILES	
				FREIGHT OPERATING EXPENSES	FREIGHT TRANSP. EXPENSES
(a)	(b)	(c)	(d)	(e)	(f)
1939	13,057,871,224	$ 79,766,959	$ 39,724,540	$ 6.11	$ 3.04
1938	11,713,952,906	71,441,544	35,810,901	6.10	3.05
1937	13,297,243,583	80,158,935	39,764,415	6.03	2.99
1936	12,522,299,230	75,594,748	35,872,420	6.04	2.86
1935	10,603,455,396	67,888,453	32,993,400	6.41	3.11
1934	9,648,888,171	62,801,202	29,375,843	6.51	3.04
1933	8,487,990,656	55,604,871	26,911,735	6.54	3.17
1932	8,151,357,814	55,893,282	27,966,489	6.86	3.43
1931	10,789,266,622	78,705,916	36,204,394	7.29	3.36
1930	13,116,330,490	93,607,322	42,410,131	7.14	3.23
1929	14,700,997,965	105,118,937	46,788,561	7.15	3.18
1928	14,573,228,989	104,945,647	46,034,325	7.20	3.16
1927	13,386,197,215	99,350,364	42,671,171	7.42	3.19
1926	13,441,676,552	100,655,236	43,110,507	7.49	3.21
1925	12,644,111,983	98,067,854	43,073,768	7.76	3.41
1924	11,962,613,612	101,654,713	44,759,505	8.50	3.74
1923	12,091,313,368	112,734,687	49,836,002	9.32	4.12
1922	10,694,094,361	104,065,774	47,315,487	9.73	4.42
TOTAL 1936-1939	50,591,366,943	306,962,186	151,172,276	6.07	2.99
TOTAL 1922-1925	47,392,133,324	416,523,028	184,984,762	8.79	3.90
PER CENT OF IMPROVEMENT 4 YEARS 1936 - 1939 COMPARED WITH 4 YEARS 1922 - 1925				30.9	23.3

SOURCE: Revenue ton-miles - Annual Reports to Interstate Commerce Com-
[illegible] Union Pacific.

YEAR	REVENUE TON MILES	FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES	AVERAGES PER 1000 REVENUE TON MILES	
				FREIGHT OPERATING EXPENSES	FREIGHT TRANSP. EXPENSES
(a)	(b)	(c)	(d)	(e)	(f)
1939	13,057,871,224	$ 79,766,959	$ 39,724,540	$ 6.11	$ 3.04
1938	11,713,952,906	71,441,544	35,810,901	6.10	3.05
1937	13,297,243,583	80,158,935	39,764,415	6.03	2.99
1936	12,522,299,230	75,594,748	35,872,420	6.04	2.86
1935	10,603,455,396	67,888,453	32,993,400	6.41	3.11
1934	9,648,888,171	62,801,202	29,375,843	6.51	3.04
1933	8,497,990,656	55,604,871	26,911,735	6.54	3.17
1932	8,151,357,814	55,893,282	27,966,489	6.86	3.43
1931	10,789,266,622	78,705,916	36,204,394	7.29	3.36
1930	13,116,330,490	93,607,322	42,410,131	7.14	3.23
1929	14,700,997,965	105,118,937	46,788,561	7.15	3.18
1928	14,573,228,989	104,945,647	46,034,325	7.20	3.16
1927	13,386,197,215	99,350,364	42,671,171	7.42	3.19
1926	13,441,676,552	100,655,236	43,110,507	7.49	3.21
1925	12,644,111,983	98,067,854	43,073,768	7.76	3.41
1924	11,962,613,612	101,654,713	44,759,505	8.50	3.74
1923	12,091,313,368	112,734,687	49,836,002	9.32	4.12
1922	10,694,094,361	104,065,774	47,315,487	9.73	4.42
TOTAL 1936-1939	50,591,366,943	306,962,186	151,172,276	6.07	2.99
TOTAL 1922-1925.	47,392,133,324	416,523,028	184,984,762	8.79	3.90
PER CENT OF IMPROVEMENT 4 YEARS 1936 - 1939 COMPARED WITH 4 YEARS 1922 - 1925				30.9	23.3

SOURCE: Revenue ton-miles - Annual Reports to Interstate Commerce Commission, excluding company material hauled by one Union Pacific line for another as revenue freight prior to January 1, 1934.

Freight operating and transportation expenses - Annual Reports to the I.C.C. with an addition to total freight expenses of a proportion of some joint facility expenses under Maintenance of Way & Structures and some locomotive repair, depreciation and retirement expenses under Maintenance of Equipment prior to Jan. 1, 1927, that were reported in Annual Reports to the I.C.C. as not apportioned to freight or passenger.

(*) Figures for all years include lines of affiliated companies, viz., Oregon Short Line RR. Co., Oregon-Washington Railroad & Navigation Co., Los Angeles & Salt Lake RR. Co., and St. Joseph and Grand Island Ry. Co., which were leased by Union Pacific Railroad Co., effective Jan. 1st, 1936.

Defendant's Exhibit No. 79 (Witness A.E. Callin)
Dec. 5, 1940

UNION PACIFIC RAILROAD COMPANY (See note)

FREIGHT SERVICE OPERATING AVERAGES

Calendar Years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 and 1939

Item	1922	1924	1926	1928	1930	1932	1934	1936	1938	1939	Percent Increase 1939 over 1922
1. Miles of line operated in freight service	9,659	9,763	9,900	10,067	10,122	10,092	10,037	9,865	9,907	9,901	2.5
2. Freight train miles	21,648,423	21,063,065	21,078,057	22,892,906	20,962,431	15,891,618	18,740,089	22,372,693	20,104,344	22,290,163	3.0
3. Freight cars per freight train	38.1	45.0	50.6	52.3	53.2	50.2	50.5	49.1	51.4	50.5	32.5
4. Net tons per freight train	614	692	756	752	738	617	620	679	699	708	15.3
5. Average tractive power per locomotive (lbs.)	39,161	43,070	45,284	47,754	50,309	50,686	52,665	53,487	54,601	54,768	39.1
6. Average capacity per freight carrying car (tons)	47.9	48.0	48.1	48.2	48.2	48.3	48.1	48.4	48.5	48.5	1.3
7. Freight train speed (m.p.h.)	13.5	14.1	14.7	15.3	16.7	18.4	20.2	20.4	21.1	21.6	60.0
8. Gross ton-miles per freight train-hour	19,373	23,804	28,138	30,118	33,267	33,539	37,143	39,000	42,253	43,006	122.0
9. Net ton-miles per freight train-hour	8,309	9,752	11,124	11,534	12,327	11,378	12,556	13,769	14,687	15,210	83.1
10. Gross ton-miles (exclusive of locomotives and tenders) per ton of fuel	10,308	11,785	14,006	14,945	15,243	14,334	14,456	14,157	14,639	14,380	39.5

SOURCE: Items 1, 2, 3, 4, 7 and 8 - Reports of Freight Train Performance, Form OS-A, filed with Interstate Commerce Commission, except item 1 for years 1922 to 1934, incl. taken from Carriers records because of some mileage being operated and reported by more than one of the companies whose results are included herein.

Item 5 - Total tractive effort ÷ total steam locomotives available for service at close of each year as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 6 - Aggregate capacity of all freight carrying cars ÷ total number of such cars available for service at close of year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 9 - Net ton miles ÷ train hours as reported on Form OS-A to Interstate Commerce Commission.

Item 10 - Gross ton miles (Cars, contents and cabooses) ÷ equated net tons of fuel consumed as reported to Interstate Commerce Commission in years 1922 to 1934, inclusive, on Form OS-A and as reported in years 1936, 1938 and 1939 on Forms OS-A and OS-E, respectively.

Note: Figures for all years include lines of affiliated companies, viz., Oregon Short Line Railroad Co., Oregon-Washington Railroad & Navigation Co., Los Angeles & Salt Lake Railroad Co. and St.Joseph and Grand Island Ry.Co. which were leased by Union Pacific Railroad Co. effective Jan.1,1936. 5397

Defendant's Exhibit No. 30 (Witness A. E. Callin)
Dec. 5, 1940

UNION PACIFIC RAILROAD COMPANY

Statement showing number of carloads of revenue freight carried during the year 1939 for certain selected commodities, total products of agriculture and total carload traffic; also, total cars and tons by general commodity groups for carload traffic and total tons of L. C. L. and of all traffic carried, as shown in Schedule 541 of the Annual Report to the Interstate Commerce Commission.

CLASS NO. (a)	COMMODITY GROUP OR CLASS (b)	REVENUE FREIGHT ORIGINATING ON RESPONDENT'S ROAD: TERMINATING ON LINE CARLOADS (c)	REVENUE FREIGHT ORIGINATING ON RESPONDENT'S ROAD: DELIVERED TO CONNECTING CARRIERS CARLOADS (d)	REVENUE FREIGHT RECEIVED FROM CONNECTING CARRIERS: TERMINATING ON LINE CARLOADS (e)	REVENUE FREIGHT RECEIVED FROM CONNECTING CARRIERS: DELIVERED TO CONNECTING CARRIERS CARLOADS (f)	TOTAL REVENUE FREIGHT CARRIED CARLOADS (g)
110	Oranges & grapefruit	495	3,050	1,818	8,103	13,466
111	Lemons, limes and citrus fruits N.O.S.	83	806	257	1,197	2,343
120	Apples, fresh	2,270	7,173	496	626	10,565
121	Bananas	537	208	687	97	1,529
122	Berries, fresh	-	71	103	16	190
123	Cantaloupes & melons NOS	71	154	234	1,895	2,354
124	Grapes, fresh	7	71	708	13,557	14,343
125	Peaches, fresh	97	109	420	1,784	2,410
126	Watermelons	9	1	298	223	531
127	Fruits, fresh domestic, N.O.S.	591	3,302	489	9,203	13,585
128	Fruits, fresh tropical, N.O.S.	-	-	10	-	10
130	Potatoes other than sweet	5,614	37,011	1,424	2,817	46,866
140	Cabbage	75	220	161	147	603
141	Onions	716	2,864	120	480	4,180
142	Tomatoes	37	29	476	1,313	1,855
143	Vegetables, fresh, N.O.S.	273	2,922	2,348	37,302	42,845
	TOTAL	10,875	57,991	10,049	78,760	157,675
	Total Products of Agriculture	115,583	86,283	20,117	85,297	307,280
	Grand Total Carload Traffic	316,994	203,596	191,862	197,942	910,394

TOTALS BY GENERAL COMMODITY GROUPS:

load traffic and total tons of L. C. L. and of all traffic carried, as shown in Schedule 541 of the Annual Report to the Interstate Commerce Commission.

CLASS NO. (a)	COMMODITY GROUP OR CLASS (b)	REVENUE FREIGHT ORIGINATING ON RESPONDENT'S ROAD: TERMINATING ON LINE CARLOADS (c)	REVENUE FREIGHT ORIGINATING ON RESPONDENT'S ROAD: DELIVERED TO CONNECTING CARRIERS CARLOADS (d)	REVENUE FREIGHT RECEIVED FROM CONNECTING CARRIERS: TERMINATING ON LINE CARLOADS (e)	REVENUE FREIGHT RECEIVED FROM CONNECTING CARRIERS: DELIVERED TO CONNECTING CARRIERS CARLOADS (f)	TOTAL REVENUE FREIGHT CARRIED CARLOADS (g)
110	Oranges & grapefruit	495	3,050	1,818	8,103	13,466
111	Lemons, limes and citrus fruits N.O.S.	83	806	257	1,197	2,343
120	Apples, fresh	2,270	7,173	496	626	10,565
121	Bananas	537	208	687	97	1,529
122	Berries, fresh	-	71	103	16	190
123	Cantaloupes & melons NOS	71	154	234	1,895	2,354
124	Grapes, fresh	7	71	708	13,557	14,343
125	Peaches, fresh	97	109	420	1,784	2,410
126	Watermelons	9	1	298	223	531
127	Fruits, fresh domestic, N.O.S.	591	3,302	489	9,203	13,585
128	Fruits, fresh tropical, N.O.S.	-	-	10	-	10
130	Potatoes other than sweet	5,614	37,011	1,424	2,817	46,866
140	Cabbage	75	220	161	147	603
141	Onions	716	2,864	120	480	4,180
142	Tomatoes	37	29	476	1,313	1,855
143	Vegetables, fresh, N.O.S.	273	2,922	2,348	37,302	42,845
	TOTAL	10,875	57,991	10,049	78,760	157,695
	Total Products of Agriculture	115,583	86,283	20,117	85,297	307,280
	Grand Total Carload Traffic	316,994	203,596	191,862	197,942	910,394

TOTALS BY GENERAL COMMODITY GROUPS:

		CARS	TONS
Group I,	Products of Agriculture (C.L.)	307,280	8,170,915
Group II,	Animals and Products (C.L.)	94,899	1,183,626
Group III,	Products of Mines (C.L.)	145,999	6,845,396
Group IV,	Products of Forests (C.L.)	99,473	3,061,318
Group V,	Manufactures and Miscellaneous (C.L.)	262,743	7,025,437
	GRAND TOTAL, CARLOAD TRAFFIC	910,394	26,286,690
Group VI,	L. C. L. Freight		367,045
	GRAND TOTAL TONS, CARLOAD AND L.C.L. TRAFFIC		26,653,735

5398

.R. Triem)

Defendant's Exhibit No. 81 (Witness Randall)
Dec. 6, 1940

ERIE RAILROAD COMPANY
R. E. Woodruff and John A. Hadden, Trustees

EXPLANATION OF SYMBOLS USED BELOW UNDER HEADING "AVERAGE CONSIST"

A - Perishable loads.
B - Other loads.
C - Empty cars and includes caboose.
D - Total all cars.

TYPICAL EXAMPLES OF FREIGHT TRAINS HANDLED
BETWEEN CERTAIN TERMINALS, AUGUST 1ST - 10TH, INCLUSIVE, 1939

LINE NO.	FROM	TO	DISTANCE (Miles)	RULING GRADE	70 CARS OR LESS							71 CARS TO 100 CARS							101 CARS TO 125 CARS						
					NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST					NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST					NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST				
							A	B	C	D	TONS			A	B	C	B	TONS			A	B	C	D
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)
1	Port Jervis, N.Y.	Croxton, N.J.	91	.20	14	Berkshire	11	44	4	59	2,644	18	Berkshire	27	54	4	85	3,875	23	Berkshire	31	77	4	11
2	Port Jervis, N.Y.	Croxton, N.J.	91	.20	9	Mikado	-	27	20	47	1,616	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Port Jervis, N.Y.	Croxton, N.J.	91	.20	6	Pacific	4	29	4	37	1,442	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Port Jervis, N.Y.	Maybrook, N.Y.	33	.20	9	Berkshire	19	33	2	54	2,433	9	Berkshire	23	54	4	81	3,576	-	-	-	-	-	-
5	Croxton, N.J.	Port Jervis, N.Y.	91	.95	19	Berkshire	2	52	10	64	2,308	27	Berkshire	1	28	58	87	2,577	14	Berkshire	-	9	102	111
6	Croxton, N.J.	Port Jervis, N.Y.	91	.95	7	Mikado	-	15	26	41	1,209	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Croxton, N.J.	Port Jervis, N.Y.	91	.95	6	Pacific	8	16	2	26	874	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Maybrook, N.Y.	Port Jervis, N.Y.	33	.60	2	Berkshire	-	3	58	61	1,530	12	Berkshire	-	49	34	83	2,415	2	Berkshire	-	-	112	11
9	Susquehanna, Pa.	Port Jervis, N.Y.	105	1.35	3	Berkshire	20	31	2	53	2,380	29	Berkshire	34	50	4	88	3,972	22	Berkshire	37	72	6	11
10	Susquehanna, Pa.	Port Jervis, N.Y.	105	1.35	12	Pacific	3	24	4	31	1,213	-	-	-	-	-	-	-	-	-	-	-	-	-
11	Port Jervis, N.Y.	Susquehanna, Pa.	105	1.30	1	Berkshire	-	56	1	57	1,923	35	Berkshire	1	54	35	90	2,868	22	Berkshire	-	15	101	11
12	Port Jervis, N.Y.	Susquehanna, Pa.	105	1.30	9	Pacific	5	14	5	24	765	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Hornell, N.Y.	Susquehanna, Pa.	139	.20	9	Berkshire	9	49	2	60	2,516	27	Berkshire	30	52	8	90	3,865	32	Berkshire	27	69	14	11
14	Hornell, N.Y.	Susquehanna, Pa.	139	.20	7	Mikado	-	19	6	25	1,099	-	-	-	-	-	-	-	1	Mikado	3	96	8	10
15	Hornell, N.Y.	Susquehanna, Pa.	139	.20	9	Pacific	4	29	5	38	1,536	-	-	-	-	-	-	-	-	-	-	-	-	-
16	Susquehanna, Pa.	Hornell, N.Y.	139	.25	2	Berkshire	-	36	23	59	1,938	22	Berkshire	9	49	32	90	2,999	29	Berkshire	3	50	60	11
17	Susquehanna, Pa.	Hornell, N.Y.	139	.25	6	Mikado	1	28	34	63	2,100	1	Mikado	3	30	60	93	3,223	-	-	-	-	-	-
18	Susquehanna, Pa.	Hornell, N.Y.	139	.25	7	Pacific	7	21	5	33	1,117	-	-	-	-	-	-	-	-	-	-	-	-	-
19	Buffalo, N.Y.	Hornell, N.Y.	90	.70	34	Mikado	13	39	6	58	2,440	-	-	-	-	-	-	-	9	Mikado	12	78	25	11
20	Buffalo, N.Y.	Hornell, N.Y.	90	.70	2	Consolid'n	-	27	2	29	1,429	-	-	-	-	-	-	-	-	-	-	-	-	-
21	Buffalo, N.Y.	Hornell, N.Y.	90	.70	10	Pacific	1	24	2	27	1,203	-	-	-	-	-	-	-	-	-	-	-	-	-
22	Hornell, N.Y.	Buffalo, N.Y.	90	.55	26	Mikado	1	35	22	58	1,987	10	Mikado	1	37	44	82	2,888	2	Mikado	-	8	103	11
23	Hornell, N.Y.	Buffalo, N.Y.	90	.55	2	Consolid'n	-	6	28	34	962	-	-	-	-	-	-	-	-	-	-	-	-	-
24	Hornell, N.Y.	Buffalo, N.Y.	90	.55	11	Pacific	5	14	19	38	1,197	-	-	-	-	-	-	-	-	-	-	-	-	-
25	Meadville, Pa.	Salamanca, N.Y.	106	.55	3	Berkshire	18	41	8	67	2,920	33	Berkshire	40	47	4	91	4,076	12	Berkshire	29	69	9	10
26	Meadville, Pa.	Salamanca, N.Y.	106	.55	8	Mikado	4	22	16	42	1,457	-	-	-	-	-	-	-	1	Mikado	54	65	3	12
27	Salamanca, N.Y.	Meadville, Pa.	102	.50	2	Berkshire	-	49	14	63	2,084	21	Berkshire	1	53	36	90	2,957	20	Berkshire	-	36	73	10
28	Salamanca, N.Y.	Meadville, Pa.	102	.50	9	Mikado	-	12	11	23	984	1	Mikado	-	-	93	93	2,487	-	-	-	-	-	-
29	Meadville, Pa.	Waterboro, N.Y.	83	.20	2	Berkshire	4	47	6	57	2,437	8	Berkshire	5	73	8	86	4,131	-	-	-	-	-	-
30	Waterboro, N.Y.	Meadville, Pa.	83	.50	5	Berkshire	-	34	21	55	2,046	3	Berkshire	-	51	28	79	2,867	-	-	-	-	-	-
31	Kent, Ohio	Meadville, Pa.	89	1.00	41	Berkshire	33	28	3	64	2,819	18	Berkshire	26	48	4	78	3,200	2	Berkshire	14	89	4	10
32	Kent, Ohio	Meadville, Pa.	89	1.00	9	Mikado	-	22	16	38	1,574	-	-	-	-	-	-	-	-	-	-	-	-	-
33	Meadville, Pa.	Kent, Ohio	89	1.00	6	Berkshire	3	12	15	30	2,058	37	Berkshire	-	35	48	83	2,678	8	Berkshire	1	37	70	10

ındall)

Trustees

HANDLED
, INCLUSIVE, 1939

101 CARS TO 125 CARS									126 CARS AND OVER							MAXIMUM CARS PER TRAIN
CONSIST		NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST					NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST					
D	TONS			A	B	C	D	TONS			A	B	C	D	TONS	
(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(bb)	(cc)	(dd)	(ee)	(ff)	(gg)	(hh)
85	3,875	23	Berkshire	31	77	4	112	6,064	5	Berkshire	52	79	6	137	7,258	146
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46
81	3,576	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95
87	2,577	14	Berkshire	-	9	102	111	2,820	1	Berkshire	1	8	121	130	3,043	130
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
83	2,415	2	Berkshire	-	-	112	112	2,748	4	Berkshire	-	1	133	134	3,385	13[illegible]
88	3,972	22	Berkshire	37	72	6	115	5,017	5	Berkshire	25	102	6	133	5,808	141
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46
90	2,868	22	Berkshire	-	15	101	116	3,188	4	Berkshire	-	7	121	128	3,557	130
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
90	3,865	32	Berkshire	27	69	14	110	4,820	12	Berkshire	17	88	30	135	5,822	145
-	-	1	Mikado	3	96	8	107	4,393	-	-	-	-	-	-	-	107
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55
90	2,999	29	Berkshire	3	50	60	113	3,607	20	Berkshire	-	27	104	131	4,045	148
93	3,223	-	-	-	-	-	-	-	1	Mikado	-	49	82	131	4,869	131
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55
-	-	9	Mikado	12	78	25	115	4,838	-	-	-	-	-	-	-	121
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31
82	2,888	2	Mikado	-	8	103	111	2,948	2	Mikado	-	47	82	129	4,856	130
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54
91	4,076	12	Berkshire	29	69	9	107	4,460	3	Berkshire	16	105	7	128	5,558	133
-	-	1	Mikado	54	65	3	122	5,412	-	-	-	-	-	-	-	122
90	2,957	20	Berkshire	-	36	73	109	3,367	8	Berkshire	-	13	117	130	3,998	138
93	2,487	-	-	-	-	-	-	-	-	-	-	-	-	-	-	93
86	4,131	-	-	-	-	-	-	-	-	-	-	-	-	-	-	91
79	2,867	-	-	-	-	-	-	-	1	Berkshire	1	51	81	133	4,419	133
78	3,200	2	Berkshire	14	89	4	107	4,310	-	-	-	-	-	-	-	109
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55
83	2,678	8	Berkshire	1	37	70	108	3,347	1	Berkshire	-	19	107	126	3,818	126
81	2,306	-	-	-	-	-	-	-								

(a)																							
1	Port Jervis, N.Y.	Croxton, N.J.	91	.20	14	Berkshire	11	44	4	59	2,644	18	Berkshire	27	54	4	85	3,875	23	Berkshire	31
2	Port Jervis, N.Y.	Croxton, N.J.	91	.20	9	Mikado	-	27	20	47	1,616	-	-	-	-	-	-	-	-	-	-
3	Port Jervis, N.Y.	Croxton, N.J.	91	.20	6	Pacific	4	29	4	37	1,442	-	-	-	-	-	-	-	-	-	-
4	Port Jervis, N.Y.	Maybrook, N.Y.	33	.20	9	Berkshire	19	33	2	54	2,433	9	Berkshire	23	54	4	81	3,576	-	-	-
5	Croxton, N.J.	Port Jervis, N.Y.	91	.95	19	Berkshire	2	52	10	64	2,308	27	Berkshire	1	28	58	87	2,577	14	Berkshire	-
6	Croxton, N.J.	Port Jervis, N.Y.	91	.95	7	Mikado	-	15	26	41	1,209	-	-	-	-	-	-	-	-	-	-
7	Croxton, N.J.	Port Jervis, N.Y.	91	.95	6	Pacific	8	16	2	26	874	-	-	-	-	-	-	-	-	-	-
8	Maybrook, N.Y.	Port Jervis, N.Y.	33	.60	2	Berkshire	-	3	58	61	1,530	12	Berkshire	-	49	34	83	2,415	2	Berkshire	-
9	Susquehanna, Pa.	Port Jervis, N.Y.	105	1.35	3	Berkshire	20	31	2	53	2,380	29	Berkshire	34	50	4	88	3,972	22	Berkshire	37
10	Susquehanna, Pa.	Port Jervis, N.Y.	105	1.35	12	Pacific	3	24	4	31	1,213	-	-	-	-	-	-	-	-	-	-
11	Port Jervis, N.Y.	Susquehanna, Pa.	105	1.30	1	Berkshire	-	56	1	57	1,923	35	Berkshire	1	54	35	90	2,868	22	Berkshire	-
12	Port Jervis, N.Y.	Susquehanna, Pa.	105	1.30	9	Pacific	5	14	5	24	765	-	-	-	-	-	-	-	-	-	-
13	Hornell, N.Y.	Susquehanna, Pa.	139	.20	9	Berkshire	9	49	2	60	2,516	27	Berkshire	30	52	8	90	3,865	32	Berkshire	27
14	Hornell, N.Y.	Susquehanna, Pa.	139	.20	7	Mikado	-	19	6	25	1,099	-	-	-	-	-	-	-	1	Mikado	3
15	Hornell, N.Y.	Susquehanna, Pa.	139	.20	9	Pacific	4	29	5	38	1,536	-	-	-	-	-	-	-	-	-	-
16	Susquehanna, Pa.	Hornell, N.Y.	139	.25	2	Berkshire	-	36	23	59	1,938	32	Berkshire	9	49	32	90	2,999	29	Berkshire	3
17	Susquehanna, Pa.	Hornell, N.Y.	139	.25	6	Mikado	1	28	34	63	2,300	1	Mikado	3	30	60	93	3,223	-	-	-
18	Susquehanna, Pa.	Hornell, N.Y.	139	.25	7	Pacific	7	21	5	33	1,117	-	-	-	-	-	-	-	-	-	-
19	Buffalo, N.Y.	Hornell, N.Y.	90	.70	34	Mikado	13	39	6	58	2,440	-	-	-	-	-	-	-	9	Mikado	12
20	Buffalo, N.Y.	Hornell, N.Y.	90	.70	2	Consolid'n	-	27	2	29	1,429	-	-	-	-	-	-	-	-	-	-
21	Buffalo, N.Y.	Hornell, N.Y.	90	.70	10	Pacific	1	24	2	27	1,203	-	-	-	-	-	-	-	-	-	-
22	Hornell, N.Y.	Buffalo, N.Y.	90	.55	26	Mikado	1	35	22	58	1,987	10	Mikado	1	37	44	82	2,888	2	Mikado	-
23	Hornell, N.Y.	Buffalo, N.Y.	90	.55	2	Consolid'n	-	6	28	34	962	-	-	-	-	-	-	-	-	-	-
24	Hornell, N.Y.	Buffalo, N.Y.	90	.55	11	Pacific	5	14	19	38	1,197	-	-	-	-	-	-	-	-	-	-
25	Meadville, Pa.	Salamanca, N.Y.	106	.55	3	Berkshire	18	41	8	67	2,920	33	Berkshire	40	47	4	91	4,076	12	Berkshire	29
26	Meadville, Pa.	Salamanca, N.Y.	106	.55	8	Mikado	4	22	16	42	1,457	-	-	-	-	-	-	-	1	Mikado	54
27	Salamanca, N.Y.	Meadville, Pa.	102	.50	2	Berkshire	-	49	14	63	2,084	21	Berkshire	1	53	36	90	2,957	20	Berkshire	-
28	Salamanca, N.Y.	Meadville, Pa.	102	.50	9	Mikado	-	12	11	23	984	1	Mikado	-	-	93	93	2,487	-	-	-
29	Meadville, Pa.	Waterboro, N.Y.	83	.20	2	Berkshire	4	47	6	57	2,437	8	Berkshire	5	73	8	86	4,131	-	-	-
30	Waterboro, N.Y.	Meadville, Pa.	83	.50	5	Berkshire	-	34	21	55	2,046	3	Berkshire	-	51	28	79	2,867	-	-	-
31	Kent, Ohio	Meadville, Pa.	89	1.00	41	Berkshire	33	28	3	64	2,819	18	Berkshire	26	48	4	78	3,200	2	Berkshire	14
32	Kent, Ohio	Meadville, Pa.	89	1.00	9	Mikado	-	22	16	38	1,574	-	-	-	-	-	-	-	-	-	-
33	Meadville, Pa.	Kent, Ohio	89	1.00	8	Berkshire	1	43	15	59	2,058	37	Berkshire	-	35	48	83	2,678	8	Berkshire	1
34	Meadville, Pa.	Kent, Ohio	89	1.00	9	Mikado	-	10	8	18	696	1	Mikado	-	4	77	81	2,306	-	-	-
35	Marion, Ohio	Kent, Ohio	114	.96	77	Berkshire	23	29	9	61	2,646	15	Berkshire	5	37	34	76	2,656	-	-	-
36	Kent, Ohio	Marion, Ohio	114	1.10	39	Berkshire	-	35	24	59	2,180	49	Berkshire	-	35	44	79	2,577	2	Berkshire	1
37	Kent, Ohio	Marion, Ohio	114	1.10	1	Mikado	-	41	3	44	2,242	-	-	-	-	-	-	-	-	-	-
38	Kent, Ohio	Creston, Ohio	35	1.10	10	Berkshire	-	23	12	35	1,634	-	-	-	-	-	-	-	-	-	-
39	Huntington, Ind.	Marion, Ohio	126	.30	4	Mikado	6	12	28	46	1,606	27	Mikado	36	41	10	87	3,808	14	Mikado	56
40	Huntington, Ind.	Marion, Ohio	126	.30	2	Pacific	12	12	27	51	1,648	1	Pacific	25	15	36	76	2,669	-	-	-
41	Marion, Ohio	Huntington, Ind.	126	.20	5	Mikado	-	19	39	58	2,288	20	Mikado	-	65	20	85	3,414	11	Mikado	-
42	Marion, Ohio	Huntington, Ind.	126	.20	3	Pacific	-	14	25	39	1,654	2	Pacific	-	10	67	77	2,422	-	-	-
43	Hammond, Ind.	Huntington, Ind.	122	.30	11	Mikado	22	24	8	54	2,364	23	Mikado	37	42	12	91	3,720	12	Mikado	44
44	Hammond, Ind.	Huntington, Ind.	122	.30	2	Consolid'n	1	13	14	28	1,017	-	-	-	-	-	-	-	-	-	-
45	Hammond, Ind.	Huntington, Ind.	122	.30	1	Pacific	7	15	8	30	1,238	-	-	-	-	-	-	-	-	-	-
46	Huntington, Ind.	Hammond, Ind.	122	.20	14	Mikado	-	45	7	52	2,082	15	Mikado	1	52	35	88	3,288	6	Mikado	-
47	Huntington, Ind.	Hammond, Ind.	122	.20	3	Consolid'n	1	19	5	25	1,136	-	-	-	-	-	-	-	-	-	-
48	Huntington, Ind.	Hammond, Ind.	122	.20	2	Pacific	-	14	10	24	1,153	-	-	-	-	-	-	-	-	-	-
49	TOTAL ALL TRAINS	1,314			492							474							244		
50	PER CENT OF ALL TRAINS	100			37.4							36.1							18.6		
51	AVERAGE CARS PER TRAIN	81			51							86							111		

85	3,875	23	Berkshire	31	77	4	112	6,064	5	Berkshire	52	79	6	137	7,258	146
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	65
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	46
81	3,576	–	–	–	–	–	–	–	–	–	–	–	–	–	–	95
87	2,577	14	Berkshire	–	9	102	111	2,820	1	Berkshire	1	8	121	130	3,043	130
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	50
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	35
83	2,415	2	Berkshire	–	–	112	112	2,748	4	Berkshire	–	1	133	134	3,385	137
88	3,972	22	Berkshire	37	72	6	115	5,017	5	Berkshire	25	102	6	133	5,808	141
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	46
90	2,868	22	Berkshire	–	15	101	116	3,188	4	Berkshire	–	7	121	128	3,557	130
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	35
90	3,865	32	Berkshire	27	69	14	110	4,820	12	Berkshire	17	88	30	135	5,822	145
–	–	1	Mikado	3	96	8	107	4,393	–	–	–	–	–	–	–	107
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	55
90	2,999	29	Berkshire	3	50	60	113	3,607	20	Berkshire	–	27	104	131	4,045	148
93	3,223	–	–	–	–	–	–	–	1	Mikado	–	49	82	131	4,869	131
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	55
–	–	9	Mikado	12	78	25	115	4,838	–	–	–	–	–	–	–	121
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	29
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	31
82	2,888	2	Mikado	–	8	103	111	2,948	2	Mikado	–	47	82	129	4,856	130
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	39
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	54
91	4,076	12	Berkshire	29	69	9	107	4,460	3	Berkshire	16	105	7	128	5,558	133
–	–	1	Mikado	54	65	3	122	5,413	–	–	–	–	–	–	–	122
90	2,957	20	Berkshire	–	36	73	109	3,367	8	Berkshire	–	13	117	130	3,998	138
93	2,487	–	–	–	–	–	–	–	–	–	–	–	–	–	–	93
86	4,131	–	–	–	–	–	–	–	–	–	–	–	–	–	–	91
79	2,867	–	–	–	–	–	–	–	1	Berkshire	1	51	81	133	4,419	133
78	3,200	2	Berkshire	14	89	4	107	4,310	–	–	–	–	–	–	–	109
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	55
83	2,678	8	Berkshire	1	37	70	108	3,347	1	Berkshire	–	19	107	126	3,818	126
81	2,306	–	–	–	–	–	–	–	–	–	–	–	–	–	–	81
76	2,656	–	–	–	–	–	–	–	1	Berkshire	27	100	2	129	5,403	129
79	2,577	2	Berkshire	1	59	46	106	3,658	–	–	–	–	–	–	–	110
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	44
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	51
87	3,808	14	Mikado	56	36	11	103	4,363	5	Mikado	7	17	129	153	4,047	161
76	2,669	–	–	–	–	–	–	–	–	–	–	–	–	–	–	76
85	3,414	11	Mikado	–	60	50	110	4,479	14	Mikado	–	25	108	133	4,693	141
77	2,422	–	–	–	–	–	–	–	–	–	–	–	–	–	–	84
91	3,720	12	Mikado	44	37	24	105	4,377	5	Mikado	2	11	132	145	3,526	153
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	42
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	30
88	3,288	6	Mikado	–	52	64	116	5,261	12	Mikado	–	27	108	135	4,738	148
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	28
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	28
		244							104							
		18.6							7.9							
		111							134							

Defendant's Exhibit No. 82 (Witness R.C. Randall)
Dec. 6 , 1940

ERIE RAILROAD COMPANY

Robert E. Woodruff and John A. Hadden, Trustees

MAXIMUM NUMBER OF CARS HANDLED IN VARIOUS MAIN LINE PASSENGER TRAINS DURING PERIOD AUG. 1ST TO 10TH, 1939, INC.

LINE NO.	TRAIN NO.	TRAIN NAME AND ROUTE	MILES	MAXIMUM CARS IN TRAINS													17 & OVER	TOTAL
				4	5	6	7	8	9	10	11	12	13	14	15	16		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)
		WEST																
1	1	The Erie Limited - Jersey City to Chicago	998	-	-	-	1	4	4	1	-	-	-	-	-	-	-	10
2	5	The Lake Cities - Jersey City to Cleveland	637	-	-	-	-	-	3	5	1	1	-	-	-	-	-	10
3	7	Pacific Express - Jersey City to Chicago	998	-	-	-	-	-	1	-	-	1	1	3	3	1	-	10
4	15	The Midlander - Salamanca to Chicago	585	5	5	-	-	-	-	-	-	-	-	-	-	-	-	10
		EAST																
5	2	The Erie Limited - Chicago to Jersey City	998	-	-	-	-	1	4	3	2	-	-	-	-	-	-	10
6	6	The Lake Cities - Cleveland to Jersey City	637	-	-	-	-	-	3	3	3	-	1	-	-	-	-	10
7	8	The Atlantic Express - Chicago to Jersey C.	998	-	-	-	-	-	-	-	-	-	-	-	-	-	10	10
8	16	The Midlander - Chicago to Salamanca	585	4	6	-	-	-	-	-	-	-	-	-	-	-	-	10
TOTAL				9	11	-	1	5	15	12	6	2	2	3	3	1	10	80
PER CENT OF TOTAL				11.25	13.75	-	1.25	6.25	18.75	15.00	7.50	2.50	2.50	3.75	3.75	1.25	12.50	100%

Total trains over 14 cars 14 or 17.50%

Total trains with 14 cars or under 66 or 82.50%

TOTAL TRAINS 80 or 100.00%

5400

Defendant's Exhibit No. 83 ± (Witness W.R. Triem)
Dec. 6, 1940

THE PENNSYLVANIA RAILROAD

TYPICAL EXAMPLES OF FREIGHT TRAINS HANDLED
BETWEEN CERTAIN TERMINALS, JULY 10TH - 19TH, INCLUSIVE, 1939

LINE NO.	FROM	TO	DISTANCE (Miles)	RULING GRADE	70 CARS OR LESS								71 CARS TO 100 CARS								101 CARS	
					NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST					NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST					NO. OF TRAINS	TYPE OF LOCOMOTIVE	
							A	B	C	D	TONS			A	B	C	D	TONS			
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	
1	Altoona, Pa.	Enola, Pa.	125	0.2	28	Mountain	23	36	4	63	2,489	61	Mountain	22	54	10	86	3,466	58	Mountain	
2	Enola, Pa.	Altoona, Pa.	125	0.5	18	Mountain	10	39	11	60	2,135	80	Mountain	7	43	38	88	3,894	58	Mountain	
3	Altoona, Pa.	Harrisburg, Pa.	127	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	Mountain	
4	Harrisburg, Pa.	Altoona, Pa.	127	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	Mountain	
5	Chicago, Ill.	Ft. Wayne, Ind.	144	0.6	18	Mountain	12	38	11	61	2,605	17	Mountain	20	55	16	91	3,583	5	Mountain	
6	Ft. Wayne, Ind.	Chicago, Ill.	144	0.5	7	Mountain	-	27	32	59	2,307	17	Mountain	1	50	41	92	3,497	21	Mountain	
7	Ft. Wayne, Ind.	Crestline, Ohio	129	0.6	9	Mountain	10	34	12	56	2,443	33	Mountain	13	55	18	86	3,480	5	Mountain	
8	Ft. Wayne, Ind.	Crestline, Ohio	129	0.6	2	Pacific	2	38	16	56	2,768	-	-	-	-	-	-	-	-	-	
9	Crestline, Ohio	Ft. Wayne, Ind.	129	0.4	5	Mountain	-	35	17	52	2,707	9	Mountain	-	52	34	86	3,759	31	Mountain	
10	Logansport, Ind.	Ft. Wayne, Ind.	81	1.0	5	Santa Fe	1	52	7	60	2,859	4	Santa Fe	1	55	25	81	3,437	-	-	
11	Ft. Wayne, Ind.	Logansport, Ind.	81	0.7	9	Santa Fe	1	13	18	32	998	-	-	-	-	-	-	-	-	-	
12	Pitcairn, Pa.	Columbus, Ohio	205	1.0	17	Mountain	-	39	21	60	2,558	39	Mountain	1	38	45	84	3,022	23	Mountain	
13	Pitcairn, Pa.	Columbus, Ohio	205	1.0	2	Decapod	-	44	1	45	4,169	-	-	-	-	-	-	-	-	-	
14	Columbus, Ohio	Pitcairn, Pa.	205	1.0	35	Mountain	30	26	7	63	2,712	51	Mountain	37	32	10	79	3,212	3	Mountain	
15	Columbus, Ohio	Pitcairn, Pa.	205	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	Decapod	
16	Dennison, Ohio	Columbus, Ohio	98	1.0	4	Decapod	-	50	16	66	2,838	5	Decapod	-	59	22	81	3,293	-	-	
17	Columbus, Ohio	Dennison, Ohio	98	1.0	2	Decapod	-	24	38	62	2,045	4	Decapod	-	41	46	87	3,127	3	Decapod	
18	Dennison, Ohio	Pitcairn, Pa.	110	1.0	-	-	-	-	-	-	-	4	Decapod	1	54	39	94	3,513	4	Decapod	
19	Pitcairn, Pa.	Dennison, Ohio	107	1.0	-	-	-	-	-	-	-	2	Decapod	-	13	74	87	2,696	-	-	
20	Weirton, W. Va.	Columbus, Ohio	150	1.0	1	Decapod	-	45	1	46	4,316	-	-	-	-	-	-	-	-	-	
21	Weirton, W. Va.	Columbus, Ohio	150	1.0	3	Mountain	-	44	14	58	3,903	7	Mountain	1	48	26	75	3,722	1	Mountain	
22	Columbus, Ohio	Weirton, W. Va.	150	1.0	1	Decapod	2	32	26	60	3,388	-	-	-	-	-	-	-	1	Decapod	
23	Pitcairn, Pa.	Washington, Pa.	44	0.8	7	Decapod	-	37	17	54	2,742	2	Decapod	-	52	32	84	5,405	-	-	
24	Washington, Pa.	Pitcairn, Pa.	44	0.9	5	Decapod	-	40	19	59	2,837	4	Decapod	-	49	23	72	3,572	-	-	
25	Dennison, Ohio	Zanesville, Ohio	62	0.6	5	Consolid'n	-	26	33	59	2,130	4	Consolid'n	-	23	62	85	2,679	-	-	
26	Zanesville, Ohio	Circleville, Ohio	65	1.0	8	Consolid'n	-	13	22	35	1,276	-	-	-	-	-	-	-	-	-	
27	Circleville, Ohio	Zanesville, Ohio	65	1.0	9	Consolid'n	-	29	15	44	2,072	-	-	-	-	-	-	-	-	-	
28	Zanesville, Ohio	Dennison, Ohio	62	0.7	8	Consolid'n	-	38	14	52	2,211	1	Consolid'n	-	49	22	71	3,040	-	-	
29	Benwood, W. Va.	Mingo Jct., Ohio	24	0.9	7	Mikado	-	49	14	63	2,599	2	Mikado	-	62	11	73	3,058	-	-	
30	Mingo Jct., Ohio	Pitcairn, Pa.	58	1.0	3	Decapod	-	33	16	49	2,098	2	Decapod	1	74	7	82	3,419	5	Decapod	
31	Pitcairn, Pa.	Weirton, W. Va.	53	1.0	6	Decapod	3	43	12	58	2,687	4	Decapod	2	53	32	86	3,665	-	-	
32	Weirton, W.Va.	Benwood, W.Va.	27	0.4	6	Decapod	-	33	22	55	2,092	2	Decapod	-	50	33	83	3,340	1	Decapod	

DELED
CLUSIVE, 1939

	101 CARS TO 125 CARS							126 CARS AND OVER							MAXIMUM CARS PER TRAIN
ST. TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	
(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(bb)	(cc)	(dd)	(ee)	(ff)	(gg)	(hh)
3,466	58	Mountain	9	95	11	115	6,409	23	Mountain	3	117	6	126	8,522	126
3,094	58	Mountain	1	21	93	115	2,973	36	Mountain	-	1	125	126	2,725	126
-	2	Mountain	-	100	23	123	7,483	6	Mountain	-	114	12	126	8,537	126
-	4	Mountain	-	1	120	121	2,781	2	Mountain	-	-	126	126	2,626	126
3,583	5	Mountain	11	90	22	123	5,054	-	-	-	-	-	-	-	125
3,497	21	Mountain	2	58	52	112	3,982	3	Mountain	-	32	95	127	4,088	129
3,480	5	Mountain	13	38	60	111	3,480	-	-	-	-	-	-	-	125
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58
3,799	31	Mountain	2	58	53	113	4,848	3	Mountain	2	68	58	128	4,381	129
3,437	-	-	-	-	-	-	-	-	-	-	-	-	-	-	93
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49
3,022	23	Mountain	1	27	80	109	3,310	-	-	-	-	-	-	-	123
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45
3,212	3	Mountain	45	46	12	103	3,970	-	-	-	-	-	-	-	104
-	1	Decapod	-	-	114	114	2,571	-	-	-	-	-	-	-	114
3,293	-	-	-	-	-	-	-	-	-	-	-	-	-	-	89
3,127	3	Decapod	1	47	60	108	3,780	-	-	-	-	-	-	-	114
3,513	4	Decapod	-	63	43	106	3,952	-	-	-	-	-	-	-	115
2,696	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46
3,722	1	Mountain	-	34	71	105	3,206	-	-	-	-	-	-	-	105
-	1	Decapod	-	-	117	117	3,425	-	-	-	-	-	-	-	117
5,405	-	-	-	-	-	-	-	-	-	-	-	-	-	-	88
3,572	-	-	-	-	-	-	-	-	-	-	-	-	-	-	73
2,679	-	-	-	-	-	-	-	-	-	-	-	-	-	-	93
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51
3,040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71
3,058	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75
3,419	5	Decapod	-	98	7	105	4,682	-	-	-	-	-	-	-	114
3,665	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96
3,340	1	Decapod	-	50	60	110	3,792	-	-	-	-	-	-	-	110
	226							73							
	25.6							8.3							
	113							126							

TYPICAL EXAMPLES OF FREIGHT TRAINS HANDLED
BETWEEN CERTAIN TERMINALS, JULY 10TH - 19TH, INCLUSIVE, 1939

LINE NO.	FROM	TO	DISTANCE (Miles)	RULING GRADE	70 CARS OR LESS								71 CARS TO 100 CARS								101 C	
					NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST						NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST						NO. OF TRAINS	TYPE OF LOCOMOTIV
							A	B	C	D	TONS				A	B	C	D	TONS			
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)		
1	Altoona, Pa.	Enola, Pa.	125	0.2	28	Mountain	23	36	4	63	2,489	61	Mountain	22	54	10	86	3,466	58	Mountain		
2	Enola, Pa.	Altoona, Pa.	125	0.5	18	Mountain	10	39	11	60	2,135	80	Mountain	7	43	38	88	3,094	58	Mountain		
3	Altoona, Pa.	Harrisburg, Pa.	127	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	Mountain		
4	Harrisburg, Pa.	Altoona, Pa.	127	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	Mountain		
5	Chicago, Ill.	Ft. Wayne, Ind.	144	0.6	18	Mountain	12	38	11	61	2,605	17	Mountain	20	55	16	91	3,583	5	Mountain		
6	Ft. Wayne, Ind.	Chicago, Ill.	144	0.5	7	Mountain	-	27	32	59	2,307	17	Mountain	1	50	41	92	3,497	21	Mountain		
7	Ft. Wayne, Ind.	Crestline, Ohio	129	0.6	9	Mountain	10	34	12	56	2,443	33	Mountain	13	55	18	86	3,480	5	Mountain		
8	Ft. Wayne, Ind.	Crestline, Ohio	129	0.6	2	Pacific	2	38	16	56	2,768	-	-	-	-	-	-	-	-	-		
9	Crestline, Ohio	Ft. Wayne, Ind.	129	0.4	5	Mountain	-	35	17	52	2,707	9	Mountain	-	52	34	86	3,759	31	Mountain		
10	Logansport, Ind.	Ft. Wayne, Ind.	81	1.0	5	Santa Fe	1	52	7	60	2,899	4	Santa Fe	1	55	25	81	3,437	-	-		
11	Ft. Wayne, Ind.	Logansport, Ind.	81	0.7	9	Santa Fe	1	13	18	32	998	-	-	-	-	-	-	-	-	-		
12	Pitcairn, Pa.	Columbus, Ohio	205	1.0	17	Mountain	-	39	21	60	2,558	39	Mountain	1	38	45	84	3,022	23	Mountain		
13	Pitcairn, Pa.	Columbus, Ohio	205	1.0	2	Decapod	-	44	1	45	4,169	-	-	-	-	-	-	-	-	-		
14	Columbus, Ohio	Pitcairn, Pa.	205	1.0	35	Mountain	30	26	7	63	2,712	51	Mountain	37	32	10	79	3,212	3	Mountain		
15	Columbus, Ohio	Pitcairn, Pa.	205	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	Decapod		
16	Dennison, Ohio	Columbus, Ohio	98	1.0	4	Decapod	-	50	16	66	2,838	5	Decapod	-	59	22	81	3,293	-	-		
17	Columbus, Ohio	Dennison, Ohio	98	1.0	2	Decapod	-	24	38	62	2,045	4	Decapod	-	41	46	87	3,127	3	Decapod		
18	Dennison, Ohio	Pitcairn, Pa.	110	1.0	-	-	-	-	-	-	-	4	Decapod	1	54	39	94	3,513	4	Decapod		
19	Pitcairn, Pa.	Dennison, Ohio	107	1.0	-	-	-	-	-	-	-	2	Decapod	-	13	74	87	2,696	-	-		
20	Weirton, W. Va.	Columbus, Ohio	150	1.0	1	Decapod	-	45	1	46	4,316	-	-	-	-	-	-	-	-	-		
21	Weirton, W. Va.	Columbus, Ohio	150	1.0	3	Mountain	-	44	14	58	3,903	7	Mountain	1	48	26	75	3,722	1	Mountain		
22	Columbus, Ohio	Weirton, W. Va.	150	1.0	1	Decapod	2	32	26	60	3,388	-	-	-	-	-	-	-	1	Decapod		
23	Pitcairn, Pa.	Washington, Pa.	44	0.8	7	Decapod	-	37	17	54	2,742	2	Decapod	-	52	32	84	5,405	-	-		
24	Washington, Pa.	Pitcairn, Pa.	44	0.9	5	Decapod	-	40	19	59	2,837	4	Decapod	-	49	23	72	3,572	-	-		
25	Dennison, Ohio	Zanesville, Ohio	62	0.6	5	Consolid'n	-	26	33	59	2,130	4	Consolid'n	-	23	62	85	2,679	-	-		
26	Zanesville, Ohio	Circleville, Ohio	65	1.0	8	Consolid'n	-	13	22	35	1,276	-	-	-	-	-	-	-	-	-		
27	Circleville, Ohio	Zanesville, Ohio	65	1.0	9	Consolid'n	-	29	15	44	2,072	-	-	-	-	-	-	-	-	-		
28	Zanesville, Ohio	Dennison, Ohio	62	0.7	8	Consolid'n	-	38	14	52	2,211	1	Consolid'n	-	49	22	71	3,040	-	-		
29	Benwood, W. Va.	Mingo Jct., Ohio	24	0.9	7	Mikado	-	49	14	63	2,599	2	Mikado	-	62	11	73	3,058	-	-		
30	Mingo Jct., Ohio	Pitcairn, Pa.	58	1.0	3	Decapod	-	33	16	49	2,098	2	Decapod	1	74	7	82	3,419	5	Decapod		
31	Pitcairn, Pa.	Weirton, W. Va.	53	1.0	6	Decapod	3	43	12	58	2,687	4	Decapod	1	53	32	86	3,665	-	-		
32	Weirton, W.Va.	Benwood, W.Va.	27	0.4	6	Decapod	-	33	22	55	2,092	2	Decapod	-	50	33	83	3,340	1	Decapod		
33	TOTAL TRAINS		883		230							354							226			
34	PER CENT OF ALL TRAINS		100		26							40.1							25.6			
35	AVERAGE CARS PER TRAIN		88		57							85							113			

Defendant's Exhibit No. 84 (Witness W.R. Triem)
Dec. 6, 1940

PENNSYLVANIA RAILROAD COMPANY

MAXIMUM NUMBER OF CARS HANDLED
IN VARIOUS MAIN LINE PASSENGER TRAINS
JULY 10TH TO 19TH, INC. 1939

TRAIN NO. (a)	NEW YORK-WASHN. ROUTE (b)	MILES (c)	5 (d)	6 (e)	7 (f)	8 (g)	9 (h)	10 (i)	11 (j)	12 (k)	13 (l)	14 (m)	15 (n)	16 (o)	17 & OVER (p)	TOTAL (q)
	WEST - SOUTH															
101	New York-Washn. Express	226.0											3	2	5	10
103	The Edison	226.0			1		1				2	2	2	1	1	10
107	New York-Washn. Mail	226.0						1	6	1	1	1				10
173	Federal Express	226.0							3		4	2	1			10
111	The Legislator	226.0									3	4	2		1	10
149	The Washingtonian	226.0					1	1			5	1	1	1		10
115	The President	226.0			1	2	1	4	1		1					10
121	The Judiciary	226.0									1	2	4	3		10
123	The Potomac	226.0								5	3	1	1			10
125	The Representative	226.0					1	2	4	1		2				10
175	Colonial Express	226.0					2	1	5		2					10
149	Sou.Ry.& S.A.L. Express	226.0									4	4		2		10
129	The Embassy	226.0				1	4	1			1		1	2		10
133	The Congressional	226.0						1	7	2						10
177	The Senator	226.0						2	5	2	2		1			10
135	The Constitution	226.0						1		1	1	1	3	2	1	10
137	The Arlington	226.0								1	3	3	3			10
143	The Mt.Vernon	226.0			1								1	3	1	10
147	NY-Washn-Sou.Ry.& S.A.L.Express	226.0							1	2	5		1	1		10
145	Havana Special	226.0								2	1	2	3	1		10
	NORTH - EAST															
102	Wash-New York Express	226.0						3	3	2		1			1	10
110	The Havana Special	226.0										2	4	2	2	10
108	The Edison	226.0				1		2	1			1			5	10
112	RAL & C&O Ry. Washn.-N.Y.Express	226.0							7		7	2	1			10
118	Sou.Ry.-Washn.-NY Express	226.0										1	1		1	10
120	The Admiral	226.0					1			1		1	5		2	10
122	ACL, Sou.Ry., RAL Washn.-N.Y.Express	226.0			1			5	1			1			2	10
174	Colonial Express	226.0				2	3	2	1			1		1		10
126	The President	226.0						2	1	3	4					10
128	The Potomac	226.0				4	4	2								10
130	The Judiciary	226.0			5	3	2									10
176	The Senator	226.0					7	1	1	1						10
132	Sou.Ry.-ACL-Washn.-N.Y.Express	226.0						6		3		1				10
134	The Representative	226.0						3	5		1	1				10
142	The Mt. Vernon	226.0					2	2	3		2	1				10
144	The Embassy	226.0				1	1	1	3	2	1	1				10
152	The Congressional	226.0								8	1			1		10
166	The Montrealer	226.0				6	2	1				1				10
154	The Constitution	226.0			1					6	1	1	1			10
156	The Patriot	226.0			1	2	2		1	1		2	1			10
158	The Arlington	226.0				5	2	1	1				1			10
172	Federal Express	226.0							1		4	3	2			10
162	Washn.-New York Mail	226.0				1	1	4	2	2						10
	TOTAL				10	28	37	49	61	46	60	44	45	28	22	430
	PER CENT OF TOTAL				2.32	6.51	8.60	11.40	14.19	10.70	13.96	10.70	10.00	6.51	5.12	

TOTAL TRAINS OVER 14 CARS 93 or 21.63%
TOTAL TRAINS 14 CARS OR UNDER 337 or 78.37%
TOTAL TRAINS 430 or 100. %

TRAIN (a)	NEW YORK-PITTSBURGH ROUTE (b)	MILES (c)	5 (d)	6 (e)	7 (f)	8 (g)	9 (h)	10 (i)	11 (j)	12 (k)	13 (l)	14 (m)	15 (n)	16 (o)	17 & OVER (p)	TOTAL (q)
	WEST															
39	The Clevelander-Akronite	434.3								2	2	2	1	3		10
37	Iron City Express	434.3								1	3	3	3			10
61	The Pittsburgher	434.3							1	4	4	1				10
25	The Metropolitan	434.3								1			6	3		10
75	The Duquesne	434.3					1					4	3	2		10
41	Cincinnati Ltd.	434.3							1	7	1					10
69	The Red Arrow	434.3						1				2	6	1		10
	EAST															
68	The Red Arrow	434.3								2	4	3	1			10
72	The Juniata	434.3						2	3	3	1	1				10
18	Chicago Mail	434.3									1	1	1	2	5	10
60	The Pittsburgher	434.3								6	3		1			10
38	The Clevelander-Akronite	434.3						1	1	6	1			1		10
40	Cincinnati Ltd.	434.3						2	2	3	2		1			10
	TOTAL						1	5	8	35	22	18	23	12	5	130
	PER CENT OF TOTAL						0.77	4.61	6.15	26.92	16.92	13.85	17.69	9.24	3.84	

TOTAL TRAINS OVER 14 CARS 40 or 30.77%
TOTAL TRAINS 14 CARS OR UNDER 90 or 69.23%
TOTAL TRAINS 130 or 100.00%

TRAIN (a)	NEW YORK - CHICAGO ROUTE (b)	MILES (c)	5 (d)	6 (e)	7 (f)	8 (g)	9 (h)	10 (i)	11 (j)	12 (k)	13 (l)	14 (m)	15 (n)	16 (o)	17 & OVER (p)	TOTAL (q)
	WEST															
6	Pennsylvania Ltd.	902.7					1	3	1	1	3	1				10
49	The General	902.7									6	3		1		10
29	Broadway Ltd.	902.7				5	4	1								10
23	Manhattan Ltd.	902.7						1	1	2	3	2		1		10
79	The Golden Arrow	902.7											5	3	2	10
	EAST															
52	The New Yorker	902.7									2	2	6			10
22	Manhattan Ltd.	902.7										4	3	3		10
78	The Golden Arrow	902.7					2	1	6				1			10
28	Broadway Ltd.	902.7				9	1									10
49	The General	902.7							1	2			2	5		10
42	The Rainbow	902.7							2	5	2		1			10
2	Pennsylvania Ltd.	902.7						2	2	4			2			10
54	Gotham Ltd.	902.7										1	3	3	3	10
	TOTAL					14	8	8	13	14	16	13	23	16	5	130
	PER CENT OF TOTAL					10.77	6.15	6.15	10.00	10.77	12.31	10.00	17.69	12.31	3.85	

TOTAL TRAINS OVER 14 CARS 44 or 33.85%
TOTAL TRAINS 14 CARS OR UNDER 86 or 66.15%
TOTAL TRAINS 130 or 100.00%

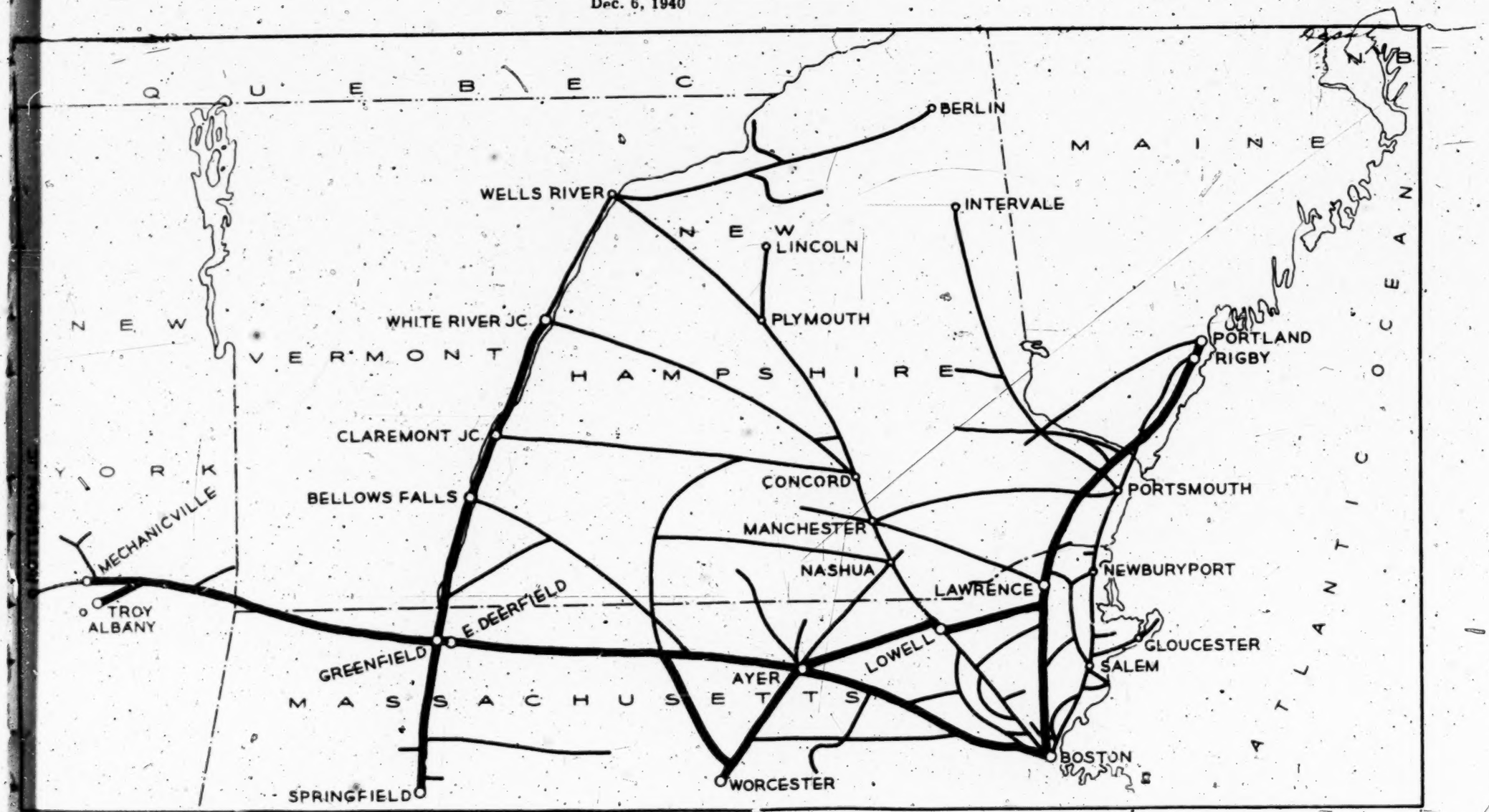
TRAIN (a)	NEW YORK - ST.LOUIS ROUTE (b)	MILES (c)	5 (d)	6 (e)	7 (f)	8 (g)	9 (h)	10 (i)	11 (j)	12 (k)	13 (l)	14 (m)	15 (n)	16 (o)	17 & OVER (p)	TOTAL (q)
	WEST															
31	Spirit of St.Louis	1045.8							1		1	1	2	5		10
33	The St.Louisan	1045.8									2	4	2	1	1	10
29	The American	1045.8							1		5	1	2	1		10
11	St.Louis Mail	1045.8							1	1	1		1	6		10
13	Mail Southwestern	1045.8					1				1	1	4	2	1	10
	EAST															
44	The American	1045.8							1		6	2	1			10
30	Spirit of St.Louis	1045.8						7	2			1				10
32	The St.Louisan	1045.8						3		1	1	2	2			10
	TOTAL						1	10	6	2	17	13	14	15	2	80
	PER CENT OF TOTAL						1.25	12.50	7.50	2.50	21.25	16.25	17.50	18.75	2.50	

TOTAL TRAINS OVER 14 CARS 31 or 38.75%
TOTAL TRAINS 14 CARS OR UNDER 49 or 61.25%
TOTAL TRAINS 80 or 100.00%

RECAPITULATION

	TOTAL TRAINS (r)	TOTAL OVER 14 (s)	PERCENT OF TOTAL (t)
NEW YORK - WASHINGTON	430	93	21.63
NEW YORK - PITTSBURGH	130	40	30.77
NEW YORK - CHICAGO	130	44	33.85
NEW YORK - ST.LOUIS	80	31	38.75
TOTAL	770	208	27.01

Defendant's Exhibit No. 85 (Witness Hammond)
Dec. 6, 1940



BOSTON AND MAINE RAILROAD COMPANY 5404

HEAVY LINE INDICATES TERRITORY COVERED BY TYPICAL FREIGHT TRAIN EXHIBIT.

BOSTON AND MAINE RAILROAD

FREIGHT OPERATING AND
FREIGHT TRANSPORTATION EXPENSES
RELATED TO TRAFFIC
YEARS 1922 TO 1939, INCLUSIVE

YEAR	REVENUE TON MILES	FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES	AVERAGES PER 1000 REVENUE TON MILES	
				FREIGHT OPERATING EXPENSES	FREIGHT TRANSP. EXPENSES
(a)	(b)	(c)	(d)	(e)	(f)
1939	2,248,167,004	$ 20,478,844	$ 10,976,390	$ 9.11	$ 4.88
1938	1,941,727,367	20,116,440	10,324,831	10.36	5.32
1937	2,278,996,148	21,744,434	11,182,786	9.54	4.91
1936	2,257,601,824	22,926,780	11,678,140	10.16	5.17
1935	2,041,652,035	19,613,918	10,673,357	9.61	5.23
1934	1,976,103,728	18,702,025	10,327,257	9.46	5.23
1933	1,840,285,410	18,093,077	9,525,752	9.83	5.18
1932	1,81[illegible],073,717	18,918,706	9,997,869	10.44	5.52
1931	2,273,290,701	24,834,750	13,014,408	10.92	5.72
1930	2,66[illegible],890,844	30,815,928	15,437,020	11.56	5.79
1929	2,993,421,378	37,581,859	16,832,342	12.55	5.62
1928	2,893,844,169	36,404,720	17,459,919	12.58	6.03
1927	2,856,589,535	38,647,005	18,465,119	13.53	6.46
1926	3,037,191,609	38,513,842	19,692,065	12.68	6.48
1925	2,955,885,209	38,606,852	19,990,877	13.06	6.76
1924	2,744,213,671	38,078,829	20,203,040	13.88	7.36
1923	3,103,817,227	46,526,233	25,602,310	14.99	8.25
1922	2,689,914,716	40,750,097	21,995,616	15.15	8.18
TOTAL 1936-1939	8,726,492,343	85,266,498	44,162,147	9.77	5.06
TOTAL 1922-1925	11,493,830,823	163,962,011	87,791,843	14.27	7.64

YEAR	REVENUE TON MILES	FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES	AVERAGES PER 1000 REVENUE TON MILES	
				FREIGHT OPERATING EXPENSES	FREIGHT TRANSP. EXPENSES
(a)	(b)	(c)	(d)	(e)	(f)
1939	2,248,167,004	$ 20,478,844	$ 10,976,390	$ 9.11	$ 4.88
1938	1,941,727,367	20,116,440	10,324,831	10.36	5.32
1937	2,278,996,148	21,744,434	11,182,786	9.54	4.91
1936	2,257,601,824	22,926,780	11,678,140	10.16	5.17
1935	2,041,652,035	19,613,918	10,673,357	9.61	5.23
1934	1,976,103,728	18,702,025	10,327,257	9.46	5.23
1933	1,840,285,410	18,093,077	9,525,752	9.83	5.18
1932	1,812,073,717	18,918,706	9,997,869	10.44	5.52
1931	2,273,290,701	24,834,750	13,014,408	10.92	5.72
1930	2,666,890,844	30,815,928	15,437,020	11.56	5.79
1929	2,993,421,378	37,581,859	16,832,342	12.55	5.62
1928	2,893,844,169	36,404,720	17,459,919	12.58	6.03
1927	2,856,589,535	38,647,005	18,465,119	13.53	6.46
1926	3,037,191,609	38,513,842	19,692,065	12.68	6.48
1925	2,955,885,209	38,606,852	19,990,877	13.06	6.76
1924	2,744,213,671	38,078,829	20,203,040	13.88	7.36
1923	3,103,817,227	46,526,233	25,602,310	14.99	8.25
1922	2,689,914,716	40,750,097	21,995,616	15.15	8.18
TOTAL 1936-1939	8,726,492,343	85,266,498	44,162,147	9.77	5.06
TOTAL 1922-1925	11,493,830,823	163,962,011	87,791,843	14.27	7.64
PER CENT OF IMPROVEMENT 4 YEARS 1936 - 1939 COMPARED WITH 4 YEARS 1922 - 1925				31.5	33.8

SOURCE - Annual Reports to Interstate Commerce Commission

Defendant's Exhibit No. 87 (Witness Hammond)
Dec. 6, 1940

BOSTON AND MAINE

FREIGHT SERVICE OPERATING AVERAGES
CALENDAR YEARS 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 AND 1939

LINE NO. (a)	ITEM (b)	1922 (c)	1924 (d)	1926 (e)	1928 (f)	1930 (g)	1932 (h)	1934 (i)	1936 (j)	1938 (k)	1939 (l)	PERCENT INCREASE 1939 OVER 1922 (m)
1	Miles of line operated in freight service,.....	2,455.03	2,445.60	2,186.98	2,073.74	2,066.15	2,062.20	2,024.39	1,964.56	1,939.00	1,916.00	22.0 Dec.
2	Freight train miles,.....	6,546,675	6,223,611	5,836,074	4,977,742	4,206,221	3,098,480	3,142,554	3,308,843	2,962,016	3,253,681	50.3 Dec.
3	Freight cars per freight train,.....	31.3	34.3	38.4	45.1	49.7	48.2	50.3	50.1	49.2	51.1	63.3 Inc.
4	Net tons per freight train,.....	444	486	544	613	671	608	681	721	697	733	65.1 Inc.
5	Average tractive power per locomotive (pounds),.....	28,225	29,135	30,424	33,278	34,004	34,188	34,407	36,626	37,584	38,072	34.9 Inc.
6	Average capacity per freight carrying car (tons),.....	33.7	34.4	34.7	35.7	37.6	40.8	40.9	43.0	44.5	47.1	39.8 Inc.
7	Freight train speed (miles per hour)	10.2	10.6	10.6	11.8	12.4	13.6	13.8	13.2	13.6	13.8	35.3 Inc.
8	Gross ton-miles per freight train-hour,.....	11,100	12,575	14,159	18,534	21,993	23,021	25,259	25,070	25,536	27,186	144.9 Inc.
9	Net ton-miles per freight train-hour,.....	4,542	5,150	5,771	7,226	8,353	8,268	9,290	9,460	9,427	10,110	122.6 Inc.
10	Gross ton-miles (exclusive of locomotives and tenders) per ton of fuel,.....	10,016	11,178	12,439	14,525	15,926	15,944	16,067	16,228	17,319	17,552	75.2 Inc.

SOURCE: Items 1, 2, 3, 4, 7 and 8 - Reports of Freight Train Performance, Form OS-A, filed with Interstate Commerce Commission.

Item 5 - Total tractive effort ÷ total steam locomotives available for service at close of each year as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 6 - Aggregate capacity of all freight carrying cars ÷ total number of such cars available for service at close of year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 9 - Net ton miles ÷ train hours as reported on Form OS-A to Interstate Commerce Commission.

Item 10 - Gross ton miles (cars, contents and cabooses) ÷ equated net tons of fuel consumed as reported to Interstate Commerce Commission in years 1922 to 1934, inclusive, on Form OS-A and as reported in years 1936, 1938 and 1939 on Forms OS-A and OS-E respectively.

5408

Defendent's Exhibit No. 88 (Witness Hammond)
Dec. 10, 1940

BOSTON AND MAINE R.R.
REVENUE FREIGHT CARRIED DURING YEAR 1939

CLASS NO. (a)	COMMODITY GROUP OR CLASS (b)	REVENUE FREIGHT ORIGINATING ON RESPONDENT'S ROAD: TERMINATING ON LINE CARLOADS (c)	REVENUE FREIGHT ORIGINATING ON RESPONDENT'S ROAD: DELIVERED TO CONNECTING CARRIERS CARLOADS (d)	REVENUE FREIGHT RECEIVED FROM CONNECTING CARRIERS: TERMINATING ON LINE CARLOADS (e)	REVENUE FREIGHT RECEIVED FROM CONNECTING CARRIERS: DELIVERED TO CONNECTING CARRIERS CARLOADS (f)	TOTAL REVENUE FREIGHT CARRIED CARLOADS (g)
	Products of Agriculture					
110	Oranges & Grapefruit	11	110	3,640	184	3,885
111	Lemons, Limes and Citrus Fruits, N.O.S.	2	5	625	1	631
120	Apples, fresh	76	21	670	24	840
121	Bananas	991	485	1	9	1,564
122	Berries, fresh	-	4	85	3	92
123	Canteloupes and Melons, N.O.S.	1	-	175	5	181
124	Grapes, fresh	-	1	1,761	19	1,781
125	Peaches, fresh	-	-	225	2	230
126	Watermelons	-	-	253	32	284
127	Fruits, fresh, domestic N.O.S.	-	-	781	68	849
128	Fruits, fresh, tropical N.O.S.	-	-	40	3	43
130	Potatoes other than sweet	171	1	11,855	23,890	35,917
140	Cabbage	-	-	259	14	273
141	Onions	73	76	597	200	945
142	Tomatoes	2	1	69	5	77
143	Vegetables, fresh N.O.S.	5	3	1,431	106	1,565
	Total classes					

CLASS NO. (a)	COMMODITY GROUP OR CLASS (b)	REVENUE FREIGHT ORIGINATING ON RESPONDENT'S ROAD: TERMINATING ON LINE CARLOADS (c)	REVENUE FREIGHT ORIGINATING ON RESPONDENT'S ROAD: DELIVERED TO CONNECTING CARRIERS CARLOADS (d)	REVENUE FREIGHT RECEIVED FROM CONNECTING CARRIERS: TERMINATING ON LINE CARLOADS (e)	REVENUE FREIGHT RECEIVED FROM CONNECTING CARRIERS: DELIVERED TO CONNECTING CARRIERS CARLOADS (f)	TOTAL REVENUE FREIGHT CARRIED CARLOADS (g)
	Products of Agriculture					
110	Oranges & Grapefruit	11	110	3,640	124	3,885
111	Lemons, Limes and Citrus Fruits, N.O.S.	2	3	635	1	651
120	Apples, fresh	76	81	679	24	860
121	Bananas	891	685	1	9	1,584
122	Berries, fresh	-	4	85	3	92
125	Cantaloupes and Melons, N.O.S.	1	-	175	5	181
124	Grapes, fresh	-	1	1,761	19	1,781
125	Peaches, fresh	-	-	228	2	230
126	Watermelons	-	-	852	52	884
127	Fruits, fresh, domestic N.O.S.	-	-	781	88	869
128	Fruits, fresh, tropical N.O.S.	-	-	40	3	43
130	Potatoes other than sweet	171	1	11,855	25,890	38,917
140	Cabbage	-	-	259	14	273
141	Onions	73	75	597	200	945
142	Tomatoes	2	1	69	5	77
143	Vegetables, fresh N.O.S.	5	3	1,451	106	1,565
	Total classes 110 to 143, Inc.	1,832	962	22,478	24,525	49,197
	Total Products of Agriculture	1,925	2,049	84,085	43,588	113,567
	Grand Total, Carload Traffic	66,446	78,756	307,767	127,655	580,674

2011

101 CARS TO 125 CARS							126 CARS AND OVER							MAXIMUM CARS PER TRAIN
OF IS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	
	(v)	(w)	(x)	(y)	(z)	(aa)	(bb)	(cc)	(dd)	(ee)	(ff)	(gg)	(hh)	(ii)
	Mountain	-	19	95	114	3,245	-	-	-	-	-	-	-	116
	2-8-4	-	27	83	110	3,086	-	-	-	-	-	-	-	123
	2-10-2	-	9	103	112	3,257	-	-	-	-	-	-	-	118
	-	-	-	-	-	-	-	-	-	-	-	-	-	55
	2-10-2	-	28	74	102	3,166	-	-	-	-	-	-	-	102
	Mountain	13	86	8	107	4,699	-	-	-	-	-	-	-	109
	2-8-4	12	94	3	109	5,613	-	-	-	-	-	-	-	111
	2-10-2	-	120	2	122	6,452	-	-	-	-	-	-	-	122
	-	-	-	-	-	-	-	-	-	-	-	-	-	89
	Mountain	8	98	1	107	4,206	-	-	-	-	-	-	-	107
	2-8-4	10	95	8	113	4,638	-	-	-	-	-	-	-	113
	-	-	-	-	-	-	-	-	-	-	-	-	-	85
	-	-	-	-	-	-	-	-	-	-	-	-	-	73
	-	-	-	-	-	-	-	-	-	-	-	-	-	74
	Mountain	-	107	1	108	6,420	-	-	-	-	-	-	-	108
	2-8-4	-	104	1	105	6,344	1	2-8-4	-	125	2	127	6,544	127
	2-10-2	1	112	1	114	6,420	-	-	-	-	-	-	-	119
	2-8-4	-	12	97	109	2,956	-	-	-	-	-	-	-	113
	2-10-2	-	15	95	110	3,131	-	-	-	-	-	-	-	124
	-	-	-	-	-	-	-	-	-	-	-	-	-	26
	-	-	-	-	-	-	-	-	-	-	-	-	-	86
	-	-	-	-	-	-	-	-	-	-	-	-	-	99
	-	-	-	-	-	-	-	-	-	-	-	-	-	98
	Mountain	3	47	56	106	3,724	-	-	-	-	-	-	-	113
	-	-	-	-	-	-	-	-	-	-	-	-	-	94
	-	-	-	-	-	-	-	-	-	-	-	-	-	92
	-	-	-	-	-	-	-	-	-	-	-	-	-	92
	Mountain	3	83	17	103	4,036	-	-	-	-	-	-	-	110
	2-8-4	3	68	40	111	4,115	-	-	-	-	-	-	-	112
	2-10-2	1	71	37	109	4,670	-	-	-	-	-	-	-	114
	-	-	-	-	-	-	-	-	-	-	-	-	-	42
	-	-	-	-	-	-	-	-	-	-	-	-	-	73
	Mountain	38	53	17	108	4,320	-	-	-	-	-	-	-	113
	2-8-4	2	64	40	106	3,209	-	-	-	-	-	-	-	106
	2-10-2	-	23	79	102	2,791	-	-	-	-	-	-	-	103
	2-8-4	11	73	28	112	4,613	-	-	-	-	-	-	-	114
	2-10-2	4	78	26	108	4,228	-	-	-	-	-	-	-	111
	-	-	-	-	-	-	-	-	-	-	-	-	-	79
	2-8-4	12	94	3	109	4,355	3	2-8-4	1	31	101	133	3,594	137
	2-10-2	3	77	45	125	4,329	3	2-10-2	-	34	95	129	3,585	131
	-	-	-	-	-	-	-	-	-	-	-	-	-	90
	-	-	-	-	-	-	-	-	-	-	-	-	-	81
	-	-	-	-	-	-	-	-	-	-	-	-	-	74
	-	-	-	-	-	-	-	-	-	-	-	-	-	70
	-	-	-	-	-	-	-	-	-	-	-	-	-	90
	-	-	-	-	-	-	-	-	-	-	-	-	-	68
	-	-	-	-	-	-	-	-	-	-	-	-	-	61
	-	-	-	-	-	-	-	-	-	-	-	-	-	99
	-	-	-	-	-	-	-	-	-	-	-	-	-	86
	-	-	-	-	-	-	-	-	-	-	-	-	-	69
	2-8-4	-	51	50	101	3,260	-	-	-	-	-	-	-	101
	2-10-2													

Map No.	TO	Distance (Miles)	Ten Day Period Studied Sept. 1939	Ruling Grade	70 Cars or Less: No. of Trains	Type of Locomotive	Average Consist A	B	C	D	Tons	71 Cars to 100 Cars: No. of Trains	Type of Locomotive	Average Consist A	B	C	D	Tons	101 Cars to 125 Cars: No. of Trains	Type of Locomotive	Average Consist A	B	C	D	Tons	No. of Trains	Type of Locomotive
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(bb)	(cc)
1	Boston, Mass.	Mechanicville, N.Y.	187	17th-26th	1.23	12	Mountain	-	41	19	60	1,923	9	Mountain	1	35	39	75	2,311	2	Mountain	-	19	95	114	3,245	-	
2	Boston, Mass.	Mechanicville, N.Y.	187	17th-26th	1.23	1	2-8-4	1	11	51	63	1,800	8	2-8-4	-	19	61	80	2,426	5	2-8-4	-	27	83	110	3,086	-	
3	Boston, Mass.	Mechanicville, N.Y.	187	17th-26th	1.23	-	-	-	-	-	-	-	2	2-10-2	4	40	41	85	3,178	2	2-10-2	-	9	103	112	3,257	-	
4	Boston, Mass.	Troy, N.Y.	190	17th-26th	1.23	1	2-8-4	-	18	37	55	1,612	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	Boston, Mass.	Troy, N.Y.	190	17th-26th	1.23	1	2-10-2	1	15	36	52	1,510	5	2-10-2	-	24	68	92	2,805	1	2-10-2	-	28	74	102	3,166	-	
6	Mechanicville, N.Y.	Boston, Mass.	188	17th-26th	1.17	-	-	-	-	-	-	-	18	Mountain	24	58	1	83	4,050	5	Mountain	13	86	8	107	4,699	-	
7	Mechanicville, N.Y.	Boston, Mass.	188	17th-26th	1.17	-	-	-	-	-	-	-	16	2-8-4	23	58	2	83	3,994	2	2-8-4	12	94	3	109	5,613	-	
8	Mechanicville, N.Y.	Boston, Mass.	188	17th-26th	1.17	-	-	-	-	-	-	-	13	2-10-2	7	74	1	82	4,124	2	2-10-2	-	120	2	122	6,452	-	
9	Mechanicville, N.Y.	Rigby, Maine	271	17th-26th	1.17	-	-	-	-	-	-	-	10	Mountain	12	67	5	84	3,711	-	-	-	-	-	-	-	-	
10	Mechanicville, N.Y.	Lawrence, Mass.	183	17th-26th	1.17	-	-	-	-	-	-	-	1	Mountain	5	80	1	86	3,481	1	Mountain	8	98	1	107	4,206	-	
11	Mechanicville, N.Y.	Lawrence, Mass.	183	17th-26th	1.17	-	-	-	-	-	-	-	4	2-8-4	26	69	1	86	3,902	1	2-8-4	10	95	8	113	4,638	-	
12	Mechanicville, N.Y.	Lawrence, Mass.	183	17th-26th	1.17	-	-	-	-	-	-	-	2	2-10-2	9	75	1	85	3,480	-	-	-	-	-	-	-	-	
13	Mechanicville, N.Y.	Worcester, Mass.	150	17th-26th	1.17	2	2-8-4	3	63	1	67	3,871	1	2-8-4	1	70	2	73	3,859	-	-	-	-	-	-	-	-	
14	Mechanicville, N.Y.	Worcester, Mass.	150	17th-26th	1.17	4	2-10-2	5	60	1	66	3,910	2	2-10-2	5	66	3	74	3,948	-	-	-	-	-	-	-	-	
15	Mechanicville, N.Y.	E.Deerfield, Mass.	85	17th-26th	.64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	Mountain	-	107	1	108	6,420	-	
16	Mechanicville, N.Y.	E.Deerfield, Mass.	85	17th-26th	.64	1	2-8-4	-	69	1	70	4,329	3	2-8-4	-	59	2	81	4,956	2	2-8-4	-	104	1	105	6,344	1	2-8-
17	Mechanicville, N.Y.	E.Deerfield, Mass.	85	17th-26th	.64	-	-	-	-	-	-	-	1	2-10-2	-	68	4	72	4,306	2	2-10-2	1	112	1	114	6,420	-	
18	E.Deerfield, Mass.	Mechanicville, N.Y.	85	17th-26th	1.00	5	2-8-4	-	30	32	62	2,087	2	2-8-4	-	6	77	83	4,165	2	2-8-4	-	12	97	109	2,956	-	
19	E.Deerfield, Mass.	Mechanicville, N.Y.	85	17th-26th	1.00	5	2-10-2	-	18	43	61	3,977	3	2-10-2	-	20	54	74	2,287	5	2-10-2	-	15	95	110	3,131	-	
20	E.Deerfield, Mass.	Troy, N.Y.	86	17th-26th	1.00	2	2-8-0	1	13	7	21	785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
21	E.Deerfield, Mass.	White River Jct. Vt.	88	17th-26th	.85	-	-	-	-	-	-	-	1	2-10-2	-	54	32	86	3,346	-	-	-	-	-	-	-	-	
22	E.Deerfield, Mass.	Boston, Mass.	103	17th-26th	1.17	-	-	-	-	-	-	-	1	2-8-4	2	69	28	99	4,016	-	-	-	-	-	-	-	-	
23	E.Deerfield, Mass.	Boston, Mass.	103	17th-26th	1.17	-	-	-	-	-	-	-	1	2-10-2	-	54	34	98	4,092	-	-	-	-	-	-	-	-	
24	Rigby, Maine	Mechanicville, N.Y.	270	17th-26th	1.23	-	-	-	-	-	-	-	5	Mountain	3	52	30	85	3,239	5	Mountain	3	47	56	106	3,724	-	
25	Lawrence, Mass.	Mechanicville, N.Y.	182	17th-26th	1.23	-	-	-	-	-	-	-	2	Mountain	-	56	33	89	2,453	-	-	-	-	-	-	-	-	
26	Lawrence, Mass.	Mechanicville, N.Y.	182	17th-26th	1.23	3	2-8-4	-	49	7	56	1,532	2	2-8-4	-	64	23	87	2,566	-	-	-	-	-	-	-	-	
27	Lawrence, Mass.	Mechanicville, N.Y.	182	17th-26th	1.23	-	-	-	-	-	-	-	1	2-10-2	-	67	25	92	2,560	-	-	-	-	-	-	-	-	
28	Boston, Mass.	Rigby, Maine	111	17th-26th	.79	-	-	-	-	-	-	-	4	Mountain	2	70	21	93	3,462	6	Mountain	3	83	17	103	4,036	-	
29	Boston, Mass.	Rigby, Maine	111	17th-26th	.79	-	-	-	-	-	-	-	4	2-8-4	1	75	18	94	3,657	2	2-8-4	3	68	40	111	4,115	-	
30	Boston, Mass.	Rigby, Maine	111	17th-26th	.79	-	-	-	-	-	-	-	2	2-10-2	-	55	37	92	4,102	2	2-10-2	1	71	37	109	4,670	-	
31	Boston, Mass.	Worcester, Mass.	64	17th-26th	1.00	1	2-8-4	1	36	5	42	2,420	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
32	Boston, Mass.	Worcester, Mass.	64	17th-26th	1.00	8	2-10-2	1	25	14	40	1,436	1	2-10-2	-	39	33	72	2,679	-	-	-	-	-	-	-	-	
33	Rigby, Maine	Boston, Mass.	108	17th-26th	.85	4	Mountain	18	31	19	68	2,486	3	Mountain	16	59	18	93	3,025	2	Mountain	38	53	17	108	4,320	-	
34	Rigby, Maine	Boston, Mass.	108	17th-26th	.85	2	2-8-4	12	37	19	68	2,365	3	2-8-4	23	42	27	92	3,311	1	2-8-4	2	64	40	106	3,209	-	
35	Rigby, Maine	Boston, Mass.	108	17th-26th	.85	-	-	-	-	-	-	-	1	2-10-2	-	33	47	80	2,186	2	2-10-2	-	23	79	102	2,791	-	
36	Rigby, Maine	Worcester, Mass.	141	17th-26th	1.00	2	2-8-4	3	37	18	58	2,185	2	2-8-4	5	63	15	83	3,167	2	2-8-4	11	73	28	112	4,613	-	
37	Rigby, Maine	Worcester, Mass.	141	17th-26th	1.00	2	2-10-2	8	41	8	57	2,376	-	-	-	-	-	-	-	2	2-10-2	4	78	26	108	4,228	-	
38	Rigby, Maine	Worcester, Mass.	141	17th-26th	1.00	4	4-6-2	-	47	3	50	1,699	3	4-6-2	-	75	2	77	2,851	-	-	-	-	-	-	-	-	
39	Worcester, Mass.	Rigby, Maine	144	17th-26th	.87	-	-	-	-	-	-	-	2	2-8-4	4	56	30	90	2,795	1	2-8-4	12	94	3	109	4,355	3	2-8-
40	Worcester, Mass.	Rigby, Maine	144	17th-26th	.87	-	-	-	-	-	-	-	2	2-10-2	5	52	28	85	2,500	1	2-10-2	3	77	45	125	4,329	3	2-10
41	Worcester, Mass.	Rigby, Maine	144	17th-26th	.87	1	4-6-2	9	51	2	62	2,796	5	4-6-2	9	56	14	79	2,762	-	-	-	-	-	-	-	-	
42	Worcester, Mass.	Lawrence, Mass.	60	17th-26th	.87	-	-	-	-	-	-	-	1	2-8-0	2	52	27	81	2,462	-	-	-	-	-	-	-	-	
43	Worcester, Mass.	Boston, Mass.	64	17th-26th	.87	1	2-8-4	9	52	2	63	2,467	1	2-8-4	1	70	3	74	3,081	-	-	-	-	-	-	-	-	
44	Worcester, Mass.	Boston, Mass.	64	17th-26th	.87	7	2-10-2	4	52	3	59	2,368	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
45	Worcester, Mass.	Mechanicville, N.Y.	148	17th-26th	1.30	2	Mountain	1	62	1	64	2,190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
46	Worcester, Mass.	Mechanicville, N.Y.	148	17th-26th	1.30	5	2-8-4	-	56	5	61	1,959	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
47	Worcester, Mass.	Mechanicville, N.Y.	148	17th-26th	1.30	1	2-10-2	-	60	1	61	2,268	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
48	Mechanicville, N.Y.	Springfield, Mass.	106	17th-26th	.64	-	-	-	-	-	-	-	2	2-10-2	9	78	2	89	4,349	-	-	-	-	-	-	-	-	
49	Troy, N.Y.	E.Deerfield, Mass.	86	17th-26th	.81	9	2-8-0	1	33	15	49	2,147	1	2-8-0	4	79	12	86	3,900	-	-	-	-	-	-	-	-	
50	Springfield, Mass.	Mechanicville, N.Y.	106	17th-26th	1.00	1	2-10-2	-	24	45	69	2,310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
51	White River Jct. Vt.	Springfield, Mass.	123	17th-26th	.76	1	2-8-4	1	55	11	67	3,141	6	2-8-4	-	74	12	86	3,778	1	2-8-4	-	51	50	101	3,260	-	
52	White River Jct. Vt.	Springfield, Mass.	123	17th-26th	.76	4	2-10-2	-	40	18	58	2,114	6	2-10-2	-	64	18	82	3,942	1	2-10-2	4	93	15	112	4,311	-	
53	Springfield, Mass.	White River Jct. Vt.	123	17th-26th	.85	2	2-8-4	2	44	11	57	2,646	5	2-8-4	1	68	16	85	2,937	1	2-8-4	6	80	15	101	3,313	-	
54	Springfield, Mass.	White River Jct. Vt.	122	17th-26th	.85	2	2-10-2	5	55	8	68	2,759	9	2-10-2	1	51	31	83	2,920	-	-	-	-	-	-	-	-	
55	Springfield, Mass.	White River Jct. Vt.	123	17th-26th	.85	1	2-8-0	2	37	22	61	2,199	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
56	Springfield, Mass.	E.Deerfield, Mass.	36	17th-26th	.57	1	2-10-2	-	4	31	35	974	1	2-10-2	-	3	78	81	1,970	-	-	-	-	-	-	-	-	
57	Springfield, Mass.	E.Deerfield, Mass.	36	17th-26th	.57	2	2-8-0	-	8	61	69	1,851	3	2-8-0	-	3	80	83	1,927	-	-	-	-	-	-	-	-	
58	E.Deerfield, Mass.	Springfield, Mass.	36	17th-26th	.35	4	2-8-0	3	56	5	64	2,419	2	2-8-0	2	72	4	78	3,304	-	-	-	-	-	-	-	-	
59	TOTAL TRAINS	354					103					182								62								
60	PER CENT. OF ALL TRAINS	100.0					29.1					51.4								17.5								
61	AVERAGE CARS PER TRAIN	81					57					82								109								

Map No.	Locomotive	A	B	C	D	Tons	Trains	Locomotive	A	B	C	D	Tons	Trains
(v)	(w)	(x)	(y)	(z)	(aa)	(bb)	(cc)	(dd)	(ee)	(ff)	(gg)	(hh)	(ii)
	Mountain	-	19	95	114	3,245	-	-	-	-	-	-	-	116
	2-8-4	-	27	83	110	3,086	-	-	-	-	-	-	-	123
	2-10-2	-	9	103	112	3,257	-	-	-	-	-	-	-	138
	-	-	-	-	-	-	-	-	-	-	-	-	-	35
	2-10-2	-	28	74	102	3,166	-	-	-	-	-	-	-	102
	Mountain	13	86	8	107	4,699	-	-	-	-	-	-	-	109
	2-8-4	12	94	3	109	5,613	-	-	-	-	-	-	-	111
	2-10-2	-	120	2	122	6,452	-	-	-	-	-	-	-	122
	-	-	-	-	-	-	-	-	-	-	-	-	-	89
	Mountain	8	98	1	107	4,206	-	-	-	-	-	-	-	107
	2-8-4	10	95	8	113	4,638	-	-	-	-	-	-	-	113
	-	-	-	-	-	-	-	-	-	-	-	-	-	85
	-	-	-	-	-	-	-	-	-	-	-	-	-	73
	-	-	-	-	-	-	-	-	-	-	-	-	-	74
	Mountain	-	107	1	108	6,420	-	-	-	-	-	-	-	108
	2-8-4	-	104	1	105	6,344	1	2-8-4	-	125	2	127	6,502	127
	2-10-2	1	112	1	114	6,420	-	-	-	-	-	-	-	119
	2-8-4	-	12	97	109	2,956	-	-	-	-	-	-	-	113
	2-10-2	-	15	95	110	3,131	-	-	-	-	-	-	-	124
	-	-	-	-	-	-	-	-	-	-	-	-	-	26
	-	-	-	-	-	-	-	-	-	-	-	-	-	86
	-	-	-	-	-	-	-	-	-	-	-	-	-	99
	-	-	-	-	-	-	-	-	-	-	-	-	-	98
	Mountain	3	47	56	106	3,724	-	-	-	-	-	-	-	113
	-	-	-	-	-	-	-	-	-	-	-	-	-	94
	-	-	-	-	-	-	-	-	-	-	-	-	-	92
	-	-	-	-	-	-	-	-	-	-	-	-	-	92
	Mountain	3	83	17	103	4,036	-	-	-	-	-	-	-	110
	2-8-4	3	68	40	111	4,115	-	-	-	-	-	-	-	112
	2-10-2	1	71	37	109	4,670	-	-	-	-	-	-	-	114
	-	-	-	-	-	-	-	-	-	-	-	-	-	42
	-	-	-	-	-	-	-	-	-	-	-	-	-	72
	Mountain	38	53	17	108	4,320	-	-	-	-	-	-	-	113
	2-8-4	2	64	40	106	3,209	-	-	-	-	-	-	-	106
	2-10-2	-	23	79	102	2,791	-	-	-	-	-	-	-	103
	2-8-4	11	73	28	112	4,613	-	-	-	-	-	-	-	114
	2-10-2	4	78	26	108	4,228	-	-	-	-	-	-	-	111
	-	-	-	-	-	-	-	-	-	-	-	-	-	79
	2-8-4	12	94	3	109	4,355	3	2-8-4	1	31	101	133	3,594	137
	2-10-2	3	77	45	125	4,329	3	2-10-2	-	34	95	129	3,585	131
	-	-	-	-	-	-	-	-	-	-	-	-	-	90
	-	-	-	-	-	-	-	-	-	-	-	-	-	81
	-	-	-	-	-	-	-	-	-	-	-	-	-	74
	-	-	-	-	-	-	-	-	-	-	-	-	-	70
	-	-	-	-	-	-	-	-	-	-	-	-	-	90
	-	-	-	-	-	-	-	-	-	-	-	-	-	68
	-	-	-	-	-	-	-	-	-	-	-	-	-	61
	-	-	-	-	-	-	-	-	-	-	-	-	-	99
	-	-	-	-	-	-	-	-	-	-	-	-	-	86
	-	-	-	-	-	-	-	-	-	-	-	-	-	69
	2-8-4	-	51	50	101	3,260	-	-	-	-	-	-	-	101
	2-10-2	4	93	16	112	4,311	-	-	-	-	-	-	-	112
	2-8-4	6	80	15	101	3,313	-	-	-	-	-	-	-	101
	-	-	-	-	-	-	-	-	-	-	-	-	-	93
	-	-	-	-	-	-	-	-	-	-	-	-	-	61
	-	-	-	-	-	-	-	-	-	-	-	-	-	81
	-	-	-	-	-	-	-	-	-	-	-	-	-	93
	-	-	-	-	-	-	-	-	-	-	-	-	-	83
		62							7					
		17.5							2.0					
		109							131					

Defendant's Exhibit No. 90 (Witness Hammond)
Dec. 10, 1940

BOSTON AND MAINE RAILROAD

MAXIMUM NUMBER OF CARS HANDLED
IN PORTLAND AND FITCHBURG DIVISION PASSENGER TRAINS
SEPTEMBER 17TH TO 20TH, INCLUSIVE, 1939

ROUTE AND TRAIN NAME (c)	MILES (d)	NUMBER OF CARS: 5 CARS OR LESS (e)	6 (f)	7 (g)	8 (h)	9 (i)	10 (j)	11 (k)	12 (l)	13 (m)	14 (n)	15 (o)	16 (p)	17 AND OVER (q)	TOTAL (r)
BOSTON-PORTLAND (EAST)															
-	115	-	-	-	2	-	-	-	-	-	-	-	-	-	2
-	115	-	-	-	5	2	1	-	-	-	-	-	-	-	8
-	115	2	-	2	4	-	-	-	-	-	-	-	-	-	8
-	115	-	1	-	-	1	-	-	-	-	-	-	-	-	2
Ranger Limited	111	1	6	1	-	-	-	-	-	-	-	-	-	-	8
-	115	1	3	2	2	1	1	-	-	-	-	-	-	-	10
Pine Tree Limited	111	3	3	1	1	-	-	-	-	-	-	-	-	-	8
-	115	1	-	7	-	-	-	-	-	-	-	-	-	-	8
-	115	2	-	-	-	-	-	-	-	-	-	-	-	-	2
Owl	115	-	-	-	-	-	-	-	-	-	5	4	-	-	9
-	115	-	-	1	2	4	3	-	-	-	-	-	-	-	10
TOTAL		10	13	14	16	8	4	1	-	-	5	4	-	-	75
PORTLAND-BOSTON (WEST)															
Owl	111	-	-	-	-	-	-	-	-	4	3	1	-	-	8
-	115	5	3	-	-	-	-	-	-	-	-	-	-	-	8
-	115	2	-	-	-	-	-	-	-	-	-	-	-	-	2
Pine Tree Limited	115	2	-	-	3	4	-	-	1	-	-	-	-	-	10
-	115	2	-	-	-	-	-	-	-	-	-	-	-	-	2
-	115	7	1	-	-	-	-	-	-	-	-	-	-	-	8
Ranger Limited	111	-	1	-	2	-	5	-	-	-	-	-	-	-	8
-	115	-	-	-	-	-	-	-	1	-	1	-	-	-	2
-	111	-	-	-	1	1	4	1	1	-	-	-	-	-	8
-	115	-	-	5	2	1	1	-	-	-	-	-	-	-	10
-	115	8	-	-	1	-	-	-	-	-	-	-	-	-	9
TOTAL		26	6	5	9	6	10	1	3	4	4	1	-	-	75
BOSTON-TROY (WEST)															
-	190	-	-	-	1	1	6	-	-	-	-	-	-	-	8
-	190	-	-	2	-	-	-	-	-	-	-	-	-	-	2
-	190	8	-	-	-	-	-	-	-	-	-	-	-	-	8
-	190	2	-	-	-	-	-	-	-	-	-	-	-	-	2
-	190	7	-	-	1	-	-	-	-	-	-	-	-	-	8
Minute Man	190	2	-	1	4	2	-	1	-	-	-	-	-	-	10
-	190	-	-	-	-	-	-	-	-	-	-	-	-	8	8
-	190	-	1	-	1	-	-	-	-	-	-	-	-	-	2
TOTAL		19	1	3	7	3	6	1	-	-	-	-	-	8	48
TROY-BOSTON (EAST)															
-	191	-	-	-	4	2	1	1	-	-	-	-	-	-	8
-	191	4	1	1	2	-	-	-	-	-	-	-	-	-	8
-	191	-	-	-	-	-	1	3	1	2	-	-	-	-	8
-	191	-	-	-	-	-	-	-	-	-	1	3	1	3	8
Minute Man	191	1	4	5	-	-	-	-	-	-	-	-	-	-	10
-	191	-	-	1	-	1	-	-	-	-	-	-	-	-	2
-	191	2	-	-	-	-	-	-	-	-	-	-	-	-	2
-	191	-	-	-	-	-	-	-	-	-	-	2	-	-	2
TOTAL		7	5	7	6	3	2	4	3	1	1	5	1	3	48

SLIDE NO. (a)	TRAIN NO. (b)	ROUTE AND TRAIN NAME (c)	MILES (d)	NUMBER OF CARS: 5 CARS OR LESS (e)	6 (f)	7 (g)	8 (h)	9 (i)	10 (j)	11 (k)	12 (l)	13 (m)	14 (n)	15 (o)	16 (p)	17 AND OVER (q)	TOTAL (r)
		SPRINGFIELD-WHITE RIVER JCT. (NORTH)															
43	733	Montrealer	123	-	7	1	1	1	-	-	-	-	-	-	-	-	10
44	703	-	123	-	-	-	1	5	1	1	-	-	-	-	-	-	8
45	73	-	123	-	-	3	3	-	2	-	-	-	-	-	-	-	8
46	77	Dartmouth	123	8	-	-	-	-	-	-	-	-	-	-	-	-	8
47	717	-	123	4	1	3	-	-	-	-	-	-	-	-	-	-	8
48	79	Connecticut Yankee	123	-	-	-	-	1	-	3	1	1	-	-	-	-	6
49	7051	-	123	-	1	-	-	1	-	-	1	-	-	-	-	-	2
50	7055	-	123	2	-	-	-	-	-	-	-	-	-	-	-	-	2
51	7059	-	123	-	-	-	-	-	1	-	-	1	-	-	-	-	2
52		TOTAL		14	9	7	5	8	4	4	1	2	-	-	-	-	54
		WHITE RIVER JCT.-SPRINGFIELD (SOUTH)															
53	732	Washingtonian	123	-	7	1	1	1	-	-	-	-	-	-	-	-	10
54	78	-	123	-	-	-	-	-	2	1	1	1	1	-	-	-	6
55	712	-	123	4	1	1	1	-	-	-	-	-	-	-	-	-	8
56	72	Dartmouth	123	-	-	5	3	-	-	-	-	-	-	-	-	-	8
57	728	-	123	-	-	-	-	2	4	2	-	-	-	-	-	-	8
58	74	Connecticut Yankee	123	6	2	2	-	-	-	-	-	-	-	-	-	-	10
59	7052	-	123	-	-	-	-	-	2	-	-	-	-	-	-	-	2
60	7060	-	123	1	1	-	-	-	-	-	-	-	-	-	-	-	2
61	2nd-7060	-	123	-	-	-	1	-	1	-	-	-	-	-	-	-	2
62		TOTAL		11	11	9	6	4	9	3	1	1	1	-	-	-	56
		WORCESTER TO PORTLAND															
		CROSS COUNTRY (EAST)															
63	85	Bar Harbor Express	148	-	-	-	-	1	-	1	-	-	-	-	-	-	2
64	81	State of Maine Express	148	-	-	-	1	2	-	4	1	1	-	1	-	-	10
65		TOTAL		-	-	-	1	3	-	5	1	1	-	1	-	-	12
		PORTLAND TO WORCESTER															
		CROSS COUNTRY (WEST)															
66	82	State of Maine Express	148	-	-	-	-	-	1	1	2	2	3	-	-	1	10
67	84	Bar Harbor Express	144	-	-	-	-	-	1	1	-	1	-	-	-	-	3
68	2nd84	Bar Harbor Express	144	-	-	-	1	-	-	-	-	-	-	-	-	-	1
69	86	Downeaster	144	-	-	1	-	-	-	-	-	-	-	-	-	-	1
70		TOTAL		-	-	1	-	1	2	2	2	3	3	-	-	1	15

RECAPITULATION

	TOTAL TRAINS	OVER 14	PERCENT. OF TOTAL
Boston-Portland	150	5	3.3
Boston-Troy	96	17	17.7
Springfield-White River Jct.	110	-	-
Worcester-Portland	27	2	7.4
TOTAL	383	24	6.3

5408

Defendant's Exhibit No. 91 (Witness Warfel)
Dec. 10, 1940

EXPLANATION OF SYMBOLS USED BELOW
UNDER HEADING "AVERAGE CONSIST"

A - Perishable loads
B - Other Loads
C - Empty cars and includes caboose
D - Total all cars

UNION PACIFIC RAILROAD COMPANY

TYPICAL EXAMPLES OF FREIGHT TRAINS HANDLED
BETWEEN CERTAIN TERMINALS, AUGUST 10TH - 19TH INCLUSIVE 1940

NAME OF RAILROAD	FROM	TO	DISTANCE (MILES)	TEN DAY PERIOD STUDIED (Mo. & Yr.)	RULING GRADE	70 CARS OR LESS							71 CARS TO 100 CARS							101 CARS TO 125 CARS						
						NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST					NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST					NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSI				
								A	B	C	D	TONS			A	B	C	D	TONS			A	B	C	D
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)
Union Pacific	Council Bluffs, Ia.	Grand Island, Neb.	147	Aug. 1940	.6	-	-	-	-	-	-	-	1	Northern	2	60	10	72	1,388	-	-	-	-	-	-
	Council Bluffs, Ia.	Grand Island, Neb.	147	Aug. 1940	.6	44	Santa Fe	4	45	7	56	2,108	8	Santa Fe	5	51	22	78	3,031	34	Santa Fe	0	3	115	118
	Council Bluffs, Ia.	Grand Island, Neb.	147	Aug. 1940	.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	Mountain	3	11	96	110
	Grand Island, Neb.	Council Bluffs, Ia.	147	Aug. 1940	.6	3	Union Pac.	5	40	10	55	1,965	2	Union Pac.	7	65	6	78	3,906	-	-	-	-	-	-
					.5	-	-	-	-	-	-	-	1	Northern	37	28	13	78	3,416	-	-	-	-	-	-
	Grand Island, Neb.	Council Bluffs, Ia.	147	Aug. 1940	.5	1	Pacific	22	9	8	39	1,461	-	-	-	-	-	-	-	-	-	-	-	-	-
	Grand Island, Neb.	Council Bluffs, Ia.	147	Aug. 1940	.5	33	Santa Fe	12	39	3	54	1,964	33	Santa Fe	37	45	6	88	3,874	24	Santa Fe	64	35	10	109
	Grand Island, Neb.	Council Bluffs, Ia.	147	Aug. 1940	.5	1	Mountain	24	25	17	66	2,423	3	Mountain	21	54	7	82	2,919	-	-	-	-	-	-
	Grand Island, Neb.	North Platte, Neb.	137	Aug. 1940	.6	-	-	-	-	-	-	-	3	Union Pac.	29	38	12	79	3,281	1	Union Pac.	39	54	21	114
					.35	-	-	-	-	-	-	-	1	Northern	2	60	14	76	1,790	-	-	-	-	-	-
	Grand Island, Neb.	North Platte, Neb.	137	Aug. 1940	.35	46	Santa Fe	5	43	7	55	2,011	12	Santa Fe	4	35	46	85	2,888	24	Santa Fe	0	3	117	120
	North Platte, Neb.	Grand Island, Neb.	137	Aug. 1940	.35	3	Union Pac.	2	45	7	54	1,877	1	Union Pac.	6	70	6	82	3,138	-	-	-	-	-	-
	North Platte, Neb.	Grand Island, Neb.	137	Aug. 1940	.12	-	-	-	-	-	-	-	1	Northern	31	63	1	95	4,221	-	-	-	-	-	-
	North Platte, Neb.	Grand Island, Neb.	137	Aug. 1940	.12	32	Santa Fe	9	41	3	53	1,973	42	Santa Fe	46	38	7	91	4,167	18	Santa Fe	52	44	12	108
					.12	1	Mountain	12	38	3	53	2,724	2	Mountain	31	46	5	82	3,709	-	-	-	-	-	-
	North Platte, Neb.	Grand Island, Neb.	137	Aug. 1940	.12	3	Union Pac.	6	34	5	45	1,548	1	Union Pac.	13	70	6	89	3,800	-	-	-	-	-	-
	Hastings, Neb.	North Platte, Neb.	137	Aug. 1940	.5	7	Santa Fe	2	33	19	54	1,737	13	Santa Fe	0	3	85	88	2,141	9	Santa Fe	0	1	105	106
	Hastings, Neb.	North Platte, Neb.	137	Aug. 1940	.5	8	Union Pac.	2	55	6	63	2,587	7	Union Pac.	1	48	28	77	2,391	-	-	-	-	-	-
	North Platte, Neb.	Hastings, Neb.	137	Aug. 1940	.6	14	Santa Fe	25	31	6	62	3,007	15	Santa Fe	58	20	4	82	3,661	1	Santa Fe	74	28	2	104
	North Platte, Neb.	Hastings, Neb.	137	Aug. 1940	.6	6	Union Pac.	28	28	6	62	2,743	8	Union Pac.	63	32	5	84	3,683	1	Union Pac.	53	43	7	103
	TOTAL TRAINS		488			202	Trains 70 cars or less						184	Trains 71 cars to 100 cars						113	Trains 101 cars to 125 cars					
	PER CENT OF ALL TRAINS		100			41.4							31.6							23.2					
	AVERAGE CARS PER TRAIN		82			56							86							114					

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INCLUSIVE 1940

100 CARS AVERAGE CONSIST				101 CARS TO 125 CARS										126 CARS AND OVER							MAXIMUM CARS PER TRAIN
B	C	D	TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	
(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(bb)	(cc)	(dd)	(ee)	(ff)	(gg)	(hh)	(ii)
60	10	72	1,368	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
51	22	78	3,031	34	Santa Fe	0	3	115	118	2,850	4	Santa Fe	2	8	119	129	2,903	72
-	-	-	-	1	Mountain	3	11	96	110	2,339	-	-	-	-	-	-	-	132
65	6	78	3,006	-	-	-	-	-	-	-	-	-	-	-	-	-	-	110
28	13	78	3,416	-	-	-	-	-	-	-	-	-	-	-	-	-	-	79
													-	-	-	-	-	78
-	-	-	-	-	-	-	-	-	-	-	-	-						
45	6	88	3,874	24	Santa Fe	64	35	10	109	4,782	-	-	-	-	-	-	-	39
54	7	82	2,919	-	-	-	-	-	-	-	-	-	-	-	-	-	-	118
38	12	79	3,281	1	Union Pac.	39	54	21	114	4,605	-	-	-	-	-	-	-	91
60	14	76	1,790	-	-	-	-	-	-	-	-	-	-	-	-	-	-	114
													-	-	-	-	-	76
35	46	85	2,888	24	Santa Fe	0	3	117	120	2,974	15	Santa Fe	0	5	126	131	3,091	144
70	6	82	3,136	-	-	-	-	-	-	-	-	-	-	-	-	-	-	82
63	1	95	4,221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95
38	7	91	4,167	18	Santa Fe	52	44	12	108	5,331	-	-	-	-	-	-	-	119
46	5	82	3,709	-	-	-	-	-	-	-	-	-	-	-	-	-	-	86
70	6	85	3,800	-	-	-	-	-	-	-	-	-	-	-	-	-	-	89
3	85	88	2,141	9	Santa Fe	0	1	105	106	2,618	1	Santa Fe	1	0	125	126	2,952	126
48	28	77	2,391	-	-	-	-	-	-	-	1	Union Pac.	0	0	135	135	3,325	135
20	4	82	3,661	1	Santa Fe	74	28	2	104	4,671	-	-	-	-	-	-	-	104
32	5	84	3,683	1	Union Pac.	53	43	7	103	3,356	-	-	-	-	-	-	-	103
100 cars				113	Trains 101 cars to 125 cars						19	Trains 126 cars and over						
				23.2							3.8							
				114							131							

Defendant's Exhibit No. 92 (Witness Warfel)
Dec. 10, 1940

UNION PACIFIC RAILROAD COMPANY

MAXIMUM NUMBER OF CARS HANDLED NOVEMBER, 1939
JANUARY, APRIL & JULY, 1940, IN THROUGH MAIN LINE PASSENGER TRAINS

LINE NO. (a)	TRAIN NO. (b)	ROUTE AND TRAIN NAME (c)	MILES (d)	NUMBER OF CARS 5 (e)	6 (f)	7 (g)	8 (h)	9 (i)	10 (j)	11 (k)	12 (l)	13 (m)	14 (n)	15 (o)	16 (p)	17 & OVER (q)	TOTAL TRIPS (r)
		OMAHA-OGDEN WESTWARD															
1	1	City of Portland	844	-	-	-	20	-	-	-	-	-	-	-	-	-	20
2	21-5	Pacific Limited	990	-	-	-	-	1	5	1	2	8	25	33	16	31	122
3	27	Overland Limited	990	-	-	-	4	3	6	4	7	6	4	16	30	71	151
4	49	Forty-Niner	990	-	-	-	16	8	1	-	-	-	-	-	-	-	25
5	87	Challenger (S.F.)	990	-	-	-	-	-	-	-	3	15	26	28	20	30	122
6	101	City of San Francisco	990	-	-	-	-	-	-	15	-	5	-	-	-	-	20
7	103	City of Los Angeles	990	-	-	-	-	-	-	20	-	-	19	-	-	-	39
8	717	Challenger (L.A.)	990	-	-	-	-	-	-	-	2	7	9	19	21	64	122
		EASTWARD															
9	2	City of Portland	844	-	-	-	20	-	-	-	-	-	-	-	-	-	20
10	14	Pacific Limited	990	-	-	-	-	-	-	-	-	30	38	16	24	14	122
11	28	Overland Limited	990	-	-	-	-	1	-	2	1	27	23	13	33	25	125
12	48	Forty-Niner	990	-	-	-	17	8	1	-	-	-	-	-	-	-	26
13	88	Challenger (S.F.)	990	-	-	-	-	-	1	7	1	8	17	13	34	41	122
14	102	City of San Francisco	990	-	-	-	-	-	-	15	-	5	-	-	-	-	20
15	104	City of Los Angeles	990	-	-	-	-	-	-	20	-	-	20	-	-	-	40
16	818	Challenger (L.A.)	990	-	-	-	-	-	-	1	-	-	7	40	31	45	124
17		TOTAL		-	-	-	77	21	14	85	16	111	188	178	209	321	1,220
18		PER CENT OF TOTAL		-	-	-	6.31	1.72	1.15	6.97	1.31	9.1	15.41	14.59	17.13	26.31	

TOTAL TRAINS OVER 14 CARS 708 or 58.03%
TOTAL TRAINS 14 CARS OR UNDER 512 or 41.97%
TOTAL TRAINS 1,220 or 100.00%

		KANSAS CITY - DENVER WESTWARD															
19	21	Pacific Limited	640	-	-	-	19	37	42	48	4	3	-	-	-	-	153
20	23	Denver Limited	640	-	-	-	-	-	1	30	52	7	1	-	-	-	91
21	37	Pony Express	640	-	-	-	-	1	9	12	8	-	1	-	-	-	31
		EASTWARD															
22	22	Denver Limited	640	-	-	-	-	36	36	41	8	1	-	-	-	-	122
23	24	Pacific Limited	640	-	-	-	9	55	44	8	5	-	1	-	-	-	122
24	38	Pony Express	640	-	-	-	27	2	2	-	-	-	-	-	-	-	31
25		TOTAL		-	-	-	55	131	134	139	77	11	3	-	-	-	550
26		PER CENT OF TOTAL		-	-	-	10.00	23.82	24.36	25.27	14.00	2.00	.55	-	-	-	

TOTAL TRAINS OVER 14 CARS 0 or 0%
TOTAL TRAINS 14 CARS OR UNDER 550 or 100.00%
TOTAL TRAINS 550 or 100.00%

		DENVER - SALT LAKE															
27	37	Pony Express	613	-	-	-	-	-	-	-	-	1	7	67	32	15	122
28	38	Pony Express	613	-	-	-	-	1	15	19	24	14	16	4	28	1	122
29		TOTAL		-	-	-	-	1	15	19	24	15	23	71	60	16	244

LINE NO. (a)	TRAIN NO. (b)	ROUTE AND TRAIN NAME (c)	MILES (d)	NUMBER OF CARS 5 (e)	6 (f)	7 (g)	8 (h)	9 (i)	10 (j)	11 (k)	12 (l)	13 (m)
		OMAHA - DENVER WESTWARD										
31	111	City of Denver	560	-	-	-	-	-	-	122	-	-
32	15	Columbine	560	-	-	-	12	54	42	7	6	-
33	19	National Parks Spl.	560	-	-	-	19	7	1	2	-	-
		EASTWARD										
34	112	City of Denver	560	-	-	-	-	-	-	122	-	-
35	12	Columbine	560	-	-	58	29	25	8	2	-	-
36	20	National Parks Spl.	560	-	-	15	4	5	6	-	-	1
37		TOTAL		-	-	73	64	91	57	255	6	1
38		PER CENT OF TOTAL		-	-	13.27	11.64	16.55	10.36	46.36	1.1	.18

TOTAL TRAINS OVER 14 CARS 1 or .18
TOTAL TRAINS 14 CARS OR UNDER 549 or 99.82
TOTAL TRAINS 550 or 100.00

		OGDEN - LOS ANGELES WESTWARD										
39	21	Pacific Limited	784	-	-	1	40	42	24	11	2	1
40	5	Pacific Limited	784	-	-	5	8	20	35	25	8	7
41	7	Los Angeles Limited	784	-	-	-	2	1	47	42	13	4
42	717	Challenger	784	-	-	-	-	-	-	-	-	-
43	103	City of Los Angeles	784	-	-	-	-	-	-	20	-	-
		EASTWARD										
44	14	Pacific Limited	784	-	-	-	-	-	37	45	15	11
45	6	Mail & Express	784	8	1	4	2	72	25	4	2	3
46	8	Los Angeles Limited	784	-	-	-	-	40	21	25	14	13
47	818	Challenger	784	-	-	-	-	-	-	2	2	-
48	104	City of Los Angeles	784	-	-	-	-	-	-	20	-	-
49		TOTAL		8	1	10	52	275	189	194	56	39
50		PER CENT OF TOTAL		.76	.10	.94	4.91	16.53	17.85	18.32	5.28	3.6

TOTAL TRAINS OVER 14 CARS 251 or 23.70
TOTAL TRAINS 14 CARS OR UNDER 808 or 76.30
TOTAL TRAINS 1,059 or 100.00

		GREEN RIVER-PORTLAND WESTWARD										
51	17	Portland Rose	969	-	-	-	-	-	-	-	-	-
52	25	Pacific Limited	969	-	-	-	-	1	5	22	39	27
		EASTWARD										
53	18	Portland Rose	969	-	-	1	-	-	-	-	-	-
54	44	Pacific Limited	969	-	-	-	1	28	37	30	15	8
55		TOTAL		-	-	1	1	29	42	52	54	35

ER TRAINS

AND TRAIN NAME (c)	MILES (d)	NUMBER OF CARS 5 (e)	6 (f)	7 (g)	8 (h)	9 (i)	10 (j)	11 (k)	12 (l)	13 (m)	14 (n)	15 (o)	16 (p)	17 & OVER (q)	TOTAL TRIPS (r)
A - DENVER															
WESTWARD															
f Denver	560	-	-	-	-	-	-	122	-	-	-	-	-	-	122
ine	560	-	-	-	12	54	42	7	6	-	1	-	-	-	122
al Parks Spl.	560	-	-	-	19	7	1	2	-	-	1	-	1	-	31
EASTWARD															
f Denver	560	-	-	-	-	-	-	122	-	-	-	-	-	-	122
ine	560	-	-	58	29	25	8	2	-	-	-	-	-	-	122
al Parks Spl.	560	-	-	15	4	5	6	-	-	1	-	-	-	-	31
		-	-	73	64	91	57	255	6	1	2	-	1	-	550
NT OF TOTAL		-	-	13.27	11.64	16.55	10.36	46.36	1.1	.18	.36	-	.18	-	

TOTAL TRAINS OVER 14 CARS 1 or .18%
TOTAL TRAINS 14 CARS OR UNDER 549 or 99.82%
TOTAL TRAINS 550 or 100.00%

- LOS ANGELES															
WESTWARD															
c Limited	784	-	-	1	40	42	24	11	2	1	-	1	-	-	122
c Limited	784	-	-	5	8	20	35	25	8	7	5	4	2	3	122
geles Limited	784	-	-	-	2	1	47	42	13	4	7	5	1	-	122
nger	784	-	-	-	-	-	-	-	-	-	6	36	26	54	122
f Los Angeles	784	-	-	-	-	-	-	20	-	-	20	-	-	-	40
EASTWARD															
c Limited	784	-	-	-	-	-	37	45	15	11	10	4	-	-	122
Express	784	8	1	4	2	72	25	4	2	3	1	-	-	-	122
geles Limited	784	-	-	-	-	40	21	25	14	13	7	2	-	-	122
nger	784	-	-	-	-	-	-	2	2	-	8	48	30	35	125
f Los Angeles	784	-	-	-	-	-	-	20	-	-	20	-	-	-	40
		8	1	10	52	175	189	194	56	39	84	100	59	92	1,059
NT OF TOTAL		.76	.10	.94	4.91	16.53	17.85	18.32	5.28	3.68	7.93	9.44	5.57	8.69	

TOTAL TRAINS OVER 14 CARS 251 or 23.70%
TOTAL TRAINS 14 CARS OR UNDER 808 or 76.30%
TOTAL TRAINS 1,059 or 100.00%

RIVER-PORTLAND															
WESTWARD															
nd Rose	969	-	-	-	-	-	7	-	-	-	1	9	9	103	122
c Limited	969	-	-	-	-	1	5	22	39	27	11	10	4	3	122
EASTWARD															
nd Rose	969	-	-	1	-	-	-	-	-	-	1	5	50	66	123
c Limited	969	-	-	-	1	28	37	30	15	8	2	-	1	-	122
		-	-	1	1	29	42	52	54	35	15	24	64	172	489
NT OF TOTAL		-	-	.20	.20	5.93	8.59	10.63	11.04	7.16	3.07	4.91	13.09	35.18	

TOTAL TRAINS OVER 14 CARS 260 or 53.17%
TOTAL TRAINS 14 CARS OR UNDER 229 or 46.83%
TOTAL TRAINS 489 or 100.00%

4	49	Forty-Niner	990	-	-	-	26	8	1	-	-	-	-	-	-	-	25
5	87	Challenger (S.F.)	990	-	-	-	-	-	-	-	3	15	26	28	20	30	122
6	101	City of San Francisco	990	-	-	-	-	-	-	15	-	5	-	-	-	-	20
7	103	City of Los Angeles	990	-	-	-	-	-	-	20	-	-	19	-	-	-	39
8	717	Challenger (L.A.)	990	-	-	-	-	-	-	-	2	7	9	19	21	64	122
		EASTWARD															
9	2	City of Portland	844	-	-	-	20	-	-	-	-	-	-	-	-	-	20
10	14	Pacific Limited	990	-	-	-	-	-	-	-	-	30	38	16	24	14	122
11	28	Overland Limited	990	-	-	-	-	1	-	2	1	27	23	13	33	25	125
12	48	Forty-Niner	990	-	-	-	17	8	1	-	-	-	-	-	-	-	26
13	88	Challenger (S.F.)	990	-	-	-	-	-	1	7	1	8	17	13	34	41	122
14	102	City of San Francisco	990	-	-	-	-	-	-	15	-	5	-	-	-	-	20
15	104	City of Los Angeles	990	-	-	-	-	-	-	20	-	-	20	-	-	-	40
16	818	Challenger (L.A.)	990	-	-	-	-	-	-	1	-	-	7	40	31	45	124
17		TOTAL		-	-	-	77	21	14	85	16	111	188	178	209	321	1,220
18		PER CENT OF TOTAL		-	-	-	6.31	1.72	1.15	6.97	1.31	9.1	15.41	14.59	17.13	26.31	

TOTAL TRAINS OVER 14 CARS 708 or 58.03%
TOTAL TRAINS 14 CARS OR UNDER 512 or 41.97%
TOTAL TRAINS 1,220 or 100.00%

		KANSAS CITY - DENVER															
		WESTWARD															
19	21	Pacific Limited	640	-	-	-	19	37	42	48	4	3	-	-	-	-	153
20	23	Denver Limited	640	-	-	-	-	-	1	30	52	7	1	-	-	-	91
21	37	Pony Express	640	-	-	-	-	1	9	12	8	-	1	-	-	-	31
		EASTWARD															
22	22	Denver Limited	640	-	-	-	-	36	36	41	8	1	-	-	-	-	122
23	24	Pacific Limited	640	-	-	-	9	55	44	8	5	-	1	-	-	-	122
24	38	Pony Express	640	-	-	-	27	2	2	-	-	-	-	-	-	-	31
25		TOTAL		-	-	-	55	131	134	139	77	11	3	-	-	-	550
26		PER CENT OF TOTAL		-	-	-	10.00	23.82	24.36	25.27	14.00	2.00	.55	-	-	-	

TOTAL TRAINS OVER 14 CARS 0 or 0%
TOTAL TRAINS 14 CARS OR UNDER 550 or 100.00%
TOTAL TRAINS 550 or 100.00%

		DENVER - SALT LAKE															
27	37	Pony Express	613	-	-	-	-	-	-	-	-	1	7	67	32	15	122
28	38	Pony Express	613	-	-	-	-	1	15	19	24	14	16	4	28	1	122
29		TOTAL		-	-	-	-	1	15	19	24	15	23	71	60	16	244
30		PER CENT OF TOTAL		-	-	-	-	.41	6.15	7.79	9.83	6.15	9.43	29.10	24.59	6.55	

TOTAL TRAINS OVER 14 CARS 97 or 39.75%
TOTAL TRAINS 14 CARS OR UNDER 147 or 60.25%
TOTAL TRAINS 244 or 100.00%

		EASTWARD															
34	112	City of Denver	560	-	-	-	-	-	-	122	-	-					
35	12	Columbine	560	-	-	58	29	25	8	2	-	-					
36	20	National Parks Spl.	560	-	-	15	4	5	6	-	-	-					
37		TOTAL		-	-	73	64	91	37	255	6	2					
38		PER CENT OF TOTAL		-	-	13.27	11.64	16.55	10.36	46.36	1.1	.18					

TOTAL TRAINS OVER 14 CARS 1 or .18
TOTAL TRAINS 14 CARS OR UNDER 549 or 99.82
TOTAL TRAINS 550 or 100.00

		OGDEN - LOS ANGELES															
		WESTWARD															
39	21	Pacific Limited	784	-	-	1	40	42	24	11	2	2					
40	5	Pacific Limited	784	-	-	5	8	20	35	25	8	7					
41	7	Los Angeles Limited	784	-	-	-	2	1	47	42	13	2					
42	717	Challenger	784	-	-	-	-	-	-	-	-	-					
43	103	City of Los Angeles	784	-	-	-	-	-	-	20	-	-					
		EASTWARD															
44	14	Pacific Limited	784	-	-	-	-	-	32	45	15	11					
45	6	Mail & Express	784	8	1	4	2	72	25	4	2	3					
46	8	Los Angeles Limited	784	-	-	-	-	40	21	25	14	13					
47	818	Challenger	784	-	-	-	-	-	-	2	2	-					
48	104	City of Los Angeles	784	-	-	-	-	-	-	20	-	-					
49		TOTAL		8	1	10	52	175	189	194	56	38					
50		PER CENT OF TOTAL		.76	.10	.94	4.91	16.53	17.85	18.32	5.28	3.6					

TOTAL TRAINS OVER 14 CARS 251 or 23.7
TOTAL TRAINS 14 CARS OR UNDER 808 or 76.3
TOTAL TRAINS 1,059 or 100.0

		GREEN RIVER-PORTLAND															
		WESTWARD															
51	17	Portland Rose	969	-	-	-	-	-	-	-	-	-					
52	25	Pacific Limited	969	-	-	-	-	1	5	22	39	2					
		EASTWARD															
53	18	Portland Rose	969	-	-	1	-	-	-	-	-	-					
54	44	Pacific Limited	969	-	-	-	1	28	37	30	15	6					
55		TOTAL		-	-	1	1	29	42	52	54	3					
56		PER CENT OF TOTAL		-	-	.20	.20	5.93	8.59	10.63	11.04	7.1					

TOTAL TRAINS OVER 14 CARS 260 or 53.1
TOTAL TRAINS 14 CARS OR UNDER 229 or 46.8
TOTAL TRAINS 489 or 100.0

RECAPITULATION

BETWEEN (aa)	TOTAL TRAINS (bb)	TOTAL OVER 14 (cc)	PER CENT OF TOTAL (dd)
Omaha-Ogden	1,220	708	58.03
Kansas City-Denver	550	None	-
Omaha-Denver	550	1	.18
Ogden-Los Angeles	1,059	251	23.70
Green River-Portland	489	260	53.17
Denver-Salt Lake	244	97	39.75
TOTAL	4,112	1,317	32.03

EASTWARD															
f Denver	560	-	-	-	-	-	-	122	-	-	-	-	-	-	122
ine	560	-	-	58	29	25	8	2	-	-	-	-	-	-	122
al Parks Spl.	560	-	-	15	4	5	6	-	-	1	-	-	-	-	31
		-	-	73	64	91	57	255	6	1	2	-	1	-	550
NT OF TOTAL		-	-	13.27	11.64	16.55	10.36	46.36	1.1	.18	.36	-	.18	-	

TOTAL TRAINS OVER 14 CARS 1 or .18%
TOTAL TRAINS 14 CARS OR UNDER 549 or 99.82%
TOTAL TRAINS 550 or 100.00%

- LOS ANGELES WESTWARD															
c Limited	784	-	-	1	40	42	24	11	2	1	-	1	-	-	122
c Limited	784	-	-	5	8	20	35	25	8	7	5	4	2	3	122
geles Limited	784	-	-	-	2	1	47	42	13	4	7	5	1	-	122
nger	784	-	-	-	-	-	-	-	-	-	6	36	26	54	122
f Los Angeles	784	-	-	-	-	-	-	20	-	-	20	-	-	-	40
EASTWARD															
c Limited	784	-	-	-	-	-	37	45	15	11	10	4	-	-	122
Express	784	8	1	4	2	72	25	4	2	3	1	-	-	-	122
geles Limited	784	-	-	-	-	40	21	25	14	13	7	2	-	-	122
nger	784	-	-	-	-	-	-	2	2	-	8	48	30	35	125
f Los Angeles	784	-	-	-	-	-	-	20	-	-	20	-	-	-	40
		8	1	10	52	175	189	194	56	39	84	100	59	92	1,059
NT OF TOTAL		.76	.10	.94	4.91	16.53	17.85	18.32	5.28	3.68	7.93	9.44	5.57	8.69	

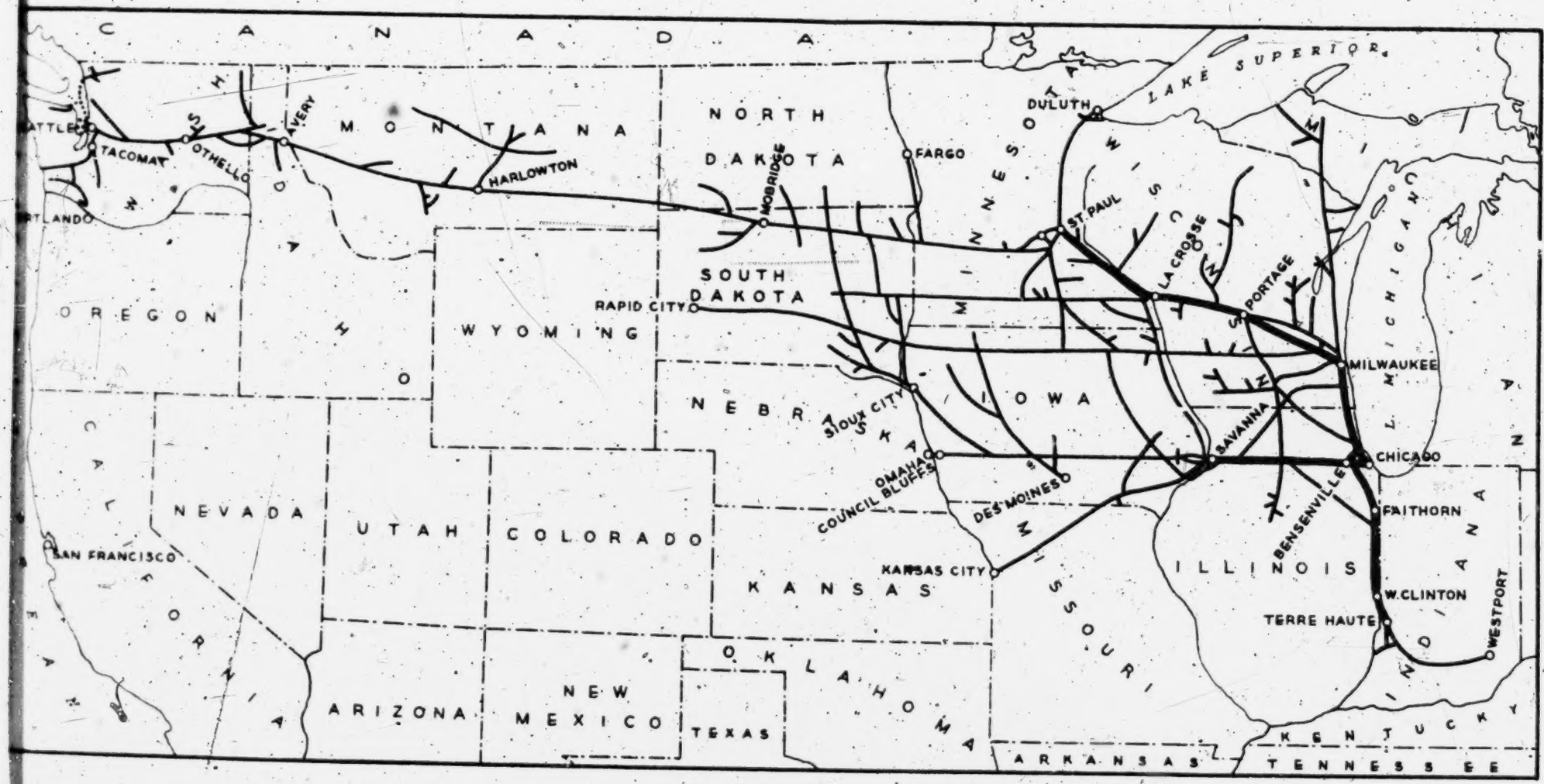
TOTAL TRAINS OVER 14 CARS 251 or 23.70%
TOTAL TRAINS 14 CARS OR UNDER 808 or 76.30%
TOTAL TRAINS 1,059 or 100.00%

RIVER-PORTLAND WESTWARD															
nd Rose	969	-	-	-	-	-	-	-	-	-	1	9	9	103	122
c Limited	969	-	-	-	-	1	5	22	39	27	11	10	4	3	122
EASTWARD															
nd Rose	969	-	-	1	-	-	-	-	-	-	1	5	50	66	123
c Limited	969	-	-	-	1	28	37	30	15	8	2	-	1	-	122
		-	-	1	1	29	42	52	54	35	15	24	64	172	489
NT OF TOTAL		-	-	.20	.20	5.93	8.59	10.63	11.04	7.16	3.07	4.91	13.09	35.18	

TOTAL TRAINS OVER 14 CARS 260 or 53.17%
TOTAL TRAINS 14 CARS OR UNDER 229 or 46.83%
TOTAL TRAINS 489 or 100.00%

ENT OF TOTAL (44)
58.03
-
.18
23.70
53.17
39.75
32.03

Defendant's Exhibit No. 93 (Witness Kileg)
Dec. 10, 1940



CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD

HEAVY LINE INDICATES TERRITORY COVERED BY TYPICAL FREIGHT TRAIN EXHIBIT.

5412

Defendant's Exhibit No. 94 (Witness Kileg)
Dec. 10, 1940

CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD COMPANY
Henry A. Scandrett, Walter J. Cummings, George I. Haight, Trustees

FREIGHT OPERATING AND FREIGHT TRANSPORTATION EXPENSES RELATED TO TRAFFIC

Calendar Years 1922 to 1939, Inclusive

Year (a)	Revenue ton-miles (b)	Freight operating expenses (c)	Freight transportation expenses (d)	Averages per 1,000 revenue ton-miles: Freight operating expenses (e)	Averages per 1,000 revenue ton-miles: Freight transportation expenses (f)
1939	9,234,307,122	$65,167,855	$30,933,818	$7.06	$3.35
1938	8,479,448,397	60,385,743	30,050,963	7.12	3.54
1937	9,691,026,608	67,249,946	32,837,842	6.94	3.39
1936	9,689,405,998	66,527,413	31,840,896	6.87	3.29
1935	7,978,909,250	56,707,987	27,299,910	7.11	3.42
1934	7,540,899,349	52,308,707	25,105,451	6.94	3.33
1933	7,220,790,618	47,842,221	23,253,139	6.63	3.22
1932	6,859,165,866	53,243,649	24,654,718	7.76	3.59
1931	8,878,320,343	66,134,691	32,192,892	7.45	3.63
1930	10,917,232,051	83,153,352	39,849,296	7.62	3.65
1929	13,091,989,908	96,459,091	46,199,483	7.37	3.53
1928	12,944,376,979	93,306,388	44,533,625	7.21	3.44
1927	12,529,704,365	98,858,335	45,674,348	7.89	3.65
1926	11,978,810,935	95,173,458	45,079,317	7.95	3.76
1925	11,966,830,189	96,486,963	45,663,953	8.06	3.82
1924	11,004,765,149	91,228,813	45,490,363	8.29	4.13
1923	11,922,243,644	100,636,820	50,067,305	8.44	4.20
1922	10,601,913,667	94,854,817	48,222,704	8.95	4.55
Total 1936-1939	37,094,188,125	259,330,957	125,663,519	6.99	3.39
Total 1922-1925	45,495,752,649	383,207,413	189,444,325	8.42	4.16
Percent of improvement 4 years 1936-1939 compared with 4 years 1922-1925				17.0	18.5

SOURCE: Annual Reports to the Interstate Commerce Commission.

Defendant's Exhibit No. 95 (Witness Kileg)
Dec. 10, 1940

CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD COMPANY
Henry A. Scandrett, Walter J. Cummings, George I. Haight, Trustees

FREIGHT SERVICE OPERATING AVERAGES

CALENDAR YEARS 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 AND 1939

LINE NO. (a)	ITEM (b)	1922 (c)	1924 (d)	1926 (e)	1928 (f)	1930 (g)	1932 (h)	1934 (i)	1936 (j)	1938 (k)	1939 (l)	PER CENT INCREASE 1939 OVER 1922 (m)
1	Miles of line operated in freight service,.....	11,026.40	10,983.40	11,189.38	11,247.79	11,298.02	11,254.17	11,163,80	11,117.22	10,945.56	10,912.40	Dec. 1.03
2	Freight train miles,.....	19,535,159	19,000,793	19,062,857	20,152,224	18,181,303	13,351,262	14,303,464	16,672,968	14,121,022	14,617,467	Dec.25.17
3	Freight cars per freight train,.....	37.8	41.8	45.6	48.0	46.7	41.6	43.4	43.4	44.1	45.8	21.2
4	Net tons per freight train, (excluding light trains),.....	626	680	712	742	700	608	614	681	694	736	17.6
5	Average tractive power per locomotive (pounds),.....	*41,415	40,823	42,793	44,648	47,035	47,718	50,653	51,508	52,440	52,653	27.1
6	Average capacity per freight car (tons),.....	40.6	41.8	42.6	44.1	45.8	45.7	46.5	46.6	47.1	47.3	16.5
7	Freight train speed (miles per hour).	11.3	11.5	12.3	12.9	13.6	15.2	15.7	15.6	16.3	16.4	45.1
8	Gross ton-miles (exclusive of locomotives and tenders) per freight train-hour,.....	15,233	17,492	20,337	22,774	23,458	23,470	24,393	26,360	28,332	28,770	92.9
9	Net ton-miles per freight train-hour.	7,076	7,810	8,740	9,574	9,513	9,232	9,607	10,542	11,265	11,978	69.
10	Gross ton-miles (exclusive of locomotives and tenders) per ton of fuel.	11,858	11,424	12,547	13,728	14,224	13,893	14,187	13,856	14,683	14,757	24.4

SOURCE: Item 1 - 1922, 1924, 1926 and 1928 from Form OS-A; figures for remaining years from Annual Reports to Interstate Commerce Commission.

Items 2, 3, 4, 7 and 8:- Reports of Freight Train Performance, Form OS-A, filed with Interstate Commerce Commission.

Item 5 - Total tractive effort freight service ÷ total locomotives available for freight service at close of each year as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission. * 1922 not in Annual Report and 1923 was used.

Item 6 - Aggregate capacity of all freight carrying cars ÷ total number of such cars available for service at close of year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 9 - Net ton-miles ÷ train-hours as reported on Form OS-A to Interstate Commerce Commission.

Item 10- Gross ton miles (cars, contents and cabooses) ÷ equated net tons of fuel consumed as reported in years 1922 to 193. on Form OS-A to Interstate Commerce Commission and as reported in years 1936 to 1939 in Schedules 531 and 571 of Annual Reports to Interstate Commerce Commission.

Defendant's Exhibit No. 96 (Witness Kileg)
Dec. 11, 1940

CHICAGO MILWAUKEE ST. PAUL AND PACIFIC RAILROAD COMPANY
(Henry A. Scandrett, Walter J. Cummings and George I. Haight, Trustees)

REVENUE FREIGHT CARRIED DURING THE YEAR 1939

Class No.	Commodity Group or Class	Revenue Freight Originating on Respondent's Road: Terminating On Line Carloads	Revenue Freight Originating on Respondent's Road: Delivered to Connecting Carriers Carloads	Revenue Freight Received from Connecting Carriers: Terminating On Line Carloads	Revenue Freight Received from Connecting Carriers: Delivered to Connecting Carriers Carloads	Total Revenue Freight Carried Carloads
110	Oranges & grapefruit	1	1	3,868	1,961	5,831
111	Lemons, limes & citrus fruits n. o. s.	-	-	275	244	519
120	Apples, fresh	67	30	1,216	381	1,694
121	Bananas	-	-	1,794	444	2,238
122	Berries, fresh	3	7	41	19	70
123	Cantaloupes & melons n.o.s.	2	2	275	223	502
124	Grapes, fresh	-	3	412	637	1,052
125	Peaches, fresh	5	16	677	73	771
126	Watermelons	5	1	214	14	234
127	Fruits, fresh domestic n. o. s.	54	105	711	821	1,691
128	Fruits, fresh tropical n. o. s.	1	-	103	8	112
130	Potatoes other than sweet	1,079	1,112	3,431	788	6,410
140	Cabbage	135	501	287	47	970
141	Onions	388	847	349	179	1,763
142	Tomatoes	1	-	315	95	411
143	Vegetables, n. o. s.	252	133	2,494	3,076	5,955
Total 110 to 143, Inclusive		1,993	2,758	16,462	9,010	30,223
800	Total Products of Agriculture	101,189	38,860	34,914	10,607	185,570
810	Total Animals and Products	63,022	51,739	17,529	2,705	134,995
820	Total Products of Mines	76,855	41,509	102,668	11,387	232,419
830	Total Products of Forests	59,410	28,624	30,866	8,935	127,835
840	Total Manufactures and Miscellaneous	109,250	106,969	177,785	26,043	420,047
850	Grand Total Carload Traffic	409,726	267,701	363,762	59,677	1,100,866
	Total Tons Carload Traffic	13,444,774	7,040,887	11,095,659	1,675,547	33,256,867
	Total Tons L. C. L. Freight	264,594	169,821	140.066	10.074	584.555

REVENUE FREIGHT CARRIED DURING THE YEAR 1933

Class No.	Commodity Group or Class	Revenue Freight Originating on Respondent's Road: Terminating On Line Carloads	Revenue Freight Originating on Respondent's Road: Delivered to Connecting Carriers Carloads	Revenue Freight Received from Connecting Carriers: Terminating On Line Carloads	Revenue Freight Received from Connecting Carriers: Delivered to Connecting Carriers Carloads	Total Revenue Freight Carried Carloads
110	Oranges & grapefruit	1	1	3,868	1,961	5,831
111	Lemons, limes & citrus fruits n. o. s.	-	-	275	244	519
120	Apples, fresh	67	30	1,216	381	1,694
121	Bananas	-	-	1,794	444	2,238
122	Berries, fresh	3	7	41	19	70
123	Cantaloupes & melons n.o.s.	2	2	275	223	502
124	Grapes, fresh	-	3	412	637	1,052
125	Peaches, fresh	5	16	677	73	771
126	Watermelons	5	1	214	14	234
127	Fruits, fresh domestic n. o. s.	54	105	711	821	1,691
128	Fruits, fresh tropical n. o. s.	1	-	103	8	112
130	Potatoes other than sweet	1,079	1,112	3,431	788	6,410
140	Cabbage	135	501	287	47	970
141	Onions	388	847	349	179	1,763
142	Tomatoes	1	-	315	95	411
143	Vegetables, n. o. s.	252	133	2,494	3,076	5,955
Total 110 to 143, Inclusive		1,993	2,758	16,462	9,010	30,223
800	Total Products of Agriculture	101,189	38,860	34,914	10,607	185,570
810	Total Animals and Products	63,022	51,739	17,529	2,705	134,995
820	Total Products of Mines	76,855	41,509	102,668	11,387	232,419
830	Total Products of Forests	59,410	28,624	30,866	8,935	127,835
840	Total Manufactures and Miscellaneous	109,250	106,969	177,785	26,043	420,047
850	Grand Total Carload Traffic	409,726	267,701	363,762	59,677	1,100,866
	Total Tons Carload Traffic	13,444,774	7,040,887	11,095,659	1,675,547	33,256,867
	Total Tons L. C. L. Freight	264,594	169,821	140,066	10,074	584,555
	Total Tons All Freight	13,709,368	7,210,708	11,235,725	1,685,621	33,841,422

Defendant's Exhibit No. 97 (Witness Kileg)
Dec. 11, 1940

CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD COMPANY
Henry A. Scandrett, Walter J. Cummings, George I. Haight, Trustees

TYPICAL EXAMPLES OF FREIGHT TRAINS HANDLED
BETWEEN CERTAIN TERMINALS, MARCH 1ST - 10TH INCLUSIVE 1939

DEC 11 1940

From (a)	To (b)	Distance (Miles) (c)	Ruling Grade (d)	70 CARS OR LESS: No. of Trains (e)	Type of Locomotive (f)	Average Consist: A (g)	B (h)	C (i)	Tons (j)	71 CARS TO 100 CARS: No. of Trains (k)	Type of Locomotive (l)	Average Consist: A (m)	B (n)	C (o)	Tons (p)	101 CARS TO 135 CARS: No. of Trains (q)	Type of Locomotive (r)	Average Consist: A (s)	B (t)	C (u)	Tons (v)	No. of Trains (w)
La Crosse, Wis.	St. Paul, Minn.	128	.30	1	4-8-4	63	5	68	3,993	14	4-8-4	82	11	93	3,853	6	4-8-4	86	18	104	3,979	
				14	2-8-2	13	35	48	1,555	10	2-8-2	26	63	88	3,643	3	2-8-2	13	99	112	2,783	
St. Paul, Minn.	La Crosse, Wis.	127	.30							19	4-8-4	73	8	81	3,588	2	4-8-4	78	27	105	4,527	
										11	2-8-2	49	37	86	3,195	10	2-8-2	41	71	112	3,578	4
La Crosse, Wis.	Portage, Wis.	103	.66	5	4-8-4	61	5	66	3,835	16	4-8-4	73	7	80	3,591	8	4-8-4	58	52	110	3,826	
				5	2-8-2	20	19	39	1,571	10	2-8-2	34	51	85	3,799	1	2-8-2	17	94	111	2,936	
Portage, Wis.	La Crosse, Wis.	103	.68	3	4-8-4	50	13	63	3,041	25	4-8-4	67	21	88	3,410							
				9	2-8-2	25	11	36	1,328	7	2-8-2	22	64	86	2,791	2	2-8-2	28	77	105	3,380	
Milwaukee, Wis.	Portage, Wis.	92	.67							28	4-8-4	68	14	82	3,328							
				10	2-8-2	29	34	63	2,537	9	2-8-2	19	65	84	2,762							
Portage, Wis.	Milwaukee, Wis.	89	.50	4	4-8-4	51	6	57	2,404	18	4-8-4	66	17	83	3,535	5	4-8-4	56	51	107	3,876	1
				10	2-8-2	22	33	55	1,755	6	2-8-2	58	26	84	3,333	4	2-8-2	31	78	109	3,352	
Milwaukee, Wis.	Western Ave., Ill.	82	.67	9	4-6-4	56	7	63	2,319													
Milwaukee, Wis.	Bensenville, Ill.	79	.67							26	4-8-4	71	13	84	3,718	5	4-8-4	50	57	107	3,984	
				3	2-8-2	51	11	62	3,009	14	2-8-2	44	41	85	3,170	9	2-8-2	5	106	111	3,658	
Bensenville, Ill.	Milwaukee, Wis.	79	.50	1	4-6-4	52	15	67	3,093	8	4-6-4	60	13	73	2,341							
										24	4-8-4	80	16	96	4,251	7	4-8-4	86	19	105	5,062	
				3	2-8-2	58	7	65	4,183	14	2-8-2	56	37	93	4,177	5	2-8-2	40	66	106	4,227	
Bensenville, Ill.	Savanna, Ill.	133	1.00	14	4-8-4	48	11	59	3,137	38	4-8-4	44	40	84	3,036	2	4-8-4	31	79	110	4,018	
				22	2-8-2	34	18	52	3,526	1	2-8-2	15	82	97	3,955	1	2-8-2	11	94	105	3,000	
Savanna, Ill.	Bensenville, Ill.	133	1.00	32	4-8-4	38	14	52	3,047	7	4-8-4	23	58	81	2,550							
				18	2-8-2	28	20	48	1,882	4	2-8-2	15	65	80	2,188							

Kileg)

OAD COMPANY
Haight, Trustees

DLED
CLUSIVE 1939

SIST TONS	101 CARS TO 125 CARS						126 CARS AND OVER						MAXIMUM CARS PER TRAIN
	NO. OF TRAINS	TYPE OF LOCO-MOTIVE	AVERAGE CONSIST				NO. OF TRAINS	TYPE OF LOCO-MOTIVE	AVERAGE CONSIST				
			A	B	C	TONS			A	B	C	TONS	
(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(bb)	(cc)
3,853	6	4-8-4	86	18	104	3,979							
3,643	3	2-8-2	13	99	112	3,783							119
3,588	8	4-8-4	78	27	105	4,527							
3,195	10	2-8-2	41	71	112	3,578	4	2-8-2	39	95	134	4,144	140
3,591	8	4-8-4	58	52	110	3,826							
3,799	1	2-8-2	17	94	111	3,936							116
3,410													
2,791	2	3-8-2	28	77	105	3,380							107
3,388													
2,762													96
3,535	5	4-8-4	56	51	107	3,876	1	4-8-4	3	123	126	3,770	
3,333	4	2-8-2	31	78	109	3,352							126
													69
3,718	5	4-8-4	50	57	107	3,984							
3,170	9	2-8-2	5	106	111	3,658							135
3,341													
4,251	7	4-8-4	86	19	105	5,062							
4,177	5	2-8-2	40	66	106	4,327							115
3,036	2	4-8-4	31	79	110	4,018							
2,955	1	2-8-2	11	94	105	3,000							113
2,550													
2,188													87
4,834	1	2-8-2	83	23	106	5,947							106

DEC 11 1940

FROM	TO	DISTANCE (Miles)	RULING GRADE	70 CARS OR LESS NO. OF TRAINS	70 CARS OR LESS TYPE OF LOCOMOTIVE	70 CARS OR LESS AVERAGE CONSIST A	B	C	TONS	71 CARS TO 100 CARS NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	TONS	101 CARS TO 125 CARS NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	TONS
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)
La Crosse, Wis.	St. Paul, Minn.	128	.30	1	4-8-4	63	5	68	3,993	14	4-8-4	82	11	93	3,853	6	4-8-4	86	18	104	3,979
				14	2-8-2	13	35	48	1,555	10	2-8-2	36	62	88	3,643	3	2-8-2	13	99	113	3,783
St. Paul, Minn.	La Crosse, Wis.	127	.30							19	4-8-4	73	8	81	3,588	2	4-8-4	78	27	105	4,537
										11	2-8-2	49	37	86	3,195	10	2-8-2	41	71	113	3,578
La Crosse, Wis.	Portage, Wis.	103	.66	5	4-8-4	61	5	66	2,825	16	4-8-4	73	7	80	3,591	8	4-8-4	58	52	110	3,836
				5	2-8-2	30	19	39	1,571	10	2-8-2	34	51	85	3,799	1	2-8-2	17	94	111	2,936
Portage, Wis.	La Crosse, Wis.	103	.66	3	4-8-4	50	13	63	3,041	25	4-8-4	67	21	88	3,410						
				9	2-8-2	25	11	36	1,328	7	2-8-2	22	64	86	2,791	2	2-8-2	28	77	105	3,380
Milwaukee, Wis.	Portage, Wis.	93	.67							28	4-8-4	68	14	82	3,328						
				10	2-8-2	29	34	63	2,537	9	2-8-2	19	65	84	2,762						
Portage, Wis.	Milwaukee, Wis.	89	.50	4	4-8-4	51	6	57	2,404	18	4-8-4	66	17	83	3,535	5	4-8-4	56	51	107	3,876
				10	2-8-2	23	33	55	1,755	6	2-8-2	58	26	84	3,333	4	2-8-2	31	78	109	3,353
Milwaukee, Wis.	Western Ave., Ill.	83	.67	9	4-6-4	56	7	63	2,319												
Milwaukee, Wis.	Bensenville, Ill.	79	.67							26	4-8-4	71	13	84	3,718	5	4-8-4	50	57	107	3,984
				3	2-8-2	51	11	62	3,009	14	2-8-2	44	41	85	3,170	9	2-8-2	5	106	111	3,658
Bensenville, Ill.	Milwaukee, Wis.	79	.50	1	4-6-4	52	15	67	3,093	8	4-6-4	60	13	73	2,341						
				3	2-8-2	58	7	65	4,182	24	4-8-4	80	16	96	4,251	7	4-8-4	86	19	105	5,062
										14	2-8-2	56	27	83	4,177	5	2-8-2	40	66	106	4,327
Bensenville, Ill.	Savanna, Ill.	123	1.00	14	4-8-4	48	11	59	3,137	38	4-8-4	44	40	84	3,036	2	4-8-4	31	79	110	4,018
				22	2-8-2	34	18	52	2,526	1	2-8-2	15	82	97	2,955	1	2-8-2	11	94	105	3,000
Savanna, Ill.	Bensenville, Ill.	123	1.00	32	4-8-4	38	14	52	3,047	7	4-8-4	23	58	81	2,550						
				18	2-8-2	28	20	48	1,882	4	2-8-2	15	65	80	2,188						
Faithorn, Ill.	Bensenville, Ill.	45	.50	7	2-8-2	62	3	65	4,513	48	2-8-2	65	22	87	4,834	1	2-8-2	83	23	106	5,947
Bensenville, Ill.	Faithorn, Ill.	45	.57	13	2-8-2	7	49	56	1,408	35	2-8-2	28	61	89	3,564	5	2-8-2	15	91	106	2,533
W. Clinton, Ind.	Faithorn, Ill.	122	.50	6	2-8-2	61	3	64	4,793	49	2-8-2	71	13	84	5,267	8	2-8-2	71	35	106	5,596
Faithorn, Ill.	W. Clinton, Ind.	122	.50	9	2-8-2	15	47	62	1,906	49	2-8-2	17	66	83	2,347	7	2-8-2	19	88	107	3,689
Terre Haute, Ind.	W. Clinton, Ind.	26	.58	38	2-8-2	56	7	63	4,113	4	2-8-2	87	8	95	6,726	4	2-8-2	89	25	114	7,641
W. Clinton, Ind.	Terre Haute, Ind.	26	1.00	32	2-8-2	14	38	52	1,597	6	2-8-2	-	88	88	1,999	7	2-8-2	-	113	113	3,578
TOTAL TRAINS		871		267						490						102					
PER CENT OF TOTAL		100		30.7						56.3						11.7					
AVERAGE CARS PER TRAIN		80		56						85						108					

SIST TONS (p)	NO. OF TRAINS (q)	TYPE OF LOCO-MOTIVE (r)	AVERAGE CONSIST A (s)	B (t)	C (u)	TONS (v)	NO. OF TRAINS (w)	TYPE OF LOCO-MOTIVE (x)	AVERAGE CONSIST A (y)	B (z)	C (aa)	TONS (bb)	MAXIMUM CARS PER TRAIN (cc)
3,853	6	4-8-4	86	18	104	3,979							
3,643	3	2-8-2	13	99	113	3,765							119
3,588	2	4-8-4	78	27	105	4,527							
3,195	10	2-8-2	41	71	112	3,578	4	2-8-2	39	95	134	4,144	140
3,591	8	4-8-4	58	52	110	3,836							
2,799	1	2-8-2	17	94	111	2,936							116
3,410													
2,791	2	3-8-2	28	77	105	3,380							107
3,328													
2,762													98
3,535	5	4-8-4	56	51	107	3,876	1	4-8-4	3	133	136	3,770	
3,333	4	3-8-2	31	78	109	3,352							126
													69
3,716	5	4-8-4	50	57	107	3,984							
3,170	9	3-8-2	5	106	111	3,658							135
2,341													
4,251	7	4-8-4	86	19	105	5,062							
4,177	5	3-8-2	40	66	106	4,327							115
3,036	2	4-8-4	31	79	110	4,018							
2,955	1	2-8-2	11	94	105	3,000							113
2,550													
2,188													87
4,834	1	3-8-2	83	23	106	5,947							106
2,564	5	3-8-2	15	91	106	3,533							113
5,267	8	2-8-2	71	35	106	5,596	1	2-8-2	35	102	137	4,976	137
2,347	7	3-8-2	19	88	107	3,689							121
6,726	4	2-8-2	89	25	114	7,641	3	2-8-2	85	46	131	7,687	135
1,999	7	2-8-2	-	113	113	3,578	3	2-8-2	-	133	133	3,148	136
	102 11.7 108						12 1.3 133						

Defendant's Exhibit No. 98 (Witness Kileg)
Dec. 11, 1940

CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD COMPANY
Henry A. Scandrett, Walter J. Cummings, George I. Haight, Trustees

MAXIMUM NUMBER OF CARS HANDLED IN SELECTED THROUGH MAIN LINE PASSENGER TRAINS
OPERATING BETWEEN CHICAGO AND MINNEAPOLIS DURING MONTHS OF JANUARY, APRIL, JULY AND OCTOBER, 1939

LINE NO. (a)	TRAIN NO. (b)	TRAIN (c)	MILES (d)	NUMBER OF CARS 5 (e)	6 (f)	7 (g)	8 (h)	9 (i)	10 (j)	11 (k)	12 (l)	13 (m)	14 (n)	15 (o)	16 (p)	17 & OVER (q)	TOTAL TRAINS (r)
		WESTBOUND															
1	1	Pioneer Limited	421	-	-	-	-	-	2	20	53	28	9	7	1	3	123
2	5	Morning Hiawatha	421	1	-	2	2	12	4	50	29	14	8	3	-	-	125
3	101	Afternoon Hiawatha	421	-	-	1	2	81	8	21	9	3	2	-	-	-	127
4	15	Olympian	421	-	-	-	-	-	-	-	-	2	28	40	35	18	123
5	57	Fast Mail	421	-	-	-	-	2	4	8	9	13	14	24	24	25	123
6		TOTAL		1	-	3	4	95	18	99	100	60	61	74	60	46	621
7		PER CENT OF TOTAL		0.16	-	0.48	0.65	15.30	2.90	15.94	16.10	9.66	9.82	11.92	9.66	7.41	100.00
		EASTBOUND															
8	4	Pioneer Limited	421	-	-	-	-	-	-	37	44	20	12	5	3	2	123
9	6	Morning Hiawatha	421	-	-	1	4	54	43	9	4	4	4	-	-	-	123
10	100	Afternoon Hiawatha	421	-	-	1	1	78	9	21	6	6	3	-	-	-	125
11	16	Olympian	421	-	-	-	-	-	-	34	16	29	30	4	10	-	123
12	56	Fast Mail	421	-	-	-	-	-	1	9	16	42	29	17	8	1	123
13		TOTAL		-	-	2	5	132	53	110	86	101	78	26	21	3	617
14		PER CENT OF TOTAL		-	-	0.33	0.81	21.39	8.59	17.83	13.94	16.37	12.64	4.21	3.40	0.49	100.00

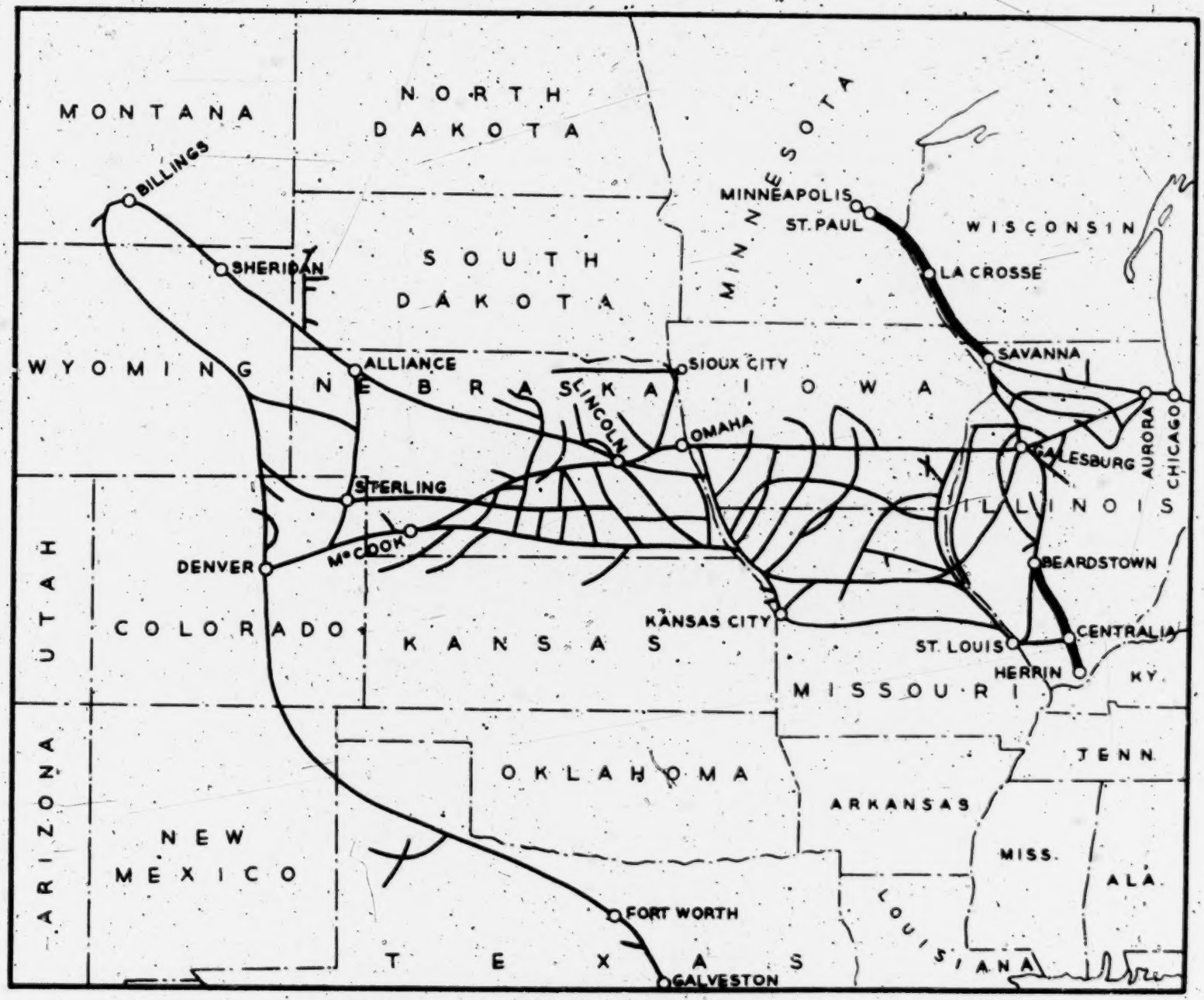
TOTAL TRAINS OVER 14 CARS 230 OR 18.58%

TOTAL TRAINS 14 CARS OR UNDER 1,008 OR 81.42%

TOTAL TRAINS 1,238 OR 100.00%

5417

Defendant's Exhibit No. 99 (Witness Peckenbaugh)
Dec. 11, 1940



CHICAGO, BURLINGTON & QUINCY RAILROAD CO.

HEAVY LINE INDICATES TERRITORY COVERED BY TYPICAL FREIGHT TRAIN EXHIBIT

5418

Defendant's Exhibit No. 100 (Witness Peckenbaugh)
Dec. 11, 1940

EXPLANATION OF SYMBOLS USED BELOW UNDER HEADING "AVERAGE CONSIST"

A - Perishable loads
B - Other loads
C - Empty cars and includes caboose
D - Total all cars

CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY

TYPICAL EXAMPLES OF THROUGH ROAD FREIGHT TRAINS RUN BETWEEN TERMINALS SHOWN FOR CONTINUOUS TEN DAY PERIOD IN SEPTEMBER, 1939 (SEPTEMBER 11 to 20, INCLUSIVE)

FROM (a)	TO (b)	DISTANCE (Miles) (c)	RULING GRADE (d)	70 CARS OR LESS: NO. OF TRAINS (e)	TYPE OF LOCOMOTIVE (f)	AVERAGE CONSIST: A (g)	B (h)	C (i)	D (j)	TONS (k)	71 CARS TO 100 CARS: NO. OF TRAINS (l)	TYPE OF LOCOMOTIVE (m)	AVERAGE CONSIST: A (n)	B (o)	C (p)	D (q)	TONS (r)	101 CARS TO 125 CARS: NO. OF TRAINS (s)	TYPE OF LOCOMOTIVE (t)	AVERAGE CONSIST: A (u)	B (v)	C (w)	D (x)
St. Paul, Minn.	LaCrosse, Wis.	128	.30	9	Light Mikado	7	43	8	58	2,418													
St. Paul, Minn.	LaCrosse, Wis.	128	.30								19	Mohawk	14	66	11	91	3,945	1	Mohawk	26	69	10	10
LaCrosse, Wis.	St. Paul, Minn.	128	.30	3	Light Mikado	4	16	15	35	1,204	4	Light Mikado	-	10	74	84	2,266						
LaCrosse, Wis.	St. Paul, Minn.	128	.30	4	Mohawk	1	52	10	63	2,657	13	Mohawk	1	64	19	84	3,009	3	Mohawk	2	41	61	10
Savanna, Ill.	LaCrosse, Wis.	157	.30	4	Light Mikado	-	16	26	42	4,546	4	Light Mikado	-	36	49	85	3,230	3	Light Mikado	-	42	72	11
Savanna, Ill.	LaCrosse, Wis.	157	.30	2	Mohawk	3	58	7	68	2,743	16	Mohawk	1	68	16	85	3,370	2	Mohawk	-	84	20	10
LaCrosse, Wis.	Savanna, Ill.	157	.30	3	Light Mikado	11	48	8	67	3,075	6	Light Mikado	4	47	27	78	2,611	1	Light Mikado	-	1	116	11
LaCrosse, Wis.	Savanna, Ill.	157	.30								17	Mohawk	16	63	12	91	3,903	3	Mohawk	14	74	17	10
Beardstown, Ill.	Centralia, Ill.	134	1.19	8	Light Mikado	4	15	18	37	1,204													
Beardstown, Ill.	Centralia, Ill.	134	1.19	2	Large Mikado	6	23	15	44	1,503													
Beardstown, Ill.	Centralia, Ill.	134	1.19	5	Santa Fe	-	9	39	48	1,451	5	Santa Fe	-	5	87	92	2,187	3	Santa Fe	-	4	108	11
Beardstown, Ill.	Centralia, Ill.	134	1.19	2	Texas	-	3	67	70	1,607	2	Texas	-	-	91	91	1,968	3	Texas	-	3	113	11
Centralia, Ill.	Beardstown, Ill.	134	.30	7	Light Mikado	-	37	6	43	2,121													
Centralia, Ill.	Beardstown, Ill.	134	.30	2	Large Mikado	-	42	7	49	2,402													
Centralia, Ill.	Beardstown, Ill.	134	.30	1	Santa Fe	-	57	5	62	2,976	12	Santa Fe	-	82	10	92	5,677	3	Santa Fe	-	88	14	10
Centralia, Ill.	Beardstown, Ill.	134	.30															6	Texas	-	116	3	11
Centralia, Ill.	Herrin, Ill.	54	.50	11	Santa Fe	-	7	44	51	1,238	11	Santa Fe	-	5	86	91	2,075	2	Santa Fe	-	3	115	11
Herrin, Ill.	Centralia, Ill.	54	.30								20	Santa Fe	-	85	5	90	5,905	9	Santa Fe	-	99	3	10
TOTAL ALL TRAINS		258		63							129							39					
PER CENT OF ALL TRAINS		100%		24.4							50.0							15.1					
AVERAGE CARS PER TRAIN		87		51							89							109					

RAILROAD COMPANY

RUN BETWEEN TERMINALS SHOWN FOR CONTINUOUS
SEPTEMBER 11 to 20, INCLUSIVE)

100 CARS AND UNDER — AVERAGE CONSIST B (o)	C (p)	D (q)	TONS (r)	NO. OF TRAINS (s)	TYPE OF LOCOMOTIVE (t)	101 CARS TO 125 CARS — AVERAGE CONSIST A (u)	B (v)	C (w)	D (x)	TONS (y)	NO. OF TRAINS (z)	TYPE OF LOCOMOTIVE (aa)	126 CARS AND OVER — AVERAGE CONSIST A (bb)	B (cc)	C (dd)	D (ee)	TONS (ff)	MAXIMUM CARS PER TRAIN (gg)
66	11	91	3,945	1	Mohawk	26	69	10	105	4,074	7	Light Mikado	-	2	134	136	2,870	138
10	74	84	2,266															
64	19	84	3,009	3	Mohawk	2	41	61	104	3,232								108
36	49	85	3,230	3	Light Mikado	-	42	72	114	4,538								
68	16	85	3,370	2	Mohawk	-	84	20	104	3,427								125
47	27	78	2,611	1	Light Mikado	-	1	116	117	2,951	8	Light Mikado	-	3	134	137	3,026	142
63	12	91	3,903	3	Mohawk	-	74	17	105	4,097								
5	87	92	2,187	3	Santa Fe	-	4	108	112	2,561	3	Santa Fe	-	5	124	129	3,101	132
-	91	91	1,968	3	Texas	-	3	113	116	2,488	1	Texas	-	-	132	132	2,639	
82	10	92	5,677	3	Santa Fe	-	88	14	102	6,102	1	Texas	-	5	126	8,320		126
				6	Texas	-	116	3	119	7,925								
5	86	91	2,075	2	Santa Fe	-	3	115	118	2,529	7	Santa Fe	-	-	136	136	2,959	147
85	5	90	5,905	9	Santa Fe	-	99	3	102	6,528								105
				39							27							
				15.1							10.8							
				109							136							

Defendant's Exhibit No. 101 (Witness Peckenbaugh)
Dec. 11, 1940

CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY

Maximum Number of Cars Handled in Various Main Line Passenger Trains

Total for 10 day period of Sept. 11th to 20th, 1939

Train No.		Miles	Number of Cars 5	6	7	8	9	10	11	12	13	14	15	16	17& over	Total
	EAST															
10	Denver Zephyr Denver Chicago	1 039								10						10
40	Exposition Flyer Denver Chicago	1 018				3	3	4								10
2	Denver Omaha	538				2		1	2	1	2		2			10
8	Omaha Chicago	496								2	2	4	1	1		10
12	Aksarben Omaha Chicago	496										8	2			10
44	Empire Builder St.Paul Chicago	427						2	5	1	1		1			10
50	North Coast Limited St.Paul Chicago	427							6	1		2		1		10
	WEST															
49	Empire Builder Chicago St.Paul	427							4	4	1				1	10
51	North Coast Limited Chicago St.Paul	427						6	3	1						10
1	Denver Zephyr Chicago Denver	1 034								10						10
9-39	Exposition Flyer Chicago Denver	1 034									5	4			1	10
3	Overland Limited Omaha Denver	538												1	9	10
7	Fast Mail Chicago Omaha	496				1			2	3	3		1			10
5	Aksarben Chicago Omaha	501									1	7	1	1		10
	Total					6	3	13	22	33	15	25	8	4	11	140
	Percent of Total					4.3	2.1	9.3	15.7	23.6	10.7	17.9	5.7	2.8	7.9	

Defendant's Exhibit No. 102 (Witness E.A. White)
Dec. 11, 1940

D. CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY

FREIGHT OPERATING AND FREIGHT TRANSPORTATION EXPENSES
RELATED TO TRAFFIC

CALENDAR YEARS 1922 TO 1939, INCLUSIVE

YEAR	REVENUE TON-MILES	FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES	AVERAGES PER 1000 REVENUE TON-MILES	
				FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES
(a)	(b)	(c)	(d)	(e)	(f)
1939	8,417,254,230	$ 49,667,902	$24,079,371	$5.90	$2.86
1938	7,876,092,493	46,485,558	23,620,822	5.90	3.00
1937	9,423,152,685	53,134,728	26,245,501	5.64	2.79
1936	9,062,367,188	51,568,994	25,354,863	5.69	2.80
1935	7,522,419,565	44,464,660	21,974,560	5.91	2.92
1934	7,137,167,686	41,102,230	20,387,395	5.76	2.86
1933	6,598,638,696	38,076,839	19,112,469	5.77	2.90
1932	6,297,638,946	40,607,364	20,012,332	6.45	3.18
1931	8,888,693,958	54,903,035	26,995,591	6.18	3.04
1930	11,356,358,912	70,783,925	34,060,951	6.23	3.00
1929	12,873,521,492	81,080,606	38,555,883	6.30	2.99
1928	12,931,723,281	83,298,364	39,085,862	6.44	3.02
1927	11,942,859,045	80,582,534	39,217,201	6.75	3.28
1926	12,651,221,639	85,349,579	40,091,712	6.75	3.17
1925	12,298,287,741	85,375,245	40,479,808	6.94	3.29
1924	12,287,747,306	88,235,767	42,809,018	7.18	3.48
1923	12,690,384,346	101,617,298	47,939,723	8.01	3.78
1922	11,754,595,862	94,976,384	46,566,367	8.08	3.96
TOTAL 1936-	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

CALENDAR YEARS 1922 TO 1939, INCLUSIVE

YEAR	REVENUE TON-MILES	FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES	AVERAGES PER 1000 REVENUE TON-MILES	
				FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES
(a)	(b)	(c)	(d)	(e)	(f)
1939	8,417,254,230	$ 49,667,902	$24,079,371	$5.90	$2.86
1938	7,876,092,493	46,485,558	23,620,822	5.90	3.00
1937	9,423,152,685	53,134,728	26,245,501	5.64	2.79
1936	9,062,367,188	51,568,294	25,354,863	5.69	2.80
1935	7,522,419,565	44,464,660	21,974,560	5.91	2.92
1934	7,137,167,686	41,102,230	20,387,396	5.76	2.86
1933	6,598,638,696	38,076,339	19,112,469	5.77	2.90
1932	6,297,638,946	40,607,364	20,012,332	6.45	3.18
1931	8,888,693,958	54,903,035	26,995,591	6.18	3.04
1930	11,356,358,912	70,783,925	34,060,951	6.23	3.00
1929	12,873,521,492	81,080,606	38,555,883	6.30	2.99
1928	12,931,723,281	83,298,364	39,085,862	6.44	3.02
1927	11,942,359,045	80,582,534	39,217,201	6.75	3.28
1926	12,551,221,639	85,349,579	40,091,712	6.75	3.17
1925	12,298,287,741	85,375,245	40,479,808	6.94	3.29
1924	12,287,747,806	88,235,767	42,309,018	7.18	3.48
1923	12,690,384,346	101,617,298	47,939,723	8.01	3.78
1922	11,754,595,862	94,976,384	46,566,367	8.08	3.96
TOTAL 1936-1939	34,778,866,596	200,857,182	99,300,557	5.78	2.86
TOTAL 1922-1925	49,031,015,753	370,204,694	177,794,916	7.55	3.63
PER CENT OF IMPROVEMENT 4 YEARS 1936 - 1939 COMPARED WITH 4 YEARS 1922 - 1925				23.4	21.2

SOURCE: Revenue ton-miles, freight operating and transportation expenses - Annual Reports to Interstate Commerce Commission.

2956

Defendant's Exhibit No. 103 (Witness E.A. White)
Dec. 11, 1940

CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY

FREIGHT SERVICE OPERATING AVERAGES
CALENDAR YEARS 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 AND 1939

LINE NO. (a)	ITEM (b)	1922 (c)	1924 (d)	1926 (e)	1928 (f)	1930 (g)	1932 (h)	1934 (i)	1936 (j)	1938 (k)	1939 (l)	PERCENT INCREASE 1939 OVER 1922 (m)
1	Miles of line operated in freight service,.....	9,326	9,337	9,348	9,318	9,281	9,212	9,058	8,943	8,905	8,922	Dec. 4.3
2	Freight train miles,.....	18,711,594	18,980,218	18,616,607	18,108,927	15,832,993	12,009,187	14,031,619	16,245,498	13,051,444	13,479,993	Dec. 28.0
3	Freight cars per freight train,.....	41.5	44.5	48.5	50.9	51.5	43.2	43.0	42.3	45.4	46.3	11.6
4	Net tons per freight train,.....	727	746	794	844	830	620	609	665	699	727	-
5	Average tractive power per locomotive (pounds),.....	35,394	36,214	37,762	41,600	45,251	45,286	48,705	48,515	49,048	49,508	39.9
6	Average capacity per freight carrying car (tons),.....	42.2	42.1	43.1	43.1	43.3	43.3	43.1	43.2	44.2	44.4	5.2
07	Freight train speed (miles per hour)	11.9	12.3	12.8	13.2	14.0	16.2	17.5	17.3	17.3	17.6	47.9
8	Gross ton-miles per freight train-hour,.....	18,442	20,239	22,574	24,663	26,140	24,048	26,406	27,385	30,357	32,145	74.3
9	Net ton-miles per freight train-hour	8,644	9,209	10,162	11,176	11,655	10,047	10,630	11,426	12,043	12,727	47.2
10	Gross ton-miles (exclusive of locomotives and tenders) per ton of fuel,.....	10,458	10,995	12,747	14,245	14,795	13,662	13,945	13,676	14,992	15,526	48.5

SOURCE: Items 1, 2, 3, 4, 7 and 8 - Reports of Freight Train Performance, Form OS-A, filed with Interstate Commerce Commission.

Item 5 - Total tractive effort ÷ total steam locomotives available for service at close of each year as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 6 - Aggregate capacity of all freight carrying cars ÷ total number of such cars available for service at close of year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 9 - Net ton miles ÷ train hours as reported on Form OS-A to Interstate Commerce Commission.

Item 10- Gross ton miles (cars, contents and cabooses) ÷ equated net tons of fuel consumed as reported to Interstate Commerce Commission in years 1922 to 1934, inclusive, on Form OS-A and as reported in Years 1936, 1938 and 1939 on Forms OS-A and OS-E respectively.

5422

Defendant's Exhibit No. 104 (Witness White)
Dec. 11, 1940

CHICAGO, BURLINGTON AND QUINCY RAILROAD COMPANY

NUMBER OF CARS OF REVENUE FREIGHT CARRIED DURING THE

CLASS NUMBER (a)	COMMODITY GROUP OR CLASS (b)	ORIGINATING ON LINE: TERMINATING ON LINE (c)	ORIGINATING ON LINE: DELIVERED TO CONNECTING CARRIERS (d)	RECEIVED FROM CONNECTING CARRIERS: TERMINATING ON LINE (e)	RECEIVED FROM CONNECTING CARRIERS: DELIVERED TO CONNECTING CARRIERS (f)	TOTAL CARRIED (g)
110	Oranges & grapefruit	-	-	2,028	2,756	4,784
111	Lemons, limes & citrus fruits n.o.s.	-	-	91	177	268
120	Apples, fresh	194	77	1,709	7,154	9,134
121	Bananas	-	-	2,811	1,007	3,818
122	Berries, fresh	3	1	145	109	258
123	Cantaloupes & melons n. o. s.	9	1	408	979	1,397
124	Grapes, fresh	33	61	217	1,367	1,678
125	Peaches, fresh	23	53	474	577	1,127
126	Watermelons	27	2	170	115	314
127	Fruits, fresh domestic n. o. s.	10	3	651	1,931	2,595
128	Fruits, fresh tropical n. o. s.	-	-	44	17	61
130	Potatoes other than sweet	1,058	3,057	4,452	4,889	13,456
140	Cabbage	42	71	335	206	654
141	Onions	18	51	347	437	853
142	Tomatoes	8	-	420	594	1,022
143	Vegetables, fresh n. o. s.	115	318	3,616	8,873	12,922
	Total 110 to 143, Inclusive	1,540	3,695	17,918	31,188	54,341
800	Total Products of Agriculture	81,567	39,468	33,841	40,046	194,922
850	Total Carload Traffic	307,035	235,642	235,781	161,177	939,635

Defendant's Exhibit No. 105 (Witness Gareiss)
Dec. 11, 1940

ILLINOIS CENTRAL RAILROAD COMPANY

NUMBER OF CARLOADS OF REVENUE FREIGHT CARRIED OF CERTAIN SELECTED COMMODITIES, TOTAL PRODUCTS OF AGRICULTURE AND TOTAL CARLOAD TRAFFIC, AS SHOWN ON SCHEDULE 541 OF THE ANNUAL REPORT TO THE INTERSTATE COMMERCE COMMISSION.

CALENDAR YEAR 1939

CLASS NUMBER (a)	COMMODITY GROUP OR CLASS (b)	ORIGINATING ON RESPONDENT'S ROAD: TERMINATING ON LINE (c)	ORIGINATING ON RESPONDENT'S ROAD: DELIVERED TO CONNECTING CARRIERS (d)	RECEIVED FROM CONNECTING CARRIERS: TERMINATING ON LINE (e)	RECEIVED FROM CONNECTING CARRIERS: DELIVERED TO CONNECTING CARRIERS (f)	TOTAL CARRIED (g)
110	Oranges & grapefruit	1	4	4,122	2,820	6,947
111	Lemons, limes & citrus fruits n.o.s.	1	-	226	563	790
120	Apples, fresh	32	187	1,348	1,639	3,206
121	Bananas	7,705	10,249	2,722	3,229	23,905
122	Berries, fresh	61	193	99	96	449
123	Cantaloupes & melons n. o. s.	2	6	88	306	402
124	Grapes, fresh	-	-	180	1,818	1,998
125	Peaches, fresh	74	300	293	196	863
126	Watermelons	45	65	1,232	1,031	2,373
127	Fruits, fresh domestic n. o. s.	43	97	460	1,993	2,593
128	Fruits, fresh tropical n. o. s.	2	13	161	178	354
130	Potatoes other than sweet	97	126	7,451	6,311	13,985
140	Cabbage	418	2,031	931	646	4,026
141	Onions	77	26	685	452	1,240
142	Tomatoes	370	1,597	753	931	3,651
143	Vegetables, fresh n. o. s.	521	806	2,792	6,669	10,788
	Total	9,449	15,700	23,543	28,878	77,570
800	Total Products of Agriculture	68,056	56,839	49,431	50,876	225,202
850	Grand Total Carload Traffic	276,441	327,600	263,007	232,849	1,099,897

Defendant's Exhibit No. 106 (Witness Gareiss)
Dec. 11, 1940

THE YAZOO AND MISSISSIPPI VALLEY RAILROAD COMPANY

STATEMENT SHOWING NUMBER OF CARLOADS OF REVENUE FREIGHT CARRIED OF CERTAIN SELECTED COMMODITIES, TOTAL PRODUCTS OF AGRICULTURE AND TOTAL CARLOAD TRAFFIC, AS SHOWN ON SCHEDULE 541 OF THE ANNUAL REPORT TO THE INTERSTATE COMMERCE COMMISSION.

CALENDAR YEAR 1939

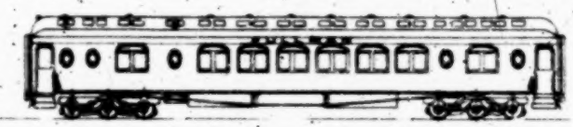
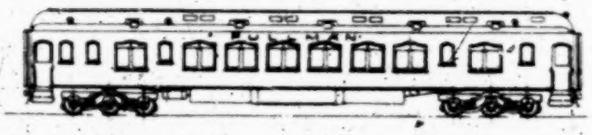
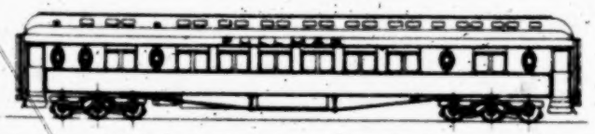
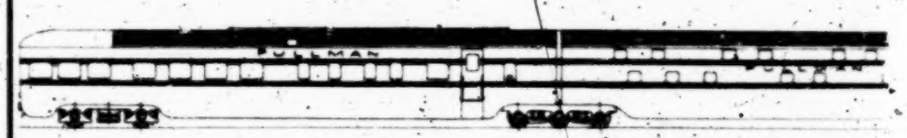
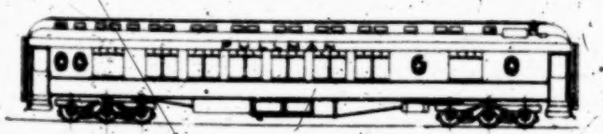
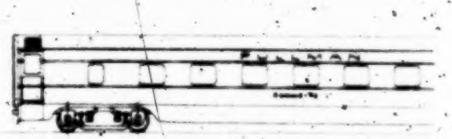
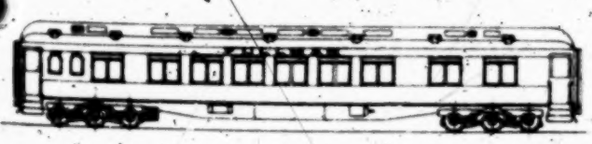
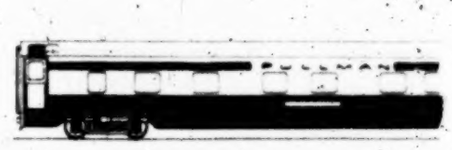
CLASS NUMBER (a)	COMMODITY GROUP OR CLASS (b)	ORIGINATING ON RESPONDENT'S ROAD: TERMINATING ON LINE (c)	ORIGINATING ON RESPONDENT'S ROAD: DELIVERED TO CONNECTING CARRIERS (d)	RECEIVED FROM CONNECTING CARRIERS: TERMINATING ON LINE (e)	RECEIVED FROM CONNECTING CARRIERS: DELIVERED TO CONNECTING CARRIERS (f)	TOTAL CARRIED (g)
110	Oranges & grapefruit	11	1	293	345	650
111	Lemons, limes & citrus fruits n.o.s.	-	-	78	611	689
120	Apples, fresh	1	-	184	47	232
121	Bananas	20	16	101	276	413
122	Berries, fresh	-	-	-	1	1
123	Cantaloupes & melons n. o. s.	-	11	3	27	41
124	Grapes, fresh	-	-	64	90	154
125	Peaches, fresh	-	-	4	15	19
126	Watermelons	-	105	3	62	170
127	Fruits, fresh domestic n. o. s.	1	-	6	8	15
128	Fruits, fresh tropical n. o. s.	-	1	-	-	1
130	Potatoes other than sweet	10	211	433	141	795
140	Cabbage	8	312	49	153	522
141	Onions	1	-	73	104	178
142	Tomatoes	4	350	51	237	642
143	Vegetables, fresh n. o. s.	1	744	278	905	1,928
	Total	57	1,751	1,620	3,022	6,450
800	Total Products of Agriculture	28,009	15,208	8,842	7,993	60,052
850	Grand Total Carload Traffic	80,235	80,534	66,687	38,791	266,247

Defendant's Exhibit No. 107 (Witness Parke)
~~Xxxx~~ Dec. 11, 1940

THE PULLMAN COMPANY

CHRONOLOGY OF ADVANCES IN SLEEPING CAR CONSTRUCTION

YEARS 1900 TO 1940

	YEAR	NEW FEATURES	LENGTH OVER PLATFORMS COUPLED	AVERAGE WEIGHT ON 6 TRUCKS	AVERAGE WEIGHT ON ONE TRUCK	SIDE ELEVATION
	1900 1901 1902 1903	HELICAL SPRING DRAFT GEAR. NATIONAL COUPLERS WITH YORK CENTERING DEVICE. WROT IRON BODY BOLSTERS. WOOD & STEEL TRUSS ROD UNDERFRAME. WOOD BODY WITH WOOD & CANVAS ROOF & WOOD INTERIOR. WOOD FRAME VESTIBULE. PLAIN BRAKE SCHEDULE ONE 14" CYLINDER BODY HUNG. M.C.B. 6 WHEEL TRUCK WOOD FRAME STEEL PLATES. TRIPLE BRAKES 4½" x 8½" JOURNALS. PLAIN BRAKE BEAMS. PRESS PLATE STEEL WHEELS 36 DIA. "GARRETT" HOT WATER HEAT. PINTSCH GAS LIGHTING. 1½" STEAM TRAINLINE.	78'-10"	120,000 lbs	19,000 lbs	
	1904	NATIONAL COUPLERS WITH CHAPPEE CENTERING DEVICE. P.M. BRAKE SCHEDULE ONE 16" CYLINDER BODY HUNG. M.C.B. 6 WHEEL TRUCK WOOD FRAME STEEL PLATES. TRIPLE BRAKES 5" x 9" JOURNALS. DIAMOND SPECIAL FORGED STEEL BRAKE BEAMS.	80'-4"	122,000 lbs	19,000 lbs	
	1906	WESTINGHOUSE D-3 WEDGE TYPE FRICTION DRAFT GEAR. BUNHUP 3-STEM COUPLERS. CAST STEEL BODY BOLSTERS. WOOD & STEEL VESTIBULE. L.N. BRAKE SCHEDULE, TWO 15" CYLINDERS. GAS & ELECTRIC LIGHTS WITH HEAD END ELECTRIC UNIT.	81'-6"	124,000 lbs	19,000 lbs	
	1907	FIRST ALL STEEL STRUCTURE PULLMAN CAR. TRUSS ROD STEEL UNDERFRAME WITH 10" I BEAM SILL. STEEL BODY WITH STEEL PLATE EXTERIOR. STEEL ROOF. STEEL VESTIBULE. P.M. BRAKE SCHEDULE WITH ONE 18" CYLINDER. GAS & ELECTRIC LIGHTS WITH BATTERIES.	80'-5"	146,629 lbs	20,700 lbs	
	1910	BODY, STEEL, WITH INTERLOCKING STEEL SHEATHING EXTERIOR, STEEL ROOF, & STEEL VESTIBULE. COMBINATION CAST STEEL PLATFORMS & BODY BOLSTERS. BUILT UP STEEL CENTER SILLS 26" DEEP. STEEL INTERIOR. NEW NYBSD CAST STEEL TRUCK, 5"x9" JOURNALS, TRIPLE BRAKES. PITT COUPLERS. VAPOR HEAT. ELECTRIC LIGHTS WITH BELT DRIVEN GENERATOR.	81'-10"	150,160 lbs	22,000 lbs	
	1911	P.C. BRAKE SCHEDULE WITH TWO 18" CYLINDERS.	81'-10"	150,300 lbs	22,000 lbs	
	1912 1913	CROCO DOUBLED TYPE STEEL BRACE BEAMS. VESTIBULE STEEL U-BEAM CONSTRUCTION. ROLLED STEEL WHEELS 36" DIA.	81'-10"	151,100 lbs	22,000 lbs	

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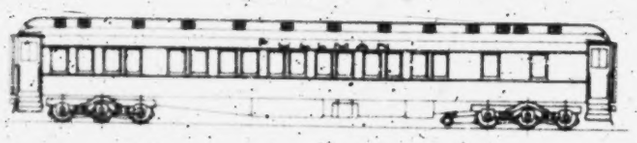
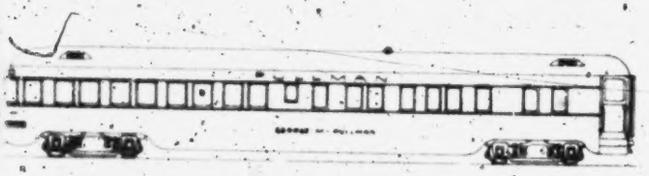
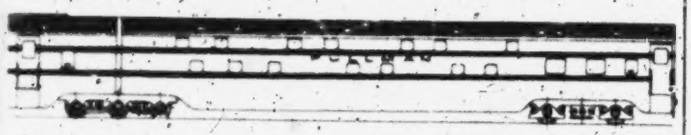
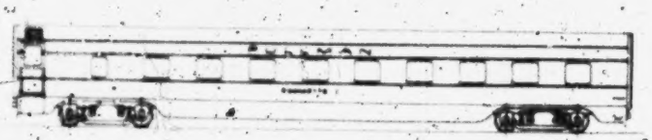
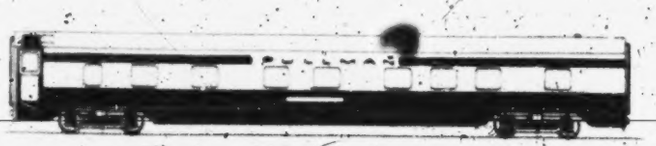
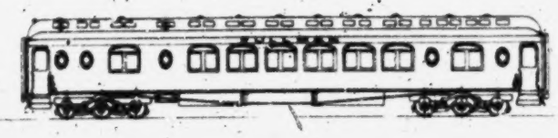
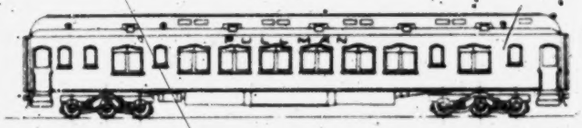
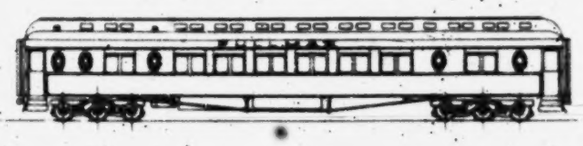
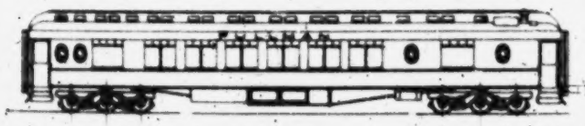
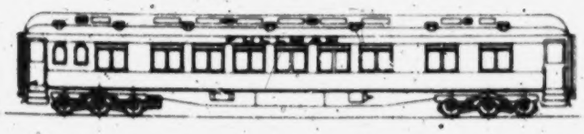
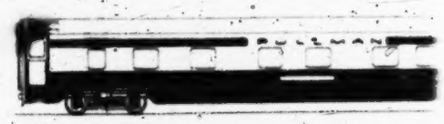
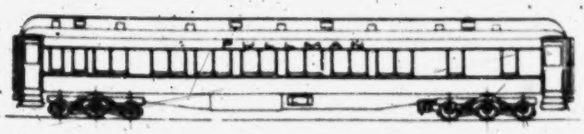
R CONSTRUCTION

SIDE ELEVATION	YEAR	NEW FEATURES	LENGTH OVER PLATFORMS COUPLED	AVERAGE WEIGHT CAR & TRUCKS	AVERAGE WEIGHT OF ONE TRUCK
	1923	LENGTH OF CARS INCREASED. WEIGHT OF CARS INCREASED.	82'-11½"	161 700 lbs.	22,600 lbs.
	1927	NEW 26 II CAST STEEL TRUCK. WAUGH FRICTION PLATES DRAFT GEAR. 2" STEAM TRAINLINE METAL CONNECTORS. FIRST MECHANICAL AIR CONDITIONING SYSTEM TRIED OUT ON EXISTING CARS.	82'-11½"	170,000 lbs.	24,600 lbs.
	1929	FIRST TEST APPLICATION OF ICE ACTUATED AIR CONDITIONING SYSTEM TO EXISTING CARS.			
	1933	FIRST ALL ALUMINUM LIGHTWEIGHT PULLMAN CAR. SPECIAL WAUGH RUBBER TYPE DRAFT GEAR. SPECIAL TYPE "D" COUPLER. ROLLED STEEL WHEELS. I.P.S. FORGED ALUMINUM ALLOY BRAKE BEAMS. U.C.B.C. BRAKE SCHEDULE, 16" DIA. CYLINDER. SPECIAL 4-WHEEL TRUCKS, LATER CHANGED TO STD. 6-WHEEL CAST STEEL TRUCKS. ALUMINUM ALLOY UNDERFRAME AND BODY. ALUMINUM ALLOY BODY BOLSTER BUILT UP TYPE. ALUMINUM ALLOY ROOF. 2" STEAM TRAINLINE. ALUMINUM ALLOY VESTIBULE SPECIAL. VAPOR HEAT. AIR CONDITIONED.	84'-3"	119700 lbs.	
	1934	ALL ALUMINUM ARTICULATED STREAMLINER "CITY OF PORTLAND" ALUMINUM CONSTRUCTION.	64'-6"	63,690 lbs.	16,200 lbs.
	1935	AXLES WITH LARGER WHEEL SEATS AND CENTERS INTRODUCED FOR CONVENTIONAL & LIGHT WEIGHT CARS.			
	1936	LIGHT WEIGHT TWIN CAR UNIT RIVETED GIRDER TYPE HIGH TENSILE STEEL CAR STRUCTURE. SPECIAL WAUGH RUBBER HAT DRAFT GEAR. THAT LOCK COUPLER. U.C. BRAKES WITH TRUCK HUNG CYLINDERS, 6-11" CYLINDERS. TRUCKS: TWO 4-WHEEL TRIPLE BOLSTER ONE 6-WHEEL DOUBLE BOLSTER ROLLER BEARING JOURNALS, 3½" DIA ROLLED STEEL WHEELS. UNDERFRAME, BODY, BODY BOLSTERS & ROOF HIGH TENSILE STEEL. AIR CONDITIONED. BUILT UP ALLOY STEEL VESTIBULE.	133'-0"	Complete Unit 223,200 lbs.	4-WHEEL 19,600 lbs. 6-WHEEL 25,400 lbs.
	1936	"CITY OF LOS ANGELES" STREAMLINER (Aluminum Construction) "CITY OF SAN FRANCISCO" STREAMLINER (Aluminum Construction) "CITY OF DENVER" STREAMLINER.	64'-10½" 64'-10½" 63'-6"	70436 lbs. 69,660 lbs. 70,380 lbs.	18,738 lbs. 18,436 lbs. 17,444 lbs.
	1937	FIRST WELDED GIRDER TYPE HIGH TENSILE STEEL CAR STRUCTURE. WAUGH RUBBER HATT DRAFT GEAR. H-5-C BRAKE SCHEDULE WITH FOUR 12" TRUCK HUNG CYLINDERS. HEAT TREATED 36½" DIA STEEL WHEELS. 2½" STEAM TRAINLINE. TRUCKS 4 WHEEL NICKEL STEEL TRIPLE BOLSTER AIR CONDITIONED.	84'-6"	130690 lbs.	18,850 lbs.
	1938	NEW LIGHT WEIGHT HIGH TENSILE STEEL CAR STRUCTURE, WITH TRUSS FRAME & CORRUGATED STAINLESS STEEL EXTERIOR ROOF & SIDE SHEATHING. BRAKES H-5-C SCHEDULE WITH FOUR 12" TRUCK HUNG BRAKE CYLINDERS. TRUCKS 63-E 4-WHEEL TRIPLE BOLSTER. HIGH TENSILE STEEL ROOFING STAINLESS STEEL EXTERIOR. 8½" x 10" JOURNALS	84'-6"	116,000 lbs.	18,400 lbs.

			COUPLED	6 TRUCKS	ONE TRUCK	
	1900 1901 1902 1903	HELICAL SPRING DRAFT GEAR NATIONAL COUPLERS WITH RIGID CENTERING DEVICE. WROT IRON BODY BOLSTERS. WOOD & STEEL TRUSS ROD UNDERFRAME. WOOD BODY WITH WOOD & CANVAS ROOF & WOOD INTERIOR. WOOD FRAME VESTIBULE. P.M. BRAKE SCHEDULE ONE 14" CYLINDER BODY HUNG. M.C.B. 6 WHEEL TRUCK WOOD FRAME STEEL PLATES. TRIPLE BRAKES. 4½" x 8½" JOURNALS. HOP BRAKE BEAMS. PRESS PLATE STEEL WHEELS. 36" DIA. "SIMPLEX" HOT WATER HEAT. PINTSCH GAS LIGHTING. 1½" STEAM TRAINLINE.	78'-10"	120,000 lbs	19[illegible]	
	1904	NATIONAL COUPLERS WITH CHESTER CENTERING DEVICE. P.M. BRAKE SCHEDULE ONE 14" CYLINDER BODY HUNG. M.C.B. 6 WHEEL TRUCK WOOD FRAME STEEL PLATES. TRIPLE BRAKES. 5" x 9" JOURNALS. DIAMOND SPECIAL FORGED STEEL BRAKE BEAMS.	80'-4"	122,000 lbs	19000 lbs	
	1906	WESTINGHOUSE D-3 WEDGE TYPE FRICTION DRAFT GEAR. BUHRUP 3-STEM COUPLERS. CAST STEEL BODY BOLSTERS. WOOD & STEEL VESTIBULE. L.N. BRAKE SCHEDULE. TWO 14" CYLINDERS. GAS & ELECTRIC LIGHTS, WITH HEAD END ELECTRIC UNIT.	81'-6"	124,000 lbs	19000 lbs	
	1907	FIRST ALL STEEL STRUCTURE PULLMAN CAR. TRUSS ROD STEEL UNDERFRAME WITH 10" I BEAM SILLS. STEEL BODY WITH STEEL PLATE EXTERIOR. STEEL ROOF. STEEL VESTIBULE. P.M. BRAKE SCHEDULE WITH ONE 18" CYLINDER. GAS & ELECTRIC LIGHTS WITH BATTERIES.	80'-5"	165659 lbs	20 300 lbs	
	1910	BODY STEEL, WITH INTERLOCKING STEEL SHEATHING EXTERIOR STEEL ROOF, & STEEL VESTIBULE. COMBINATION CAST STEEL PLATFORMS & BODY BOLSTERS. BUILT UP STEEL CENTER SILLS 24" DEEP. STEEL INTERIOR. NEW RIGID CAST STEEL TRUCK. 5½" JOURNALS. TRIPLE BRAKES. H.T.T. COUPLERS. VAPOR HEAT. ELECTRIC LIGHTS WITH BELT DRIVEN GENERATOR.	81'-10"	150,300 lbs	22,000 lbs	
	1911	P.C. BRAKE SCHEDULE WITH TWO 18" CYLINDERS.	81'-10"	150300 lbs	22,000 lbs	
	1912 1913	CORCO TRUSSED TYPE STEEL BRAKE BEAMS VESTIBULE STEEL U-BEAM CONSTRUCTION. ROLLED STEEL WHEELS 36" DIA.	81'-10"	151,100 lbs	22,000 lbs	
	1918	BUILT UP STRUCTURAL STEEL BOLSTERS & PLATFORMS.	81'-10"	153,300 lbs	22,000 lbs	
	1916	NEW STRUCTURAL STEEL FRAMING WITH STEEL PLATE EXTERIOR. U.C. BRAKE SCHEDULE WITH TWO 16" CYLINDERS OR ONE 18" CYLINDER.	81'-10"	153,500 lbs	22,000 lbs	
	1917	CLOSED [illegible] TRUCK FITTED TO NEW TYPE "E" 2440 CAST STEEL 6 WHEEL TRUCK. FORGED STEEL BRAKE BEAMS SCHEDULE TYPE.	81'-10"	154,000 lbs	22400 lbs	
	1920 1921	WESTINGHOUSE TYPE H-6 FRICTION PLATE DRAFT GEAR TYPE "D" COUPLERS QUADRUPLE SHEAR YOKES. NEW NO 88 CAST STEEL TRUCK WITH CLOSE SPRINGS. IMPROVED CLOSED BEAMS. 2" STEAM TRAINLINE. WEIGHT OF CAR INCREASED.	81'-11½"	159000 lbs	22 800 lbs	

BRAKE S

PM. EMERGENCY BRAKING RATIO

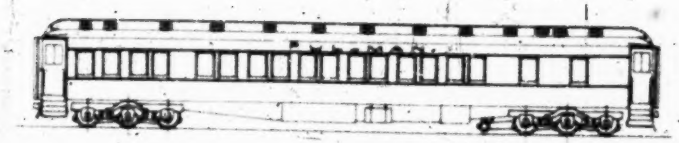
L.N. EMERGENCY BRAKING RATIO

P.C. EMERGENCY BRAKING RATI

- SERVICE APPLICATION DE

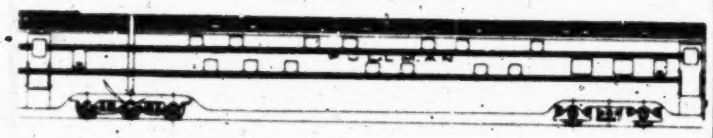
U.C. SAME AS P.C. EXCEPT IT CA

H.S.C. OPERATED SAME AS U.C

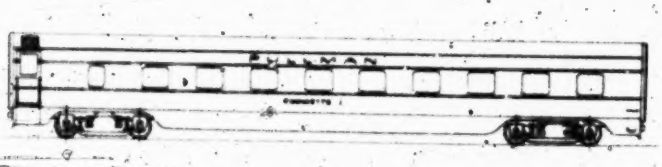


1927	NEW 2611 CAST STEEL TRUCK. WAUGH FRICTION PLATES DRAFT GEAR. 2" STEAM TRAINLINE METAL CONNECTORS. FIRST MECHANICAL AIR CONDITIONING SYSTEM TRIED OUT ON EXISTING CARS.	82'-11½"	170,000 lbs.	24,000 lbs.
1929	FIRST TEST APPLICATION OF ICE ACTUATED AIR CONDITIONING SYSTEM TO EXISTING CARS.			

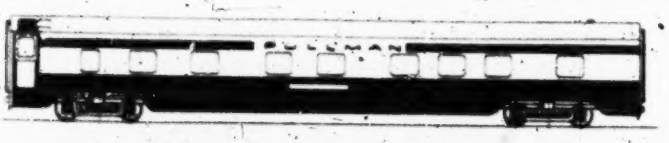
1933	FIRST ALL ALUMINUM LIGHT WEIGHT PULLMAN CAR. SPECIAL WAUGH RUBBER TYPE DRAFT GEAR. SPECIAL TYPE "D" COUPLER. ROLLED STEEL WHEELS. H-S-F FORGED ALUMINUM ALLOY BRAKE BEAMS. U.C.S.C. BRAKE SCHEDULE, 16" DIA. CYLINDER. SPECIAL 4-WHEEL TRUCKS, LATER CHANGED TO STD. 6-WHEEL CAST STEEL TRUCKS. ALUMINUM ALLOY UNDERFRAME AND BODY. ALUMINUM ALLOY BODY BOLSTERS BUILT UP TYPE. ALUMINUM ALLOY ROOF. 2" STEAM TRAINLINE. ALUMINUM ALLOY VESTIBULE SPECIAL. VAPOR HEAT. - AIR CONDITIONED.	84'-3"	119,700 lbs.	
1934	ALL ALUMINUM ARTICULATED STREAMLINER "CITY OF PORTLAND" ALUMINUM CONSTRUCTION.	64'-6"	63,690 lbs.	16,200 lbs.
1935	ROLLER WITH LARGER WHEEL SEATS AND CENTERS INTRODUCED FOR CONVENTIONAL & LIGHT WEIGHT CARS.			



1936	LIGHT WEIGHT TWIN CAR UNIT. RIVETED GIRDER TYPE HIGH TENSILE STEEL CAR STRUCTURE. SPECIAL WAUGH RUBBER MATT DRAFT GEAR. TIGHT LOCK COUPLER. U.C. BRAKES WITH TRUCK HUNG CYLINDERS. 6-12" CYLINDER TRUCKS - TWO 4-WHEEL TRIPLE BOLSTER. ONE 6-WHEEL DOUBLE BOLSTER. ROLLER BEARING JOURNALS. 5½"x10" DIA. ROLLED STEEL WHEELS. UNDERFRAME, BODY, BODY BOLSTERS, & ROOF HIGH TENSILE STEEL. AIR CONDITIONED. BUILT UP ALLOY STEEL VESTIBULE.	153'-0"	COMPLETE UNIT 223,200 lbs.	4-WHEEL 19,600 lbs. 6-WHEEL 25,400 lbs.
1936	"CITY OF LOS ANGELES" STREAMLINER "CITY OF SAN FRANCISCO" STREAMLINER "CITY OF DENVER" STREAMLINER ALUMINUM CONSTRUCTION	64'-10½" 64'-10½" 63'-6"	70,936 lbs. 69,660 lbs. 70,980 lbs.	18,732 lbs. 18,436 lbs. 17,666 lbs.



1937	FIRST WELDED GIRDER TYPE HIGH TENSILE STEEL CAR STRUCTURE. WAUGH RUBBER MATT DRAFT GEAR. H-S-C BRAKE SCHEDULE WITH FOUR 12" TRUCK HUNG CYLINDERS. HEAT TREATED 36½" DIA. STEEL WHEELS. 2½" STEAM TRAINLINE. TRUCKS: 4-WHEEL NICKEL STEEL TRIPLE BOLSTER AIR CONDITIONED.	84'-6"	130,690 lbs.	18,850 lbs.



1938.	NEW LIGHT WEIGHT HIGH TENSILE STEEL CAR STRUCTURE WITH TRUSS FRAME & CORRUGATED STAINLESS STEEL EXTERIOR ROOF & SIDE HOUSING. BRAKES, H-S-C SCHEDULE WITH FOUR 12" TRUCK HUNG BRAKE CYLINDERS. TRUCKS, 83-C, 4-WHEEL TRIPLE BOLSTER. HIGH TENSILE STEEL FRAMING, STAINLESS STEEL EXTERIOR. 5½"x10" JOURNALS.	84'-6"	116,000 lbs.	18,400 lbs.

1939	WAUGH TWIN TYPE RUBBER DRAFT GEAR. TRUCKS 4-WHEEL 6-WHEEL DROP EQUALIZER. HELICAL BOLSTER SPRINGS, SHOCK ABSORBERS, 2 STAY ROD.	84'-6"	126,800 lbs.	19,000 lbs.

BRAKE SCHEDULES.

P.M. EMERGENCY BRAKING RATIO 127% REDUCED DURING STOPPING TIME.

L.N. EMERGENCY BRAKING RATIO 150% MAINTAINED THROUGHOUT STOP.

P.C. EMERGENCY BRAKING RATIO 150% WITH EMERGENCY AFTER LIGHT SERVICE APPLICATION. DESIGNED FOR 110 lbs. TRAIN LINE PRESSURE.

U.C. SAME AS P.C. EXCEPT IT CAN OPERATE AT ANY BRAKE PRESSURE.

H.S.C. OPERATES SAME AS U.C. CAN BE CONNECTED FOR HIGHER BRAKING PRESSURES & ELECTRO PNEUMATIC CONTROL.

THE PULLMAN COMPANY
OFFICE OF CHIEF ENGINEER
PULLMAN BLDG. CHICAGO, ILL.

MICROCARD 22
TRADE MARK ®

44

MATTHEW BENDER & COMPANY
639
microcard

13300 N

Defendant's Exhibit No. 108 (Witness Peter Parke)
Dec. 12, 1940

THE PULLMAN COMPANY

DEC 12 1940

Clerk

NUMBER OF PULLMAN CARS "ON HAND", DECEMBER 31

YEAR	TOTAL DECEMBER 31	CARS ADDED DURING YEAR						
		NEW			REBUILT			
		WOOD	STEEL	TOTAL	WOOD	STEEL	TOTAL	PURCHASED
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
1900	3,027	103		103	126		126	9
1901	3,175	221		221	101		101	8
1902	3,326	200		200	89		89	11
1903	3,658	403		403	94		94	-
1904	3,947	350		350	18		18	-
1905	4,092	219		219	2		2	-
1906	4,312	276		276	33		33	-
1907	4,531	295	1	296	9		9	-
1908	4,818	295	-	295	12		12	26
1909	5,025	155	5	160	37		37	93
1910	5,513	54	519	573	23		23	-
1911	5,970	-	519	519	82		82	-
1912	6,164	12	285	297	38		38	-
1913	7,027		785	785	464		464	257
1914	7,083		377	377	615		615	-
1915	7,104		374	374	137		137	-
1916	7,296		412	412	31		31	-
1917	7,706		448	448	-		-	61
1918	7,711		108	108	-		-	-
1919	7,641		-	-	-		-	-
1920	7,727		415	415	-		-	-
1921	7,826		260	260	-		-	-
1922	7,765		123	123	1	1	2	-
1923	7,602		238	238	56	19	75	-
1924	8,003		477	477	98	52	150	-
1925	8,805		887	887	21	-	21	11
1926	8,952		512	512	27	3	30	-
1927	9,068		289	289	-	-	-	-
1928	9,249		206	206	11	-	11	-
1929	9,528		394 (374)	394	2	-	2	-
1930	9,701		339	339	1	8	9	-
1931	9,379		2	2	-	5	5	-
1932	9,276		-	-	-	35	35	-
1933	8,478		1	1	-	28	28	-

YEAR	TOTAL DECEMBER 31	CARS ADDED DURING YEAR						
		NEW			REBUILT			
		WOOD	STEEL	TOTAL	WOOD	STEEL	TOTAL	PURCHASED
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
1900	3,027	103		103	126		126	9
1901	3,175	221		221	101		101	8
1902	3,326	200		200	89		89	11
1903	3,658	403		403	94		94	-
1904	3,947	350		350	18		18	-
1905	4,092	219		219	2		2	-
1906	4,312	276		276	33		33	-
1907	4,531	295	1	296	9		9	-
1908	4,818	295	-	295	12		12	26
1909	5,025	155	5	160	37		37	93
1910	5,513	54	519	573	23		23	-
1911	5,970	-	519	519	82		82	-
1912	6,164	12	285	297	38		38	-
1913	7,027		785	785	464		464	257
1914	7,083		377	377	615		615	-
1915	7,104		374	374	137		137	-
1916	7,296		412	412	31		31	-
1917	7,706		448	448	-		-	61
1918	7,711		108	108	-		-	-
1919	7,641		-	-	-		-	-
1920	7,727		415	415	-		-	-
1921	7,826		260	260	-		-	-
1922	7,765		123	123	1	1	2	-
1923	7,602		238	238	56	19	75	-
1924	8,003		477	477	98	52	150	-
1925	8,805		887	887	21	-	21	11
1926	8,952		512	512	27	3	30	-
1927	9,068		289	289	-	-	-	-
1928	9,249		206	206	11	-	11	-
1929	9,528		~~394~~ (394)	~~394~~ 394	2	-	2	-
1930	9,701		339	339	1	8	9	-
1931	9,379		2	2	-	5	5	-
1932	9,276		-	-	-	35	35	-
1933	8,478	LIGHTWEIGHT	1	1	-	28	28	-
1934	8,473		-	-	-	44	44	-
1935	8,027		3	3	-	35	35	-
1936	8,004		19	19	-	38	38	-
1937	7,763		33	33	-	35	35	-
1938	7,578		156	156	-	1	1	-
1939	7,092		78	78	-	58	58	-

[fol. 5428]

DEFENDANT'S EXHIBIT No. 109 (Witness Parke)

Dec. 12, 1940

The Pullman Company Classification of Cars Owned as of December 31, 1900 to 1939, Inclusive, as Wood, Steel or Lightweight

Year	Cars "On Hand" December 31			
	Total	Wood	Steel	Lightweight
1900	3027	3027		
1901	3127	3175		
1902	3326	3326		
1903	3658	3658		
1904	3947	3947		
1905	4092	4092		
1906	4312	4312		
1907	4531	4530	1	
1908	4818	4817	1	
1909	6025	5019	6	
1910	5513	4988	525	
1911	5970	4926	1044	
1912	6164	4836	1328	
1913	7027	4914	2113	
1914	7083	4593	2490	
1915	7104	4240	2864	
1916	7296	4020	3276	
1917	7706	3983	3723	
1918	7711	3883	3828	
1919	7641	3820	3821	
1920	7727	3493	4234	
1931	7826	3344	4482	
1922	7765	3162	4603	
1923	7602	2764	4838	
1924	8003	2689	5314	
1925	8805	2600	6205	
1926	8952	2241	6711	
1927	9068	2073	6995	
1928	9249	2051	7198	
1929	9528	1940	7588	
1930	9701	1779	7922	
1931	9379	1490	7889	
1932	9276	1388	7888	
1933	8478	587	7890	1
1934	8473	586	7886	1
1935	8027	154	7869	4
1936	8004	130	7851	23
1937	7763	18	7689	56
1938	7578	17	7349	212
1939	7052	8	6756	288

Defendant's Exhibit No. 110 (Witness J.B. Baker)
Dec. 12, 1940

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

STATEMENT SHOWING BY ACCOUNTS APPRAISED MARKET VALUE OF LAND AND REPRODUCTION COST NEW OF OTHER FACILITIES AS SHOWN IN THE I.C.C. 19A VALUATION REPORTS AS OF VALUATION DATES ADJUSTED FOR ADDITIONS, BETTERMENTS AND RETIREMENTS, AS SHOWN IN CARRIER'S REPORTS TO I.C.C. UNDER VALUATION ORDER 3

DOES NOT INCLUDE ROLLING EQUIPMENT

Location of Facilities (A)	Reproduction Cost New Including Additions and Betterments less Retirements to December 31, 1923 (B)	Additions, Betterments and Retirements January 1, 1924 to December 31, 1939		Total to December 31, 1939 (E)	Road Miles (F)	Main Track Miles (G)
		Additions (C)	Retirements (D)			
PACIFIC LINES						
California	354,945,709	160,220,136	65,803,075	449,362,770	4,290.73	4,739.29
Nevada	35,034,464	13,691,282	6,626,334	42,099,412	663.68	973.42
Utah	17,745,849	4,939,506	1,262,159	21,423,216	259.53	302.44
Oregon	70,814,021	47,155,392	13,462,593	104,506,820	1,344.20	1,345.96
Arizona	50,441,379	29,336,157	10,901,511	68,876,025	1,208.49	1,273.25
New Mexico	30,921,528	10,959,779	7,538,129	34,343,178	859.53	862.20
Texas	6,223,492	1,211,106	430,497	7,004,101	21.96	27.81
Off Line Property	651,986	871,432	82,051	1,441,367	-	-
Total Pacific Lines	566,778,448	268,384,790	106,106,349	729,056,889	8,648.12	9,524.37
TEXAS AND LOUISIANA LINES						
Texas	149,624,899	76,009,787	35,267,737	190,366,949	3,681.55	3,738.85
Louisiana	34,495,611	12,985,149	8,695,910	38,784,850	677.11	714.04
Total Texas and Louisiana Lines	184,120,510	88,994,936	43,963,647	229,151,799	4,358.66	4,452.89
GRAND TOTAL	750,898,958	357,379,726	150,069,996	958,208,688	13,006.78	13,977.26

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Defendant's Exhibit No. 111 (Witness J.B.Baker)
Dec. 12, 1940

Superior Court, Pima Co., Arizona
State v. S.P.Co. No. 20087

Defts.Ex.No. (Witness)

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

STATEMENT SHOWING BY ACCOUNTS APPRAISED MARKET VALUE OF LAND AND REPRODUCTION COST NEW OF OTHER FACILITIES AS SHOWN IN THE I.C.C. 19A VALUATION REPORTS AS OF VALUATION DATES ADJUSTED FOR ADDITIONS, BETTERMENTS AND RETIREMENTS, AS SHOWN IN CARRIER'S REPORTS TO I.C.C. UNDER VALUATION ORDER 3

Sheet 1 of 1 Sheet

YUMA, ARIZONA, TO EL PASO, TEXAS, VIA GILA AND LORDSBURG
TUCSON, ARIZONA, TO EL PASO, TEXAS, VIA DOUGLAS
WELLTON, ARIZONA, TO PICACHO, ARIZONA, VIA PHOENIX

SUMMARY

Account Number (A)	Description (B)	Reproduction Cost New Including Additions and Betterments less Retirements to December 31, 1923 (C)	Additions, Betterments and Retirements January 1, 1924 to December 31, 1939 Additions (D)	Retirements (E)	Total to December 31, 1939 (F)
		$	$	$	
1	Engineering	1,285,487	597,483	18,750	1,864,220
2	Land for Transportation Purposes	7,077,966	400,884	21,554	7,457,296
3	Grading	6,374,396	2,925,107	162,150	9,137,353
5	Tunnels and Subways	173,231	1,896	2,500	172,627
6	Bridges, Trestles and Culverts	3,679,459	5,048,753	842,609	7,885,603
8	Ties	4,785,558	2,027,171	217,703	6,595,026
9	Rails	6,853,064	7,833,864	5,382,608	9,304,320
10	Other Track Material	3,280,419	4,339,736	2,360,845	5,259,310
11	Ballast	2,290,517	1,662,804	35,663	3,917,658
12	Tracklaying and Surfacing	2,799,654	1,494,204	130,617	4,163,241
13	Right of Way Fences	377,973	165,388	27,830	515,531
14	Snow and Sand Fences and Snow Sheds	934	1,128	1,128	934
15	Crossings and Signs	244,071	339,995	29,155	554,911
16	Station and Office Buildings	1,997,624	808,265	442,238	2,363,651
17	Roadway Buildings	668,944	571,854	226,248	1,014,550
18	Water Stations	1,396,464	638,058	347,146	1,687,376
19	Fuel Stations	302,027	433,045	70,808	664,264
20	Shops and Enginehouses	1,536,616	279,177	134,662	1,681,131
25	Gas Producing Plants	8,948	3,650	6,950	5,648
26	Telegraph and Telephone Lines	190,095	359,812	69,120	480,787
27	Signals and Interlockers	907,221	1,620,241	190,389	2,337,073
29	Power Plant Buildings	38,312	7,734	9	46,037
31	Power Transmission Systems	3,959	26,965	6,187	24,737
32	Power Distribution Systems	35,866	53,979	8,036	81,809
33	Power Line Poles and Fixtures	5,309	21,395	1,375	25,329
35	Miscellaneous Structures	147,112	9,886	31,786	125,212
36	Paving	2,949	5,136	-	8,085
37	Roadway Machines	100,485	77,073	50,535	127,023
38	Roadway Small Tools	39,672	6,252	-	45,924
39	Assessments for Public Improvements	57,337	148,426	15,128	190,635
44	Shop Machinery	735,950	398,182	121,593	1,012,539
45	Power Plant Machinery	222,907	48,492	15,734	255,665
(71 to 75) & 77	General Expenditures	497,865	8,499	7,308	499,056
76	Interest during Construction	2,394,406	187	28,971	2,365,622
	Total	50,512,797	32,364,721	11,007,335	71,870,183

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Defendant's Exhibit No. 112 (Witness J. B Baker)
Dec. 12, 1940

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

Superior Court, Pima County, Arizona
State v. S.P.Co. No. 20067

Defts.Ex.No. (Witness)

STATEMENT SHOWING BY ACCOUNTS APPRAISED MARKET VALUE OF LAND AND REPRODUCTION COST NEW OF OTHER FACILITIES AS SHOWN IN THE I.C.C. 19A VALUATION REPORTS AS OF VARIOUS DATES ADJUSTED FOR ADDITIONS, BETTERMENTS AND RETIREMENTS, AS SHOWN IN CARRIER'S REPORTS TO I.C.C. UNDER VALUATION ORDER 3

WELLTON, ARIZONA, TO PICACHO, ARIZONA, VIA PHOENIX

ARIZONA

Account Number (A)	Description (B)	Reproduction Cost New Including Additions and Betterments less Retirements to December 31, 1923 ($) (C)	Additions, Betterments and Retirements January 1, 1924 to December 31, 1939 Additions ($) (D)	Retirements ($) (E)	Total to December 31, 1939 ($) (F)
1	Engineering	88,208	538,932	18,741	608,399
2	Land for Transportation Purposes	603,436	241,165	16,647	827,954
3	Grading	296,094	2,036,117	132,221	2,199,990
6	Bridges, Trestles and Culverts	464,946	3,006,932	256,927	3,214,951
8	Ties	302,925	1,356,980	101,697	1,558,208
9	Rails	445,089	2,059,833	470,918	2,034,004
10	Other Track Material	140,894	1,122,617	160,406	1,103,105
11	Ballast	50,829	1,207,565	16,732	1,241,662
12	Tracklaying and Surfacing	189,956	1,108,511	70,323	1,228,144
13	Right of Way Fences	36,272	149,172	19,201	166,243
15	Crossings and Signs	15,997	132,620	7,893	140,724
16	Station and Office Buildings	319,851	371,115	59,208	631,758
17	Roadway Buildings	12,618	311,460	28,664	295,414
18	Water Stations	72,547	214,955	128,255	159,247
19	Fuel Stations	20,940	32,671	3,943	49,668
20	Shops and Enginehouses	94,384	53,006	1,998	145,392
26	Telegraph and Telephone Lines	4,279	64,825	1,401	67,703
27	Signals and Interlockers	207	447,868	16,819	431,256
31	Power Transmission Systems	25	1,118	-	1,143
32	Power Distribution Systems	4,971	7,500	841	11,630
33	Power Line Poles and Fixtures	328	2,894	65	3,157
35	Miscellaneous Structures	9,095	56	2,590	6,561
36	Paving	507	298	-	805
37	Roadway Machines	33,846	13,442	18,795	28,493
38	Roadway Small Tools	3,569	3,820	-	7,389
39	Assessments for Public Improvements	17,318	49,001	1,985	64,334
44	Shop Machinery	117,592	7,711	43,891	81,412
(71 to 75) & 77	General Expenditures	34,100	8,437	7,308	35,229
76	Interest during Construction	136,385	-	28,971	107,414
	Total	3,517,208	14,550,621	1,616,440	16,451,389

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Defendant's Exhibit No. 113 (Witness J.B. Baker)
Dec. 12, 1940

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

STATEMENT SHOWING BY ACCOUNTS APPRAISED MARKET VALUE OF LAND AND REPRODUCTION COST NEW OF OTHER FACILITIES AS SHOWN IN THE I.C.C. 19A VALUATION REPORTS AS OF VALUATION DATES ADJUSTED FOR ADDITIONS, BETTERMENTS AND RETIREMENTS, AS SHOWN IN CARRIER'S REPORTS TO I.C.C. UNDER VALUATION ORDER 3

YUMA, ARIZONA, TO EL PASO, TEXAS, VIA GILA AND LORDSBURG

ARIZONA - NEW MEXICO - TEXAS

SUMMARY

Account Number (A)	Description (B)	Reproduction Cost New Including Additions and Betterments less Retirements to December 31, 1923 (C)	Additions, Betterments and Retirements January 1, 1924 to December 31, 1939 Additions (D)	Retirements (E)	Total to December 31, 1939 (F)
		$	$	$	$
1	Engineering	682,077	56,204	-	738,281
2	Land for Transportation Purposes	4,117,554	104,056	4,905	4,216,705
3	Grading	3,077,908	723,185	27,737	3,773,356
6	Bridges, Trestles and Culverts	1,899,451	1,457,578	454,488	2,902,541
8	Ties	2,702,231	558,295	77,563	3,182,963
9	Rails	4,309,750	4,089,781	3,503,419	4,896,112
10	Other Track Material	2,222,428	2,124,633	1,518,559	2,828,502
11	Ballast	1,525,269	394,731	18,401	1,901,599
12	Tracklaying and Surfacing	1,756,767	298,681	47,300	2,008,148
13	Right of Way Fences	189,159	15,406	6,837	197,728
14	Snow and Sand Fences and Snow Sheds	934	1,128	1,128	934
15	Crossings and Signs	140,658	170,700	15,981	295,377
16	Station and Office Buildings	866,820	346,709	184,670	1,028,859
17	Roadway Buildings	454,048	215,883	167,522	502,409
18	Water Stations	953,529	250,608	167,252	1,036,885
19	Fuel Stations	205,046	306,532	45,929	465,649
20	Shops and Enginehouses	554,070	117,117	59,191	611,996
26	Telegraph and Telephone Lines	69,350	233,042	804	301,588
27	Signals and Interlockers	588,953	833,942	131,865	1,291,030
29	Power Plant Buildings	21,227	7,312	9	28,530
31	Power Transmission Systems	3,934	10,244	4,681	9,497
32	Power Distribution Systems	19,844	31,025	4,766	46,103
33	Power Line Poles and Fixtures	3,928	11,319	257	14,990
35	Miscellaneous Structures	102,847	9,779	3,009	109,617
36	Paving	2,442	4,838	-	7,280
37	Roadway Machines	55,961	32,768	17,895	70,834
38	Roadway Small Tools	21,979	1,312	-	23,291
39	Assessments for Public Improvements	24,832	81,191	9,712	96,311
44	Shop Machinery	192,260	124,135	45,225	271,170
45	Power Plant Machinery	118,679	44,610	6,985	156,304
(to 75) (77)	General Expenditures	263,476	62	-	263,538
76	Interest during Construction	1,269,317	187	-	1,269,504
	Total	28,416,728	12,556,993	6,526,090	34,547,631

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SOUTHERN PACIFIC COMPANY
(Pacific Lines)

STATEMENT SHOWING BY ACCOUNTS APPRAISED MARKET VALUE OF LAND AND REPRODUCTION COST NEW OF OTHER FACILITIES AS SHOWN IN THE I.C.C. 19A VALUATION REPORTS AS OF VALUATION DATES ADJUSTED FOR ADDITIONS, BETTERMENTS AND RETIREMENTS, AS SHOWN IN CARRIER'S REPORTS TO I.C.C. UNDER VALUATION ORDER 3

YUMA, ARIZONA, TO EL PASO, TEXAS, VIA GILA AND LORDSBURG

ARIZONA

Account Number (A)	Description (B)	Reproduction Cost New Including Additions and Betterments Less Retirements to December 31, 1923 (C)	Additions, Betterments and Retirements January 1, 1924 to December 31, 1939 Additions (D)	Retirements (E)	Total to December 31, 1939 (F)
		$	$	$	$
1	Engineering	475,235	55,730	-	530,965
2	Land for Transportation Purposes	1,043,724	103,403	536	1,146,591
3	Grading	2,035,573	675,469	10,223	2,700,819
6	Bridges, Trestles and Culverts	1,391,829	1,256,337	400,089	2,248,077
8	Ties	1,753,885	448,962	44,996	2,157,851
9	Rails	3,120,425	2,596,940	2,262,314	3,455,051
10	Other Track Material	1,657,725	1,419,724	1,029,319	2,048,130
11	Ballast	913,835	300,819	2,761	1,211,893
12	Tracklaying and Surfacing	1,097,237	271,132	32,759	1,335,610
13	Right of Way Fences	125,468	14,285	6,122	133,631
15	Crossings and Signs	48,698	147,056	13,800	181,954
16	Station and Office Buildings	597,351	282,928	128,497	751,782
17	Roadway Buildings	288,731	118,484	27,467	379,748
18	Water Stations	698,293	222,491	116,379	804,405
19	Fuel Stations	169,523	199,370	37,091	331,802
20	Shops and Enginehouses	520,619	103,023	54,144	569,498
26	Telegraph and Telephone Lines	49,663	169,336	804	218,195
27	Signals and Interlockers	486,489	473,463	87,262	872,690
29	Power Plant Buildings	19,990	7,312	-	27,302
31	Power Transmission Systems	3,934	8,697	4,592	8,039
32	Power Distribution Systems	18,681	28,410	4,373	42,718
33	Power Line Poles and Fixtures	3,852	10,637	257	14,232
35	Miscellaneous Structures	89,474	5,024	1,739	92,759
36	Paving	-	4,838	-	4,838
37	Roadway Machines	50,227	29,089	14,519	64,797
38	Roadway Small Tools	18,052	947	-	18,999
39	Assessments for Public Improvements	24,557	70,780	4,511	90,826
44	Shop Machinery	183,333	122,864	44,308	261,889
45	Power Plant Machinery	109,018	43,863	3,949	148,932
(1 to 75)					
(77)	General Expenditures	184,976	-	-	184,976
76	Interest during Construction	844,750	-	-	844,750
	Total	18,025,147	9,191,413	4,332,811	22,883,749

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SOUTHERN PACIFIC COMPANY
(Pacific Lines)

Sheet 3 of 4 Sheets

STATEMENT SHOWING BY ACCOUNTS APPRAISED MARKET VALUE OF LAND AND REPRODUCTION COST NEW OF OTHER FACILITIES AS SHOWN IN THE I.C.C. 19A VALUATION REPORTS AS OF VALUATION DATES ADJUSTED FOR ADDITIONS, BETTERMENTS AND RETIREMENTS, AS SHOWN IN CARRIER'S REPORTS TO I.C.C. UNDER VALUATION ORDER 3

YUMA, ARIZONA, TO EL PASO, TEXAS, VIA GILA AND LORDSBURG

NEW MEXICO

Account Number (A)	Description (B)	Reproduction Cost New Including Additions and Betterments Less Retirements to December 31, 1923 (C)	Additions, Betterments and Retirements January 1, 1924 to December 31, 1939 Additions (D)	Retirements (E)	Total to December 31, 1939 (F)
1	Engineering	167,997	474	-	168,471
2	Land for Transportation Purposes	168,825	6	6	168,825
3	Grading	876,899	22,707	17,486	882,120
6	Bridges, Trestles and Culverts	315,482	174,819	49,689	440,612
8	Ties	839,057	91,459	25,527	904,989
9	Rails	1,069,757	1,473,486	1,232,399	1,310,844
10	Other Track Material	478,721	675,164	474,427	679,458
11	Ballast	590,761	91,256	15,587	666,430
12	Trackslaying and Surfacing	583,304	18,748	11,679	590,373
13	Right of Way Fences	61,241	1,013	494	61,760
14	Snow and Sand Fences and Snow Sheds	934	1,128	1,128	934
15	Crossings and Signs	3,828	23,644	701	26,771
16	Station and Office Buildings	148,660	22,175	40,816	130,019
17	Roadway Buildings	148,704	97,291	139,427	106,568
18	Water Stations	238,526	28,069	43,392	223,203
19	Fuel Stations	28,026	84,760	4,099	108,687
20	Shops and Enginehouses	30,744	14,094	5,047	39,791
26	Telegraph and Telephone Lines	19,687	63,706	-	83,393
27	Signals and Interlockers	68,364	314,486	30,965	351,885
29	Power Plant Buildings	1,237	-	9	1,228
31	Power Transmission Systems	-	1,547	89	1,458
32	Power Distribution Systems	1,163	2,615	393	3,385
33	Power Line Poles and Fixtures	76	682	-	758
35	Miscellaneous Structures	4,644	-	1,270	3,374
37	Roadway Machines	5,302	3,679	3,376	5,605
38	Roadway Small Tools	3,537	365	-	3,902
39	Assessments for Public Improvements	-	2,074	621	1,453
44	Shop Machinery	8,927	1,271	917	9,281
45	Power Plant Machinery	9,661	747	3,036	7,372
(to 75)					
(77)	General Expenditures	65,519	62	-	65,581
76	Interest during Construction	132,508	187	-	132,695
	Total	6,272,091	3,211,714	2,102,580	7,381,225

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

Sheet 4 of 4 Sheets

STATEMENT SHOWING BY ACCOUNTS APPRAISED MARKET VALUE OF LAND AND REPRODUCTION COST NEW OF OTHER FACILITIES AS SHOWN IN THE I.C.C. 19A VALUATION REPORTS AS OF VALUATION DATES ADJUSTED FOR ADDITIONS, BETTERMENTS AND RETIREMENTS, AS SHOWN IN CARRIER'S REPORTS TO I.C.C. UNDER VALUATION ORDER 3

YUMA, ARIZONA, TO EL PASO, TEXAS, VIA GILA AND LORDSBURG

TEXAS

Account No. (A)	Description (B)	Reproduction Cost New Including Additions and Betterments Less Retirements to December 31, 1923 (C)	Additions, Betterments and Retirements January 1, 1924 to December 31, 1939 Additions (D)	Retirements (E)	Total to December 31, 1939 (F)
1	Engineering	38,845	-	-	38,845
2	Land for Transportation Purposes	2,905,005	647	4,363	2,901,289
3	Grading	165,436	25,009	28	190,417
6	Bridges, Trestles and Culverts	192,140	26,422	4,710	213,852
8	Ties	109,289	17,874	7,040	120,123
9	Rails	119,568	19,355	8,706	130,217
10	Other Track Material	85,982	29,745	14,813	100,914
11	Ballast	20,673	2,656	53	23,276
12	Tracklaying and Surfacing	76,226	8,801	2,862	82,165
13	Right of Way Fences	2,450	108	221	2,337
15	Crossings and Signs	88,132	-	1,480	86,652
16	Station and Office Buildings	120,809	41,606	15,357	147,058
17	Roadway Buildings	16,613	108	628	16,093
18	Water Stations	16,710	48	7,481	9,277
19	Fuel Stations	7,497	22,402	4,739	25,160
20	Shops and Enginhouses	2,707	-	-	2,707
27	Signals and Interlockers	34,100	45,993	13,638	66,455
35	Miscellaneous Structures	8,729	4,755	-	13,484
36	Paving	2,442	-	-	2,442
37	Roadway Machines	432	-	-	432
38	Roadway Small Tools	390	-	-	390
39	Assessments for Public Improvements	275	8,337	4,580	4,032
(1 to 75) & 77	General Expenditures	12,981	-	-	12,981
76	Interest during Construction	92,059	-	-	92,059
	Total	4,119,490	253,866	90,699	4,282,657

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Defendant's Exhibit No. 114 (Witness J.B. Baker)
Dec. 12, 1940

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

STATEMENT SHOWING BY ACCOUNTS APPRAISED MARKET VALUE OF LAND AND REPRODUCTION COST NEW OF OTHER FACILITIES AS SHOWN IN THE I.C.C. 19A VALUATION REPORTS AS OF VALUATION DATES ADJUSTED FOR ADDITIONS, BETTERMENTS AND RETIREMENTS, AS SHOWN IN CARRIER'S REPORTS TO I.C.C. UNDER VALUATION ORDER 3

TUCSON, ARIZONA, TO EL PASO, TEXAS, VIA DOUGLAS

ARIZONA - NEW MEXICO - TEXAS

SUMMARY

Account Number (A)	Description (B)	Reproduction Cost New Including Additions and Betterments less Retirements to December 31, 1923 (C)	Additions, Betterments and Retirements January 1, 1924 to December 31, 1939 Additions (D)	Retirements (E)	Total to December 31, 1939 (F)
		$	$	$	
1	Engineering	515,202	2,347	9	517,540
2	Land for Transportation Purposes	2,356,976	55,663	2	2,412,637
3	Grading	3,000,394	165,805	2,192	3,164,007
5	Tunnels and Subways	173,231	1,896	2,500	172,627
6	Bridges, Trestles and Culverts	1,315,062	584,243	131,194	1,768,111
8	Ties	1,780,402	111,896	38,443	1,853,855
9	Rails	2,098,225	1,684,250	1,408,271	2,374,204
10	Other Track Material	917,097	1,092,486	681,880	1,327,703
11	Ballast	714,419	60,508	530	774,397
12	Tracklaying and Surfacing	852,931	87,012	12,994	926,949
13	Right of Way Fences	152,542	810	1,792	151,560
15	Crossings and Signs	87,416	36,675	5,281	118,810
16	Station and Office Buildings	810,953	90,441	198,360	703,034
17	Roadway Buildings	202,278	44,511	30,062	216,727
18	Water Stations	370,388	172,495	51,639	491,244
19	Fuel Stations	76,041	93,842	20,936	148,947
20	Shops and Enginehouses	888,162	109,054	73,473	923,743
25	Gas Producing Plants	8,948	3,650	6,950	5,648
26	Telegraph and Telephone Lines	116,466	61,945	66,915	111,496
27	Signals and Interlockers	318,061	338,431	41,705	614,787
29	Power Plant Buildings	17,085	422	-	17,507
31	Power Transmission Systems	-	15,603	1,506	14,097
32	Power Distribution Systems	11,051	15,454	2,429	24,076
33	Power Line Poles and Fixtures	1,053	7,182	1,053	7,182
35	Miscellaneous Structures	35,170	51	26,187	9,034
37	Roadway Machines	10,678	30,863	13,845	27,696
38	Roadway Small Tools	14,124	1,120	-	15,244
39	Assessments for Public Improvements	15,187	18,234	3,431	29,990
44	Shop Machinery	426,098	266,336	32,477	659,957
45	Power Plant Machinery	104,228	3,882	8,749	99,361
(46 to 75)					
(77)	General Expenditures	200,289	-	-	200,289
76	Interest during Construction	988,704	-	-	988,704
	Total	18,578,861	5,157,107	2,864,805	20,871,163

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

STATEMENT SHOWING BY ACCOUNTS APPRAISED MARKET VALUE OF LAND AND REPRODUCTION COST NEW OF OTHER FACILITIES AS SHOWN IN THE I.C.C. 19A VALUATION REPORTS AS OF VALUATION DATES ADJUSTED FOR ADDITIONS, BETTERMENTS AND RETIREMENTS, AS SHOWN IN CARRIER'S REPORTS TO I.C.C. UNDER VALUATION ORDER 3

TUCSON, ARIZONA, TO EL PASO, TEXAS, VIA DOUGLAS

ARIZONA

Account Number (A)	Description (B)	Reproduction Cost New Including Additions and Betterments less Retirements to December 31, 1923 (C)	Additions, Betterments and Retirements January 1, 1924 to December 31, 1939 Additions (D)	Retirements (E)	Total to December 31, 1939 (F)
1	Engineering	272,130	1,250	-	273,380
2	Land for Transportation Purposes	358,389	55,243	2	413,630
3	Grading	1,832,727	123,952	1,691	1,954,988
5	Tunnels and Subways	73,105	-	-	73,105
6	Bridges, Trestles and Culverts	882,155	384,514	99,360	1,167,309
8	Ties	922,526	48,731	19,930	951,327
9	Rails	1,088,329	619,875	494,730	1,213,474
10	Other Track Material	485,661	457,730	272,503	670,888
11	Ballast	348,932	55,204	509	403,627
12	Tracklaying and Surfacing	451,678	41,861	6,298	487,241
13	Right of Way Fences	82,931	511	613	82,829
15	Crossings and Signs	21,999	16,780	387	38,392
16	Station and Office Buildings	397,810	33,950	180,131	251,629
17	Roadway Buildings	106,121	2,379	8,009	100,491
18	Water Stations	189,526	33,032	17,467	205,091
19	Fuel Stations	39,596	39,272	17,950	60,918
20	Shops and Enginehouses	176,672	6,470	15,461	167,681
26	Telegraph and Telephone Lines	65,190	17,799	40,589	42,400
27	Signals and Interlockers	247,012	35,508	17,459	265,061
31	Power Transmission Systems	-	1,486	-	1,486
32	Power Distribution Systems	2,762	1,451	-	4,213
33	Power Line Poles and Fixtures	-	442	-	442
35	Miscellaneous Structures	30,511	51	25,378	5,184
37	Roadway Machines	6,011	5,717	1,690	10,038
38	Roadway Small Tools	5,661	-	-	5,661
39	Assessments for Public Improvements	526	10,403	2,239	8,690
44	Shop Machinery	49,824	2,963	8,536	44,251
(No 75) (" 77)	General Expenditures	106,063	-	-	106,063
76	Interest During Construction	540,171	-	-	540,171
	Total	8,784,018	1,996,574	1,230,932	9,549,660

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

Sheet 3 of 4 Sheets

STATEMENT SHOWING BY ACCOUNTS APPRAISED MARKET VALUE OF LAND AND REPRODUCTION COST NEW OF OTHER FACILITIES AS SHOWN IN THE I.C.C. 19A VALUATION REPORTS AS OF VALUATION DATES ADJUSTED FOR ADDITIONS, BETTERMENTS AND RETIREMENTS, AS SHOWN IN CARRIER'S REPORTS TO I.C.C. UNDER VALUATION ORDER 3

TUCSON, ARIZONA, TO EL PASO, TEXAS, VIA DOUGLAS

NEW MEXICO

Account Number (A)	Description (B)	Reproduction Cost New Including Additions and Betterments less Retirements to December 31, 1923 ($) (C)	Additions, Betterments and Retirements January 1, 1924 to December 31, 1939 Additions ($) (D)	Retirements ($) (E)	Total to December 31, 1939 ($) (F)
1	Engineering	164,633	626	9	165,250
2	Land for Transportation Purposes	43,983	420	-	44,403
3	Grading	1,023,253	32,363	441	1,055,175
5	Tunnels and Subways	100,126	1,896	2,500	99,522
6	Bridges, Trestles and Culverts	300,800	148,118	31,542	417,376
8	Ties	743,078	42,355	6,926	778,507
9	Rails	909,068	993,009	866,909	1,035,168
10	Other Track Material	388,315	562,048	375,957	574,406
11	Ballast	365,487	3,619	21	369,085
12	Tracklaying and Surfacing	364,965	30,419	3,221	392,163
13	Right of Way Fences	69,611	299	1,179	68,731
15	Crossings and Signs	4,297	20	22	4,295
16	Station and Office Buildings	49,190	8,174	3,731	53,633
17	Roadway Buildings	95,577	41,692	21,932	115,337
18	Water Stations	131,899	88,908	17,203	203,604
19	Fuel Stations	22,235	31,714	2,330	51,619
20	Shops and Enginehouses	6,063	-	2,458	3,605
26	Telegraph and Telephone Lines	44,643	16,184	22,219	38,608
27	Signals and Interlockers	47,119	268,106	7,278	307,947
31	Power Transmission Systems	-	301	301	-
32	Power Distribution Systems	-	1,261	-	1,261
33	Power Line Poles and Fixtures	-	522	-	522
35	Miscellaneous Structures	4,659	-	809	3,850
37	Roadway Machines	2,945	24,656	11,994	15,607
38	Roadway Small Tools	4,230	1,120	-	5,350
44	Shop Machinery	605	-	605	-
(71 to 75) & 77	General Expenditures	64,195	-	-	64,195
76	Interest during Construction	326,196	-	-	326,196
	Total	5,277,172	2,297,830	1,379,587	6,195,415

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

Sheet 4 of 4 Sheets

STATEMENT SHOWING BY ACCOUNTS APPRAISED MARKET VALUE OF LAND AND REPRODUCTION COST NEW OF OTHER FACILITIES AS SHOWN IN THE I.C.C. 19A VALUATION REPORTS AS OF VALUATION DATES ADJUSTED FOR ADDITIONS, BETTERMENTS AND RETIREMENTS, AS SHOWN IN CARRIER'S REPORTS TO I.C.C. UNDER VALUATION ORDER 3

TUCSON, ARIZONA, TO EL PASO, TEXAS, VIA DOUGLAS

TEXAS

Account Number (A)	Description (B)	Reproduction Cost New Including Additions and Betterments less Retirements to December 31, 1923 (C)	Additions, Betterments and Retirements January 1, 1924 to December 31, 1939		Total to December 31, 1939 (F)
			Additions (D)	Retirements (E)	
		$	$	$	
1	Engineering	78,439	471	-	78,910
2	Land for Transportation Purposes	1,954,604	-	-	1,954,604
3	Grading	144,414	9,490	60	153,844
6	Bridges, Trestles and Culverts	132,107	51,611	292	183,426
8	Ties	114,798	20,810	11,587	124,021
9	Rails	100,828	71,366	46,632	125,562
10	Other Track Material	43,121	72,708	33,420	82,409
11	Ballast	-	1,685	-	1,685
12	Tracklaying and Surfacing	36,288	14,732	3,475	47,545
13	Crossings and Signs	61,120	19,875	4,872	76,123
16	Station and Office Buildings	363,953	48,317	14,498	397,772
17	Roadway Buildings	580	440	121	899
18	Water Stations	48,963	50,555	16,969	82,549
19	Fuel Stations	14,210	22,856	656	36,410
20	Shops and Enginehouses	705,427	102,584	55,554	752,457
25	Gas Producing Plants	8,948	3,650	6,950	5,648
26	Telegraph and Telephone Lines	6,633	27,962	4,107	30,488
27	Signals and Interlockers	23,930	34,817	16,968	41,779
29	Power Plant Buildings	17,085	422	-	17,507
31	Power Transmission Systems	-	13,816	1,205	12,611
32	Power Distribution Systems	8,289	12,742	2,429	18,602
33	Power Line Poles and Fixtures	1,053	6,218	1,053	6,218
37	Roadway Machines	1,722	490	161	2,051
38	Roadway Small Tools	4,233	-	-	4,233
39	Assessments for Public Improvements	14,661	7,831	1,192	21,300
44	Shop Machinery	375,569	263,373	23,336	615,706
45	Power Plant Machinery	104,228	3,882	8,749	99,361
(to 75)					
(77)	General Expenditures	30,031	-	-	30,031
76	Interest during Construction	122,337	-	-	122,337
	Total	4,517,671	862,703	254,286	5,126,088

Defendant's Exhibit No. 115 (Witness L.J. Masson)
Dec. 12, 1940

SOUTHERN PACIFIC COMPANY - Pacific Lines

OPERATED STEAM MILEAGE BY DIVISIONS AND STATES AS OF DECEMBER 31, 1939

A - OPERATED STEAM MILEAGE BY DIVISIONS

Divisions (1)	First Track			Additional Tracks			Total Main Track (8)	Total Sidings (9)	Grand Total All Tracks (10)
	Main Line (2)	Branch (3)	Total (4)	Main Line (5)	Branch (6)	Total (7)			
Western	570.69	345.24	915.93	143.80	-	143.80	1 059.73	705.11	1 764.84
Sacramento	867.77	392.60	1 260.37	153.46	-	153.46	1 413.83	587.76	2 001.59
Salt Lake	722.12	356.20	1 078.32	* 342.46	-	342.46	1 420.78	* 367.58	1 788.36
Portland	433.99	732.19	1 166.18	1.76	-	1.76	1 167.94	347.22	1 515.16
Coast	371.27	156.89	528.16	78.51	-	78.51	606.67	495.99	1 102.66
San Joaquin - S.O.	354.75	419.56	774.31	41.36	-	41.36	815.67	366.87	1 182.54
San Joaquin - N.O.	-	101.98	101.98	-	-	-	101.98	9.59	111.57
Los Angeles	420.75	312.18	732.93	29.34	12.32	41.66	774.59	566.06	1 340.65
Tucson	629.30	326.43	955.73	40.12	-	40.12	995.85	338.77	1 334.62
Rio Grande	777.32	356.89	1 134.21	33.12	-	33.12	1 167.33	359.87	1 527.20
Total	5 147.96	3 500.16	8 648.12	863.93	12.32	876.25	9 524.37	4 144.82	13 669.19

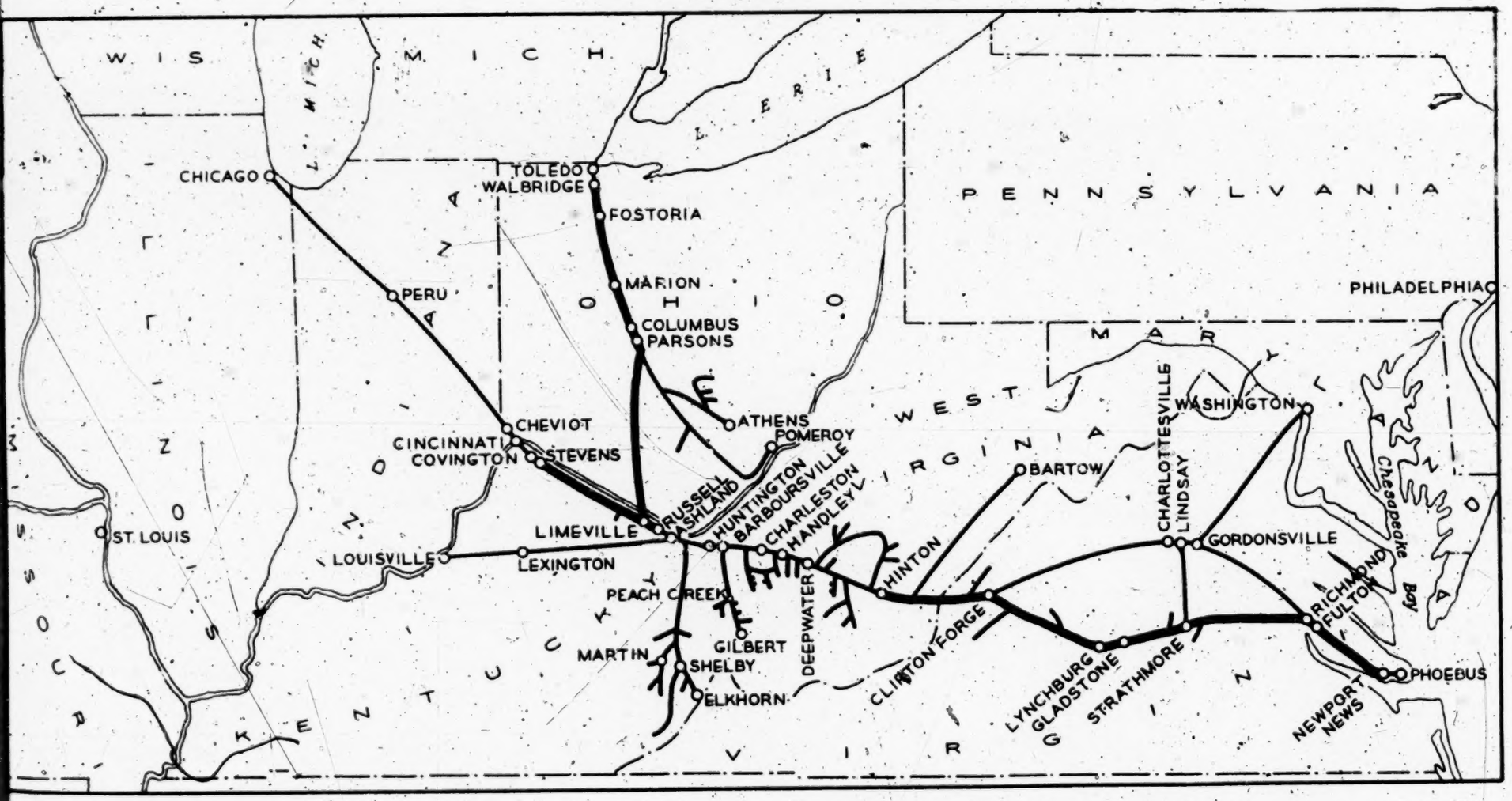
B - OPERATED STEAM MILEAGE BY STATES

States									
California - S.O.	2 523.22	1 665.53	4 188.75	436.24	12.32	448.56	4 637.31	2 670.44	7 307.75
California - N.O.	-	101.98	101.98	-	-	-	101.98	9.59	111.57
Oregon	597.31	746.89	1 344.20	1.76	-	1.76	1 345.96	429.65	1 775.61
Nevada	510.08	153.60	663.68	* 309.74	-	309.74	973.42	* 258.01	1 231.43
Utah	110.69	148.84	259.53	42.91	-	42.91	302.44	78.49	380.93
Arizona	743.53	464.96	1 208.49	64.76	-	64.76	1 273.25	429.24	1 702.49
New Mexico	641.17	218.36	859.53	2.67	-	2.67	862.20	218.04	1 080.24
Texas	21.96	-	21.96	5.85	-	5.85	27.81	51.36	79.17
Total	5 147.96	3 500.16	8 648.12	863.93	12.32	876.25	9 524.37	4 144.82	13 669.19

* Includes 177.73 miles of Western Pacific Railroad Company main track and 24.21 miles of siding between Weso and Alaska, Nevada, operated under trackage rights.

Source: Records of the Company.
Total of all tracks for all divisions agrees with total of such tracks as shown in column (k), schedule 411, page 400B, of annual report to Interstate Commerce Commission and to the Corporation Commission of the State of Arizona.
Total of all tracks within State of Arizona agrees with total of such tracks as shown in column (k), schedule 811, of annual report to the Corporation Commission of the State of Arizona.

Defendant's Exhibit No. 116 (Witness F.L. Beale)
Dec. 13, 1940



THE CHESAPEAKE AND OHIO RAILWAY COMPANY

HEAVY LINE INDICATES TERRITORY COVERED BY TYPICAL FREIGHT TRAIN EXHIBIT FOR SEVEN SUB-DIVISIONS.

5441

Defendant's Exhibit No. 117 (Witness F. L. Beale)
Dec. 13. 1940

THE CHESAPEAKE AND OHIO RAILWAY COMPANY

Freight trains operated between the regular freight engine terminals on Sub-divisions listed, separated to show number of trains handling a maximum number of cars (including caboose) as indicated by the groupings.

Four-weeks period
Two weeks ending June 24, 1939.
Two weeks ending Oct. 24, 1939.

28 days represented

	Number of trains with maximum cars as listed	Peninsula Sub-div.	Rivanna Sub-div.	James River Sub-div.	Alleghany Sub-div.	Cincinnati Division Main Line	Northern Sub-div.	Toledo Sub-div.	Total for items listed
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1)	0- 10	-	-	-	-	8	7	1	16
(2)	11- 20	1	1	-	-	12	1	-	15
(3)	21- 30	2	1	3	6	23	10	3	48
(4)	31- 40	5	-	6	10	11	2	14	48
(5)	41- 50	2	1	14	9	6	8	16	56
(6)	51- 60	-	1	13	18	4	12	17	65
(7)	61- 70	1	3	4	32	30	18	21	109
(8)	71- 80	5	3	10	33	26	18	23	118
(9)	81- 90	3	16	15	3	26	33	19	155
(10)	91-100	3	24	25	26	32	21	27	158
(11)	101-120	15	36	49	83	44	59	50	330

Freight trains operated between the regular freight engine terminals on Sub-divisions listed, separated to show number of trains handling a maximum number of cars (including caboose) as indicated by the groupings.

Four-weeks period
Two weeks ending June 24, 1939.
Two weeks ending Oct. 24, 1939.

28 days represented

	Number of trains with maximum cars as listed	Peninsula Sub-div.	Rivenna Sub-div.	James River Sub-div.	Alleghany Sub-div.	Cincinnati Division Main Line	Northern Sub-div.	Toledo Sub-div.	Total for items listed
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1)	0- 10	-	-	-	-	8	7	1	16
(2)	11- 20	1	1	-	-	12	1	-	15
(3)	21- 30	2	1	3	6	23	10	3	48
(4)	31- 40	5	-	6	10	11	2	14	48
(5)	41- 50	2	1	14	9	6	8	16	56
(6)	51- 60	-	1	13	18	4	12	17	65
(7)	61- 70	1	3	4	32	30	18	21	109
(8)	71- 80	5	3	10	33	26	18	23	118
(9)	81- 90	3	16	15	43	26	33	19	155
(10)	91-100	3	24	25	26	32	21	27	158
(11)	101-120	15	30	49	83	44	59	50	330
(12)	121-140	35	35	57	107	21	50	55	360
(13)	141 and over	133	149	169	90	177	520	484	1,722
		---	---	---	---	---	---	---	-----
(14)	Total	205	264	365	457	420	759	730	3,200

Defendant's ~~Exhibit~~ Exhibit No. 119 (Witness F.L. Beale)
Dec. 13, 1940

THE CHESAPEAKE AND OHIO RAILWAY COMPANY

MAXIMUM NUMBER OF CARS HANDLED IN VARIOUS MAIN LINE PASSENGER TRAIN

TOTAL FOR MONTHS OF JANUARY, APRIL, JULY AND OCTOBER 1939

LINE NO.	TRAIN NO.	REGULAR THROUGH TRAINS BETWEEN WASHINGTON AND CINCINNATI	MILES	NUMBER OF CARS 3	4	5	6	7	8	9	10	11	12	13	14	15	16	17 & OVER	TOTAL
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)
		WEST:																	
1	1	George Washington	600	-	-	-	-	-	-	-	-	1	74	30	9	7	1	1	123
2	3	Fast Flying Virginian	600	-	-	-	-	-	-	-	-	-	-	1	19	42	40	21	123
3	5-47	#5 and Sportsman	600	-	-	-	-	-	-	-	-	3	23	45	31	10	5	6	123
		EAST:																	
4	2	George Washington	600	-	-	-	-	-	-	-	1	3	37	34	27	12	6	1	123
5	6	Fast Flying Virginian	600	-	-	-	-	-	-	-	-	-	34	38	23	11	11	6	123
6	4	Sportsman	600	-	-	-	-	-	-	-	1	1	12	38	41	18	10	2	123
7		TOTAL		-	-	-	-	-	-	-	2	10	180	186	150	100	73	37	738
8		PER CENT OF TOTAL									.27	1.36	24.39	25.20	20.33	13.55	9.89	5.01	100.00

Total trains over 14 cars 210 or 28.45%
Total trains 14 cars or under 528 or 71.55%
Total trains 738 or 100.00%

	Additional sections of above trains operating whole or part distance	Avg. Miles																	
	WEST Section of																		
9	1 George Washington	389	-	1	-	1	-	-	-	-	-	1	-	-	3	-	1	-	7
10	3 Fast Flying Virginian	213	1	2	8	3	6	4	2	6	1	2	-	-	-	1	1	-	37
11	5 #5 and Sportsman	226	-	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	3
	EAST Section of																		
12	2 George Washington	471	-	-	1	-	-	-	-	1	-	-	1	-	-	-	-	-	3
13	6 Fast Flying Virginian	297	-	-	-	2	1	1	2	1	-	1	-	3	-	-	2	-	13
14	4 Sportsman	353	1	3	-	-	2	1	1	1	-	-	1	2	-	-	-	1	13
15	TOTAL		2	6	9	6	9	8	5	9	2	3	3	8	1	4	1	76	
16	PER CENT OF TOTAL		2.63	7.90	11.64	7.90	11.84	10.52	6.58	11.84	2.63	3.95	3.95	10.52	1.32	5.26	1.32	100.00	

Total trains over 14 cars 6 or 7.90%
Total trains 14 cars or under 70 or 92.10%
Total trains 76 or 100.00%

RECAPITULATION

	TOTAL TRAINS (u)	TOTAL OVER 14 (v)	PER CENT OF TOTAL (w)
Regular Through Trains	738	210	28.45
Additional Sections	76	6	7.90
TOTAL	814	216	26.54

5444

Defendant's Exhibit No. 120 (Witness Wilbur)
Dec. 13, 1940

THE CHESAPEAKE AND OHIO RAILWAY COMPANY

(Includes Hocking Valley Railway for entire period)

FREIGHT OPERATING AND
FREIGHT TRANSPORTATION EXPENSES
RELATED TO TRAFFIC
CALENDAR YEARS 1922 TO 1939, INCLUSIVE

YEAR	REVENUE TON MILES	FREIGHT OPERATING EXPENSES	FREIGHT TRANSPORTATION EXPENSES	AVERAGES PER 1000 REVENUE TON MILES	
				FREIGHT OPERATING EXPENSES	FREIGHT TRANSP. EXPENSES
(a)	(b)	(c)	(d)		(f)
1939	18,041,023,867	$59,410,440	$24,188,212	$ 3.29	$ 1.34
1938	16,054,234,956	54,924,130	22,717,621	3.42	1.42
1937	20,203,850,487	62,454,614	25,470,823	3.09	1.26
1936	20,819,939,979	60,780,779	24,556,665	2.92	1.18
1935	17,531,508,404	53,429,854	21,677,607	3.05	1.24
1934	17,612,662,359	51,228,561	20,473,265	2.91	1.16
1933	16,881,355,028	48,836,608	19,320,843	2.89	1.14
1932	15,572,338,642	45,962,730	18,826,498	2.95	1.21
1931	18,391,434,397	62,072,440	25,067,147	3.38	1.36
1930	20,714,483,352	73,507,138	29,609,330	3.55	1.43
1929	21,953,237,527	84,972,234	32,693,095	3.87	1.49
1928	21,182,681,618	82,225,264	32,986,905	3.88	1.56
1927	22,235,978,853	89,565,454	35,979,165	4.03	1.62
1926	22,393,718,786	91,592,743	36,732,814	4.09	1.64
1925	20,081,770,222	90,093,696	35,073,849	4.49	1.75
1924	16,527,268,079	83,143,646	32,908,087	5.03	1.99
1923	14,953,327,479	80,415,321	33,107,149	5.38	2.21
1922	11,487,568,319	65,052,409	28,696,993	5.66	2.50
TOTAL 1936-1939	75,119,049,289	237,569,963	96,933,321	3.16	1.29
TOTAL					

Defendant's Exhibit No. 121 (Witness Wilbur)
Dec. 13, 1940

THE CHESAPEAKE AND OHIO RAILWAY COMPANY

(Includes Hocking Valley Railway for entire period)

FREIGHT SERVICE OPERATING AVERAGES
CALENDAR YEARS 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 AND 1939

LINE NO. (a)	ITEM (b)	1922 (c)	1924 (d)	1926 (e)	1928 (f)	1930 (g)	1932 (h)	1934 (i)	1936 (j)	1938 (k)	1939 (l)	PERCENT INCREASE 1939 OVER 1922 (m)
1	Miles of line operated in freight service,.....	2,894	2,901	2,992	3,069	3,094	3,136	3,088	3,050	3,050	3,053	5.5
2	Freight train miles (thousands),....	9,417	13,945	16,479	14,979	13,570	8,924	9,669	10,501	8,891	9,569	1.6
3	Freight cars per freight train,.....	51.9	53.5	58.1	61.7	66.2	73.6	77.9	81.3	77.3	79.5	53.2
4	Net tons per freight train,.....	1,269	1,276	1,434	1,493	1,608	1,819	1,909	2,094	1,942	2,021	59.3
5	Average tractive power per locomotive (pounds),.....	49,460	53,107	56,127	58,431	63,203	64,788	66,261	68,139	68,445	68,343	38.2
6	Average capacity per freight car (tons),.....	50.6	53.0	54.8	55.5	52.7	53.1	53.2	53.3	53.3	53.2	5.1
7	Freight train speed (miles per hour)	8.8	9.6	10.7	12.4	13.0	13.8	13.9	13.9	15.1	14.8	68.2
8	Gross ton miles per freight train hour,.....	20,308	22,366	28,099	34,392	39,020	46,689	49,737	52,833	54,160	54,855	170.1
9	Net ton miles per freight train hour	11,150	12,192	15,345	18,555	20,022	25,023	26,506	28,730	29,102	29,540	164.9
10	Gross ton miles (exclusive of locomotives and tenders) per ton of fuel,.....	12,911	14,428	17,289	19,128	21,068	23,453	23,405	23,726	23,998	24,651	90.9

SOURCE: Items 1, 2, 3, 4, 7 and 8 - Reports of Freight Train Performance, Forms CS-A, filed with Interstate Commerce Commission.

Item 5 - Total tractive effort ÷ total steam locomotives available for service at close of each year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 6 - Aggregate capacity of all freight carrying cars ÷ total number of such cars available for service at close of year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 9 - Net ton miles ÷ train hours as reported on Form CS-A to Interstate Commerce Commission.

Item 10 - Gross ton miles (cars, contents and cabooses) ÷ equated net tons of fuel consumed, as reported in years 1922, 1924, 1926, 1928, 1930, 1932 and 1934 on Form CS-A to Interstate Commerce Commission and as reported in years 1936, 1938 and 1939 in Schedules 531 and 771 respectively of Annual Report to Interstate Commerce Commission.

5446

Defendant's Exhibit No. 122 (Witness L.S. Wilbur)
Dec. 13, 1940

THE CHESAPEAKE & OHIO RAILWAY COMPANY
(Includes Hocking Valley Railway for entire period)

CASUALTIES TO ALL CLASSES OF EMPLOYEES ON DUTY
AND TO TRAINMEN AND ENGINEMEN ON DUTY
SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS

LINE NO.	YEAR	CAR MILES ALL TRANSPORTATION SERVICE AND WORK (Thousands)	CASUALTIES TO ALL EMPLOYES ON DUTY			CASUALTIES TO TRAINMEN AND ENGINEMEN ON DUTY			CASUALTIES PER 1,000,000 CAR MILES	
			KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL	ALL EMPLOYES ON DUTY	TRAINMEN & ENGINEMEN ON DUTY
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
1	1924	782,565	31	564	595	20	505	525	.76	.67
2	1925	924,241	33	587	620	12	534	546	.67	.59
3	1926	996,055	23	569	592	15	522	537	.59	.54
4	1927	1,010,961	17	457	474	9	413	422	.47	.42
5	1928	961,949	8	376	384	6	345	351	.40	.36
6	1929	993,517	16	322	338	7	292	299	.34	.30
7	1930	936,393	15	283	298	10	244	254	.32	.27
8	1931	826,481	11	219	230	8	189	197	.28	.24
9	1932	686,193	10	198	208	7	180	187	.30	.27
10	1933	745,779	16	157	173	7	143	150	.23	.20
11	1934	781,499	8	157	165	4	141	145	.21	.19
12	1935	766,863	13	164	177	10	149	159	.23	.21
13	1936	885,138	9	167	176	4	146	150	.20	.17
14	1937	862,226	4	189	193	4	175	179	.22	.21
15	1938	722,026	4	122	126	3	103	106	.17	.15
16	1924 to 1927 Incl.	3,713,822	104	2,177	2,281	56	1,974	2,030	.61	.55
17	1928 to 1931 Incl.	3,716,340	50	1,200	1,250	31	1,070	1,101	.34	.30
18	1932 to 1935 Incl.	2,980,334	47	676	723	28	613	641	.24	.22
19	1936 to 1938 Incl.	2,469,390	17	478	495	11	424	435	.20	.18

LINE NO.	YEAR	CAR MILES ALL TRANSPORTATION SERVICE AND WORK (Thousands)	CASUALTIES TO ALL EMPLOYES ON DUTY			CASUALTIES TO TRAINMEN AND ENGINEMEN ON DUTY			CASUALTIES PER 1,000,000 CAR MILES	
			KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL	ALL EMPLOYES ON DUTY	TRAINMEN & ENGINEMEN ON DUTY
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
1	1924	782,565	31	564	595	20	505	525	.76	.67
2	1925	926,241	33	587	620	12	534	546	.67	.59
3	1926	996,055	23	569	592	15	522	537	.59	.54
4	1927	1,010,961	17	457	474	9	413	422	.47	.42
5	1928	961,949	8	376	384	6	345	351	.40	.36
6	1929	993,517	16	322	338	7	292	299	.34	.30
7	1930	936,393	15	283	298	10	244	254	.32	.27
8	1931	826,481	11	219	230	8	189	197	.28	.24
9	1932	686,193	10	198	208	7	180	187	.30	.27
10	1933	745,779	16	157	173	7	143	150	.23	.20
11	1934	781,499	8	157	165	4	141	145	.21	.19
12	1935	766,863	13	164	177	10	149	159	.23	.21
13	1936	885,138	9	167	176	4	146	150	.20	.17
14	1937	862,226	4	189	193	4	175	179	.22	.21
15	1938	722,026	4	122	126	3	103	106	.17	.15
16	1924 to 1927 Incl.	3,713,822	104	2,177	2,281	56	1,974	2,030	.61	.55
17	1928 to 1931 Incl.	3,718,340	50	1,200	1,250	31	1,070	1,101	.34	.30
18	1932 to 1935 Incl.	2,980,334	47	676	723	28	613	641	.24	.22
19	1936 to 1938 Incl.	2,469,390	17	478	495	11	424	435	.20	.18
20	IMPROVEMENT - PERIOD 1936 - 1938 COMPARED WITH 1924 - 1927								67.21%	67.27%

SOURCE: Column (b): Annual Reports to Interstate Commerce Commission, Schedule 531.

Columns (c) to (h) inclusive: Interstate Commerce Commission Accident Bulletins, Table 99.

5447

2182

Defendant's Exhibit No. 123 (Witness Wilbur)
Dec. 13, 1940

THE CHESAPEAKE AND OHIO RAILWAY COMPANY

(Includes Hocking Valley Railway for entire period)

Derailments, all classes of service
Reportable to the Interstate Commerce Commission
for the years 1924 to 1938, inclusive

System

Line Number	Year	Locomotive miles (thousands)	Train miles (thousands)	Car miles (thousands)	Cause					Total Derailments Per		
					Negligence of Employes	Defects in or Failures of Equipment	Defects in or Improper Maintenance of Way and Structures	Miscellaneous	Total	100,000 locomotive miles	100,000 train miles	1,000,000 car miles
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
(1)	1924	30,557	21,323	782,565	48	187	170	95	500	1.64	2.34	0.64
(2)	1925	33,358	23,548	924,241	51	129	141	75	406	1.22	1.72	0.44
(3)	1926	34,284	23,973	996,055	55	122	111	57	345	1.01	1.44	0.35
(4)	1927	33,724	23,427	1,010,961	36	132	95	40	303	0.90	1.29	0.30
(5)	1928	31,621	22,178	961,949	24	115	84	39	262	0.83	1.18	0.27
(6)	1929	31,344	22,218	993,517	32	109	46	22	209	0.67	0.94	0.21
(7)	1930	28,947	20,851	936,393	28	69	21	23	141	0.49	0.68	0.15
(8)	1931	24,443	17,746	826,481	25	53	19	14	111	0.45	0.63	0.13
(9)	1932	19,845	14,372	686,193	13	38	18	15	84	0.42	0.58	0.12
(10)	1933	20,197	14,184	745,779	13	44	13	22	92	0.46	0.65	0.12
(11)	1934	20,988	14,565	781,499	16	28	13	16	73	0.35	0.50	0.09
(12)	1935	20,603	14,319	766,863	10	32	11	14	67	0.33	0.47	0.09
(13)	1936	23,024	15,605	885,138	8	35	29	14	86	0.37	0.55	0.10
(14)	1937	22,804	15,427	862,226	15	31	10	11	67	0.29	0.43	0.08
(15)	1938	19,673	13,640	722,026	12	23	6	15	56	0.28	0.41	0.08
(16)	1924 to 1927 Incl.	131,923	92,271	3,713,822	200	570	527	257	1,554	1.18	1.68	0.42
(17)	1928 to 1931 Incl.	116,355	82,993	3,718,340	109	346	170	98	723	0.62	0.87	0.19
(18)	1932 to	81,613	57,440	2,980,334	52	142	55	67	316	0.39	0.55	0.11

Line Number	Year	# Locomotive Miles (thousands)	Train Miles (thousands)	Car Miles (thousands)	Cause					Total Derailments Per		
					Negligence of Employes	Defects in or Failures of Equipment	Defects In or Improper Maintenance of Way and Structures	Miscellaneous	Total	100,000 locomotive miles	100,000 train miles	1,000,000 car miles
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
(1)	1924	30,557	21,323	782,565	48	187	170	95	500	1.64	2.34	0.64
(2)	1925	33,358	23,548	924,241	61	129	141	75	406	1.22	1.72	0.44
(3)	1926	34,284	23,973	996,055	55	122	111	57	345	1.01	1.44	0.35
(4)	1927	33,724	23,427	1,010,961	36	132	95	40	303	0.90	1.29	0.30
(5)	1928	31,621	22,178	961,949	24	115	84	39	262	0.83	1.18	0.27
(6)	1929	31,344	22,218	993,517	32	109	46	22	209	0.67	0.94	0.21
(7)	1930	28,947	20,851	936,393	28	69	21	23	141	0.49	0.68	0.15
(8)	1931	24,443	17,746	826,481	25	53	19	14	111	0.45	0.63	0.13
(9)	1932	19,845	14,372	686,193	13	38	18	15	84	0.42	0.58	0.12
(10)	1933	20,197	14,184	745,779	13	44	13	22	92	0.46	0.65	0.12
(11)	1934	20,988	14,565	781,499	16	28	13	16	73	0.35	0.50	0.09
(12)	1935	20,603	14,319	766,863	10	32	11	14	67	0.33	0.47	0.09
(13)	1936	23,024	15,605	885,138	8	35	29	14	86	0.37	0.55	0.10
(14)	1937	22,804	15,427	862,226	15	31	10	11	67	0.29	0.43	0.08
(15)	1938	19,673	13,640	722,026	12	23	6	15	56	0.28	0.41	0.08
(16)	1924 to 1927 Incl.	131,923	92,271	3,713,822	200	570	517	267	1,554	1.18	1.68	0.42
(17)	1928 to 1931 Incl.	116,355	82,993	3,718,340	109	346	170	98	723	0.62	0.87	0.19
(18)	1932 to 1935 Incl.	81,633	57,440	2,980,234	52	142	55	67	316	0.39	0.55	0.11
(19)	1936 to 1938 Incl.	65,501	44,672	2,469,390	35	89	45	40	209	0.32	0.47	0.08
(20)	Improvement period 1936 to 1938 Compared with period 1924 to 1927				82.5%	84.4%	91.3%	85.0%	86.6%	72.9%	72.0%	81.0%
(21)	Improvement 1938 compared with 1924				75.0%	87.7%	96.5%	84.2%	88.8%	82.9%	82.5%	87.5%

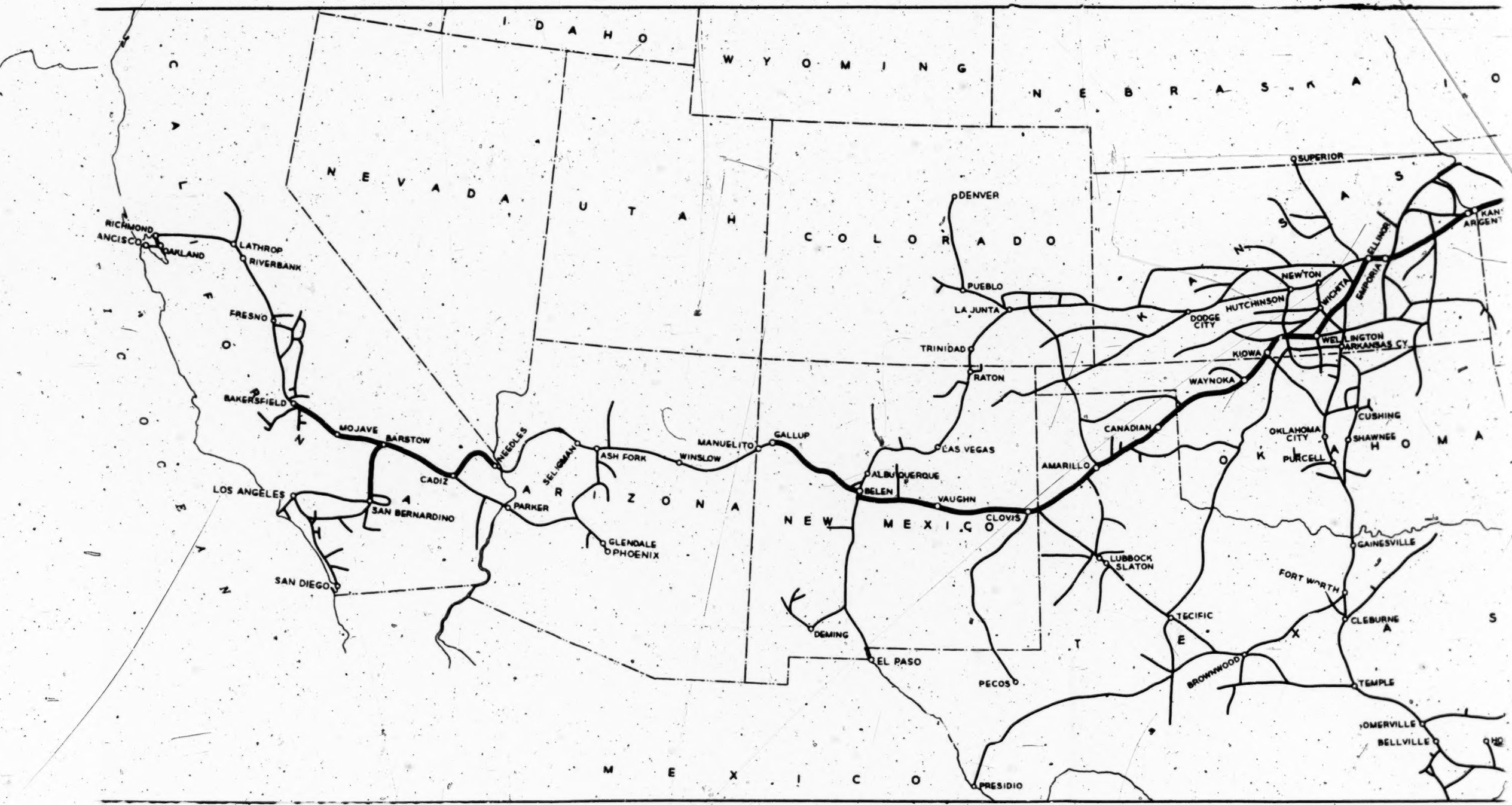
Includes motor car train miles.

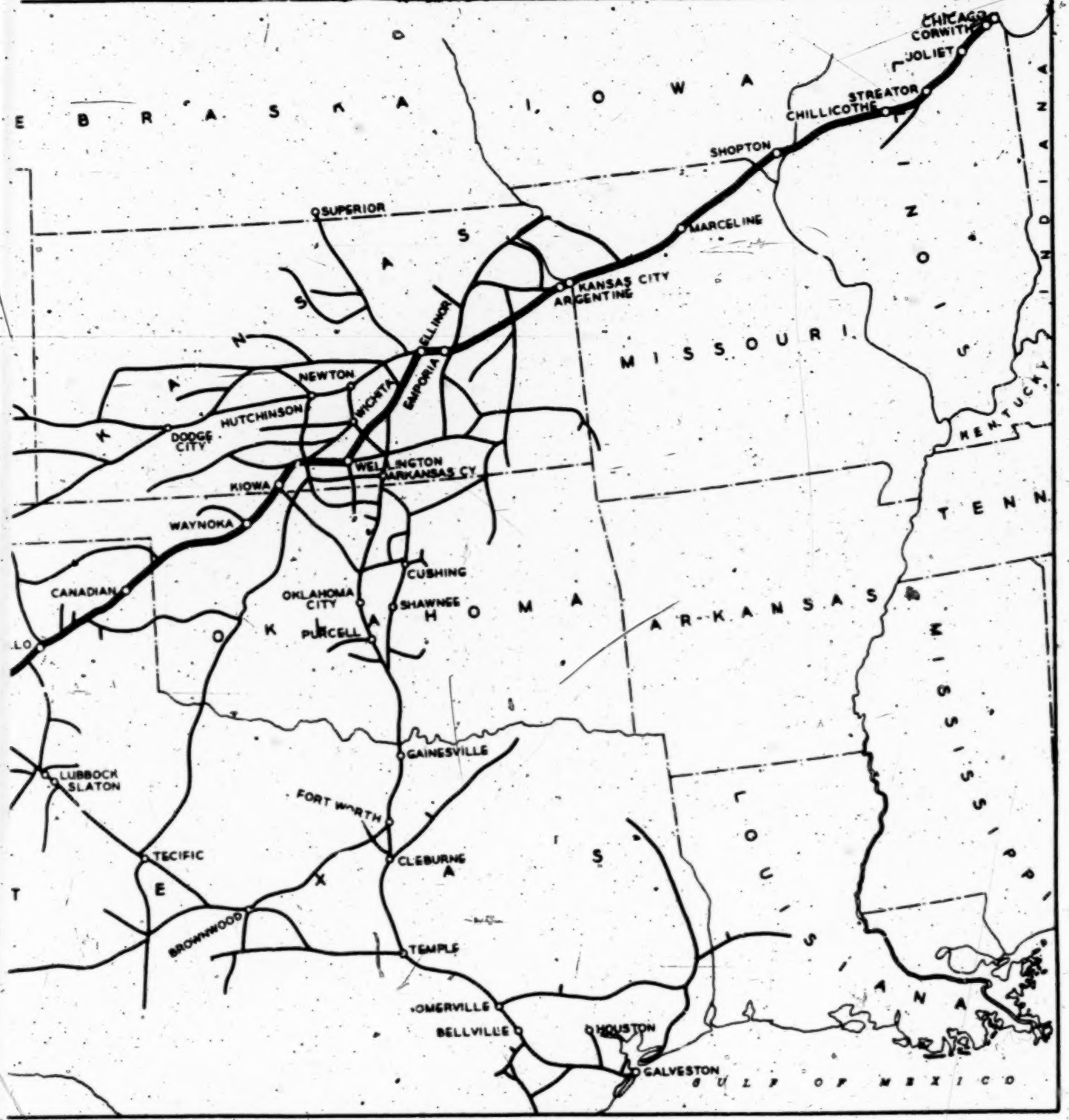
Source - Columns (b), (c) and (d): Annual Reports to the Interstate Commerce Commission, Schedule No. 531.

Columns (e) to (i), both inclusive: Annual Accident Bulletins issued by the Interstate Commerce Commission, Table No. 101.

23983

Defendant's Exhibit No. 124 (Witness Blanchard)
~~Dec. 6, 1940~~ Jan. 6, 1941





THE ATCHISON, TOPEKA AND SANTA FE RAILWAY SYSTEM

HEAVY LINE INDICATES TERRITORY COVERED BY TYPICAL FREIGHT TRAIN EXHIBIT.

5449

Defendant s Exhibit No. 125 (Witness Blanchard)
Jan. 6, 1941 ess

MAIN TRACK OPERATED MILEAGE
—of—
THE A. T. & S. F. nY. SYSTEM
C.E.S.,Chicago, Dec., 1940

Los Angeles to Chicago (via Amarillo)

Division	District	Single Trk	East Bd Trk	West Bd Trk	Total
Los Angeles	Third	57.4	14.1	14.1	85.6
" "	First	-	82.8	80.8	163.6
Arizona	Second	-	165.7	167.6	333.3
"	First	-	143.7	143.0	286.7
Albuquerque	Third	-	143.6	142.7	286.3
"	Second	-	127.7	127.7	255.4
"	First	-	134.1	133.7	267.8
"	Belen	10.3	-	-	10.3
Pecos	Second	103.0	-	-	103.0
"	First	130.8	-	-	130.8
Pecos	Third	85.1	18.6	18.6	122.3
"	Second	43.0	54.9	54.3	152.2
"	First	103.7	54.4	54.4	212.5
Panhandle	First	108.6	-	-	108.6
Middle	Second	79.1	20.8	20.8	120.7
"	First	-	17.3	17.3	34.6
Eastern	Second	-	118.1	118.1	236.2
Missouri	Second	-	103.8	103.8	207.6
" "	First	-	112.7	112.7	225.4
Illinois	Second	-	154.5	154.5	309.0
"	First	-	130.1	130.1	260.2

Dalies to Trinidad (via La Junta)

Albuquerque	First	28.3	8.7	8.7	45.7
New Mexico	Third	114.2	7.4	7.4	129.0
" "	Second	103.5	8.5	8.5	120.5
" "	First	91.4	28.2	28.2	147.8
Colorado	First	134.8	9.2	9.2	153.2
Western	Second	107.8	13.5	13.5	134.8
"	First	-	11.9	11.9	23.8

Los Angeles to Chicago (via Amarillo)

Division	District	Single Trk	East Bd Trk	West Bd Trk	Total
Los Angeles	Third	57.4	14.1	14.1	85.6
" "	First	-	82.8	80.8	163.6
Arizona	Second	-	165.7	167.6	333.3
"	First	-	140.7	140.0	280.7
Albuquerque	Third	-	143.6	142.7	286.3
"	Second	-	127.7	127.7	255.4
"	First	-	134.1	133.7	267.8
"	Belen	10.3	-	-	10.3
Pecos	Second	155.0	-	-	155.0
"	First	180.8	-	-	180.8
Prairie	Third	95.1	13.6	13.6	122.3
"	Second	43.0	54.9	54.3	152.2
"	First	103.7	4.4	4.4	112.5
Panhandle	First	106.6	-	-	106.6
Middle	Second	73.1	20.8	20.8	114.7
"	First	-	17.3	17.3	34.6
Eastern	Second	-	112.1	112.4	224.5
Missouri	Second	-	103.8	103.8	207.6
"	First	-	112.7	112.7	225.4
Illinois	Second	-	104.5	104.5	209.0
"	First	-	130.1	130.1	260.2

Dallas to Illinois (via Ka Junta)

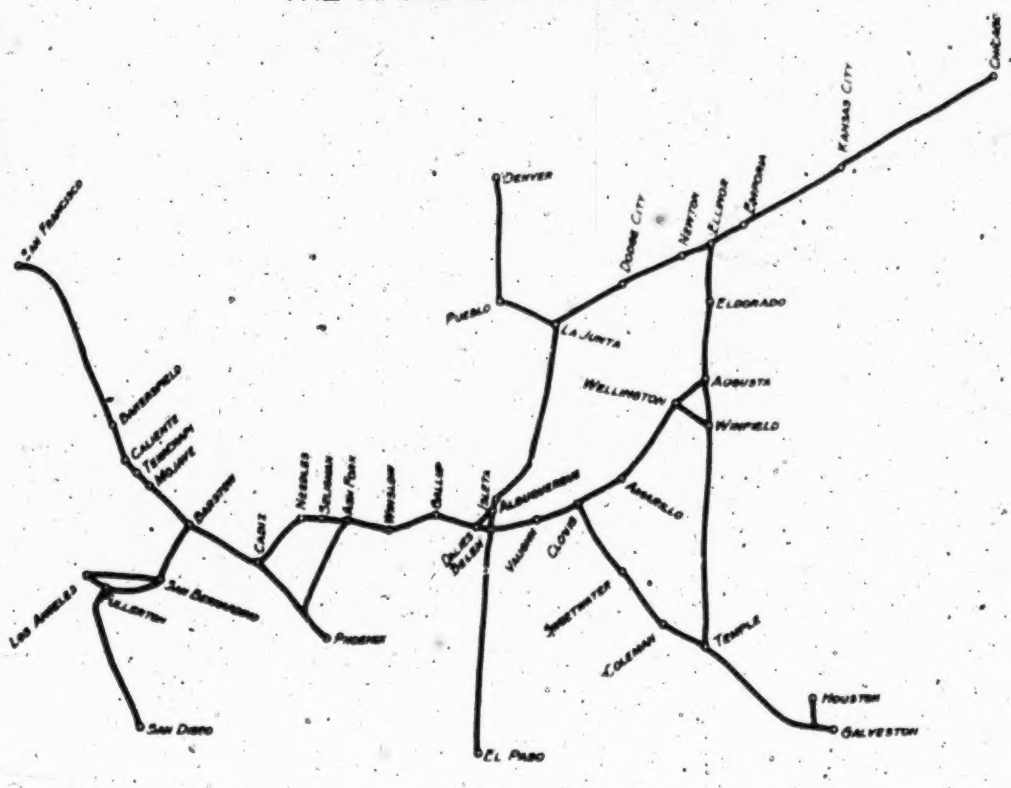
Albuquerque	First	22.3	1.7	1.7	25.7
New Mexico	Third	124.2	[illegible]	[illegible]	[illegible]
" "	Second	109.5	[illegible]	[illegible]	[illegible]
" "	First	92.4	[illegible]	[illegible]	[illegible]
Colorado	First	[illegible]	[illegible]	[illegible]	[illegible]
Western	Second	[illegible]	[illegible]	[illegible]	[illegible]
"	First	-	[illegible]	[illegible]	[illegible]
Kansas	First	-	[illegible]	[illegible]	[illegible]

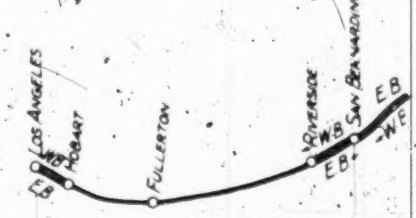
Part of Exhibit No.

5450

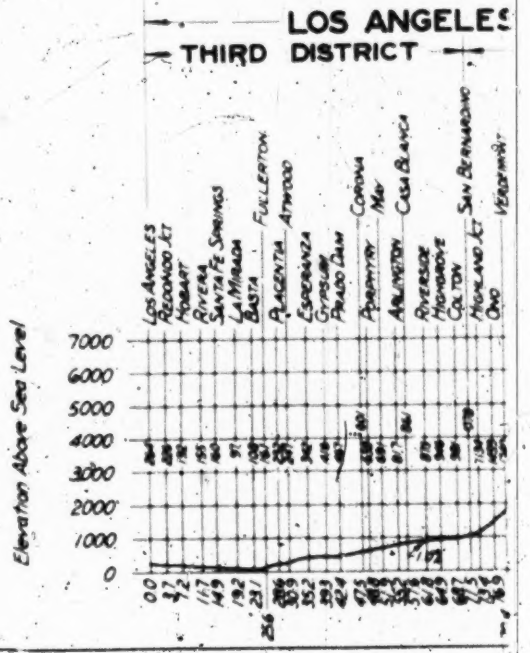
2965

SKETCH SHOWING
MAIN LINES OF
THE A. T. & S. F. RY. SYSTEM





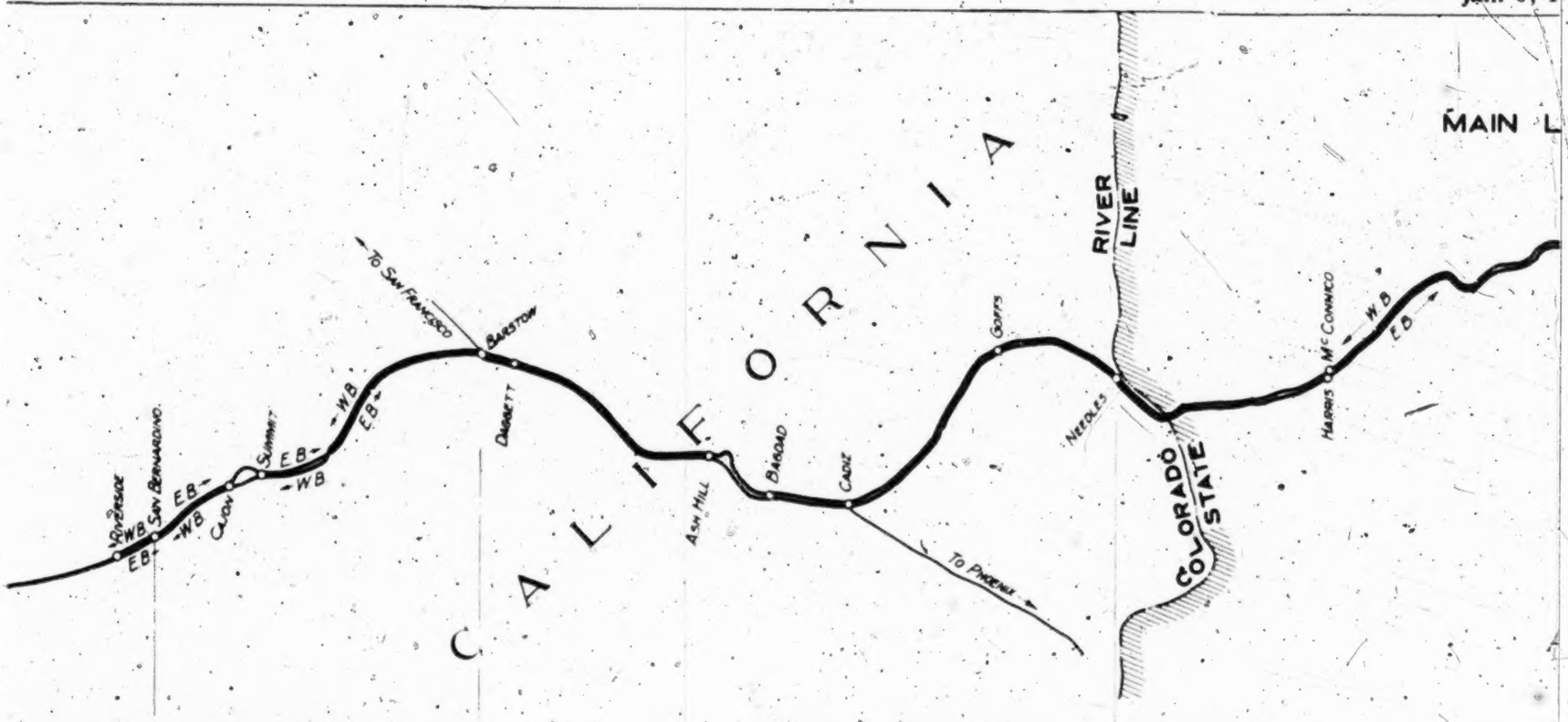
LOS ANGELES
THIRD DISTRICT



NOTES: (See Profile).
The controlling ascending or ruling eastbound or westbound grades are shown immediately below the grade line.
Immediately above the grade line are shown all descending grades between Barstow and Belen which would control tonnage if trains were run against the current of traffic on double track and which exceed (a) 1.42% west of Winslow and (b) 0.60% east of Winslow. Arrows pointing easterly indicate grades on eastbound track and arrows pointing westerly indicate grades on westbound track.

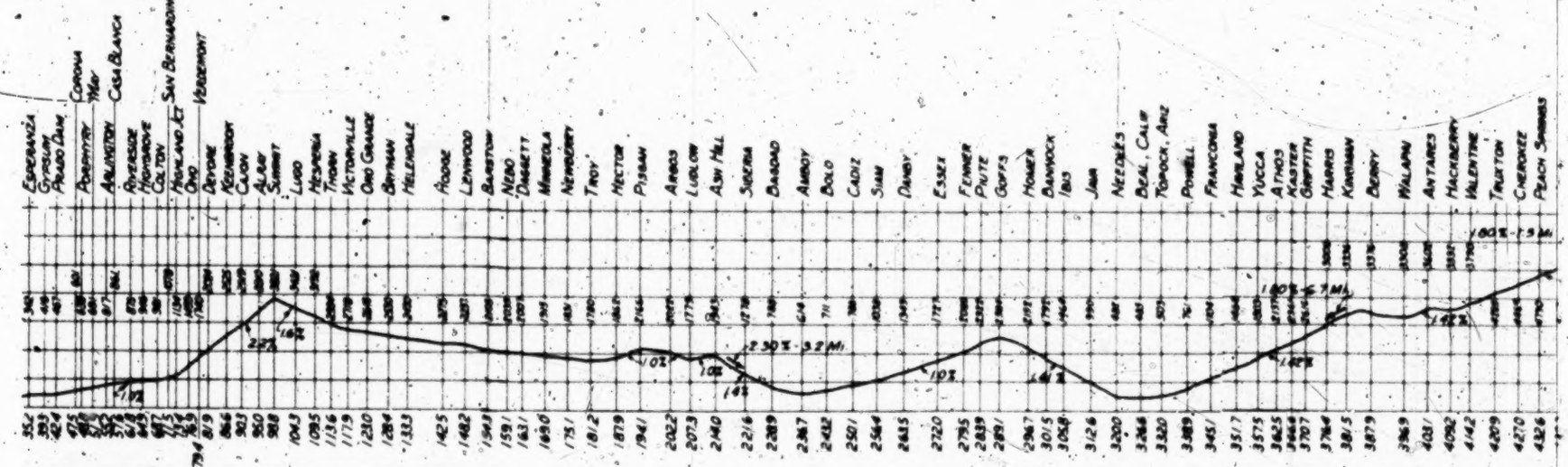
Defendant's Exhibit N
Jan. 6, 1

MAIN L



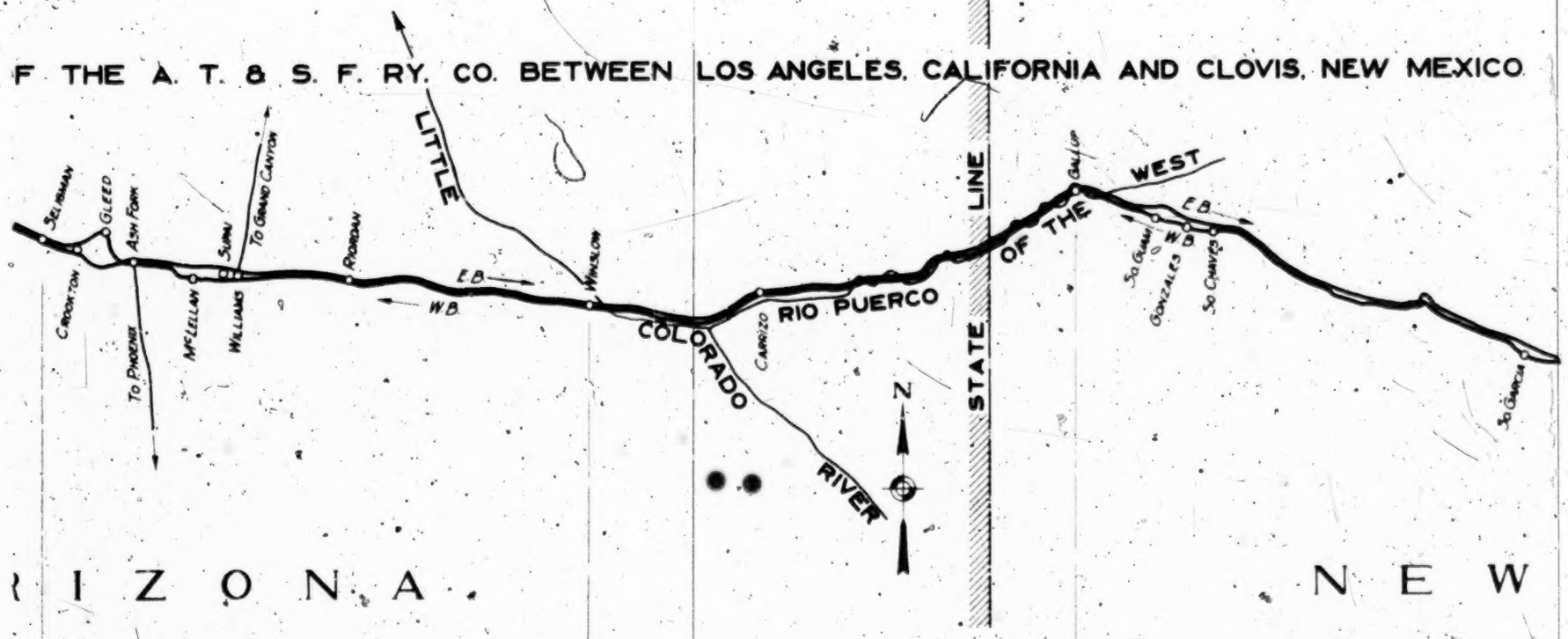
LOS ANGELES DIVISION — ARIZONA DIVISION

DISTRICT — FIRST DISTRICT — SECOND DISTRICT — FIRST DISTRICT


ESPERANZA
GYPSUM
PRADO DAM
CORONA
MAR
ARLINGTON
CASA BLANCA
RIVERSIDE
HIGHGROVE
COLTON
SAN BERNARDINO
HIGHLAND JCT
ONO
VERDEMONT
DEVORE
KEENBROOK
CAJON
ALAN
SUMMIT
LUGO
HESPERIA
THORN
VICTORVILLE
ORO GRANDE
OEHMAN
HELENDALE
ADOBE
LENWOOD
BARSTOW
NEBO
DAGGETT
MINNEOLA
NEWBERRY
TROY
HECTOR
PISGAH
AMBOY
LUDLOW
ASH HILL
SIBERIA
BAGDAD
AMOY
BOLO
CADIZ
SIAM
DANBY
ESSEX
FENNER
PIUTE
GOFFS
HOMER
BANNOCK
IBIS
JAM
NEEDLES
BEAL, CALIF
TOPOCK, ARIZ
POWELL
FRANCONIA
HARLAND
YUCCA
ATHOS
KASTER
GRIFFITH
HARRIS
KINNMAN
DERBY
WILLARD
ANTARES
HACKBERRY
VALENTINE
TRILETON
CHEROKEE
PEACH SPRINGS
2.30% - 3.2 MI
1.08%
1.02%
2.27%
1.62%
1.08%
1.41%
1.08%
1.42%
1.60%
1.60%
1.60

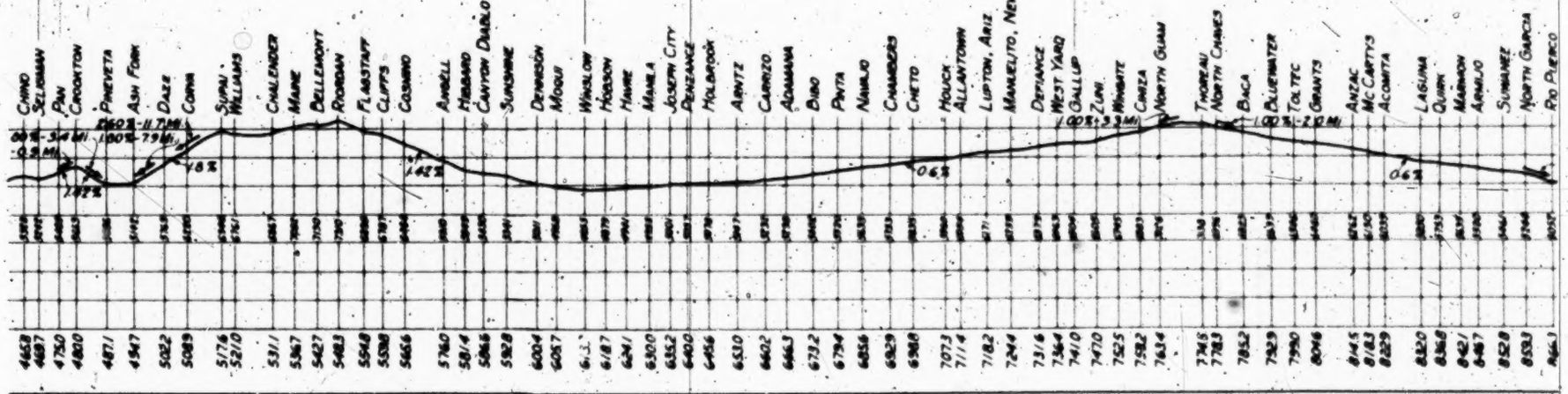
Witness Blanchard)

F THE A. T. & S. F. RY. CO. BETWEEN LOS ANGELES, CALIFORNIA AND CLOVIS, NEW MEXICO

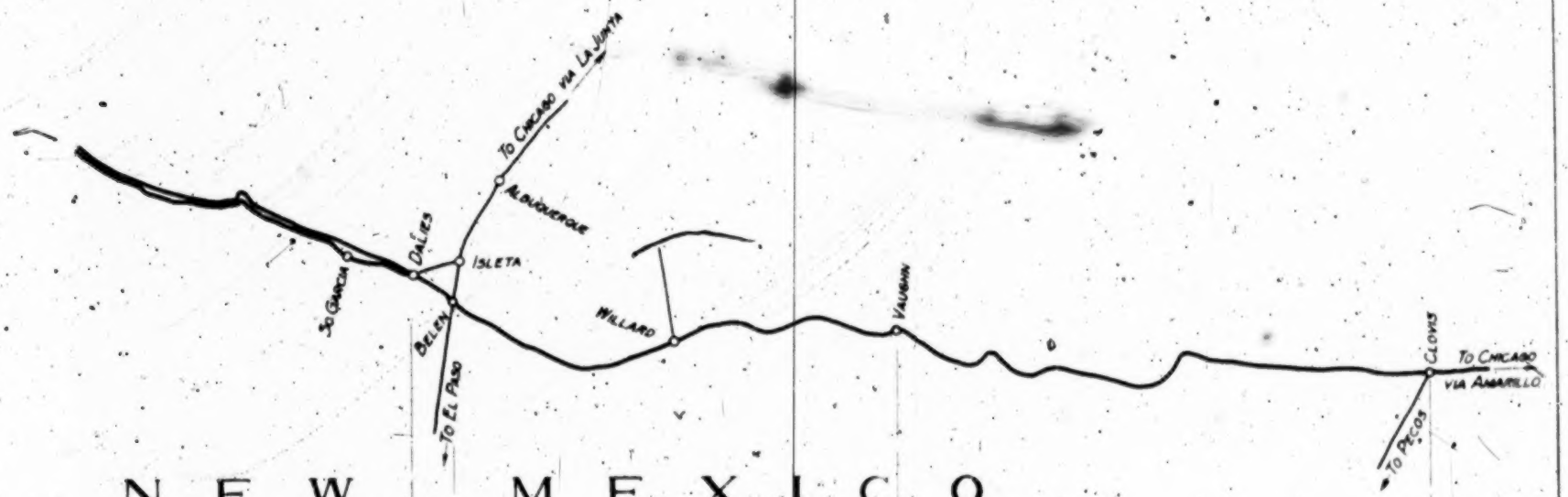


ALBUQUERQUE DIVISION

THIRD DISTRICT — SECOND DISTRICT — FIRST DISTRICT



'IS, NEW MEXICO



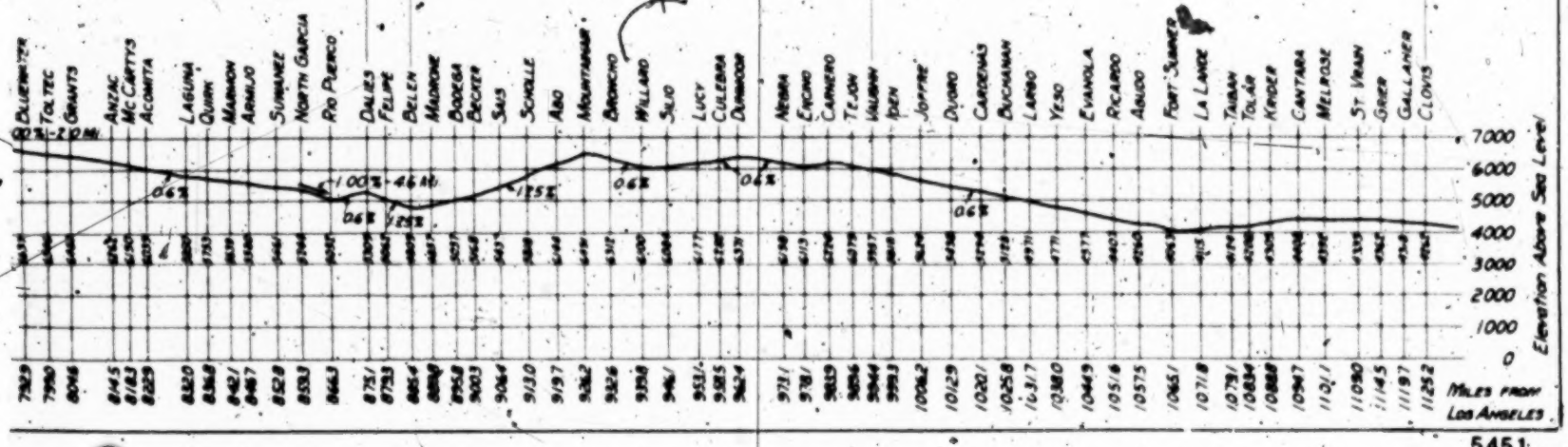
NEW MEXICO

PECOS DIVISION

RST DISTRICT — SECOND DISTRICT — FIRST DISTRICT

BELEN DIST.

5451



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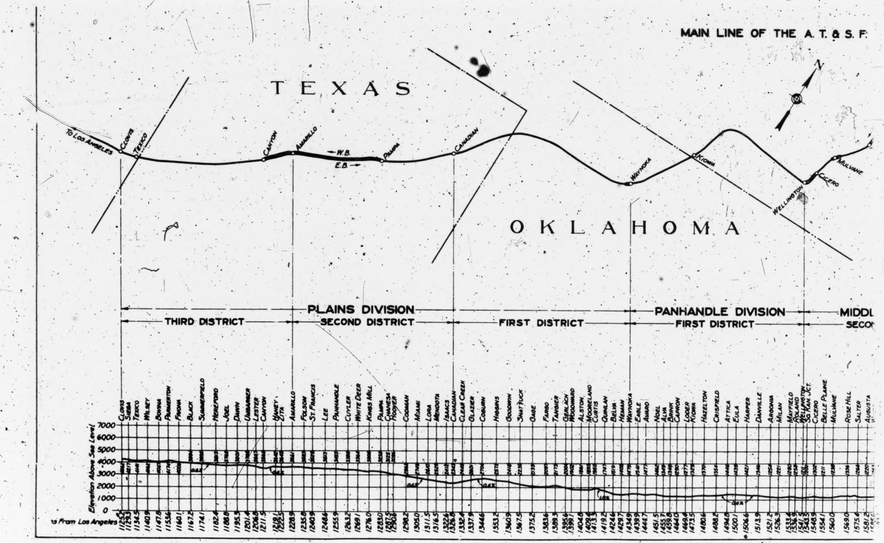

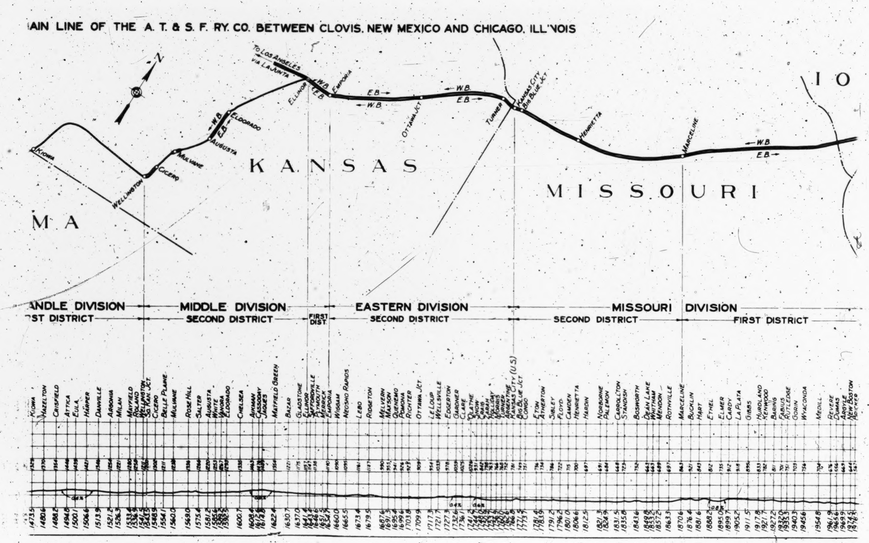
AIN LINE OF THE A. T. & S. F. RY. CO. BETWEEN CLOVIS, NEW MEXICO AND CHICAGO, ILLINOIS
KANSAS
MISSOURI
M A
I O
To Los Angeles via La Junta
Clovis
Texico
Melrose
Elkhart
Coolidge
Syracuse
Lakin
Deerfield
Kendall
Garden City
Holcomb
Pierceville
Ingalls
Dodge City
Cimarron
Ford
Spearville
Kinsley
Offerle
Belpre
Larned
Pawnee
Rocky Ford
Fowler
Sanford
Las Animas
Boone
Swink
Manzanola
Rocky Ford
Fowler
Sanford
Las Animas
Boone
Swink
Manzanola
Hasty
Granada
Holly
Wiley
Bristol
Coolidge
Arkansas City
Winfield
Arkansas City
Winfield
Augusta
Eldorado
Towanda
Florence
Peabody
Newton
Halstead
Sedgwick
Wichita
Mulvane
Arkansas City
Winfield
Augusta
Eldorado
Towanda
Florence
Peabody
Newton
Halstead
Sedgwick
Wichita
Mulvane
Belle Plaine
Oxford
Arkansas City
Winfield
Augusta
Eldorado
Towanda
Florence
Peabody
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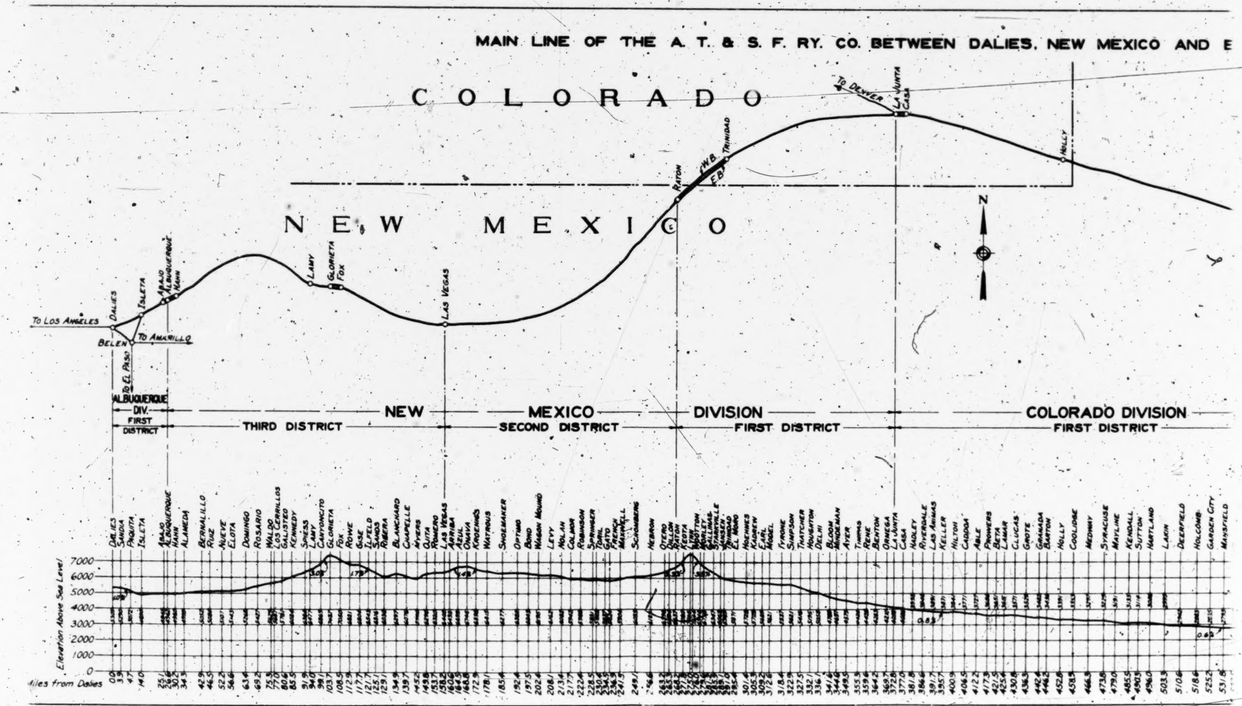
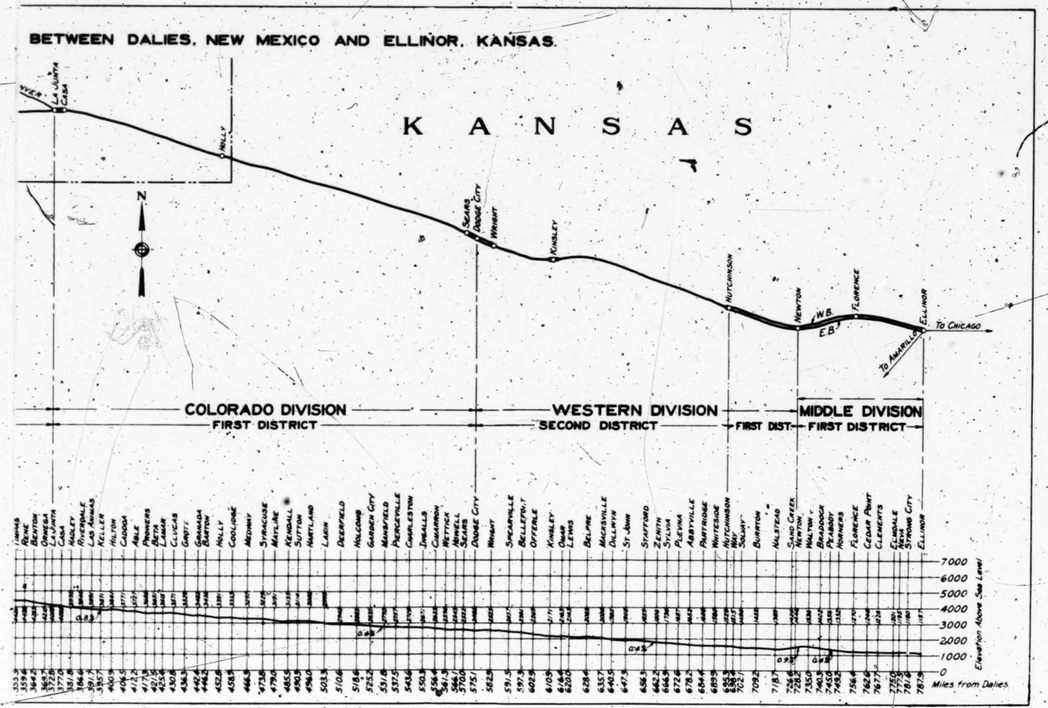

MAIN LINE OF THE A. T. & S. F. RY. CO. BETWEEN DALIES, NEW MEXICO AND E
COLORADO
NEW MEXICO
To Los Angeles
Dalies
Isleta
Albuquerque
To Amarillo
Belen
El Paso
Lamy
Glorieta Pa.
Las Vegas
Raton
To Trinidad
To Denver
La Junta
Casa
Holly
N
ALBUQUERQUE DIV. FIRST DISTRICT
THIRD DISTRICT
NEW MEXICO DIVISION
SECOND DISTRICT
FIRST DISTRICT
COLORADO DIVISION
FIRST DISTRICT
Elevation Above Sea Level
Miles from Dalies


BETWEEN DALIES, NEW MEXICO AND ELLINOR, KANSAS.
KANSAS
To Trinidad
La Junta
Casa
Holly
Sugar City
Wiggins
Kinsley
Hutchinson
Newton
W.B.
E.B.
Florence
Ellinor
To Chicago
To Amarillo
N
COLORADO DIVISION
FIRST DISTRICT
WESTERN DIVISION
SECOND DISTRICT
FIRST DIST.
MIDDLE DIVISION
FIRST DISTRICT
Elevation Above Sea Level
Miles from Dalies
5453

Defendant's Exhibit No. 127 (Witness Blanchard)
Jan. 6, 1941

ATCHISON, TOPEKA AND SANTA FE RAILWAY

DATES OF CONSTRUCTION OF SECOND TRACK ACROSS THE STATE OF ARIZONA

			MILES	YEAR
New Mexico - Arizona State Line	MP 179 + 1483 to Chambers	MP 205 + 3907	26.4	1927
Chambers	MP 205 + 3907 to Carrizo	MP 239 + 3714	34.0	1928
Carrizo	MP 239 + 3714 to Joseph City	MP 263 + 1853	23.6	1940
Joseph City	MP 263 + 1853 to	MP 282 + 2453	19.1	1930
	MP 282 + 2453 to	MP 283 + 1711	0.9	1931
	MP 283 + 1711 to W. of Winslow	MP 287 + 1028	3.8	1930
West of Winslow	MP 287 + 1028 to W. of Dennison	MP 300 + 3485	13.5	1910
Dennison	MP 300 + 3485 to near Flagstaff	MP 342 + 2645	41.8	1913
Near Flagstaff	MP 342 + 2645 to Ashfork	MP 401 + 1015	58.7	1911
Ashfork	MP 401 + 1015 to Yampai	MP 452 + 947	51.0	1913
Yampai	MP 452 + 947 to Hackberry	MP 489 + 1760	37.1	1923
Hackberry	MP 489 + 1760 to Louise	MP 514 + 647	24.8	1922
Louise	MP 514 + 647 to near Topock	MP 566 + 590	52.0	1923
Near Topock	MP 566 + 590 to Colorado River Br.	MP 566 + 3952	0.7	1913
	TOTAL		387.4	

Colorado River is Arizona - California State Line

Defendant's Exhibit No. 128 (Witness Blanchard)
Jan. 6, 1941

Weight of Rail
in Main Track Operated Mileage of A.T.& S.F.Ry.System
Los Angeles to Chicago (via Amarillo)

ion	District	Single Track			East bound Track			West Bound Track			Total
		90#	110-112#	130-131#	90#	110-112#	130-131#	90#	110-112#	130-131#	
n.eles	Third		57.4		2.8	11.3		1.7	12.4		85.6
"	First				0.3	58.0	24.5	0.5	70.4	9.9	163.6
na	Second				0.8	164.9		0.8	166.8		333.3
"	First					147.2	2.5	0.1	146.4	4.5	298.7
uerque	Third					132.3	6.1		127.6	15.1	286.3
"	Second				1.0	106.4	20.3		123.0	4.7	255.4
"	First •					134.1			133.7		267.8
"	Selen	0.3	10.0								10.3
	Second	2.1	106.9								109.0
	First	1.1	122.7	7.0							130.8
s	Third	1.9	72.7	10.5		18.6			18.6		122.3
	Second		42.0			54.9			54.9		152.8
	First		103.7			4.4			4.4		112.5
ndle	First		100.6								106.6
•	Second		75.1			20.8		16.2	4.6		120.7
	First •					9.4	3.9		13.3		26.6
rn	Second					112.1			112.1		224.2
uri	Second					103.8			90.7	13.1	207.6
	First					109.7	3.0		112.7		225.4
ois	Second					104.5			104.5		209.0
	First					130.1			130.1		260.2
Totals		5.4	702.1	17.5	4.9	1427.5	60.5	19.3	1426.2	45.3	3708.7

Dalies to Ellinor (via La Junta)

uerque	First •		23.9		2.7			2.7			29.3
dexico	Third		118.8	5.4		5.0	2.4		7.4		139.0
"	Second		109.5		0.5			0.5			110.5
"	First	0.8	80.6			1.1	22.1		1.2	22.0	127.8
rado	First	0.9	173.1	20.0	4.9	3.4		2.5		5.8	210.6
ern	Second		107.7		0.7	11.8		0.7	11.8		132.7
"	First •					32.9			32.9		65.8
le	First •					59.7			59.7		119.4
Totals		1.7	613.6	25.4	8.8	113.9	24.5	6.4	113.0	27.8	935.1

• Part of District only.

S., Chicago, Dec., 1940

5455

Defendant's Exhibit No. 129 (Witness Blanchard)
Jan. 6, 1941

Class of Ballast
in Main Track Operated Mileage of the A.T.& S.F.Ry. System
Los Angeles to Chicago (via Amarillo)

Division	District	Single Track			East Bound Track			West Bound Track			Total
		Rock	Gravel	Cinders	Rock	Gravel	Cinders	Rock	Gravel	Cinders	
Angeles	Third	18.2	39.2		6.7	7.4		6.7	7.4		85.6
"	First				2.9	80.2		4.0	76.8		161.9
Arizona	Second					104.7			147.4		* 252.1
"	First					104.7	24.9		100.9	25.0	** 254.6
Albuquerque	Third						143.6			142.7	286.3
"	Second						127.7	10.5		117.2	255.4
"	First *				87.5	1.2	45.4	102.1	0.9	50.7	287.8
"	Belen		10.3								10.3
Pecos	Second	109.0									109.0
"	First	130.8									130.8
Plains	Third	85.1			18.6			18.6			122.3
"	Second	43.0			54.9			54.9			152.8
"	First	103.7			4.4			4.4			112.5
Panhandle	First	106.6									106.6
Middle	Second	73.6	5.5		8.3	1.4	11.1	19.7		1.1	120.7
"	First *				13.3			13.3			26.6
Western	Second				112.1			112.1			224.2
Missouri	Second				60.8	43.0		55.3	48.3	0.2	207.6
"	First				45.6	67.1		58.2	54.2		225.4
Illinois	Second				49.9	54.6		46.7	57.6		209.0
"	First				37.3	92.0	0.8	20.8	108.5	1.3	260.2
Totals		670.0	55.0		502.0	556.3	352.6	527.0	602.3	318.2	3583.4 **

Dalies to Ellinor (via La Junta)

Albuquerque	First *	14.0		9.9			2.7			2.7	29.3
New Mexico	Third	124.2			7.4			7.4			139.0
"	Second	109.2			0.5			0.5			110.5
"	First	81.4			23.2			23.2			127.8
Colorado	First	194.0			8.3			8.3			210.6
Western	Second	103.8		3.9	7.2		5.3	5.4		7.1	132.7
"	First *				11.2		1.7	30.4		2.5	65.8
Middle	First *				59.7			59.7			119.4
Totals		626.9		13.8	137.5		9.7	134.9		12.3	935.1

* Part of District only
* does not include 20.2 miles W.B. and 61.0 miles E.B. ballasted with native material
** " " " 23.1 " " " 21.0 " " " " " " "

"Rock" consists of crushed rock, prepared gravel, and slag
"Gravel" " " pit run gravel, screenings and chats
"Cinders" " " volcanic cinders and engine cinders

E.S.,Chicago, Dec., 1940

5456

THE ATCHISON, TOPEKA AND SANTA FE RAILWAY SYSTEM

FREIGHT OPERATING AND FREIGHT TRANSPORTATION EXPENSES RELATED TO TRAFFIC

Calendar Years 1922 to 1939, Inclusive

Year (a)	Revenue ton-miles (b)	Freight operating expenses (c)	Freight transportation expenses (d)	Averages per 1,000 revenue ton-miles: Freight operating expenses (e)	Averages per 1,000 revenue ton-miles: Freight transportation expenses (f)
1939	11,700,077,134	$88,561,342	$40,145,180	$7.57	$3.43
1938	11,172,423,784	85,780,909	40,701,465	7.68	3.64
1937	12,937,725,968	101,416,375	45,009,565	7.84	3.48
1936	11,513,453,101	90,413,214	38,953,809	7.85	3.38
1935	9,718,655,287	77,063,186	33,140,292	7.93	3.41
1934	9,351,567,968	72,792,249	29,939,688	7.78	3.20
1933	8,711,882,176	65,938,173	27,282,826	7.57	3.13
1932	9,069,545,011	71,975,533	29,396,927	7.94	3.24
1931	12,350,190,688	94,111,163	38,992,293	7.62	3.16
1930	14,526,835,462	113,553,032	46,432,793	7.82	3.20
1929	16,579,277,969	125,874,358	51,629,022	7.59	3.11
1928	15,207,097,600	121,587,989	49,876,992	8.00	3.28
1927	16,247,802,274	127,471,148	52,836,757	7.85	3.25
1926	16,314,038,059	122,082,167	54,913,202	7.48	3.37
1925	13,861,804,088	116,880,229	50,722,540	8.43	3.66
1924	13,080,877,846	121,081,259	50,197,381	9.26	3.84
1923	12,323,632,260	124,101,728	51,326,467	10.07	4.16
1922	11,177,223,688	117,860,319	49,338,971	10.54	4.41
Total 1936-1939	47,323,679,987	366,171,840	164,810,019	7.74	3.48
Total 1922-1925	50,443,537,882	479,923,535	201,585,359	9.51	4.00
Percent of improvement 4 years 1936-1939 compared with 4 years 1922-1925				18.6	13.0

SOURCE: Revenue ton-miles - Annual reports to the Interstate Commerce Commission of operating lines comprising Atchison System.

Freight operating and transportation expenses - Accounting records of Atchison System operating lines for years 1922 and 1923; thereafter annual reports of operating lines comprising Atchison System to the Interstate Commerce Commission.

Defendant's Exhibit No. 131 (Witness G.A. McDonald)
Jan. 6, 1941

THE ATCHISON, TOPEKA AND SANTA FE RAILWAY SYSTEM

FREIGHT SERVICE OPERATING AVERAGES
CALENDAR YEARS 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 AND 1939

Item	1922	1924	1926	1928	1930	1932	1934	1936	1938	1939	Per Cent Increase 1939 Over 1922
les of line operated in freight service	11 701	11 831	12 121	12 388	13 195	13 545	13 319	13 230	13 502	13 456	15.0
eight train miles	22 311 848	23 072 826	25 378 666	23 251 846	22 977 390	18 003 195	18 820 258	21 827 586	20 881 598	21 477 099	Dec. 3.7
eight cars per freight train	41.5	46.6	50.1	52.7	51.3	44.4	44.5	44.6	45.3	45.9	10.6
t tons per freight train	582	646	712	740	709	550	547	589	579	600	3.1
erage tractive power per Locomotive (Pounds)	41 539	43 779	46 079	48 924	50 158	50 767	51 825	52 402	53 171	53 959	29.9
erage capacity per freight car (Tons)	36.9	37.6	38.2	39.7	41.2	41.6	41.9	42.7	43.5	43.6	18.2
eight train speed (Miles per hour)	12.9	13.3	13.6	14.8	16.0	17.8	18.5	18.6	19.2	19.6	51.9
oss ton-miles per freight train-hour	19 350	22 887	25 423	29 445	31 115	29 492	30 642	32 562	34 233	35 471	83.3
t ton-miles per freight train-hour	7 481	8 615	9 664	10 973	11 370	9 803	10 116	10 936	11 090	11 699	56.4
oss ton-miles (exclusive of locomotives and tenders) per ton of fuel	11 628	13 567	15 043	16 097	16 772	15 906	15 661	14 142	14 587	14 723	26.6

1. Reported in Schedule 531 of Annual Report Form A to the Interstate Commerce Commission.

2, 3, 4, 7, and 8. For years 1922 to 1934 inclusive developed from Form OS-A and for years 1936 to 1939 inclusive taken direct from Form OS-A filed with the Interstate Commerce Commission.

5. Total tractive effort divided by total steam locomotives available for service at close of year as reported in Schedule 417 of Annual Report Form A to the Interstate Commerce Commission.

6. Aggregate capacity of all freight carrying cars divided by total number of such cars available for service at close of year as reported in Schedule 417 of Annual Report Form A to the Interstate Commerce Commission.

9. Net ton-miles divided by train hours as reported on Form OS-A to the Interstate Commerce Commission.

10. Gross ton-miles (cars, contents and cabooses) divided by equated net tons of fuel consumed as reported to the Interstate Commerce Commission years 1922 to 1934 inclusive on Form OS-A, and years 1936 to 1939 inclusive on Forms OS-A and OS-E.

Defendant's Exhibit No. 132 (Witness J.P. McDonald)
Jan. 6, 1941
Superior Court, Pima Co., Arizona
State v. S.P.Co. No. 20087
Defts. E

The Atchison, Topeka and Santa Fe Ry. System. Year 1939

841. REVENUE FREIGHT CARRIED DURING THE YEAR†

Give the particulars called for concerning the commodities carried on the respondent's road during the year, the revenue from which is includible in account No. 101, "Freight", classifying them in accordance with the Interstate Commerce Commission's Order of November 22, 1937, in the Matter of Freight Commodity Statistics, effective on January 1, 1938, as amended by order of December 14, 1938.

Classes 10 to 701 should include carload traffic only, all L. C. L. traffic being included in class 710.

Information as to carloads, tons, and revenue of forwarder traffic included in class 701 should be reported against commodity class designated 701-A. To avoid undue clerical labor, class 701-A may be restricted to the principal forwarding companies or their subsidiaries originating in the aggregate not less than approximately 80 percent of such traffic handled on respondent's line. The term "forwarder traffic" means freight traffic consigned by or to a forwarder, i. e., a company, firm, or individual recognized as engaged in the business of collecting and accumulating less-than-carload shipments into consolidated carloads without an ownership interest in the property so handled.

A "carload" for the purpose of this report should consist of a shipment of not less than 10,000 pounds of one commodity from one consignor to one consignee. Where mixed carload ratings are provided in classifications or tariffs, a mixed carload should be treated as a carload within the meaning of this paragraph, provided such shipment is from one consignor to one consignee at one destination, or in the case of shipments upon which stop-overs are permitted, from one consignor to two or more consignees, each at a different destination; and provided the shipment is waybilled at, and the charges are collected upon, the basis of the carload rate applicable. In such cases the shipment should be treated as a carload of that commodity which forms the major portion of the shipment in weight.

Class No.	Commodity group or class (a)	Revenue Freight Originating on Respondent's Road — Terminating on line: Number of carloads (b)	Terminating on line: Number of tons (2,000 lb.) (c)	Delivered to connecting carriers: Number of carloads (d)	Delivered to connecting carriers: Number of tons (2,000 lb.) (e)
	GROUP I. PRODUCTS OF AGRICULTURE				
10	Wheat	66 886	3 187 010	4 103	199 002
20	Corn	6 327	234 959	1 666	63 772
30	Oats	1 014	33 364	707	22 841
40	Barley and rye	2 331	79 168	432	16 917
41	Rice	1 869	63 051	139	4 351
49	Grain, n. o. s.	116	4 528	64	2 043
50	Flour, wheat	9 280	246 846	20 180	529 532
51	Meal, corn	155	3 966	42	1 136
52	Flour and meal, edible, n. o.	86	2 620	27	735
60	Cereal food preparations, edible, n. o.	437	8 425	99	2 231
61	Mill products, n. o. s.	9 162	221 464	7 294	174 822
70	Hay and alfalfa	1 081	14 802	453	6 090
71	Straw	595	7 531	1	13
80	Tobacco, leaf				
90	Cotton in bales	16 285	194 647	1 051	23 600
91	Cotton linters, nolls, and motes (ginnery)	242	5 540	327	7 997
100	Cottonseed	369	10 612	151	4 293
101	Cottonseed meal and cake	803	20 402	376	8 554
110	Oranges and grapefruit	4 082	74 019	22 516	404 722
111	Lemons, limes, and citrus fruits, n. o. s.	1 726	32 553	4 439	75 841
120	Apples, fresh	9	143	9	146
121	Bananas	916	10 158	92	1 008
122	Berries, fresh				
123	Cantaloupes and melons, n. o. s.	329	3 928	2 318	26 769
124	Grapes, fresh	1 029	16 850	7 956	135 037
125	Peaches, fresh	497	8 307	1 009	16 365
126	Watermelons	36	445	46	573
127	Fruits, fresh, domestic, n. o. s.	368	4 856	855	12 609
128	Fruits, fresh, tropical, n. o. s.	12	176	290	4 139
130	Potatoes, other than sweet	4 764	75 758	10 436	159 814
140	Cabbage	49	642	215	2 759
141	Onions	531	7 806	1 643	23 308
142	Tomatoes	93	1 002	990	10 739
143	Vegetables, fresh, n. o. s.	1 033	11 918	4 978	57 708

The Atchison, Topeka and Santa Fe Ry. Syst

841. REVENUE FREIGHT CARRIED DURING THE YEAR†—Continued

In stating the number of tons received from connecting carriers, all shipments should be included that, so far as apparent from the information on the waybills or abstracts of waybills, have been received from connecting rail carriers either directly or indirectly. Shipments from boat lines should also be included when identified as having had previous rail transportation by United States rail carriers or as moving on joint through bills of lading by coastwise water carriers and railways.

Tonnage originating on switching roads connecting directly or indirectly with respondent's line should be regarded as tonnage originated by respondent.

Import traffic and traffic from outlying possessions of the United States received from water carriers should be regarded as originating at the port of entry.

All other tonnage should be treated as originating on line, including finished products from transit points.

The terms "delivered to connecting line" should be understood in a manner to "received from connecting ... "Freight revenue" means revenue without adjustment for absorptions ...

In the note on page 518 show the protective services to perishable freight ... portion thereof credited to account ... on whose rails protective service ... which the charges are credited, with ... such services. Tariff charges for ... in transit, or at destination, which ... (standard) charges from the point ... first applicable, and which are not ... should be reported by the carrier to ...

Revenue Freight Received from Connecting Carriers — Terminating on line: Number of carloads (f)	Terminating on line: Number of tons (2,000 lb.) (g)	Delivered to connecting carriers: Number of carloads (h)	Delivered to connecting carriers: Number of tons (2,000 lb.) (i)	Total Revenue Freight Ca... Number of carloads (j)	Number ... (2,000 lb.) (k)
1 191	53 740	16	723	72 196	3 44
2 396	96 027	175	7 290	10 564	4
256	8 152	15	502	1 992	
143	5 140	9	345	2 915	1
152	4 715	56	2 050	2 216	
42	1 205	2	62	224	
3 344	88 690	559	14 785	33 363	8
135	3 633	4	120	336	
59	1 661	2	50	174	
1 008	18 456	71	1 185	1 615	
3 026	73 577	94	2 234	19 576	4
297	4 591	20	285	1 851	
1	10			597	
40	803			40	
398	7 219	17	435	17 751	2
17	363	40	924	626	
34	862	13	353	567	
2 626	64 373	91	2 097	3 898	
1 608	28 978	1 017	18 269	29 223	5
2 974	56 893	353	5 989	9 492	1
1 200	21 048	302	5 600	1 520	
1 010	11 377	5	55	2 023	
23	305	6	198	29	
127	1 457	935	10 420	3 709	
781	13 133	3 471	59 978	13 237	2
336	4 740	55	919	1 897	
61	761	6	77	149	
320	4 924	358	5 814	1 901	
6	82	6	103	314	
4 400	78 555	585	9 767	20 185	3
111	1 444	4	50	379	
238	3 490	150	2 119	2 562	
172	1 875	90	982	1 345	
1 488	17 210	3 697	43 502	11 196	1
	6 241	174	5 549	822	

The Atchison, Topeka and Santa Fe Ry. System.

341. REVENUE FREIGHT CARRIED DURING THE YEAR†—Continued

tons received from connecting carriers, all that, so far as apparent from the informa- racts of waybills, have been received from r directly or indirectly. Shipments from ded when identified as having had previous l States rail carriers or as moving on joint etwise water carriers and railways.

witching roads connecting directly or indi- should be regarded as tonnage originated by

om outlying possessions of the United States should be regarded as originating at the port

be treated as originating on line, including t points.

The terms "delivered to connecting carriers" and "terminating on line" should be understood in a manner consistent with the above definitions of "received from connecting carriers" and "originating on line."

"Freight revenue" means reporting carrier's gross freight revenue without adjustment for absorptions or corrections.

In the note on page 318 show the aggregate of the gross charges for protective services to perishable freight (without deduction for any proportion thereof credited to account No. 101, "Freight"). The carrier on whose rails protective service to perishable freight originates, or to which the charges are credited, will report the gross tariff charges for such services. Tariff charges for specific services performed at origin, in transit, or at destination, which are not included in the established (standard) charges from the point at which the protective service was first applicable, and which are collected from shippers or consignees, should be reported by the carrier to which such charges accrue.

Received from Connecting Carriers			Total Revenue Freight Carried		Freight revenue (dollars)	Operating
Delivered to Connecting Carriers						
Number of tons (b)	Number of carloads (c)	Number of tons (1,000 lb.) (d)	Number of carloads (e)	Number of tons (1,000 lb.) (f)	(g)	
3 740	16	723	72 196	3 440 475	9 851 216	
5 027	175	7 290	10 564	402 048	1 297 309	
3 152	15	502	1 992	64 859	154 511	
5 140	9	345	2 915	101 570	236 240	
4 715	56	2 050	2 216	74 167	182 334	
1 205	2	62	224	7 836	28 464	
8 690	559	14 785	33 363	879 853	2 080 891	
3 633	4	120	336	8 855	32 678	
1 661	2	50	174	5 066	19 368	
8 456	71	1 185	1 615	30 297	252 161	
3 577	94	2 234	19 576	472 097	967 113	
4 591	20	285	1 851	25 768	109 940	
10			597	7 554	12 530	
803			40	803	10 284	
7 219	17	435	17 751	225 901	1 588 229	
363	40	924	626	14 824	111 476	
862	13	353	567	16 120	68 441	
4 373	91	2 097	3 898	96 426	271 407	
8 978	1 017	18 269	29 223	525 988	8 664 228	
6 893	353	5 989	9 492	171 276	1 796 173	
1 048	302	5 600	1 520	26 937	148 376	
1 377	5	55	2 023	22 598	267 380	
305	6	198	29	503	2 806	
1 457	935	10 420	3 709	42 574	677 816	
3 133	3 471	59 978	13 237	224 998	3 563 280	
4 740	55	919	1 897	30 331	221 663	
761	6	77	149	1 856	12 981	
4 924	358	5 814	1 901	28 203	473 102	
82	6	103	314	4 500	76 834	
8 655	585	9 767	20 185	323 894	2 967 217	
1 444	4	50	379	4 895	57 936	
3 490	150	2 119	2 562	36 723	334 405	
1 875	90	982	1 345	14 598	232 245	
7 210	3 697	43 502	11 196	130 338	1 915 508	
6 241	174	5 549	822	25 171	164 080	

...s of 701-A. To avoid undue clerical labor, class 701-A may be restricted to the principal forwarding companies or their subsidiaries originating in the aggregate not less than approximately 80 percent of such traffic handled on respondent's line. The term "Forwarder traffic" means freight traffic consigned by or to a forwarder, i. e., a company, ... or more consignees, each at a different destination; and provided the shipment is waybilled at, and the charges are collected upon, the basis of the carload rate applicable. In such cases the shipment should be treated as a carload of that commodity which forms the major portion of the shipment in weight.

Class No.	Commodity group or class (a)	Revenue Freight Originating on Respondent's Road				Revenue Freight Received from Connecting Carriers			
		Terminating on line		Delivered to connecting carriers		Terminating on line		Delivered to connecting carriers	
		Number of carloads (b)	Number of tons (2,000 lb.) (c)	Number of carloads (d)	Number of tons (2,000 lb.) (e)	Number of carloads (f)	Number of tons (2,000 lb.) (g)	Number of carloads (h)	Number of tons (2,000 lb.) (i)
	GROUP I. Products of Agriculture								
10	Wheat	66 886	3 187 010	4 103	199 002	1 191	53 740	16	723
11	Corn	6 327	234 959	1 666	63 772	2 396	96 027	175	7 290
12	Oats	1 014	33 364	707	22 841	256	8 152	15	502
13	Barley and rye	2 331	79 168	432	16 917	143	5 140	9	345
14	Rice	1 869	63 051	139	4 351	152	4 715	56	2 050
15	Grain, n. o. s.	116	4 528	64	2 043	42	1 205	2	62
16	Flour, wheat	9 280	246 846	20 180	529 532	3 344	88 690	559	14 785
17	Meal, corn	155	3 966	42	1 136	135	3 633	4	120
18	Flour and meal, edible, n. o.	86	2 620	27	735	59	1 661	2	50
19	Cereal food preparations, edible, n. o.	437	8 425	99	2 231	1 008	18 456	71	1 185
20	Mill products, n. o. s.	9 162	221 464	7 294	174 822	3 026	73 577	94	2 234
70	Hay and alfalfa	1 081	14 802	453	6 090	297	4 591	20	285
71	Straw	595	7 531	1	13	1	10		
80	Tobacco, leaf					40	803		
90	Cotton in bales	16 285	194 647	1 051	23 600	398	7 219	17	435
91	Cotton linters, soiled and [illegible]	242	5 540	327	7 997	17	363	40	924
100	Cottonseed	369	10 612	151	4 293	34	862	13	353
101	Cottonseed meal and cake	803	20 402	378	8 554	2 626	64 373	91	2 097
110	Oranges and grapefruit	4 082	74 019	22 516	404 722	1 608	28 978	1 017	18 269
111	Lemons, limes, and citrus fruits, n. o. s.	1 726	32 553	4 439	75 841	2 974	56 893	353	5 989
120	Apples, fresh	9	143	9	146	1 200	21 048	302	5 600
121	Bananas	916	10 158	92	1 008	1 010	11 377	5	55
122	Berries, fresh					23	305	6	198
123	Cantaloupes and melons, n. o. s.	329	3 928	2 318	26 769	127	1 457	935	10 420
124	Grapes, fresh	1 029	16 550	7 956	135 037	781	13 133	3 471	59 978
125	Peaches, fresh	497	8 307	1 009	16 365	336	4 740	55	919
126	Watermelons	36	445	46	573	61	761	6	77
127	Fruits, fresh, domestic, n. o. s.	368	4 856	855	12 609	320	4 924	358	5 814
130	Fruits, fresh, tropical, n. o. s.	12	176	290	4 139	6	82	6	103
130	Potatoes, other than sweet	4 764	75 758	10 436	159 814	4 400	78 555	585	9 767
140	Cabbage	49	642	215	2 759	111	1 444	4	50
141	Onions	531	7 806	1 643	23 308	238	3 490	150	2 119
142	Tomatoes	93	1 002	990	10 739	172	1 876	90	982
143	Vegetables, fresh, n. o. s.	1 033	11 918	4 978	57 708	1 488	17 210	3 697	43 502
150	Beans and peas, dried	148	4 614	288	8 767	212	6 241	174	5 549
151	Fruits, dried or evaporated	982	28 472	1 270	42 977	531	12 485	111	3 783
152	Vegetables, dry, n. o. s.	6	103	33	509	53	823	4	48
160	Vegetable-oil cake and meal, except cottonseed	201	4 408	40	1 191	456	10 639	35	785
161	Peanuts	168	3 208	159	2 744	299	5 731		
162	Flaxseed	129	5 304			19	739		
163	Sugar beets	4 262	163 275	116	4 627	395	14 555		
199	Products of agriculture, n. o. s.	3 836	95 428	3 082	66 194	1 086	29 984	271	6 057
(200)	Total Products of Agriculture	142 244	4 892 308	99 894	2 126 475	33 071	760 686	12 819	213 504

† Not required from switching and terminal companies.

...responden...

Import traffic and traffic from outlying possessions of the United States received from water carriers should be regarded as originating at the port of entry.

All other tonnage should be treated as originating on line, including finished products from transit points.

...such ab... in trans... (standar... first ap... should ...

† Not required from switching and ter...

om outlying possessions of the United States should be regarded as originating at the port

be treated as originating on line, including t points.

such services. Tariff charges for special services performed at origin, in transit, or at destination, which are not included in the established (standard) charges from the point at which the protective service was first applicable, and which are collected from shippers or consignees, should be reported by the carrier to which such charges accrue.

Received from Connecting Carriers			Delivered to Connecting Carriers		Total Revenue Freight Carried		Freight charges (dollars)	
Number of tons (2,000 lb.)	Number of carloads (b)	Number of tons (2,000 lb.) (b)	Number of carloads (j)	Number of tons (2,000 lb.) (b)				
3 740	16	723	72 196	3 440 475		9 851 216		
5 027	175	7 290	10 564	402 048		1 297 309		
3 152	15	502	1 992	64 859		154 611		
5 140	9	345	2 915	101 670		236 940		
4 715	56	2 050	2 216	74 167		182 334		
1 205	2	62	224	7 838		28 464		
8 690	559	14 785	33 363	879 863		2 080 881		
3 633	4	120	336	8 855		32 878		
1 661	2	50	174	5 066		19 368		
8 456	71	1 185	1 615	30 297		252 151		
3 577	94	2 234	19 576	472 097		967 113		
4 591	20	285	1 851	26 768		109 940		
10			597	7 554		12 636		
803			40	803		10 284		
7 219	17	435	17 751	225 901		1 588 228		
363	40	924	626	14 824		111 476		
862	13	353	567	16 120		68 441		
4 373	91	2 097	3 898	96 426		271 407		
8 978	1 017	18 269	29 223	525 988		8 664 288		
6 893	353	5 989	9 492	171 276		1 796 173		
1 048	302	5 600	1 520	26 937		142 376		
1 377	5	55	2 023	22 598		267 380		
305	6	198	29	503		2 806		
1 457	935	16 420	3 709	42 574		677 816		
3 133	3 471	59 978	13 237	224 998		3 663 280		
4 740	55	919	1 897	30 331		221 663		
761	6	77	149	1 856		12 981		
4 924	358	5 814	1 901	28 203		473 102		
82	6	103	314	4 500		76 834		
8 655	585	9 767	20 185	323 894		2 967 217		
1 444	4	50	379	4 896		67 836		
3 490	150	2 119	2 562	36 723		334 405		
1 876	90	982	1 345	14 598		232 845		
7 210	3 697	43 502	11 196	130 338		1 915 508		
6 241	174	5 549	822	26 171		164 080		
2 485	111	3 783	2 894	87 717		869 082		
823	4	48	96	1 483		6 490		
0 639	35	785	732	17 023		64 490		
5 731			626	11 683		43 387		
739			148	6 043		13 868		
4 655			4 773	182 457		101 396		
9 984	271	6 057	8 275	197 663		1 278 738		
0 686	12 819	213 504	288 028	7 992 973		41 191 063		

1 Not required from switching and terminal companies.

The Atchison, Topeka and Santa Fe Ry. System. Year 1939 — The Atchison, Topeka and Santa Fe Ry. Syste

541. REVENUE FREIGHT CARRIED DURING THE YEAR†—Continued

Class No.	Commodity group or class	Revenue Freight Originating on Respondent's Road: Terminating on line — Number of carloads	Terminating on line — Number of tons (2,000 lb.)	Delivered to connecting carriers — Number of carloads	Delivered to connecting carriers — Number of tons (2,000 lb.)	Revenue Freight Received from Connecting Carriers: Terminating on line — Number of carloads	Terminating on line — Number of tons (2,000 lb.)	Delivered to connecting carriers — Number of carloads	Delivered to connecting carriers — Number of tons (2,000 lb.)	Total Revenue Freight Carried: Number of carloads	Number of tons (2,000 lb.)
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
	GROUP II. Animals and Products (C. L.)										
101	Horses, mules, ponies, and asses	274	3 249	774	9 441	106	1 290	22	257	1 176	14 237
102	Cattle and calves, single-deck	23 616	273 635	21 532	242 935	10 638	113 652	2 242	24 177	58 028	654 399
103	Calves, double-deck	157	2 296	297	4 558	527	7 556	256	3 590	1 237	18 000
109	Sheep and goats, single-deck	489	2 837	224	1 265	128	745	22	116	863	4 963
110	Sheep and goats, double-deck	5 759	60 633	5 522	54 742	1 803	18 840	564	5 576	13 648	139 791
120	Hogs, single-deck	743	6 307	58	503	200	1 765	4	34	1 005	8 608
124	Hogs, double-deck	3 598	47 145	99	1 354	1 131	15 232	15	184	4 843	63 915
130	Fresh meats, n. o. s.	1 673	20 762	6 711	78 618	513	7 605	49	712	8 949	107 697
131	Meats, cured, dried, or smoked	432	9 941	284	4 532	478	8 721	80	1 291	1 274	24 485
132	Butterine and margarine	19	249			19	283			38	532
133	Packing-house products, n. o. s., not including meat meal	550	8 697	203	2 787	227	3 926	7	137	987	15 547
139	Poultry, live	1	3	24	170	14	100	22	157	61	436
141	Poultry, dressed	109	1 312	1 195	13 834	67	994	46	538	1 417	16 678
148	Eggs	226	2 592	401	4 446	63	850	88	1 155	778	9 043
149	Butter	432	4 860	833	9 599	166	2 227	22	245	1 453	16 931
151	Cheese	13	170	4	54	127	1 975	10	166	154	2 365
159	Wool	1 344	16 855	890	13 991	74	929	82	988	2 390	32 763
170	Hides, green	311	8 689	427	12 263	2	39	39	958	779	21 949
171	Leather			2	26	1	15			3	41
172	Fish or sea-animal oil	574	21 540	174	4 907	56	2 050	73	2 152	877	30 649
191	Animals, live, n. o. s.										
192	Animal products, n. o. s. (other than fertilizers and fertilizer materials)	676	16 210	784	18 284	298	7 036	139	3 851	1 897	45 381
199	Total Animals and Products	40 999	507 988	40 438	478 309	16 638	195 830	3 782	46 284	101 857	1 228 411
	GROUP III. Products of Mines (C. L.)										
201	Anthracite coal	236	10 320	164	6 601	9	290	2	54	411	17 165
202	Bituminous coal	13 368	580 776	8 708	403 196	10 840	430 543	5 680	316 767	38 596	1 731 282
204	Coke	350	14 003	2 175	103 526	563	20 008	53	1 814	3 141	139 351
232	Iron ore			759	44 012	2	50	1	27	762	44 089
233	Copper ore and concentrates	30 898	2 206 500	50	2 210	36	1 523			30 984	2 210 233
234	Lead ore and concentrates	630	27 864	1	41	1	42	3	120	635	28 067
237	Zinc ore and concentrates	2 121	108 454	1 020	47 365	384	21 555	41	2 500	3 566	179 874
239	Ores and concentrates, n. o. s.	959	48 063	363	17 131	125	6 026	72	3 561	1 519	74 781
240	Gravel and sand (other than glass or molding)	15 895	877 813	7 197	389 444	3 423	190 150	245	12 587	26 760	1 469 994
241	Stone, broken, ground, or crushed	7 773	416 296	1 601	89 614	1 358	74 998	124	6 222	10 856	587 130
243	Stone, rough, n. o. s.	108	4 918	22	957	100	3 829	6	199	236	9 903
244	Stone, finished, n. o. s.	16	413	8	249	98	3 069	19	657	141	4 288
245	Petroleum, crude	7 357	269 735	817	29 415	6 407	239 725	70	2 211	14 651	541 086
246	Asphalt (natural, by-product, or petroleum)	3 420	121 181	4 722	176 525	961	33 250	53	1 692	9 156	332 648
247	Salt	1 452	46 061	2 806	86 542	2 077	62 955	125	4 712	6 460	200 270
248	Phosphate rock, crude (ground or not ground)					45	1 737	6	235	12 027	794 595
251	Sulphur (brimstone)	10 630	728 300	1 346	64 323	2 438	111 851	126	5 470	11 919	599 528
299	Products of mines, n. o. s.	7 594	392 587	1 761	89 620	28 867	1 201 601	6 626	358 728	171 820	8 964 284
299	Total Products of Mines	102 807	5 853 284	33 520	1 550 671						

...e Atchison, Topeka and Santa Fe Ry. System.

REVENUE FREIGHT CARRIED DURING THE YEAR—Continued

From Connecting Carriers — Delivered to Connecting Carriers				Total Revenue Freight Carried				Freight revenue (dollars)		Class No.
Number of carloads (h)	Number of tons (2,000 lb.) (i) c			Number of carloads (j)	Number of tons (2,000 lb.) (k)					
22			257	1	176	14	237	114	226	
2 242		24	177	58	028	654	399	3 958	484	
256		3	590	1	237	18	000	107	791	
22			116		863	4	963	36	618	
564		5	576	13	648	139	791	971	646	
4			34	1	005	8	609	43	688	
15			184	4	843	63	915	662	734	
49			712	8	949	107	697	1 060	712	
80		1	291	1	274	24	485	387	740	
					38		532	7	588	
7			137		987	15	547	203	976	
22			157		61		436	8	065	
46			538	1	417	16	678	254	849	
88		1	155		778	9	043	113	754	
22			245	1	453	16	931	257	382	
10			166		154	2	365	46	359	
82			988	2	390	32	763	451	819	
39			958		779	21	948	152	604	
					3		41	1	191	
73		2	152		877	30	649	110	565	
139		3	851	1	897	45	381	420	388	
3 782		46	284	101	857	1	228 411	9	361 968	
2			54		411	17	165	38	221	
3 680		316	767	38	596	1	731 282	2	221 576	
53		1	814	3	141		139 351		209 662	
1			27		762		44 089		98 723	
				30	984	2	210 233		326 215	
3			120		635		28 067		118 766	
41		2	500	3	566		179 874		404 679	
72		3	561	1	519		74 781		278 006	
245		12	587	26	760	1	469 994		899 797	
124		6	222	10	856		587 130		492 516	
6			199		236		9 903		36 585	
19			657		141		4 288		12 685	
70		2	211	14	651		541 086		549 064	
53		1	692	9	156		332 648		800 724	
125		4	712	6	460		200 270		637 586	
6			235	12	027		794 595		977 202	
126		5	470	11	919		599 528	1	066 503	
6 626		358	728	171	820	8	964 284	9	168 500	

The Atchison, Topeka and Santa Fe Ry. System. Year 1939

541. REVENUE FREIGHT CARRIED DURING THE YEAR †—Continued

Class No.	Commodity group or class	Terminating on line: Number of carloads (b)	Terminating on line: Number of tons (2,000 lb.)	Delivered to connecting carriers: Number of carloads	Delivered to connecting carriers: Number of tons (2,000 lb.)
	GROUP IV. PRODUCTS OF FORESTS (C. L.)				
400	Logs	6 232	124 782	17	598
401	Posts, poles, and piling	1 043	30 275	477	14 275
402	Wood (fuel)	62	1 936	7	187
410	Ties, railroad	884	29 573	65	1 963
420	Pulpwood	563	24 132	778	33 096
430	Lumber, shingles, and lath	8 182	226 603	8 185	208 007
431	Box, crate, and cooperage materials	371	9 980	480	11 470
439	Veneer and built-up wood	2	35	4	84
442	Rosin	17	499		
443	Turpentine	59	1 623	22	640
449	Crude rubber (not reclaimed)	12	334	52	1 685
462	Products of forests, n. o. s.	88	1 731	186	4 798
1320	Total, Products of Forests	14 515	451 503	10 273	276 803
	GROUP V. MANUFACTURES AND MISCELLANEOUS (C. L.)				
632	Petroleum oils, refined, and all other gasoline	40 253	1 134 100	57 425	1 534 819
631	Fuel, road, and petroleum residual oils, n. o. s.	18 271	701 006	17 633	560 667
633	Lubricating oils and greases	4 265	95 213	4 298	88 950
634	Petroleum products, n. o. s.	101	2 730	153	4 017
635	Cottonseed oil	1 412	43 217	435	13 028
636	Linseed oil	21	506	21	606
1343	Vegetable oils, n. o. s.	508	17 860	403	12 197
670	Sugar (beet or cane)	1 491	48 217	1 760	65 253
671	Table syrups and cane-sugar gleanings	315	8 305	21	584
672	Molasses, blackstrap, and beet special	396	17 907	93	4 025
673	Iron, pig	30	1 547	47	2 532
691	Iron and steel, scrap, not class in official classification, n. o. s.	7	392		
699	Rails, fastenings, frogs, and switches	162	7 780	36	1 578
710	Cast iron pipe and fittings	17	573	45	1 563
711	Iron and steel pipe and fittings, n. o. s.	2 011	69 780	656	23 275
712	Iron and steel: Nails and wire, not woven	759	25 470	77	2 237
713	Iron and steel, and articles classed therein, n. o. s. (except nails and wire)	3 051	104 522	678	21 000
720	Copper: Ingot, matte, and pig	64	3 228	1 159	63 703
721	Copper, brass, and bronze: Bar, sheet, and pipe	53	2 619	257	14 591
722	Lead and zinc: Ingot, pig, or bar	199	8 887	559	26 116
723	Aluminum: Ingot, pig, or slabs				
730	Machinery and boilers	314	6 674	366	8 415
740	Cement, natural or Portland (building)	13 885	462 843	6 912	250 544
741	Brick, common	669	24 475	203	6 553
742	Brick, n. o. s., and building tile	912	32 366	819	29 098
743	Artificial stone, n. o. s.	50	1 670	10	301
670	Lime, common (quick or slaked)	480	12 430	137	3 740
744	Plaster (stucco) or wall and dry kalsomine	2 365	54 380	2 771	64 925
170	Sewer pipe and drainage tile, not metal	581	9 661	55	983
760	Agricultural implements and parts, n. o. s.	435	6 336	90	1 490
761	Vehicles, horse-drawn, and parts, n. o. s.			3	15
762	Tractors and parts	475	6 386	133	2 196
763	Railway car wheels, axles, and boxes	28	749	7	268

The Atchison, Topeka and Santa Fe Ry

541. REVENUE FREIGHT CARRIED DURING THE YEAR

Terminating on line: Number of carloads (b)	Terminating on line: Number of tons (2,000 lb.)	Delivered to connecting carriers: Number of carloads	Delivered to connecting carriers: Number of tons (2,000 lb.)	Total Revenue: Number of carloads
2 001	80 965	3	105	5 253
2 273	63 044	141	3 972	3 934
19	548			88
566	17 386	6	148	1 521
		1	31	1 342
16 289	413 476	2 188	58 755	34 844
4 029	96 213	226	5 493	5 106
566	16 563	113	2 792	685
31	840	1	24	49
19	433	3	81	103
3	102	1	45	68
621	12 647	61	1 396	956
267 417	702 222	2 744	72 842	53 949
15 196	412 008	3 711	97 836	116 584
2 749	99 927	292	9 166	38 945
2 650	49 454	500	10 620	11 713
105	2 592	116	3 248	475
249	7 500	27	1 000	2 123
72	1 496	11	220	125
144	4 228	73	2 230	1 128
2 008	63 991	441	16 291	5 700
353	9 738	24	611	713
418	19 516	5	210	912
371	20 882	54	3 461	507
92	5 843			99
48	2 128	612	33 726	858
803	21 156	120	2 793	985
3 693	127 436	481	16 193	7 043
1 135	35 803	363	12 686	2 354
4 092	167 429	1 097	41 213	9 518
523	24 844	191	9 741	1 937
69	1 512	10	612	386
78	3 855	32	1 427	863
16	338	1	20	17
1 215	26 572	196	4 471	2 088
3 022	97 479	36	1 866	23 885
469	16 653	37	607	1 358
1 269	44 334	147	5 936	3 117
52	1 747	3	82	115
1 197	34 799	13	300	1 827
796	19 119	137	4 040	6 009
419	7 634	4	78	1 062
1 123	15 637	139	1 975	1 783
11	136	1	15	15
1 102	16 123	113	2 075	1 823

Atchison, Topeka and Santa Fe Ry. System.

41. REVENUE FREIGHT CARRIED DURING THE YEAR—Continued

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	Class No.
5	3	105	5	253	206	450	87	055	
4	141	3 972	3	934	111	566	353	256	
3				88	2	671	3	957	
6	6	148	1	521	49	070	128	726	
	1	31	1	342	57	259	31	128	
5	2 188	58 755	34	844	906	843	3 506	285	
5	226	5 493	5	106	123	159	293	535	
3	113	2 792		685	19	474	74	956	
0	1	24		49	1	363	6	966	
3	3	81		103	2	777	34	244	
2	1	45		68	2	166	27	722	
7	61	1 396		956	20	572	82	917	
2	2 741	72 842	53	949	1 503	370	4 730	747	
5	3 711	97 536	116	584	3 178	463	10 032	760	
7	292	9 166	38	945	1 370	986	3 741	689	
4	500	10 620	11	713	244	237	1 158	369	
2	116	3 248		475	12	587	54	400	
0	27	1 000	2	123	64	745	446	121	
5	11	220		125	2	828	18	625	
3	73	2 230	1	128	36	515	235	610	
1	441	16 291	5	700	193	762	1 458	298	
2	24	611		713	19	236	176	750	
5	5	110		912	41	658	137	045	
2	59	3 461		507	28	392	28	957	
3				99	6	235	21	121	
5	612	33 728		858	45	214	76	752	
0	120	2 753		985	26	065	98	061	
5	481	16 193	7	043	236	684	2 087	183	
3	383	12 886	2	354	76	406	554	608	
9	1 097	41 213	9	518	334	164	2 401	840	
1	191	3 741	1	937	101	516	586	311	
2	16	612		386	19	334	107	695	
3	32	1 427		863	40	385	193	107	
00	1	20		17		358	6	208	
2	185	4 471	2	088	45	032	678	817	
4	86	1 866	23	886	812	732	2 142	723	
5	17	607	1	388	48	488	85	686	
1	142	5 938	3	117	111	736	272	865	
	3	82		115	3	800	11	484	
1	13	300	1	827	51	269	115	065	
	137	4 040	6	069	142	470	521	601	
	4	78	1	062	18	346	97	787	
	136	1 975	1	783	25	438	312	596	
1	1	15		15		166	2	319	
	113	2 075	1	823	26	780	359	138	

600	Logs	8 232	124 782	17	598	2 001	80 965	3	105	5 253
601	Posts, poles, and piling	1 043	30 275	477	14 275	2 273	63 044	141	3 972	3 934
602	Wood (fuel)	62	1 936	7	187	19	548			88
610	Ties, railroad	884	29 573	65	1 963	566	17 386	6	148	1 521
620	Pulpwood	563	24 132	778	33 096		1	1	31	1 342
630	Lumber, shingles, and lath	8 182	226 603	8 185	208 007	16 289	413 476	2 188	58 755	34 844
631	Box, crate, and cooperage materials	371	9 980	480	11 470	4 029	96 216	226	5 493	5 106
632	Veneer and built-up wood	2	35	4	84	566	16 563	113	2 792	685
640	Rosin	17	499			31	840	1	24	49
641	Turpentine	59	1 623	22	640	19	433	3	81	103
643	Crude rubber (not reclaimed)	12	334	52	1 685	3	102	2	45	68
648	Products of forests, n. o. s.	88	1 731	186	4 798	621	12 647	61	1 396	956
600	TOTAL PRODUCTS OF FORESTS	14 515	451 503	10 273	276 803	26 417	702 222	2 741	72 842	53 949
	GROUP V. MANUFACTURES AND MISCELLANEOUS (C. L.)									
630	Petroleum oils, refined, and all other gasolines	40 253	1 134 100	57 425	1 534 819	15 195	412 008	3 711	97 836	116 584
631	Fuel, road, and petroleum residual oils, n. o. s.	18 271	701 006	17 633	560 867	2 749	99 927	292	9 166	38 945
632	Lubricating oils and greases	4 265	95 213	4 298	88 950	2 650	48 454	500	10 620	11 713
637	Petroleum products, n. o. s.	101	2 730	153	4 017	106	2 592	116	3 248	475
660	Cottonseed oil	1 412	43 217	435	13 028	249	7 500	27	1 000	2 123
661	Linseed oil	21	506	21	606	72	1 496	11	220	125
662	Vegetable oils, n. o. s.	508	17 860	403	12 197	144	4 228	73	2 230	1 128
670	Sugar (beet or cane)	1 491	48 217	1 760	65 253	2 008	63 992	441	16 291	5 700
671	Table syrups and edible molasses	315	8 305	21	584	353	9 735	24	611	713
672	Molasses, blackstrap, and last resort sugar	396	17 907	93	4 025	418	19 516	5	210	912
680	Iron, pig	30	1 547	47	2 532	371	20 552	69	3 461	507
681	Iron and steel, rated 6th class in official classification, n. o. s.	7	392			92	5 843			99
700	Rails, fastenings, flange, and switches	162	7 780	36	1 578	48	2 128	612	33 728	858
710	Cast iron pipe and fittings	17	573	45	1 563	803	21 150	120	2 755	985
711	Iron and steel pipe and fittings, n. o. s.	2 011	69 780	656	23 275	3 693	127 436	481	16 193	7 043
712	Iron and steel: Nails and wire, not woven	759	25 470	77	2 237	1 135	35 803	383	12 686	2 354
713	Iron and steel, rated 5th class in official classification, n. o. s. Vehicles and iron plow	3 051	104 522	678	21 000	4 092	167 429	1 097	41 213	9 518
720	Copper: Ingot, matte, and pig	64	3 228	1 159	63 703	523	24 844	191	9 741	1 937
721	Copper, brass, and bronze: Bar, sheet, and pipe	53	2 619	257	14 591	60	1 512	16	612	386
722	Lead and zinc: Ingot, pig, or bar	199	8 987	559	26 116	78	3 658	32	1 427	863
723	Aluminum: Ingot, pig, or slab					16	836	1	20	17
730	Machinery and boilers	314	6 674	366	8 415	1 215	26 572	195	4 471	2 088
740	Cement, natural or Portland (building)	13 885	462 843	6 912	250 544	3 022	97 479	66	1 866	23 885
750	Brick, common	669	24 475	203	6 553	469	16 653	17	607	1 358
751	Brick, n. o. s., and building tile	912	32 366	819	29 098	1 254	44 334	247	5 938	3 117
752	Artificial stone, n. o. s.	50	1 670	10	301	82	1 747	3	82	115
760	Lime, common (quick or slaked)	480	12 430	137	3 740	1 197	34 799	13	300	1 827
761	Plaster (stucco or wall) and dry kalsomine	2 365	54 380	2 771	64 925	796	19 119	137	4 040	6 069
770	Sewer pipe and draintile (not metal)	584	9 651	55	983	419	7 634	4	78	1 062
780	Agricultural implements and parts, n. o. s.	435	6 336	90	1 490	1 123	15 637	135	1 975	1 783
781	Vehicles, horse-drawn, and parts, n. o. s.			3	15	11	136	1	15	15
782	Tractors and parts	475	6 386	133	2 196	1 102	16 123	113	2 075	1 823
790	Railway car wheels, axles, and trucks	28	749	7	268		156	21	898	65
800	Automobiles (passenger)	3 081	18 541	1 305	7 605	10 929	65 376	1 714	10 537	17 029
801	Autotrucks	100	647	114	746	1 337	9 376	199	1 407	1 750
802	Automobiles and autotrucks, K. D. and parts, n. o. s.	377	5 000	82	1 645	3 635	66 043	891	14 014	4 985
803	Automobile and autotruck tires	93	1 767	423	8 171	510	8 690	174	3 740	1 200
810	Furniture, metal	86	1 060	76	1 041	297	3 626	64	803	523
811	Furniture, other than metal	192	1 924	146	1 078	1 436	12 062	226	2 619	2 000
820	Beverages	782	19 043	1 016	16 212	2 563	66 070	936	25 674	6 199
	Carried forward	96 294	2 909 801	101 026	2 975 387	67 307	1 594 479	13 251	343 971	275 878

5		3		105		5	253		206	450		87 055
4		141		3 972		3	934		111	566		353 256
8							88		2	671		3 957
6		6		148		1	521		49	070		128 726
		1		31		1	342		57	259		31 128
5	2	188		58 755		34	844		906	843	3	506 285
6		226		5 493		5	106		123	159		393 535
3		113		2 792			685		19	474		74 956
0		1		24			49		1	363		6 966
3		3		81			103		2	777		34 244
2				45			68		2	166		27 722
7		64		1 396			956		20	572		82 917
2	2	744		72 842		53	949	1	503	370	4	730 747
3	3	711		97 536		116	584	3	178	463	10	032 760
7		292		9 186		38	945	1	370	986	3	741 689
4		500		10 620		11	713		244	237	1	158 369
2		116		3 248			476		12	887		54 400
0		27		1 000		2	123		64	745		446 121
3		11		220			125		2	828		18 625
3		73		2 230		1	128		36	516		235 610
1		441		16 291		5	700		193	752	1	458 298
		24		611			713		19	236		176 750
		5		210			912		41	658		137 045
		84		3 461			507		28	392		28 957
3							99		6	235		21 121
3		612		33 728			858		45	214		76 762
3		120		2 765			985		26	065		98 061
3		481		16 193		7	043		236	684	2	087 183
3		383		12 896		2	354		76	406		554 608
1	1	097		41 213		9	518		334	164	2	401 840
1		191		9 741		1	937		101	516		586 311
2		16		612			386		19	334		107 695
3		32		1 427			863		40	385		193 107
1		1		20			17			358		6 208
2		196		4 471		2	088		45	032		678 817
1		66		1 866		23	885		812	732	2	142 723
1		17		607		1	358		48	488		85 686
		147		5 936		3	117		111	736		272 865
		3		82			115		3	800		11 484
		13		300		1	827		51	269		115 055
		137		4 040		6	069		142	470		521 601
		4		78		1	062		18	346		97 787
		138		1 975		1	783		25	438		312 596
		1		15			15			166		2 319
		113		2 075		1	823		26	780		359 138
		21		898			65		2	071		9 164
	1	714		10 537		17	029		102	061	3	050 305
		198		1 407		1	750		12	178		370 554
		891		14 014		4	985		86	732	1	817 890
		174		3 740		1	200		22	368		334 315
		84		803			523		6	530		115 209
		226		2 019		2	000		17	083		311 306
		936		25 674		4	189		159	199	1	562 081
	43	251		343 971		279	878	7	774	238	36	811 285

The Atchison, Topeka and Santa Fe Ry. System. Year 1939

541. REVENUE FREIGHT CARRIED DURING THE YEAR?—Concluded

Class No.	Commodity group or class (a)	Revenue Freight Originating on Respondent's Road				Revenue Freight Received from Connecting Carriers			
		Terminating on line			Delivered to connecting carriers	Terminating on line			Delivered to connecting carriers
		Number of carloads (b)	Number of tons (2,000 lb.) (c)		Number of carloads (d)	Number of carloads (f)	Number of tons (2,000 lb.) (g)		Number of carloads (h)
	GROUP V. Manufactures and Miscellaneous (C. L.)—Con.								
	Brought forward	98 294	2 959	801	101 026	67 307	1 594	479	13 251
						13		301	
28	Ice	308	6	768		1 100	34	624	55
29	Fertilizers, n. o. s.	6 327	289	642	3 446	1 117	80	969	549
30	Newsprint paper	164	4	475	58	568	14	047	123
31	Printing paper, n. o. s.	20		548	2	74	1	466	9
32	Alcohol, denatured or wood	41		721	13	42	2	207	2
33	Sulphuric acid	660	30	879	73	343	5	932	27
34	Explosives, n. o. s.	87	1	330	354	198	3	072	8
35	Cotton cloth and cotton fabrics, n. o. s.	7		89	28	89	1	778	21
36	Bagging and bags, burlap, gunny, or jute	412	7	171	99	3 639	94	877	855
37	Canned food products, n. o. s.	2 028	57	255	3 168	269	5	726	25
38	Tobacco, manufactured products	41		750	10	213	5	316	54
39	Paints in oil and varnishes	116	2	868	20				
40	Furnace slag					299	12	875	108
41	Scrap iron and scrap steel	2 422	113	316	1 960	1 354	32	452	87
42	Paper bags and wrapping paper	280	7	126	516	1 071	26	757	194
43	Paperboard, pulpboard, and wallboard (paper)	2 547	67	671	619	698	16	607	161
44	Building paper and prepared roofing materials	556	11	649	810	491	10	747	48
45	Building woodwork (millwork)	123	2	402	82	209	4	376	31
46	Soap and washing compounds	1 010	21	110	315	229	7	465	41
47	Glass, flat, other than plate	8		197	7	324	5	924	188
48	Glass: Bottles, jars, and jelly glasses	413	8	632	442	22 578	410	023	3 701
49	Manufactures and miscellaneous, n. o. s.	29 567	742	029	16 883	108 225	2 322	020	19 538
49(1)	Total Manufactures and Miscellaneous	145 421	4 336	419	129 940	207 218	5 182	359	45 509
49(2)	Grand Total, Carload Traffic	445 986	16 041	502	314 065				
	GROUP VI. L. C. L. Freight								
710	All L. C. L. freight	.....	308	959	.....	.....	142	720	.....
710(1)	Grand Total, Carload and L. C. L. Traffic	.....	16 350	461	.....	.....	5 325	079	.....
710-A	Forwarder traffic included in Class 710	1 877	28	902	595	2 394	36	371	160

Note.—Gross charges for protective services to perishable freight, without deduction for any proportion thereof credited to account No. 101, "Freight":

(a) Charges for service for the protection against heat ..... $ 2 114 563 17

(b) Charges for service for the protection against cold ..... $ 2 147 68

Difference between amount reported in
schedule and total shown on line 1 column
adjustments resulting from absorptions an
revenue not carried through column (1) of

The Atchison, Topeka and Santa Fe Ry. System

541. REVENUE FREIGHT CARRIED DURING THE YEAR—Concluded

Revenue Freight Received from Connecting Carriers						Total Revenue Freight Carried				Freight revenue (dollars)			Class No.
Terminating on line			Delivered to connecting carriers										
Number of carloads (f)	Number of tons (2,000 lb.) (g)		Number of carloads (h)	Number of tons (2,000 lb.) (i)		Number of carloads (j)	Number of tons (2,000 lb.) (k)			(l)			
67 307	1	594	479	13 251	343	971	279	878	7	774	238	35	811	285	
13			301					321		7	069		11	976	
1 100		34	624	55	2	150	10	928		486	791	2	373	512	
1 117		30	969	549	16	220	1	888		53	263		218	581	
568		14	047	123	3	183		713		17	820		142	167	
74		1	466	9		172		137		2	594		20	361	
42		2	207	2		101		777		36	675		60	090	
343		5	932	27		526		811		12	506		117	816	
198		3	072	8		163		241		3	604		54	474	
89		1	778	21		507		621		11	500		85	592	
3 639		94	877	855	26	772	9	690		284	796	2	810	612	
269		5	726	25		498		345		7	132		124	836	
213		5	316	54	1	411		412		10	247		118	379	
299		12	875	108	4	506	4	789		218	781		649	451	
1 354		32	452	87	2	143	2	237		55	343		298	149	
1 071		26	757	194	4	581	4	431		114	924		408	213	
698		16	607	161	3	994	2	225		50	473		277	814	
491		10	747	48	1	062		744		16	844		61	122	
209		4	376	31		647	1	565		33	256		357	103	
229		7	465	41	1	377		285		9	251		75	611	
324		5	924	188	3	299	1	367		25	848		140	513	
22 578		410	023	3 701	82	788	72	719	1	614	669	13	421	890	
108 225	2	322	020	19 538	500	270	397	124	10	846	624	67	639	445	
207 218	5	182	359	45 509	1	191	528	1 012	778	30	635	662	122	091	723	
.....		142	720	.....	6	324	.....			517	886	10	449	688	
.....	5	325	079	.....	1	197	952	.....		31	053	547	132	541	311	
2 394		36	371	160	1	705	5	026		77	565	1	857	372	

Difference between amount reported in column (1) class 860 of this schedule and total shown on line 1 column (b) Schedule 310 is due to adjustments resulting from absorptions and corrections in freight revenue not carried through column (1) of the former schedule.

Defendant's Exhibit No. 1
Jan. 6, 1
Superior Court, Pima Co
State v. S.P.Co. No.
ARIZONA
The Atchison, Topeka and Santa Fe Ry. Co.
Report for the Year ended December 31, 1939

The Atchison, Topeka and Santa Fe Ry.Co. Arizona. Year 1939.

941. REVENUE FREIGHT CARRIED DURING THE YEAR—WITHIN THE STATE*

Give the particulars called for concerning the commodities carried on the respondent's road during the year, the revenue from which is includible in account No 101, "Freight", classifying them in accordance with the Interstate Commerce Commission's Order in the Matter of Freight Commodity Statistics, effective January 1, 1928, as amended by order of December 14, 1938.

In stating the number of tons received from connecting carriers, include all shipments that, so far as apparent from the information on the waybills or abstracts of waybills, have been received from connecting rail carriers either directly or indirectly. Shipments from boat lines should also be included when identified as having had previous rail transportation by United States rail carriers or as moving on joint through bills of lading by connecting water carriers and railways.

Tonnage originating on switching roads connecting directly or indirectly with respondent's line should be regarded as tonnage originated by respondent. Import traffic and traffic from outlying possessions of the United States received from water carriers should be regarded as originating at the port of entry. All other tonnage should be treated as originating on line, including finished products from transit points.

If the application of these instructions results in any marked deviation from the respondent's past practice, that fact should be stated in a footnote in order that proper allowance can be made in interpreting the statistics.

Particulars for Classes Nos. 10 to 701 should include carload traffic only, all less than carload traffic being included in Class No. 702.

Information as to cubicals and tons of forwarder traffic included in Class 701 should be reported against commodity class designated 701-A. To avoid undue clerical labor, Class 701-A may be restricted to the principal forwarding companies or their subsidiaries originating in the aggregate not less than approximately 80 percent of such traffic handled on respondent's line. The term "forwarder traffic" is defined in the third paragraph of instructions for schedule No. 541 on page No. 512.

Class No.	Commodity (a)	Revenue Freight Originating on Respondent's Road Within the State		All Other Revenue Freight Carried Within the State		Total Revenue Freight Carried Within the State		Total Revenue Freight Terminating on Respondent's Road Within the State	
		Number of carloads (b)	Number of tons (2,000 lb.) (c)	Number of carloads (d)	Number of tons (2,000 lb.) (e)	Number of carloads (f)	Number of tons (2,000 lb.) (g)	Number of carloads (h)	Number of tons (2,000 lb.) (i)
	GROUP 1. PRODUCTS OF AGRICULTURE (C. L.)								
1	Wheat			78	3 694	78	3 694	1	25
2	Corn	9	264	1 138	47 734	1 146	47 998	82	2 018
3	Oats	1	15	41	1 439	42	1 454	8	260
4	Barley and rye			173	7 566	173	7 566	1	20
5	Rice	1	11	160	5 454	161	5 465	7	211
6	Grain, n. o. s.			16	530	16	530		
7	Flour, wheat	72	1 258	545	16 075	618	17 333	439	11 685
8	Meal, corn			65	1 896	65	1 896	21	573
9	Flour and meal, edible, n. o. s.			32	917	32	917	2	56
10	Cereal food preparations, edible, n. o.			308	8 208	308	8 208	64	1 266
11	Mill products, n. o. s.	26	656	197	5 387	223	6 043	91	2 027
12	Hay and alfalfa	118	1 671	94	1 496	212	3 167	156	2 319
13	Straw								
14	Tobacco, leaf			40	803	40	803		
15	Cotton in bales	251	4 619	103	2 567	454	7 186	243	2 277
16	Cotton linters, waste, and ryegins	2	42	2	48	4	90		
17	Cottonseed	2	48	24	599	26	647	2	60
18	Cottonseed meal and cake	99	2 500	1	25	100	2 525	17	408
19	Oranges and grapefruit	546	9 122	21 404	386 127	21 978	395 249	7	95
20	Lemons, limes, and citrus fruit, n. o. s.	7	117	4 731	80 854	4 738	80 971		
21	Apples, fresh			107	1 962	107	1 962	59	1 058
22	Bananas			183	2 002	188	2 002	171	1 877
23	Berries, fresh								
24	Cantaloupes and melons	891	10 949	195	2 215	1 086	13 164		
25	Grapes, fresh	23	324	8 517	144 369	8 540	144 693	3	37
26	Peaches, fresh			484	7 317	484	7 317	8	108
27	Watermelons	15	177	19	231	34	408	1	12
28	Fruits, fresh, domestic, n. o. s.	2	85	1 294	18 518	1 298	18 537	78	976
29	Fruits, fresh, tropical, n. o. s.			195	2 854	195	2 854		
30	Potatoes, other than sweet	12	150	9 502	146 843	9 514	146 993	122	1 894
31	Cabbages	94	451	118	1 520	132	1 971		
32	Onions			348	5 171	348	5 171	10	146
33	Tomatoes			755	8 156	755	8 156		
34	Vegetables, fresh, n. o. s.	2 832	33 910	2 688	30 037	5 524	63 947	11	353

Fruits, fresh, tropical, n.o.s.			195	2 854	195	2 854			
Potatoes, other than sweet	12	150	9 508	146 843	9 514	146 993	122		1 894
Cabbage	34	451	118	1 520	153	1 971			
Onions			342	5 171	342	5 171	10		146
Tomatoes			755	8 156	755	8 156			
Vegetables, fresh, n.o.s.	2 836	33 910	2 688	30 037	5 524	62 947	21		353
Beans and peas, dried	7	210	177	5 511	184	5 721	8		188
Fruits, dried or evaporated			1 179	40 486	1 179	40 486	26		653
Vegetables, dry, n.o.s.			8	136	8	136			
Vegetable oil cake and meal, except cottonseed			7	271	7	271	1		20
Peanuts			56	1 044	56	1 044	1		18
Linseed									
Sugar beets									
Products of agriculture, n.o.s.	49	1 493	1 138	31 967	1 187	33 460	45		1 401
Total, Products of Agriculture	5 136	66 042	56 300	1 021 983	61 436	1 090 025	1 675		31 940
GROUP II. Animals and Products (C. L.)									
Horses, mules, ponies, and asses	163	1 881	71	825	234	2 706	30		433
Cattle and calves, except dairy	2 511	26 196	1 873	21 427	4 384	47 623	755		7 958
Calves, dairy	21	675	15	237	46	710			
Sheep and lambs, except dairy	19	110	13	76	32	186	8		50
Swine and hogs, except dairy	917	9 481	90	938	1 007	10 439	565		5 828
Hogs, dairy			17	167	17	167	1		9
Hogs, slaughter			2 816	37 196	2 816	37 196	6		80
Cattle hides, n.o.s.			147	2 559	147	2 559	1		11
Meats, n.o.s., fresh, or slightly salted			471	11 353	471	11 353	13		308
Butterine and margarine			7	90	7	90			
Lard, except oleomargarine			205	3 581	205	3 581	10		167
Poultry, live			26	188	26	188			
Poultry, dressed			46	600	46	600			
Eggs			79	1 080	79	1 080	4		45
Butter			196	2 569	196	2 569	17		236
Cheese			92	1 346	92	1 346	19		291
Wool	54	889	4	67	58	956			
Hides, green	15	283	172	5 436	187	5 937			
Leather			3	41	3	41			
Fish or sea animal oil			245	6 980	245	6 980			
Animals, live, n.o.s.									
Animal products, n.o.s., other than fertilizer and fertilizer materials	19	416	685	17 854	704	18 270	23		664
Total, Animals and Products	3 739	39 769	7 373	114 712	11 008	154 481	1 440		15 660
GROUP III. Products of Mines (C. L.)									
Anthracite coal			27	841	27	841	3		89
Bituminous coal			1 983	71 781	1 983	71 781	1 603		60 199
Coke			134	4 987	134	4 987	43		1 483
Iron ore									
Copper ore and concentrates	101	5 338	1	58	102	5 396	2		73
Lead ore and concentrates	308	12 181			308	12 183			
Zinc ore and concentrates	56	2 668			56	2 668			
Ores and concentrates, n.o.s.	1 013	20 539	73	3 134	1 086	24 173	190		8 941
Gravel and sand (other than glass or molding)	218	12 030	31	1 221	249	13 251	231		13 145
Stone, broken, ground, or crushed	879	15 466	12	466	291	16 110	289		16 021
Stone, rough, n.o.s.	77	3 679	12	554	89	4 235			
Stone, finished, n.o.s.			1	36	1	36			
Petroleum, crude			6	170	6	170			
Carried forward	3 653	108 163	3 271	83 679	4 290	188 847	3 361		99 850

* Not required from switching and terminal companies. † Trans-State traffic may be given in a footnote without subdivision by commodities, but if possible by direction of movement.

The Atchison, Topeka and Santa Fe Ry.Co. Arizona. Year 1939.

941. REVENUE FREIGHT CARRIED DURING THE YEAR—WITHIN THE STATE—Concluded

Class No.	Commodity (a)	Revenue Freight (Originating on Respondent's Road Within the State): Number of carloads (b)	Revenue Freight (Originating on Respondent's Road Within the State): Number of tons (2,000 lb.) (c)	All Other Revenue Freight Carried Within the State: Number of carloads (d)	All Other Revenue Freight Carried Within the State: Number of tons (2,000 lb.) (e)	Total Revenue Freight Carried Within the State: Number of carloads (f)	Total Revenue Freight Carried Within the State: Number of tons (2,000 lb.) (g)	Total Revenue Freight Terminating on Respondent's Road Within the State: Number of carloads (h)	Total Revenue Freight Terminating on Respondent's Road Within the State: Number of tons (2,000 lb.) (i)
	GROUP III. Products of Mines (C. L.)—Contd. Brought forward	3 029	108 168	3 271	81 679	4 299	185 847	2 341	99 850
[illegible]	Asphalt (natural, byproduct, or petroleum)			784	27 337	784	27 337	375	12 729
[illegible]	Salt			63	2 359	63	2 359	78	2 239
[illegible]	Phosphate rock, crude (ground or not ground								
[illegible]	Sulphur (brimstone)			126	7 315	126	7 315		
[illegible]	Products of mines, n. o. s.	305	25 267	414	18 344	916	47 513	89	4 683
	TOTAL PRODUCTS OF MINES	3 520	133 135	3 685	129 234	6 215	270 371	2 903	119 211
	GROUP IV. Products of Forests (C. L.)								
[illegible]	Logs			3	97	3	97	1	40
[illegible]	Posts, poles, and piling	39	1 333	307	9 837	346	11 170	258	8 162
[illegible]	Wood (fuel)	26	983	1	23	27	974	29	747
[illegible]	Ties, railroad	80	1 833	46	1 311	105	3 763	5	195
[illegible]	Pulpwood								
[illegible]	Lumber, shingles, and lath	3 291	81 887	2 753	78 935	6 044	160 809	1 539	42 472
[illegible]	Box, crate, and [illegible] packing materials	497	13 082	189	4 837	686	16 919	246	6 032
[illegible]	Veneer and [illegible] wood			43	1 114	43	1 114	13	313
[illegible]	Resin			9	303	9	303		
[illegible]	Turpentine			73	3 080	73	3 080		
[illegible]	Other products of [illegible]			64	2 045	64	2 045		
[illegible]	Products of forests, n. o. s.	19	817	91	1 677	101	1 894	7	111
	TOTAL PRODUCTS OF FORESTS	1 913	98 804	3 576	103 863	7 510	201 167	2 098	58 073
	GROUP V. Manufactures and Miscellaneous (C. L.)								
[illegible]	Petroleum oils, refined, and [illegible]			3 999	91 198	3 999	91 198	2 834	89 384
[illegible]	Gasoline and [illegible]	8	53	7 015	285 271	7 017	285 324	6 988	284 338
[illegible]	Lubricating oils and greases			905	18 018	905	18 018	298	4 417
[illegible]	Petroleum products, n. o. s.			33	771	33	771		
[illegible]	[illegible]	52	1 584	603	18 438	655	20 022		
[illegible]	[illegible]			12	297	12	297	1	24
[illegible]	[illegible]			601	13 314	601	13 314	2	55
[illegible]	Fats and edible oils			2 436	88 316	2 436	88 316	170	4 714
[illegible]	Molasses, blackstrap, and [illegible]			187	5 936	187	5 936	13	453
[illegible]	Iron, pig			17	717	17	717	10	418
[illegible]	[illegible]			5	267	5	267		
[illegible]	Rails, [illegible], frogs, and switches	4	245	13	495	17	737	3	97
	Cast-iron pipe and fittings			66	2 405	66	2 405	12	396
	Iron and steel pipe and fittings, n. o. s.			419	13 223	419	13 223	76	2 263
	Iron and steel: Nails and spikes, not wrought			310	13 018	310	13 018	56	1 938
[illegible]	[illegible]	17	341	1 573	67 576	1 590	67 917	272	11 760
[illegible]	Copper, brass, and bronze, in bars	590	19 295			590	19 295		
[illegible]	Cutlery, [illegible] and tools: Par steel, n. o. s.			40	1 032	41	1 011		

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Lead and zinc: Ingot, pig, or bar			60	2 730	60	2 730				
Aluminum: Ingot, pig, or slab			15	318	15	318				
Machinery and boilers	20	616	548	18 328	582	18 944	32		712	
Cement, natural or Portland-cement	1	56	1 282	55 392	1 282	55 448	1 205		52 561	
Brick, common			11	383	11	383	11		383	
Brick, fire, and building tile			93	3 192	93	3 192	49		1 751	
Artificial stone, n. o. s.	13	538			13	538	13		538	
Lime, common ground or slaked	196	6 078	86	440	428	6 518	65		1 076	
Plaster, calcined or wall, and dry wall-mortar	1	20	475	12 400	476	12 420	221		5 055	
Sewer pipe and drain tile (not metal)	3	71	87	1 644	90	1 715	88		1 678	
Agricultural implements and parts, n. o. s.	1	12	88	1 832	89	1 844	5		100	
Automobiles, horse-drawn, and parts, n. o. s.			1	5	1	5				
Trailers and parts										
Locomotives, wheels, axles, and trucks										
Automobiles, new			2 811	16 852	2 811	16 852	393		2 380	
Automobiles			387	3 120	387	3 120	72		531	
Automobiles, trucks, busses, and parts, n. o. s.	5	84	3 387	60 155	3 392	60 239	7		65	
Automobile and motor-truck tires			503	10 950	503	10 950				
Furniture, metal	2	20	194	2 485	196	2 505	16		171	
Furniture, other than metal			657	5 836	657	5 836	16		130	
Beverages			2 470	67 702	2 470	67 702	352		8 403	
Ice	88	1 981			88	1 981	88		1 981	
Fertilizers, n. o. s.	27	607	97	3 958	124	4 565	28		777	
Newsprint paper			128	3 536	128	3 536	109		2 902	
Printing paper, n. o. s.			154	3 843	154	3 843	1		83	
Alcohol, denatured or wood			20	631	20	631				
Sulphuric acid			1	51	1	51	1		51	
Explosives, n. o. s.	1	18	100	1 805	101	1 887	70		1 108	
Cotton cloth and cotton fabrics, n. o. s.			135	1 830	135	1 830				
Bagging and bags, burlap, gunny, or jute			53	1 102	53	1 102	8		230	
Canned food products, n. o. s.	4	36	4 545	128 600	4 549	128 636	437		11 789	
Tobacco, manufactured products			272	5 647	272	5 647				
Paints, oils and varnishes			90	2 040	90	2 040	3		80	
Furnace slag										
Scrap iron and scrap steel	137	5 001	20	495	146	5 496				
Paper bags and wrapping paper			147	3 307	147	3 307	93		567	
Paperboard, pulpboard, and wallboard (paper)			260	6 028	260	6 028	83		487	
Building paper and prepared roofing materials			147	3 301	147	3 311	5		40	
Building woodwork (millwork)			46	327	48	337	14		114	
Soap and washing compounds			241	5 256	246	5 364	67		468	
Glass, flat, other than plate			148	5 004	148	5 004				
Glass: Bottles, jars, and jelly glasses			106	1 928	106	1 928	20		412	
Manufactures and miscellaneous, n. o. s.	631	9 680	16 788	403 035	17 194	413 644	783		16 588	
TOTAL MANUFACTURES AND MISCELLANEOUS	1 880	40 [illegible]	53 [illegible]	1 385 [illegible]	55 [illegible]	1 444 [illegible]	15 001		517 437	
GRAND TOTAL, CARLOAD TRAFFIC	16 897	406 [illegible]	246 [illegible]	3 [illegible]	141 [illegible]	3 180 [illegible]	23 137		945 [illegible]	
GROUP VI. L. C. L. FREIGHT										
All L. C. L. freight		5 [illegible]		50 [illegible]		55 [illegible]			18 [illegible]	
GRAND TOTAL, CARLOAD AND L. C. L. TRAFFIC		411 [illegible]		3 [illegible]		3 [illegible]			961 [illegible]	
Forwarder traffic included in Class 701[00]	-	-	3 837	45 [illegible]	3 837	45 [illegible]	-		-	

*Not required from switching and terminal companies. † Trans-Border traffic may be given in a footnote without subdivision by commodities, but if possible by direction of movement. **Not required for Class II roads.

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The Atchison, Topeka and Santa Fe Ry.Co. New Mexico. Year 1939.

941. REVENUE FREIGHT CARRIED DURING THE YEAR—WITHIN THE STATE*

Give the particulars called for concerning the commodities carried on the respondent's road during the year, the revenue from which is includible in account No 101, Freight revenue, classifying them in accordance with the Interstate Commerce Commission's order in the Matter of Freight Commodity Statistics, effective January 1, 1939, as established by order of December 14, 1938.

In stating the number of tons received from connecting carriers, include all shipments that, so far as apparent from the information on the waybills or abstracts of waybills, have been received from connecting rail carriers either directly or indirectly [illegible] Less-than-carload freight is to be included when identified as having had previous rail transportation by United States rail carriers or as moving on joint through bills of lading by coastwise water carriers and railways.

Tonnage originating on switching roads connecting directly or indirectly with respondent's line should be regarded as tonnage originated by respondent. Import traffic and traffic from outlying possessions of the United States received from water carriers should be regarded as originating at the port of entry. All other tonnage should be treated as originating on line, including finished products from transit points.

If the application of these instructions results in any marked deviation from the respondent's past practice, that fact should be stated in a footnote in order that proper allowance can be made in interpreting the statistics.

Particulars for Classes Nos. 10 to 701 should include carload traffic only, all less than carload traffic being included in Class No. 710.

Information as to carloads and tons of forwarder traffic included in Class 701 should be reported against commodity class designated 701-A. To avoid undue clerical labor, Class 701-A may be restricted to the principal forwarding companies or their subsidiaries originating in the aggregate not less than approximately 50 percent of such traffic handled on respondent's line. The term "Forwarder traffic" is defined in the third paragraph of instructions for schedule No. 941 on page No. 512.

Commodity	Revenue Freight Originating on Respondent's Road Within the State		All Other Revenue Freight Carried Within the State†		Total Revenue Freight Carried Within the State		Total Revenue Freight Terminating on Respondent's Road Within the State	
	Number of carloads	Number of tons (2,000 lb.)	Number of carloads	Number of tons (2,000 lb.)	Number of carloads	Number of tons (2,000 lb.)	Number of carloads	Number of tons (2,000 lb.)
	(a)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
GROUP I PRODUCTS OF AGRICULTURE (C.L.)								
Wheat	967	44 826	77	3 736	1 044	48 550	1	27
Corn	46	1 955	1 294	53 582	1 340	55 537	40	1 163
Oats	1	43	55	1 770	56	1 813	13	362
Barley and rye			179	7 723	179	7 723	4	106
Rice			171	5 800	171	5 800	8	238
Grain, n. o. s.	1	26	22	764	23	790		
Flour, wheat	1	20	1 712	44 138	1 713	44 158	1 102	26 784
Meal, corn			78	2 287	78	2 287	14	420
Flour and meal, edible, n. o. s.			33	960	33	960	3	63
Cereal food preparations, edible, n. o. s.	1	10	575	9 799	576	9 809	74	1 594
Mill products, n. o. s.	288	6 228	472	12 041	734	18 283	208	6 674
Hay and alfalfa	465	6 225	90	1 370	575	7 595	289	4 416
Straw								
Tobacco, leaf			40	803	40	803		
Cotton in bales	1 703	18 694	444	5 975	2 147	24 669	204	2 514
Cotton linters, noils, and rejects	125	3 308	2	48	127	3 347		
Cottonseed	2	76	22	539	24	615		
Cottonseed meal and cake	21	644	305	7 385	326	8 029	168	4 132
Oranges and grapefruit			21 806	308 982	21 806	308 982	86	1 304
Lemons, limes, and citrus fruits, n. o. s.			4 747	81 187	4 747	81 187		
Apples, fresh			130	2 753	130	2 753	52	929
Bananas			509	5 419	509	5 419	57	639
Berries, fresh			3	26	3	26	3	26
Cantaloupes and melons, n. o. s.	288	3 291	1 664	19 606	1 952	22 897	2	23
Grapes, fresh			8 577	145 867	8 577	145 867	20	260
Peaches, fresh			406	7 340	406	7 340	11	144
Watermelons			72	876	72	876	39	473
Fruits, fresh, domestic, n. o. s.			1 227	17 697	1 227	17 697	135	1 484
Fruits, fresh, tropical, n. o. s.			196	2 872	196	2 872		
Potatoes, other than sweet			9 521	147 349	9 521	147 349	296	4 649
Cabbage			152	1 971	152	1 971		
Onions	3	39	351	5 317	354	5 356	7	111
Tomatoes			805	8 727	805	8 727	1	11
Vegetables, fresh, n. o. s.	204	2 460	8 439	74 950	8 643	77 410	131	1 464
		4 400	348	7 826	361	11 218	19	384

STATE CORPORATION COMMISSION

The Atchison, Topeka and Santa Fe Ry. Co.
Report for the Year ended December 31, 1939

Superior Court, Pima Co., Ariz.
State v. S.F.Co. No. 800

Defendant's Exhibit No. 134
Jan. 6, 1941

	Potatoes, other than sweet				9 581	147 369	9 581	147 369	296		4 649
	Cabbage				152	1 971	152	1 971			
	Onions	3		39	351	5 317	354	5 356	7		111
	Tomatoes				805	8 727	805	8 727	1		11
	Vegetables, fresh, n. o. s	304		2 460	5 439	74 950	6 643	77 410	131		1 464
	Beans and peas, dried	113		2 402	248	7 886	361	11 218	19		584
	Fruits, dried or evaporated				1 163	40 185	1 163	40 185	39		1 068
	Vegetables, dry, n. o. s	4		62	5	87	9	149			
	Vegetable-oil cake and meal, except cottonseed				19	588	19	588	10		261
	Peanuts	2		55	58	1 079	61	1 134	2		56
	Flaxseed										
	Sugar beets	58		2 092			58	2 092			
	Products of agriculture, n. o. s	653		15 781	1 231	36 288	2 084	52 069	80		1 741
	TOTAL PRODUCTS OF AGRICULTURE	5 131		109 364	65 000	1 157 388	70 131	1 266 752	3 327		63 771
	GROUP II. ANIMALS AND PRODUCTS (C. L.)										
	Horses, mules, ponies, and asses	894		3 575	139	1 647	433	5 222	66		1 028
	Cattle and calves, single-deck	4 699		74 304	3 806	42 148	10 505	116 452	1 001		10 777
	Calves, double-deck	65		919	254	3 503	319	4 422	92		1 264
	Sheep and goats, single-deck	66		385	40	234	106	619	26		164
	Sheep and goats, double-deck	1 738		17 595	816	8 692	2 554	26 087	280		3 896
	Hogs, single-deck	13		113	46	433	59	546	35		218
	Hogs, double-deck	400		5 183	2 795	37 036	3 195	42 219	260		3 465
	Fresh meats, n. o. s				236	3 639	236	3 639	43		501
	Meats, cured, dried, or smoked				482	11 640	482	11 640	9		218
	Butterine and margarine				7	90	7	90			
	Packing-house products, edible, n. o. s., not including canned meat				258	4 130	258	4 130	61		728
	Poultry, live				25	182	26	182			
	Poultry, dressed				46	600	46	600			
	Eggs				93	1 177	93	1 177			
	Butter	21		241	202	3 642	223	3 903	17		315
	Cheese	4		50	77	1 094	81	1 144			
	Wool	421		6 719	59	969	480	7 688	23		336
	Hides, green	33		490	169	5 305	202	6 285			
	Leather				3	41	3	41			
	Fish or sea-animal oil				241	7 430	241	7 430			
	Animals, live, n. o. s										
	Animal products, n. o. s (other than fertilizer and fertilizer materials)	65		1 010	750	19 825	815	20 835	11		294
	TOTAL ANIMALS AND PRODUCTS	9 519		110 876	10 845	158 567	20 684	263 441	1 946		22 122
	GROUP III. PRODUCTS OF MINES (C. L.)										
	Anthracite coal	400		16 821			400	16 821	186		5 394
	Bituminous coal	6 798		280 946	1 118	36 800	7 910	296 665	3 833		153 191
	Coke				283	12 703	283	12 703	36		1 803
	Iron ore	628		21 985			628	26 985			
	Copper ore and concentrates	20 966		2 203 214	86	4 636	20 938	2 207 850	29 807		2 129 711
	Lead ore and concentrates	363		15 722	283	12 017	656	27 739			
	Zinc ore and concentrates	2 921		166 800	181	7 154	3 102	175 954	1 447		77 189
	Ores and concentrates, n. o. s	188		2 207	460	24 996	648	43 203			
	Gravel and sand (other than glass or molding)	87		4 623	80	1 036	167	5 788	83		4 868
	Stone, broken, ground, or crushed	2		80	601	23 698	603	23 683	609		23 657
	Stone, rough, n. o. s				18	709	18	709			
	Stone, finished, n. o. s				7	181	7	181	4		105
	Petroleum, crude	344		20 277	3	96	347	20 373	307		18 912
	Carried forward	41 993		3 719 188	3 870	143 480	44 105	3 858 343	36 120		3 434 185

* Not required from switching and terminal companies. † Trans-State traffic may be given in a footnote without subdivision by commodities, but if possible by direction of more than

The Atchison, Topeka and Santa Fe Ry.Co. New Mexico. Year 1939.

941. REVENUE FREIGHT CARRIED DURING THE YEAR—WITHIN THE STATE*—Concluded

No.	Commodity	Revenue Freight originating on Respondent's Road Within the State		All Other Revenue Freight Carried Within the State		Total Revenue Freight Carried Within the State		Total Revenue Freight To Destination on Respondent's Road Within the State	
		Number of carloads (b)	Number of tons (2,000 lb.) (c)	Number of carloads (d)	Number of tons (2,000 lb.) (e)	Number of carloads (f)	Number of tons (2,000 lb.) (g)	Number of carloads (h)	Number of tons (2,000 lb.) (i)
	GROUP III Products of Mines (C. 1. —Concld								
	Brought forward	42 838	2 715 123	3 870	143 480	46 108	2 858 563	36 150	2 424 185
	Asphalt (natural, byproduct, or petroleum)	19	887	572	20 248	591	20 836	531	18 915
	Salt	4	83	229	8 749	340	8 778	291	7 442
	Phosphate rock, crude (ground or not ground)								
	Sulphur (brimstone)			137	7 413	137	7 413		
	Products of mines, n.o.s.	273	18 140	459	20 856	732	38 996	128	6 482
	Total Products of Mines	43 134	2 737 893	4 777	200 667	47 908	2 938 560	37 100	2 457 284
	GROUP IV Products of Forests (C. 1.								
	Logs	1 262	46 920	2	97	1 264	46 017	1 262	45 920
	Piles, poles, and posts	199	5 400	300	8 838	499	14 238	349	9 877
	Wood (coal)								
	Ties, railroad	15	414	40	1 750	55	2 164	49	1 982
	Pulpwood								
	Lumber, timber, and shingles	941	35 733	5 477	142 140	6 418	167 893	1 915	51 453
	Box, crate, and fruit-package material	151	3 494	122	3 269	273	6 763	21	492
	Wooden ware (tubs, pails, etc.)	1	15	64	1 611	65	1 626	35	831
	Rosin			9	208	9	302		
	Turpentine			81	2 212	81	2 212		
	Cork (raw or manufactured)			64	2 045	64	2 045		
	Products of forests, n.o.s.	149	4 095	99	1 847	248	5 942	6	143
	Total Products of Forests	2 718	85 091	6 858	164 211	8 976	249 302	3 637	110 698
	GROUP V Manufactures and Miscellaneous								
	Food and kindred products	835	21 688	4 945	126 739	5 780	158 361	5 332	146 378
	Textile-mill products and other fiber manufactures	108	3 138	431	13 854	539	16 992	489	15 001
	Iron and steel and other metal products	3	45	1 162	22 664	1 165	22 709	577	9 456
	Petroleum products, n.o.s.			29	802	29	802		
	Cement	146	4 552	564	17 928	730	22 480		
	Lime			13	303	13	303	8	30
	Stone, sand, and gravel			619	18 866	619	18 866		
	Brick and clay products			2 410	88 076	2 410	88 076		
	Agricultural implements and vehicles other than automobiles	1	18	262	7 484	263	7 502	342	10 541
	Automobiles, trucks, and parts			23	996	23	996	51	1 391
	Boats			7	325	7	325	20	877
	Household goods								
	Machinery, except electrical			50	2 115	50	2 115	37	1 604
	Electrical machinery, equipment, and supplies			80	2 191	80	2 191	45	1 135
	Iron and steel pipes and tubes	2	38	1 167	35 662	1 169	35 718	776	23 114
	Iron and steel, n.o.s.	3	102	493	18 616	496	18 718	131	3 726
	Coal tar products	15	374	2 019	80 741	2 034	81 115	459	14 187
	Other manufactures and miscellaneous	531	27 591	691	39 323	1 222	66 914		
				336	17 948	336	17 948		

	Iron and steel pipe and fittings, n. o. s.	2	36	1 167	8 491	80	2 191	45	1 135
	Iron and steel: Nails and spikes	3	102	493	18 616	496	18 718	131	3 726
	Copper: Ingot, pig, or bar	13	374	2 019	80 741	2 034	81 115	459	14 187
	Copper: Brass or bronze in bars, rods, plates, sheets, tubes, pipes, or fittings	531	27 591	691	39 323	1 222	66 914		
				236	17 948	236	17 948		
	Lead and zinc: Ingot, pig, or bar			158	8 433	158	8 433		
	Aluminum: Ingot, pig, or slab			15	318	15	318		
	Machinery and boilers	33	867	709	16 381	748	17 248	147	3 335
	Cement, natural or Portland, in bags			2 507	81 513	2 507	81 513	2 004	66 339
	Brick, common	17	557	234	8 517	251	9 074	240	6 691
	Brick, n. o. s., and building tile	1	44	417	14 528	418	14 572	331	11 220
	Structural steel, n. o. s.			12	393	12	393	11	349
	Lime, common (quick or slaked)			429	16 858	429	16 858	426	16 777
	Plaster (stucco or wall) and its basic mixtures			496	13 684	496	13 684	294	7 001
	Sewer pipe and drain tile (not metal)			207	4 818	207	4 818	371	4 261
	Agricultural implements and parts, n. o. s.			166	2 890	166	2 890	68	922
	Vehicles, horse-drawn, and parts, n. o. s.			6	73	6	73	5	68
	Tractors and parts	1	30	341	6 418	342	6 448	147	2 182
	Railway car wheels, axles, and trucks			4	110	4	110	3	77
	Automobiles (passenger)			4 132	24 801	4 132	24 801	1 336	6 058
	Auto trucks			756	5 579	756	5 579	363	2 391
	Automobiles and auto trucks, n. o. s., and parts, n. o. s.			3 396	60 265	3 396	60 265	8	79
	Automobile and auto truck tires			583	11 220	583	11 220	18	212
	Furniture, metal			238	2 963	238	2 963	33	342
	Furniture, other than metal			912	7 510	912	7 510	140	1 244
	Beverages	1	24	3 246	85 559	3 247	85 583	844	17 664
	Ice	39	1 195	53	1 881	113	2 476	113	2 476
	Fertilizers, n. o. s.	7 675	203 261	128	3 750	8 003	397 011	82	1 976
	Newsprint paper			84	2 348	84	2 348	59	1 696
	Printing paper, n. o. s.			180	4 519	180	4 519	13	328
	Alcohol, denatured or wood			85	538	85	538	4	77
	Sulphuric acid			8	63	8	63		
	Explosives, n. o. s.			150	3 135	150	3 135	113	2 257
	Cotton cloth and cotton fabrics, n. o. s.			139	1 870	139	1 870	3	20
	Bagging and bags, burlap, gunny, or jute	1	15	118	2 389	119	2 544	60	1 125
	Canned food products, n. o. s.			4 756	159 443	4 756	159 443	570	16 172
	Tobacco, manufactured products			872	5 647	872	5 647		
	Paints in oil and varnishes			103	2 986	103	2 986	16	399
	Furnace slag								
	Scrap iron and scrap steel	281	9 596	40	1 675	870	11 273	17	618
	Paper bags and wrapping paper			190	4 703	190	4 703	65	1 623
	Paperboard, pulpboard, and wallboard (paper)			894	7 396	894	7 396	53	1 318
	Building paper and prepared roofing materials			226	5 700	226	5 700	166	4 023
	Building woodwork (millwork)	169	2 896	75	1 586	237	4 219	38	1 044
	Soap and washing compounds			307	8 760	307	8 760	208	4 384
	Glass, flat, other than plate			160	5 724	160	5 724	3	97
	Glass: Bottles, jars, and jelly glasses	2	20	144	2 506	148	2 826	50	1 039
	Manufactures and miscellaneous, n. o. s.	997	28 908	18 718	366 096	19 960	389 726	1 993	49 431
	TOTAL MANUFACTURES AND MISCELLANEOUS	11 084	408 888	60 804	1 447 178	71 608	1 939 441	18 574	469 081
	GRAND TOTAL, CARLOAD TRAFFIC	71 605	3 383 588	147 884	3 121 948	219 084	6 647 456	64 584	3 122 906
	GROUP VI. L. C. L. FREIGHT								
710	All L. C. L. freight		20 895		96 828		108 827		45 113
7000	GRAND TOTAL, CARLOAD AND L. C. L. TRAFFIC		3 404 483		3 218 180		6 756 283		3 168 019
701 A	Forwarder traffic included in Class 701**	-	-	3 013	44 885	3 013	44 885	150	2 816

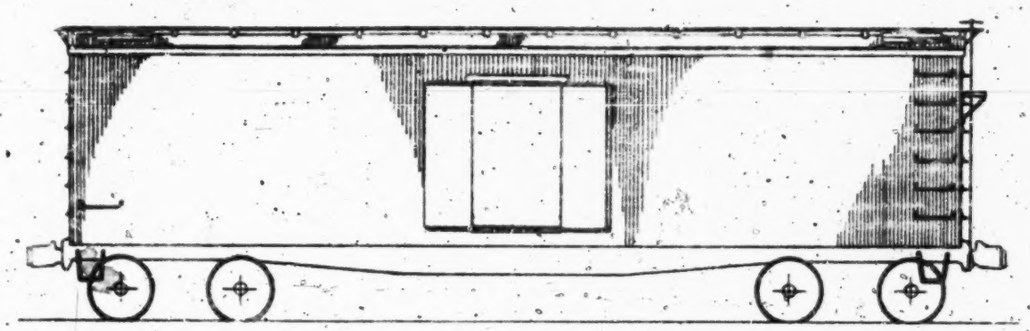
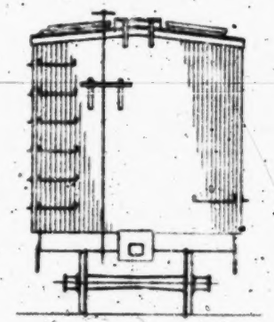
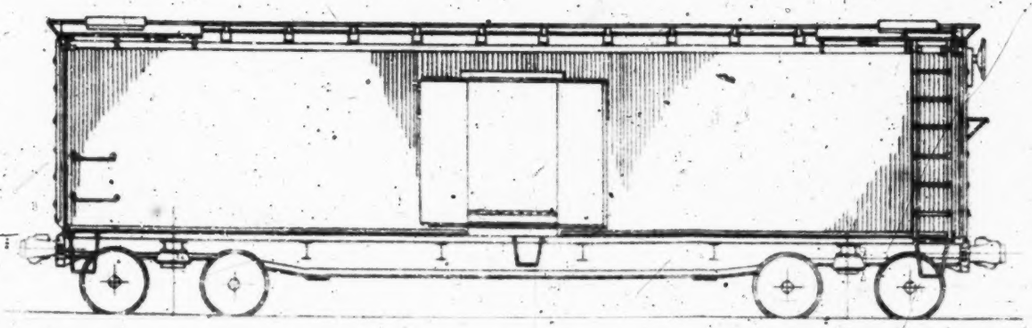
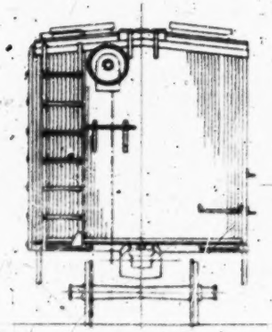
*Not required from switching and terminal companies. †Two-digit traffic may be given in a footnote without subdivision by commodities, but if possible by direction of movement. **Not required for Class II roads.

Defendant's Exhibit No. 135 (Witness Cartmill)
Jan. 7, 1941

Superior
State v.

CHRONOLOGY OF PACIFIC FRUIT EXPRESS FREIGHT REFRIGERATOR CARS
YEARS 1906 - 1936
SHOWING DESIGN AND CAPACITY CHARACTERISTICS

JA 7 1941

YEAR	A SIDE ELEVATION	B END ELEVATION	C NEW FEATURES	D CARRYING CAPACITY & WEIGHT	
1906			10" Air Brake Cylinder Triple Valve H-T Brake Beam 1" Truss Rod Pressed Steel Underframe Arch Bar Trucks 4-1/4" x 8" Journals Cast Steel Coupler 5" x 7" MCB Shank Carmer Release Rigging Tandem Spring Draft Rigging Drop Forged Coupler Yoke Simplex Truck Bolster Wheels Cast Iron Wood Superstructure " Roof	60000	44500
1930			Triple Valve K-2 Struct. Steel Built up Underframe Cast Steel Truck Side Frames 5" x 9" Journals Brake Beam Safety Supports Bottom Rod Safety Guard Cast Steel Truck Bolster Type "D" Coupler 6" x 8" Shank Coupler Centering Device Improved Cast Iron Wheels (Single plate) Friction Draft Gears Cast Steel Coupler Yokes Rotary Coupler Release Rigging No. 24 Brake Beam 1-1/4" Truss Rod Additional Handhold Side and end Ladders Metal Brake Steps Power Hand Brakes Steel Superstructure Flexible Metal Roof	80000	52500

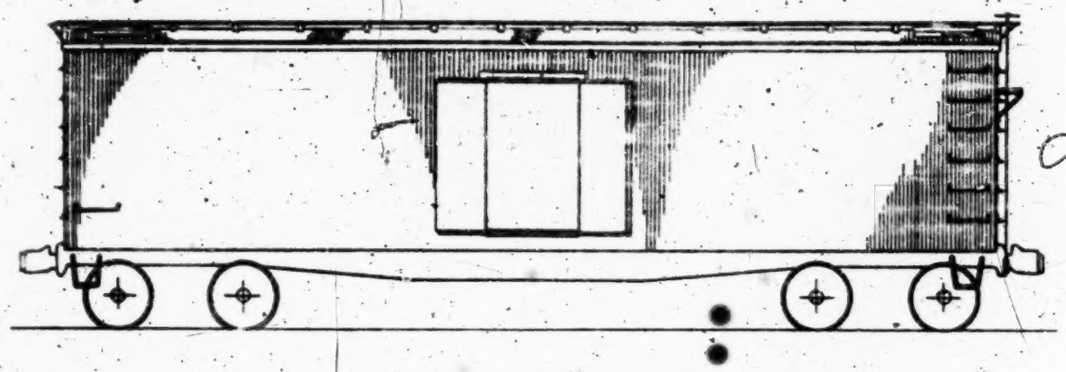
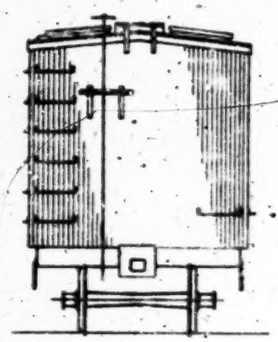
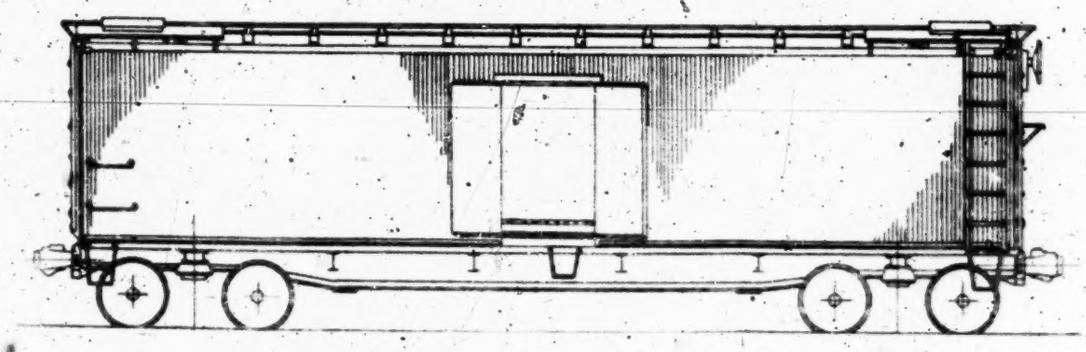
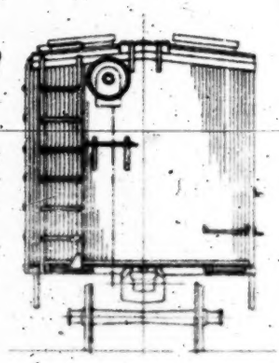
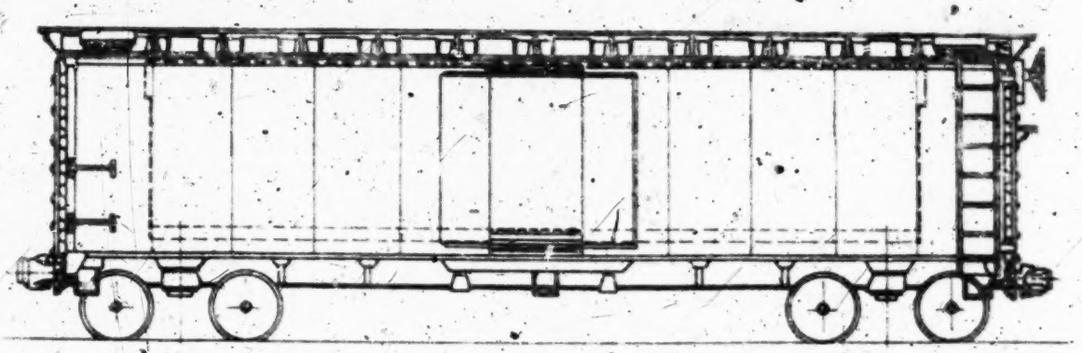
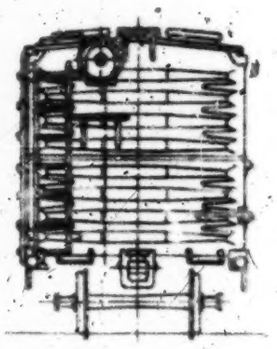
rtmill)

Superior Court, Pima Co., Arizona
State v. C.F. Co. No. 80087

.GERATOR CARS

'ICS.

REV FEATURES	CARRYING CAPACITY & WEIGHT LBS.	CUBICAL CAPACITY CU.FT.	CROSS SECTIONAL AREA CENTER SILLS - SQ.IN.
Brake Cylinder alve E-1 am 1" Truss Rod Steel Underframe Trucks 4-1/4" x 8" Journals el Coupler 5" x 7" MCB Shank elease Rigging pring Draft Rigging ged Coupler Yoke Truck Bolster ast Iron erstructure f	60000 44500	1964	20.81
alve E-2 Steel Built up Underframe el Truck Side Frames Journals am Safety Supports ad Safety Guard el Truck Bo ter ' Coupler 6" x 8" Shank Centering Device Cast Iron Wheels (Single plate) Draft Gears el Coupler Yokes Coupler Release Rigging Brake Beam 1-1/4" Truss Rod al Handhold and Ladders ake Steps nd Brakes perstructure Metal Roof	80000 52500	1988	28.4.
derframe with Corten steel	80000 53100	1988	18.40

Year	Side Elevation	End Elevation	New Features	Marginal Weights
1926			10" Air Brake Cylinder Triple Valve E-1 Brake Beam 1" Truss Rod Pressed Steel Underframe Arch Bar Trucks 4-1/4" x 8" Journals Cast Steel Coupler 5" x 7" MCB Shank Corner Release Rigging Tandem Spring Draft Rigging Drop Forged Coupler Yoke Simplex Truck Bolster Wheels Cast Iron Wood Superstructure " Roof	60000
1930			Triple Valve K-2 Struct. Steel Built up Underframe Cast Steel Truck Side Frames 5" x 9" Journals Brake Beam Safety Supports Bottom Rod Safety Guard Cast Steel Truck Bolster Type "D" Coupler 5" x 5" Shank Coupler Centering Device Improved Cast Iron Wheels (Single plate) Friction Draft Gears Cast Steel Coupler Yokes Rotary Coupler Release Rigging No. 24 Brake Beam 1-1/4" Truss Rod Additional Handhold Side and End Ladders Metal Brake Steps Power Hand Brakes Steel Superstructure Flexible Metal Roof	80000
1936			AB Brakes Steel Underframe with Corten Steel Center Sill Double Truss Spring Plankgpus Truck Loop Type Brake Hangers and Wear Plates Type "E" Coupler Truck Snubber Springs No. 3 Brake Beam 1-1/8" Truss Rod Steel Sheathing and Framing Steel Ends Solid Steel Roof	60000

Brake Cylinder alve K-1 am 1" Truss Rod Steel Underframe Trucks 4-1/4" x 8" Journals el Coupler 5" x 7" MCB Shank elease Rigging pring Draft Rigging ged Coupler Yoke Truck Bolster ast Iron erstructure f	60000	44500	1954	28.61
alve K-2 Steel Built up Underframe el Truck Side Frames Journals am Safety Supports od Safety Guard el Truck Bolster " Coupler 6" x 8" Shank Centering Device Cast Iron Wheels (Single plate) Draft Gears el Coupler Yokes Coupler Release Rigging Brake Beam 1-1/4" Truss Rod al Handhold and Ladders ake Steps nd Brakes perstructure Metal Roof	80000	52500	1988	28.4.
s derframe with Corten Steel Sill Truck Spring Planeless Truck e Brake Hangers and Gear Plates " Coupler ubber Springs ake Beam 1-3/8" Truss Rod athing and Framing de eel Roof	80000	52100	1988	28.40

Defendant's Exhibit No. 136 (Witness Cartmill)
Jan. 7, 1941

PACIFIC FRUIT EXPRESS COMPANY

PART I

Details of construction of P.F.E. cars of various series; years in which built; the number of cars of each series as of October 31, 1940; the average light weight of cars by series as of October 31, 1940, and as of year 1908; the cubical capacity of cars by series as at present and as of year 1908, and the carrying capacity of P.F.E. cars in 1908.

Class	Year Built	No. of Cars in Service 12-31-08	No. of Cars in Service 10-31-40	Average Weight 12-31-08	Average Weight 10-31-40	Cubical Capacity Cars 12-31-08	Cubical Capacity Cars 10-31-40	Truck Capacity
R30-2	1906-07	6,582	-	44,500	-	1,964	-	30-Ton
R30-2-13	"	-	918	-	51,800	-	1,964	"
R30-4	1909	-	2	-	50,900	-	1,921	"
R30-5	1909-10-11	-	43	-	51,100	-	1,921	"
R30-6	1913	-	19	-	50,400	-	1,928	"
R30-11	1917-18	-	1,225	-	51,700	-	1,924	40-Ton
R30-12	1920-21-22-23-24	-	5,939	-	52,400	-	1,918	"
R30-13	1920-23-24-25-26	-	4,609	-	54,000	-	1,918	"
R30-14	1926	-	660	-	52,600	-	1,918	"
R30-11-4	1917-18	-	604	-	56,000	-	1,918	"
R30-11-8	"	-	612	-	56,200	-	1,974	"
R30-11-9	"	-	93	-	53,300	-	1,988	"
R30-11-16	"	-	21	-	53,400	-	1,988	"
R30-12-4	1922	-	1	-	54,500	-	1,918	"
R30-12-8	1922-23-24	-	6	-	57,000	-	1,974	"
R30-12-9	1920-21-22-23-24	-	4,941	-	53,200	-	1,988	"
R30-12-15	1920-21-22-23	-	15	-	60,600	-	1,500	"
R30-12-16	1920-21-22-23-24	-	578	-	53,400	-	1,988	"
R30-13-8	1920-23-26	-	4	-	57,300	-	1,974	"
R30-13-9	1920-23-24-25-26	-	2,380	-	53,400	-	1,988	"
R30-13-16	1920-23-24-25-26	-	412	-	53,400	-	1,988	"
R30-14-9	1926	-	242	-	53,400	-	1,988	"
R30-14-16	"	-	83	-	53,400	-	1,988	"
R40-1	1927	-	88	-	57,700	-	1,918	"
R40-2	1928-29-30	-	3,259	-	54,400	-	1,918	"
R40-2-9	1928-29-30	-	39	-	54,200	-	1,988	"
R40-2-16	1928-29-30	-	63	-	53,400	-	1,988	"
R40-4	1930-31	-	994	-	57,300	-	1,918	"
R40-6	1917-18-20-21-22-23-24	-	50	-	59,300	-	1,948	"
R40-8	1931-32	-	394	-	58,300	-	1,974	"
R40-10	1936-37	-	4,681	-	53,300	-	1,988	"
W.P.	1923-24	-	708	-	52,200	-	1,918	"
"	"	-	1,969	-	53,200	-	1,988	"
SUB-TOTAL								
Standard Refrs. in Service		6,582	35,652	-	-	-	-	-
Average tare weight		-	-	44,500	53,500	-	-	-
R50-1	1930	-	395	-	67,400	-	2,349	50-Ton
R70-2	1932	-	100	-	87,400	-	2,612	70-Ton
R70-3	1939	-	20	-	77,600	-	2,808	"
R70-4	1940	-	5	-	85,300	-	2,820	"
GRAND TOTAL								
Freight Refrs. in Service		6,582	36,172	-	-	-	-	-
Average tare weight		-	-	44,500	53,800	-	-	-
			298	-	83,200	-	2,586	50-Ton

the number of cars of each series as of October 31, [illegible]; the average [illegible] cars by series as of October 31, 1940, and as of year 1908; the cubical capacity of cars by series as at present and as of year 1908, and the carrying capacity of P.F.E. cars in 1908.

Class	Year Built	No. of Cars in Service 12-31-08	No. of Cars in Service 10-31-40	Average Weight 12-31-08	Average Weight 10-31-40	Cubical Capacity Cars 12-31-08	Cubical Capacity Cars 10-31-40	Truck Capacity
R30-2	1906-07	6,582	-	44,500	-	1,964	-	30-Ton
R30-2-13	"	-	918	-	51,800	-	1,964	"
R30-4	1909	-	2	-	50,900	-	1,921	"
R30-5	1909-10-11	-	43	-	51,100	-	1,921	"
R30-6	1913	-	19	-	50,400	-	1,928	"
R30-11	1917-18	-	1,225	-	51,700	-	1,924	40-Ton
R30-12	1920-21-22-23-24	-	5,939	-	52,400	-	1,918	"
R30-13	1920-23-24-25-26	-	4,609	-	54,000	-	1,918	"
R30-14	1926	-	660	-	52,600	-	1,918	"
R30-11-4	1917-18	-	604	-	56,000	-	1,918	"
R30-11-8	"	-	612	-	56,200	-	1,974	"
R30-11-9	"	-	93	-	53,300	-	1,988	"
R30-11-16	"	-	21	-	53,400	-	1,988	"
R30-12-4	1922	-	1	-	54,500	-	1,918	"
R30-12-8	1922-23-24	-	6	-	57,000	-	1,974	"
R30-12-9	1920-21-22-23-24	-	4,941	-	53,200	-	1,988	"
R30-12-15	1920-21-22-23	-	15	-	60,600	-	1,500	"
R30-12-16	1920-21-22-23-24	-	378	-	53,400	-	1,988	"
R30-13-8	1920-23-26	-	4	-	57,300	-	1,974	"
R30-13-9	1920-23-24-25-26	-	2,380	-	53,400	-	1,988	"
R30-13-16	1920-23-24-25-26	-	412	-	53,400	-	1,988	"
R30-14-9	1926	-	242	-	53,400	-	1,988	"
R30-14-16	"	-	83	-	53,400	-	1,988	"
R40-1	1927	-	88	-	57,700	-	1,918	"
R40-2	1928-29-30	-	3,259	-	54,400	-	1,918	"
R40-2-9	1928-29-30	-	39	-	54,200	-	1,988	"
R40-2-16	1928-29-30	-	63	-	53,400	-	1,988	"
R40-4	1930-31	-	994	-	57,300	-	1,918	"
R40-6	1917-18-20-21-22-23-24	-	50	-	59,300	-	1,948	"
R40-8	1931-32	-	394	-	58,300	-	1,974	"
R40-10	1936-37	-	4,681	-	53,300	-	1,988	"
W.P.	1923-24	-	708	-	52,200	-	1,918	"
"	"	-	1,969	-	53,200	-	1,988	"
SUB-TOTAL Standard Refrs. in Service		6,582	35,652	-	-	-	-	-
Average tare weight		-	-	44,500	53,500	-	-	-
R50-1	1930	-	395	-	67,400	-	2,349	50-Ton
R70-2	1932	-	100	-	87,400	-	2,612	70-Ton
R70-3	1939	-	20	-	77,600	-	2,808	"
R70-4	1940	-	5	-	85,300	-	2,820	"
GRAND TOTAL Freight Refrs. in Service		6,582	36,172	-	-	-	-	-
Average tare weight		-	-	44,500	53,800	-	-	-
RF-1	1923-24	-	298	-	83,200	-	2,586	50-Ton

PART II

Number of cars built new by or for the Pacific Fruit Express Company, by years from 1925 to and including October 31, 1940, and the number of cars rebuilt, (which cars were modernized at the time of rebuilding), by years from 1925 to and including October 31, 1940.

Year	No.Cars Built New	No.Cars Rebuilt	Total
1925	128	1,667	1,795
1926	5,039	1,468	6,507
1927	89	1,306	1,395
1928	2,000	1,670	3,670
1929	-	1,449	1,449
1930	900	1,133	2,033
1931	-	1,338	1,338
1932	100	614	714
1933	-	61	61
1934	-	2	2
1935	-	4	4
1936	2,700	300	3,000
1937	2,000	2,799	4,799
1938	-	1,768	1,768
1939	20	2,302	2,322
1940	5	3,774*	3,779

NOTE: Rebuilt to and including October 31, 1940.

PART III

The number of P.F.E. cars handled through P.F.E. shops and outside light repair points or culling stations, by years from 1930 to 1939, both inclusive.

Year	Average No. PFE Cars In Active Service	Total No. PFE Cars Handled At Shops	Average No. Times Per Year Each PFE Car Handled At Shops	Total No. PFE Cars Handled at Outside Pts.	Average No. Times Per Year Each PFE Car Handled at Outside Pts.	Grand Total PFE Cars Handled	Average No. Times Per Year Each PFE Car Handled at Shops and Outside Pts.
1930	40,892	224,252	5.48	115,453	2.82	339,705	8.30
1931	41,174	237,025	5.76	95,342	2.32	332,367	8.08
1932	41,109	209,240	5.09	93,120	2.27	302,360	7.36
1933	41,084	187,186	4.56	85,586	2.08	272,772	6.64
1934	39,437	214,684	5.44	91,330	2.32	306,014	7.76
1935	37,211	211,716	5.69	88,451	2.38	300,167	8.07
1936	35,225	220,386	6.26	97,159	2.76	317,545	9.02
1937	37,263	227,233	6.10	102,788	2.76	330,021	8.86
1938	36,355	233,142	6.41	107,448	2.96	340,590	9.37
1939	35,640	237,318	6.66	106,037	2.98	343,355	9.64

Number of P.F.E. cars retired and number of P.F.E. cars set aside for retirement or rebuilding as of October 31, 1940, account unsuited for further use.

(a) Number cars inspected and authorized for retirement since 1933 8,548

(b) Number cars inspected and set aside awaiting retirement 199

(c) Number cars jointly inspected and authorized for rebuilding since 1933 ... 12,973

(d) Total cars inspected and authorized for retirement or rebuilding since 1933 21,720

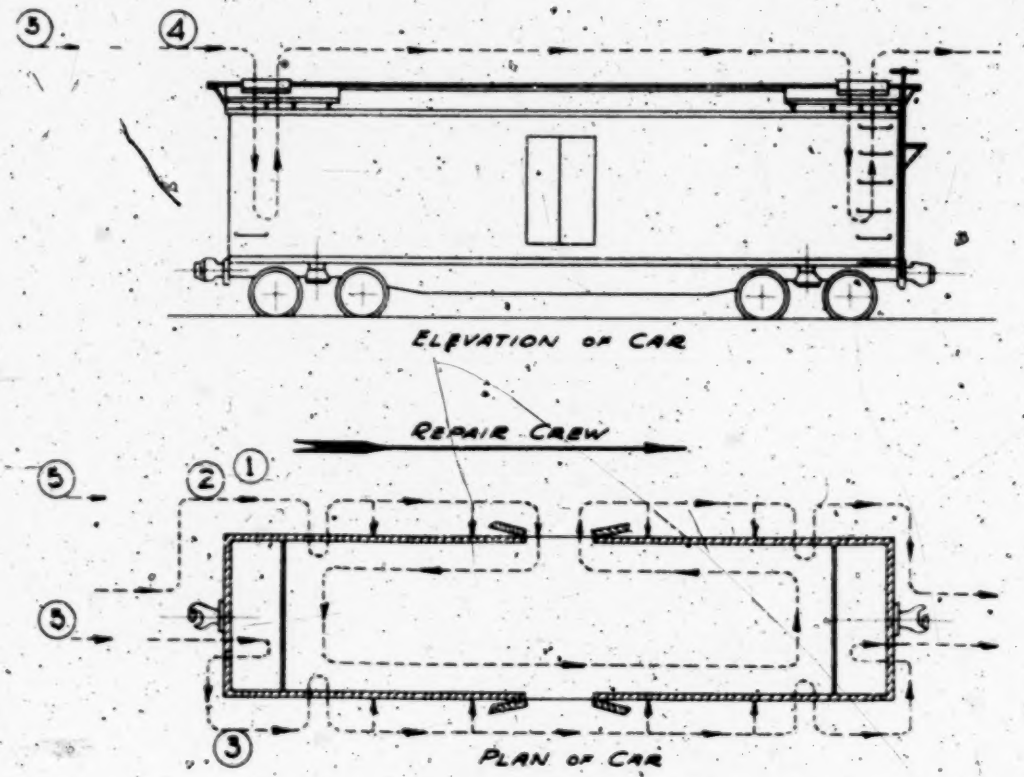
-cOo-

(e) Number cars awaiting joint inspection for rebuilding 132

-cOo-

(f) Number of P.F.E. cars in active service as of October 31, 1940 33,978

GENERAL INSTRUCTIONS
FOR
INSPECTING CARS



POSITION DIAGRAM

No. 1 on the DIAGRAM shall be the recorder, who will have a supply of Forms 59, "Repair Record," and be capable of properly and legibly recording all defects found by Inspectors, also be equipped with chalk to mark any defects which he notes, and he may assist in making inspections.

No. 2 Inspector will inspect draft gears, trucks, underframe, sides and ends and side doors, also enter body of car and make inspection of interior, marking all defects plainly with chalk.

No. 3 Inspector will be equipped with a coupler height gauge and will inspect all draft gears; gauge couplers; inspect trucks, underframe and sides and ends of car on opposite side from Inspectors No. 1 and No. 2, marking plainly with chalk all defects noted.

No. 4 Inspector will inspect top of cars, running boards, roof, hatch platforms, hatch covers and plugs; also test hand brakes and examine foot boards. He will enter ice tanks for inspection of ice grates, bulkheads and interior of ice tanks, marking with chalk all defects found.

NOTE: It will be necessary that Inspectors No. 2, No. 3 and No. 4 call out distinctly to recorder defects found in order that correct record will be made on door card of their findings.

Inspection should be made of all cars in advance of repairmen, which would necessitate Inspectors starting to work possibly thirty minutes in advance of repairmen.

No. 5 Light Repair Foreman, or an Inspector-Lead Workman, will be stationed with repairmen and will direct and advise them; see that repairs are properly made and that materials are delivered promptly, and pass judgment on any work or defects found which have not been noted at previous inspection. One or the other of them will make note on door card of any additional defects found, and after repairs have been properly made, doors and plugs tested and car properly cleaned, one or the other of them will sign door card in space provided indicating that such work has been performed and that car is in first-class condition for loading.

NOTE: It is expected that Foreman and/or Inspector-Lead Workman may possibly require services of Inspectors who have made prior inspections to assist him in making subsequent inspections.

It will be necessary that doors and hatch plugs be closed and tested for air leaks by those assigned to this work, and Foreman is expected to make frequent test to insure doors and plugs being tight.

Inspectors No. 2, No. 3 and No. 4 will inspect all safety appliances, including side and end ladders, roof, side and end grab irons, cut-off levers, etc.

Defendant's Exhibit No. 138 (Witness Weeks)
Jan. 7, 1941

THE ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

TYPICAL EXAMPLES OF FREIGHT TRAINS HANDLED ON MAIN LINE BETWEEN CHICAGO, ILLINOIS AND GALLUP, NEW MEXICO, FEBRUARY 1ST TO 10TH

FROM	TO	DISTANCE (MILES)	RULING GRADE	70 CARS OR LESS							71 CARS TO 100 CARS							101 CARS TO 125 CARS						
				NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D
Chillicothe, Ill.	Corwith, Ill.	125	.50	32	Mikado	12	29	12	53	2 281	18	Mikado	12	26	45	83	3 274	4	Mikado	-	8	102	110	3
Chillicothe, Ill.	Corwith, Ill.	125	.50	4	Prairie	-	5	20	25	752														
Chillicothe, Ill.	Corwith, Ill.	125	.50	2	Pacific	22	15	3	40	1 720														
Chillicothe, Ill.	Corwith, Ill.	125	.50	1	Diesel M-103	11	37	8	56	2 914														
Corwith, Ill.	Chillicothe, Ill.	125	.71	31	Mikado	-	46	15	61	2 133	14	Mikado	-	45	30	75	2 523	9	Mikado	-	10	92	102	3
Corwith, Ill.	Chillicothe, Ill.	125	.71	5	Prairie	-	11	3	14	664														
Corwith, Ill.	Chillicothe, Ill.	125	.71	2	Pacific	-	45	-	45	1 520														
Shopton, Ia.	Chillicothe, Ill.	105	.60	26	Mikado	14	27	13	54	2 288	27	Mikado	14	31	37	82	3 294	2	Mikado	-	11	92	103	2
Shopton, Ia.	Chillicothe, Ill.	105	.60	2	Pacific	26	19	3	48	2 119														
Shopton, Ia.	Chillicothe, Ill.	105	.60	3	Prairie	-	4	11	15	439														
Shopton, Ia.	Chillicothe, Ill.	105	.60	1	Diesel M-103	11	37	9	57	2 994														
Shopton, Ia.	Chillicothe, Ill.	105	.60	1	Pacific-Mikado	-	3	66	69	1 945														
Chillicothe, Ill.	Shopton, Ia.	105	1.10	13	Mikado	-	44	9	53	1 769	31	Mikado	-	45	38	83	3 772	5	Mikado	-	22	90	112	3
Chillicothe, Ill.	Shopton, Ia.	105	1.10	2	Pacific	-	44	1	45	1 519								1	Pacific	-	29	89	118	4
Chillicothe, Ill.	Shopton, Ia.	105	1.10	4	Prairie	-	5	20	25	767														
Marceline, Mo.	Shopton, Ia.	113	.80	31	Mikado	12	28	9	49	2 198	7	Mikado	6	12	62	80	2 569							
Marceline, Mo.	Shopton, Ia.	113	.80	19	2 - 8 - 4	17	25	12	54	2 368	7	2 - 8 - 4	6	25	49	80	3 001	1	2 - 8 - 4	-	2	115	117	3
Marceline, Mo.	Shopton, Ia.	113	.80	5	Prairie	-	6	9	15	521														
Marceline, Mo.	Shopton, Ia.	113	.80	1	Diesel M-103	10	39	9	58	3 027														
Shopton, Ia.	Marceline, Mo.	113	.80	24	Mikado	4	37	22	63	2 178	9	Mikado	-	12	71	83	2 441	5	Mikado	-	3	99	102	2
Shopton, Ia.	Marceline, Mo.	113	.80	21	2 - 8 - 4	-	43	13	56	1 950	3	2 - 8 - 4	-	32	42	74	2 313	3	2 - 8 - 4	-	3	100	103	2
Shopton, Ia.	Marceline, Mo.	113	.80	4	Prairie	-	6	31	37	1 137														
																		1	2-8-4-Pacific	-	3	113	116	3
Argentine, Kans.	Marceline, Mo.	108	.92	29	Mikado	12	27	9	48	2 154	10	Mikado	5	23	62	90	2 870							
Argentine, Kans.	Marceline, Mo.	108	.92	19	2 - 8 - 4	16	29	11	56	2 491	5	2 - 8 - 4	8	25	48	81	3 061	1	2 - 8 - 4	-	1	115	116	3
Argentine, Kans.	Marceline, Mo.	108	.92	4	Prairie	-	9	5	14	498														
Argentine, Kans.	Marceline, Mo.	108	.92	1	Diesel M-103	10	39	9	58	3 027														
Argentine, Kans.	Marceline, Mo.	108	.92	1	Pacific-2-8-4	24	18	1	43	2 017														
Marceline, Mo.	Argentine, Kans.	108	.83	25	Mikado	-	45	16	61	2 139	12	Mikado	-	39	40	79	2 565	4	Mikado	-	2	101	103	2
Marceline, Mo.	Argentine, Kans.	108	.83	10	2 - 8 - 4	-	45	8	53	1 784	9	2 - 8 - 4	-	25	56	81	2 434	7	2 - 8 - 4	-	3	114	117	3
Marceline, Mo.	Argentine, Kans.	108	.83	5	Prairie	-	5	19	24	777														
Emporia, Kans.	Argentine, Kans.	108	.40	33	Mikado	6	42	15	63	2 655	42	Mikado	14	41	28	83	3 455	8	Mikado	12	40	53	105	3
Emporia, Kans.	Argentine, Kans.	108	.40	9	Prairie	-	11	10	21	751														
Emporia, Kans.	Argentine, Kans.	108	.40								1	Diesel M-103	30	22	29	81	3 252							
Argentine, Kans.	Emporia, Kans.	108	.60	53	Mikado	3	50	10	63	2 279	11	Mikado	3	49	21	73	2 391	14	Mikado	-	9	105		
Argentine, Kans.	Emporia, Kans.	108	.60	2	Prairie	-	23	39	62	1 857	6	Prairie	-	6	73	79	1 927							
Argentine, Kans.	Emporia, Kans.	108	.60	1	Diesel M-103	-	46	3	49	2 056														
Wellington, Kans.	Emporia, Kans.	113	.60	10	Mikado	16	23	21	60	2 411	21	Mikado	22	30	32	84	3 348	5	Mikado	19	27	61	107	3
Wellington, Kans.	Emporia, Kans.	113	.60								1	Diesel M-103	32	25	27	84	3 442							
Emporia, Kans.	Wellington, Kans.	113	.60	1	Diesel M-103	1	46	1	48	2 070														
Emporia, Kans.	Wellington, Kans.	113	.60	27	Mikado	4	47	14	65	2 420	11	Mikado	3	43	34	80	2 672	10	Mikado	-	5	105	110	2
Kansas City, Mo.	Wellington, Kans.	207	.60	8	Mikado	11	18	23	52	1 882	24	Mikado	4											

Weeks)

COMPANY

GALLUP, NEW MEXICO, FEBRUARY 1ST TO 10TH, 1940, INCLUSIVE

101 CARS TO 125 CARS								126 CARS AND OVER								MAXIMUM CARS PER TRAIN
NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS		NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS		
4	Mikado	-	8	102	110	3 264										114
																41
																42
9	Mikado	-	10	92	102	3 245		1	Mikado	-	10	118	128	3 522		56
																128
																21
2	Mikado	-	11	92	103	2 968										45
																105
																54
																17
5	Mikado	-	22	90	112	3 533		4	Mikado	-	11	120	131	3 956		57
1	Pacific	-	29	89	118	4 367										69
																138
																118
																55
1	2 - 8 - 4	-	2	115	117	3 093										90
																117
																23
5	Mikado	-	3	99	102	2 711		1	Mikado	-	-	128	128	3 454		58
3	2 - 8 - 4	-	3	100	103	2 782										128
																105
1	2-8-4-Pacific	-	3	113	116	3 191										45
																116
1	2 - 8 - 4	-	1	115	116	3 003										99
																116
																80
																58
4	Mikado	-	2	101	103	2 839		1	Mikado	-	4	123	127	3 378		43
7	2 - 8 - 4	-	3	114	117	3 202										127
																123
																37
8	Mikado	12	40	53	105	3 967										15
																91
14	Mikado	-	9	105		3 049		9	Mikado	-	10	118	128	3 327		81
																130
																88
																49
5	Mikado	19	27	61	107	3 653										120
																84
10	Mikado	-	5	105	110	3 124										48

FROM	TO	DIS-TANCE (MILES)	RULING GRADE	70 CARS OR LESS: NO.OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST: A	B	C	D	TONS	71 CARS TO 100 CARS: NO.OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST: A	B	C	D	TONS	101 CARS TO 125 CARS: NO.OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST: A	B	C	D	TONS	NO.OF TRAINS	L
Chillicothe, Ill.	Corwith, Ill.	125	.50	32	Mikado	12	29	12	53	2 281	18	Mikado	12	26	45	83	3 274	4	Mikado	-	8	102	110	3 264		
Chillicothe, Ill.	Corwith, Ill.	125	.50	4	Prairie	-	5	20	25	752																
Chillicothe, Ill.	Corwith, Ill.	125	.50	2	Pacific	22	15	3	40	1 720																
Chillicothe, Ill.	Corwith, Ill.	125	.50	1	Diesel M-103	11	37	8	56	2 914																
Corwith, Ill.	Chillicothe, Ill.	125	.71	31	Mikado	-	46	15	61	2 133	14	Mikado	-	45	30	75	2 523	9	Mikado	-	10	92	102	3 245	1	M
Corwith, Ill.	Chillicothe, Ill.	125	.71	5	Prairie	-	11	3	14	664																
Corwith, Ill.	Chillicothe, Ill.	125	.71	2	Pacific	-	45	-	45	1 520																
Shopton, Ia.	Chillicothe, Ill.	105	.60	26	Mikado	14	27	13	54	2 288	27	Mikado	14	31	37	82	3 294	2	Mikado	-	11	92	103	2 968		
Shopton, Ia.	Chillicothe, Ill.	105	.60	2	Pacific	26	19	3	48	2 119																
Shopton, Ia.	Chillicothe, Ill.	105	.60	3	Prairie	-	4	11	15	439																
Shopton, Ia.	Chillicothe, Ill.	105	.60	1	Diesel M-103	11	37	9	57	2 994																
Shopton, Ia.	Chillicothe, Ill.	105	.60	1	Pacific-Mikado	-	3	66	69	1 945																
Chillicothe, Ill.	Shopton, Ia.	105	1.10	13	Mikado	-	44	9	53	1 769	31	Mikado	-	45	38	83	2 772	5	Mikado	-	22	90	112	3 533	4	M
Chillicothe, Ill.	Shopton, Ia.	105	1.10	2	Pacific	-	44	1	45	1 519								1	Pacific	-	29	89	118	4 367		
Chillicothe, Ill.	Shopton, Ia.	105	1.10	4	Prairie	-	5	20	25	767																
Marceline, Mo.	Shopton, Ia.	113	.80	31	Mikado	12	26	9	49	2 198	7	Mikado	6	12	62	80	2 569									
Marceline, Mo.	Shopton, Ia.	113	.80	19	2 - 8 - 4	17	25	12	54	2 368	7	2 - 8 - 4	6	25	49	80	3 001	1	2 - 8 - 4	-	2	115	117	3 093		
Marceline, Mo.	Shopton, Ia.	113	.80	5	Prairie	-	6	9	15	521																
Marceline, Mo.	Shopton, Ia.	113	.80	1	Diesel M-103	10	39	9	58	3 027																
Shopton, Ia.	Marceline, Mo.	113	.80	24	Mikado	4	37	22	63	2 178	9	Mikado	-	12	71	83	2 441	5	Mikado	-	3	99	102	2 711	1	M
Shopton, Ia.	Marceline, Mo.	113	.80	21	2 - 8 - 4	-	43	13	56	1 950	3	2 - 8 - 4	-	32	42	74	2 313	3	2 - 8 - 4	-	3	100	103	2 782		
Shopton, Ia.	Marceline, Mo.	113	.80	4	Prairie	-	6	31	37	1 137																
	Marceline, Mo.	113	.80															1	2-8-4-Pacific	-	3	113	116	3 191		
	Marceline, Mo.	108	.92	29	Mikado	12	27	9	48	2 154	10	Mikado	5	23	62	90	2 670									
Argentine, Kans.	Marceline, Mo.	108	.92	19	2 - 8 - 4	16	29	11	56	2 491	5	2 - 8 - 4	8	25	48	81	3 061	1	2 - 8 - 4	-	1	115	116	3 003		
Argentine, Kans.	Marceline, Mo.	108	.92	4	Prairie	-	9	5	14	498																
Argentine, Kans.	Marceline, Mo.	108	.92	1	Diesel M-103	10	39	9	58	3 027																
Argentine, Kans.	Marceline, Mo.	108	.92	1	Pacific-2-8-4	24	18	1	43	2 017																
Argentine, Kans.	Argentine, Kans.	108	.83	25	Mikado	-	45	16	61	2 139	12	Mikado	-	39	40	79	2 565	4	Mikado	-	2	101	103	2 839		M
Argentine, Kans.	Argentine, Kans.	108	.83	10	2 - 8 - 4	-	45	8	53	1 784	9	2 - 8 - 4	-	25	56	81	2 434	7	2 - 8 - 4	-	3	114	117	3 202		
Argentine, Kans.	Argentine, Kans.	108	.83	5	Prairie	-	5	19	24	777																
Argentine, Kans.	Emporia, Kans.	108	.40	33	Mikado	6	42	15	63	2 655	42	Mikado	14	41	28	83	2 455	8	Mikado	12	40	53	103	3 967		
Argentine, Kans.	Emporia, Kans.	108	.40	9	Prairie	-	11	10	21	751																
Argentine, Kans.	Emporia, Kans.	108	.40								1	Diesel M-103	30	22	29	81	3 252									
Emporia, Kans.	Wellington, Kans.	108	.60	53	Mikado	3	50	10	63	2 279	11	Mikado	3	49	21	73	2 391	14	Mikado	-	9	105	[illegible]	3 049	9	Mi
Emporia, Kans.	Wellington, Kans.	108	.60	2	Prairie	-	23	39	62	1 857	6	Prairie	-	6	73	79	1 927									
Emporia, Kans.	Wellington, Kans.	108	.60	1	Diesel M-103	-	46	3	49	2 056																
Emporia, Kans.	Wellington, Kans.	113	.60	10	Mikado	16	23	21	60	2 411	21	Mikado	22	30	32	84	3 348	5	Mikado	19	27	61	107	3 853		
Emporia, Kans.	Wellington, Kans.	113	.60								1	Diesel M-103	32	25	27	84	3 442									
Wellington, Kans.	Oklahoma City, Okla.	113	.60	1	Diesel M-103	1	46	1	48	2 070																
Wellington, Kans.	Oklahoma City, Okla.	113	.60	27	Mikado	4	47	14	65	2 420	11	Mikado	3	43	34	80	2 672	10	Mikado	-	5	105	110	3 124		
Wellington, Kans.	Oklahoma City, Okla.	107	.60	8	Mikado	11	19	23	53	1 983	24	Mikado	23	31	30	84	3 397	4	Mikado	19	27	67	103	3 933		
Wellington, Kans.	Oklahoma City, Okla.	107	.60	5	Prairie	1	16	26	43	1 367	1	Prairie	2	21	53	76	2 353									
Wellington, Kans.	Oklahoma City, Okla.	107	.60	2	Consolid.	1	9	32	42	1 284																
Wellington, Kans.	Oklahoma City, Okla.	107	.60								1	Diesel M-103	32	27	29	88	3 644									
Waynoka, Okla.	Oklahoma City, Okla.	107	.60	24	Mikado	2	49	8	59	2 270	14	Mikado	1	55	22	78	2 798	12	Mikado	-	8	109	117	3 306	1	Mi
Waynoka, Okla.	Oklahoma City, Okla.	107	.60	4	Prairie	-	30	29	59	2 127	1	Prairie	-	33	43	76	2 251									
Waynoka, Okla.	Oklahoma City, Okla.	107	.60	1	Consolid.	1	31	34	66	2 143																
Waynoka, Okla.	Oklahoma City, Okla.	107	.60	1	Diesel M-103	1	48	3	52	2 252																

101 CARS TO 125 CARS								126 CARS AND OVER								MAXIMUM
NO. OF S.	TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS		CARS PER TRAIN
4	4	Mikado	-	8	102	110	3 264									114
																41
																42
																56
3	9	Mikado	-	10	92	102	3 245	1	Mikado	1	10	118	128	3 522		128
																21
																45
1	2	Mikado	-	11	92	103	2 968									105
																54
																17
																57
																69
2	5	Mikado	-	22	90	112	3 533	4	Mikado	-	11	120	131	3 956		138
	1	Pacific	-	29	89	118	4 367									118
																55
																90
	1	2 - 8 - 4	-	2	115	117	3 093									117
																23
																58
	5	Mikado	-	3	99	102	2 711	1	Mikado	-	-	128	128	3 454		128
	3	2 - 8 - 4	-	3	100	103	2 782									105
																45
	1	2-8-4-Pacific	-	3	113	116	3 191									116
																99
	1	2 - 8 - 4	-	1	115	116	3 003									116
																20
																59
																43
	4	Mikado	-	2	101	103	2 839	3	Mikado	-	4	123	127	3 378		127
	7	2 - 8 - 4	-	3	114	117	3 202									123
																37
	8	Mikado	12	40	53	105	3 967									15
																31
																81
	14	Mikado	-	9	105	114	3 049	9	Mikado	-	10	118	128	3 327		130
																88
																49
	5	Mikado	19	27	61	107	2 853									120
																84
																48
	10	Mikado	-	5	105	110	3 124									116
	4	Mikado	19	27	67	113	3 933									123
																76
																56
																88
	12	Mikado	-	8	109	117	3 306	1	Mikado	-	-	126	126	3 525		126
																76
																66
																52

EXPLANATIONS OF SYMBOLS USED BELOW
UNDER HEADING "AVERAGE CONSIST":

A—Perishable loads
B—Other loads
C—Empty cars and includes caboose
D—Total all cars

THE ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

TYPICAL EXAMPLES OF FREIGHT TRAINS HANDLED ON MAIN LINE BETWEEN CHICAGO, ILLINOIS AND GALLUP, NEW MEXICO, FEBRUARY 1ST TO 10TH, 1940, INCLUSIVE

FROM	TO	DISTANCE (MILES)	RULING GRADE	70 CARS OR LESS: NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	71 CARS TO 100 CARS: NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	101 CARS TO 125 CARS: NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	MAXIMUM CARS PER TRAIN
Canadian, Tex.	Waynoka, Okla.	108	.60	2	Mikado	9	22	31	62	2 344	18	Mikado	22	29	34	85	3 328	8	Mikado	20	26	52	106	3 997								116
Canadian, Tex.	Waynoka, Okla.	108	.60	4	Prairie	-	9	9	18	643																						34
Canadian, Tex.	Waynoka, Okla.	108	.60	1	Consolid.	-	9	12	21	784																						21
Canadian, Tex.	Waynoka, Okla.	108	.60								1	Santa Fe	45	21	22	88	3 747	1	Santa Fe	9	23	75	107	3 283								107
Canadian, Tex.	Waynoka, Okla.	108	.60								1	Diesel M-103	33	26	30	89	3 623															89
Canadian, Tex.	Waynoka, Okla.	108	.60								3	Mikado-Santa Fe	33	26	24	83	3 475															87
Canadian, Tex.	Waynoka, Okla.	108	.60								1	Mikado-Prairie	16	28	55	99	3 428															99
Waynoka, Okla.	Canadian, Tex.	108	1.00	27	Mikado	4	49	8	61	2 269	10	Mikado	-	30	57	87	2 777	9	Mikado	-	4	102	106	2 957								109
Waynoka, Okla.	Canadian, Tex.	108	1.00	5	Santa Fe	3	50	5	58	2 320								1	Santa Fe	-	8	97	105	3 102								105
Waynoka, Okla.	Canadian, Tex.	108	1.00	2	Prairie	1	11	21	33	994																						34
Waynoka, Okla.	Canadian, Tex.	108	1.00	1	Consolid.	-	6	40	46	1 267																						46
Waynoka, Okla.	Canadian, Tex.	108	1.00	1	Diesel M-103		49	3	52	2 239																						52
Amarillo, Tex.	Canadian, Tex.	99	.60	7	Mikado	12	18	21	51	2 008	16	Mikado	21	30	32	83	3 353	9	Mikado	25	18	93	106	3 944								110
Amarillo, Tex.	Canadian, Tex.	99	.60	5	Prairie	-	19	31	50	1 744																						66
Amarillo, Tex.	Canadian, Tex.	99	.60	1	Consolid.	-	27	22	49	1 947																						49
Amarillo, Tex.	Canadian, Tex.	99	.60								1	Santa Fe	45	44	22	91	3 874	1	Santa Fe	9	27	76	112	3 516								112
Amarillo, Tex.	Canadian, Tex.	99	.60								1	Diesel M-103	33	26	30	89	3 623															89
Amarillo, Tex.	Canadian, Tex.	99	.60								3	Mikado-Santa Fe	33	27	23	83	3 511															98
Canadian, Tex.	Amarillo, Tex.	99	.60	28	Mikado	3	48	8	59	2 225	7	Mikado	1	36	48	86	3 618	9	Mikado	-	4	103	107	3 [illegible]								124
Canadian, Tex.	Amarillo, Tex.	99	.60	5	Santa Fe	3	51	5	59	2 357	1	Santa Fe	-	5	80	85	3 495															85
Canadian, Tex.	Amarillo, Tex.	99	.60	6	Prairie	-	20	27	47	1 638	1	Prairie	1	44	55	100	3 897															100
Canadian, Tex.	Amarillo, Tex.	99	.60	1	Diesel M-103	-	49	3	52	2 239																						52
Canadian, Tex.	Amarillo, Tex.	99	.60	1	Consolid.	1	22	29	52	2 031																						52
Clovis, N. M.	Amarillo, Tex.	102	.60	1	Consolid.	-	11	13	24	777																						24
Clovis, N. M.	Amarillo, Tex.	102	.60	15	Mikado	15	16	27	58	2 240	17	Mikado	28	20	32	80	3 194	1	Mikado	14	10	81	105	3 160								105
Clovis, N. M.	Amarillo, Tex.	102	.60								1	Diesel M-103	32	22	36	90	3 577															90
Clovis, N. M.	Amarillo, Tex.	102	.60								2	Mikado-Prairie	45	20	25	90	3 752															100
Clovis, N. M.	Amarillo, Tex.	103	.60	3	Prairie	-	10	12	22	726																						33
Amarillo, Tex.	Clovis, N. M.	102	.60	22	Mikado	3	44	15	62	2 382	15	Mikado	2	49	35	86	3 058	3	Mikado	-	1	110	111	3 110								111
Amarillo, Tex.	Clovis, N. M.	102	.60								2	Santa Fe	-	9	83	92	2 859															93
Amarillo, Tex.	Clovis, N. M.	102	.60								1	Mikado-Pacific	4	72	8	84	3 480															84
Amarillo, Tex.	Clovis, N. M.	102	.60	3	Prairie	-	16	15	31	1 327																						45
Amarillo, Tex.	Clovis, N. M.	102	.60	1	Diesel M-103	-	49	3	52	2 241																						53
Vaughn, N. M.	Clovis, N. M.	131	.60	2	Santa Fe	-	35	3	38	2 186	10	Santa Fe	23	21	39	83	3 355	1	Santa Fe	14	25	68	107	3 832								107
Vaughn, N. M.	Clovis, N. M.	131	.60	1	Prairie	1	32	1	34	1 970																						34
Vaughn, N. M.	Clovis, N. M.	131	.60	1	2 - 10 - 4	38	17	7	62	2 826	20	2 - 10 - 4	30	26	34	90	3 689	3	2 - 10 - 4	25	16	62	103	3 641								106
Vaughn, N. M.	Clovis, N. M.	131	.60	1	Decapod	-	16	3	19	1 225																						19
Clovis, N. M.	Vaughn, N. M.	131	.60	9	Santa Fe	2	37	27	66	2 336	1	Santa Fe	-	3	90	93	2 554	6	Santa Fe	-	3	103	106	3 017								108
Clovis, N. M.	Vaughn, N. M.	131	.60	2	Prairie	-	8	32	40	1 365																						41
Clovis, N. M.	Vaughn, N. M.	131	.60								26	2 - 10 - 4	4	58	25	87	3 270															98
Clovis, N. M.	Vaughn, N. M.	131	.60															1	Santa Fe-Pac.	-	16	91	107	3 193								107
																				4	26	20	56	102	3 771						106
																																20

From	To	Distance (Miles)	Ruling Grade	No. of Trains	Type of Locomotive	Tonnage Rating A	B	C	D	Tons	No. of Trains	Type of Locomotive	A	B	C	D	Tons	No. of Trains	Type of Locomotive	A	B	C	D	Tons	No. of Trains	Locomo
Canadian, Tex.	Waynoka, Okla.	108	.60	2	Mikado	9	22	31	62	2 344	18	Mikado	22	29	34	85	3 328	8	Mikado	26	28	52	106	3 997		
Canadian, Tex.	Waynoka, Okla.	108	.60	4	Prairie	2	9	9	18	643																
Canadian, Tex.	Waynoka, Okla.	108	.60	1	Consolid.	-	9	12	21	784																
Canadian, Tex.	Waynoka, Okla.	108	.60								1	Santa Fe	45	21	22	88	3 747	1	Santa Fe	9	23	75	107	3 283		
Canadian, Tex.	Waynoka, Okla.	108	.60								1	Diesel M-103	33	26	30	89	3 623									
Canadian, Tex.	Waynoka, Okla.	108	.60								3	Mikado-Santa Fe	33	26	24	83	3 475									
Canadian, Tex.	Waynoka, Okla.	108	.60								1	Mikado-Prairie	16	28	55	99	3 428									
Waynoka, Okla.	Canadian, Tex.	108	1.00	27	Mikado	4	49	8	61	2 289	10	Mikado	-	30	57	87	2 777	9	Mikado	-	4	102	106	2 957		
Waynoka, Okla.	Canadian, Tex.	108	1.00	5	Santa Fe	3	50	5	58	2 320								1	Santa Fe	-	8	97	105	3 103		
Waynoka, Okla.	Canadian, Tex.	108	1.00	2	Prairie	1	11	21	33	994																
Waynoka, Okla.	Canadian, Tex.	108	1.00	1	Consolid.		6	40	46	1 267																
Waynoka, Okla.	Canadian, Tex.	108	1.00	1	Diesel M-103		49	3	52	2 239																
Amarillo, Tex.	Canadian, Tex.	99	.60	7	Mikado	12	18	21	51	2 008	16	Mikado	21	30	35	86	3 353	9	Mikado	25	28	53	106	3 944		
Amarillo, Tex.	Canadian, Tex.	99	.60	5	Prairie	-	19	31	50	1 744																
Amarillo, Tex.	Canadian, Tex.	99	.60	1	Consolid.	-	27	22	49	1 927																
Amarillo, Tex.	Canadian, Tex.	99	.60								1	Santa Fe	45	24	22	91	3 874	1	Santa Fe	5	27	76	112	3 516		
Amarillo, Tex.	Canadian, Tex.	99	.60								1	Diesel M-103	33	26	30	89	3 623									
Amarillo, Tex.	Canadian, Tex.	99	.60								5	Mikado-Santa Fe	33	27	23	83	3 511									
Canadian, Tex.	Amarillo, Tex.	99	.60	28	Mikado	3	48	8	59	2 225	7	Mikado	1	36	49	86	2 818	9	Mikado	-	4	103	107	2 990		
Canadian, Tex.	Amarillo, Tex.	99	.60	5	Santa Fe	3	51	5	59	2 357	1	Santa Fe	-	5	80	85	2 493									
Canadian, Tex.	Amarillo, Tex.	99	.60	6	Prairie	-	20	27	47	1 638	1	Prairie	1	44	55	100	3 897									
Canadian, Tex.	Amarillo, Tex.	99	.60	1	Diesel M-103	-	49	3	52	2 239																
Canadian, Tex.	Amarillo, Tex.	99	.60	1	Consolid.	1	22	29	52	2 031																
Clovis, N. M.	Amarillo, Tex.	102	.60	1	Consolid.	-	11	13	24	777																
Clovis, N. M.	Amarillo, Tex.	102	.60	15	Mikado	15	16	27	58	2 240	17	Mikado	28	20	32	80	3 194	1	Mikado	14	10	81	105	3 160		
Clovis, N. M.	Amarillo, Tex.	102	.60								1	Diesel M-103	32	22	36	90	3 577									
Clovis, N. M.	Amarillo, Tex.	102	.60								2	Mikado-Prairie	45	20	25	90	3 752									
Clovis, N. M.	Amarillo, Tex.	102	.60	3	Prairie	-	10	12	22	726																
Amarillo, Tex.	Clovis, N. M.	102	.60	22	Mikado	3	44	15	62	2 382	15	Mikado	2	49	35	86	3 058	3	Mikado	-	1	110	111	3 110		
Amarillo, Tex.	Clovis, N. M.	102	.60								2	Santa Fe	-	9	83	92	2 859									
Amarillo, Tex.	Clovis, N. M.	102	.60								1	Mikado-Pacific	4	72	8	84	3 480									
Amarillo, Tex.	Clovis, N. M.	102	.60	5	Prairie	-	16	15	31	1 327																
Amarillo, Tex.	Clovis, N. M.	102	.60	1	Diesel M-103	-	49	3	52	2 241																
Vaughn, N. M.	Clovis, N. M.	131	.60	2	Santa Fe	-	35	3	38	2 186	10	Santa Fe	23	21	39	83	3 355	1	Santa Fe	14	25	68	107	3 832		
Vaughn, N. M.	Clovis, N. M.	131	.60	1	Prairie	1	32	1	34	1 970																
Vaughn, N. M.	Clovis, N. M.	131	.60	1	2 - 10 - 4	38	17	7	62	2 826	20	2 - 10 - 4	30	26	34	90	3 689	3	2 - 10 - 4	25	16	62	103	3 641		
Vaughn, N. M.	Clovis, N. M.	131	.60	1	Decapod	-	16	3	19	1 229																
Clovis, N. M.	Vaughn, N. M.	131	.60	9	Santa Fe	2	37	27	66	2 336	1	Santa Fe	-	3	90	93	2 554	6	Santa Fe	-	3	103	106	3 017		
Clovis, N. M.	Vaughn, N. M.	131	.60	2	Prairie	-	8	32	40	1 365																
Clovis, N. M.	Vaughn, N. M.	131	.60								26	2 - 10 - 4	4	58	25	87	3 270									
Clovis, N. M.	Vaughn, N. M.	131	.60															1	Santa Fe-Pac.	-	16	91	107	3 193		
Belen, N. M.	Vaughn, N. M.	109	1.25	3	2 - 10 - 4	28	17	17	62	2 568	13	2 - 10 - 4	33	27	30	90	3 800	8	2 - 10 - 4	26	20	56	102	3 771		
Belen, N. M.	Vaughn, N. M.	109	1.25	3	Prairie	1	13	3	17	805																
Belen, N. M.	Vaughn, N. M.	109	1.25	1	Decapod	5	8	6	19	976																
Belen, N. M.	Vaughn, N. M.	109	1.25								10	Santa Fe	23	22	39	84	3 399	1	Santa Fe	14	20	68	102	3 507		
Vaughn, N. M.	Belen, N. M.	109	.60	1	2 - 10 - 4	3	47	16	66	3 216	24	2 - 10 - 4	4	59	24	87	3 259	1	2 - 10 - 4	1	34	66	101	3 176		
Vaughn, N. M.	Belen, N. M.	109	.60	5	Prairie	2	15	26	43	1 535																
Vaughn, N. M.	Belen, N. M.	109	.60	4	Santa Fe	3	54	10	67	2 590	2	Santa Fe	-	31	43	74	2 374	6	Santa Fe	-	6	100	106	3 076		
Gallup, N. M.	Belen, N. M.	144	.60	38	Mikado	24	16	22	62	2 570	7	Mikado	16	14	45	77	2 771									
Gallup, N. M.	Belen, N. M.	144	.60	1	Mikado-Mtn.	29	19	16	64	2 686																
Belen, N. M.	Gallup, N. M.	144	1.30	41	Mikado	2	37	21	60	2 234	10	Mikado	1	8	69	78	2 294									
TOTAL TRAINS		1457		764							511							165						17	
PER CENT OF ALL TRAINS		100		52.4							35.1							11.3						1.2	
AVERAGE CARS PER TRAIN		98		58							85							108						129	

Of the 1,457 trains, 106 were local freight trains consisting of 70 cars or less and 8 were local freight trains consisting of 71 cars to 100 cars

o							26	28	52	106	3 997															113
																										84
																										81
Fe							9	23	75	107	3 283															107
																										89
																										87
																										99
o							-	4	102	106	2 957															109
Fe							-	8	97	105	3 102															105
																										34
																										46
																										52
o							25	28	53	106	3 944															118
																										65
																										49
Fe							5	27	76	112	3 516															112
																										89
																										96
o							-	4	103	107	2 990															124
																										85
																										100
																										52
																										52
																										84
o							14	10	81	105	3 160															105
																										90
																										100
																										33
o							-	1	110	111	3 110															111
																										93
																										84
																										45
																										52
Fe							14	25	68	107	3 832															107
- 4							25	16	62	103	3 641															34
																										106
Fe							-	3	103	106	3 017															19
																										108
																										41
																										98
Fe-Pac.							-	16	91	107	3 193															107
- 4							26	20	56	102	3 771															106
																										20
																										19
Fe							14	20	68	102	3 507															108
- 4							1	34	66	101	3 176															101
																										80
Fe							-	6	100	106	3 076															108
																										85
																										64
																										83

17
1.2
129

NATION OF SYMBOLS USED BELOW
HEADING "AVERAGE CONSIST":

ishable loads
er loads
ty cars and includes caboose
al all cars

THE ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

TYPICAL EXAMPLES OF FREIGHT TRAINS HANDLED ON MAIN LINE BETWEEN NEEDLES, ARIZ., AND BAKERSFIELD, CALIF., AND BARSTOW AND SAN BERNARDI
PERIOD FEBRUARY 1ST TO 10TH, 1940

	TO	DIS-TANCE (MILES)	RULING GRADE	NO. OF TRAINS	70 CARS OR LESS: TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	71 CARS TO 100 CARS: TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	101 CARS TO 125 CARS: TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS
tow, Calif.	Needles, Calif.	166	1.12	21	Santa Fe	21	20	18	59	2 667	6	Santa Fe	8	11	52	71	2 337								
tow, Calif.	Needles, Calif.	166	1.12	19	2-10-4	23	27	14	63	2 789	5	2-10-4	7	22	47	76	2 999								
les, Calif.	Barstow, Calif.	168	1.41	32	Santa Fe	1	19	36	56	1 852	1	Santa Fe	2	42	27	71	2 544								
les, Calif.	Barstow, Calif.	168	1.41	23	2-10-4	1	39	17	57	2 140	1	2-10-4	-	-	78	78	2 143								
rsfield, Calif.	Barstow, Calif.	141	2.52	29	Santa Fe	8	31	13	58	2 332	6	Santa Fe	10	43	19	72	3 629								
tow, Calif.	Bakersfield, Calif.	141	2.34	53	Santa Fe	3	24	19	46	1 665	5	Santa Fe	2	30	50	72	2 291								
Bdno., Calif.	Barstow, Calif.	83	2.20	43	Santa Fe	17	23	17	57	2 217	7	Santa Fe	6	9	58	73	2 084								
Bdno., Calif.	Barstow, Calif.	83	2.20	1	2-10-4	2	46	1	49	1 953															
Bdno., Calif.	Barstow, Calif.	83	2.20								1	Mountain	69	2	1	72	3 311								
tow, Calif.	San Bdno., Calif.	81	1.60	55	Santa Fe	2	30	15	47	1 838	5	Santa Fe	-	8	66	74	2 212								
tow, Calif.	San Bdno., Calif.	81	1.60	1	Mountain	-	-	65	65	1 829															
tow, Calif.	San Bdno., Calif.	81	1.60	1	Mikado	2	39	5	46	2 122															
AL TRAINS		295		358							37														
R CENT OF ALL TRAINS		100		87.5							12.5														
RAGE CAR PER TRAIN		56		55							73														

NO LOCAL TRAINS

MPANY

IELD, CALIF., AND BARSTOW AND SAN BERNARDINO, CALIF.

101 CARS TO 125 CARS							126 CARS AND OVER							MAXIMUM CARS PER TRAIN
NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	NO. OF TRAINS	TYPE OF LOCOMOTIVE	AVERAGE CONSIST A	B	C	D	TONS	
														72
														85
														71
														78
														75
														73
														77
														49
														72
														83
														65
														46

Defendant's Exhibit No. 1 (Witness Weeks)
Jan. 7, 1941

THE ATCHISON, TOPEKA & SANTA FE RAILWAY SYSTEM

Maximum number of cars handled in regular main line passenger trains between Chicago, Illinois and Los Angeles, California, February 2nd to [illegible], 1940 inclusive

Train No.	Chicago - Kansas City	Miles	Number of Cars in Train: 2	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
			Number of Trains														
	EAST																
1	The Scout	452								3	2	1	1				7
3	The California Limited	452									1	4	2				7
7	Fast Mail and Express	452							1				2	2	2		7
	(Retro Sec.)	452						1									1
17	The Super Chief	452							2								2
19	The Chief	452								1	2	1	3				7
21	El Capitan	452		2													2
23	The Grand Canyon Limited	452							2	3	1		1				7
	WEST																
2	The Scout	452								3	4						7
4	The California Limited	452							2	3	1	1					7
8	Fast Mail and Express	452								1	5	1					7
18	The Super Chief	452							2								2
20	The Chief	452							2	5							7
22	El Capitan	452		2													2
24	The Grand Canyon Limited	452							5	2							7
	Total		4					1	6	14	20	14	11	5	2	2	79
	Per Cent of Total		5.06					1.27	7.60	17.72	25.32	17.72	13.92	6.33	2.53	2.53	100.00

Total Trains over 14 Cars 4 or 5.06%
Total Trains 14 Cars or Under 75 or 94.94%
Total Trains 79 or 100.00%

Train No.	Kansas City - Newton	Miles	Number of Cars in Train: 2	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
			Number of Trains														
	WEST																
1	The Scout	185								3	3	1					7
3	The California Limited (via Topeka)	200									2	4		1			7
7	Fast Mail and Express	185						1	1	1							7
17	The Super Chief	185							2			3					2
19	The Chief	185									2	2	1	2			7
21	El Capitan	185		2													2
23	The Grand Canyon Limited	185								1			4	2			7
	EAST																
2	The Scout (via Topeka)	200							3	2	2						7
4	The California Limited	200									4	2	1				7
8	Fast Mail and Express	185									2	3	2				7
18	The Super Chief	185							2								2
20	The Chief	185								5	2						7
22	El Capitan	185		2													2
24	The Grand Canyon Limited	185								4	2			1			7
	Total		4					1	5	7	18	19	10	8	6		78
	Per Cent of Total		5.13					1.28	6.41	8.97	23.08	24.36	12.82	10.26	7.69		100.00

Total Trains over 14 Cars 6 or 7.69%
Total Trains 14 Cars or Under 72 or 92.31%
Total Trains 78 or 100.00%

5475

THE ATCHISON, TOPEKA & SANTA FE RAILWAY SYSTEM

Maximum number of cars handled in various main line passenger trains between Chicago, Illinois and Los Angeles, California, February 2nd to 8th, inclusive, 1940

Train No.	Marion - La Junta	Miles	Number of Cars in Train: 2	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
			Number of Trains														
	WEST																
3	The California Limited (via Gt.Bd.)	369								3	2	1		1			7
7	Fast Mail and Express	355					1	1	2		1	2					7
17	The Super Chief	355						2									2
19	The Chief	355									2	2	1	2			7
21	El Capitan	355		2													2
	EAST																
4	The California Limited (via Gt.Bd.)	369									5	2					7
8	Fast Mail and Express	355									3	2	2				7
18	Super Chief	355						2									2
20	The Chief	355								5	2						7
22	El Capitan	355		2													2
	Total		4				1	5	2	8	15	9	3	3			50
	Per Cent of Total		8.00				2.00	10.00	4.00	16.00	30.00	18.00	6.00	6.00			100.00

Total Trains over 14 Cars 3 or 6.00%
Total Trains 14 Cars or Under 47 or 94.00%
Total Trains 50 or 100.00%

Train No.	Marion - Pueblo	Miles	Number of Cars in Train: 2	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
			Number of Trains														
	WEST																
1	The Scout	717							2	2	3						7
23	The Grand Canyon Limited	717								2	3	2					7
	EAST																
2	The Scout	717								3	2	2					7
24	The Grand Canyon Limited	717									3	2		2			7
	Total								2	7	11	6		2			28
	Per Cent of Total								7.14	25.00	39.29	21.43		7.14			100.00

Total Trains over 14 Cars 2 or 7.14%
Total Trains 14 Cars or Under 26 or 92.86%
Total Trains 28 or 100.00%

Train No.	La Junta - Albuquerque	Miles	Number of Cars in Train: 2	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
			Number of Trains														
	WEST																
3	The California Limited	346								2	3	1	1				7
7	Fast Mail and Express	342				1		3		3							7
17	Super Chief	342						2									2
19	The Chief	342									2	2	1	2			7
21	El Capitan	342		2													2
	EAST																
4	The California Limited	346								7							7
8	Fast Mail and Express	342									2		4	1			7
18	Super Chief	342						2									2
20	The Chief	342								5	2						7
22	El Capitan	342		2													2
	Total		4		1			7		17	9	3	6	3			50
	Per Cent of Total		8.00		2.00			14.00		34.00	18.00	6.00	12.00	6.00			100.00

Total Trains over 14 Cars 3 or 6.00%
Total Trains 14 Cars or Under 47 or 94.00%
Total Trains 50 or 100.00%

5476

THE ATCHISON, TOPEKA & SANTA FE RAILWAY SYSTEM

Maximum number of cars handled in various main line passenger trains between Chicago, Illinois and Los Angeles, California, February 2nd to 8th, inclusive, 1940

Train No.	Albuquerque - Los Angeles	Miles	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
	Number of Cars in Train		Number of Trains																
	WEST																		
3	The California Limited	889												5	2				7
*	" " " (Alt. Sec.)	600				1													1
**	" " " "	23	1																1
7	Fast Mail and Express	889								1	2		1	2	1				7
17	The Super Chief	889									2								2
19	The Chief	889												2	2	1	2		7
***	" " (Alt. Sec.)	243			2														2
21	El Capitan	889				2													2
	EAST																		
4	The California Limited	891												5	2				7
8	Fast Mail and Express	891											2	2	1	1	1		7
18	The Super Chief	891									2								2
20	The Chief	891											5	2					7
22	El Capitan	891				2													2
	Total		1		2	5				1	6		8	13	11	4	3		54
	Per Cent of Total		1.85		3.70	9.26				1.85	11.11		14.82	24.07	20.37	7.41	5.56		100.00

Total Trains Over 14 Cars - 3 or 5.56%
Total Trains 14 Cars or Under - 51 or 94.44%
Total Trains - 54 or 100.00%

*Train 3-E operated in two sections between Winslow and Los Angeles
Consist out Albuquerque - 10 cars
1st Section - Winslow to Flagstaff - 11 cars
Flagstaff to Williams - 11 cars
Williams to Ash Fork - 13 cars
Ash Fork to Los Angeles - 12 cars
2nd Section - Winslow to Flagstaff - 2 cars
Flagstaff to Williams - 4 cars
Williams to Ash Fork - 5 cars
Ash Fork to Los Angeles - 5 cars

**Train 3-F operated in two sections between Williams and Ash Fork
Consist out Albuquerque - 10 cars
1st Section - Williams to Ash Fork - 14 cars
2nd Section - Williams to Ash Fork - 2 cars

***Train 19-B and Train 19-C operated in two sections between Gallup and Ash For
Consist out Albuquerque - Train 19-B - 15 cars
1st Section - Gallup to Ash Fork - 12 cars
2nd Section - Gallup to Ash Fork - 4 cars

Consist out Albuquerque - Train 19-C - 15 cars
1st Section - Gallup to Ash Fork - 12 cars
2nd Section - Gallup to Ash Fork - 4 cars

Train No.	Balen - Los Angeles	Miles	2	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
	Number of Cars in Train		Number of Trains														
	WEST																
1	The Scout (via Riverside)	872								4	2	1					7
23	The Grand Canyon Limited	885							5		2						7
	EAST																
2	The Scout (via Riverside)	874								2	4		1				7
24	The Grand Canyon Limited	887								3	2	2					7
	Total			5		9		10		3		1					28
	Per Cent of Total			17.85		32.15		35.71		10.72		3.57					100.00

Total Trains over 14 Cars -
Total Trains 14 Cars or Under - 28 or 100.00%
Total Trains - 28 or 100.00%

5477

THE ATCHISON, TOPEKA & SANTA FE RAILWAY SYSTEM

Maximum number of cars handled in various main line passenger trains between Chicago, Illinois and Los Angeles, California, November 17th to 23rd, inclusive, 1940

Train No.	Chicago - Kansas City	Miles	Number of Cars in Train	2	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
				Number of Trains														
	EAST																	
1	The Scout	472											1	4	2			7
3	The California Limited	472									2	2	2	1				7
5	The Fast Mail and Express	472								1	3	1	1	1				7
17	The Super Chief	472							2									2
19	The Chief	472							1	1	2	2	1					7
21	El Capitan	472				2												2
23	The Grand Canyon Limited	472							2	2	3							7
	WEST																	
2	The Scout	472								4	1	1	1					7
4	The California Limited	472								1		2	4					7
6	The Fast Mail and Express	472						1		1	1	2	2					7
18	The Super Chief	472							2									2
20	The Chief	472							1	6								7
22	El Capitan	472				2												2
24	The Grand Canyon Limited	472								2	1	3	1					7
	Total					4		1	8	18	13	13	13	6	2			78
	Per Cent of Total					5.13		1.28	10.25	23.08	16.67	16.67	16.67	7.69	2.56			100.00

Total Trains 14 Cars or Less 2 or 2.56%
Total Trains 15 Cars or Under 76 or 97.44%
Total Trains 78 or 100.00%

Train No.	Kansas City - Newton	Miles	Number of Cars in Train	2	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
				Number of Trains														
	EAST																	
1	The Scout (via Topeka)	200									2	3	1	1				7
3	The California Limited "	200								2			4		1			7
5	The Fast Mail and Express	165							2	2		3						7
17	The Super Chief	165							2									2
19	The Chief	165							3		2	1	1					7
21	El Capitan	165				2												2
23	The Grand Canyon Limited	165										1	1	4	1			7
	WEST																	
2	The Scout (via Topeka)	200									3	1	3					7
4	The California Limited "	200							1	1		2						7
6	The Fast Mail and Express	165								2		4	1					7
18	The Super Chief	165							2									2
20	The Chief	165								1	6							7
22	El Capitan	165				2												2
24	The Grand Canyon Limited (via Top.)	200										1	4	2				7
	Total					4			10	8	16	16	15	7	2			78
	Per Cent of Total					5.13			12.82	10.26	20.51	20.51	19.23	8.98	2.56			100.00

Total Trains 14 Cars or Less 2 or 2.56%
Total Trains 15 Cars or Under 76 or 97.44%
Total Trains 78 or 100.00%

THE ATCHISON, TOPEKA & SANTA FE RAILWAY SYSTEM

Maximum number of cars handled in various main line passenger trains between Chicago, Illinois and Los Angeles, California, November 17th to 23rd inclusive, 1940

Newton - La Junta

Train No.	Number of Cars in Train	Miles	2	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
	WEST							Number of Trains									
1	The California Limited (via St.Fe.)	369								4	3						7
3	Fast Mail and Express	353						3	1		3						7
17	The Super Chief	353						2									2
19	The Chief	355						3		2	1	1					7
21	El Capitan	355			2												2
	EAST																
4	The California Limited (via St.Fe.)	369							2	3	2						7
6	Fast Mail and Express	353								2	4		1				7
18	The Super Chief	353						2									2
20	The Chief	355							1	6							7
22	El Capitan	355			2												2
	Total				4			10	4	17	13	1	1				50
	Per Cent of Total				8.00			20.00	8.00	34.00	26.00	2.00	2.00				100.00

Total Trains over 14 Cars
Total Trains 14 Cars or Under 50 or 100.00%
Total Trains 50 or 100.00%

Newton - Galen

Train No.	Number of Cars in Train	Miles	2	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
	WEST							Number of Trains									
1	The Scout	717									2	3	1	1			7
23	The Grand Canyon Limited	717									2	3		2			7
	EAST																
2	The Scout	717									4	1	1	1			7
24	The Grand Canyon Limited	717									1	1	4		1		7
	Total										9	8	6	4	1		28
	Per Cent of Total										32.14	28.57	21.43	14.29	3.57		100.00

Total Trains over 14 Cars 5 or 17.86%
Total Trains 14 Cars or Under 23 or 82.14%
Total Trains 28 or 100.00%

La Junta - Albuquerque

Train No.	Number of Cars in Train	Miles	2	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
	WEST							Number of Trains									
1	The California Limited	346								3	4						7
3	Fast Mail and Express	346						2	1	1	2	1					7
17	The Super Chief	346							2								2
19	The Chief	346								2	1	2	1		1		7
21	El Capitan	346			2												2
	EAST																
4	The California Limited	346							4	2	1						7
6	Fast Mail Express	346								2	5						7
18	Super Chief	346						2									2
20	The Chief	346							1	6							7
22	El Capitan	346			2												2
	Total				4			2	5	6	17	12	2	1		1	50
	Per Cent of Total				8.00			4.00	10.00	12.00	34.00	24.00	4.00	2.00		2.00	100.00

Total Trains over 14 Cars 1 or 2.00%
Total Trains 14 Cars or Under 49 or 98.00%
Total Trains 50 or 100.00%

5479

Maximum number of cars handled in various main line passenger trains between Chicago, Illinois and Los Angeles, California, November 17th to 23rd, inclusive, 1940

Train No.	Albuquerque - Los Angeles	Miles	Number of Cars in Train	2	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
				Number of Trains														
	EAST																	
1	The California Limited	889											3	4				7
3	Fast Mail and Express	889						2		2	3							7
17	The Super Chief	889							2									2
*19	The Chief	892								1	1	1	2	1		1		7
*2/19		728							1									1
21	El Capitan	889				2												2
	WEST																	
4	The California Limited	891								3	1	1	1	1				7
8	Fast Mail and Express	891									3	4						7
18	The Super Chief	891							2									2
20	The Chief	891								1	6							7
22	El Capitan	891				2												2
	Total					4		2	5	7	14	6	6	6		1		51
	Per Cent of Total					7.84		3.92	9.81	13.73	27.46	11.76	11.76	11.76		1.96		100.00

Total Trains over 14 Cars 1 or 1.96%
Total Trains 14 Cars or Under 50 or 98.04%
Total Trains 51 or 100.00%

*Train 19-4 operated in two sections between Gallup and Los Angeles
Consist out Albuquerque - 16 cars
First section between Gallup and Ash Fork - 9 cars
" " " Ash Fork and Los Angeles - 9 cars

Second Section between Gallup and Ash Fork - 9 cars
" " " Ash Fork and Los Angeles - 6 cars

Train No.	Balboa - Los Angeles	Miles	Number of Cars in Train	2	5	6	7	8	9	10	11	12	13	14	15	16	17	Total
				Number of Trains														
	EAST																	
1	The Scout (via Riverside)	872								2	3	2						7
23	The Grand Canyon Limited	885								5	2							7
	WEST																	
2	The Scout (via Riverside)	874									4	1	1	1				7
24	The Grand Canyon Limited	887									3	2	1	1				7
	Total									7	12	5	2	2				28
	Per Cent of Total									25.00	42.86	17.86	7.14	7.14				100.00

Total Trains over 14 Cars
Total Trains 14 Cars or Under 28 or 100.00%
Total Trains 28 or 100.00%

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OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY, APPELLANT,

vs.

STATE OF ARIZONA, EX REL. JOE CONWAY, ATTORNEY GENERAL OF THE STATE OF ARIZONA

APPEAL FROM THE SUPERIOR COURT OF THE STATE OF ARIZONA, COUNTY OF PIMA

FILED AUG 12, 1944.

SUPREME COURT OF THE UNITED STATES

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201—S. P. Co., Pacific Lines, Grade crossings (same as 200 except reported to Nevada Public Service Commission for State of Nevada)	5619	3150
202—S. P. Co., Pacific Lines, Yuma, Arizona to El Paso, Texas, increased investment in siding extensions incident to long train operation	5620	3151
204—Chronological History of certain rules relating to air brakes, axles, brake beams and hangers, couplers, draft gears, etc., as appearing in Rule Books of Amer. Assoc. of Railroads	5621	3153
205—S. P. Co., Pacific Lines, Yuma, Arizona to El Paso, Texas, increased investment in water, roundhouse and shop facilities incident to adoption of long train program	5667	3190
207—Northern Pacific Ry. Co., Typical examples of freight trains handled between certain terminals, October 1–10, inclusive, 1939	5668	3191
208—Northern Pacific Ry. Co., Maximum number of cars handled in various main line passenger trains, October 1–10, 1939, inclusive	5669	3192
209—S. P. Co., Pacific Lines, Basic rates of pay for standard days and certain runs on the Tucson and Rio Grande Divisions	5670	3193

Record from Superior Court of State of Arizona in and for County of Pima—Continued
Statement of evidence—Continued
Defendant's exhibits—Continued

	Original	Print
210—S. P. Co., Pacific Lines, Comparative position of coupler under maximum draft gear travel, normal buff and pull, (representing National M-17, M-17-A, and M-17A (certified) draft gears)	5671	3194
211—S. P. Co., Pacific Lines, Number of passenger trains of different lengths between El Paso, Texas and Tucumcari, New Mexico, Year 1939	5672	319
212—S. P. Co., Pacific Lines, Tucson and Salt Lake Divisions, locomotive assignment as of November 30, 1940	5673	3196
213—S. P. Co., Pacific Lines, lengths and capacities of main line sidings in Arizona, Yuma, Arizona State Line to Arizona-N. M. State Line, via Gila and Bowie, year 1912	5674	3197
214—Main line freight trains of various lengths operated between Yuma, Ariz., and El Paso, Texas, via Gila, Arizona, and Lordsburg, New Mexico and via Douglas Arizona, over south line during June and August, 1938, actual operations compared with redispatched	5675	3198

Defendant's Exhibit No. 140 (Witness Weeks)
Jan. 7, 1941

THE ATCHISON, TOPEKA AND SANTA FE RAILWAY

TRAIN MILES AND FREIGHT CAR MILES
MAIN LINE TERRITORY BETWEEN CLOVIS, NEW MEXICO
AND GALLUP, NEW MEXICO, AND BETWEEN GALLUP,
NEW MEXICO AND NEEDLES, CALIFORNIA
YEARS 1923 TO 1939, INCLUSIVE

LINE NO.	YEAR	FREIGHT TRAIN MILES		FREIGHT CAR MILES	
		CLOVIS TO GALLUP	GALLUP TO NEEDLES	CLOVIS TO GALLUP	GALLUP TO NEEDLES
(a)	(b)	(c)	(d)	(e)	(f)
1	1923	1,175,346	1,960,891	76,115,151	88,156,075
2	1924	1,140,306	1,698,814	75,556,360	84,653,953
3	1925	1,195,872	1,634,851	81,264,647	89,079,641
4	1926	1,171,228	1,628,608	82,968,327	88,392,993
5	1927	1,290,853	1,801,731	94,394,619	99,414,342
6	1928	1,231,455	1,716,015	91,988,648	97,722,751
7	6 year period 1923-1928, Inc.	7,205,060	10,440,910	502,287,752	547,419,755
8	1929	1,309,064	1,793,971	95,155,812	102,365,961
9	1930	1,099,683	1,529,121	80,877,423	88,858,774
10	1931	893,347	1,331,527	67,232,573	78,107,725
11	1932	804,039	1,223,178	61,344,551	71,689,489
12	1933	801,770	1,178,002	59,227,107	68,972,780
13	1934	906,205	1,497,165	65,635,580	75,580,016
14	6 year period 1929-1934, Inc.	5,814,108	8,552,964	429,473,046	485,574,745
15	1935	1,074,834	1,668,739	75,002,697	88,121,066
16	1936	1,286,576	1,778,901	85,966,636	98,992,578
17	1937	1,380,033	1,845,289	92,268,686	103,456,158
18	1938	1,187,564	1,656,791	84,957,728	94,595,398
19	1939	1,251,246	1,754,961	89,761,348	98,712,427
20	5 year period 1935-1939, Inc.	6,180,253	8,704,681	427,957,095	483,878,227
21	TOTAL-17 YEARS	19,199,421	27,698,555	1,359,717,893	1,516,872,727

Defendant's Exhibit No. 141 (Witness Masson)
Jan. 8, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

FREIGHT REVENUES WITHIN THE STATE OF ARIZONA

Years 1912 to 1939 Inclusive

Year (1)	Intrastate (2)	Interstate (3)	Total (4)	Percent Interstate of Total (5)
1939	$1 264 811	$17 078 911	$18 343 722	93.10
1938	1 162 879	15 380 178	16 543 057	92.97
1937	1 450 617	17 784 487	19 235 104	92.46
1936	1 181 747	15 562 453	16 744 200	92.94
1935	818 256	13 131 891	13 950 147	94.13
1934	567 676	10 956 081	11 523 757	95.07
1933	305 062	9 982 867	10 287 929	97.03
1932	463 754	11 231 642	11 695 396	96.03
1931	1 071 215	14 508 277	15 579 492	93.12
1930	1 710 830	18 183 720	19 894 550	91.40
1929	2 380 174	23 120 356	25 500 530	90.67
1928	2 044 925	20 514 946	22 559 871	90.94
1927	1 942 862	19 567 884	21 510 746	90.97
1926	1 882 115	19 004 440	20 886 555	90.99
# 1925	1 921 398	18 104 940	20 026 338	90.41
1924	661 420	15 608 946	16 270 366	95.93
1923	489 618	14 552 624	15 042 242	96.75
1922	422 258	12 562 695	12 984 953	96.75
1921	370 978	12 727 179	13 098 157	97.17
1920	535 367	12 791 841	13 327 208	95.98
1919	548 989	12 357 127	12 906 116	95.75
1918	845 343	11 246 719	12 092 062	93.01
1917	840 704	11 291 105	12 131 809	93.07
1916	617 080	8 958 025	9 575 105	93.56
1915	236 856	5 518 909	5 755 765	95.88
1914	279 577	6 590 217	6 869 794	95.93
1913	329 170	6 165 094	6 494 264	94.93
1912	264 376	5 472 986	5 737 362	95.39

Note (a) # El Paso and Southwestern taken into accounts November 1, 1924 (System main line mileage, 673.09 miles; branch line mileage, 466.81 miles. In Arizona, main line mileage, 392.82 miles; branch line mileage, 144.93 miles). Arizona Eastern taken into accounts November 8, 1924, (main line mileage, 348.34 miles; branch line mileage, 34.32 [illegible] Arizona)

1937	1 450 617	17 784 487	19 235 104	92.46
1936	1 181 747	15 562 453	16 744 200	92.94
1935	818 256	13 131 891	13 950 147	94.13
1934	567 676	10 956 081	11 523 757	95.07
1933	305 062	9 982 867	10 287 929	97.03
1932	463 754	11 231 642	11 695 396	96.03
1931	1 071 215	14 508 277	15 579 492	93.12
1930	1 710 830	18 183 720	19 894 550	91.40
1929	2 380 174	23 120 356	25 500 530	90.67
1928	2 044 925	20 514 946	22 559 871	90.94
1927	1 942 862	19 567 884	21 510 746	90.97
1926	1 882 115	19 004 440	20 886 555	90.99
# 1925	1 921 398	18 104 940	20 026 338	90.41
1924	661 420	15 608 946	16 270 366	95.93
1923	489 618	14 552 624	15 042 242	96.75
1922	422 258	12 562 695	12 984 953	96.75
1921	370 978	12 727 179	13 098 157	97.17
1920	535 367	12 791 841	13 327 208	95.98
1919	548 989	12 357 127	12 906 116	95.75
1918	845 343	11 246 719	12 092 062	93.01
1917	840 704	11 291 105	12 131 809	93.07
1916	617 080	8 958 025	9 575 105	93.56
1915	236 856	5 518 909	5 755 765	95.88
1914	279 577	6 590 217	6 869 794	95.93
1913	329 170	6 165 094	6 494 264	94.93
1912	264 376	5 472 986	5 737 362	95.39

Note (a) # El Paso and Southwestern taken into accounts November 1, 1924 (System main line mileage, 673.09 miles; branch line mileage, 466.81 miles. In Arizona, main line mileage, 392.82 miles; branch line mileage, 144.93 miles). Arizona Eastern taken into accounts November 8, 1924, (main line mileage, 348.34 miles; branch line mileage, 34.32 miles, all in Arizona).

Note (b) Revenue from interstate traffic apportioned to State of Arizona on basis of mileage prorate of distance carried by Southern Pacific Company, which method of apportionment accords with formula prescribed by Arizona Corporation Commission September 23, 1914.

Note (c) Accounts are by fiscal years (July 1 to June 30) until the year 1915; after that by calendar years.

SOURCE: Schedule 710 "Railway Operating Revenues Earned Within the State" or corresponding schedules of Annual Reports to Corporation Commission of the State of Arizona.

30127

Defendant's Exhibit No. 142 (Witness Masson)
Jan. 8, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

FREIGHT REVENUES AS ALLOCATED TO THE STATE OF ARIZONA IN ACCORDANCE WITH FORMULAE PRESCRIBED BY ARIZONA CORPORATION COMMISSION, SEPTEMBER 23, 1914, SEGREGATED BETWEEN SPECIFIED CLASSES OF TRAFFIC

Calendar Years 1930 to 1939, Inclusive

Year (1)	Revenue from Intrastate Freight Traffic (2)	Percent of Total (3)	Revenue from Freight Traffic Originating Without and Ending Within the State (4)	Percent of Total (5)	Revenue from Freight Traffic Originating Within and Ending Without the State (6)	Percent of Total (7)	Revenue from Freight Traffic Passing Through the State (8)	Percent of Total (9)	Total Freight Revenue Allocated to State of Arizona (10)
1939	$1 264 811	6.90	$3 073 097	16.75	$2 217 904	12.09	$11 787 910	64.26	$18 343 722
1938	1 162 879	7.03	2 560 967	15.48	2 020 415	12.21	10 798 796	65.28	16 543 057
1937	1 450 617	7.54	3 563 466	18.53	2 123 175	11.04	12 097 846	62.89	19 235 104
1936	1 181 746	7.06	2 458 179	14.68	2 117 300	12.64	10 986 975	65.62	16 744 200
1935	818 256	5.87	1 883 972	13.50	1 984 142	14.22	9 263 777	66.41	13 950 147
1934	567 675	4.93	1 631 068	14.15	1 157 446	10.04	8 167 568	70.88	11 523 757
1933	305 062	2.97	1 302 617	12.66	1 057 710	10.28	7 622 540	74.09	10 287 929
1932	463 754	3.97	1 700 799	14.54	1 393 580	11.91	8 137 263	69.58	11 695 396
1931	1 071 215	6.88	3 308 367	21.23	1 501 739	9.64	9 698 171	62.25	15 579 492
1930	1 710 830	8.60	5 155 490	25.91	1 999 620	10.05	11 028 610	55.44	19 894 550

SOURCE: Accounting records of the Company. Total agrees with account 101 "Freight" revenue, reported in schedule 710 "Railway Operating Revenues Earned Within the State" of Annual Reports to the Corporation Commission of the State of Arizona.

Defendant's Exhibit No. 143 (Witness Masson)
Jan. 8, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

REVENUE TON MILES OF FREIGHT CARRIED IN STATE OF ARIZONA

Calendar Years 1925 to 1939, Inclusive

Year (1)	INTRASTATE		INTERSTATE		TOTAL	
	Number (2)	Percent (3)	Number (4)	Percent (5)	Number (6)	Percent (7)
1939	127 080 216	7.73	1 517 521 282	92.27	1 644 601 498	100.00
1938	118 947 110	8.08	1 353 569 735	91.92	1 472 516 845	100.00
1937	131 475 053	7.49	1 623 605 330	92.51	1 755 080 383	100.00
1936	103 602 522	6.91	1 394 919 298	93.09	1 498 521 820	100.00
1935	69 665 634	5.71	1 150 488 618	94.29	1 220 154 252	100.00
1934	51 777 625	5.20	944 395 536	94.80	996 173 161	100.00
1933	21 789 322	2.59	820 275 872	97.41	842 065 194	100.00
1932	36 179 346	3.98	872 528 938	96.02	908 708 284	100.00
1931	90 423 137	7.36	1 138 955 599	92.64	1 229 378 736	100.00
1930	147 634 059	10.05	1 321 453 942	89.95	1 469 088 001	100.00
1929	210 154 384	10.98	1 703 360 134	89.02	1 913 514 518	100.00
1928	175 613 789	10.61	1 478 810 507	89.39	1 654 424 296	100.00
1927	161 726 805	10.10	1 439 188 483	89.90	1 600 915 288	100.00
1926	157 303 010	10.09	1 402 252 088	89.91	1 559 555 098	100.00
1925	151 749 782	10.27	1 325 419 296	89.73	1 477 169 078	100.00

Note (a) Interstate ton miles assigned to State on basis of distance carried within or through the State.

Calendar Years 1925 to 1939, Inclusive

Year (1)	INTRASTATE Number (2)	INTRASTATE Percent (3)	INTERSTATE Number (4)	INTERSTATE Percent (5)	TOTAL Number (6)	TOTAL Percent (7)
1939	127 080 216	7.73	1 517 521 282	92.27	1 644 601 498	100.00
1938	118 947 110	8.08	1 353 569 735	91.92	1 472 516 845	100.00
1937	131 475 053	7.49	1 623 605 330	92.51	1 755 080 383	100.00
1936	103 602 522	6.91	1 394 919 298	93.09	1 498 521 820	100.00
1935	69 665 634	5.71	1 150 488 618	94.29	1 220 154 252	100.00
1934	51 777 625	5.20	944 395 536	94.80	996 173 161	100.00
1933	21 789 322	2.59	820 275 872	97.41	842 065 194	100.00
1932	36 179 346	3.98	872 528 938	96.02	908 708 284	100.00
1931	90 423 137	7.36	1 138 955 599	92.64	1 229 378 736	100.00
1930	147 634 059	10.05	1 321 453 942	89.95	1 469 088 001	100.00
1929	210 154 384	10.98	1 703 360 134	89.02	1 913 514 518	100.00
1928	175 613 789	10.61	1 478 810 507	89.39	1 654 424 296	100.00
1927	161 726 805	10.10	1 439 188 483	89.90	1 600 915 288	100.00
1926	157 303 010	10.09	1 402 252 088	89.91	1 559 555 098	100.00
1925	151 749 782	10.27	1 325 419 296	89.73	1 477 169 078	100.00

Note (a) Interstate ton miles assigned to State on basis of distance carried within or through the State.

SOURCE: Statistical records of the Company. Total agrees with schedule 931 "Statistics of Rail-Line Operations-Within the State" of Annual Reports to the Corporation Commission of the State of Arizona.

3049

Defendant's Exhibit No. 144 (Witness Masson)
Jan. 8, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

ANALYSIS OF INTERSTATE AND INTRASTATE REVENUE FREIGHT TONS CARRIED ONE MILE IN STATE OF ARIZONA

Calendar Years 1925, 1929, 1938 and 1939

(1)	1925		1929		1938		1939	
	Tons one mile (2)	Percent of total (3)	Tons one mile (4)	Percent of total (5)	Tons one mile (6)	Percent of total (7)	Tons one mile (8)	Percent of total (9)
INTERSTATE								
(a) Freight originating without and terminating within the State	391 790 626	26.52	519 394 147	27.14	199 835 118	13.57	236 409 964	14.37
(b) Freight originating within and terminating without the State	98 042 568	6.64	121 643 557	6.36	141 467 912	9.61	151 491 212	9.21
(c) Freight passing through the State ..	835 586 102	56.57	1 062 322 430	55.52	1 012 266 705	68.74	1 129 620 106	68.69
Total interstate	1 325 419 296	89.73	1 703 360 134	89.02	1 353 569 735	91.92	1 517 521 282	92.27
INTRASTATE								
(d) Freight originating and terminating within the State	151 749 782	10.27	210 154 384	10.98	118 947 110	8.08	127 080 216	7.73
Grand total interstate and intrastate	1 477 169 078	100.00	1 913 514 518	100.00	1 472 516 845	100.00	1 644 601 498	100.00

SOURCE: Statistical records of the Company. Totals agree with schedule 931 "Statistics of Rail-Line Operations - Within the State" of Annual Reports to the Corporation Commission of the State of Arizona.

Defendant's Exhibit No. 145 (Witness Masson)
Jan. 8, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

TONS OF REVENUE FREIGHT CARRIED ONE MILE THROUGH, AND/OR, TO AND FROM POINTS WITHIN, STATE OF ARIZONA, SEGREGATED BETWEEN TRAFFIC TO AND FROM MEXICO AND TRAFFIC TO AND FROM ALL OTHER POINTS BEYOND THE STATE

Calendar Year 1939

(1)	Tons One Mile (2)	Percent of Total (3)
A - Traffic to and from points beyond Arizona		
1 - Freight traffic originating or terminating in Mexico passing through State of Arizona to and from points beyond the State	18 876 622	1.24
2 - All other freight traffic passing through State of Arizona to and from points beyond other than Mexico	1 110 743 484	73.20
B - Traffic to and from points in Arizona		
3 - Freight traffic originating or terminating in Mexico terminating or originating within State of Arizona	415 752	.03
4 - All other freight traffic originating or terminating at points beyond State of Arizona terminating or originating within the State	387 485 424	25.53
C - Total interstate freight traffic	1 517 521 282	100.00

Defendant's Exhibit No. 146 (Witness Masson)
Jan. 8, 1941

RIZONA

S8

SOUTHERN PACIFIC COMPANY - Pacific Lines

PASSENGER REVENUES WITHIN THE STATE OF ARIZONA

Years 1912 to 1939 Inclusive

Year (1)	Intrastate (2)	Interstate (3)	Total (4)	Percent Interstate of Total (5)
1939	$94 696	$1 944 988	$2 039 684	95.36
1938	99 698	1 985 389	2 085 087	95.22
1937	114 003	2 314 741	2 428 744	95.31
1936	100 598	1 985 940	2 086 538	95.18
1935	80 469	1 587 558	1 668 027	95.18
1934	87 837	1 319 823	1 407 660	93.76
1933	67 464	1 230 466	1 297 930	94.80
1932	100 102	1 576 178	1 676 280	94.03
1931	178 720	2 581 567	2 760 287	93.53
1930	235 453	3 407 316	3 642 769	93.54
1929	285 982	3 857 467	4 143 449	93.10
1928	295 758	3 705 727	4 001 485	92.61
1927	309 660	3 839 550	4 149 210	92.54
1926	367 025	3 901 549	4 268 574	91.40
# 1925	397 393	3 746 504	4 143 897	90.41
1924	290 173	3 662 877	3 953 050	92.66
1923	352 336	3 957 017	4 309 353	91.82
1922	349 258	3 354 752	3 704 010	90.57
1921	479 295	3 734 151	4 213 446	88.62
1920	732 103	4 253 223	4 985 326	85.31
1919	477 331	2 923 017	3 400 348	85.96
1918	402 699	2 736 640	3 139 339	87.17
1917	474 785	2 372 839	2 847 624	83.33
1916	410 979	1 857 115	2 268 094	81.88
1915	298 126	1 448 980	1 747 106	82.94
1914	314 341	1 648 097	1 962 438	83.98
1913	330 711	1 761 036	2 091 747	84.19
1912	290 813	1 706 618	1 997 431	85.44

Note (a) # El Paso and Southwestern taken into the accounts November 1,1924 (System main line mileage, 673.09 miles; branch line mileage, 466.81 miles. In Arizona, main line mileage, 392.82 miles; branch line mileage, 144.93 miles). Arizona Eastern taken into accounts November 8, 1924, (main line mileage, 348.34 miles; branch line mileage, 34.32 miles, all in Arizona.)

1939	$94 696	$1 944 988	$2 039 684	95.36
1938	99 698	1 985 389	2 085 087	95.22
1937	114 003	2 314 741	2 428 744	95.31
1936	100 598	1 985 940	2 086 538	95.18
1935	80 469	1 587 558	1 668 027	95.18
1934	87 837	1 319 823	1 407 660	93.76
1933	67 464	1 230 466	1 297 930	94.80
1932	100 102	1 576 178	1 676 280	94.03
1931	178 720	2 581 567	2 760 287	93.53
1930	235 453	3 407 316	3 642 769	93.54
1929	285 982	3 857 467	4 143 449	93.10
1928	295 758	3 705 727	4 001 485	92.61
1927	309 660	3 839 550	4 149 210	92.54
1926	367 025	3 901 549	4 268 574	91.40
# 1925	397 393	3 746 504	4 143 897	90.41
1924	290 173	3 662 877	3 953 050	92.66
1923	352 336	3 957 017	4 309 353	91.82
1922	349 258	3 354 752	3 704 010	90.57
1921	479 295	3 734 151	4 213 446	88.62
1920	732 103	4 253 223	4 985 326	85.31
1919	477 331	2 923 017	3 400 348	85.96
1918	402 699	2 736 640	3 139 339	87.17
1917	474 785	2 372 839	2 847 624	83.33
1916	410 979	1 857 115	2 268 094	81.88
1915	298 126	1 448 980	1 747 106	82.94
1914	314 341	1 648 097	1 962 438	83.98
1913	330 711	1 761 036	2 091 747	84.19
1912	290 813	1 706 618	1 997 431	85.44

Note (a) # El Paso and Southwestern taken into the accounts November 1,1924 (System main line mileage, 673.09 miles; branch line mileage, 466.81 miles. In Arizona, main line mileage, 392.82 miles; branch line mileage, 144.93 miles). Arizona Eastern taken into accounts November 8, 1924, (main line mileage, 348.34 miles; branch line mileage, 34.32 miles, all in Arizona.)

Note (b) Revenue from interstate traffic apportioned to State of Arizona on basis of mileage prorate of distance carried by Southern Pacific Company, which method of apportionment accords with formula prescribed by Arizona Corporation Commission September 23, 1914.

Note (c) Accounts are by fiscal years (July 1 to June 30) until the year 1915; after that by calendar years.

SOURCE: Schedule 710 "Railway Operating Revenues Earned Within the State" or corresponding schedules of Annual Reports to Corporation Commission of the State of Arizona.

Defendant's Exhibit No. 147 (Witness Masson)
Jan. 8, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

REVENUE PASSENGERS CARRIED ONE MILE IN THE STATE OF ARIZONA

Years 1925 to 1939 Inclusive

Year (1)	INTRASTATE Number (2)	INTRASTATE Percent (3)	INTERSTATE Number (4)	INTERSTATE Percent (5)	TOTAL Number (6)	TOTAL Percent (7)
1939	5 516 913	4.59	114 591 060	95.41	120 107 973	100.00
1938	5 659 182	4.66	115 844 927	95.34	121 504 109	100.00
1937	6 414 225	4.25	144 654 127	95.75	151 068 352	100.00
1936	5 778 145	4.52	122 152 212	95.48	127 930 357	100.00
1935	4 651 407	4.63	95 907 170	95.37	100 558 577	100.00
1934	4 787 681	5.92	76 046 972	94.08	80 834 653	100.00
1933	3 524 491	5.55	60 034 527	94.45	63 559 018	100.00
1932	4 253 525	5.65	70 977 912	94.35	75 231 437	100.00
1931	7 072 085	6.21	106 847 706	93.79	113 919 791	100.00
1930	7 163 024	5.57	121 497 714	94.43	128 660 738	100.00
1929	8 692 351	6.21	131 235 787	93.79	139 928 138	100.00
1928	8 366 021	6.37	122 891 201	93.63	131 257 222	100.00
1927	8 807 568	6.60	124 642 368	93.40	133 449 936	100.00
1926	9 505 172	7.05	125 248 253	92.95	134 753 425	100.00
1925	10 006 254	7.53	122 855 320	92.47	132 861 574	100.00

Note (a) Interstate passengers carried one mile assigned to state on basis of distance carried within or through the state.

SOURCE: Records of the Company. Total agrees with Schedule 931, "Statis-

Year (1)	Number (2)	Percent (3)	Number (4)	Percent (5)	Number (6)	Percent (7)
1939	5 516 913	4.59	114 591 060	95.41	120 107 973	100.00
1938	5 659 182	4.66	115 844 927	95.34	121 504 109	100.00
1937	6 414 225	4.25	144 654 127	95.75	151 068 352	100.00
1936	5 778 145	4.52	122 152 212	95.48	127 930 357	100.00
1935	4 651 407	4.63	95 907 170	95.37	100 558 577	100.00
1934	4 787 681	5.92	76 046 972	94.08	80 834 653	100.00
1933	3 524 491	5.55	60 034 527	94.45	63 559 018	100.00
1932	4 253 525	5.65	70 977 912	94.35	75 231 437	100.00
1931	7 072 085	6.21	106 847 706	93.79	113 919 791	100.00
1930	7 163 024	5.57	121 497 714	94.43	128 660 738	100.00
1929	8 692 351	6.21	131 235 787	93.79	139 928 138	100.00
1928	8 366 021	6.37	122 891 201	93.63	131 257 222	100.00
1927	8 807 568	6.60	124 642 368	93.40	133 449 936	100.00
1926	9 505 172	7.05	125 248 253	92.95	134 753 425	100.00
1925	10 006 254	7.53	122 855 320	92.47	132 861 574	100.00

Note (a) Interstate passengers carried one mile assigned to state on basis of distance carried within or through the state.

SOURCE: Records of the Company. Total agrees with Schedule 931, "Statistics of Rail-line Operations - Within the State" of Annual Reports to the Corporation Commission of the State of Arizona.

3023

Defendant's Exhibit No. 148 (Witness Massen)
Jan. 8. 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

ANALYSIS OF INTERSTATE AND INTRASTATE REVENUE PASSENGERS CARRIED ONE MILE IN STATE OF ARIZONA

Calendar Years 1925, 1929, 1938, and 1939

INTERSTATE (1)	1925 (2)	Percent of Total (3)	1929 (4)	Percent of Total (5)	1938 (6)	Percent of Total (7)	1939 (8)	Percent of Total (9)
(a) Passengers originating without and terminating within the State	14 141 178	10.64	16 892 258	12.07	13 696 935	11.27	13 104 302	10.91
(b) Passengers originating within and terminating without the State	16 001 272	12.04	19 222 112	13.74	12 016 130	9.89	11 709 338	9.75
(c) Passengers passing through the State	92 712 870	69.79	95 121 417	67.98	90 131 862	74.18	89 777 420	74.75
TOTAL	122 855 320	92.47	131 235 787	93.79	115 844 927	95.34	114 591 060	95.41
INTRASTATE								
(d) Passengers originating and terminating within the State	10 006 254	7.53	8 692 351	6.21	5 659 182	4.66	5 516 913	4.59
GRAND TOTAL	132 861 574	100.00	139 928 138	100.00	121 504 109	100.00	120 107 973	100.00

SOURCE: Accounting records of the Company. Grand total agrees with schedule 931 "Statistics of Rail-Line Operations - Within the State" of Annual Reports to the Corporation Commission of the State of Arizona.

Defendant's ~~Pltf~~ Exhibit No. 149 (Witness Masson)
Jan. 8, 1941

(ARIZONA)

SOUTHERN PACIFIC COMPANY - Pacific Lines

STATISTICS OF RAIL-LINE OPERATIONS-WITHIN THE STATE OF ARIZONA
(Main Line and Branches, Excluding Mixed Service)

Years 1910 to 1939 Inclusive

FREIGHT TRAINS

Year (1)	Train Miles (2)	Car Miles (Excluding Caboose) (3)	Average Cars per Train (4)
1939	2 557 651	140 207 889	54.82
1938	2 300 584	127 687 953	55.50
1937	2 775 692	145 352 443	52.37
1936	2 452 310	129 961 927	53.00
1935	2 055 636	116 223 257	56.54
1934	1 755 019	100 265 968	57.13
1933	1 563 224	89 291 778	57.12
1932	1 722 567	97 764 545	56.76
1931	2 078 051	116 508 088	56.07
1930	2 438 091	137 487 849	56.39
1929	2 934 623	155 665 984	53.04
1928	2 705 144	140 778 450	52.04
1927	2 652 639	136 447 598	51.44
1926	2 554 435	133 589 694	52.30
1925	2 305 369	120 951 604	52.47
1924	1 750 830	96 409 559	55.07
1923	1 621 570	89 876 957	55.43
1922	1 274 932	71 134 149	55.79
1921	1 313 205	70 945 458	54.02
1920	1 506 195	68 457 102	45.45
1919	1 649 762	75 275 107	45.63
1918	1 812 457	76 615 230	42.27
1917	2 170 645	88 610 088	40.82
1916	1 646 508	70 775 450	4[illegible] 99
1915	942 053	46 909 827	49.80
1914	1 203 056	55 835 421	46.41
1913	1 141 006	50 578 980	44.33
1912	972 931	47 083 056	48.39
1911	906 488	45 088 268	49.74
1910	[illegible]	[illegible]	[illegible]

Year (1)	Train Miles (2)	Car Miles (Excluding Caboose) (3)	Average Cars per Train (4)
1939	2 557 651	140 207 889	54.82
1938	2 300 584	127 687 953	55.50
1937	2 775 692	145 352 443	52.37
1936	2 452 310	129 961 927	53.00
1935	2 055 636	116 223 257	56.54
1934	1 755 019	100 265 968	57.13
1933	1 563 224	89 291 778	57.12
1932	1 722 567	97 764 545	56.76
1931	2 078 051	116 508 088	56.07
1930	2 438 091	137 487 849	56.39
1929	2 934 623	155 665 984	53.04
1928	2 705 144	140 778 450	52.04
1927	2 652 639	136 447 598	51.44
1926	2 554 435	133 589 694	52.30
# 1925	2 305 369	120 951 604	52.47
1924	1 750 830	96 409 559	55.07
1923	1 621 570	89 876 957	55.43
1922	1 274 932	71 134 149	55.79
1921	1 313 205	70 945 458	54.02
1920	1 506 195	68 457 102	45.45
1919	1 649 762	75 275 107	45.63
1918	1 812 457	76 615 230	42.27
1917	2 170 645	88 610 088	40.82
1916	1 646 508	70 775 450	42.99
1915	942 053	46 909 827	49.80
1914	1 203 056	55 835 421	46.41
1913	1 141 006	50 578 980	44.33
1912	972 931	47 083 056	48.39
1911	906 488	45 088 268	49.74
1910	988 461	47 012 235	47.56

Note (a) Accounts are by fiscal years (July 1 to June 30) until the year 1915; after that by calendar years.

Note (b) # El Paso and Southwestern and Arizona Eastern were taken over for operation by S.P.Co. on Nov. 1 and Nov. 8, 1924, respectively, and operations are included in above figures from those dates.

SOURCE: Schedule 931 "Statistics of Rail-Line Operations-Within the State," or corresponding schedules, of Annual Reports to the Corporation Commission of the State of Arizona.

3125

Defendant s Exhibit No. 150 (Witness Masson) RIZONA
Jan. 8, 1941

(NEVADA) DEFTS. EX. NO (WITNESS

SOUTHERN PACIFIC COMPANY - Pacific Lines

STATISTICS OF RAIL-LINE OPERATIONS-WITHIN THE STATE OF NEVADA
(Main Line and Branches, Excluding Mixed Service)

Years 1910 to 1939 Inclusive

FREIGHT TRAINS

Year (1)	Train Miles (2)	Car Miles (Excluding Caboose) (3)	Average Cars per Train (4)
1939	1 813 925	142 327 056	78.46
1938	1 646 649	129 709 470	78.77
1937	2 007 305	149 400 978	74.43
1936	1 929 183	142 818 837	74.03
1935	1 466 885	120 280 978	82.00
1934	1 374 001	119 079 421	86.67
1933	1 237 393	102 338 096	82.70
1932	1 334 358	108 161 667	81.06
1931	1 497 251	120 299 426	80.35
1930	1 864 976	143 939 779	77.18
1929	2 123 781	146 350 208	68.91
1928	2 223 599	152 394 383	68.54
1927	1 959 584	135 534 789	69.17
1926	1 898 656	125 524 044	66.11
1925	2 080 001	122 919 215	59.10
1924	1 897 095	103 134 216	54.36
1923	2 201 378	109 235 378	49.62
1922	1 745 294	85 384 163	48.92
1921	1 779 334	88 379 549	49.67
1920	2 236 332	96 443 543	43.13
1919	1 881 638	83 344 069	44.29
1918	1 963 540	82 705 178	42.12
1917	2 126 197	87 328 222	41.07
1916	1 935 643	79 931 080	41.29
1915	1 280 677	55 470 815	43.31
1914	1 245 621	51 639 424	41.46
1913	1 366 296	56 360 400	41.25
1912	1 269 065	51 498 251	40.58
1911	1 157 283	51 057 521	44.12
1910	1 344 094	59 460 520	44.24

FREIGHT TRAINS

Year (1)	Train Miles (2)	Car Miles (Excluding Caboose) (3)	Average Cars per Train (4)
1939	1 813 925	142 327 056	78.46
1938	1 646 649	129 709 470	78.77
1937	2 007 305	149 400 978	74.43
1936	1 929 183	142 818 837	74.03
1935	1 466 885	120 280 978	82.00
1934	1 374 001	119 079 421	86.67
1933	1 237 393	102 338 096	82.70
1932	1 334 358	108 161 667	81.06
1931	1 497 251	120 299 426	80.35
1930	1 864 976	143 939 779	77.18
1929	2 123 781	146 350 208	68.91
1928	2 223 599	152 394 383	68.54
1927	1 959 584	135 534 789	69.17
1926	1 898 656	125 524 044	66.11
1925	2 080 001	122 919 215	59.10
1924	1 897 095	103 134 216	54.36
1923	2 201 378	109 235 378	49.62
1922	1 745 294	85 384 163	48.92
1921	1 779 334	88 379 549	49.67
1920	2 236 332	96 443 543	43.13
1919	1 881 638	83 344 069	44.29
1918	1 963 540	82 705 178	42.12
1917	2 126 197	87 328 222	41.07
1916	1 935 643	79 931 080	41.29
1915	1 280 677	55 470 815	43.31
1914	1 245 621	51 639 424	41.46
1913	1 366 296	56 360 400	41.25
1912	1 269 065	51 498 251	40.58
1911	1 157 283	51 057 521	44.12
1910	1 344 094	59 460 520	44.24

Note: Accounts are by fiscal years, (July 1 to June 30) until the year 1915; after that by calendar years.

SOURCE: Schedule 931 "Statistics of Rail-Line Operations - Within the State," or corresponding schedules, of annual reports to the Public Service Commission of the State of Nevada.

30926

Defendant's Exhibit No. 151 (Witness Masson)
Jan. 8, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

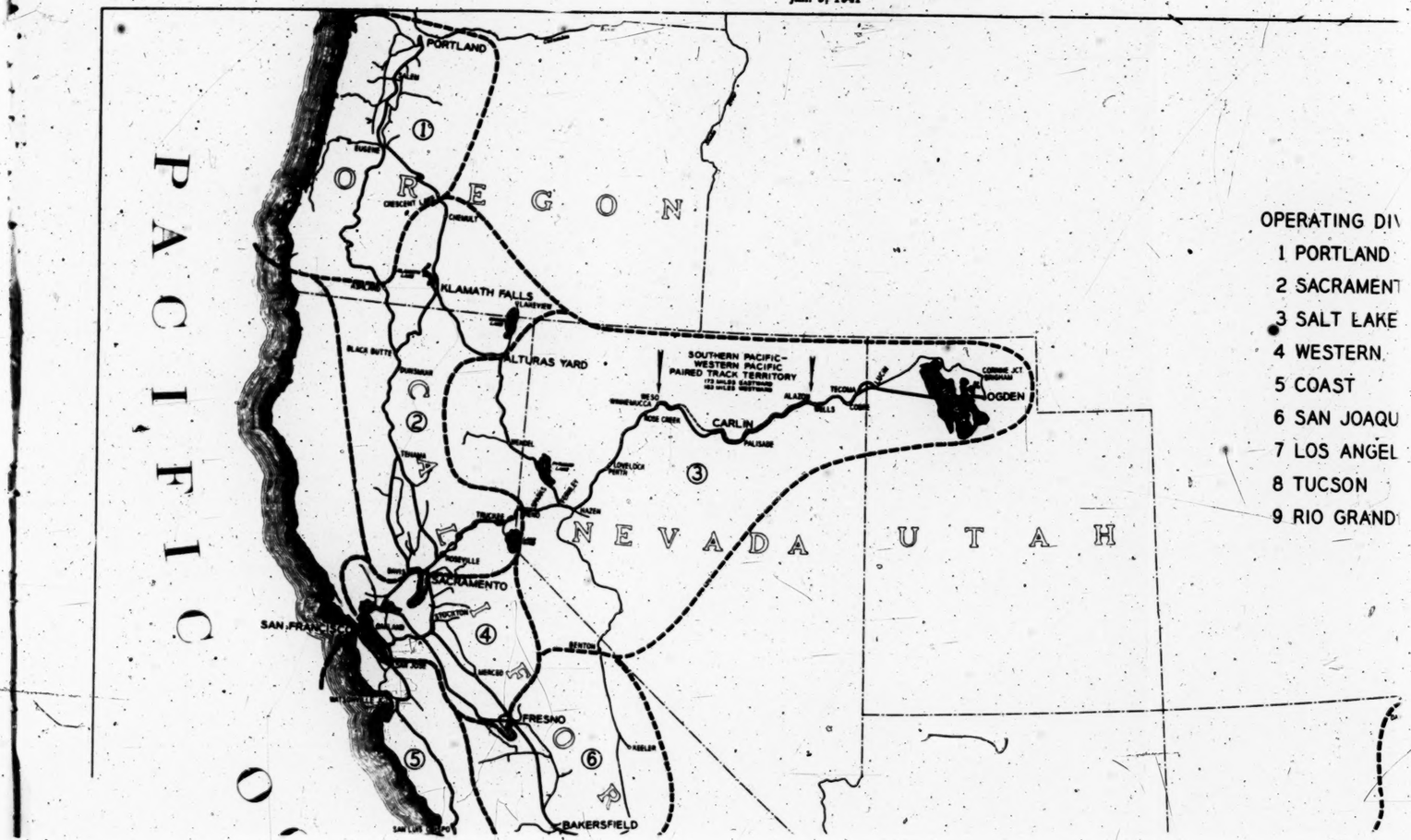
FREIGHT OPERATING AND FREIGHT TRANSPORTATION EXPENSES RELATED TO TRAFFIC

Calendar Years 1922 to 1939, Inclusive

Year (1)	Revenue ton miles (In freight and mixed trains) (2)	Freight operating expenses (3)	Freight transportation expenses (4)	Averages Per 1,000 Revenue Ton-Miles	
				Freight operating expenses (5)	Freight transportation expenses (6)
1939	11 853 110 963	$83 589 167	$45 261 151	$7.05	$3.82
1938	10 408 603 754	79 542 999	43 366 424	7.64	4.17
1937	12 370 345 376	89 128 717	50 699 879	7.21	4.10
1936	11 258 900 898	75 661 220	41 877 105	6.72	3.72
1935	8 458 433 079	60 625 182	32 966 633	7.17	3.90
1934	7 632 038 126	54 010 818	28 040 514	7.08	3.67
1933	6 137 639 518	47 638 131	24 239 727	7.76	3.95
1932	6 159 540 049	52 072 529	26 761 104	8.45	4.34
1931	8 035 935 667	68 991 042	35 554 421	8.59	4.42
1930	10 051 100 584	88 228 861	44 185 306	8.78	4.40
1929	12 098 051 653	103 995 607	52 042 071	8.60	4.30
1928	11 679 441 111	101 300 502	51 437 710	8.67	4.40
1927	11 133 712 019	99 208 484	49 635 048	8.91	4.46
1926	10 971 917 871	96 665 177	47 987 769	8.81	4.37
1925	10 569 416 545	98 948 735	51 760 446	9.36	4.90
1924	9 156 815 341	89 027 810	45 279 056	9.72	4.94
1923	9 176 701 177	90 638 996	44 918 140	9.88	4.89
1922	7 513 884 076	83 414 940	41 116 428	11.10	5.47
Total 1936 - 1939	45 890 960 991	327 922 103	181 204 559	7.15	3.95
Total 1922 - 1925	36 416 817 139	362 030 481	183 074 070	9.94	5.03
Percent of improvement 4 years 1936 - 1939 compared with 4 years 1922 - 1925				28.1	21.5

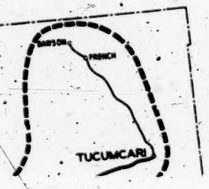
SOURCE: Revenue ton-miles - Schedule 531 "Statistics of Rail-Line Operations" of Annual Reports to Interstate Commerce Commission. Freight operating and transportation expenses - Accounting records of the Company to and including year 1935; thereafter schedule 320 "Railway Operating Expenses" of Annual Reports to Interstate Commerce Commission.

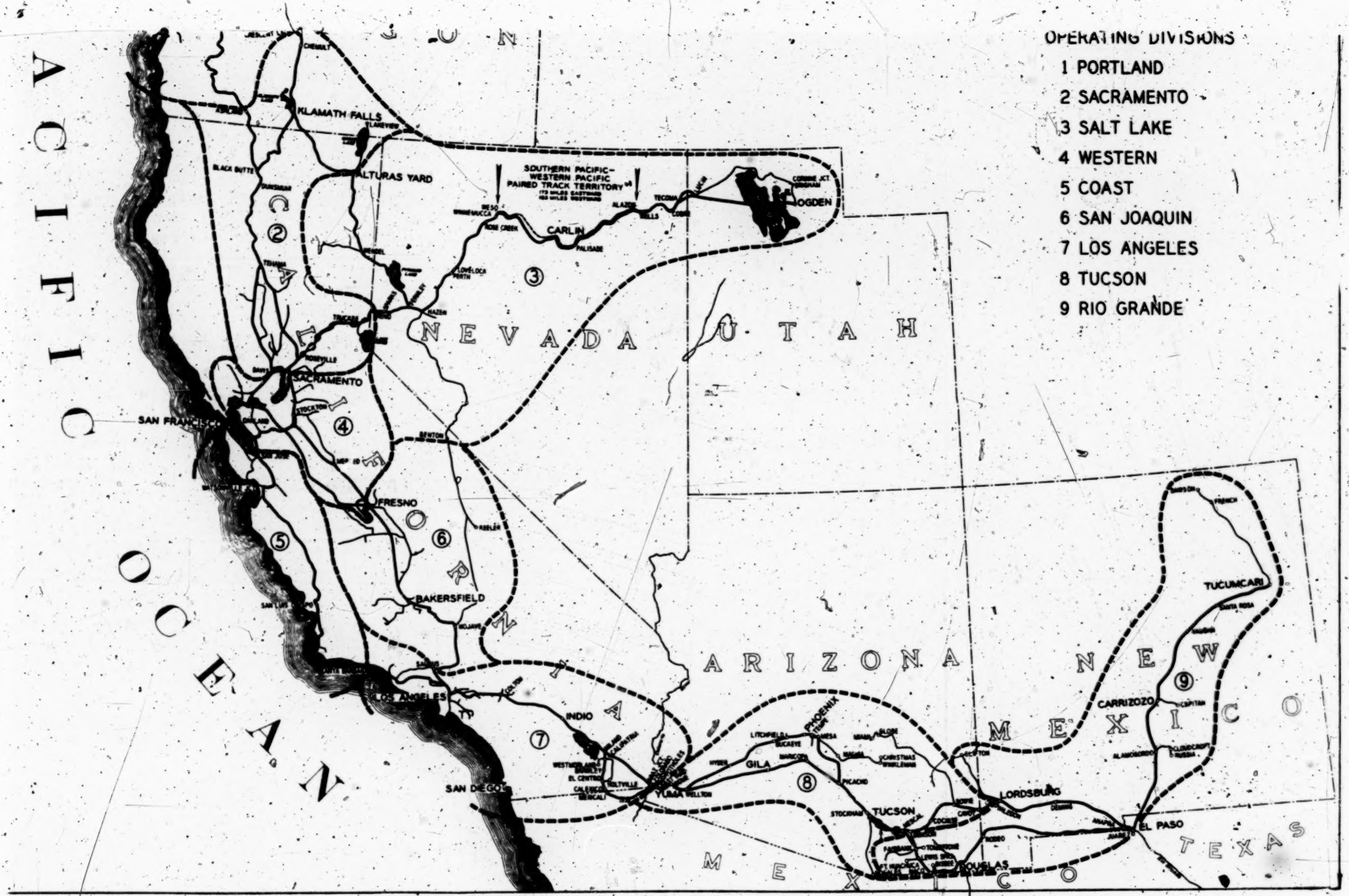
Defendant's Exhibit No. 154 (Witness Kirkbride)
Jan. 9, 1941



OPERATING DI\
1 PORTLAND
2 SACRAMENT
3 SALT LAKE
4 WESTERN
5 COAST
6 SAN JOAQU
7 LOS ANGEL
8 TUCSON
9 RIO GRAND

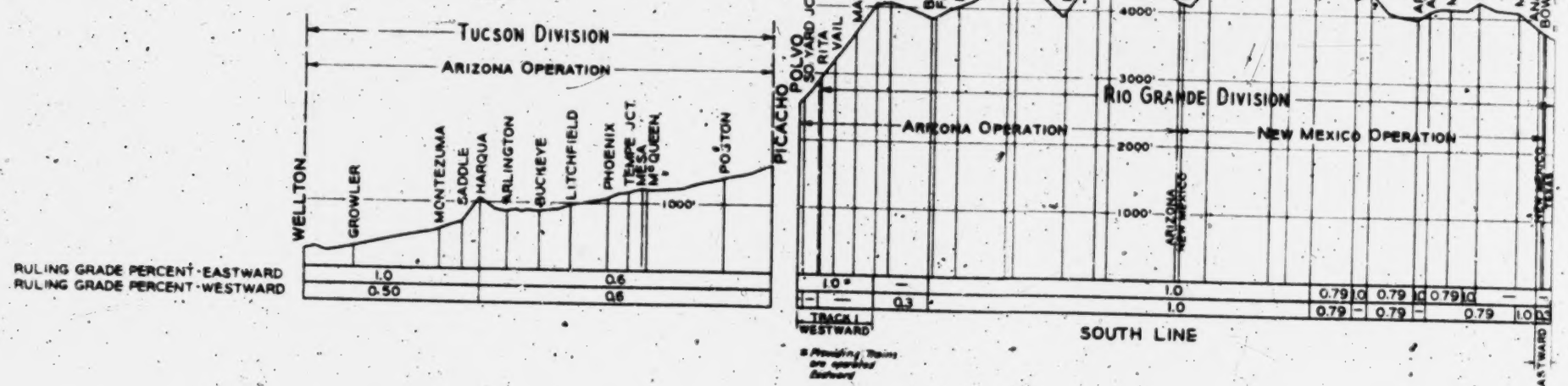
OPERATING DIVISIONS
1 PORTLAND
2 SACRAMENTO
3 SALT LAKE
4 WESTERN
5 COAST
6 SAN JOAQUIN
7 LOS ANGELES
8 TUCSON
9 RIO GRANDE

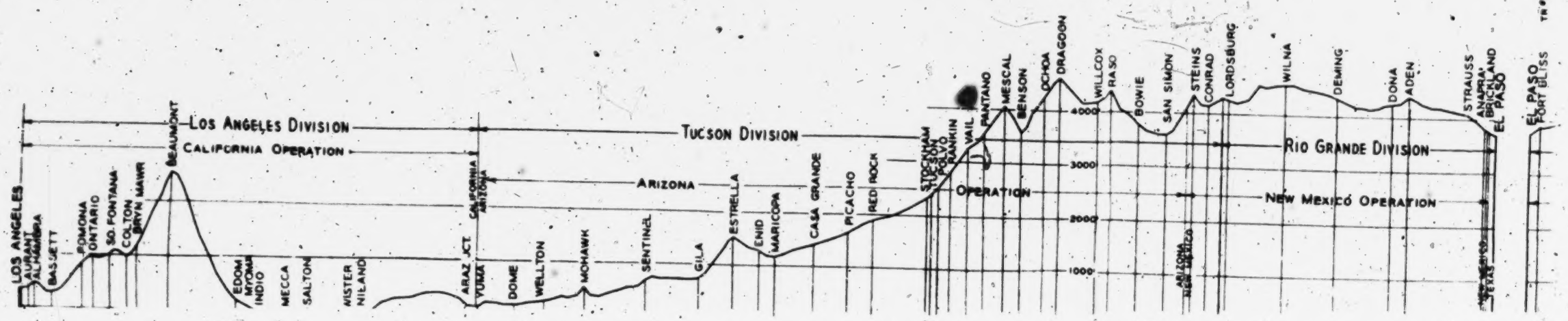



OPERATING DIVISIONS
1 PORTLAND
2 SACRAMENTO
3 SALT LAKE
4 WESTERN
5 COAST
6 SAN JOAQUIN
7 LOS ANGELES
8 TUCSON
9 RIO GRANDE
PACIFIC OCEAN
OREGON
NEVADA
UTAH
ARIZONA
NEW MEXICO
TEXAS
MEXICO
KLAMATH FALLS
ALTURAS YARD
SOUTHERN PACIFIC–WESTERN PACIFIC PAIRED TRACK TERRITORY
CARLIN
OGDEN
SACRAMENTO
SAN FRANCISCO
FRESNO
BAKERSFIELD
LOS ANGELES
SAN DIEGO
INDIO
YUMA
PHOENIX
GILA
TUCSON
LORDSBURG
EL PASO
CARRIZOZO
TUCUMCARI
DOUGLAS

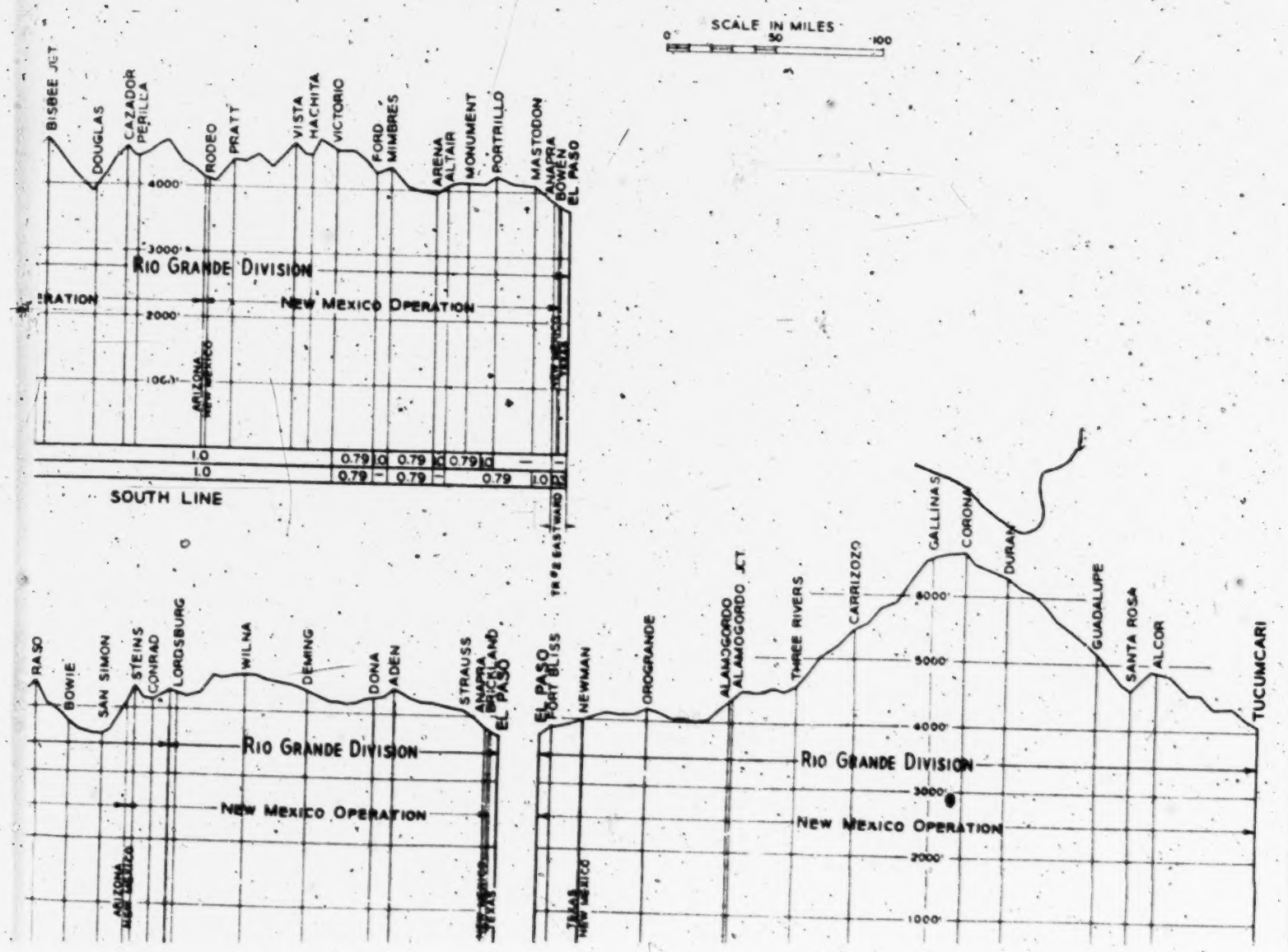
Defendant's Exhibit No. 155 (Witness Kirkbride)
Jan. 9, 1941

CONDEN





SOUTHERN PACIFIC COMPANY
CONDENSED PROFILES - EL PASO ROUTE



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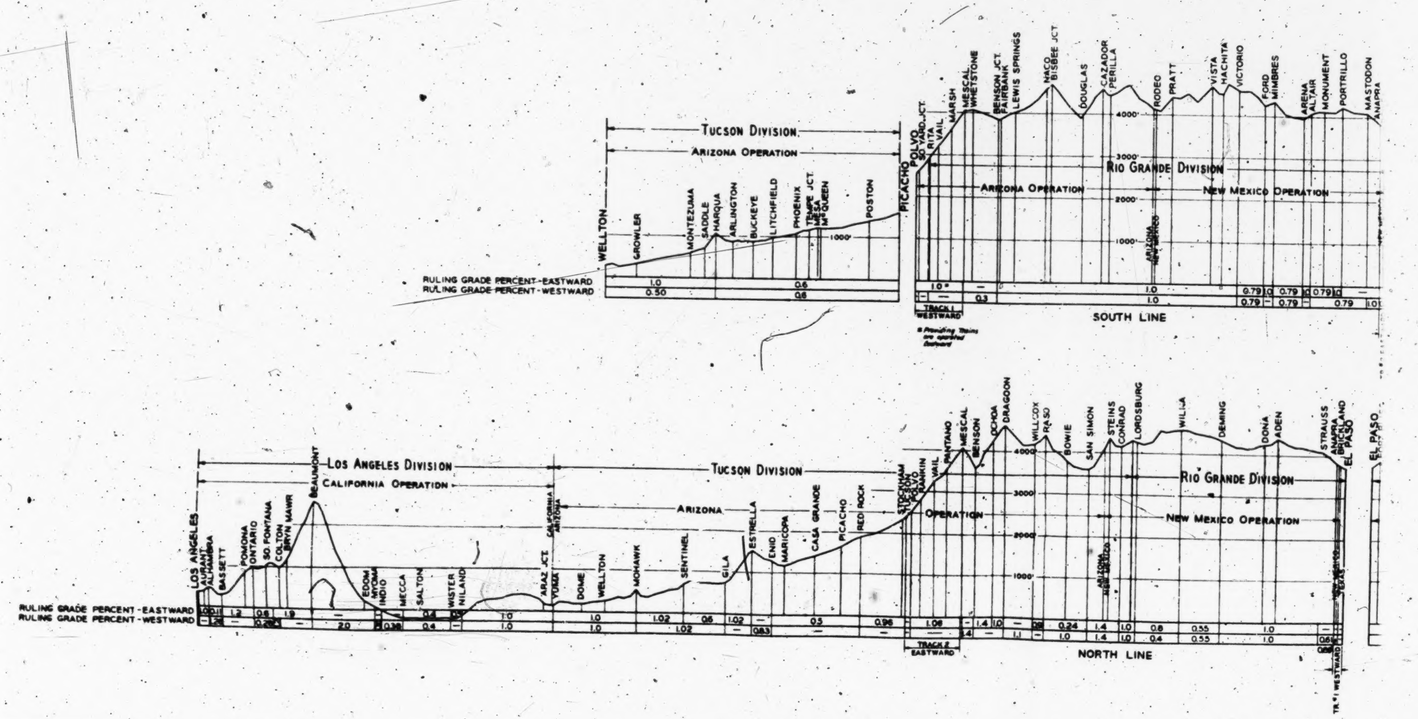
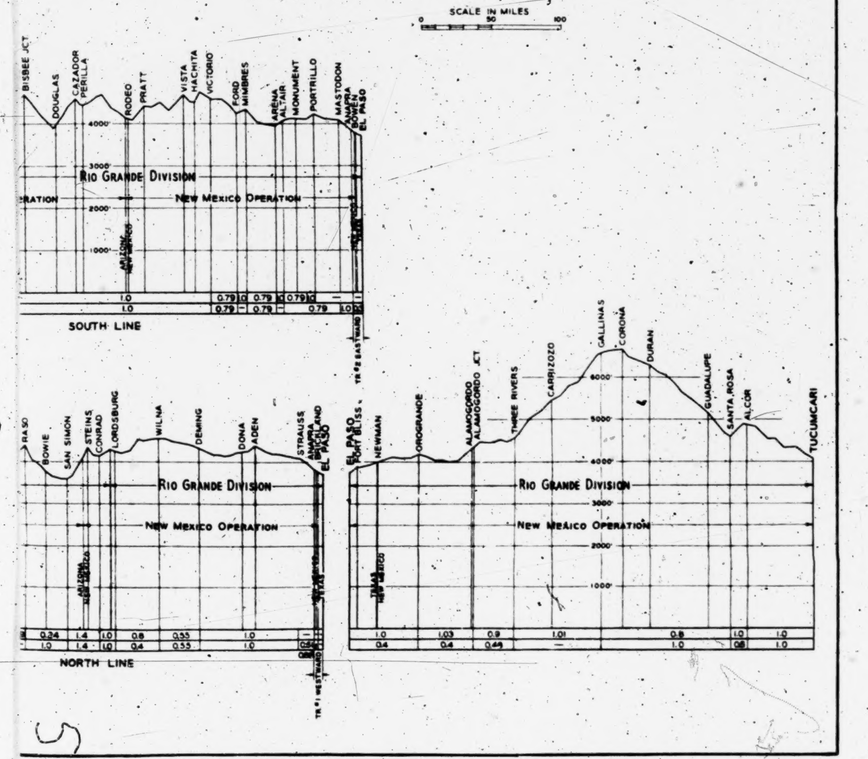


SOUTHERN PACIFIC COMPANY

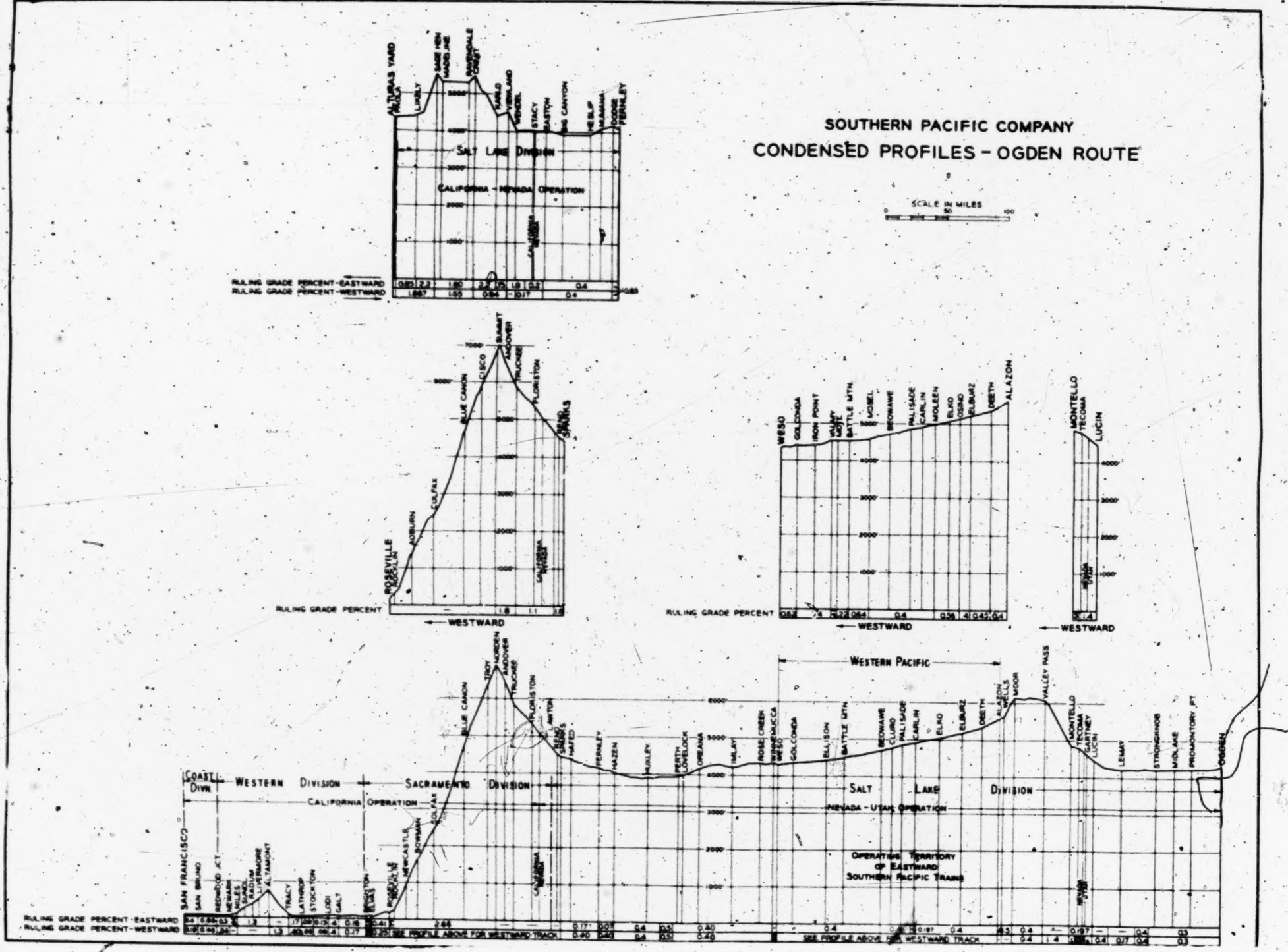
CONDENSED PROFILES - EL PASO ROUTE



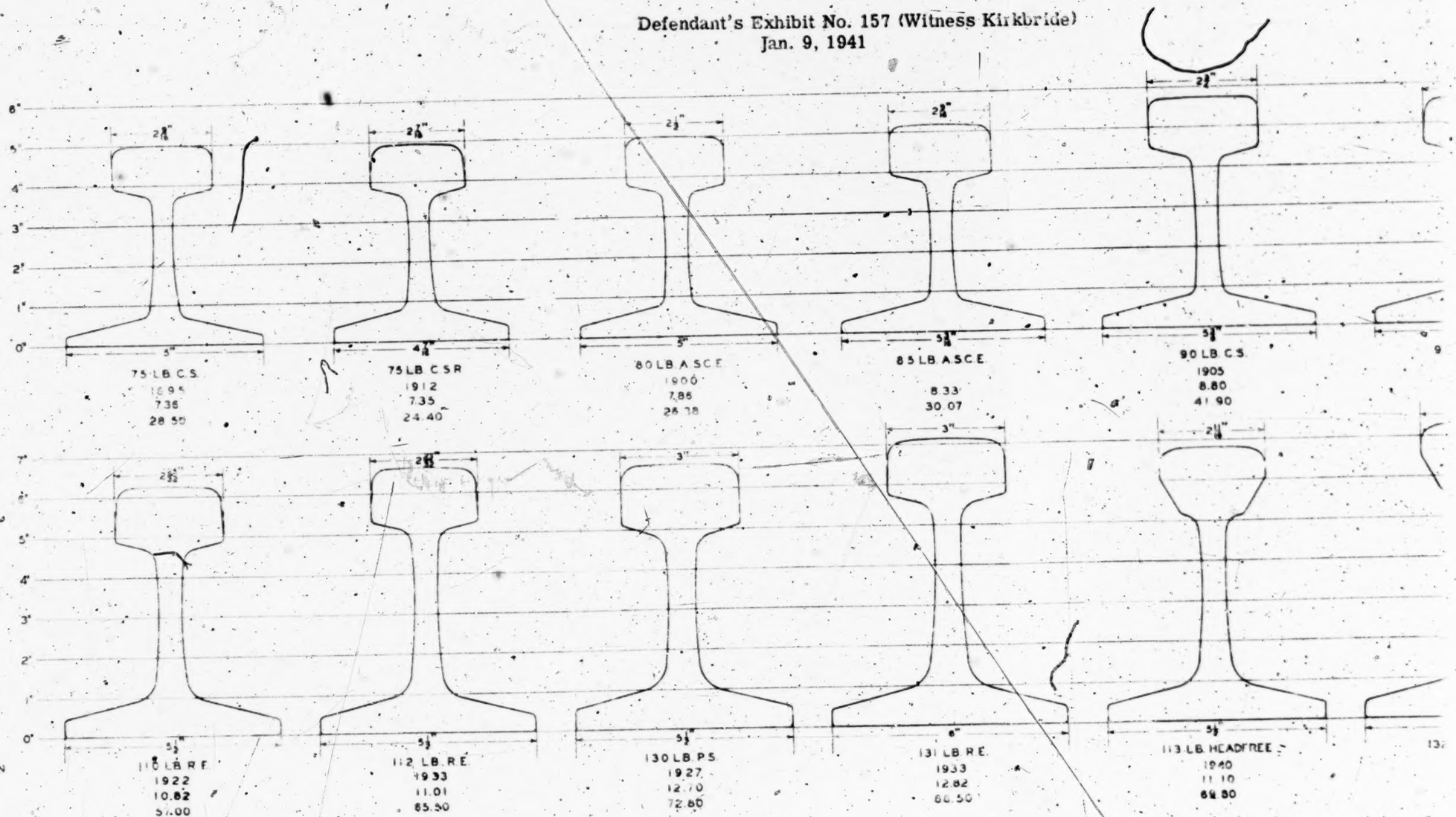
Defendant's Exhibit No. 156 (Witness Kirkbride)
Jan. 9, 1941

3030

SOUTHERN PACIFIC COMPANY
CONDENSED PROFILES - OGDEN ROUTE



Defendant's Exhibit No. 157 (Witness Kirkbride)
Jan. 9, 1941



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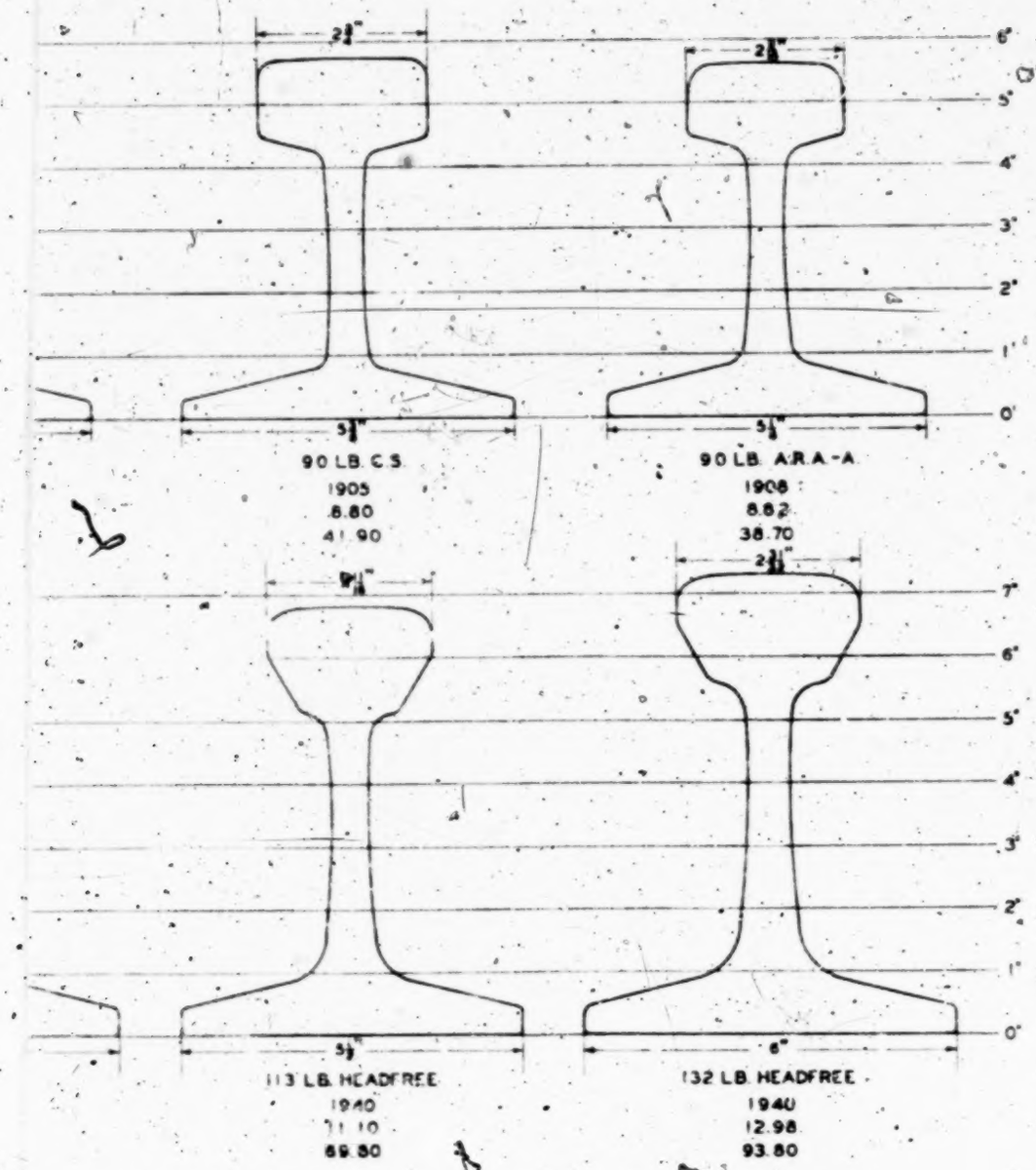
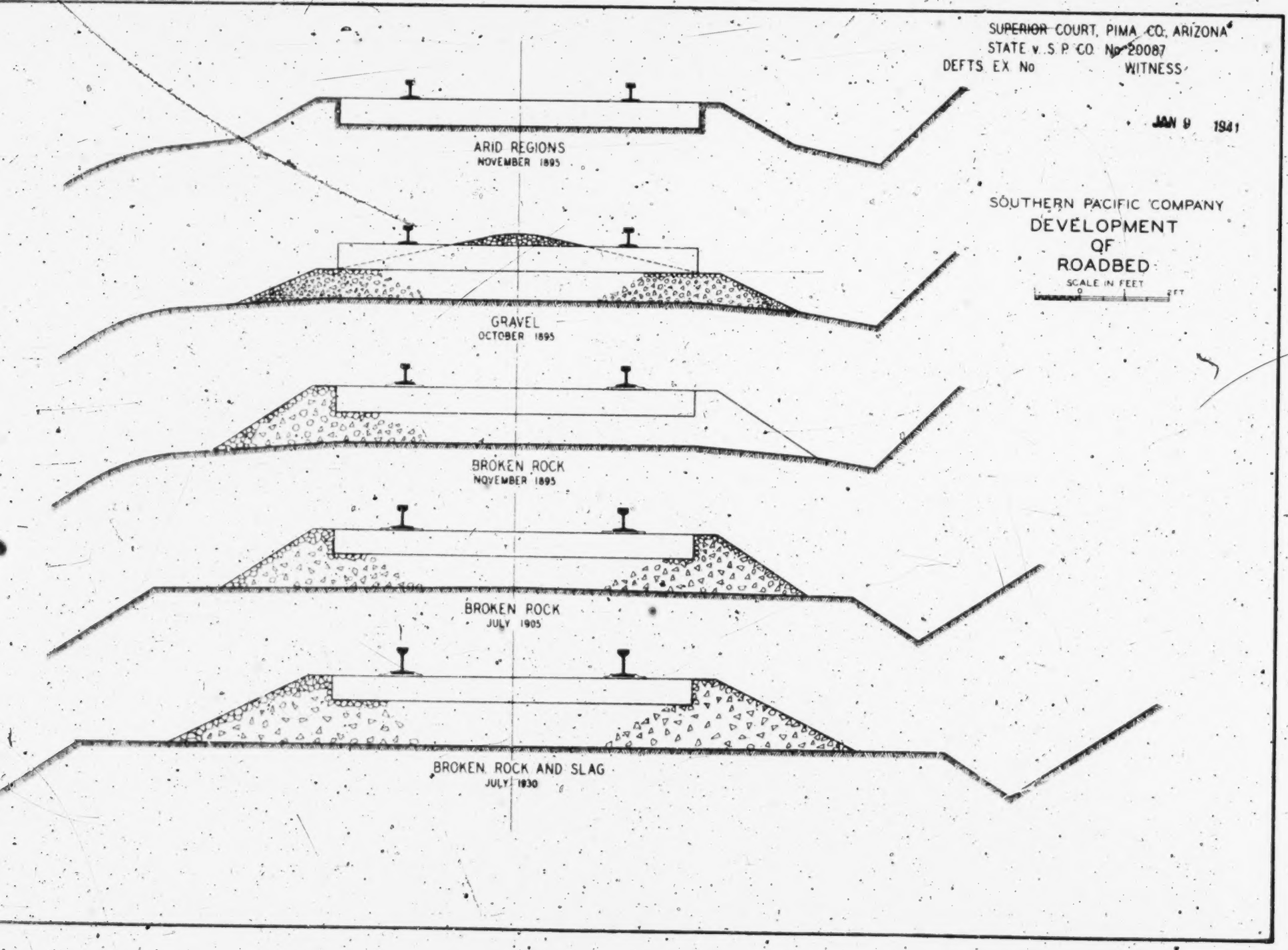
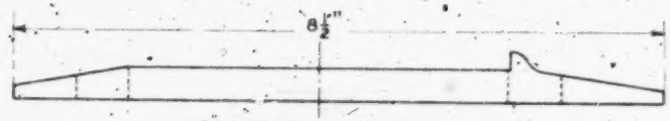


SOUTHERN PACIFIC COMPANY
DEVELOPMENT
OF
RAIL SECTIONS
SCALE IN INCHES

5496


SUPERIOR COURT, PIMA CO, ARIZONA
STATE v. S P CO No 20087
DEFTS EX No WITNESS
JAN 9 1941
ARID REGIONS
NOVEMBER 1895
GRAVEL
OCTOBER 1895
BROKEN ROCK
NOVEMBER 1895
BROKEN ROCK
JULY 1905
BROKEN ROCK AND SLAG
JULY 1930
SOUTHERN PACIFIC COMPANY
DEVELOPMENT
OF
ROADBED
SCALE IN FEET
0 1 2FT

Defendant's Exhibit No. 159 (Witness Kirkbride)
Jan. 9, 1941



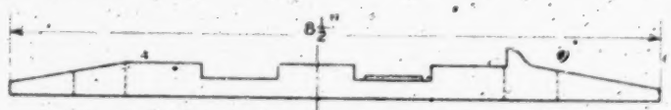
FOR 80 LB A.S.C.E. RAIL
DECEMBER 1904

SOUTHERN PACIFIC COMPANY

DEVELOPMENT
OF
TIE PLATES

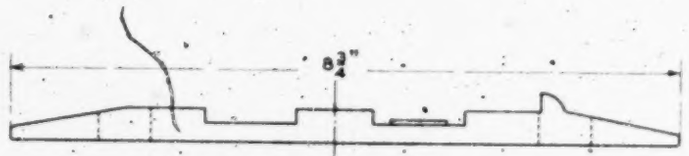
SCALE IN INCHES
0 1 2 3

68.0 SQUARE INCHES



FOR 75 LB C.S. RAIL AND 80 LB. A.S.C.E. RAIL
APRIL 1905

70.0 SQUARE INCHES



FOR 90 LB. A.R.A.-SERIES A RAIL
JUNE 1909

92.44 SQUARE INCHES

FOR 110 LB. R.E., 112 LB. R.E. & 130 LB. P.S. RAIL
FEBRUARY 1940

96.69 SQUARE INCHES

FOR 131 LB R.E. RAIL
FEBRUARY 1940

5498

Defendant's Exhibit No. 160 (Witness Masson)
Jan. 14, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

FREIGHT OPERATING AND FREIGHT TRANSPORTATION EXPENSES RELATED TO TRAFFIC
STATE OF ARIZONA

Calendar Years 1922 to 1939, Inclusive

Year (1)	Revenue ton miles (In freight and mixed trains) (2)	Freight operating expenses (3)	Freight transportation expenses (4)	Averages Per 1,000 Revenue Ton-Miles	
				Freight operating expenses (5)	Freight transportation expenses (6)
1939	1 644 505 311	$10 057 792	$4 857 224	$6.12	$2.95
1938	1 472 452 229	9 177 862	4 662 542	6.23	3.17
1937	1 754 996 923	10 255 938	5 313 529	5.84	3.03
1936	1 498 153 598	8 518 450	4 257 310	5.69	2.84
1935	1 220 154 252	7 054 875	3 339 898	5.78	2.74
1934	996 173 161	6 084 279	2 822 130	6.11	2.83
1933	842 065 194	5 637 707	2 484 325	6.70	2.95
1932	908 708 284	6 600 875	3 088 357	7.26	3.40
1931	1 229 378 736	8 940 554	4 101 752	7.27	3.34
1930	1 469 088 001	10 172 962	4 569 533	6.92	3.11
1929	1 913 514 518	12 318 389	5 658 008	6.44	2.96
[illegible]	1 654 424 296	11 662 989	5 251 933	7.05	3.17
1927	1 600 915 288	11 679 959	5 112 663	7.30	3.19
1926	1 559 555 098	11 790 975	4 990 685	7.56	3.20
1925	1 477 169 078	11 203 423	5 251 315	7.58	3.55
1924	1 146 609 847	8 025 217	3 507 746	7.00	3.06
1923	1 015 973 318	7 118 935	2 971 740	7.01	2.93
1922	831 758 490	6 852 595	2 682 895	8.24	3.23
Total 1936 - 1939	6 370 108 061	38 010 042	19 090 605	5.97	3.00
Total 1922 - 1925	4 471 510 733	33 200 170	14 413 696	7.42	3.22
Per cent of improvement 4 years 1936 - 1939 compared with 4 years 1922 - 1925				19.5	6.8

SOURCE: Schedule 931 and 720 or corresponding schedules of Annual Reports to Corporation Commission of the State of Arizona.

Defendant's Exhibit No. 161 (Witness Masson)
Jan. 14, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

FREIGHT OPERATING AND FREIGHT TRANSPORTATION EXPENSES RELATED TO TRAFFIC
STATE OF NEVADA

Calendar Years 1922 to 1939, Inclusive

Year (1)	Revenue ton miles (in freight and mixed trains) (2)	Freight operating expenses (3)	Freight transportation expenses (4)	Averages Per 1,000 Revenue Ton-Miles: Freight operating expenses (5)	Averages Per 1,000 Revenue Ton-Miles: Freight transportation expenses (6)
1939	1 893 645 006	$8 266 967	$4 476 327	$4.37	$2.36
1938	1 612 484 285	7 222 505	3 937 673	4.48	2.44
1937	1 884 781 340	8 217 668	4 674 530	4.36	2.48
1936	1 767 651 942	6 915 433	3 827 566	3.91	2.17
1935	1 414 220 333	5 747 267	3 125 236	4.06	2.21
1934	1 306 841 605	5 255 253	2 728 342	4.02	2.09
1933	1 123 565 456	4 521 006	2 300 350	4.02	2.05
1932	1 101 109 394	4 847 952	2 491 459	4.40	2.26
1931	1 354 780 129	6 340 277	3 267 451	4.68	2.41
1930	1 692 596 340	8 751 503	4 382 382	5.17	2.59
1929	1 863 369 519	10 069 896	5 040 335	5.40	2.70
1928	1 888 457 440	9 716 137	4 924 323	5.15	2.61
1927	1 704 132 295	8 802 544	4 395 465	5.17	2.58
1926	1 647 890 313	8 402 694	4 162 891	5.10	2.53
1925	1 624 558 217	8 996 100	4 697 247	5.54	2.89
1924	1 435 505 619	8 686 900	4 408 272	6.05	3.07
1923	1 459 812 538	9 269 467	4 583 080	6.35	3.14
1922	1 292 056 352	8 371 489	4 115 836	7.02	3.45
Total 1936-1939	7 158 562 573	30 622 573	16 916 096	4.28	2.36
Total 1922-1925	5 711 932 726	35 323 956	17 804 435	6.18	3.12
Percent of improvement 4 years 1936-1939 compared with 4 years 1922-1925				30.7	24.4

SOURCE: Schedule 931 and 720 or corresponding schedules of Annual Reports to Public Service Commission of the State of Nevada.

Defendant's Exhibit No. 162 (Witness Masson)
Jan. 14, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

FREIGHT SERVICE OPERATING AVERAGES

Calendar Years 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938 and 1939

Item	1922	1924	1926	1928	1930	1932	1934	1936	1938	1939	Percent Increase 1939 over 1922	Percent Increase 1939 over 1930
1. Miles of road operated in freight service	6 982	7 233	8 589	8 712	8 991	8 909	8 632	8 606	8 572	8 559	-	-
2. Freight train miles	13 113 601	15 264 876	18 337 924	19 454 353	16 873 073	12 350 930	13 082 480	17 370 115	16 006 251	17 193 709	-	-
3. Freight cars per freight train	43.4	46.6	48.7	50.1	52.5	49.5	52.7	51.8	53.0	54.6	25.8	4.0
4. Net tons per freight train	663	706	693	687	683	559	650	701	709	751	13.3	10.0
5. Average tractive power per locomotive (lbs.)	38 431	39 972	41 931	43 197	45 711	47 393	48 819	49 776	51 435	53 897	40.2	17.9
6. Average capacity per freight carrying car (tons)	46.2	46.8	47.2	47.4	47.5	47.5	47.4	47.7	48.0	47.6	3.0	.2
7. Freight train speed (m.p.h.)	10.9	11.1	12.0	12.8	13.9	15.7	16.0	16.0	16.5	16.7	53.2	20.1
8. Gross ton-miles per freight train-hour (excluding locomotives and tenders)	17 688	19 534	22 125	24 137	27 507	28 540	31 670	32 511	34 352	36 364	105.6	32.2
9. Net ton-miles per freight train-hour.	7 258	7 822	8 334	8 784	9 501	8 755	10 375	11 129	11 589	12 490	72.1	31.5
10. Gross ton-miles (exclusive of locomotives and tenders) per ton of fuel.	11 405	12 950	13 756	14 571	15 160	15 395	16 295	16 263	16 672	17 318	51.8	14.2

SOURCE: Items 1, 2, 3, 4, 7 and 8 - Reports of Freight Train Performance, Form OS-A, filed with Interstate Commerce Commission.

Item 5 - Total tractive effort ÷ total steam locomotives available for service at close of each year as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 6 - Aggregate capacity of all freight carrying cars ÷ total number of such cars available for service at close of year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Item 9 - Net ton miles ÷ train hours as reported on Form OS-A to Interstate Commerce Commission.

Item 10 - Gross ton miles (cars, contents and cabooses) - equated net tons of fuel consumed as reported to Interstate Commerce Commission in years 1922 to 1934, inclusive, on Form OS-A and as reported in years 1936, 1938 and 1939 on Forms OS-A and OS-E.

5501

Defendant's Exhibit No. 163 (Witness Masson)
Jan. 14, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

FREIGHT SERVICE OPERATING AVERAGES - TUCSON DIVISION

Calendar Years 1930, 1932, 1934, 1936, 1938 and 1939

No. (a)	Item (b)	1930 (c)	1932 (d)	1934 (e)	1936 (f)	1938 (g)	1939 (h)	Percent of Increase 1939 over 1930 (i)
1	Miles of line operated in freight service	977.35	977.34	959.73	955.73	955.73	955.73	-
2	Freight train miles	2 123 339	1 564 526	1 680 188	2 352 277	2 195 445	2 457 097	-
3	Freight cars per freight train	58.0	58.1	58.6	54.6	58.0	56.7	Dec. 2.2
4	Net tons per freight train	637	560	634	669	712	702	10.2
5	Average tractive power per locomotive (lbs.) .	50 671	49 660	50 564	52 535	55 690	56 568	11.6
6	Average capacity per freight carrying car (tons)	47.5	47.5	47.4	47.7	48.0	47.6	0.2
7	Freight train speed (m.p.h.)	16.6	17.1	19.2	18.3	18.8	20.2	21.7
8	Gross ton-miles per freight train-hour	35 087	35 730	41 499	39 026	42 801	45 026	28.3
9	Net ton-miles per freight train-hour	10 550	9 556	12 207	12 227	13 358	14 112	33.8
10	Gross ton-miles (exclusive of locomotives and tenders) per ton of fuel	17 081	17 476	18 321	17 997	18 263	18 590	8.8

URCE: Items 1, 2, 3, 4, 7, 8, 9, 10 - As stated, or computed from basic data shown, on Form 521; being a report of "Operating Statistics" issued monthly and annually by the Accounting Department of the Company in ordinary course of business.

Item 5 - Total tractive effort ÷ total steam locomotives assigned for service on division at close of each year.

Item 6 - Aggregate capacity of all freight carrying cars ÷ total number of such cars available for service at close of year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

5502

Defendant's Exhibit No. 164 (Witness Masson)
Jan. 14, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

FREIGHT SERVICE OPERATING AVERAGES - SALT LAKE DIVISION

Calendar Years 1930, 1932, 1934, 1936, 1938 and 1939

Item No. (a)	Item (b)	1930 (c)	1932 (d)	1934 (e)	1936 (f)	1938 (g)	1939 (h)	Percent of Increase 1939 over 1930 (i)
1	Miles of line operated in freight service	1 261.83	1 257.34	1 238.37	1 230.17	1 091.09	1 078.32	-
2	Freight train miles	2 560 519	1 864 231	1 897 770	2 467 794	2 081 677	2 288 572	-
3	Freight cars per freight train	72.0	73.4	79.7	72.9	77.2	79.8	10.8
4	Net tons per freight train	938	790	920	977	1 031	1 104	17.7
5	Average tractive power per locomotive (lbs.) .	46 062	49 564	53 603	55 162	60 650	62 423	35.5
6	Average capacity per freight carrying car (tons)	47.5	47.5	47.4	47.7	48.0	47.6	0.2
7	Freight train speed (m.p.h.)	17.5	19.2	20.4	21.3	21.1	21.2	21.1
8	Gross ton-miles per freight train-hour	48 559	51 780	60 563	62 185	65 710	68 873	41.8
9	Net ton-miles per freight train-hour	16 418	15 158	18 755	20 735	21 697	23 351	42.2
10	Gross ton-miles (exclusive of locomotives and tenders) per ton of fuel	23 898	23 535	25 154	25 214	26 514	27 566	15.3

SOURCE: Items 1, 2, 3, 4, 7, 8, 9, 10 - As stated, or computed from basic data shown on Form 521; being a report of "Operating Statistics" issued monthly and annually by the Accounting Department in the ordinary course of business.

Item 5 - Total tractive effort ÷ total steam locomotives assigned for service on division at close of each year.

Item 6 - Aggregate capacity of all freight carrying cars ÷ total number of such cars available for service at close of year, as reported in Schedule 417 of Annual Report to the Interstate Commerce Commission.

Defendant's Exhibit No. 165 (Witness Masson)
Jan. 14, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

AVERAGE FREIGHT REVENUE PER TRAIN MILE, CAR MILE, AND 1,000 REVENUE TON MILES
PACIFIC LINES COMPARED WITH STATES OF NEVADA AND ARIZONA, RESPECTIVELY

Calendar Years 1923 to 1939, Inclusive

Year (a)	(1) Freight Revenue Per Freight Service Train Mile			(2) Freight Revenue Per Loaded Freight Car Mile			(3) Revenue Per 1,000 Ton Miles of Freight		
	Pacific Lines (b)	State of Nevada (c)	State of Arizona (d)	Pacific Lines (e)	State of Nevada (f)	State of Arizona (g)	Pacific Lines (h)	State of Nevada (i)	State of Arizona (j)
1939	$7.46	$10.10	$7.17	$.220	$.204	$.223	$10.93	$9.68	$11.15
1938	7.17	9.67	7.19	.218	.198	.221	11.16	9.89	11.23
1937	6.86	8.90	6.93	.212	.189	.217	10.70	9.48	10.96
1936	6.92	9.06	6.82	.213	.195	.211	10.83	9.89	11.17
1935	6.62	9.06	6.67	.204	.189	.205	11.13	10.10	11.43
1934	6.54	9.11	6.44	.205	.189	.199	11.24	10.39	11.57
1933	6.32	8.85	6.37	.207	.188	.199	11.79	10.52	12.22
1932	6.30	8.51	6.36	.215	.193	.209	12.67	11.32	12.87
1931	7.44	9.26	7.11	.241	.203	.233	13.12	11.15	12.67
1930	8.16	9.61	7.78	.257	.207	.250	13.73	11.37	13.54
1929	8.31	9.05	8.32	.266	.209	.270	13.60	10.98	13.33
1928	8.18	8.91	7.97	.264	.209	.264	13.66	11.15	13.64
1927	8.22	9.19	7.74	.270	.213	.258	13.84	11.38	13.44
1926	8.28	9.23	7.79	.271	.211	.258	13.89	11.35	13.39
1925	8.18	8.47	8.26	.275	.220	.267	14.03	11.53	13.56
1924	8.51	8.56	9.18	.283	.230	.264	14.22	11.91	14.90
1923	8.39	8.33	9.28	.290	.238	.264	14.83	12.82	14.81

SOURCE: Items 1, 2 and 3: Annual Reports to Interstate Commerce Commission, Public Service Commission of Nevada, and Corporation Commission of Arizona:

Items 1 and 2, years 1923 to 1935 inclusive appear in schedule 531, entitled "Statistics of Rail Line Operations" of Annual Report to Interstate Commerce Commission and corresponding schedule of annual reports to respective states. Whereas such averages are not required in annual reports for years 1936 to 1939, they have been computed for purpose of this exhibit, from basic data reported in schedule above referred to.

Year (a)	(1) Freight Revenue Per Freight Service Train Mile			(2) Freight Revenue Per Loaded Freight Car Mile			(3) Revenue Per 1,000 Ton Miles of Freight		
	Pacific Lines (b)	State of Nevada (c)	State of Arizona (d)	Pacific Lines (e)	State of Nevada (f)	State of Arizona (g)	Pacific Lines (h)	State of Nevada (i)	State of Arizona (j)
1939	$7.46	$10.10	$7.17	$.220	$.204	$.223	$10.93	$9.68	$11.15
1938	7.17	9.67	7.19	.218	.198	.221	11.16	9.89	11.23
1937	6.86	8.90	6.93	.212	.189	.217	10.70	9.48	10.96
1936	6.92	9.06	6.82	.213	.195	.211	10.83	9.89	11.17
1935	6.62	9.06	6.67	.204	.189	.205	11.13	10.10	11.43
1934	6.54	9.11	6.44	.205	.189	.199	11.24	10.39	11.57
1933	6.32	8.85	6.37	.207	.188	.199	11.79	10.52	12.22
1932	6.30	8.51	6.36	.215	.193	.209	12.67	11.32	12.87
1931	7.44	9.26	7.11	.241	.203	.233	13.12	11.15	12.67
1930	8.16	9.61	7.78	.257	.207	.250	13.73	11.37	13.54
1929	8.31	9.05	8.32	.266	.209	.270	13.60	10.98	13.33
1928	8.18	8.91	7.97	.264	.209	.264	13.66	11.15	13.64
1927	8.22	9.19	7.74	.270	.213	.258	13.84	11.38	13.44
1926	8.28	9.23	7.79	.271	.211	.258	13.89	11.35	13.39
1925	8.18	8.47	8.26	.275	.220	.267	14.03	11.53	13.56
1924	8.51	8.56	9.18	.283	.230	.264	14.22	11.91	14.90
1923	8.39	8.33	9.28	.290	.238	.264	14.83	12.82	14.81

SOURCE: Items 1, 2 and 3: Annual Reports to Interstate Commerce Commission, Public Service Commission of Nevada, and Corporation Commission of Arizona:

Items 1 and 2, years 1923 to 1935 inclusive appear in schedule 531, entitled "Statistics of Rail Line Operations" of Annual Report to Interstate Commerce Commission and corresponding schedule of annual reports to respective states. Whereas such averages are not required in annual reports for years 1936 to 1939, they have been computed for purpose of this exhibit, from basic data reported in schedule above referred to.

Item 3 represents the revenue per ton per mile reported in schedule 531 of Interstate Commerce Commission report, and corresponding schedule of state reports, multiplied by 1,000.

30339

Defendant's Exhibit No. 166 (Witness Masson)
Jan. 14, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

REVENUE FREIGHT CARRIED BY PACIFIC LINES

YEAR 1939

Class No. (a)	Commodity group or class (b)	Cars Originating on Line		Cars Received from Connecting		Total cars carried (g)
		Terminating on line (c)	Delivered to connections (d)	Terminating on line (e)	Delivered connections (f)	
110	Oranges and grapefruit	2 365	20 725	655	7 253	30 998
111	Lemons, limes and citrus fruits, n.o.s.	598	7 651	188	4 579	13 016
120	Apples, fresh	1 391	38	1 220	716	3 365
121	Bananas	1 751	543	976	620	3 890
122	Berries, fresh	21	62	3	10	96
123	Cantaloupes and melons, n.o.s.	324	12 811	28	1 069	14 232
124	Grapes, fresh	1 074	14 487	161	1 621	17 343
125	Peaches, fresh	2 793	1 811	614	53	5 271
126	Watermelons	1 339	1 276	140	14	2 769
127	Fruits, fresh, domestic, n.o.s.	3 344	8 295	1 074	959	13 672
128	Fruits, fresh, tropical, n.o.s.	3	155	5	69	232
130	Potatoes, other than sweet	5 172	3 990	1 398	1 123	11 683
140	Cabbage	62	825	23	127	1 037
141	Onions	1 099	761	67	141	2 068
142	Tomatoes	140	2 394	357	1 280	4 171
143	Vegetables, fresh, n.o.s.	1 773	74 206	543	9 071	85 593
	Total perishable products of agriculture - Classes 110 to 143, inclusive	23 249	150 030	7 452	28 705	209 436
800	Total products of agriculture	93 439	168 324	27 157	32 532	321 452
850	Grand total, carload traffic	532 503	312 867	206 086	74 170	1 125 626

SOURCE: Schedule 541, Report to Interstate Commerce Commission for year 1939.

Defendant's Exhibit No. 167 (Witness Masson)
Jan. 14, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

REVENUE FREIGHT CARRIED WITHIN THE STATE OF ARIZONA

YEAR 1939

Class No. (a)	Commodity group or class (b)	Cars Originating on Line Within the State (c)	All Other Cars Handled on Line Within the State (d)	Total Cars Handled on Line Within the State (e)	Cars Terminating on Line Within the State (f)
110	Oranges and grapefruit	1 189	17 427	18 616	7
111	Lemons, limes and citrus fruits, n.o.s.	3	9 210	9 213	2
120	Apples, fresh	-	342	342	102
121	Bananas	-	297	297	272
122	Berries, fresh	4	-	4	-
123	Cantaloupes and melons, n.o.s.	2 290	9 095	11 385	-
124	Grapes, fresh	3	1 683	1 686	14
125	Peaches, fresh	-	83	83	15
126	Watermelons	-	152	152	11
127	Fruits, fresh, domestic, n.o.s.	1	349	350	6
128	Fruits, fresh, tropical, n.o.s.	1	63	64	2
130	Potatoes, other than sweet	15	1 758	1 773	196
140	Cabbage	97	562	659	-
141	Onions	-	334	334	4
142	Tomatoes	-	2 456	2 456	49
143	Vegetables, fresh, n.o.s.	9 103	32 141	41 244	150
	Total perishable products of agriculture - Classes 110 to 143, inclusive	12 706	75 952	88 658	785
300	Total products of agriculture	20 767	83 972	104 739	5 803
850	Grand total, carload traffic	59 666	202 089	261 755	87 742

EXPLANATIONS: Column (c) includes all cars originated at point on Pacific Lines within the State and moved to points in or out of the State located on Pacific Lines or foreign lines.

Column (d) includes:

1. Cars originated outside the State on Pacific Lines or foreign lines and moved via Pacific Lines to points on Pacific Lines or foreign lines within the State; also, cars originated outside the State and moved via Pacific Lines through the State.
2. Cars originated on foreign lines within the State and moved via Pacific Lines to points within the State located on Pacific Lines or a foreign line; also, moved via Pacific Lines to points outside the State.

Column (e) is the total of Columns (c) and (d) and represents all cars handled by Pacific Lines within State of Arizona.

Column (f) includes all cars originated within or outside the State moved to points on Pacific Lines located within the State. These cars are included in either Columns (c) or (d).

SOURCE: Schedule 941, Annual Report to the Corporation Commission of the State of Arizona.

5506

Defendant's Exhibit No. 168 (Witness Masson)
Jan. 14, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

REVENUE FREIGHT CARRIED WITHIN THE STATE OF NEW MEXICO

YEAR 1939

Class No. (a)	Commodity group or class (b)	Cars Originating on Line Within the State (c)	All Other Cars Handled on Line Within the State (d)	Total Cars Handled on Line Within the State (e)	Cars Terminating on Line Within the State (f)
110	Oranges and grapefruit	-	17 691	17 691	3
111	Lemons, limes and citrus fruits, n.o.s.	-	9 210	9 210	-
120	Apples, fresh	-	299	299	3
121	Bananas	-	767	767	1
122	Berries, fresh	-	5	5	-
123	Cantaloupes and melons, n.o.s.	-	11 384	11 384	-
124	Grapes, fresh	-	1 671	1 671	-
125	Peaches, fresh	-	70	70	-
126	Watermelons	-	125	125	2
127	Fruits, fresh, domestic, n.o.s.	-	349	349	-
128	Fruits, fresh, tropical, n.o.s.	-	64	64	-
130	Potatoes, other than sweet	-	1 664	1 664	5
140	Cabbage	-	640	640	-
141	Onions	-	336	336	-
142	Tomatoes	-	1 999	1 999	-
143	Vegetables, fresh, n.o.s.	-	40 852	40 852	-
	Total perishable products of agriculture - Classes 110 to 143, inclusive	-	87 126	87 126	14
800	Total products of agriculture	86	96 164	96 250	280
850	Grand total, carload traffic	9 991	180 837	190 828	7 801

EXPLANATIONS: Column (c) includes all cars originated at point on Pacific Lines within the State and moved to points in or out of the State located on Pacific Lines or foreign lines.

Column (d) includes:

1. Cars originated outside the State on Pacific Lines or foreign lines and moved via Pacific Lines to points on Pacific Lines or foreign lines within the State; also, cars originated outside the State and moved via Pacific Lines through the State.
2. Cars originated on foreign lines within the State and moved via Pacific Lines to points within the State located on Pacific Lines or a foreign line; also, moved via Pacific Lines to points outside the State.

Column (e) is the total of Columns (c) and (d) and represents all cars handled by Pacific Lines within State of New Mexico.

Column (f) includes all cars originated within or outside the State moved to points on Pacific Lines located within the State. These cars are included in either Columns (c) or (d).

SOURCE: Schedule 941, Annual Report to Corporation Commission of the State of New Mexico for year 1939.

5507

Defendant's Exhibit No. 169 (Witness Masson)
Jan. 14, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

REVENUE FREIGHT CARRIED WITHIN THE STATE OF NEVADA

YEAR 1939

Class No. (a)	Commodity group or class (b)	Cars Originating on Line Within the State (c)	All Other Cars Handled on Line Within the State (d)	Total Cars Handled on Line Within the State (e)	Cars Terminating on Line Within the State (f)
110	Oranges and grapefruit	-	4 901	4 901	20
111	Lemons, limes and citrus fruits, n.o.s.	-	290	290	-
120	Apples, fresh	-	367	367	12
121	Bananas	-	144	144	48
122	Berries, fresh	-	8	8	-
123	Cantaloupes and melons, n.o.s.	-	2 000	2 000	4
124	Grapes, fresh	-	12 876	12 876	3
125	Peaches, fresh	-	1 573	1 573	3
126	Watermelons	-	210	210	4
127	Fruits, fresh, domestic, n.o.s.	-	8 531	8 531	-
128	Fruits, fresh, tropical, n.o.s.	-	136	136	-
130	Potatoes, other than sweet	29	2 407	2 436	8
140	Cabbage	-	22	22	-
141	Onions	29	224	253	2
142	Tomatoes	-	1 316	1 316	2
143	Vegetables, fresh, n.o.s.	-	35 865	35 865	4
	Total perishable products of agriculture - Classes 110 to 143, inclusive	58	70 870	70 928	110
800	Total products of agriculture	750	81 852	82 602	412
830	Grand total, carload traffic	5 351	196 146	201 497	14 208

EXPLANATIONS: Column (c) includes all cars originated at point on Pacific Lines within the State and moved to points in or out of the State located on Pacific Lines or foreign lines.

Column (d) includes:

1. Cars originated outside the State on Pacific Lines or foreign lines and moved via Pacific Lines to points on Pacific Lines or foreign lines within the State; also, cars originated outside the State and moved via Pacific Lines through the State.
2. Cars originated on foreign lines within the State and moved via Pacific Lines to points within the State located on Pacific Lines or a foreign line; also, moved via Pacific Lines to points outside the State.

Column (e) is the total of Columns (c) and (d) and represents all cars handled by Pacific Lines within State of Nevada.

Column (f) includes all cars originated within or outside the State moved to points on Pacific Lines located within the State. These cars are included in either Columns (c) or (d).

5508

SOURCE: Schedule 941, Annual Report to Public Service Commission of the State of Nevada for year 1939.

Defendant's Exhibit No. 170 (Witness Masson)
Jan. 14, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

SEGREGATION OF FREIGHT CAR MILES IN STATES OF NEVADA AND ARIZONA AND FOR PACIFIC LINES AS A WHOLE

YEAR 1939

Item No. (a)	Cars Owned by (b)	Nevada		Arizona		Pacific Lines	
		Car Miles (c)	% (d)	Car Miles (e)	% (f)	Car Miles (g)	% (h)
1	Foreign Lines * .	47 106 368	33.3	32 344 092	23.2	261 394 696	27.8
2	Pacific Fruit Express Company	63 207 455	44.8	68 810 287	49.2	323 879 987	34.5
3	Other Private Car Lines	10 691 815	7.6	10 902 590	7.8	65 408 010	7.0
4	Pacific Lines ...	20 211 135	14.3	27 708 192	19.8	289 052 871	30.7
5	Total	141 216 773	100.0	139 765 161	100.0	939 735 564	100.0

* Includes cars owned by Texas and New Orleans Railroad Company and other separately operated companies solely controlled by Southern Pacific Company.

SOURCE: Segregation per items 1 to 4 inclusive, developed from records of the Company.
Totals (item 5, columns (c), (e), and (g)) agree with the sum of lines 40 and 41, column (d) in schedule of annual reports for 1939, as follows:

Column (c) - Schedule 931. Annual Report, Public Service Commission

SEGREGATION OF FREIGHT CAR MILES IN STATES OF NEVADA AND ARIZONA
AND FOR PACIFIC LINES AS A WHOLE

YEAR 1939

Item No. (a)	Cars Owned by (b)	Nevada		Arizona		Pacific Lines	
		Car Miles (c)	% (d)	Car Miles (e)	% (f)	Car Miles (g)	% (h)
1	Foreign Lines * .	47 106 368	33.3	32 344 092	23.2	261 394 696	27.8
2	Pacific Fruit Express Company	63 207 455	44.8	68 810 287	49.2	323 879 987	34.5
3	Other Private Car Lines	10 691 815	7.6	10 902 590	7.8	65 408 010	7.0
4	Pacific Lines ...	20 211 135	14.3	27 708 192	19.8	289 052 871	30.7
5	Total	141 216 773	100.0	139 765 161	100.0	939 735 564	100.0

* Includes cars owned by Texas and New Orleans Railroad Company and other separately operated companies solely controlled by Southern Pacific Company.

SOURCE: Segregation per items 1 to 4 inclusive, developed from records of the Company.
Totals (item 5, columns (c), (e), and (g)) agree with the sum of lines 40 and 41, column (d) in schedule of annual reports for 1939, as follows:

Column (c) - Schedule 931, Annual Report, Public Service Commission of Nevada.
Column (e) - Schedule 931, Annual Report, Corporation Commission of Arizona.
Column (g) - Schedule 531, Annual Report to the Interstate Commerce Commission.

5509

30411

Superior Court, Pima Co., Arizona

Defendant's Exhibit No. 171 (Witness Masson)
Jan. 14, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

LINES AND OPERATIONS ABANDONED UNDER AUTHORITY OF INTERSTATE COMMERCE COMMISSION
(Exclusive of Electric Lines in California and Oregon)

PERIOD JANUARY 1, 1930 TO DECEMBER 31, 1939, INCLUSIVE

Line No. (a)	Name of Line or Branch (b)	Termini (c)	State (d)	Mileage Abandoned (e)	Date Abandoned (f)	I.C.C. Finance Docket Number (g)
1	Calabasas	Calabasas to Flux	Arizona	12.39	6-15-31	7957
2	Cochise-Douglas	Cochise to Douglas	"	58.96	7-20-33	9114
3	Gleeson	Kelton to Gleeson	"	6.81	7-20-33	9114
4	Courtland	Kelton to Courtland	"	4.60	7-20-33	9114
5	Commonwealth	Pearce to Commonwealth Mill	"	1.33	7-20-33	9114
6	Hansen	West Chandler Wye to Hansen	"	2.17	12-16-33	10153
7	Amster	Amster Jct. to Amster	"	4.35	2- 1-34	10148
8	Mesa	Tempe to Center St., Mesa	"	4.52	2-20-34	10079
9	Casaba	Poso Jct. to Casaba	"	4.36	2-20-34	10079
10	Maricopa	West Chandler to Maricopa	"	16.60	4-15-35	10678
11	Patagonia	Patagonia to Flux	"	2.88	10- 5-39	12415
12		Total miles abandoned - Arizona		118.97		
13	Newport	Dyer to Huntington Beach	California	11.99	12- 1-33	10012
14	Santa Rosa	Schellville to Yulupa	"	7.74	1-15-34	9950
15	Santa Rosa	Los Guilicos to Santa Rosa	"	8.03	1-15-34	9950
16	Wingo-Union	Ramal to Wingo	"	1.80	1-15-34	9950
17	Boulder Creek	Felton to Boulder Creek	"	7.02	1-25-34	10120
18	Magnesite	Howton to Magnesite	"	.50	2- 1-34	10164
19	New Almaden	Le Franc to Almaden Jct.	"	4.36	4- 1-34	10196
20	New Almaden	Alamitos to New Almaden	"	4.09	4- 1-34	10196
21	Rumsey	Capay to Rumsey	"	18.05	4-15-34	10136
22	Howton	Magnesite Jct. to Howton	"	3.12	11- 1-34	10560
23	Springville	Clavicle to Springville	"	2.40	5-25-35	10732
24	Santa Ana	West Anaheim to Anaheim Jct.	"	2.16	8- 7-35	Note (1)
25	Le Franc	Campbell Gravel Pit to Le Franc	"	3.85	12-15-37	11703
26	Coalinga	Le Roy to Crump	"	2.06	11- 1-37	11730
27	Duarte	Near Duarte to Rivas	"	.69	1- 1-38	11335
28	Mina	Nevada-California State Line to Benton	"	6.77	2-20-38	11285
29	Kerman	Caruthers to Hardwick	"	11.35	11-10-38	11964
30	Los Alamitos	At Los Alamitos	"	.42	10- 7-39	12468
31	Buchli-Union	Buchli to West Napa	"	6.37	12-25-39	12463
32		Total miles abandoned - California		102.77		

Sheet 2 of 2 sheets

SOUTHERN PACIFIC COMPANY - Pacific Lines

LINES AND OPERATIONS ABANDONED UNDER AUTHORITY OF INTERSTATE COMMERCE COMMISSION
(Exclusive of Electric Lines in California and Oregon)

PERIOD JANUARY 1, 1930 TO DECEMBER 31, 1939, INCLUSIVE

Line No. (a)	Name of Line or Branch (b)	Termini (c)	State (d)	Mileage Abandoned (e)	Date Abandoned (f)	I.C.C. Finance Docket Number (g)
33	Candelaria	Filben to Candelaria	Nevada	5.23	3- 1-32	8932
34	Mound House	Churchill to Mound House	"	26.27	4-25-34	9896
35	Mina	Tonopah Jct. to Nevada-California State Line	"	42.93	2-20-38	11285
36		Total miles abandoned - Nevada		74.43		
37	Lordsburg-Hachita	Hachita to Oil Siding	New Mexico	37.59	12-22-33	10090
38	Tyrone	Burro Mountain Jct. to Tyrone	"	13.08	5- 1-34	9876
39	Jarilla	Oro Grande to Zora	"	3.81	12-15-34	10195
40		Total miles abandoned - New Mexico		54.48		
41	West Side	Portland to Bertha	Oregon	4.81	6-15-30	7930
42	West Side	At Forest Grove	"	1.58	6-15-30	7930
43	West Side	At Hillsboro	"	1.07	6-15-30	7930
44	Newberg	At Newberg	"	1.30	6-15-30	7930
45	Mills City	Albany to Shelburn	"	12.69	2-10-30	7512
46	West Side	Beaverton to Bertha	"	5.41	2-20-32	8988
47	Monmouth	Dallas to Monmouth	"	6.75	1-15-34	9988
48	West Side	Transfer to Cheshire	"	11.00	1-15-36	10962
49	Yaquina	Altree to Yaquina	"	7.26	5-15-37	11348
50		Total miles abandoned - Oregon		51.87		

SUMMARY OF LINES ABANDONED

State	Miles
Arizona	118.97
California	102.77
Nevada	74.43
New Mexico	54.48
Oregon	51.87
Grand Total	402.52

Note (1): Abandonment line West Anaheim to Anaheim Jct., compelled by condemnation proceedings by State of California, Department of Public Works. Orange County Court Order No. 33172.

5511

Defendant's Exhibit No. 172 (Witness Masson)
Jan. 15, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

NET RAILWAY OPERATING INCOME AND RATE OF RETURN ON INVESTMENT (BOOK VALUE)

Calendar Years 1925 to 1939 Inclusive

Item	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	
RAILWAY OPERATING REVENUES:											
Freight	$148 483 728	$152 637 760	$154 200 274	$159 642 877	$164 624 940	$138 010 278	$105 417 075	$78 038 122	$72 384 094	$85 757 493	
Passenger	42 676 902	41 840 997	40 691 182	38 850 440	39 215 281	34 291 656	27 171 029	18 450 895	15 221 018	16 009 009	
All Other	19 213 687	19 491 690	20 007 031	20 391 938	21 837 516	16 535 747	13 529 877	10 673 131	9 453 975	11 152 315	
Total Railway Operating Revenues	$210 374 317	$213 970 447	$214 898 487	$218 885 255	$225 677 737	$188 837 681	$146 117 981	$107 162 148	$97 059 087	$112 918 817	
RAILWAY OPERATING EXPENSES	148 706 635	146 417 881	149 215 801	151 212 056	153 351 563	132 831 268	107 434 090	82 645 456	73 771 902	81 743 959	
NET REVENUE FROM RAILWAY OPERATIONS	$61 667 682	$67 552 566	$65 682 686	$67 673 199	$72 326 174	$56 006 413	$38 683 891	$24 516 692	$23 287 185	$31 174 858	
Railway Tax Accruals	17 475 215	17 571 415	17 573 939	17 551 203	18 068 082	15 315 053	13 990 523	11 913 303	9 778 617	9 546 697	
Uncollectible Railway Revenues	45 969	45 810	61 937	37 570	28 878	53 103	27 813	27 533	94 334	31 893	
RAILWAY OPERATING INCOME	$44 146 498	$49 935 341	$48 046 810	$50 084 426	$54 229 214	$40 638 257	$24 665 555	$12 575 856	$13 414 234	$21 660 054	
Equipment and Joint Facility Rents-Net Debit	3 189 602	3 318 294	3 922 292	4 778 543	5 733 964	5 498 863	4 993 099	4 796 537	3 678 293	4 078 258	
NET RAILWAY OPERATING INCOME	$40 956 896	$46 617 047	$44 124 518	$45 305 883	$48 495 250	$35 139 394	$19 672 456	$7 779 319	$9 735 941	$17 581 796	
PROPERTY INVESTMENT: (Including Cash and Material and Supplies)											
Book Value at Close of Year per details on following sheets	$1 112 031 315	$1 172 956 401	$1 189 691 071	$1 193 071 946	$1 222 501 688	$1 141 674 587	$1 245 887 504	$1 231 410 556	$1 224 953 332	$1 219 297 910	$1
Rate of Return - Percent	3.68	3.97	3.71	3.80	3.97	2.83	1.58	.63	.79	1.44	

redit.

: Includes operations in States of California, Nevada, Utah, Oregon, Arizona, New Mexico and Texas.

CE: Lines 1 to 12 inclusive, Monthly Report of Revenues and Expenses rendered by Pacific Lines to Interstate Commerce Commission.

K VALUE)

32	1933	1934	1935	1936	1937	1938	1939
038 122	$72 384 094	$85 757 493	$94 138 112	$122 087 866	$132 457 688	$116 299 568	$129 616 129
50 895	15 221 018	16 009 009	17 753 609	20 899 622	23 416 723	21 565 863	22 148 104
73 131	9 453 975	11 152 315	12 148 391	13 298 116	14 869 867	13 832 846	14 858 861
62 148	$97 059 087	$112 918 817	$124 040 112	$156 285 604	$170 744 278	$151 698 277	$166 623 094
45 456	73 771 902	81 743 959	90 658 863	110 531 464	130 395 352	118 247 208	120 266 896
516 692	$23 287 185	$31 174 858	$33 381 249	$45 754 140	$40 348 926	$33 451 069	$46 356 198
913 303	9 778 617	9 546 697	9 573 702	9 542 077	23 492 258	14 228 045	14 309 641
27 533	94 334	31 893	22 018	-			-
375 856	$13 414 234	$21 660 054	$23 785 529	$36 212 063	$26 856 668	$19 223 024	$32 046 557
796 537	3 678 293	4 078 258	4 884 475	7 812 123	8 734 428	8 275 741	8 931 062
779 319	$9 735 941	$17 581 796	$18 901 054	$28 399 940	$18 122 240	$10 947 283	$23 115 495
410 556	$1 224 953 332	$1 219 297 910	$1 212 179 945	$1 207 703 263	$1 206 389 310	$1 214 423 982	$1 216 305 130
.63	.79	1.44	1.56	2.35	1.50	.90	1.90

SOUTHERN PACIFIC COMPANY

DETAILS OF TOTAL PROPERTY INVESTMENT, INCLUDING CASH AND MATERIAL AND SUPPLIES, AS OF DECEMBER 31, 1925, WITH SEGREGATION THEREOF AS BETWEEN INVESTMENT IN LINES OPERATED AS PACIFIC LINES AND INVESTMENT IN OTHER LINES

Line No. (a)	Name of Company (b)	Account 701 Investment in Road and Equipment			Account 702 Improvements on Leased Railway Property			Account 708 Cash		
		Total per Annual Reports (c)	Invested in Pacific Lines (d)	Invested in Other Lines (e)	Total per Annual Reports (f)	Improvements by Pacific Lines (g)	Improvements by Other Lines (h)	Total per Annual Reports (i)	On Hand by Pacific Lines (j)	On Hand Other L (k)
1	Southern Pacific Company	$252 711 638 01	$228 471 320 29	$24 240 317 72	$191 716 09	$84 814 42	$106 901 67	$20 455 098 81	$19 720 879 01	$734
2	Alamogordo & Sacramento Mountain Ry. Co.	1 308 312 03	1 308 312 03	-	-	-	-	-	-	
3	Arizona Eastern R.R. Co.	21 607 942 98	21 607 942 98	-	-	-	-	-	-	
4	Arizona and New Mexico Ry. Co.	4 632 753 41	4 632 753 41	-	-	-	-	-	-	
5	Burro Mountain R.R. Co.	502 504 97	502 504 97	-	-	-	-	-	-	-
6	Central Pacific Ry. Co.	329 569 124 39	329 569 124 39	-	2 744 71	2 744 71	-	-	-	-
7	Dawson Ry. Co.	7 527 412 64	7 527 412 64	-	-	-	-	-	-	-
8	El Paso & Northeastern R.R. Co.	648 728 13	648 728 13	-	-	-	-	-	-	-
9	El Paso & Northeastern Ry. Co.	6 565 601 83	6 565 601 83	-	-	-	-	-	-	-
10	El Paso & Rock Island Ry. Co.	8 711 814 65	8 711 814 65	-	-	-	-	-	-	-
11	El Paso & Southwestern R.R. Co.	32 477 195 19	32 477 195 19	-	-	-	-	-	-	-
12	El Paso & Southwestern R.R. Co. of Texas	3 881 068 17	3 881 068 17	-	-	-	-	-	-	-
13	Inter-California Railway Co.	4 950 865 97	2 847 386 16	2 103 479 81	-	-	-	-	-	-
14	Marion and Linn County R.R. Co.	107 499 48	107 499 48	-	-	-	-	-	-	-
15	New Mexico and Arizona R.R. Co.	7 240 292 47	7 240 292 47	-	-	-	-	-	-	-
16	Oregon & California R.R. Co.	51 657 696 94	51 657 696 94	-	49 655 92	49 655 92	-	-	-	-
17	Phoenix and Eastern R.R. Co.	5 454 657 16	5 454 657 16	-	-	-	-	-	-	-
18	Porterville Northeastern Ry. Co.	612 492 20	612 492 20	-	-	-	-	-	-	-
19	South Pacific Coast Ry. Co.	16 161 699 38	16 161 699 38	-	-	-	-	-	-	-
20	Southern Pacific R.R. Co.	339 298 652 51	339 298 652 51	-	168 00	168 00	-	-	-	-
21	Tucson & Nogales R.R. Co.	1 710 516 66	1 710 516 66	-	-	-	-	-	-	-
22	Total	$1 097 338 429 17	$1 070 994 631 64	$26 343 797 53	$244 284 72	$137 383 05	$106 901 67	$20 455 098 81	$19 720 879 01	$734

SOURCE: Line 1, Columns (c), (f), (i), and (l), Schedule 2004 of Annual Report to Interstate Commerce Commission or Table 1 of Annual Report to Stockholders
Line 1, Columns (d), (e), (g), (h), (j), and (m), Balance sheets of General Ledger - S.P. Co.
Line 1, Columns (k) and (n) - Balance sheets of General Ledger - S.P. Co. - Atlantic Steamship Lines
Lines 2 to 12 inclusive, and 14 to 21, inclusive - Columns (c), (d), (f), and (g) - Table 8 of S.P. Co. Annual Report to Stockholders
Line 13, Column (c), Table 23 of S.P. Co. Annual Report to Stockholders
Line 13, Columns (d) and (e) - Balance sheet of General Ledger - Inter-California Railway Co.

Explanation: Line 1, Columns (e), (h), (k) and (n) represent investment in Atlantic Steamship Lines of S.P. Co.
Line 13, Column (e) represents investment in Mexican Lines of Inter-California Railway Co.

PLIES, AS OF DECEMBER 31, 1925,
LINES AND INVESTMENT IN OTHER LINES

Account 708 Cash			Account 716 Material and Supplies			Total Property Investment Including Cash and Material and Supplies Pacific Lines (Col. d+g+j+m) (o)
Total per nual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	Total per Annual Reports (l)	On Hand by Pacific Lines (m)	On Hand by Other Lines (n)	
0 455 098 81	$19 720 879 01	$734 219 80	$21 664 807 87	$21 178 421 67	$486 386 20	$269 455 435 39
-	-	-	-	-	-	1 308 312 03
-	-	-	-	-	-	21 607 942 98
-	-	-	-	-	-	4 632 753 41
-	-	-	-	-	-	502 504 97
-	-	-	-	-	-	329 571 869 10
-	-	-	-	-	-	7 527 412 64
-	-	-	-	-	-	648 728 13
-	-	-	-	-	-	6 565 601 83
-	-	-	-	-	-	8 711 814 65
-	-	-	-	-	-	32 477 195 19
-	-	-	-	-	-	3 881 068 17
-	-	-	-	-	-	2 847 386 16
-	-	-	-	-	-	107 499 48
-	-	-	-	-	-	7 240 292 47
-	-	-	-	-	-	51 707 352 86
-	-	-	-	-	-	5 454 657 16
-	-	-	-	-	-	612 492 20
-	-	-	-	-	-	16 161 659 38
-	-	-	-	-	-	339 298 820 51
-	-	-	-	-	-	1 710 516 66
0 455 098 81	$19 720 879 01	$734 219 80	$21 664 807 87	$21 178 421 67	$486 386 20	$1 112 031 315 37

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SOUTHERN PACIFIC COMPANY

DETAILS OF TOTAL PROPERTY INVESTMENT, INCLUDING CASH AND MATERIAL AND SUPPLIES, AS OF DECEMBER 31, 1926, WITH SEGREGATION THEREOF AS BETWEEN INVESTMENT IN LINES OPERATED AS PACIFIC LINES AND INVESTMENT IN OTHER LINES

Line No. (a)	Name of Company (b)	Account 701 Investment in Road and Equipment			Account 702 Improvements on Leased Railway Property			Account 706 Cash		
		Total per Annual Reports (c)	Invested in Pacific Lines (d)	Invested in Other Lines (e)	Total per Annual Reports (f)	Improvements by Pacific Lines (g)	Improvements by Other Lines (h)	Total per Annual Reports (i)	On Hand by Pacific Lines (j)	On Ha Other (
1	Southern Pacific Company	$274 257 320 06	$249 728 404 09	$24 528 915 97	$465 099 34	$355 821 46	$109 277 88	$20 781 376 58	$20 038 771 05	$74
2	Alamogordo & Sacramento Mountain Ry. Co.	1 308 897 35	1 308 897 35	-	-	-	-	-	-	
3	Arizona Eastern R.R. Co.	28 254 250 23	28 254 250 23	-	-	-	-	-	-	
4	Arizona and New Mexico Ry. Co.	4 637 796 24	4 637 796 24	-	-	-	-	-	-	
5	Burro Mountain R.R. Co.	508 020 27	508 020 27	-	-	-	-	-	-	
6	Central Pacific Ry. Co.	341 871 835 61	341 871 835 61	-	16 344 13	16 344 13	-	-	-	
7	Dawson Ry. Co.	7 587 154 61	7 587 154 61	-	-	-	-	-	-	
8	El Paso & Northeastern R.R. Co.	652 621 23	652 621 23	-	-	-	-	-	-	
9	El Paso & Northeastern Ry. Co.	6 659 865 09	6 659 865 09	-	-	-	-	-	-	
10	El Paso & Rock Island Ry. Co.	8 916 488 20	8 916 488 20	-	-	-	-	-	-	
11	El Paso & Southwestern R.R. Co.	32 689 054 07	32 689 054 07	-	-	-	-	-	-	
12	El Paso & Southwestern R.R. Co. of Texas	4 001 814 18	4 001 814 18	-	-	-	-	-	-	
13	Inter-California Railway Co.	5 111 782 54	2 939 121 98	2 172 660 56	-	-	-	-	-	
14	Marion and Linn County R.R. Co.	35 724 21	35 724 21	-	-	-	-	-	-	
15	New Mexico and Arizona R.R. Co.	6 593 598 56	6 593 598 56	-	-	-	-	-	-	
16	Oregon & California R.R. Co.	53 187 355 65	53 187 355 65	-	49 655 92	49 655 92	-	-	-	
17	Phoenix and Eastern R.R. Co.	5 662 846 87	5 662 846 87	-	-	-	-	-	-	
18	Porterville Northeastern Ry. Co.	618 834 86	618 834 86	-	-	-	-	-	-	
19	South Pacific Coast Ry. Co.	16 370 436 03	16 370 436 03	-	-	-	-	-	-	
20	Southern Pacific R.R. Co.	346 737 159 39	346 737 159 39	-	168 00	168 00	-	-	-	
21	Tucson & Nogales R.R. Co.	1 714 409 48	714 409 48	-	-	-	-	-	-	
22	Total	$1 147 377 264 73	$1 12 675 688 20	$26 701 576 53	$531 267 39	$421 989 51	$109 277 88	$20 781 376 58	$20 038 771 05	$74

SOURCE: Line 1, Columns (c), (f), (i), and (l), Schedule 200A of Annual Report to Interstate Commerce Commission or Table 1 of Annual Report to Stockholders
Line 1, Columns (d), (e), (g), (h), (j) and (m), Balance sheets of General Ledger - S.P. Co.
Line 1, Columns (k) and (n), Balance sheets of General Ledger - S.P. Co. - Atlantic Steamship Lines
Lines 2 to 12, inclusive, and 14 to 21, inclusive, Columns (c), (d), (f), and (g), Table 8 of S.P. Co. Annual Reports to Stockholders
Line 13, Column (c), Table 23 of S.P. Co. Annual Report to Stockholders
Line 13, Columns (d) and (e), Balance sheet of General Ledger - Inter-California Railway Co.

EXPLANATIONS: Line 1, Columns (e), (h), (k), and (n) represent investment in Atlantic Steamship Lines of S.P. Co.
Line 13, Column (e) represents investment in Mexican Line of Inter-California Railway Co.

S, AS OF DECEMBER 31, 1926,
S AND INVESTMENT IN OTHER LINES

Account 708 Cash			Account 716 Material and Supplies			Total Property Investment Including Cash and Material and Supplies Pacific Lines (Col. d+g+j+m) (o)
l per Reports)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	Total per Annual Reports (l)	On Hand by Pacific Lines (m)	On Hand by Other Lines (n)	
1 376 58	$20 038 771 05	$742 605 53	$32 265 145 20	$31 819 951 89	$445 193 31	$301 942 948 49
-	-	-	-	-	-	1 308 897 35
-	-	-	-	-	-	28 254 250 23
-	-	-	-	-	-	4 637 [illegible]6 24
-	-	-	-	-	-	506 020 27
-	-	-	-	-	-	341 888 179 74
-	-	-	-	-	-	7 587 154 61
-	-	-	-	-	-	652 621 23
-	-	-	-	-	-	6 659 865 09
-	-	-	-	-	-	8 916 488 20
-	-	-	-	-	-	32 689 054 07
-	-	-	-	-	-	4 001 814 18
-	-	-	-	-	-	2 939 121 98
-	-	-	-	-	-	35 724 21
-	-	-	-	-	-	6 593 598 56
-	-	-	-	-	-	53 237 011 57
-	-	-	-	-	-	5 662 846 87
-	-	-	-	-	-	618 834 86
-	-	-	-	-	-	16 370 436 03
-	-	-	-	-	-	346 737 327 39
-	-	-	-	-	-	1 714 409 48
1 376 58	$20 038 771 05	$742 605 53	$32 265 145 20	$31 819 951 89	$445 193 31	$1 172 956 400 65

SOUTHERN PACIFIC COMPANY

DETAILS OF TOTAL PROPERTY INVESTMENT, INCLUDING CASH AND MATERIAL AND SUPPLIES, AS OF DECEMBER 31, 1927,
WITH SEGREGATION THEREOF AS BETWEEN INVESTMENT IN LINES OPERATED AS PACIFIC LINES AND INVESTMENT IN OTHER LINES

Line No. (a)	Name of Company (b)	Account 701 Investment in Road and Equipment			Account 702 Improvements on Leased Railway Property			Account 708 Cash		
		Total per Annual Reports (c)	Invested in Pacific Lines (d)	Invested in Other Lines (e)	Total per Annual Reports (f)	Improvements by Pacific Lines (g)	Improvements by Other Lines (h)	Total per Annual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)
1	Southern Pacific Company	$340 457 049 52	$314 729 448 98	$25 727 600 54	$536 518 17	$424 285 59	$112 232 58	$21 517 483 46	$20 466 176 49	$1 051 306
2	Alamogordo & Sacramento Mountain Ry. Co.	1 316 990 80	1 316 990 80	-	-	-	-	-	-	-
3	Arizona Eastern R.R. Co.	28 432 340 17	28 432 340 17	-	-	-	-	-	-	-
4	Arizona and New Mexico Ry. Co.	4 600 643 62	4 600 643 62	-	-	-	-	-	-	-
5	Burro Mountain R.R. Co.	508 283 98	508 283 98	-	-	-	-	-	-	-
6	Central Pacific Ry. Co.	346 011 442 52	346 011 442 52	-	14 143 39	14 143 39	-	-	-	-
7	Dawson Ry. Co.	7 613 883 23	7 613 883 23	-	-	-	-	-	-	-
8	El Paso & Northeastern R.R. Co.	651 303 90	651 303 90	-	-	-	-	-	-	-
9	El Paso & Northeastern Ry. Co.	6 763 411 81	6 763 411 81	-	-	-	-	-	-	-
10	El Paso & Rock Island Ry. Co.	9 035 634 35	9 035 634 35	-	-	-	-	-	-	-
11	El Paso & Southwestern R.R. Co.	33 031 154 93	33 031 154 93	-	-	-	-	-	-	-
12	El Paso & Southwestern R.R. Co. of Texas	4 059 603 49	4 059 603 49	-	-	-	-	-	-	-
13	Inter-California Railway Co.	5 311 543 73	3 077 625 67	.2 233 918 06	-	-	-	-	-	-
14	New Mexico and Arizona R.R. Co.	6 604 902 36	6 604 902 36	-	-	-	-	-	-	-
15	Phoenix and Eastern R.R. Co.	5 592 391 33	5 592 391 33	-	-	-	-	-	-	-
16	Porterville Northeastern Ry. Co.	620 587 70	620 587 70	-	-	-	-	-	-	-
17	South Pacific Coast Ry. Co.	16 502 358 65	16 502 358 65	-	-	-	-	-	-	-
18	Southern Pacific R.R. Co.	350 955 820 96	350 955 820 96	-	168 00	168 00	-	-	-	-
19	Tucson & Nogales R.R. Co.	1 729 028 60	1 729 028 60	-	-	-	-	-	-	-
20	Total	$1 169 798 375 65	$1 141 836 857 05	$27 961 518 60	$550 829 56	$438 596 98	$112 232 58	$21 517 483 46	$20 466 176 49	$1 051 306

SOURCE: Line 1, Columns (c), (f), (i), and (l) - Schedule 200A of Annual Report to Interstate Commerce Commission or Table 1 of Annual Report to Stockholders.
Line 1, Columns (d), (e), (g), (h), (j), and (m) - Balance sheets of General Ledger - S.P. Co.
Line 1, Columns (k) and (n) - Balance sheets of General Ledger - S.P. Co. - Atlantic Steamship Lines.
Lines 2 to 12 inclusive, and 14 to 19 inclusive, Columns (c), (d), (f), and (g) - Table 8 of S.P. Co. Annual Report to Stockholders.
Line 13, Column (c) - Table 23 of S.P. Co. Annual Report to Stockholders.
Line 13, Columns (d) and (e) - Balance sheet of General Ledger - Inter-California Railway Co.

EXPLANATIONS: Line 1, Columns (e), (h), (k), and (n) represent investment in Atlantic Steamship Lines of S.P. Co.
Line 13, Column (e) represents investment in Mexican Line of Inter-California Railway Co.

PPLIES, AS OF DECEMBER 31, 1927,
LINES AND INVESTMENT IN OTHER LINES

Account 708 Cash			Account 716 Material and Supplies			Total Property Investment Including Cash and Material and Supplies Pacific Lines (Col. d+g+j+m) (o)
otal per al Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	Total per Annual Reports (l)	On Hand by Pacific Lines (m)	On Hand by Other Lines (n)	
517 483 46	$20 466 176 49	$1 051 306 97	$27 599 510 28	$26 949 440 73	$650 069 55	$362 569 351 79
-	-	-	-	-	-	1 316 990 80
-	-	-	-	-	-	28 432 340 17
-	-	-	-	-	-	4 600 643 62
-	-	-	-	-	-	508 283 98
-	-	-	-	-	-	346 025 585 91
-	-	-	-	-	-	7 613 883 23
-	-	-	-	-	-	651 303 90
-	-	-	-	-	-	6 763 411 81
-	-	-	-	-	-	9 035 634 35
-	-	-	-	-	-	33 031 154 93
-	-	-	-	-	-	4 059 603 49
-	-	-	-	-	-	3 077 625 67
-	-	-	-	-	-	6 604 902 36
-	-	-	-	-	-	5 592 391 33
-	-	-	-	-	-	620 587 70
-	-	-	-	-	-	16 502 358 65
-	-	-	-	-	-	350 955 988 96
-	-	-	-	-	-	1 729 028 60
517 483 46	$20 466 176 49	$1 051 306 97	$27 599 510 28	$26 949 440 73	$650 069 55	$1 189 691 071 25

ers.

SOUTHERN PACIFIC COMPANY

DETAILS OF TOTAL PROPERTY INVESTMENT, INCLUDING CASH AND MATERIAL AND SUPPLIES, AS OF DECEMBER 31, 1926, WITH SEGREGATION THEREOF AS BETWEEN INVESTMENT IN LINES OPERATED AS PACIFIC LINES AND INVESTMENT IN OTHER LINES

No.	Name of Company (b)	Account 701 Investment in Road and Equipment			Account 702 Improvements on Leased Railway Property			Account 706 Cash			A
		Total per Annual Reports (c)	Invested in Pacific Lines (d)	Invested in Other Lines (e)	Total per Annual Reports (f)	Improvements by Pacific Lines (g)	Improvements by Other Lines (h)	Total per Annual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	
1	Southern Pacific Company	$333 456 085 74	$307 441 147 05	$26 014 938 69	$533 842 91	$419 557 36	$114 285 55	$21 589 546 85	$20 931 585 29	$657 961 56	
2	Alamogordo & Sacramento Mountain Ry. Co.	1 320 438 04	1 320 438 04	-	-	-	-	-	-	-	
3	Arizona Eastern R.R. Co.	29 504 814 36	29 504 814 36	-	2 885 75	2 885 75	-	-	-	-	
4	Arizona and New Mexico Ry. Co.	4 614 327 88	4 614 327 88	-	-	-	-	-	-	-	
5	Burro Mountain R.R. Co.	507 902 58	507 902 58	-	-	-	-	-	-	-	
6	Central Pacific Ry. Co.	351 051 323 20	351 051 323 20	-	18 076 95	18 076 95	-	-	-	-	
7	Dawson Ry. Co.	7 669 425 90	7 669 425 90	-	-	-	-	-	-	-	
8	El Paso & Northeastern R.R. Co.	662 398 45	662 398 45	-	-	-	-	-	-	-	
9	El Paso & Northeastern Ry. Co.	6 907 603 60	6 907 603 60	-	-	-	-	-	-	-	
10	El Paso & Rock Island Ry. Co.	9 207 822 92	9 207 822 92	-	-	-	-	-	-	-	
11	El Paso & Southwestern R.R. Co.	33 309 669 42	33 309 669 42	-	1 914 75	1 914 75	-	-	-	-	
12	El Paso & Southwestern R.R. Co. of Texas	4 163 324 38	4 163 324 38	-	-	-	-	-	-	-	
13	Inter-California Railway Co.	5 514 156 16	3 266 482 04	2 247 674 12	-	-	-	-	-	-	
14	New Mexico and Arizona R.R. Co.	6 636 178 15	6 636 178 15	-	-	-	-	-	-	-	
15	Phoenix and Eastern R.R. Co.	5 649 676 14	5 649 676 14	-	-	-	-	-	-	-	
16	Portersville Northeastern Ry. Co.	620 642 88	620 642 88	-	-	-	-	-	-	-	
17	South Pacific Coast Ry. Co.	16 578 169 17	16 578 169 17	-	-	-	-	-	-	-	
18	Southern Pacific R.R. Co.	355 857 343 22	355 857 343 22	-	47 208 67	47 208 67	-	-	-	-	
19	Tucson & Nogales R.R. Co.	1 744 719 71	1 744 719 71	-	-	-	-	-	-	-	
20	Total	$1 174 976 021 90	$1 146 713 409 09	$28 262 612 81	$603 929 03	$489 643 48	$114 285 55	$21 589 546 85	$20 931 585 29	$657 961 56	

SOURCE: Line 1, Columns (c), (f), (i), and (l) - Schedule 200A of Annual Report to Interstate Commerce Commission or Table 1 of Annual Report to Stockholders.
Line 1, Columns (d), (e), (g), (h), (j), and (m) - Balance sheets of General Ledger - S.P. Co.
Line 1, Columns (k) and (n) - Balance sheets of General Ledger - S.P. Co. - Atlantic Steamship Lines.
Lines 2 to 12, inclusive, and 14 to 19, inclusive, Columns (c), (d), (f), and (g) - Table 8 of S.P. Co. Annual Reports to Stockholders.
Line 13, Column (c) - Table 23 of S.P. Co. Annual Report to Stockholders.
Line 13, Columns (d) and (e) - Balance sheet of General Ledger - Inter-California Railway Co.

EXPLANATIONS: Line 1, Columns (e), (h), (k), and (n) represent investment in Atlantic Steamship Lines of S.P. Co.
Line 13, Column (e) represents investment in Mexican Line of Inter-California Railway Co.

UPPLIES, AS OF DECEMBER 31, 1928,
C LINES AND INVESTMENT IN OTHER LINES

Account 708 Cash			Account 71. Material and Supplies			Total Property Investment Including Cash and Material and Supplies Pacific Lines (Col.d+g+j+m) (o)
Total per nual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	Total per Annual Reports (l)	On Hand by Pacific Lines (m)	On Hand by Other Lines (n)	
21 589 546 85	$20 931 585 29	$657 961 56	$25 652 699 39	$24 937 308 60	$715 350 79	$353 729 598 30
						1 320 438 04
						29 507 700 11
						4 614 327 88
						907 902 58
						351 069 400 15
						7 669 425 90
						662 398 45
						6 907 603 60
						9 207 822 92
						33 309 669 42
						4 165 239 13
						3 266 482 04
						6 636 178 15
						5 649 676 14
						620 642 88
						16 578 169 17
						355 904 551 89
						1 744 719 71
21 589 546 85	$20 931 585 29	$657 961 56	$25 652 699 39	$24 937 308 60	$715 350 79	$1 193 071 946 46

lders.

SOUTHERN PACIFIC COMPANY

DETAILS OF TOTAL PROPERTY INVESTMENT, INCLUDING CASH AND MATERIAL AND SUPPLIES, AS OF DECEMBER 31, 1929, WITH SEGREGATION THEREOF AS BETWEEN INVESTMENT IN LINES OPERATED AS PACIFIC LINES AND INVESTMENT IN OTHER LINES

Line No. (a)	Name of Company (b)	Account 701 Investment in Road and Equipment			Account 702 Improvements on Leased Railway Property			Account 708 Cash		
		Total per Annual Reports (c)	Invested in Pacific Lines (d)	Invested in Other Lines (e)	Total per Annual Reports (f)	Improvements by Pacific Lines (g)	Improvements by Other Lines (h)	Total per Annual Reports (i)	On Hand by Pacific Lines (j)	On Hand Other Li: (k)
1	Southern Pacific Company	$332 153 440 09	$311 333 340 99	$20 820 099 10	$555 514 40	$432 499 96	$123 014 44	$24 777 431 00	$24 125 153 90	$652
2	Alamogordo & Sacramento Mountain Ry. Co.	1 321 920 54	1 321 920 54	-	-	-	-	-	-	
3	Arizona Eastern R.R. Co.	30 022 116 54	30 022 116 54	-	2 885 75	2 885 75	-	-	-	
4	Arizona and New Mexico Ry. Co.	4 615 242 76	4 615 242 76	-	-	-	-	-	-	
5	Borre Mountain R.R. Co.	508 165 86	508 165 86	-	-	-	-	-	-	
6	Central Pacific Ry. Co.	360 926 468 73	360 926 468 73	-	19 115 95	19 115 95	-	-	-	
7	Dawson Ry. Co.	7 744 373 99	7 744 373 99	-	-	-	-	-	-	
8	El Paso & Northeastern R.R. Co.	668 308 14	668 308 14	-	-	-	-	-	-	
9	El Paso & Northeastern Ry. Co.	7 355 984 11	7 355 984 11	-	-	-	-	-	-	
10	El Paso & Rock Island Ry. Co.	9 480 267 08	9 480 267 08	-	-	-	-	-	-	
11	El Paso & Southwestern R.R. Co.	33 160 074 20	33 160 074 20	-	-	-	-	-	-	
12	El Paso & Southwestern R.R. Co. of Texas	4 253 161 49	4 253 161 49	-	1 914 75	1 914 75	-	-	-	
13	Inter-California Railway Co.	5 632 743 71	3 379 614 67	2 253 129 04	-	-	-	-	-	
14	Nevada-California-Oregon Ry.	4 901 521 25	4 901 521 25	-	-	-	-	-	-	
15	New Mexico and Arizona R.R. Co.	6 693 281 55	6 693 281 55	-	-	-	-	-	-	
16	Phoenix and Eastern R.R. Co.	5 708 530 89	5 708 530 89	-	-	-	-	-	-	
17	Porterville Northeastern Ry. Co.	623 850 34	623 850 34	-	-	-	-	-	-	
18	South Pacific Coast Ry. Co.	16 286 286 27	16 286 286 27	-	-	-	-	-	-	
19	Southern Pacific R.R. Co.	364 084 479 67	364 084 479 67	-	55 221 81	55 221 81	-	-	-	
20	Tucson & Nogales R.R. Co.	1 735 663 44	1 735 663 44	-	-	-	-	-	-	
21	Total	$1 197 875 880 65	$1 174 802 652 51	$23 073 228 14	$634 652 66	$511 638 22	$123 014 44	$24 777 431 00	$24 125 153 90	$652

SOURCE: Line 1, Columns (c), (f), (i), and (l) - Schedule 200A of Annual Report to Interstate Commerce Commission or Table 1 of Annual Report to Stockholders.
Line 1, Columns (d), (e), (g), (h), (j), and (m) - Balance sheets of General Ledger - S.P. Co.
Line 1, Columns (k) and (n) - Balance sheets of General Ledger - S.P. Co. - Atlantic Steamship Lines.
Lines 2 to 12 inclusive, and 14 to 20 inclusive, Columns (c), (d), (f), and (g) - Table 8 of S.P. Co. Annual Report to Stockholders.
Line 13, Column (c) - Table 23 of S.P. Co. Annual Report to Stockholders.
Line 13, Columns (d) and (e) - Balance sheet of General Ledger - Inter-California Railway Co.

EXPLANATIONS: Line 1, Columns (e), (h), (k), and (n) represent investment in Atlantic Steamship Lines of S.P. Co.
Line 13, Column (e) represents investment in Mexican Line of Inter-California Railway Co.

UPPLIES, AS OF DECEMBER 31, 1929,
C LINES AND INVESTMENT IN OTHER LINES

Account 708 Cash			Account 716 Material and Supplies			Total Property Investment Including Cash and Material and Supplies Pacific Lines (Col. d+g+j+m) (o)
Total per nnual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	Total per Annual Reports (l)	On Hand by Pacific Lines (m)	On Hand by Other Lines (n)	
$24 777 431 00	$24 125 153 90	$652 277 10	$23 487 980 73	$23 062 243 86	$425 736 87	$358 953 238 71
-	-	-	-	-	-	1 321 920 54
-	-	-	-	-	-	30 025 002 29
-	-	-	-	-	-	4 615 242 76
-	-	-	-	-	-	508 165 86
-	-	-	-	-	-	360 945 584 68
-	-	-	-	-	-	7 744 373 99
-	-	-	-	-	-	668 308 14
-	-	-	-	-	-	7 355 984 11
-	-	-	-	-	-	9 480 267 08
-	-	-	-	-	-	33 160 074 20
-	-	-	-	-	-	4 255 076 24
-	-	-	-	-	-	3 379 614 67
-	-	-	-	-	-	4 901 521 25
-	-	-	-	-	-	6 693 281 55
-	-	-	-	-	-	5 708 530 89
-	-	-	-	-	-	623 850 34
-	-	-	-	-	-	16 286 286 27
-	-	-	-	-	-	364 139 701 48
-	-	-	-	-	-	1 735 663 44
$24 777 431 00	$24 125 153 90	$652 277 10	$23 487 980 73	$23 062 243 86	$425 736 87	$1 222 501 688 49

olders.

SOUTHERN PACIFIC COMPANY

DETAILS OF TOTAL PROPERTY INVESTMENT, INCLUDING CASH AND MATERIAL AND SUPPLIES, AS OF DECEMBER 31, 1930,
WITH SEGREGATION THEREOF AS BETWEEN INVESTMENT IN LINES OPERATED AS PACIFIC LINES AND INVESTMENT IN OTHER LINES

Line No.	Name of Company (b)	Account 701 - Investment in Road and Equipment			Account 702 Improvements on Leased Railway Property			Account 708 Cash		
		Total per Annual Reports (c)	Invested in Pacific Lines (d)	Invested in Other Lines (e)	Total per Annual Reports (f)	Improvements by Pacific Lines (g)	Improvements by Other Lines (h)	Total per Annual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)
1	Southern Pacific Company	$341 705 348 88	$320 902 259 90	$20 803 088 98	$546 893 18	$416 017 02	$130 876 16	$18 435 131 41	$17 819 044 67	$616 086 74
2	Alamogordo & Sacramento Mountain Ry. Co.	1 324 547 51	1 324 547 51	-	-	-	-	-	-	-
3	Arizona Eastern R.R. Co.	30 178 860 33	30 178 860 33	-	2 885 75	2 885 75	-	-	-	-
4	Arizona and New Mexico Ry. Co.	4 615 825 44	4 615 825 44	-	-	-	-	-	-	-
5	Burro Mountain R.R. Co.	508 524 27	508 524 27	-	-	-	-	-	-	-
6	Central Pacific Ry. Co?	364 986 098 59	364 986 098 59	-	29 268 65	29 268 65	-	-	-	-
7	Dawson Ry. Co.	7 749 272 92	7 749 272 92	-	-	-	-	-	-	-
8	El Paso & Northeastern R.R. Co.	692 308 46	692 308 46	-	-	-	-	-	-	-
9	El Paso & Northeastern Ry. Co.	7 659 859 78	7 659 859 78	-	-	-	-	-	-	-
10	El Paso & Rock Island Ry. Co.	9 705 726 29	9 705 726 29	-	-	-	-	-	-	-
11	El Paso & Southwestern R.R. Co.	33 395 460 13	33 395 460 13	-	-	-	-	-	-	-
12	El Paso & Southwestern R.R. Co. of Texas	4 340 761 03	4 340 761 03	-	1 914 75	1 914 75	-	-	-	-
13	Inter-California Railway in California .	3 702 041 59	3 702 041 59	-	-	-	-	-	-	-
14	Nevada-California-Oregon Railway	5 308 598 94	5 308 598 94	-	-	-	-	-	-	-
15	New Mexico and Arizona R.R. Co.	6 663 811 78	6 663 811 78	-	-	-	-	-	-	-
16	Phoenix and Eastern R.R. Co.	5 750 431 07	5 750 431 07	-	-	-	-	-	-	-
17	Porterville Northeastern Ry. Co.	624 512 97	624 512 97	-	-	-	-	-	-	-
18	South Pacific Coast Ry. Co.	16 424 129 94	16 424 129 94	-	-	-	-	-	-	-
19	Southern Pacific R.R. Co.	371 754 890 32	371 754 890 32	-	57 594 48	57 594 48	-	-	-	-
20	Tucson & Nogales R.R. Co.	1 751 303 15	1 751 303 15	-	-	-	-	-	-	-
21	Total	$1 218 842 313 39	$1 198 039 224 41	$20 803 088 98	$638 556 81	$507 680 65	$130 876 16	$18 435 131 41	$17 819 044 67	$616 086 74

SOURCE: Line 1, Columns (c), (f), (i), and (l) - Schedule 2004 of Annual Report to Interstate Commerce Commission or Table 1 of Annual Report to Stockholders.
Line 1, Columns (d), (e), (g), (h), (j), and (m) - Balance sheets of General Ledger - S.P. Co.
Line 1, Columns (k) and (n) - Balance sheets of General Ledger - S.P. Co. - Atlantic Steamship Lines.
Lines 2 to 20 inclusive, Columns (c), (d), (f), and (g) - Table 8 of S.P. Co. Annual Report to Stockholders.

EXPLANATION: Line 1, Columns (e), (h), (k), and (n) represent investment in Atlantic Steamship Lines of S.P. Co.

PLIES, AS OF DECEMBER 31, 1930,
LINES AND INVESTMENT IN OTHER LINES

Account 708 Cash			Account 716 Material and Supplies			Total Property Investment Including Cash and Material and Supplies Pacific Lines (Col. d+g+j+m) (o)
otal per al Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	Total per Annual Reports (l)	On Hand by Pacific Lines (m)	On Hand by Other Lines (n)	
435 131 41	$17 819 044 67	$616 086 74	$25 856 847 93	$25 308 637 72	$548 210 21	$364 445 959 31
-	-	-	-	-	-	1 324 547 51
-	-	-	-	-	-	30 181 746 08
-	-	-	-	-	-	4 615 825 44
-	-	-	-	-	-	308 524 27
-	-	-	-	-	-	365 015 367 24
-	-	-	-	-	-	7 749 272 92
-	-	-	-	-	-	692 308 46
-	-	-	-	-	-	7 659 85[illegible] 78
-	-	-	-	-	-	9 705 [illegible]26 29
-	-	-	-	-	-	33 39[illegible] 460 13
-	-	-	-	-	-	4 34[illegible] 675 78
-	-	-	-	-	-	3 702 041 59
-	-	-	-	-	-	5 308 598 94
-	-	-	-	-	-	6 663 811 78
-	-	-	-	-	-	5 750 431 07
-	-	-	-	-	-	624 512 97
-	-	-	-	-	-	16 424 129 94
-	-	-	-	-	-	371 812 484 80
-	-	-	-	-	-	1 751 303 15
3 435 131 41	$17 819 044 67	$616 086 74	$25 856 847 93	$25 308 637 72	$548 210 21	$1 241 674 587 45

iers.

SOUTHERN PACIFIC COMPANY

DETAILS OF TOTAL PROPERTY INVESTMENT, INCLUDING CASH AND MATERIAL AND SUPPLIES, AS OF DECEMBER 31, 1931, WITH SEGREGATION THEREOF AS BETWEEN INVESTMENT IN LINES OPERATED AS PACIFIC LINES AND INVESTMENT IN OTHER LINES

Name of Company (b)	Account 701 Investment in Road and Equipment			Account 702 Improvements on Leased Railway Property			Account 708 Cash			
	Total per Annual Reports (c)	Invested in Pacific Lines (d)	Invested in Other Lines (e)	Total per Annual Reports (f)	Improvements by Pacific Lines (g)	Improvements by Other Lines (h)	Total per Annual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	To Annu
thern Pacific Company	$343 186 839 41	$322 488 735 72	$20 698 103 69	$559 080 73	$420 356 61	$138 724 12	$19 109 310 02	$18 607 718 93	$501 591 09	$24
ngordo & Sacramento Mountain Ry. Co.	1 322 530 37	1 322 530 37	-	-	-	-	-	-	-	
ona Eastern R.R. Co.	30 216 234 09	30 216 234 09	-	2 885 75	2 885 75	-	-	-	-	
ona and New Mexico Ry. Co.	4 209 296 36	4 209 296 36	-	-	-	-	-	-	-	
o-Mountain R.R. Co.	507 018 27	507 018 27	-	-	-	-	-	-	-	
tral Pacific Ry. Co.	366 330 625 28	366 330 625 28	-	26 192 86	26 192 86	-	-	-	-	
son Ry. Co.	7 708 623 21	7 708 623 21	-	-	-	-	-	-	-	
Paso & Northeastern R.R. Co.	698 163 86	698 163 86	-	-	-	-	-	-	-	
Paso & Northeastern Ry. Co.	7 680 595 30	7 680 595 30	-	-	-	-	-	-	-	
Paso & Rock Island Ry. Co.	9 924 239 12	9 924 239 12	-	-	-	-	-	-	-	
Paso & Southeastern R.R. Co.	33 344 900 27	33 344 900 17	-	-	-	-	-	-	-	
Paso & Southeastern R.R. Co. of Texas	4 349 980 69	4 349 980 69	-	1 914 75	1 914 75	-	-	-	-	
or-California Railway in California	3 732 019 13	3 732 019 13	-	-	-	-	-	-	-	
ada-California-Oregon Ry.	5 509 258 71	5 509 258 71	-	-	-	-	-	-	-	
Mexico and Arizona R.R. Co.	5 909 868 84	5 909 868 84	-	-	-	-	-	-	-	
enix and Eastern R.R. Co.	5 772 819 33	5 772 819 33	-	-	-	-	-	-	-	
terville Northeastern Ry. Co.	625 681 12	625 681 12	-	-	-	-	-	-	-	
th Pacific Coast Ry. Co.	16 448 751 68	16 448 751 68	-	-	-	-	-	-	-	
thern Pacific R.R. Co.	374 073 702 43	374 073 702 43	-	59 931 17	59 931 17	-	-	-	-	
son & Nogales R.R. Co.	1 754 726 12	1 754 726 12	-	-	-	-	-	-	-	
Total	$1 223 305 873 49	$1 202 607 769 80	$20 698 103 69	$650 005 26	$511 281 14	$138 724 12	$19 109 310 02	$18 607 718 93	$501 591 09	$24

NOTE: Line 1, Columns (c), (f), (i), and (l) - Schedule 200A of Annual Report to Interstate Commerce Commission or Table 1 of Annual Report to Stockholders.
Line 1, Columns (d), (e), (g), (h), (j), and (m) - Balance sheets of General Ledger - S.P. Co.
Line 1, Columns (k) and (n) - Balance sheets of General Ledger - S.P. Co. - Atlantic Steamship Lines.
Lines 2 to 20 inclusive, Columns (c), (d), (f), and (g) - Table 8 of S.P. Co. Annual Report to Stockholders.

EXPLANATION: Line 1, Columns (e), (h), (k), and (n) represent investment in Atlantic Steamship Lines of S.P. Co.

IES, AS OF DECEMBER 31, 1931,
MES AND INVESTMENT IN OTHER LINES

Account 708 Cash			Account 716 Material and Supplies			Total Property Investment Including Cash and Material and Supplies Pacific Lines (Col. d+g+j+m) (o)
l per Reports i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	Total per Annual Reports (l)	On Hand by Pacific Lines (m)	On Hand by Other Lines (n)	
09 310 02	$18 607 718 93	$501 591 09	$24 516 356 70	$24 160 734 42	$355 622 28	$365 677 545 68
-	-	-	-	-	-	1 322 530 37
-	-	-	-	-	-	30 219 119 84
-	-	-	-	-	-	4 209 296 36
-	-	-	-	-	-	507 018 27
-	-	-	-	-	-	366 356 818 14
-	-	-	-	-	-	7 708 623 21
-	-	-	-	-	-	698 163 86
-	-	-	-	-	-	7 680 595 30
-	-	-	-	-	-	9 924 239 12
-	-	-	-	-	-	33 344 900 17
-	-	-	-	-	-	4 351 895 44
-	-	-	-	-	-	3 732 019 13
-	-	-	-	-	-	5 309 258 71
-	-	-	-	-	-	5 909 868 84
-	-	-	-	-	-	5 772 819 33
-	-	-	-	-	-	625 681 12
-	-	-	-	-	-	16 448 751 68
-	-	-	-	-	-	374 133 633 60
-	-	-	-	-	-	1 754 726 12
09 310 02	$18 607 718 93	$501 591 09	$24 516 356 70	$24 160 734 42	$355 622 28	$1 245 887 504 29

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SOUTHERN PACIFIC COMPANY

DETAILS OF TOTAL PROPERTY INVESTMENT, INCLUDING CASH AND MATERIAL AND SUPPLIES, AS OF DECEMBER 31, 1932,
WITH SEGREGATION THEREOF AS BETWEEN INVESTMENT IN LINES OPERATED AS PACIFIC LINES AND INVESTMENT IN OTHER LINES

Line No. (a)	Name of Company (b)	Account 701 Investment in Road and Equipment			Account 702 Improvements on Leased Railway Property			Account 708 Cash		
		Total per Annual Reports (c)	Invested in Pacific Lines (d)	Invested in Other Lines (e)	Total per Annual Reports (f)	Improvements by Pacific Lines (g)	Improvements by Other Lines (h)	Total per Annual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)
1	Southern Pacific Company	$332 111 040 44	$314 077 673 81	$18 033 366 63	$559 729 68	$416 892 53	$142 837 15	$13 891 559 16	$13 886 781 83	$4 77
2	Alamogordo & Sacramento Mountain Ry. Co.	1 360 330 37	1 360 330 37	-	-	-	-	-	-	-
3	Arizona Eastern R.R. Co.	30 316 799 94	30 316 799 94	-	2 885 75	2 885 75	-	-	-	-
4	Arizona and New Mexico Ry. Co.	4 235 899 08	4 235 899 08	-	-	-	-	-	-	-
5	Barro Mountain R.R. Co.	507 023 66	507 023 66	-	-	-	-	-	-	-
6	Central Pacific Ry. Co.	369 700 186 05	369 700 186 05	-	21 956 25	21 956 25	-	-	-	-
7	Dawson Ry. Co.	7 707 871 15	7 707 871 15	-	-	-	-	-	-	-
8	El Paso & Northeastern R.R. Co.	701 323 59	701 323 59	-	-	-	-	-	-	-
9	El Paso & Northeastern Ry. Co.	7 782 803 17	7 782 803 17	-	-	-	-	-	-	-
10	El Paso & Rock Island Ry. Co.	9 965 767 51	9 965 767 51	-	-	-	-	-	-	-
11	El Paso & Southwestern R.R. Co.	35 167 317 25	35 167 317 25	-	-	-	-	-	-	-
12	El Paso & Southwestern R.R. Co. of Texas	4 333 857 16	4 333 857 16	-	1 914 75	1 914 75	-	-	-	-
13	Inter-California Railway in California	3 719 655 66	3 719 655 66	-	-	-	-	-	-	-
14	Nevada-California-Oregon Ry.	5 563 907 55	5 563 907 55	-	-	-	-	-	-	-
15	New Mexico and Arizona R.R. Co.	5 915 972 88	5 915 972 88	-	-	-	-	-	-	-
16	Phoenix and Eastern R.R. Co.	5 777 332 87	5 777 332 87	-	-	-	-	-	-	-
17	Porterville Northeastern Ry. Co.	626 201 72	626 201 72	-	-	-	-	-	-	-
18	South Pacific Coast Ry.	16 505 160 81	16 505 160 81	-	-	-	-	-	-	-
19	Southern Pacific R. R. Co.	371 064 639 22	371 064 639 22	-	58 500 61	58 500 61	-	-	-	-
20	Tucson & Nogales R.R. Co.	1 756 507 84	1 756 507 84	-	-	-	-	-	-	-
21	Total	$1 214 819 597 92	$1 196 786 231 29	$18 033 366 63	$644 987 04	$502 149 89	$142 837 15	$13 891 559 16	$13 886 781 83	$4 77

SOURCE: Line 1, Columns (c), (f), (i), and (l) - Schedule 200A of Annual Report to Interstate Commerce Commission or Table 1 of Annual Report to Stockholders.
Line 1, Columns (d), (e), (g), (h), (j), and (m) - Balance sheets of General Ledger - S.P. Co.
Line 1, Columns (k) and (n) - Balance sheets of General Ledger - S.P. Co.-- Atlantic Steamship Lines.
Lines 2 to 20 inclusive, Columns (c), (d), (f), and (g) - Table 7 of S.P. Co. Annual Report to Stockholders.

EXPLANATION: Line 1, Columns (e), (h), (k), and (n) represent investment in Atlantic Steamship Lines of S.P. Co.

SUPPLIES, AS OF DECEMBER 31, 1932,
TIC LINES AND INVESTMENT IN OTHER LINES

Account 708 Cash			Account 716 Material and Supplies			Total Property Investment Including Cash and Material and Supplies Pacific Lines (Col. d+g+j+m) (o)
Total per Annual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	Total per Annual Reports (l)	On Hand by Pacific Lines (m)	On Hand by Other Lines (n)	
$13 891 559 16	$13 886 781 83	$4 777 33	$20 465 266 41	$20 235 392 83	$229 873 58	$348 616 741 00
-	-	-	-	-	-	1 360 330 37
-	-	-	-	-	-	30 319 685 69
-	-	-	-	-	-	4 235 899 08
-	-	-	-	-	-	507 023 66
-	-	-	-	-	-	369 722 142 30
-	-	-	-	-	-	7 707 871 15
-	-	-	-	-	-	701 323 59
-	-	-	-	-	-	7 782 803 17
-	-	-	-	-	-	9 965 767 51
-	-	-	-	-	-	35 167 317 25
-	-	-	-	-	-	4 335 771 91
-	-	-	-	-	-	3 719 655 66
-	-	-	-	-	-	5 563 907 55
-	-	-	-	-	-	5 915 972 88
-	-	-	-	-	-	5 777 332 87
-	-	-	-	-	-	626 201 72
-	-	-	-	-	-	16 505 160 81
-	-	-	-	-	-	371 123 139 83
-	-	-	-	-	-	1 756 507 84
$13 891 559 16	$13 886 781 83	$4 777 33	$20 465 266 41	$20 235 392 83	$229 873 58	$1 231 410 555 84

olders.

SOUTHERN PACIFIC COMPANY

DETAILS OF TOTAL PROPERTY INVESTMENT, INCLUDING CASH AND MATERIAL AND SUPPLIES, AS OF DECEMBER 31, 1933,
WITH SEGREGATION THEREOF AS BETWEEN INVESTMENT IN LINES OPERATED AS PACIFIC LINES AND INVESTMENT IN OTHER LINES

Name of Company (b)	Account 701 Investment in Road and Equipment			Account 702 Improvements on Leased Railway Property			Account 708 Cash		
	Total per Annual Reports (c)	Invested in Pacific Lines (d)	Invested in Other Lines (e)	Total per Annual Reports (f)	Improvements by Pacific Lines (g)	Improvements by Other Lines (h)	Total per Annual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)
Southern Pacific Company	$331 835 957 03	$313 828 144 67	$18 007 812 36	$208 883 50	$64 447 18	$144 436 32	$19 220 605 79	$19 210 979 82	$9 625 97
Alamogordo & Sacramento Mountain Ry. Co.	1 362 209 84	1 362 209 84	-	-	-	-	-	-	-
Arizona Eastern R.R. Co.	29 894 631 43	29 894 631 43	-	2 885 75	2 885 75	-	-	-	-
Arizona and New Mexico Ry. Co.	3 550 032 47	3 550 032 47	-	-	-	-	-	-	-
Burro Mountain R.R. Co.	506 695 24	506 695 24	-	-	-	-	-	-	-
Central Pacific Ry. Co.	369 776 297 46	369 776 297 46	-	31 343 79	31 343 79	-	-	-	-
Dawson Ry. Co.	7 716 004 44	7 716 004 44	-	-	-	-	-	-	-
El Paso & Northeastern R.R. Co.	723 408 71	723 408 71	-	-	-	-	-	-	-
El Paso & Northeastern Ry. Co.	7 789 589 75	7 789 589 75	-	-	-	-	-	-	-
El Paso & Rock Island Ry. Co.	9 985 066 92	9 985 066 92	-	-	-	-	-	-	-
El Paso & Southwestern R.R. Co.	34 548 387 66	34 548 387 66	-	-	-	-	-	-	-
El Paso & Southwestern R.R. Co. of Texas	4 330 277 36	4 330 277 36	-	1 914 75	1 914 75	-	-	-	-
Inter-California Railway in California	3 718 863 17	3 718 863 17	-	-	-	-	-	-	-
Nevada-California-Oregon Railway	5 585 740 04	5 585 740 04	-	-	-	-	-	-	-
New Mexico and Arizona R.R. Co.	5 922 766 33	5 922 766 33	-	-	-	-	-	-	-
Phoenix and Eastern R.R. Co.	5 775 756 83	5 775 756 83	-	-	-	-	-	-	-
Porterville Northeastern Ry. Co.	626 713 95	626 713 95	-	-	-	-	-	-	-
South Pacific Coast Ry. Co.	16 399 695 61	16 399 695 61	-	-	-	-	-	-	-
Southern Pacific R.R. Co.	369 892 906 50	369 892 906 50	-	58 465 27	58 465 27	-	-	-	-
Tucson & Nogales R.R. Co.	1 754 960 90	1 754 960 90	-	-	-	-	-	-	-
Total	$1 211 695 961 64	$1 193 688 149 28	$18 007 812 36	$303 493 06	$159 056 74	$144 436 32	$19 220 605 79	$19 210 979 82	$9 625 97

SOURCE: Line 1, Columns (c), (f), (i), and (l) - Schedule 200A of Annual Report to Interstate Commerce Commission or Table 1 of Annual Report to Stockholders.
Line 1, Columns (d), (e), (g), (h), (j), and (m) - Balance sheets of General Ledger - S.P. Co.
Line 1, Columns (k) and (n) - Balance sheets of General Ledger - S.P. Co. - Atlantic Steamship Lines.
Lines 2 to 20 inclusive, Columns (c), (d), (f), and (g) - Table 1 of S.P. Co. Annual Report to Stockholders.

EXPLANATION: Line 1, Columns (c), (h), (k), and (n) represent investment in Atlantic Steamship Lines of S.P. Co.

OF DECEMBER 31, 1933,
INVESTMENT IN OTHER LINES

	Account 708 Cash		Account 716 Material and Supplies			Total Property Investment Including Cash and Material and Supplies Pacific Lines (Col.d+g+j+m) (o)
s	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	Total per Annual Reports (l)	On Hand by Pacific Lines (m)	On Hand by Other Lines (n)	
79	$19 210 979 82	$9 625 97	$12 182 973 30	$11 895 146 33	$287 826 97	$344 998 718 00
	-	-	-	-	-	1 362 209 84
	-	-	-	-	-	29 897 517 18
	-	-	-	-	-	3 550 032 47
	-	-	-	-	-	506 695 24
	-	-	-	-	-	369 807 641 25
	-	-	-	-	-	7 716 004 44
	-	-	-	-	-	723 408 71
	-	-	-	-	-	7 789 589 75
	-	-	-	-	-	9 985 066 92
	-	-	-	-	-	34 548 387 66
	-	-	-	-	-	4 332 192 11
	-	-	-	-	-	3 718 863 17
	-	-	-	-	-	5 585 740 04
	-	-	-	-	-	5 922 766 33
	-	-	-	-	-	5 775 756 83
	-	-	-	-	-	626 713 95
	-	-	-	-	-	16 399 695 61
	-	-	-	-	-	369 951 371 77
	-	-	-	-	-	1 754 960 90
79	$19 210 979 82	$9 625 97	$12 182 973 30	$11 895 146 33	$287 826 97	$1 224 953 332 17

SOUTHERN PACIFIC COMPANY

DETAILS OF TOTAL PROPERTY INVESTMENT, INCLUDING CASH AND MATERIAL AND SUPPLIES, AS OF DECEMBER 31, 1934,
WITH SEGREGATION THEREOF AS BETWEEN INVESTMENT IN LINES OPERATED AS PACIFIC LINES AND INVESTMENT IN OTHER LINES

	Name of Company (b)	Account 701 Investment in Road and Equipment			Account 702 Improvements on Leased Railway Property			Account 708 Cash		
		Total per Annual Reports (c)	Invested in Pacific Lines (d)	Invested in Other Lines (e)	Total per Annual Reports (f)	Improvements by Pacific Lines (g)	Improvements by Other Lines (h)	Total per Annual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)
1	Southern Pacific Company	$333 315 907 89	$317 878 757 47	$15 437 150 42	$221 678 86	$59 943 70	$161 735 16	$25 754 124 49	$25 746 807 69	$7 316 8
2	Alamogordo & Sacramento Mountain Ry. Co.	1 351 055 42	1 351 055 42	-	-	-	-	-	-	-
3	Arizona Eastern R.R. Co.	29 615 814 33	29 615 814 33	-	2 885 75	2 885 75	-	-	-	-
4	Arizona and New Mexico Ry. Co.	3 277 772 28	3 277 772 28	-	-	-	-	-	-	-
5	Central Pacific Ry. Co.	367 876 877 72	367 876 877 72	-	21 780 18	21 780 18	-	-	-	-
6	Dawson Ry. Co.	7 713 971 20	7 713 971 20	-	-	-	-	-	-	-
7	El Paso & Northeastern R.R. Co.	724 347 62	724 347 62	-	-	-	-	-	-	-
8	El Paso & Northeastern Ry. Co.	7 732 369 77	7 732 369 77	-	-	-	-	-	-	-
9	El Paso & Rock Island Ry. Co.	10 006 022 44	10 006 022 44	-	-	-	-	-	-	-
10	El Paso & Southwestern R.R. Co.	34 334 963 21	34 334 963 21	-	-	-	-	-	-	-
11	El Paso & Southwestern R.R. Co. of Texas	4 342 052 66	4 342 052 66	-	1 914 75	1 914 75	-	-	-	-
12	Inter-California Railway in California	3 719 875 31	3 719 875 31	-	-	-	-	-	-	-
13	Nevada-California-Oregon Ry.	5 587 815 44	5 587 815 44	-	-	-	-	-	-	-
14	South Pacific Coast Ry. Co.	15 812 296 48	15 812 296 48	-	-	-	-	-	-	-
15	Southern Pacific R.R. Co.	371 057 623 08	371 057 623 08	-	56 107 28	56 107 28	-	-	-	-
16	Total	$1 196 468 364 85	$1 181 031 214 43	$15 437 150 42	$304 366 82	$142 631 66	$161 735 16	$25 754 124 49	$25 746 807 69	$7 316 8

SOURCE: Line 1, Columns (c), (f), (i), and (l) - Schedule 2004 of Annual Report to Interstate Commerce Commission or Table 1 of Annual Report to Stockholders.
Line 1, Columns (d), (e), (g), (h), (j), and (m) - Balance sheets of General Ledger - S.P. Co.
Line 1, Columns (k) and (m) - Balance sheets of General Ledger - S.P. Co. - Atlantic Steamship Lines.
Lines 2 to 15 inclusive, Columns (c), (d), (f), and (g) - Table 1 of S.P. Co. Annual Report to Stockholders.

EXPLANATION: Line 1, Columns (e), (h), (k), and (m) represent investment in Atlantic Steamship Lines of S.P. Co.

AS OF DECEMBER 31, 1934,
AND INVESTMENT IN OTHER LINES

...per ...ports	Account 708 Cash: On Hand by Pacific Lines (j)	Account 708 Cash: On Hand by Other Lines (k)	Account 716 Material and Supplies: Total per Annual Reports (l)	Account 716 Material and Supplies: On Hand by Pacific Lines (m)	Account 716 Material and Supplies: On Hand by Other Lines (n)	Total Property Investment Including Cash and Material and Supplies Pacific Lines (Col. d+g+j+m) (o)
124 49	$25 746 807 69	$7 316 80	$12 684 824 38	$12 377 255 94	$307 568 44	$356 062 764 80
	-	-	-	-	-	1 351 055 42
	-	-	-	-	-	29 618 700 08
	-	-	-	-	-	3 277 772 28
	-	-	-	-	-	367 898 657 90
	-	-	-	-	-	7 713 571 20
	-	-	-	-	-	724 347 62
	-	-	-	-	-	7 732 369 77
	-	-	-	-	-	10 006 022 44
	-	-	-	-	-	34 334 963 21
	-	-	-	-	-	4 343 967 41
	-	-	-	-	-	3 719 875 31
	-	-	-	-	-	5 587 815 44
	-	-	-	-	-	15 812 296 48
	-	-	-	-	-	371 113 730 36
124 49	$25 746 807 69	$7 316 80	$12 684 824 38	$12 377 255 94	$307 568 44	$1 219 297 909 72

SOUTHERN PACIFIC COMPANY

DETAILS OF TOTAL PROPERTY INVESTMENT, INCLUDING CASH AND MATERIAL AND SUPPLIES, AS OF DECEMBER 31, 1935, WITH SEGREGATION THEREOF AS BETWEEN INVESTMENT IN LINES OPERATED AS PACIFIC LINES AND INVESTMENT IN OTHER LINES

Name of Company (b)	Account 701 Investment in Road and Equipment			Account 702 Improvements on Leased Railway Property			Account 708 Cash			Am
	Total per Annual Reports (c)	Invested in Pacific Lines (d)	Invested in Other Lines (e)	Total per Annual Reports (f)	Improvements by Pacific Lines (g)	Improvements by Other Lines (h)	Total per Annual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	
Southern Pacific Company	$332 579 370 56	$317 091 394 81	$15 487 975 75	$347 281 43	$186 654 86	$160 626 57	$25 826 693 71	$25 820 740 99	$5 952 72	$1
Alamogordo & Sacramento Mountain Ry. Co.	1 354 400 08	1 354 400 08	-	-	-	-	-	-	-	
Arizona Eastern R.R. Co.	28 970 264 24	28 970 264 24	-	2 885 75	2 885 75	-	-	-	-	
Central Pacific Ry. Co.	367 667 687 03	367 667 687 03	-	14 862 00	14 862 00	-	-	-	-	
Dawson Ry. Co.	7 703 909 54	7 703 909 54	-	-	-	-	-	-	-	
El Paso & Northeastern R.R. Co.	724 530 12	724 530 12	-	-	-	-	-	-	-	
El Paso & Northeastern Ry. Co.	7 742 171 68	7 742 171 68	-	-	-	-	-	-	-	
El Paso & Rock Island Ry. Co.	10 030 472 41	10 030 472 41	-	-	-	-	-	-	-	
El Paso & Southwestern R.R. Co.	37 091 949 67	37 091 949 67	-	-	-	-	-	-	-	
El Paso & Southwestern R.R. Co. of Texas	4 365 003 39	4 365 003 39	-	1 914 75	1 914 75	-	-	-	-	
Nevada-California-Oregon Railway	5 601 924 47	5 601 924 47	-	-	-	-	-	-	-	
South Pacific Coast Ry. Co.	15 997 052 20	15 997 052 20	-	-	-	-	-	-	-	
Southern Pacific R.R. Co.	370 632 523 88	370 632 523 88	-	55 666 22	55 666 22	-	-	-	-	
Total	$1 190 061 259 27	$1 174 573 283 52	$15 487 975 75	$422 610 15	$261 983 58	$160 626 57	$25 826 693 71	$25 820 740 99	$5 952 72	$1

SOURCE: Line 1, Columns (c), (f), (i), and (l) - Schedule 200A of Annual Report to Interstate Commerce Commission or Table 1 of Annual Report to Stockholders.
Line 1, Columns (d), (e), (g), (h), (j), and (m) - Balance sheets of General Ledger - S.P. Co.
Line 1, Columns (k) and (m) - Balance sheets of General Ledger - S.P. Co. - Atlantic Steamship Lines.
Lines 2 to 13 inclusive, Columns (c), (d), (f), and (g) - Table 1 of S.P. Co. Annual Report to Stockholders.

EXPLANATION: Line 1, Columns (c), (h), (k), and (m) represent investment in Atlantic Steamship Lines of S.P. Co.

PPLIES, AS OF DECEMBER 31, 1935,
LINES AND INVESTMENT IN OTHER LINES

Account 708 Cash			Account 716 Material and Supplies			Total Property Investment Including Cash and Material and Supplies Pacific Lines (Col. d+g+j+m) (o)
Total per Annual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	Total per Annual Reports (l)	On Hand by Pacific Lines (m)	On Hand by Other Lines (n)	
5 826 693 71	$25 820 740 99	$5 952 72	$11 771 102 91	$11 523 936 59	$247 166 32	$354 622 727 25
-	-	-	-	-	-	1 354 400 08
-	-	-	-	-	-	28 973 149 99
-	-	-	-	-	-	367 682 549 03
-	-	-	-	-	-	7 703 909 54
-	-	-	-	-	-	724 530 12
-	-	-	-	-	-	7 742 171 68
-	-	-	-	-	-	10 030 472 41
-	-	-	-	-	-	37 091 949 67
-	-	-	-	-	-	4 366 918 14
-	-	-	-	-	-	5 601 924 47
-	-	-	-	-	-	15 597 052 20
-	-	-	-	-	-	370 688 190 10
5 826 693 71	$25 820 740 99	$5 952 72	$11 771 102 91	$11 523 936 59	$247 166 32	$1 212 179 944 68

dars.

SOUTHERN PACIFIC COMPANY

DETAILS OF TOTAL PROPERTY INVESTMENT, INCLUDING CASH AND MATERIAL AND SUPPLIES, AS OF DECEMBER 31, 1936,
WITH SEGREGATION THEREOF AS BETWEEN INVESTMENT IN LINES OPERATED AS PACIFIC LINES AND INVESTMENT IN OTHER LINES

Name of Company (b)	Account 701 Investment in Road and Equipment			Account 702 Improvements on Leased Railway Property			Account 708 Cash			T Ann
	Total per Annual Reports (c)	Invested in Pacific Lines (d)	Invested in Other Lines (e)	Total per Annual Reports (f)	Improvements by Pacific Lines (g)	Improvements by Other Lines (h)	Total per Annual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	
outhern Pacific Company	$325 804 300 57	$310 391 111 86	$15 413 188 71	$348 428 91	$187 054 83	$161 374 08	$23 371 808 10	$23 353 088 06	$18 720 04	$11
lamogordo & Sacramento Mountain Ry. Co.	1 374 984 22	1 374 984 22	-	-	-	-	-	-	-	
risona Eastern R.R. Co.	28 997 225 47	28 997 225 47	-	2 885 75	2 885 75	-	-	-	-	
entral Pacific Ry. Co.	372 253 763 08	372 253 763 08	-	16 047 66	16 047 66	-	-	-	-	
umson Ry. Co.	7 675 034 23	7 675 034 23	-	-	-	-	-	-	-	
l Paso & Northeastern R.R. Co.	726 812 41	726 812 41	-	-	-	-	-	-	-	
l Paso & Northeastern Ry. Co.	7 710 288 53	7 710 288 53	-	-	-	-	-	-	-	
l Paso & Rock Island Ry. Co.	10 040 210 10	10 040 210 10	-	-	-	-	-	-	-	
l Paso & Southwestern R.R. Co.	37 872 796 34	37 872 796 34	-	-	-	-	-	-	-	
l Paso & Southwestern R.R. Co. of Texas	4 384 134 79	4 384 134 79	-	-	-	-	-	-	-	
vada-California-Oregon Ry.	5 607 976 78	5 607 976 78	-	1 914 75	1 914 75	-	-	-	-	
uth Pacific Coast Ry. Co.	15 615 005 54	15 615 005 54	-	-	-	-	-	-	-	
uthern Pacific R.R. Co.	369 773 314 96	369 773 314 96	-	55 651 64	55 651 64	-	-	-	-	
Total	$1 187 835 847 02	$1 172 422 658 31	$15 413 188 71	$424 928 71	$263 554 63	$161 374 08	$23 371 808 10	$23 353 088 06	$18 720 04	$11

URCE: Line 1, Columns (c), (f), (i), and (l) - Schedule 200A of Annual Report to Interstate Commerce Commission or Table 1 of Annual Report to Stockholders.
Line 1, Columns (d), (e), (g), (h), (j), and (m) - Balance sheets of General Ledger - S.P. Co.
Line 1, Columns (k) and (n) - Balance sheets of General Ledger - S.P. Co. - Atlantic Steamship Lines.
Lines 2 [illegible]3 inclusive, Columns (e), (d), (f), and (g) - Table 1 of S.P. Co. Annual Report to Stockholders.

PLANATION: Line 1, Columns (e), (h), (k), and (n) represent investment in Atlantic Steamship Lines of S.P. Co.

PPLIES, AS OF DECEMBER 31, 1936,
LINES AND INVESTMENT IN OTHER LINES

Account 708 Cash			Account 716 Material and Supplies			Total Property Investment Including Cash and Material and Supplies Pacific Lines (Col. d+g+j+m) (o)
Total per nual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	Total per Annual Reports (l)	On Hand by Pacific Lines (m)	On Hand by Other Lines (n)	
23 371 808 10	$23 353 088 06	$18 720 04	$11 920 064 10	$11 663 962 09	$256 102 01	$345 595 216 84
-	-	-	-	-	-	1 374 984 22
-	-	-	-	-	-	29 000 111 22
-	-	-	-	-	-	372 269 810 74
-	-	-	-	-	-	7 675 034 23
-	-	-	-	-	-	726 812 41
-	-	-	-	-	-	7 710 288 53
-	-	-	-	-	-	10 040 210 10
-	-	-	-	-	-	37 872 796 34
-	-	-	-	-	-	4 386 049 54
-	-	-	-	-	-	5 607 976 78
-	-	-	-	-	-	15 615 005 54
-	-	-	-	-	-	369 828 966 60
23 371 808 10	$23 353 088 06	$18 720 04	$11 920 064 10	$11 663 962 09	$256 102 01	$1 207 703 263 09

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SOUTHERN PACIFIC COMPANY

DETAILS OF TOTAL PROPERTY INVESTMENT, INCLUDING CASH AND MATERIAL AND SUPPLIES, AS OF DECEMBER 31, 1937,
WITH SEGREGATION THEREOF AS BETWEEN INVESTMENT IN LINES OPERATED AS PACIFIC LINES AND INVESTMENT IN OTHER LINES

Line No. (a)	Name of Company (b)	Account 701 Investment in Road and Equipment			Account 702 Improvements on Leased Railway Property			Account 706 Cash		
		Total per Annual Reports (c)	Invested in Pacific Lines (d)	Invested in Other Lines (e)	Total per Annual Reports (f)	Improvements by Pacific Lines (g)	Improvements by Other Lines (h)	Total per Annual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)
1	Southern Pacific Company	$353 606 389 06	$338 111 125 30	$15 495 263 76	$361-814 68	$199 969 78	$161 844 90	$5 212 073 80	$5 202 254 71	$9 819 0
2	Arizona Eastern R.R. Co.	29 091 852 16	29 091 852 16	-	2 885 75	2 885 75	-	-	-	-
3	Central Pacific Ry. Co.	374 625 395 22	374 625 395 22	-	16 289 96	16 289 96	-	-	-	-
4	Dawson Ry. Co.	7 682 281 93	7 682 281 93	-	-	-	-	-	-	-
5	El Paso & Rock Island Ry. Co.	10 061 989 75	10 061 989 75	-	-	-	-	-	-	-
6	El Paso & Southwestern R.R. Co.	46 745 386 69	46 745 386 69	-	-	-	-	-	-	-
7	El Paso & Southwestern R.R. Co. of Texas	5 224 248 09	5 224 248 09	-	1 914 75	1 914 75	-	-	-	-
8	Nevada-California-Oregon Ry.	5 602 002 64	5 602 002 64	-	-	-	-	-	-	-
9	Southern Pacific R.R. Co.	370 001 042 21	370 001 042 21	-	55 285 66	55 285 66	-	-	-	-
10	Total	$1 202 640 587 75	$1 187 145 323 99	$15 495 263 76	$438 190 80	$276 345 90	$161 844 90	$5 212 073 80	$5 202 254 71	$9 819 0

SOURCE: Line 1, Columns (c), (f), (i), and (l) - Schedule 200A of Annual Report to Interstate Commerce Commission or Table 1 of Annual Report to Stockholders.
Line 1, Columns (d), (e), (g), (h), (j), and (m) - Balance sheets of General Ledger - S.P. Co.
Line 1, Columns (k) and (n) - Balance sheets of General Ledger - S.P. Co. - Atlantic Steamship Lines.
Lines 2 to 9 inclusive, Columns (c), (d), (f), and (g) - Table 1 of S.P. Co. Annual Report to Stockholders.

EXPLANATION: Line 1, Columns (e), (h), (k), and (n) represent investment in Atlantic Steamship Lines of S.P. Co.

LIES, AS OF DECEMBER 31, 1937,
NES AND INVESTMENT IN OTHER LINES

Account 708 Cash			Account 716 Material and Supplies			Total Property Investment Including Cash and Material and Supplies Pacific Lines (Col. d+g+j+n)
al per 1 Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	Total per Annual Reports (l)	On Hand by Pacific Lines (m)	On Hand by Other Lines (n)	(o)
212 073 80	$5 202 254 71	$9 819 09	$14 070 332 81	$13 765 385 64	$304 947 17	$357 278 735 43
-	-	-	-	-	-	29 094 737 91
-	-	-	-	-	-	374 641 685 18
-	-	-	-	-	-	7 682 281 93
-	-	-	-	-	-	10 061 989 75
-	-	-	-	-	-	46 745 386 69
-	-	-	-	-	-	5 226 162 84
-	-	-	-	-	-	5 602 002 64
-	-	-	-	-	-	370 056 327 87
212 073 80	$5 202 254 71	$9 819 09	$14 070 332 81	$13 765 385 64	$304 947 17	$1 286 389 310 24

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SOUTHERN PACIFIC COMPANY

DETAILS OF TOTAL PROPERTY INVESTMENT, INCLUDING CASH AND MATERIAL AND SUPPLIES, AS OF DECEMBER 31, 1938,
WITH SEGREGATION THEREOF AS BETWEEN INVESTMENT IN LINES OPERATED AS PACIFIC LINES AND INVESTMENT IN OTHER LINES

Line No. (a)	Name of Company (b)	Account 701 Investment in Road and Equipment			Account 702 Improvements on Leased Railway Property			Account 708 Cash		
		Total per Annual Reports (c)	Invested in Pacific Lines (d)	Invested in Other Lines (e)	Total per Annual Reports (f)	Improvements by Pacific Lines (g)	Improvements by Other Lines (h)	Total per Annual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)
1	Southern Pacific Company	$951 298 972 74	$335 693 525 47	$15 505 446 27	$361 962 03	$200 117 13	$161 844 90	$18 561 625 45	$18 537 535 67	$24 089 78
2	Arizona Eastern R.R. Co.	29 156 615 58	29 156 615 58	-	2 885 75	2 885 75	-	-	-	-
3	Central Pacific Ry. Co.	374 696 514 38	374 696 514 38	-	5 180 03	5 180 03	-	-	-	-
4	Dawson Ry. Co.	7 675 260 85	7 675 260 85	-	-	-	-	-	-	-
5	El Paso & Rock Island Ry. Co.	10 073 880 41	10 073 880 41	-	-	-	-	-	-	-
6	El Paso & Southwestern R.R. Co.	46 588 632 34	46 588 632 34	-	-	-	-	-	-	-
7	El Paso & Southwestern R.R. Co. of Texas	5 219 486 49	5 219 486 49	-	1 914 75	1 914 75	-	-	-	-
8	Nevada-California-Oregon Ry.	5 616 319 97	5 616 319 97	-	-	-	-	-	-	-
9	Southern Pacific R.R. Co.	370 708 255 23	370 708 255 23	-	55 285 83	55 285 83	-	-	-	-
10	Total	$1 200 893 936 99	$1 185 388 490 72	$15 505 446 27	$427 228 39	$265 383 49	$161 844 90	$18 561 625 45	$18 537 535 67	$24 089 78

SOURCE: Line 1, Columns (c), (f), (i), and (l) - Schedule 200A of Annual Report to Interstate Commerce Commission or Table 2 of Annual Report to Stockholders.
Line 1, Columns (d), (e), (g), (h), (j), and (m) - Balance sheets of General Ledger - S.P. Co.
Line 1, Columns (k) and (m) - Balance sheets of General Ledger - S.P. Co. - Atlantic Steamship Lines.
Lines 2 to 9, inclusive, Columns (c), (d), (f), and (g) - Table 2 of S.P. Co. Annual Report to Stockholders.

EXPLANATION: Line 1, Columns (c), (h), (k), and (m) represent investment in Atlantic Steamship Lines of S.P. Co.

IPPLIES, AS OF DECEMBER 31, 1938,
LINES AND INVESTMENT IN OTHER LINES

Account 708 Cash			Account 716 Material and Supplies			Total Property Investment Including Cash and Material and Supplies Pacific Lines (Col. d+g+j+m) (o)
Total per nual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	Total per Annual Reports (l)	On Hand by Pacific Lines (m)	On Hand by Other Lines (n)	
18 561 625 45	$18 537 535 67	$24 089 78	$10 424 663 11	$10 232 571 70	$192 091 41	$364 663 749 97
-	-	-	-	-	-	29 159 501 33
-	-	-	-	-	-	374 661 694 41
-	-	-	-	-	-	7 675 260 85
-	-	-	-	-	-	10 073 880 41
-	-	-	-	-	-	46 588 632 34
-	-	-	-	-	-	5 221 401 24
-	-	-	-	-	-	5 616 319 97
-	-	-	-	-	-	370 763 [illegible] 06
18 561 625 45	$18 537 535 67	$24 089 78	$10 424 663 11	$10 232 571 70	$192 091 41	$1 214 423 981 58

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SOUTHERN PACIFIC COMPANY

DETAILS OF TOTAL PROPERTY INVESTMENT, INCLUDING CASH AND MATERIAL AND SUPPLIES, AS OF DECEMBER 31, 1939,
WITH SEGREGATION THEREOF AS BETWEEN INVESTMENT IN LINES OPERATED AS PACIFIC LINES AND INVESTMENT IN OTHER LINES

	Name of Company (b)	Account 701 Investment in Road and Equipment			Account 702 Improvements on Leased Railway Property			Account 706 Cash			
		Total per Annual Reports (c)	Invested in Pacific Lines (d)	Invested in Other Lines (e)	Total per Annual Reports (f)	Improvements by Pacific Lines (g)	Improvements by Other Lines (h)	Total per Annual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	To Annu
1	Southern Pacific Company	$348 350 321 67	$332 794 651 52	$15 555 670 15	$368 825 69	$201 235 31	$167 590 38	$24 927 852 48	$24 919 229 84	$8 622 64	$10
2	Arizona Eastern R.R. Co.	29 098 137 96	29 098 137 96	-	2 885 75	2 885 75	-	-	-	-	
3	Central Pacific Ry. Co.	375 240 337 13	375 240 337 13	-	6 358 47	6 358 47	-	-	-	-	
4	Dawson Ry. Co.	7 666 751 71	7 666 751 71	-	-	-	-	-	-	-	
5	El Paso & Rock Island Ry. Co.	10 116 744 32	10 116 744 32	-	-	-	-	-	-	-	
6	El Paso & Southwestern R.R. Co.	46 548 989 38	46 548 989 38	-	-	-	-	-	-	-	
7	El Paso & Southwestern R.R. Co. of Texas	5 307 726 63	5 307 726 63	-	1 914 75	1 914 75	-	-	-	-	
8	Nevada-California-Oregon Ry.	5 621 505 71	5 621 505 71	-	-	-	-	-	-	-	
9	Southern Pacific R.R. Co.	368 679 135 18	368 679 135 18	-	59 311 18	59 311 18	-	-	-	-	
10	Total	$1 196 629 649 69	$1 181 073 979 54	$15 555 670 15	$439 295 84	$271 705 46	$167 590 38	$24 927 852 48	$24 919 229 84	$8 622 64	$1

SOURCE: Line 1, Columns (c), (f), (i), and (l) - Schedule 200A of Annual Report to Interstate Commerce Commission or Table 2 of Annual Report to Stockholders.
Line 1, Columns (d), (e), (g), (h), (j), and (m) - Balance sheets of General Ledger - S.P. Co.
Line 1, Columns (k) and (n) - Balance sheets of General Ledger - S.P. Co. - Atlantic Steamship Lines.
Lines 2 to 9 inclusive, Columns (c), (d), (f), and (g) - Table 2 of S.P. Co. Annual Report to Stockholders.

EXPLANATION: Line 1, Columns (e), (h), (k), and (n) represent investment in Atlantic Steamship Lines of S.P. Co.

UPPLIES, AS OF DECEMBER 31, 1939,
C LINES AND INVESTMENT IN OTHER LINES

Account 708 Cash			Account 716 Material and Supplies			Total Property Investment Including Cash and Material and Supplies Pacific Lines (Col. d+g+j+m) (o)
Total per nual Reports (i)	On Hand by Pacific Lines (j)	On Hand by Other Lines (k)	Total per Annual Reports (l)	On Hand by Pacific Lines (m)	On Hand by Other Lines (n)	
24 927 852 48	$24 919 229 84	$8 622 64	$10 317 027 15	$10 040 215 63	$276 811 52	$367 955 332 30
-	-	-	-	-	-	29 101 023 71
-	-	-	-	-	-	375 246 695 60
-	-	-	-	-	-	7 666 751 71
-	-	-	-	-	-	10 116 744 32
-	-	-	-	-	-	46 548 989 38
-	-	-	-	-	-	5 309 641 38
-	-	-	-	-	-	5 621 505 71
-	-	-	-	-	-	368 738 446 36
24 927 852 48	$24 919 229 84	$8 622 64	$10 317 027 15	$10 040 215 63	$276 811 52	$1 216 305 130 47

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SOUTHERN PACIFIC TRANSPORTATION SYSTEM
(Including Southern Pacific Company-Pacific Lines, Southern Pacific Steamship Lines and Texas and New Orleans RR Co.)

INCOME ACCOUNT FOR THE CALENDAR YEARS 1925 TO 1939, INCLUSIVE

Item	1925	1926	1927	1928	1929	1930	1931
OPERATING INCOME							
1. Total railway operating revenues	$293 074 553	$298 800 998	$297 745 406	$300 104 028	$310 969 138	$258 758 129	$198 462 176
2. Total railway operating expenses	215 609 318	215 595 480	218 179 192	216 734 282	219 698 403	187 644 862	151 708 548
3. Net revenue from railway operations	$77 465 235	$83 205 518	$79 566 214	$83 369 825	$91 270 735	$71 113 267	$46 933 627
4. Railway tax accruals	21 275 282	21 476 811	21 213 512	21 525 426	22 263 607	19 241 663	17 056 835
5. Uncollectible railway revenues	95 349	80 823	132 126	75 568	72 990	82 580	61 348
6. Equipment and joint facility rents - Net Dr.	5 780 845	5 851 166	6 616 510	6 860 730	9 192 278	8 689 366	7 856 985
7. Net railway operating income	$50 313 759	$55 796 718	$51 604 068	$54 908 101	$59 741 860	$43 108 660	$21 964 459
OTHER INCOME							
8. Revenues from miscellaneous operations	-	-	-	-	$243 503	$575 100	$443 914
9. Other income	$12 299 443	$11 907 022	$13 057 275	$13 300 658	$17 852 215	18 824 282	17 289 607
10. Total other income	$12 299 443	$11 907 022	$13 057 275	$13 300 658	$18 095 718	$19 399 382	$17 933 521
11. Total income	$62 613 202	$67 703 740	$62 661 343	$68 208 759	$77 837 578	$62 508 042	$39 897 980
MISCELLANEOUS DEDUCTIONS FROM INCOME							
12. Expenses of miscellaneous operations	-	-	-	-	$223 903	$554 158	$621 038
13. Taxes on miscellaneous operating property	-	-	-	-	-	-	-
14. Other miscellaneous deductions from income	$1 146 038	$1 343 840	$1 301 181	$1 083 114	$1 733 957	1 668 678	1 552 046
15. Total miscellaneous deductions	$1 146 038	$1 343 840	$1 301 181	$1 083 114	$1 957 860	$2 222 836	$2 173 084
16. Income available for fixed charges	$61 467 164	$66 361 900	$61 360 162	$67 125 645	$75 879 718	$60 285 206	$37 724 896
FIXED CHARGES							
17. Interest on funded debt - Bonds and notes	$25 335 857	$27 034 924	$27 107 506	$27 380 647	$27 552 433	$28 816 753	$29 898 436
18. Other fixed charges	473 897	535 602	550 132	716 365	892 355	784 350	689 884
19. Total fixed charges	$25 809 754	$27 570 526	$27 657 638	$28 097 012	$28 444 788	$29 601 103	$30 586 320
20. Net income or deficit	$35 657 410	$38 791 374	$33 702 524	$39 028 633	$47 434 930	$30 684 103	$7 138 576
21. Number of times fixed charges earned (16 ÷ 19)	2.38	2.41	2.22	2.39	2.67	2.04	1.23
22. Dividends paid on capital stock of Southern Pacific Company	$22 342 854	$22 342 854	$22 342 854	$22 342 854	$22 342 871	$22 342 908	$20 480 999

Item	1932	1933	1934	1935	1936	1937	1938	1939
OPERATING INCOME								
1. Total railway operating revenues	$142 597 140	$129 860 962	$149 192 709	$163 381 512	$204 338 550	$225 016 912	$200 070 814	$217 572 889
2. Total railway operating expenses	115 202 961	102 374 151	113 579 816	123 898 159	148 233 849	172 912 676	157 246 669	159 441 623
3. Net revenue from railway operations	$27 394 179	$27 486 811	$35 613 493	$39 483 353	$56 104 701	$51 104 236	$42 824 145	$58 131 266
4. Railway tax accruals	14 768 413	12 435 776	12 274 874	12 035 942	12 092 093	16 998 747	17 930 065	18 092 562
5. Uncollectible railway revenues	53 599	146 181	Cr. 8 706	35 511	-	-	-	-
6. Equipment and joint facility rents - Net Dr.	6 563 650	5 847 860	6 343 447	7 892 020	9 925 928	11 489 208	10 597 077	11 610 296
7. Net railway operating income	$5 606 157	$9 057 074	$17 003 658	$20 319 880	$34 086 680	$22 616 281	$14 297 003	$28 428 410
OTHER INCOME								
8. Revenues from miscellaneous operations	$493 445	$425 561	$477 312	$561 330	$586 864	$256 095	$223 613	$181 279
9. Other income	20 635 954	18 389 909	15 752 956	13 639 659	12 234 973	10 984 222	11 952 500	9 979 187
10. Total other income	$21 129 599	$18 815 470	$16 230 268	$14 180 989	$12 821 837	$10 340 317	$11 276 113	$9 260 466
11. Total income	$26 735 756	$27 872 544	$33 233 926	$34 500 869	$46 908 517	$32 956 598	$25 572 116	$37 689 876
MISCELLANEOUS DEDUCTIONS FROM INCOME								
12. Expenses of miscellaneous operations	$495 996	$416 556	$455 665	$507 129	$566 243	$259 988	$220 151	$177 553
13. Taxes on miscellaneous operating property	-	-	976	14 423	16 274	7 300	6 600	5 180
14. Other miscellaneous deductions from income	1 346 537	1 564 517	1 363 378	1 054 185	1 245 218	1 236 022	1 455 378	1 366 558
15. Total miscellaneous deductions	$1 842 533	$1 981 073	$1 820 019	$1 575 737	$1 827 735	$1 496 310	$1 682 129	$1 547 211
16. Income available for fixed charges	$24 893 223	$25 891 471	$31 413 907	$32 925 132	$45 080 782	$31 460 288	$23 890 987	$36 141 665
FIXED CHARGES								
17. Interest on funded debt - Bonds and notes	$29 708 390	$29 516 168	$29 534 969	$29 287 668	$29 606 847	$30 821 047	$29 439 423	$29 211 572
18. Other fixed charges	964 504	1 346 234	1 478 797	1 291 474	972 604	652 448	1 290 278	792 749
19. Total fixed charges	$30 672 894	$30 862 402	$31 805 676	$30 578 542	$30 577 451	$30 703 495	$30 719 995	$30 007 291
20. Net income or deficit	∅ $5 779 671	∅ $4 970 931	$1 608 225	$2 346 590	$14 503 331	∅ 54 793	∅ $6 829 008	$6 134 374
21. Number of times fixed charges earned (16 ÷ 19)	.81	.84	1.01	1.08	1.47	1.02	.78	1.20
22. Dividends paid on capital stock of Southern Pacific Company	-	-	-	-	-	-	-	-

∅ Deficit.

SOURCE: Annual Reports of the Southern Pacific Company to Stockholders.

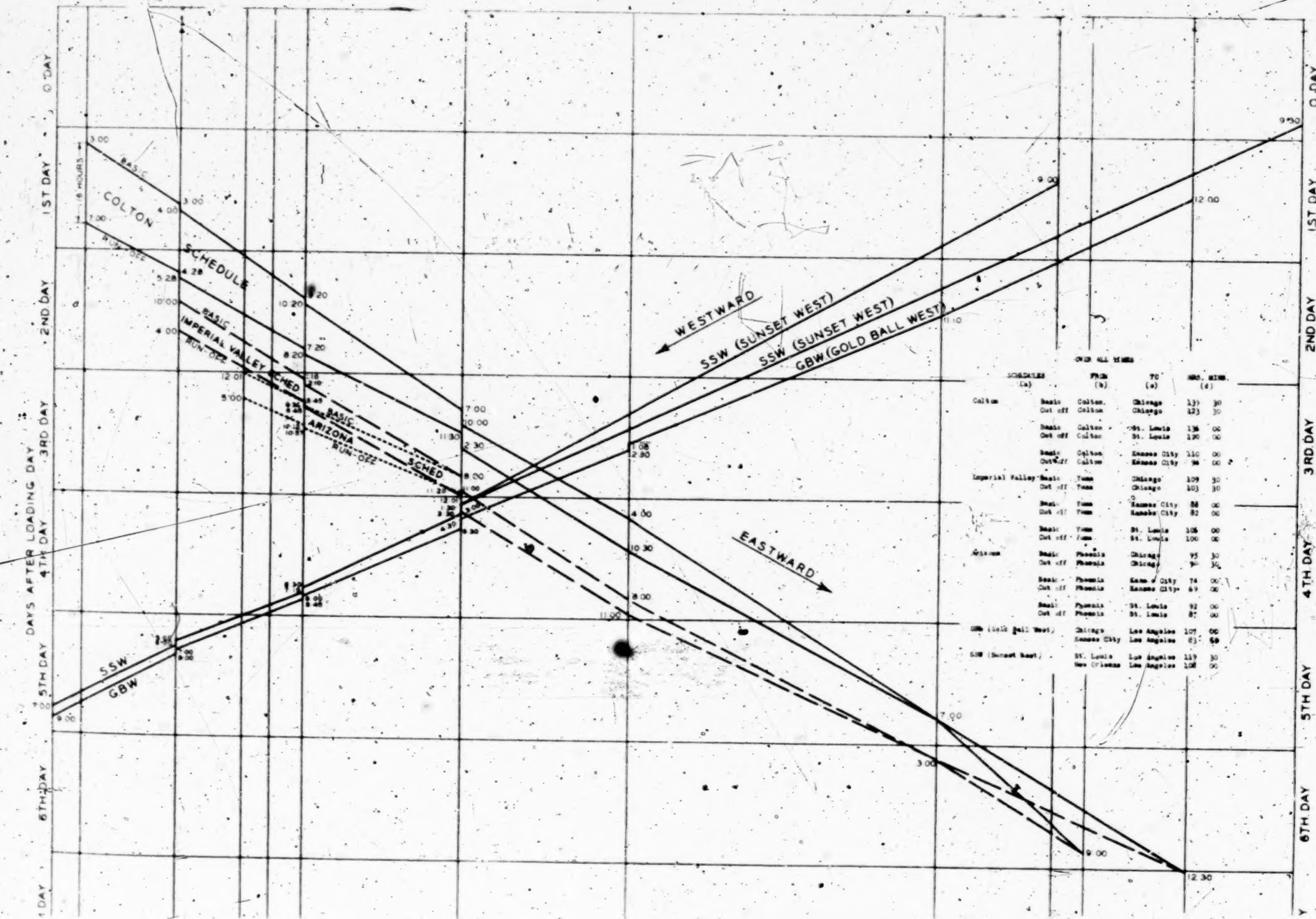
Defendant's Exhibit No. 174 (Witness Masson)
Jan. 15, 1941

SOUTHERN PACIFIC COMPANY

SUMMARY OF AUTHORIZATIONS GRANTED BY INTERSTATE COMMERCE COMMISSION UNDER SECTION 20a OF INTERSTATE COMMERCE ACT, TO ASSUME OBLIGATION AND LIABILITY IN RESPECT OF VARIOUS ISSUES OF EQUIPMENT TRUST CERTIFICATES

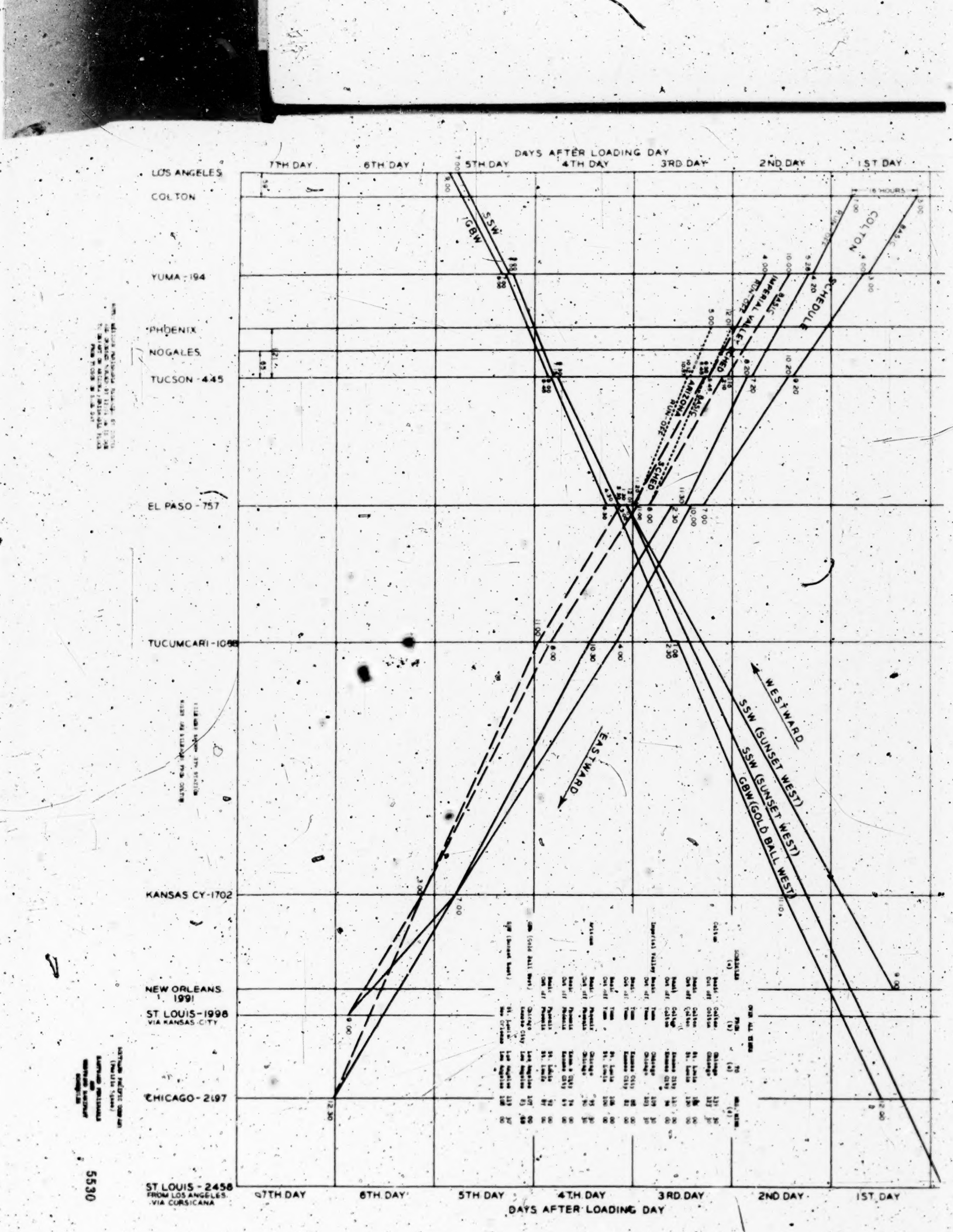
Trust		I.C.C. Finance Docket Number	Date of I.C.C. Order	I.C.C. Published Report Reference
Series (a)	Date (b)	(c)	(d)	(e)
F	Dec. 1, 1923	3331	Dec. 8, 1923	86-ICC-35
G	May 1, 1924	3589	May 14, 1924	90-ICC-45
H	June 1, 1925	4864	June 24, 1925	99-ICC-303
I	June 1, 1926	5506	May 24, 1926	111-ICC-255
J	July 1, 1927	6389	July 18, 1927	131-ICC-23
K	Aug. 1, 1928	7062	Aug. 14, 1928	145-ICC-305
L	June 1, 1929	7628	June 14, 1929	154-ICC-367
M	May 1, 1930	8216	May 14, 1930	162-ICC-602
N	Nov. 2, 1936	11391	Nov. 16, 1936	217-ICC-500
O	Mar. 1, 1937	11564	Mar. 12, 1937	221-ICC-167
P	Aug. 1, 1939	12481	Aug. 7, 1939	233-ICC-641
Q	Oct. 1, 1940	13032	Sept. 24, 1940	242-ICC-108

Defendant's Exhibit No. 176 (Witness Baker)
Jan. 15, 1941



OVER ALL TIMES

SCHEDULES (a)		FROM (b)	TO (c)	HRS. MINS. (d)	
Colton	Basic	Colton	Chicago	131	30
	Cut off	Colton	Chicago	123	30
	Basic	Colton	St. Louis	136	00
	Cut off	Colton	St. Louis	130	00
	Basic	Colton	Kansas City	110	00
	Cut off	Colton	Kansas City	96	00
Imperial Valley	Basic	Yuma	Chicago	109	30
	Cut off	Yuma	Chicago	103	30
	Basic	Yuma	Kansas City	88	00
	Cut off	Yuma	Kansas City	82	00
	Basic	Yuma	St. Louis	105	00
	Cut off	Yuma	St. Louis	100	00
Arizona	Basic	Phoenix	Chicago	95	30
	Cut off	Phoenix	Chicago	90	30
	Basic	Phoenix	Kansas City	74	00
	Cut off	Phoenix	Kansas City	69	00
	Basic	Phoenix	St. Louis	92	00
	Cut off	Phoenix	St. Louis	87	00
GBW (Gold Ball West)		Chicago	Los Angeles	107	00
		Kansas City	Los Angeles	83	00
SSW (Sunset West)		St. Louis	Los Angeles	117	30
		New Orleans	Los Angeles	108	00


DAYS AFTER LOADING DAY
7TH DAY
6TH DAY
5TH DAY
4TH DAY
3RD DAY
2ND DAY
1ST DAY
LOS ANGELES
COLTON
YUMA - 194
PHOENIX
NOGALES
TUCSON - 445
EL PASO - 757
TUCUMCARI - 1085
KANSAS CY - 1702
NEW ORLEANS 1991
ST LOUIS - 1998
VIA KANSAS CITY
CHICAGO - 2197
ST LOUIS - 2458
FROM LOS ANGELES
VIA CORSICANA
SSW
GBW
SCHED
IMPERIAL VALLEY
ARIZONA
COLTON
WESTWARD
EASTWARD
SSW (SUNSET WEST)
GBW (GOLD BALL WEST)
18 HOURS
5530

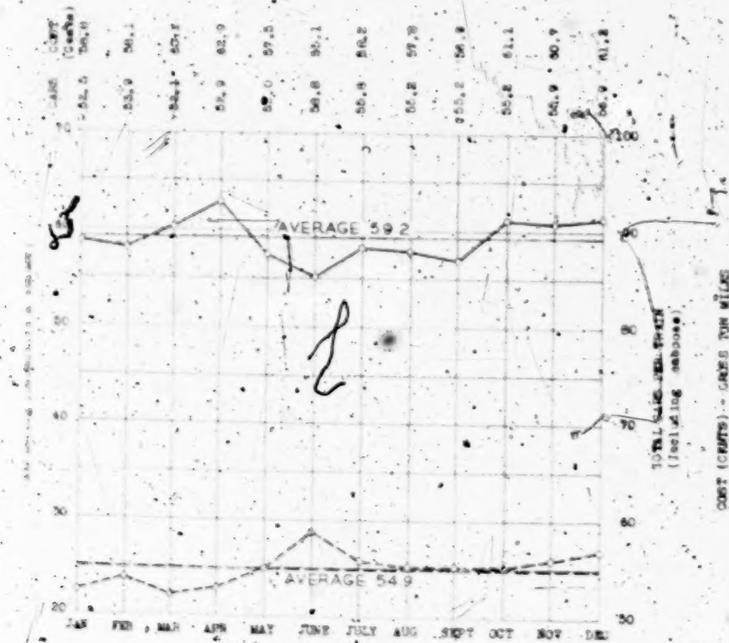
Defendant's Exhibit No. 177 (Witness Herbert)
Jan. 16, 1941

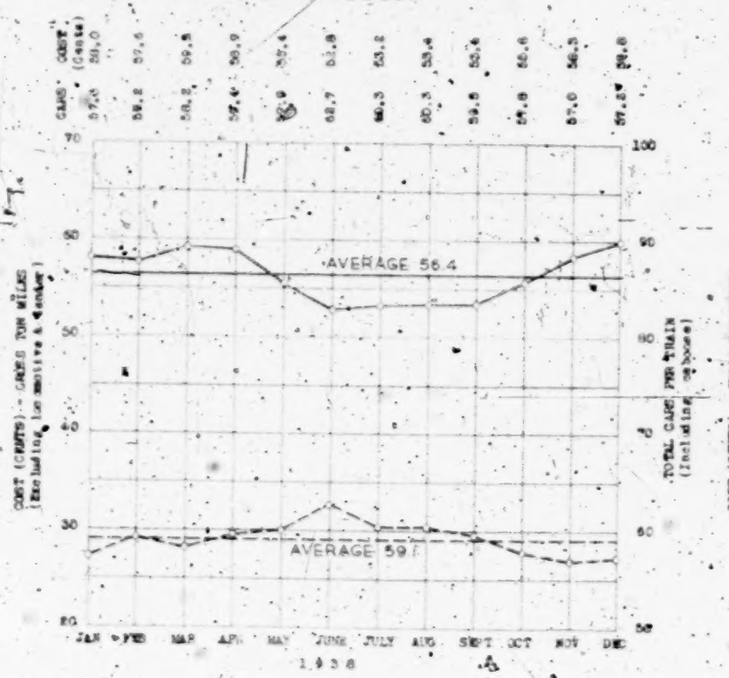
SOUTHERN PACIFIC COMPANY
(Pacific Lines)

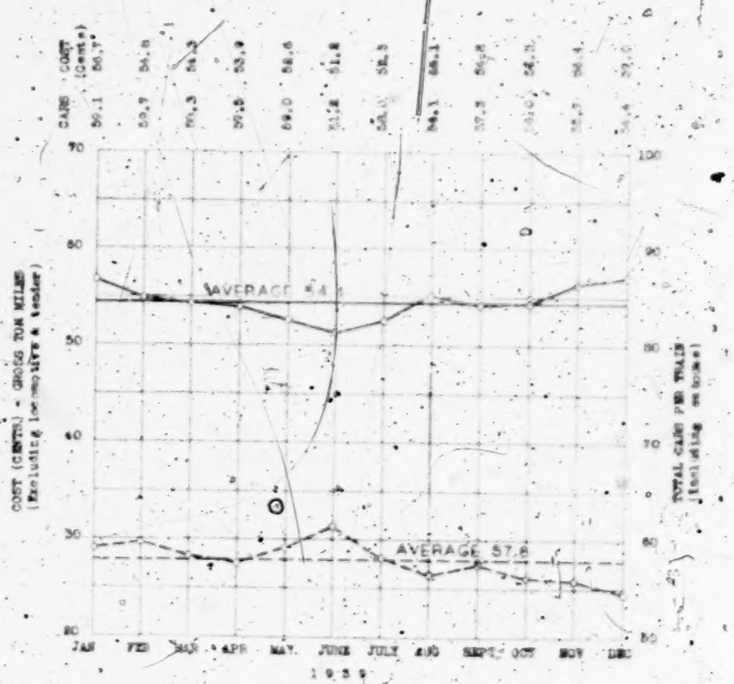
AVERAGE CARS PER FREIGHT TRAIN VERSUS
COST PER 1000 GROSS TON MILES
MAIN & BRANCH LINE - FORM 521 FREIGHT STATISTICS

TUCSON AND SALT LAKE DIVISIONS
FOR THE YEARS 1939, 1938 AND 1939

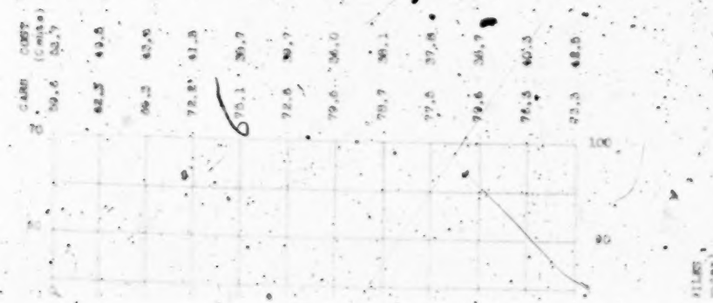
TUCSON DIVISION

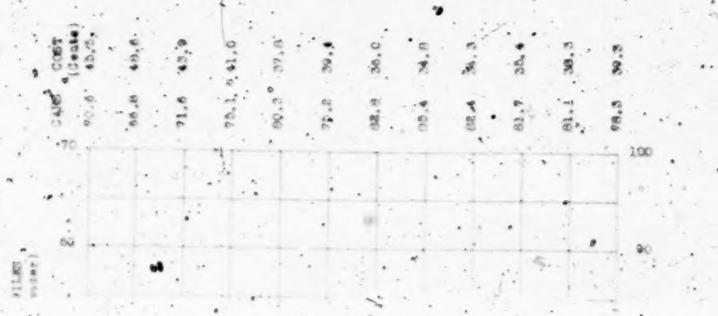


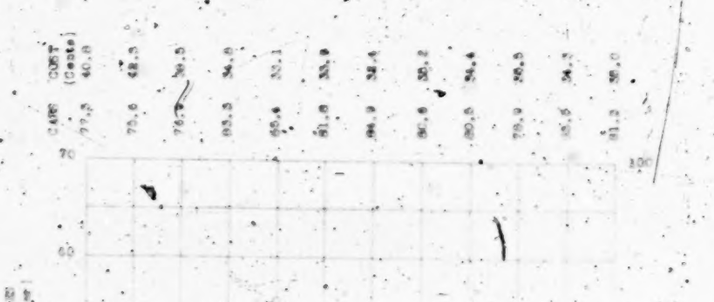




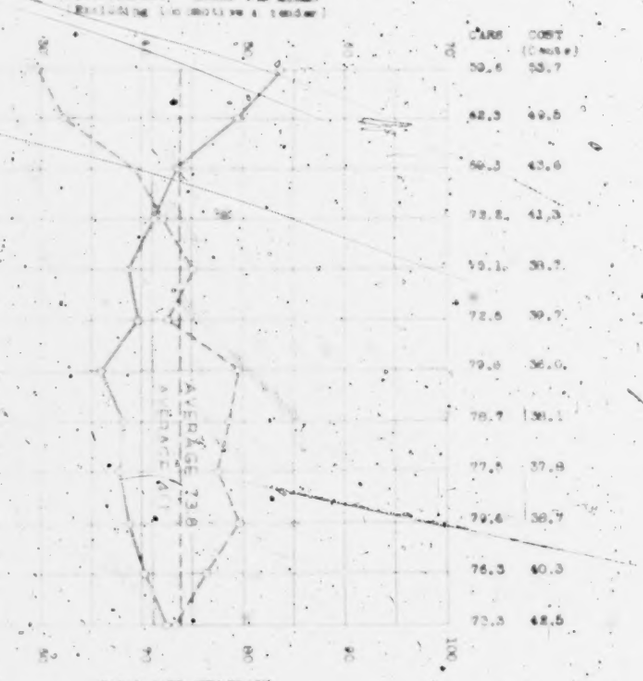
SALT LAKE DIVISION







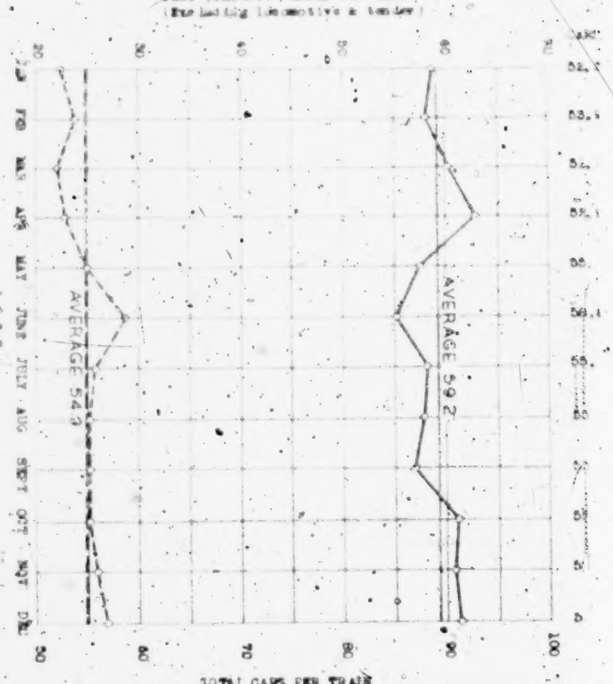
COST (CENTS) - GROSS TON MILES
(Excluding locomotive & tender)



CARS	COST (Cents)
59.6	53.7
62.3	49.8
59.3	43.6
73.8	41.3
73.1	38.7
72.6	39.7
79.6	36.0
78.7	38.1
77.5	37.8
79.6	38.7
76.3	40.3
73.3	42.5

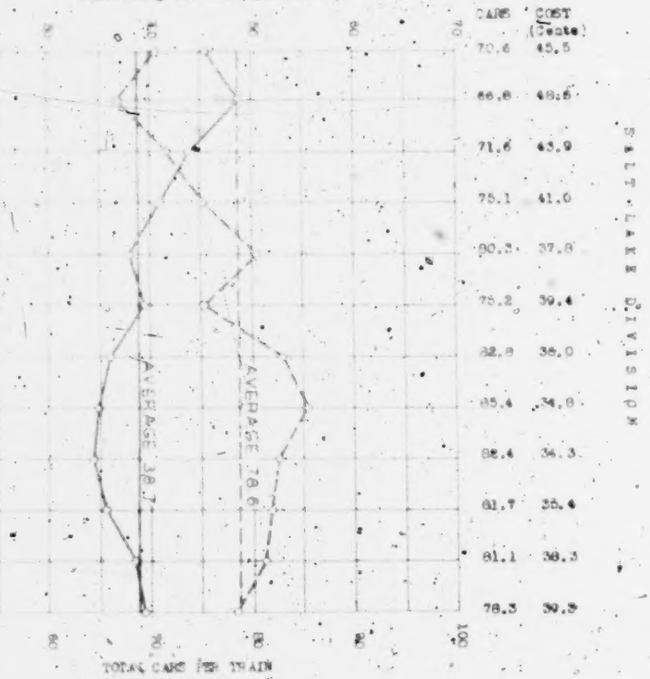
TOTAL CARS PER TRAIN
(Including caboose)

COST (CENTS) - GROSS TON MILES
(Excluding locomotive & tender)



TOTAL CARS PER TRAIN
(Including caboose)

COST (CENTS) - GROSS TON MILES
(Excluding locomotive & tender)

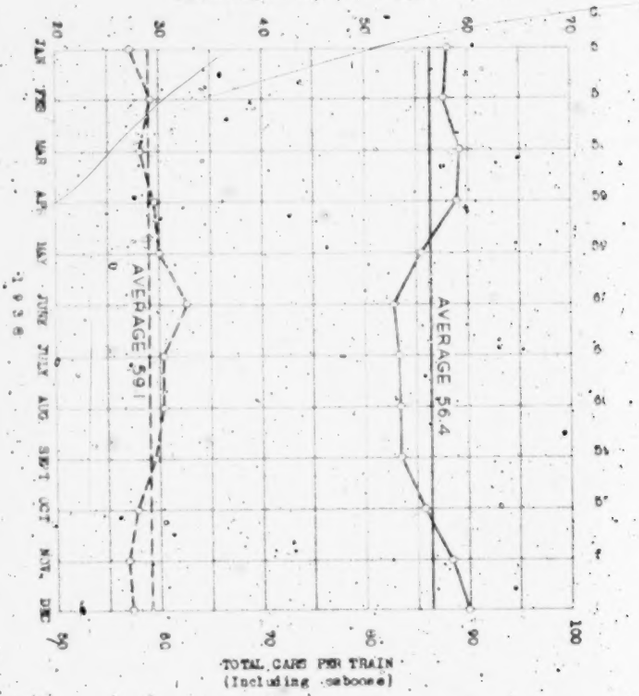


CARS	COST (Cents)
70.6	45.5
66.8	48.6
71.6	45.9
75.1	41.0
80.3	37.8
78.2	39.4
82.8	36.0
85.4	34.8
86.4	34.3
81.7	35.4
81.1	38.3
78.3	39.8

SALT LAKE DIVISION

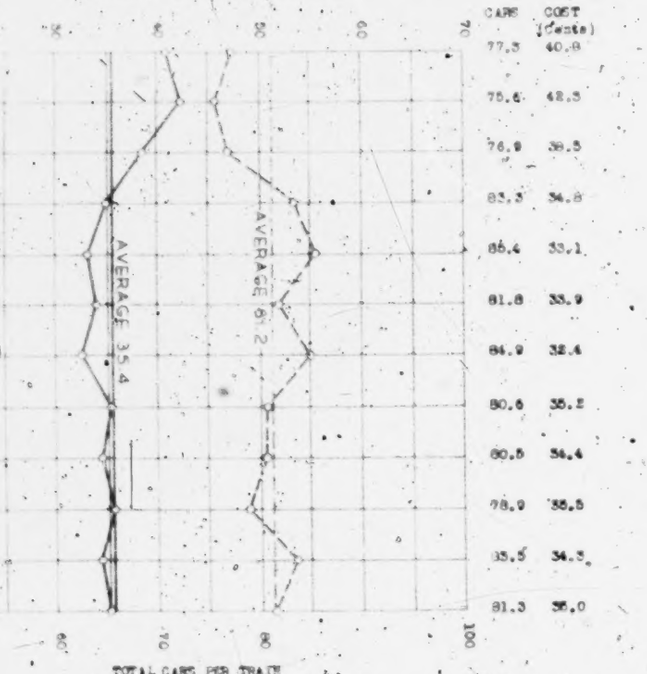
TOTAL CARS PER TRAIN
(Including caboose)

COST (CENTS) - GROSS TON MILES
(Excluding locomotive & tender)



TOTAL CARS PER TRAIN
(Including caboose)

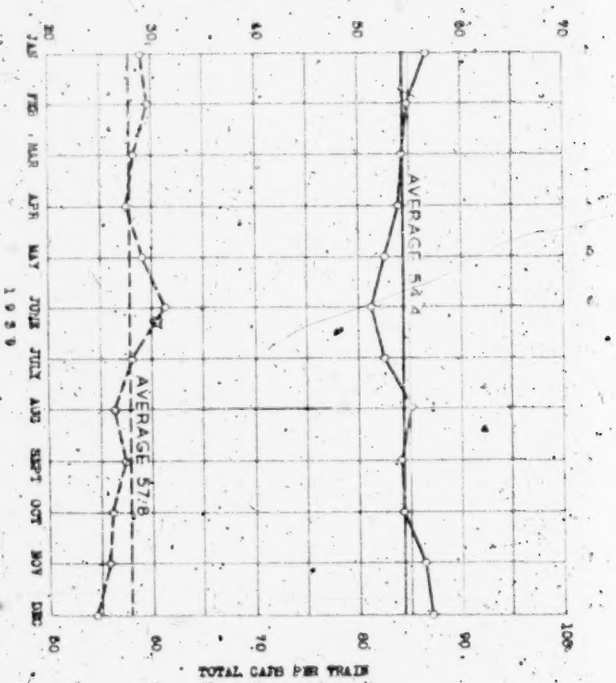
COST (CENTS) - GROSS TON MILES
(Excluding locomotive & tender)



CARS	COST (Cents)
77.3	40.8
75.6	42.3
76.9	39.5
83.3	34.8
86.4	33.1
81.8	33.9
84.9	32.4
80.6	35.2
80.5	34.4
78.9	35.5
85.5	34.3
81.3	35.0

TOTAL CARS PER TRAIN
(Including caboose)

COST (CENTS) - GROSS TON MILES
(Excluding locomotive & tender)

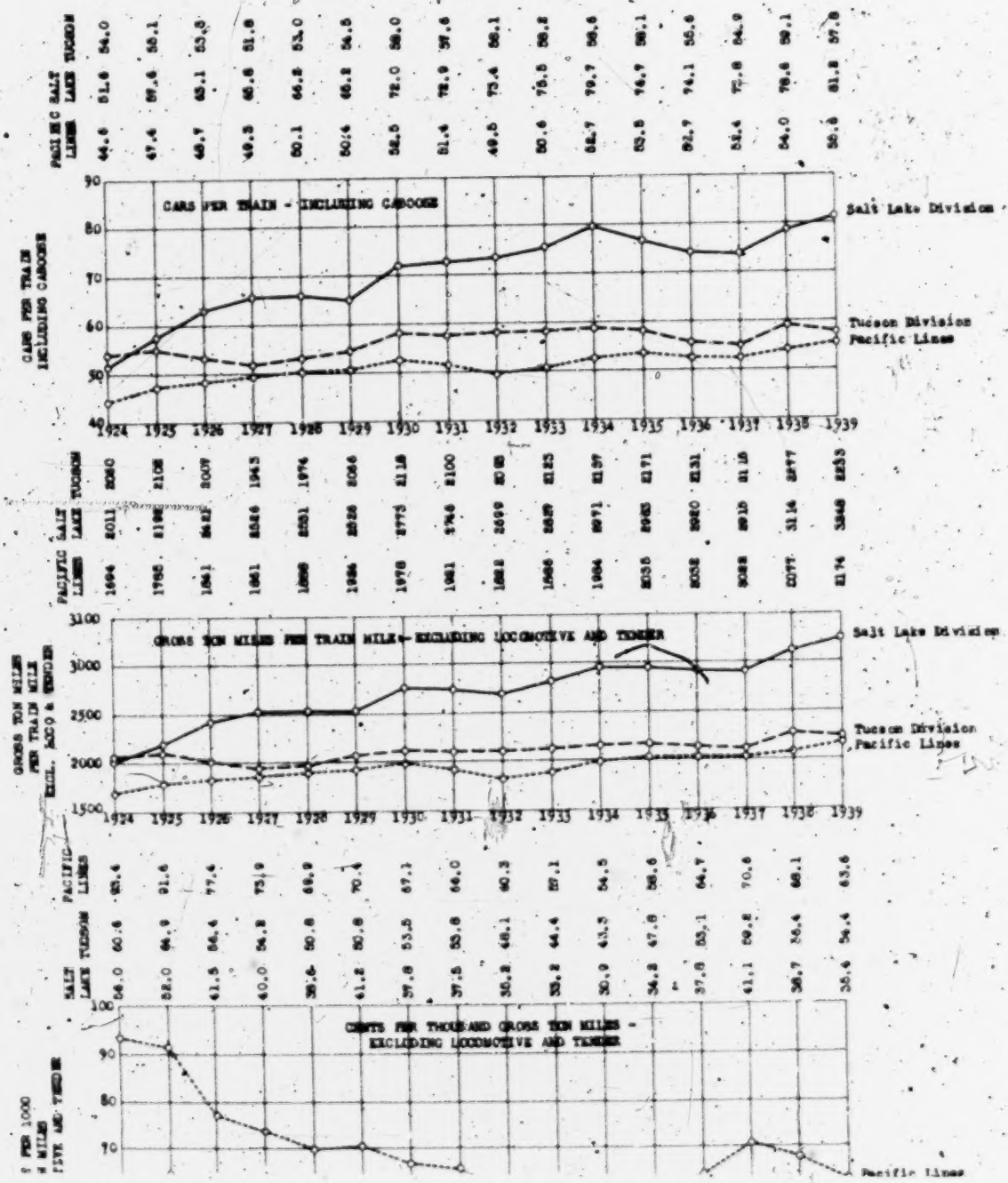


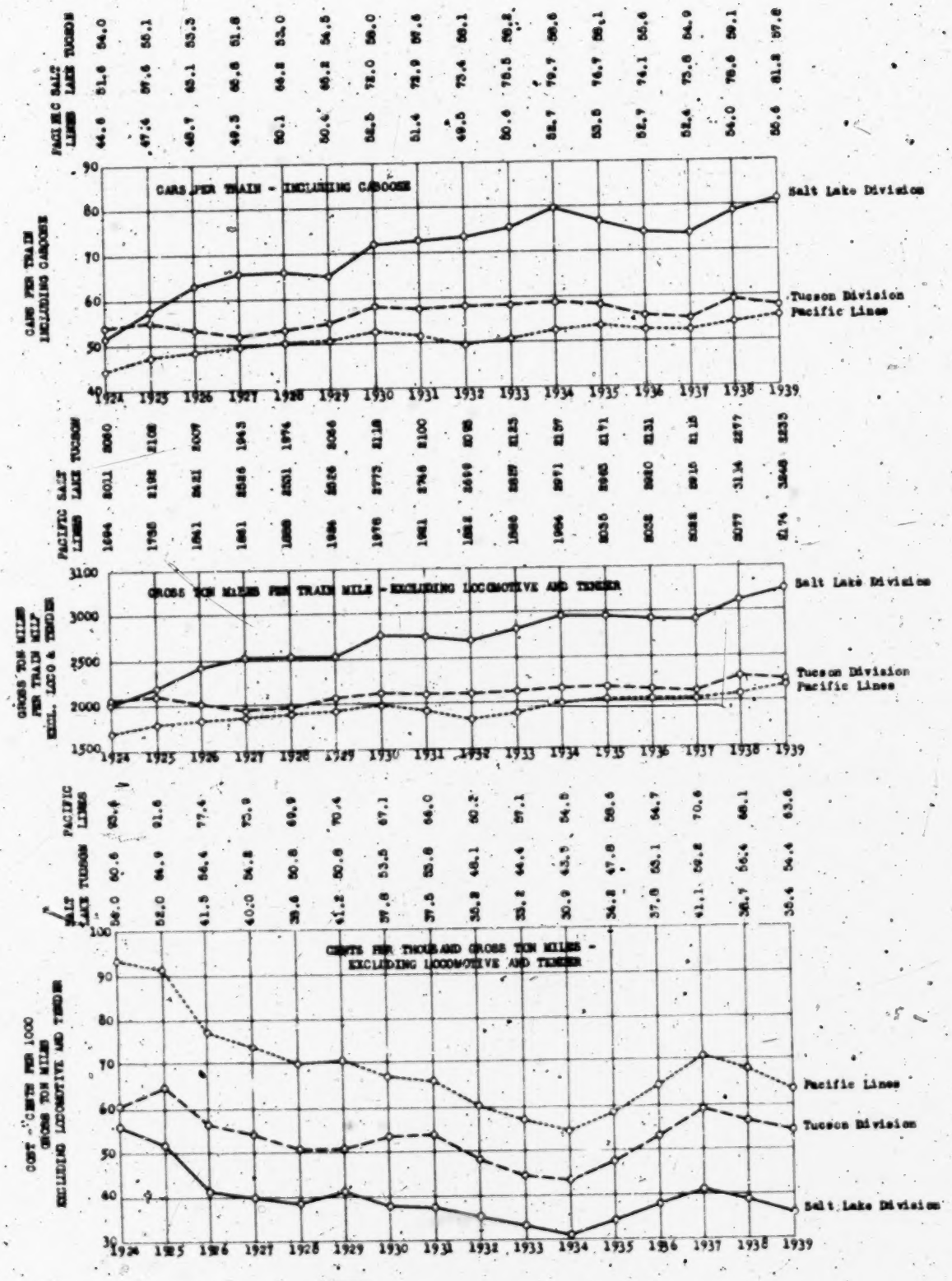
TOTAL CARS PER TRAIN
(Including caboose)

Defendant's Exhibit No. 178 (Witness Herbert)
Jan. 16, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

MAIN AND BRANCH LINE FREIGHT TRAIN COMPARISONS
TUCSON AND SALT LAKE DIVISIONS AND PACIFIC LINES
CARS PER TRAIN, GROSS TON MILES PER TRAIN MILE,
COST PER 1,000 GROSS TON MILES




CARS PER TRAIN - INCLUDING CABOOSE
CARS PER TRAIN INCLUDING CABOOSE
Salt Lake Division
Tucson Division
Pacific Lines
GROSS TON MILES PER TRAIN MILE - EXCLUDING LOCOMOTIVE AND TENDER
GROSS TON MILES PER TRAIN MILE EXCL. LOCO & TENDER
Salt Lake Division
Tucson Division
Pacific Lines
CENTS PER THOUSAND GROSS TON MILES - EXCLUDING LOCOMOTIVE AND TENDER
COST - CENTS PER 1000 GROSS TON MILES EXCLUDING LOCOMOTIVE AND TENDER
Pacific Lines
Tucson Division
Salt Lake Division
1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939
LEGEND
Tucson Division
Salt Lake Division
Southern Pacific (Pacific Lines)

Defendant's Exhibit No. 179 (Witness Herbert)
Jan. 16, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

COMPARISONS BETWEEN TUCSON DIVISION, PACIFIC LINES, AND SALT LAKE DIVISION SHOWING TRENDS IN FREIGHT TRAIN LENGTHS AND FREIGHT TRAIN LOADING, AND EFFECT ON OPERATING COSTS

	TOTAL PERCENTAGE CHANGE FOR TWO PERIODS 1924-25 TO 1928-29 AND 1930-31 TO 1938-39		
	TUCSON DIVISION. (a)	PACIFIC LINES (b)	SALT LAKE DIVISION (c)
Percentage increase in cars per train	D 0.43	14.73	30.61
Percentage increase in gross ton miles per train mile	3.95	18.70	35.42
Percentage decrease in cost (cents) per 1,000 gross ton miles	D 15.93	D 25.40	D 27.72

D - indicates decrease

SOURCE: Southern Pacific Company Forms 522 and 521

TUCSON DIVISION
MAIN AND BRANCH

YEAR (a)	TRAIN MILES (b)	CAR MILES (INCLUDING CABOOSE) (c)	GROSS TON MILES (EXCL. LOCOMOTIVE AND TENDER) (THOUSANDS) (d)	FREIGHT TRAIN COST (EXCL. LOCOMOTIVE REPAIRS) (e)	CARS PER TRAIN (f)	GROSS TON MILES PER TRAIN MILE (g)	COST (EXCL. LOCO. REPAIRS) PER 1000 GROSS TON MILES (EXCL. LOCOMOTIVE AND TENDER) (CENTS) (h)
1924	1,262,381	68,155,950	2,600,029	$1,575,618	54.0	2,060	60.6
1925	1,391,255	76,665,581	2,925,849	1,897,578	55.1	2,102	64.9
1926	1,611,795	88,919,165	3,235,642	1,824,902	53.3	2,007	56.4
1927	1,678,797	86,995,112	3,261,458	1,768,261	51.8	1,943	54.2
1928	1,675,049	88,703,729	3,307,074	1,679,850	53.(	1,974	50.8
1929	1,796,663	97,958,307	3,712,182	1,886,108	54.!	2,066	50.8
1930	2,125,339	123,148,586	4,496,375	2,404,388	58.(	2,118	53.5
1931	1,840,825	106,102,142	3,865,806	2,080,256	57.6	2,100	53.8
1932	1,564,586	90,835,368	3,274,761	1,573,257	58.1	2,093	48.1
1933	1,464,477	85,288,455	3,110,006	1,381,847	58.2	2,123	44.4
1934	1,680,188	98,411,317	3,684,314	1,568,500	58.6	2,157	43.3
1935	1,998,928	115,730,795	4,386,429	2,066,333	58.1	2,171	47.8
1936	2,356,102	131,108,594	5,020,317	2,663,455	55.6	2,131	53.1
1937	2,581,764	141,701,698	5,460,250	3,233,549	54.9	2,115	59.2
1938	2,199,250	129,999,600	5,007,078	2,825,336	59.1	2,277	56.4
1939	2,463,209	142,465,627	5,499,410	2,993,784	57.8	2,233	54.4
TOTAL 1924-25	2,653,636	144,821,531	5,525,878	$3,473,196	54.6	2,082	62.86
TOTAL 1929-29	3,471,712	186,662,034	7,019,254	$3,565,966	55.8	2,022	50.80
PER CENT CHANGE 2 YEARS 1924-25 COMPARED WITH 2 YEARS 1928-29					D 1.47	D 2.88	D 19.21
TOTAL 1930-31	3,964,164	229,250,727	8,362,181	$4,484,714	57.8	2,109	53.43
TOTAL 1938-39	4,662,459	272,465,227	10,506,488	$5,819,090	58.4	2,255	55.39
PER CENT CHANGE 2 YEARS 1930-31 COMPARED WITH 2 YEARS 1938-39					1.04	6.88	3.69
TOTAL PER CENT CHANGE FOR THE TWO PERIODS COMPARED					D 0.43	3.96	D 15.96

D - indicates decrease

PACIFIC LINES
MAIN AND BRANCH

YEAR (a)	TRAIN MILES (b)	CAR MILES (INCLUDING CABOOSE) (c)	GROSS TON MILES (EXCL. LOCOMOTIVE AND TENDER) (THOUSANDS) (d)	FREIGHT TRAIN COST (EXCL. LOCOMOTIVE REPAIRS) (e)	CARS PER TRAIN (f)	GROSS TON MILES PER TRAIN MILE (g)	COST (EXCL. LOCO. REPAIRS) PER 1000 GROSS TON MILES (EXCL. LOCOMOTIVE AND TENDER) (CENTS) (h)
1924	17,421,585	777,176,907	29,512,517	$27,584,691	44.6	1,694	93.4
1925	18,057,330	855,651,944	32,239,921	29,531,768	47.4	1,785	91.6
1926	18,337,924	893,269,657	33,754,671	28,126,115	48.7	1,841	77.4
1927	18,701,635	922,352,698	34,812,462	25,757,710	49.3	1,861	73.9
1928	19,454,353	974,681,918	36,736,421	25,665,485	50.1	1,888	69.9
1929	19,744,417	998,278,305	37,989,651	26,746,998	50.4	1,924	70.4
1930	16,873,073	865,135,380	33,367,924	22,377,450	52.5	1,978	67.1
1931	14,124,510	726,276,911	27,129,918	17,911,205	51.4	1,921	66.0
1932	12,352,250	611,317,532	22,509,048	13,571,063	49.5	1,822	60.3
1933	11,427,186	578,050,895	21,547,351	12,295,563	50.6	1,886	57.1
1934	13,082,480	669,298,323	25,953,989	14,154,932	52.7	1,984	54.5
1935	14,175,526	736,411,843	28,840,309	16,902,995	53.5	2,035	58.6
1936	17,507,446	923,782,455	35,579,016	23,027,747	52.7	2,032	64.7
1937	19,207,708	1,005,980,516	38,656,345	27,410,300	52.4	2,022	70.9
1938	16,119,057	870,462,516	33,644,736	22,928,422	54.0	2,077	68.1
1939	17,299,613	962,123,716	37,603,623	23,926,843	55.6	2,174	63.6
TOTAL 1924-25	35,478,915	1,632,828,871	61,752,438	$57,096,459	46.0	1,741	92.46
TOTAL 1928-29	39,198,770	1,969,960,223	74,726,072	$52,410,483	50.3	1,908	70.14
PER CENT CHANGE 2 YEARS 1924-25 COMPARED WITH 2 YEARS 1928-29					9.35	9.48	D 24.14
TOTAL 1930-31	30,997,583	1,611,412,291	60,497,842	$40,288,655	52.0	1,952	66.60
TOTAL 1938-39	33,418,670	1,832,586,232	71,248,359	$46,855,265	54.8	2,132	65.76
PER CENT CHANGE 2 YEARS 1930-31 COMPARED WITH 2 YEARS 1938-39					5.38	9.22	D 1.26
TOTAL PER CENT CHANGE FOR THE TWO PERIODS COMPARED					14.73	18.70	D 25.40

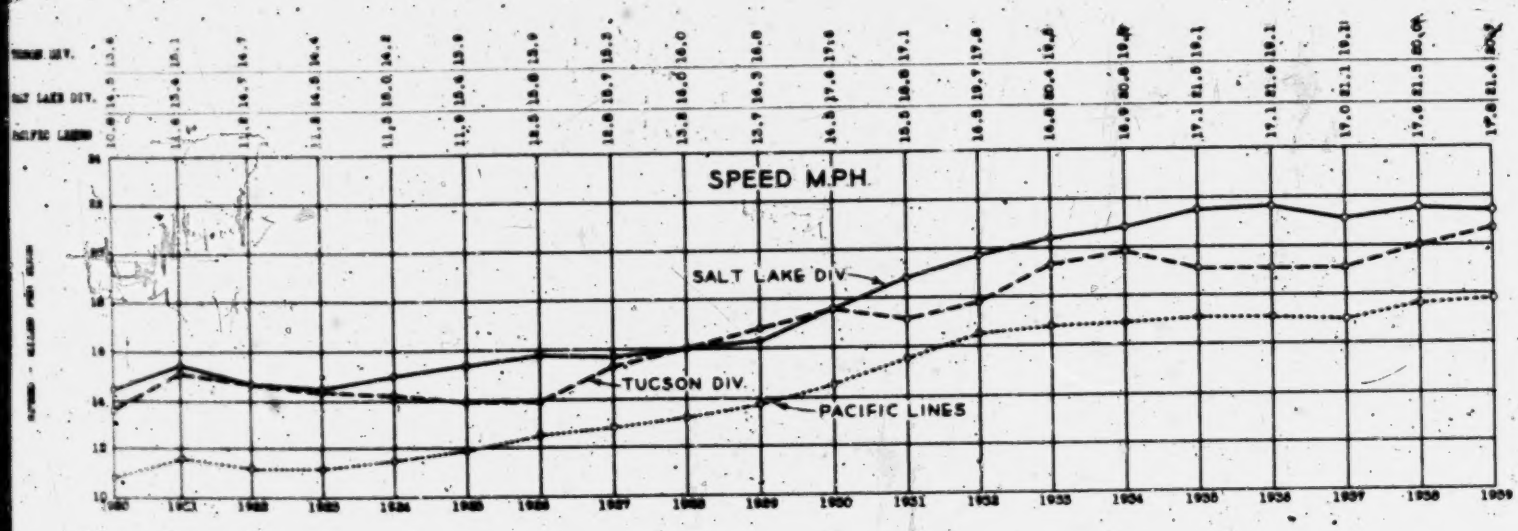
D - Indicates decrease

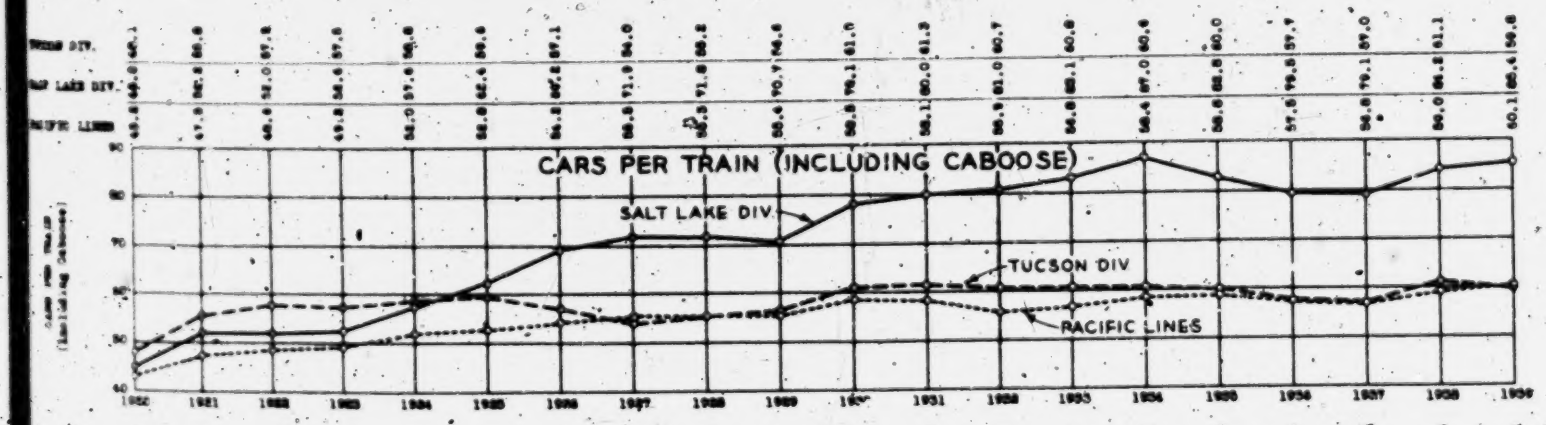
SALT LAKE DIVISION
MAIN AND BRANCH

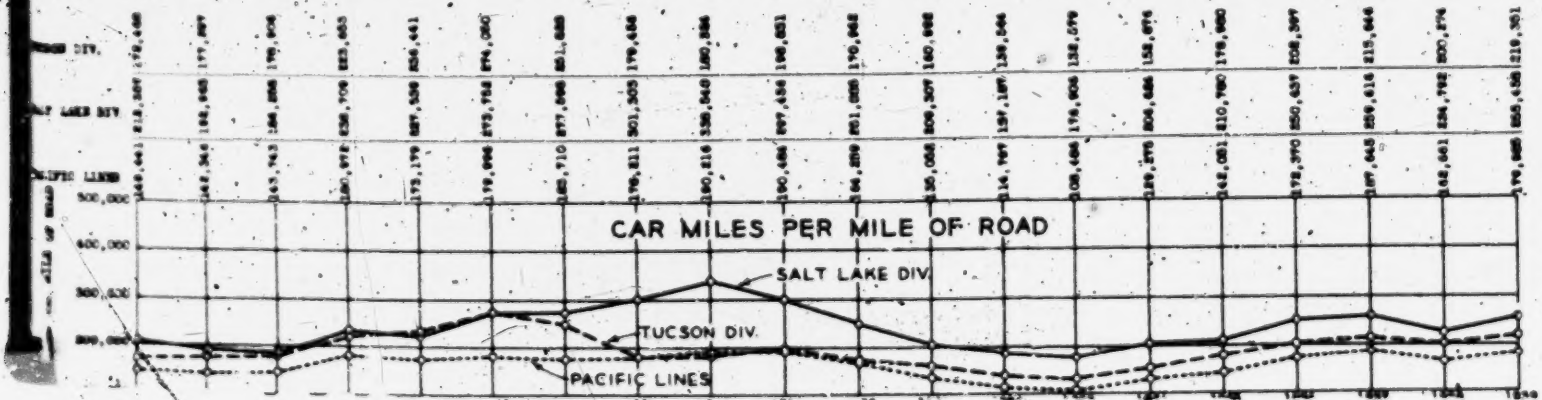
YEAR (a)	TRAIN MILES (b)	CAR MILES (INCLUDING CABOOSE) (c)	GROSS TON MILES (EXCL. LOCOMOTIVE AND TENDER) (THOUSANDS) (d)	FREIGHT TRAIN COST (EXCL. LOCOMOTIVE REPAIRS) (e)	CARS PER TRAIN (f)	GROSS TON MILES PER TRAIN MILE (g)	COST (EXCL. LOCO. REPAIRS) PER 1000 GROSS TON MILES (EXCL. LOCOMOTIVE AND TENDER) (CENTS) (h)
1924	2,512,265	129,683,119	5,052,658	$2,689,698	51.6	2,011	56.0
1925	2,687,730	134,684,285	5,891,284	3,065,468	57.6	2,192	52.0
1926	2,488,971	136,857,337	6,018,202	2,497,554	63.1	2,421	41.5
1927	2,582,291	139,857,362	6,580,017	2,605,566	65.8	2,526	40.0
1928	2,678,615	190,565,082	7,286,721	2,812,971	66.2	2,531	38.6
1929	2,843,361	186,381,383	8,180,618	2,961,350	65.2	2,526	41.2
1930	2,560,519	184,335,235	7,100,425	2,681,864	72.0	2,773	37.8
1931	2,104,885	155,386,367	5,777,372	2,167,941	72.9	2,746	37.5
1932	1,864,231	136,895,195	5,032,436	1,773,901	73.4	2,699	35.2
1933	1,712,262	129,886,939	4,841,197	1,606,381	75.5	2,827	33.2
1934	1,897,770	151,195,775	5,637,970	1,742,232	79.7	2,971	30.9
1935	2,010,254	154,861,995	5,955,649	2,056,739	76.7	2,963	34.2
1936	2,477,276	183,451,764	7,233,39[illegible]	2,731,950	74.1	2,920	37.8
1937	2,574,550	190,062,342	7,504,868	3,084,589	73.8	2,915	41.1
1938	2,087,211	164,148,112	6,500,398	2,516,297	78.6	3,114	38.7
1939	2,293,710	186,211,865	7,449,707	2,639,287	81.2	3,248	35.4
TOTAL 1924-25	5,199,995	264,567,404	10,943,942	$5,692,956	54.7	2,105	53.85
TOTAL 1928-29	5,721,976	375,946,665	14,467,339	5,774,321	65.7	2,528	39.91
PER CENT CHANGE 2 YEARS 1924-25 COMPARED WITH 2 YEARS 1928-29					20.11	20.10	D 25.89
TOTAL 1930-31	4,664,404	337,721,602	12,877,797	4,849,805	72.4	2,761	37.66
TOTAL 1938-39	4,380,921	350,359,977	13,950,105	5,157,584	80.0	3,184	36.97
PER CENT CHANGE 2 YEARS 1930-31 COMPARED WITH 2 YEARS 1938-39					10.50	15.32	D 1.83
TOTAL PER CENT CHANGE FOR THE TWO PERIODS COMPARED					30.61	35.42	D 27.72

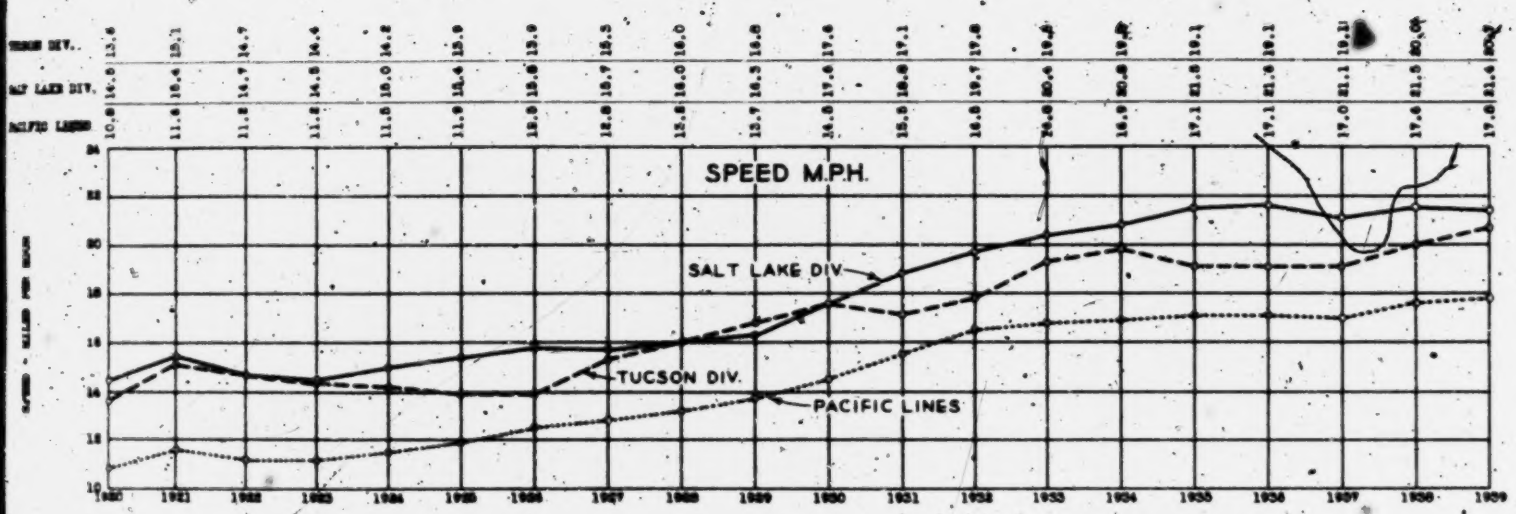
D - indicates decrease

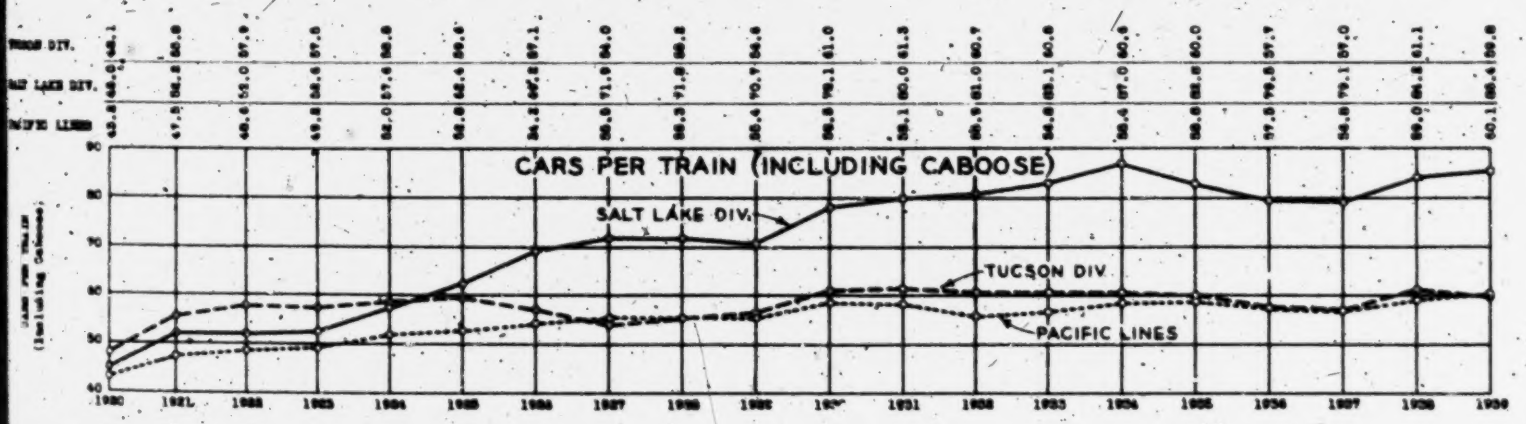
Defendant's Exhibit No. 180 (Witness Herbert)
Jan. 16, 1941

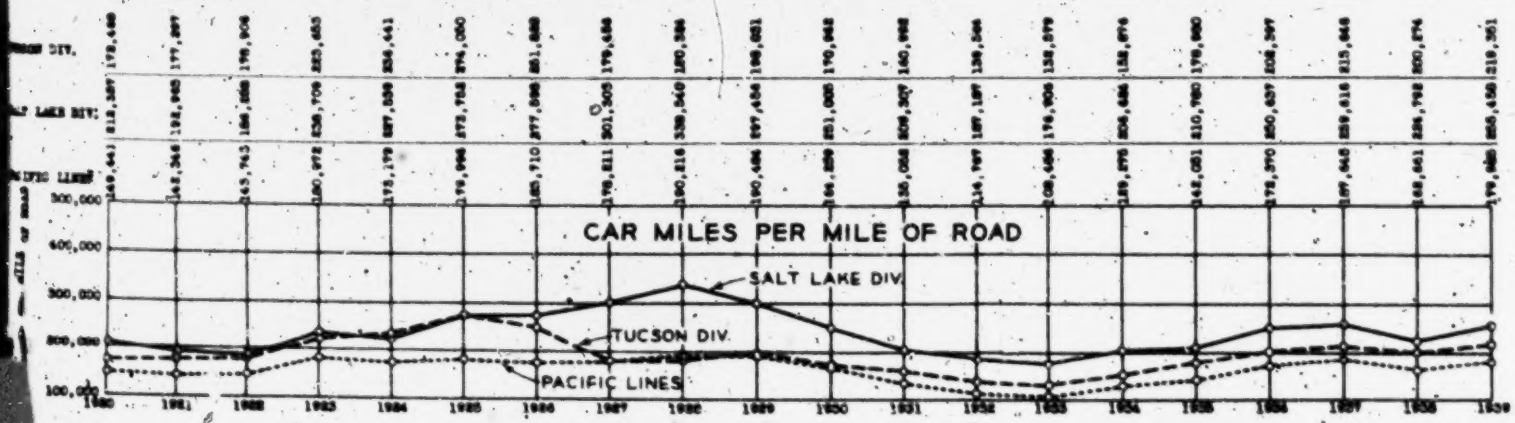












LEGEND

——— SALT LAKE DIVISION

– – – – TUCSON DIVISION

····· PACIFIC LINES

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

STATISTICS OF MAIN LINE OPERATIONS
TUCSON DIVISION COMPARED WITH SALT LAKE DIVISION AND PACIFIC LINES
YEARS 1920 - 1939, INCLUSIVE

Defendant's Exhibit No. 181 (Witness Herbert)
Jan. 16, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

COMPARISON BETWEEN SHORT TRAIN OPERATION ON TUCSON DIVISION AND LONG TRAIN OPERATION ON SALT LAKE DIVISION, SHOWING EXCESS TRAIN MILES CAUSED ON TUCSON DIVISION BY SHORT TRAIN OPERATION
MAIN LINE

LINE NO.	YEAR	TUCSON DIVISION			SALT LAKE DIVISION	COMPUTED TRAIN MILES USING TUCSON DIV. CAR MILES AND SALT LAKE DIV. CARS PER TRAIN. (**)	EXCESS TUCSON DIVISION TRAIN MILES OVER COMPUTED TRAIN MILES (***)
		CAR MILES INCL. CABOOSE	TRAIN MILES	CARS PER TRAIN (*)	CARS PER TRAIN		
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1	1925	70,785,335	1,187,963	59.6	62.4	1,134,380	53,583
2	1926	78,521,068	1,375,851	57.1	69.2	1,134,698	241,153
3	1927	82,769,233	1,533,873	54.0	71.9	1,151,172	382,701
4	1928	84,389,672	1,529,025	55.2	71.8	1,175,344	353,681
5	1929	93,150,393	1,645,009	56.6	70.7	1,317,544	327,465
6	1930	91,549,969	1,499,754	61.0	78.1	1,172,215	327,539
7	1931	101,312,121	1,651,998	61.3	80.0	1,266,402	385,596
8	1932	87,827,318	1,448,022	60.7	81.0	1,084,288	363,734
9	1933	83,432,264	1,371,917	60.8	83.1	1,003,998	367,919
10	1934	96,205,010	1,587,118	60.6	87.0	1,105,805	481,313
11	1935	112,632,020	1,875,348	60.0	82.8	1,360,290	515,058
12	1936	127,368,362	2,206,895	57.7	79.5	1,602,118	604,777
13	1937	135,706,296	2,379,510	57.0	79.1	1,715,630	663,880
14	1938	126,032,506	2,061,540	61.1	84.2	1,496,823	564,717
15	1939	138,037,358	2,308,080	59.8	85.4	1,616,363	691,717
16	TOTAL		25,661,903			19,337,070	6,324,833

(*) - (c) divided by (d)

(**) - (c) divided by (f)

TUCSON DIVISION BY SHORT TRAIN OPERATION
MAIN LINE

MINE NO.	YEAR	TUCSON DIVISION			SALT LAKE DIVISION CARS PER TRAIN	COMPUTED TRAIN MILES USING TUCSON DIV. CAR MILES AND SALT LAKE DIV. CARS PER TRAIN (**)	EXCESS TUCSON DIVISION TRAIN MILES OVER COMPUTED TRAIN MILES (***)
		CAR MILES INCL. CABOOSE	TRAIN MILES	CARS PER TRAIN (*)			
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
1	1925	70,785,335	1,187,963	59.6	62.4	1,134,380	53,583
2	1926	78,521,068	1,375,851	57.1	69.2	1,134,698	241,153
3	1927	82,769,233	1,533,873	54.0	71.9	1,151,172	382,701
4	1928	84,389,672	1,529,025	55.2	71.8	1,175,344	353,681
5	1929	93,150,393	1,645,009	56.6	70.7	1,317,544	327,465
6	1930	91,549,969	1,499,754	61.0	78.1	1,172,215	327,539
7	1931	101,312,121	1,651,998	61.3	80.0	1,266,402	385,596
8	1932	87,827,318	1,448,022	60.7	81.0	1,084,288	363,734
9	1933	83,432,264	1,371,917	60.8	83.1	1,003,998	367,919
10	1934	96,205,010	1,587,118	60.6	87.0	1,105,805	481,313
11	1935	112,632,020	1,875,348	60.0	82.8	1,360,290	515,058
12	1936	127,368,362	2,206,895	57.7	79.5	1,602,118	604,777
13	1937	135,706,296	2,379,510	57.0	79.1	1,715,630	663,880
14	1938	126,032,506	2,061,540	61.1	84.2	1,496,823	564,717
15	1939	138,037,358	2,308,080	59.8	85.4	1,616,363	691,717
16	TOTAL		25,661,903			19,337,070	6,324,833

(*) - (c) divided by (d)

(**) - (c) divided by (f)

(***) - (d) minus (g)

5538

Defendant's Exhibit No. 182 (Witness Sines)
Jan. 16, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)
YUMA, ARIZONA TO LORDSBURG, NEW MEXICO
LENGTH OF FREIGHT AND PASSENGER TRAINS
OPERATED DURING THE SIX MONTH PERIOD
JANUARY TO JUNE, 1918

FREIGHT TRAINS

	NO. OF TRAINS	CARS 60 & LESS	61-50	51-60	61-70	OVER 70	DETAIL OF TRAINS WITH CARS 61 - 75: 61-65	66	67	68	69	70	71	72	73	74	75
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)
YUMA-GILA																	
EAST	753	283	340	126	34	1	20	3	2	1	-	8	1	-	-	-	-
WEST	555	84	89	238	211	3	106	16	9	23	21	36	3	-	-	-	-
TOTAL	1,308	367	429	364	245	4	126	19	11	24	21	44	4	-	-	-	-
TUCSON-GILA																	
EAST	711	136	294	231	48	-	24	3	5	6	3	7	-	-	-	-	-
WEST	557	25	95	260	171	6	74	12	10	13	16	46	3	-	-	2	1
TOTAL	1,268	165	389	491	219	6	98	15	15	19	19	53	3	-	-	2	1
TUCSON-LORDSBURG																	
EAST	653	220	289	231	71	2	35	4	7	7	7	13	1	1	-	-	-
WEST	758	172	259	213	10	4	31	7	5	10	18	39	3	-	1	-	-
TOTAL	1,411	392	548	444	181	6	66	11	12	17	25	52	4	1	1	-	-
GRAND TOTAL	4,187	802	1,406	1,318	645	16	288	45	38	60	65	149	11	1	1	2	1
PER CENT OF TOTAL	100.00	19.15	33.59	31.48	15.40	0.38	6.88	1.07	0.91	1.43	1.55	3.56	0.27	0.02	0.02	0.05	0.02
							SUB-TOTAL 61-70 PER CENT 15.40						71-75 PER CENT				0.38

PASSENGER TRAINS

	NO. OF TRAINS	CARS 2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)
YUMA-TUCSON																			
EAST	777	-	1	2	1	36	36	226	198	220	36	24	2	1	1	-	1	-	-
WEST	780	1	3	-	4	46	41	209	174	122	100	74	1	-	2	1	-	-	-
TOTAL	1,557	1	4	2	5	82	75	435	368	342	136	98	3	1	3	1	1	-	-
TUCSON-LORDSBURG																			
EAST	779	1	2	1	1	46	134	264	164	111	32	17	1	-	3	1	-	-	1
WEST	782	3	1	-	3	86	114	218	158	81	65	43	5	1	1	1	1	1	-
TOTAL	1,561	4	3	1	4	132	248	482	322	192	97	60	6	1	4	2	1	1	1
GRAND TOTAL	3,118	5	7	3	9	214	323	917	690	534	233	158	9	2	7	3	2	1	1
PER CENT OF TOTAL	100.00	0.16	0.22	0.10	0.29	6.86	10.37	29.42	22.13	17.13	7.47	5.06	0.29	0.06	0.22	0.10	0.06	0.03	0.03

DESCRIPTION OF PASSENGER TRAINS OF 14 CARS AND OVER

YUMA - TUCSON

1 - 14 car train - soldiers
2 - 15 car trains - pay trains
1 - 15 car train - soldiers
1 - 16 car train - pay train
1 - 17 car train - show train
6 trains 14 cars and over

TUCSON - LORDSBURG

1 - 14 car train - pay train
1 - 15 car train - deadhead equipment
1 - 15 car train - soldiers
1 - 15 car train - show train
1 - 15 car train - pay train
1 - 16 car train - pay train
1 - 16 car train - soldiers
1 - 17 car train - pay train
1 - 18 car train - pay train
1 - 19 car train - soldiers
10 trains 14 cars and over

5590

Defendant's Exhibit No. 183 (Witness Sines)
Jan. 16, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

TUCSON DIVISION

YUMA, ARIZONA TO EL PASO, TEXAS
LOCOMOTIVES IN SERVICE, JANUARY TO JUNE 1912

LINE NO. (a)	TYPE (b)	WHEEL ARRANGEMENT (WHYTE SYSTEM) (c)	NUMBERS (NOT CONTINUOUS) (d)	FREIGHT (e)	PASSENGER (f)
1	Mogul - 4	2-6-0	1678, 1701	Occasional	2
2	Mogul - 6	2-6-0	1725 - 1805	Occasional	14
3	Ten Wheel 1,2,8,9	4-6-0	2171, 2180 2229, 2274	4	Occasional
4	Ten Wheel 25,26	4-6-0	2275 - 2290	Occasional	8
5	Consolidation - 4	2-8-0	2619	1	
6	Consolidation - 5	2-8-0	2679 - 2685	6	
7	Consolidation - 8	2-8-0	2705 - 2749	12	
8	Consolidation - 9	2-8-0	2646 - 2697 2752 - 2821	49	
9	Consolidation - 10	2-8-0	2750 2834, 2835	3	
10	Twelve Wheel 3,6	4-8-0	2933 - 2936 2954	4	
11	Atlantic - 3 ∮	4-4-2	3082 - 3085		28
TOTAL				79	44
TOTAL FREIGHT AND PASSENGER				123	

∮ - Atlantic - 3 Tractive effort 24,680 pounds

Defendant's Exhibit No. 184 (Witness Sines)
Jan. 16, 1941

FULL CREW LAWS

STATES OF NEVADA AND ARIZONA

NEVADA FULL CREW LAW

TRAIN CREWS

t to promote the public safety by requiring common-carrier railroads to provide adequate train crews, and defining such crews, and rescribing a penalty for the violation of the provisions thereof

Approved March 12, 1913, 62.

c. 6318. Full Train Crew Required. - Crew of 4, When. Sec. 1. It be unlawful for any person, firm, company or corporation engaged in usiness of common carrier, operating freight and passenger trains, or r of them, within or through the State of Nevada, to run or operate, mit or cause to be run or operated, within or through this state, or over its road or tracks, other than along or over the road or within yard limits, any freight or passenger train consisting of ars or less, exclusive of caboose and engine and tenders, with less a full crew consisting of not less than four persons, to wit, one en-, one fireman, one conductor and one brakeman, who will act in the ty of flagman.

. 6319. Crew of 5, When. Sec. 2. It shall be unlawful for any , firm, company, or corporation engaged in the business of common r, operating freight and passenger trains, or either of them, within ough the State of Nevada, to run or operate, or permit or cause to be operated, within or through this state, along or over its road or , other than along or over the road or tracks within yard limits, any t or passenger train of three or more and less than fifty freight, ger, or other cars exclusive of caboose and engine with less than a rew consisting of five persons, to wit, one engineer, one fireman, onductor, one brakeman and one flagman.

. 6320. Crew of 6, When. Sec. 3. It shall be unlawful for any per- firm, company, or corporation, engaged in the business of common car- operating freight and passenger trains, or either of them, within or h the State of Nevada, to run or operate, or permit or cause to be operated, within or through this state, along or over its road or other than along or over its road or tracks within yard limits, any t or passenger train of more than fifty freight, passenger or other exclusive of caboose and engine and tender, with less than a full crew, ting of not less than six persons, to wit, one conductor, one engineer, reman; two brakeman and one flagman.

ARIZONA FULL CREW LAW

Secs. 649 and 651

REVISED CODE ARIZONA, 1928

Sec. 649. Train crews; failure to use full crews; penalty. A single locomotive, or a single locomotive with its accompanying tender, when operated outside of the yard limits, shall be equipped with, and shall carry, a crew consisting of not less than one engineer, one fireman, and one conductor or flagman; provided, however, that this section shall not apply to helper locomotives going or returning a distance of twenty-five (25) miles.

A passenger, mail or express train, composed of less than six cars, when operated outside of the yard limits shall be equipped with, and shall carry, a crew consisting of not less than one engineer, one fire-man, one conductor, one baggage-master, and one flagman; provided, however, that this section shall not apply to gasoline motor cars.

A passenger, mail or express train composed of six or more cars, when operated outside of the yard limits, shall be equipped with, and shall carry a crew consisting of not less than one engineer, one fireman, one conductor, one baggage-master, one flagman, and one brakeman.

A freight train composed of less than forty cars, when operated outside of the yard limits, shall be equipped with, and shall carry, a crew consisting of not less than one engineer, one fireman, one conductor, one flagman, and one brakeman.

A freight train composed of forty or more cars, when operated outside of the yard limits, shall be equipped with, and shall carry, a crew consisting of not less than one engineer, one fireman, one conductor, one flagman and two brakemen.

All local freight trains, doing any switching, or unloading any freight of whatever nature, shall be equipped with, and shall carry, a crew consisting of six persons, to wit: One conductor, one engineer, one fireman, two brakemen, and one flagman.

All trains other than those described in the preceding portions of this act, when operated outside of the yard limits, shall be equipped with, and shall carry, a crew consisting of not less than one engineer, one fireman, one conductor, one flagman, and one brakeman.

That all flagmen mentioned in the preceding sections shall have had at least

TRAIN CREWS

An Act to promote the public safety by requiring common-carrier railroads to provide adequate train crews, and defining such crews, and prescribing a penalty for the violation of the provisions thereof

Approved March 12, 1913, 62.

Sec. 6318. Full Train Crew Required. - Crew of 4, When. Sec. 1. It shall be unlawful for any person, firm, company or corporation engaged in the business of common carrier, operating freight and passenger trains, or either of them, within or through the State of Nevada, to run or operate, or permit or cause to be run or operated, within or through this state, along or over its road or tracks, other than along or over the road or tracks within yard limits, any freight or passenger train consisting of two cars or less, exclusive of caboose and engine and tenders, with less than a full crew consisting of not less than four persons, to wit, one engineer, one fireman, one conductor and one brakeman, who will act in the capacity of flagman.

Sec. 6319. Crew of 5, When. Sec. 2. It shall be unlawful for any person, firm, company, or corporation engaged in the business of common carrier, operating freight and passenger trains, or either of them, within or through the State of Nevada, to run or operate, or permit or cause to be run or operated, within or through this state, along or over its road or tracks, other than along or over the road or tracks within yard limits, any freight or passenger train of three or more and less than fifty freight, passenger, or other cars exclusive of caboose and engine with less than a full crew consisting of five persons, to wit, one engineer, one fireman, one conductor, one brakeman and one flagman.

Sec. 6320. Crew of 6, When. Sec. 3. It shall be unlawful for any person, firm, company, or corporation, engaged in the business of common carrier, operating freight and passenger trains, or either of them, within or through the State of Nevada, to run or operate, or permit or cause to be run or operated, within or through this state, along or over its road or tracks other than along or over its road or tracks within yard limits, any freight or passenger train of more than fifty freight, passenger or other cars, exclusive of caboose and engine and tender, with less than a full crew, consisting of not less than six persons, to wit, one conductor, one engineer, one fireman, two brakeman and one flagman.

REVISED CODE ARIZONA, 1928

Sec. 649. Train crews; failure to use full crews; penalty. A single locomotive, or a single locomotive with its accompanying tender, when operated outside of the yard limits, shall be equipped with, and shall carry, a crew consisting of not less than one engineer, one fireman; and one conductor or flagman; provided, however, that this section shall not apply to helper locomotives going or returning a distance of twenty-five (25) miles.

A passenger, mail or express train, composed of less than six cars, when operated outside of the yard limits shall be equipped with, and shall carry, a crew consisting of not less than one engineer, one fireman, one conductor, one baggage-master, and one flagman; provided, however, that this section shall not apply to gasoline motor cars.

A passenger, mail or express train composed of six or more cars; when operated outside of the yard limits, shall be equipped with, and shall carry, a crew consisting of not less than one engineer, one fireman, one conductor, one baggage-master, one flagman, and one brakeman.

A freight train composed of less than forty cars, when operated outside of the yard limits, shall be equipped with, and shall carry, a crew consisting of not less than one engineer, one fireman, one conductor, one flagman, and one brakeman.

A freight train composed of forty or more cars, when operated outside of the yard limits, shall be equipped with, and shall carry, a crew consisting of not less than one engineer, one fireman, one conductor, one flagman and two brakemen.

All local freight trains, doing any switching, or unloading any freight of whatever nature, shall be equipped with, and shall carry, a crew consisting of six persons, to wit: One conductor, one engineer, one fireman, two brakemen, and one flagman.

All trains other than those described in the preceding portions of this act, when operated outside of the yard limits, shall be equipped with, and shall carry, a crew consisting of not less than one engineer, one fireman, one conductor, one flagman, and one brakeman.

That all flagmen mentioned in the preceding sections shall have had at least one year's experience as brakemen.

All engines used in switching or placing cars within the limits of any railroad yard shall be equipped with and shall carry a crew of not less than one engineer and one fireman. (Sections 1-2-3-4-5-6-7-8-9, Ch. 16, L. '12, referred measure passed at General Election 1912.)

* * * * * *

Defendant's Exhibit No. 185 (Witness Sines)
Jan. 16, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

SUMMARY OF FREIGHT TRAIN OPERATIONS
OF TRAINS OF 70 CARS AND LESS AND 71 CARS AND OVER
IN SPECIFIC DISTRICTS
STATES OF OREGON, CALIFORNIA, UTAH, NEW MEXICO AND TEXAS
EXCLUDING LINES IN ARIZONA
FOR MONTHS OF JANUARY, APRIL, JULY AND OCTOBER 1939

LINE NO. (a)	FREIGHT DISTRICT (b)	MILES (c)	70 CARS AND LESS (d)	71 CARS AND OVER (e)	PERCENTAGE OF TRAINS 71 CARS AND OVER, TO TOTAL TRAINS RUN (f)
	STATE OF OREGON				
1	Calif.-Oregon Line - Klamath Falls	19	671	494	42.40
2	Klamath Falls - Crescent Lake	99	598	679	53.17
3	Crescent Lake - Eugene	97	451	640	58.66
4	Eugene - Brooklyn	118	948	568	37.47
5	Calif.-Oregon Line - Ashland	26	256	-	-
6	Klamath Falls - Calif.-Oregon Line (Alturas Line)	22	541	121	18.28
7	Ashland - Eugene (Siskiyou Line)	220	589	-	-
8	TOTAL		4,054	2,502	38.16
	STATE OF CALIFORNIA				
9	Oakland - Port Costa	26	1,603	463	22.41
10	Port Costa - Sacramento	61	1,310	582	30.76
11	Port Costa - Tracy	51	879	39	4.25
12	Tracy - Fresno	148	1,130	88	7.22
13	Tracy - Brighton	62	2,802	810	28.81
14	Lathrop - Fresno	112	1,542	281	15.41
15	Redwood, Niles, Tracy (via Dumbarton)	58	2,141	181	7.80
16	Oakland, San Jose, Santa Clara	40	2,244	359	13.79
17	Davis - Sacramento	13	363	2	.55
18	Davis - Gerber (via Willows)	113	814	85	9.45
19	Roseville - Gerber	107	522	609	53.85
20	Roseville, Calif. - Nevada Line	E-119) W-121)	1,091	767	41.28
21	Brighton, Sacramento and Roseville	21	2,494	1,083	30.28
22	Gerber - Dunsmuir	107	1,275	500	28.17
23	Dunsmuir, Calif-Oregon Line (Siskiyou)	83	499	3	.65
24	Dunsmuir, Calif-Oregon Line (Cascade)	89	845	510	37.64
25	California-Oregon Line-Alturas	76	516	138	21.10
26	Alturas-California-Nevada Line	114	241	226	48.39
27	San Francisco - Redwood	21	1,507	32	2.08
28	San Francisco - Watsonville Junction	92	1,269	347	21.47
29	Watsonville Junction - San Luis Obispo	152	1,420	237	14.30
30	San Luis Obispo - Santa Barbara	119	693	107	13.38
31	Fresno - Bakersfield (via Exeter)	124	997	-	-
32	Fresno - Bakersfield (via Goshen)	107	1,130	188	14.26
33	Bakersfield - Saugus	138	897	182	16.87
34	Santa Barbara - Los Angeles	99	1,109	194	14.89
35	Saugus - Los Angeles	29	1,126	102	8.31
36	Los Angeles - Indio	130	1,301	688	34.99

19	Roseville - Portola	107	522	609	53.85
20	Roseville, Calif. - Nevada Line	E-119 W-121	1,091	767	41.28
21	Brighton, Sacramento and Roseville	21	2,494	1,083	30.28
22	Gerber - Dunsmuir	107	1,275	500	28.17
23	Dunsmuir, Calif-Oregon Line (Siskiyou)	83	459	3	.65
24	Dunsmuir, Calif-Oregon Line (Cascade)	89	845	510	37.64
25	California-Oregon Line-Alturas	76	516	138	21.10
26	Alturas-California-Nevada Line	114	241	226	48.39
27	San Francisco - Redwood	21	1,507	32	2.08
28	San Francisco - Watsonville Junction	92	1,269	347	21.47
29	Watsonville Junction - San Luis Obispo	152	1,420	237	14.30
30	San Luis Obispo - Santa Barbara	119	693	107	13.38
31	Fresno - Bakersfield (via Exeter)	124	997	-	-
32	Fresno - Bakersfield (via Goshen)	107	1,130	188	14.26
33	Bakersfield - Saugus	138	897	182	16.87
34	Santa Barbara - Los Angeles	99	1,109	194	14.89
35	Saugus - Los Angeles	29	1,126	102	8.31
36	Los Angeles - Indio	130	1,301	686	34.59
37	Indio - California - Arizona Line	122	674	588	46.59
38	Niland-Calif.-Arizona Line (via Inter-Calif. Ry.)	102	772	157	16.90
39	TOTAL		34,366	9,548	21.74
	STATE OF UTAH				
40	Nevada-Utah Line - Ogden	111	178	1,080	85.85
	STATE OF NEVADA				
41	California-Nevada Line - Sparks	18	824	687	45.47
42	Sparks - Carlin	E-283 W-288	467	1,225	72.40
43	Carlin - Nevada - Utah Line	E-137 E-138	147	1,121	88.41
44	California-Nevada Line-Fernley	67	195	165	45.83
45	TOTAL		1,633	3,198	66.20
	STATE OF NEW MEXICO				
46	Arizona-New Mexico Line to Lordsburg	23	1,592	1	.06
47	Lordsburg to El Paso (North Line)	E-148 W-149	1,102	317	22.34
48	Arizona-New Mexico Line to El Paso (South Line)	E-167 E-168	246	5	1.99
49	Texas-New Mexico Line to Tucumcari	311	1,073	77	6.70
50	TOTAL		4,013	400	9.06
	STATE OF TEXAS				
51	El Paso-Texas-New Mexico Line (via Tucumcari Line)	29	958	13	1.34

RECAPITULATIONS

	70 CARS & LESS (g)	71 CARS & OVER (h)	PERCENTAGE OF TRAINS 71 CARS AND OVER TO TOTAL TRAINS RUN (i)
OREGON	4,054	2,502	38.16
CALIFORNIA	34,366	9,548	21.74
UTAH	178	1,080	85.85
NEVADA	1,633	3,198	66.20
NEW MEXICO	4,013	400	9.06
TEXAS	958	13	1.34
TOTAL	45,202	16,741	27.03

Defendant's Exhibit No. 186 (Witness Sines)
Jan. 16, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

SUMMARY OF FREIGHT TRAIN OPERATIONS
BY VARIOUS LENGTHS
BETWEEN SPARKS, NEVADA AND OGDEN, UTAH

TOTAL OF MONTHS
JANUARY, APRIL, JULY AND OCTOBER
YEAR 1939

ROUTE	CARS	50 AND LESS (a)	51 TO 60 (b)	61 TO 70 (c)	71 TO 80 (d)	81 TO 90 (e)	91 TO 100 (f)	101 TO 110 (g)	111 TO 120 (h)	121 TO 130 (i)	TOTAL (j)
SPARKS, NEVADA - CARLIN, NEVADA (Miles, East 283, West 288)	1939	379	23	65	199	205	337	366	90	28	1,692
Per Cent of total		22.40	1.36	3.84	11.76	12.12	19.92	21.63	5.32	1.65	100%
CARLIN, NEVADA - NEVADA-UTAH LINE (Miles, East 137, West 138)	1939	61	19	67	154	212	370	323	46	16	1,268
Per Cent of total		4.81	1.50	5.28	12.15	16.72	29.18	25.47	3.63	1.26	100%
NEVADA - UTAH LINE - OGDEN, UTAH (111 Miles)	1939	39	30	109	185	245	440	190	17	3	1,258
Per Cent of total		3.10	2.38	8.66	14.71	19.48	34.98	15.10	1.35	0.24	100%

RECAPITULATION

	TRAINS	PER CENT
SPARKS, NEVADA-CARLIN, NEVADA		
70 and under	467	27.60
Over 70	1,225	72.40
TOTAL	1,692	100.00
CARLIN, NEVADA-NEVADA-UTAH LINE		
70 and under	147	11.59
Over 70	1,121	88.41
TOTAL	1,268	100.00
NEVADA-UTAH LINE-OGDEN, UTAH		
70 and under	178	14.14
over 70	1,080	85.86
TOTAL	1,258	100.00

Defendant's Exhibit No. 187 (Witness Sines)
Jan. 16, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

MAXIMUM NUMBER OF CARS HANDLED IN VARIOUS MAIN LINE PASSENGER TRAINS

JANUARY, APRIL, JULY AND OCTOBER 1939

TRAIN NO. (a)	ROUTE AND TRAIN NAME (b)	4 (c)	5 (d)	6 (e)	7 (f)	8 (g)	9 (h)	10 (i)	11 (j)	12 (k)	13 (l)	14 (m)	15 (n)	16 (o)	17 & OVER (p)	TOTAL (q)
	OGDEN ROUTE															
	WEST															
101	City of San Francisco	-	-	-	-	-	-	-	5	-	-	15	-	-	-	20
49	Forty-Niner	-	-	-	-	8	9	1	-	-	1	-	-	-	1	20
27	Overland Limited	-	-	-	-	-	1	1	3	6	8	8	13	34	49	123
21	Pacific Limited	-	-	-	-	-	-	6	8	20	29	9	22	20	9	123
9	Fast Mail	-	-	-	2	13	8	25	27	14	15	6	7	4	2	123
87	Challenger	-	-	-	-	1	-	2	5	14	11	19	16	22	33	123
209	Sierra	2	6	11	5	3	1	1	1	1	-	-	-	-	-	31
	EAST															
102	City of San Francisco	-	-	-	-	-	-	-	5	-	-	15	-	-	-	20
48	Forty-Niner	-	-	-	-	12	8	-	-	-	-	-	-	-	-	20
28	Overland Limited	-	-	-	-	-	-	1	1	7	7	16	18	33	40	123
14	Pacific Limited	-	-	-	-	-	-	3	6	19	20	31	11	22	11	123
10	Fast Mail	1	2	5	4	2	2	6	5	3	5	3	2	-	-	40
88	Challenger	-	-	-	-	-	-	-	1	5	3	8	17	34	55	123
210	Sierra	-	-	-	-	-	17	26	25	11	12	10	8	7	7	123
	TOTAL	3	8	16	11	39	46	72	92	100	111	140	114	176	207	1 135
	PER CENT OF TOTAL	.26	.70	1.41	.97	3.44	4.05	6.34	8.11	8.81	9.78	12.34	10.04	15.51	18.24	100%
	TOTAL TRAINS OVER 14 CARS							497 or 43.79%								
	TOTAL TRAINS 14 CARS OR UNDER							638 or 56.21%								
	TOTAL TRAINS							1,135 or 100.00%								
	SHASTA ROUTE															
	WEST															
7	Shasta	-	-	1	19	36	33	13	11	5	2	2	1	-	-	123
15	West Coast	-	-	-	-	-	-	5	5	22	38	24	23	5	1	123
17	Oregonian	-	-	-	1	-	4	2	17	23	29	11	18	17	1	123
19	Klamath	-	-	-	-	-	8	5	18	27	21	16	11	9	8	123
23	Cascade	-	-	-	-	55	15	15	7	13	8	7	2	1	-	123
	EAST															
8	Shasta	-	10	13	-	10	5	2	1	1	-	-	-	-	-	42
16	West Coast	-	-	-	-	-	1	10	20	20	21	16	20	9	6	123
18	Oregonian	-	-	-	-	-	-	4	24	33	12	14	15	12	9	123
20	Klamath	-	-	-	-	-	-	-	4	12	26	28	21	15	17	123
24	Cascade	-	-	-	-	20	30	35	5	4	9	14	6	-	-	123
	TOTAL	-	10	14	20	121	96	91	112	160	166	132	117	68	42	1 149
	PER CENT OF TOTAL		.87	1.22	1.74	10.53	8.36	7.92	9.75	13.93	14.45	11.48	10.18	5.92	3.65	100%
	TOTAL TRAINS OVER 14 CARS							227 or 19.76%								
	TOTAL TRAINS 14 CARS OR UNDER							922 or 80.24%								
	TOTAL TRAINS							1,149 or 100.00%								
	SAN FRANCISCO - LOS ANGELES VALLEY ROUTE															
	WEST															
25	Owl	-	-	-	-	-	5	18	15	21	18	14	20	6	5	122
51	San Joaquin	-	1	1	9	41	25	11	10	9	7	7	1	1	-	123
55	Tehachapi	23	39	33	10	5	2	5	1	1	1	-	-	-	-	120
60	West Coast	-	1	-	-	-	-	2	5	18	32	22	27	6	10	123
95	- (Fresno - Oakland)	9	3	-	1	1	-	-	-	-	-	-	-	-	-	14
53	- (Fresno - Oakland)	-	23	2	2	2	1	-	1	-	-	-	-	-	-	31
	EAST															
26	Owl	-	-	-	-	-	11	14	18	17	24	12	14	8	5	123
52	San Joaquin	-	-	3	14	48	17	7	11	18	3	1	1	-	-	123
56	Tehachapi	-	-	7	9	15	20	20	19	8	8	4	6	6	1	123
58	Sequoia:	-	-	-	3	22	27	25	13	20	4	3	5	-	1	123
59	West Coast	-	-	-	-	-	-	-	-	-	5	39	21	29	24	123
54	- (Oakland - Fresno)	-	24	6	1	-	-	-	-	-	-	-	-	-	5	31
	TOTAL	32	91	52	49	134	108	102	93	117	136	85	103	51	33	1 179
	PER CENT OF TOTAL	2.72	7.72	4.41	4.16	11.36										

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

MAXIMUM NUMBER OF CARS HANDLED IN VARIOUS MAIN LINE PASSENGER TRAINS

JANUARY, APRIL, JULY AND OCTOBER 1939

TRAIN NO. (a)	ROUTE AND TRAIN NAME (b)	4 (c)	5 (d)	6 (e)	7 (f)	8 (g)	9 (h)	10 (i)	11 (j)	12 (k)	13 (l)	14 (m)	15 (n)	16 (o)	17 & OVER (p)	TOTAL (q)
	OGDEN ROUTE															
	WEST															
101	City of San Francisco	-	-	-	-	-	-	-	5	-	-	15	-	-	-	20
49	Forty-Niner	-	-	-	-	-	9	1	-	-	1	-	-	-	1	20
27	Overland Limited	-	-	-	-	-	1	1	3	6	8	8	13	34	49	123
21	Pacific Limited	-	-	-	-	-	-	6	8	20	29	9	22	20	9	123
9	Fast Mail	-	-	-	2	13	8	25	27	14	15	6	7	4	2	123
87	Challenger	-	-	-	-	1	-	2	5	14	11	19	16	22	33	123
289	Sierra	2	6	11	5	3	1	1	1	1	-	-	-	-	-	31
	EAST															
102	City of San Francisco	-	-	-	-	-	-	-	5	-	-	15	-	-	-	20
48	Forty-Niner	-	-	-	-	12	8	-	-	-	-	-	-	-	-	20
28	Overland Limited	-	-	-	-	-	-	1	1	7	7	16	18	33	40	123
14	Pacific Limited	-	-	-	-	-	-	3	6	19	20	31	11	22	11	123
10	Fast Mail	1	2	5	4	2	2	6	5	3	5	3	2	-	-	40
88	Challenger	-	-	-	-	-	-	-	1	5	3	8	17	34	55	123
210	Sierra	-	-	-	-	-	17	26	25	11	12	10	8	7	7	123
	TOTAL	3	8	16	11	39	46	72	92	100	111	140	114	176	207	1 135
	PER CENT OF TOTAL	.26	.70	1.41	.97	3.44	4.05	6.34	8.11	8.81	9.78	12.34	10.04	15.51	18.24	100%
	TOTAL TRAINS OVER 14 CARS							497 or 43.79%								
	TOTAL TRAINS 14 CARS OR UNDER							638 or 56.21%								
	TOTAL TRAINS							1,135 or 100.00%								
	SHASTA ROUTE															
	WEST															
7	Shasta	-	-	1	19	36	33	13	11	5	2	2	1	-	-	123
15	West Coast	-	-	-	-	-	-	5	5	22	38	24	23	5	1	123
17	Oregonian	-	-	-	1	-	4	2	17	23	29	11	18	17	1	123
19	Klamath	-	-	-	-	-	8	5	18	27	21	16	11	9	8	123
23	Cascade	-	-	-	-	55	15	15	7	13	8	7	2	1	-	123
	EAST															
8	Shasta	-	10	13	-	10	3	2	1	-	-	-	-	-	-	42
16	West Coast	-	-	-	-	-	1	10	20	20	21	16	20	9	6	123
18	Oregonian	-	-	-	-	-	-	4	24	33	12	14	15	12	9	123
20	Klamath	-	-	-	-	-	-	-	4	12	26	28	21	15	17	123
24	Cascade	-	-	-	-	20	30	35	5	4	9	14	6	-	-	123
	TOTAL	-	10	14	20	121	96	91	112	160	166	132	117	68	42	1 149
	PER CENT OF TOTAL		.87	1.22	1.74	10.53	8.36	7.92	9.75	13.93	14.45	11.48	10.18	5.92	3.65	100%
	TOTAL TRAINS OVER 14 CARS							227 or 19.76%								
	TOTAL TRAINS 14 CARS OR UNDER							922 or 80.24%								
	TOTAL TRAINS							1,149 or 100.00%								
	SAN FRANCISCO - LOS ANGELES VALLEY ROUTE															
	WEST															
25	Owl	-	-	-	-	-	3	18	15	21	18	14	20	6	5	122
51	San Joaquin	-	1	1	9	41	25	11	10	9	7	7	1	1	-	123
55	Tehachapi	23	39	33	10	5	2	5	1	1	1	-	-	-	-	120
60	West Coast	-	1	-	-	-	-	2	5	18	32	22	27	6	10	123
95	- (Fresno - Oakland)	9	3	-	1	1	-	-	-	-	-	-	-	-	-	14
53	- (Fresno - Oakland)	-	23	2	2	2	1	-	1	-	-	-	-	-	-	31
	EAST															
26	Owl	-	-	-	-	-	11	14	18	17	24	12	14	8	5	123
52	San Joaquin	-	-	3	14	48	17	7	11	18	3	1	1	-	-	123
56	Tehachapi	-	-	7	9	15	20	20	19	8	8	4	6	6	1	123
58	Sequoia	-	-	-	3	22	27	25	13	20	4	3	5	-	1	123
99	West Coast	-	-	-	-	-	-	-	-	5	39	21	29	24	5	123
54	- (Oakland - Fresno)	-	24	6	1	-	-	-	-	-	-	-	-	-	-	31
	TOTAL	32	91	52	49	134	108	102	93	117	136	84	103	51	27	1 179
	PER CENT OF TOTAL	2.71	7.72	4.41	4.16	11.37	9.16	8.65	7.89	9.92	11.54	7.12	8.73	4.33	2.29	100%
	TOTAL TRAINS OVER 14 CARS							181 or 15.35%								
	TOTAL TRAINS 14 CARS OR UNDER							998 or 84.65%								
	TOTAL TRAINS							1,179 or 100.00%								

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

MAXIMUM NUMBER OF CARS HANDLED IN VARIOUS MAIN LINE PASSENGER TRAINS

JANUARY, APRIL, JULY AND OCTOBER 1939

TRAIN NO. (a)	ROUTE AND TRAIN NAME (b)	4 (c)	5 (d)	6 (e)	7 (f)	8 (g)	9 (h)	10 (i)	11 (j)	12 (k)	13 (l)	14 (m)	15 (n)	16 (o)	17 & OVER (p)	TOTAL (q)
	COAST ROUTE															
	WEST															
1	Sunset Limited	-	-	-	-	-	-	-	3	16	28	30	23	17	6	123
69	Coaster	-	-	-	-	-	7	10	13	11	15	16	22	19	10	123
71	-	-	-	19	33	30	13	17	6	3	1	1	-	-	-	123
75	Lark	-	-	-	-	-	-	-	-	1	-	16	49	34	17	123
99	Daylight	-	-	-	-	-	-	-	-	17	4	81	21	-	-	123
	EAST															
2	Sunset Limited	-	-	-	-	-	-	-	-	5	19	39	31	22	7	123
70	Coaster	-	-	-	-	-	-	5	25	17	17	22	19	12	6	123
72	-	-	18	26	12	10	23	14	10	6	-	3	1	-	-	123
76	Lark	-	-	-	-	-	-	-	-	14	2	20	30	45	12	123
98	Daylight	-	-	-	-	-	-	-	-	14	2	87	20	-	-	123
	TOTAL.	-	18	45	45	40	43	46	57	104	94	315	216	149	58	1 230
	PER CENT OF TOTAL	-	1.46	3.66	3.66	3.25	3.50	3.74	4.63	8.46	7.64	25.61	17.56	12.11	4.72	100%

TOTAL TRAINS OVER 14 CARS 423 or 34.39%
TOTAL TRAINS 14 CARS AND UNDER 807 or 65.61%
TOTAL TRAINS 1,230 or 100.00%

RECAPITULATION

	TOTAL TRAINS (r)	TOTAL OVER 14 (s)	PERCENT OF TOTAL (t)
OGDEN ROUTE	1 135	497	43.79%
SHASTA ROUTE	1 149	227	19.76%
VALLEY ROUTE	1 179	181	15.35%
COAST ROUTE	1 230	423	34.39%
TOTAL	4 693	1 328	28.30%

5545

Defendant's Exhibit No. 188 (Witness Sines)
Jan. 16, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

NUMBER OF PASSENGER TRAINS OF DIFFERENT LENGTHS
BETWEEN LOS ANGELES, CALIFORNIA AND EL PASO, TEXAS.
YEAR 1939

TRAIN NO. (a)	TRAIN NAME (b)	4 (c)	5 (d)	6 (e)	7 (f)	8 (g)	9 (h)	10 (i)	11 (j)	12 (k)	13 (l)	14 (m)	15 (n)	16 (o)	17 & OVER (p)	TOTAL (q)
	WEST															
1	Sunset Limited															
	El Paso - Lordsburg	-	-	-	-	-	-	49	106	106	49	49	4	0	2	365
	Lordsburg-Tuma via Phoenix	-	-	-	-	-	-	26	49	30	8	12	-	-	-	125
	Lordsburg-Tuma via Gila	-	-	-	-	-	-	14	63	77	41	45	-	-	-	240
	Tuma - Los Angeles	-	-	-	-	-	93	123	64	40	27	15	1	2	-	365
3	Golden State Limited															
	El Paso-Tucson via Douglas	-	-	-	-	-	-	5	88	172	68	29	2	1	-	365
	Tucson-Tuma via Phoenix	-	-	-	-	-	-	1	-	100	189	75	-	-	-	365
	Tuma - Los Angeles	-	1	-	1	-	2	81	174	76	18	9	1	2	-	365
5	Argonaut															
	El Paso-Tucson via Douglas	-	-	-	-	-	1	8	105	125	58	64	4	-	-	365
	Tucson-Tuma via Phoenix	-	-	-	-	-	1	-	3	46	96	219	-	-	-	365
	Tuma - Los Angeles	-	-	-	-	-	1	-	3	43	95	188	29	4	2	365
43	Californian															
	El Paso - Lordsburg	-	-	-	-	-	3	86	116	75	49	32	-	1	3	365
	Lordsburg-Tuma via Gila	-	-	-	-	-	3	24	43	25	12	19	-	-	-	126
	Lordsburg-Tuma via Phoenix	-	-	-	-	-	-	22	44	46	67	60	-	-	-	239
	Tuma - Los Angeles	-	-	-	-	1	15	106	63	56	70	50	2	2	-	365
	TOTAL WEST	-	1	-	1	1	119	545	921	1 017	847	866	43	12	7	4 380
	PERCENT OF TOTAL	-	.02	-	.02	.02	2.72	12.44	21.04	23.22	19.34	19.77	.98	.27	.16	100%
	EAST															
2	Sunset Limited															
	Los Angeles - Tuma	-	-	-	-	-	1	74	64	84	65	48	21	6	2	365
	Tuma-Lordsburg via Phoenix	-	-	-	-	-	-	1	55	67	101	140	-	-	-	364
	Lordsburg - El Paso	-	-	-	-	-	2	68	76	98	91	26	2	-	1	364
4	Golden State Limited															
	Los Angeles - Tuma	-	-	-	-	-	-	1	10	33	111	87	89	33	1	365
	Tuma-Tucson via Phoenix	-	-	-	-	-	-	-	1	37	121	205	-	-	-	364
	Tucson-El Paso via Douglas	-	-	-	-	-	-	-	3	99	184	72	4	2	-	364
6	Argonaut															
	Los Angeles - Tuma	-	-	-	-	-	6	250	11	11	26	49	6	5	1	365
	Tuma-Lordsburg via Gila	-	-	-	-	-	1	22	57	71	113	98	-	-	-	364
	Lordsburg - El Paso	-	-	-	-	1	4	66	61	78	102	46	2	-	4	364
44	Californian															
	Los Angeles - Tuma	-	-	-	-	-	5	225	47	17	41	16	10	4	-	365
	Tuma-Tucson via Phoenix	-	-	-	-	-	-	11	179	72	30	72	-	-	-	364
	Tucson-El Paso via Douglas	-	-	-	-	-	1	82	106	77	47	45	6	-	-	364
	TOTAL EAST	-	-	-	-	1	20	800	670	744	1 034	904	140	50	9	4 372
	PERCENT OF TOTAL	-	-	-	-	.02	.46	18.30	15.32	17.02	23.65	20.68	3.20	1.14	.21	100%

RECAPITULATION			
	TOTAL TRAINS	TOTAL OVER 14	PERCENT OF TOTAL
CALIFORNIA: Los Angeles - Tuma			
West	1 460	45	3.08
East	1 460	178	12.19
Total	2 920	223	7.64
NEW MEXICO: Lordsburg - El Paso			
West	730	10	1.37
East	728	9	1.24
Total	1 458	19	1.30

Defendant's Exhibit No. 189 (Witness Sines)
Jan. 16, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

CARS RECEIVED AND FORWARDED AT EL PASO, TEXAS
YEARS 1930 TO 1939, INCLUSIVE
AND
AT OGDEN, UTAH, YEAR 1939

	1930 (a)	1931 (b)	1932 (c)	1933 (d)	1934 (e)	1935 (f)	1936 (g)	1937 (h)	1938 (i)	1939 (j)
CARS RECEIVED AT EL PASO - EASTWARD										
LOADS:										
Refrigerators,	95 683	90 672	82 642	71 544	70 924	80 864	83 401	84 080	86 645	88 416
Others,	35 551	25 365	15 295	18 562	27 545	13 397	23 574	43 831	37 710	44 076
Total,	131 234	116 037	97 937	90 106	98 469	94 261	106 975	127 911	124 355	132 492
EMPTIES,	32 667	24 439	16 998	18 030	22 997	17 318	21 167	33 845	31 069	28 370
TOTAL LOADS AND EMPTIES,	163 901	140 476	114 935	108 136	121 466	111 579	128 142	161 756	155 424	160 862
CARS FORWARDED AT EL PASO - WESTWARD										
LOADS:	56 847	41 787	31 248	33 562	41 010	36 877	51 464	71 201	56 751	64 142
EMPTIES:										
Refrigerators,	94 553	87 119	77 831	63 970	64 300	74 435	76 873	77 610	85 554	82 261
Others,	20 886	16 994	8 067	11 266	16 604	4 859	8 437	19 401	22 371	21 118
Total,	115 439	104 113	85 898	75 236	80 904	79 294	85 310	97 011	107 925	103 379
TOTAL LOADS AND EMPTIES,	172 286	145 900	117 146	108 798	121 914	116 171	136 774	168 212	164 676	167 521
CARS RECEIVED AT OGDEN - EASTWARD										
LOADS:										
Refrigerators,										76 095
Others,										58 668
Total,										134 763
EMPTIES,										17 850
TOTAL LOADS AND EMPTIES,										152 613
CARS FORWARDED AT OGDEN - WESTWARD										
LOADS,										48 924
EMPTIES:										
Refrigerators,										67 901
Others,										28 047
Total,										95 948
TOTAL LOADS AND EMPTIES,										144 892

Defendant's Exhibit No. 190 (Witness Sines)
Jan. 16, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

LOADED AND EMPTY P.F.E. AND OTHER CAR MILES
STATES OF NEVADA AND ARIZONA
MAIN AND BRANCH - FREIGHT AND MIXED

YEAR	PACIFIC FRUIT EXPRESS LOADED	PACIFIC FRUIT EXPRESS EMPTY	OTHER LOADED	OTHER EMPTY	TOTAL ALL CARS LOADED	TOTAL ALL CARS EMPTY	PERCENTAGE P.F.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
STATE OF NEVADA							
1929	34,530,295	28,487,060	63,384,878	21,324,583	97,915,173	49,811,643	42.7
1930	39,051,832	28,924,366	53,929,543	23,278,774	92,981,375	52,203,140	46.8
1931	35,466,502	27,066,579	39,046,000	19,735,298	74,512,502	46,801,877	51.5
1932	35,379,039	27,902,759	29,255,198	16,587,543	64,634,237	44,490,302	58.0
1933	30,145,038	24,183,469	32,876,273	15,824,524	63,021,311	40,007,993	52.7
1934	33,225,218	29,199,601	38,639,059	19,108,302	71,864,277	48,307,903	51.9
1935	30,536,159	25,275,160	45,010,297	20,877,604	75,526,456	46,152,764	45.9
1936	33,025,565	27,682,240	56,869,421	24,423,180	89,894,986	52,105,420	42.8
1937	35,006,315	29,263,144	59,261,878	25,080,280	94,268,193	54,343,424	43.2
1938	32,855,514	27,770,809	47,882,731	20,058,383	80,738,245	47,829,192	47.2
1939	34,564,457	28,642,998	55,046,114	22,963,204	89,610,571	51,606,202	44.8
STATE OF ARIZONA							
1929	38,341,654	34,443,919	56,102,585	28,122,422	94,444,239	62,566,341	46.4
1930	36,005,846	35,370,594	43,461,830	23,771,126	79,467,676	59,141,720	51.5
1931	35,839,113	33,153,830	31,082,158	17,416,415	66,921,271	50,570,245	58.7
1932	33,194,803	30,437,188	22,867,872	12,589,211	56,062,675	43,026,399	64.2
1933	29,098,405	25,268,899	22,480,887	12,458,034	51,579,292	37,726,933	60.9
1934	29,359,403	25,539,952	28,661,924	16,722,673	58,021,327	42,262,625	54.7
1935	32,628,247	28,921,670	35,641,802	19,192,988	68,270,049	48,114,658	52.9

STATE OF NEVADA

YEAR	PACIFIC FRUIT EXPRESS		OTHER		TOTAL ALL CARS		PERCENTAGE
	LOADED	EMPTY	LOADED	EMPTY	LOADED	EMPTY	P.F.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1929	34,530,295	28,487,060	63,384,878	21,324,583	97,915,173	49,811,643	42.7
1930	39,051,832	28,924,366	53,929,543	23,278,774	92,981,375	52,203,140	46.8
1931	35,466,502	27,066,579	39,046,000	19,735,298	74,512,502	46,801,877	51.5
1932	35,379,039	27,902,759	29,255,198	16,587,543	64,634,237	44,490,302	58.0
1933	30,145,038	24,183,469	32,876,273	15,824,524	63,021,311	40,007,993	52.7
1934	33,225,218	29,199,601	38,639,059	19,108,302	71,864,277	48,307,903	51.9
1935	30,516,159	25,275,160	45,010,297	20,877,604	75,526,456	46,152,764	45.9
1936	33,025,565	27,682,240	56,869,421	24,423,180	89,894,986	52,105,420	42.8
1937	35,006,315	29,263,144	59,261,878	25,080,280	94,268,193	54,343,424	43.2
1938	32,855,514	27,770,809	47,882,731	20,058,383	80,738,245	47,829,192	47.2
1939	34,564,457	28,642,998	55,046,114	22,963,204	89,610,571	51,606,202	44.8

STATE OF ARIZONA

1929	38,341,654	34,443,919	56,102,585	28,122,422	94,444,239	62,566,341	46.4
1930	36,005,846	35,370,594	43,461,830	23,771,126	79,467,676	59,141,720	51.5
1931	35,839,113	33,153,830	31,082,158	17,416,415	66,921,271	50,570,245	58.7
1932	33,194,803	30,437,188	22,867,872	12,589,211	56,062,675	43,026,399	64.2
1933	29,098,405	25,268,899	22,480,887	12,458,034	51,579,292	37,726,933	60.9
1934	29,359,403	25,539,952	28,661,924	16,722,673	58,021,327	42,262,625	54.7
1935	32,628,247	28,921,670	35,641,802	19,192,988	68,270,049	48,114,658	52.9
1936	32,777,916	26,120,492	46,458,036	24,310,459	79,235,952	50,430,951	45.4
1937	33,537,898	29,252,789	55,078,821	27,106,497	88,616,719	56,359,286	43.3
1938	34,125,150	30,977,776	40,635,142	21,618,459	74,760,292	52,596,235	51.1
1939	35,135,386	33,674,901	47,168,986	23,785,888	82,304,372	57,460,789	49.2

Defendant's Exhibit No. 191 (Witness Sines)
Jan. 16, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

AVERAGE NUMBER OF FREIGHT TRAINS PER DAY PER MILE OF ROAD
FOR SELECTED MONTHS OF YEARS 1928 TO 1939, INCLUSIVE

	MONTH YEAR (a)	FREIGHT SPARKS - OGDEN EAST (b)	FREIGHT SPARKS - OGDEN WEST (c)	MONTH YEAR (d)	FREIGHT YUMA-LORDSBURG EAST (e)	FREIGHT YUMA-LORDSBURG WEST (f)
(1)	Feb. 1928	3.63	3.44	Aug. 1928	3.03	2.77
(2)	Oct. 1928	12.62	11.88	June 1928	8.08	7.98
(3)	Feb. 1929	3.62	3.95	Aug. 1929	4.15	3.91
(4)	Oct. 1929	11.09	10.52	June 1929	9.23	8.72
(5)	Feb. 1930	3.16	3.27	Aug. 1930	3.11	2.70
(6)	Oct. 1930	10.50	11.55	June 1930	6.18	6.97
(7)	Feb. 1931	2.66	2.38	Aug. 1931	2.21	1.78
(8)	Oct. 1931	6.22	5.83	June 1931	8.50	9.01
(9)	Feb. 1932	2.30	2.56	Aug. 1932	1.96	1.45
(10)	Oct. 1932	6.23	5.95	June 1932	5.75	5.95
(11)	Feb. 1933	1.99	2.48	Aug. 1933	2.39	2.25
(12)	Oct. 1933	4.63	4.63	June 1933	5.18	5.03
(13)	Feb. 1934	2.20	2.55	Aug. 1934	3.50	3.17
(14)	Oct. 1934	4.83	4.90	June 1934	6.45	7.36
(15)	Feb. 1935	2.63	2.98	Aug. 1935	3.54	3.60
(16)	Oct. 1935	6.12	6.40	June 1935	6.85	6.75
(17)	Feb. 1936	2.94	3.09	Aug. 1936	4.39	4.44
(18)	Oct. 1936	7.00	6.75	June 1936	8.80	9.09
(19)	Feb. 1937	4.27	4.35	Aug. 1937	4.82	4.98
(20)	Oct. 1937	7.54	7.44	June 1937	8.87	9.49
(21)	Feb. 1938	2.44	2.52	Aug. 1938	4.33	4.71
(22)	Oct. 1938	6.68	6.98	June 1938	7.48	8.33
(23)	Feb. 1939	2.55	2.68	Aug. 1939	4.71	4.58
(24)	Oct. 1939	6.92	7.18	June 1939	8.18	9.11

	MONTH YEAR (a)	FREIGHT SPARKS - OGDEN EAST (b)	FREIGHT SPARKS - OGDEN WEST (c)	MONTH YEAR (d)	FREIGHT YUMA-LORDSBURG EAST (e)	FREIGHT YUMA-LORDSBURG WEST (f)
(1)	Feb. 1928	3.63	3.44	Aug. 1928	3.03	2.77
(2)	Oct. 1928	12.62	11.88	June 1928	8.08	7.98
(3)	Feb. 1929	3.62	3.95	Aug. 1929	4.15	3.91
(4)	Oct. 1929	11.09	10.52	June 1929	9.23	8.72
(5)	Feb. 1930	3.16	3.27	Aug. 1930	3.11	2.70
(6)	Oct. 1930	10.50	10.55	June 1930	6.18	6.97
(7)	Feb. 1931	2.66	2.38	Aug. 1931	2.21	1.78
(8)	Oct. 1931	6.22	5.83	June 1931	8.50	9.01
(9)	Feb. 1932	2.30	2.56	Aug. 1932	1.96	1.45
(10)	Oct. 1932	6.23	5.95	June 1932	5.75	5.95
(11)	Feb. 1933	1.99	2.48	Aug. 1933	2.39	2.25
(12)	Oct. 1933	4.63	4.63	June 1933	5.18	5.03
(13)	Feb. 1934	2.20	2.55	Aug. 1934	3.50	3.17
(14)	Oct. 1934	4.83	4.90	June 1934	6.45	7.36
(15)	Feb. 1935	2.63	2.98	Aug. 1935	3.54	3.60
(16)	Oct. 1935	6.12	6.40	June 1935	6.85	6.75
(17)	Feb. 1936	2.94	3.09	Aug. 1936	4.39	4.44
(18)	Oct. 1936	7.00	6.75	June 1936	8.80	9.09
(19)	Feb. 1937	4.27	4.35	Aug. 1937	4.82	4.98
(20)	Oct. 1937	7.54	7.44	June 1937	8.87	9.49
(21)	Feb. 1938	2.44	2.52	Aug. 1938	4.33	4.71
(22)	Oct. 1938	6.68	6.98	June 1938	7.48	8.33
(23)	Feb. 1939	2.55	2.68	Aug. 1939	4.71	4.58
(24)	Oct. 1939	6.92	7.18	June 1939	8.48	9.51
LAST 5 YEARS 1935 - 1939						
AVER.-FEBRUARY		2.96	3.16	AVER.-AUG.	4.36	4.46
AVER.-OCTOBER		6.78	6.95	AVER.-JUNE	8.10	8.63

SOURCE: Computed from basic data shown on Form S-1232 "Efficiency of freight locomotive loading."

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DEFENDANT'S EXHIBIT No. 192

January 21, 1944

For the Guidance of Officials and Employes Only

nger Train Consist No. 2-B, Revised: (Cancels No. 2-A, January 14, 1940)
Showing Consist of Passenger Trains as of June 2, 1940

tchison, Topeka & Santa Fe Railway Company, Gulf, Colorado & Santa Fe Railway Company

Issued by: J. J. Mahoney, General Supt. of Transportation

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(Page 1)
Returns

Train No. 1,

Chicago-Kansas City

1	Harvey Refgr.		Chicago-Los Angeles (Wed. for No. 7, Kansas City)		8
1	Express		Chicago-Kansas City (ex. Sun.)		DH
1	Bage Exp.		" Los Angeles		2
1	Chair-Women's	(AC-LW)	Chicago-Los Angeles		2
1	"	(AC-LW)	" "		2
1	"	(AC-LW)	" "		2
1	Diner	(AC)	" "		2
1	Lounge	(AC)	" "		2
½ 1	Tourist 14-sec.	(AC)	" "		2
½ 1	" 14-sec.	(AC)	" "		2
½ 1	" 14-sec.	(AC)	" "		2
½ 1	" 16-sec.	(AC)	" " (Sun., Tues., Wed., Fri.)		2
½ 1	" 16-sec.	(AC)	" Oakland (Mon., Thurs., Sat.)		2
½ 1	" 14-sec.	(AC)	Chg-Carlsbad-Los Angeles		2

12 cars; 11 Sun., 13 Wed.

Train No. 1,

Kansas City-Belen

1	Bage Mail (30'RPO)		Newton-Amarillo	124
1	" " (15'RPO)		Amarillo-Belen	2
1	Exp Mail		Kansas City-Amarillo (ex. Mon.)	124
1	Bage Exp.		Chicago-Los Angeles	2
1	Chair-Women's	(AC-LW)	" "	2
1	"	(AC-LW)	" "	2
1	"	(AC-LW)	" "	2
1	"	(AC)	Kansas City-Oakland	2
1	Diner	(AC)	Chicago-Los Angeles	2
1	Lounge	(AC)	" "	2
½ 1	Tourist 14-sec.	(AC)	" "	2
½ 1	" 14-sec.	(AC)	" "	2
½ 1	" 14-sec.	(AC)	" "	2
½ 1	" 16-sec.	(AC)	" " (Mon., Wed., Thurs., Sat.)	2
½ 1	" 14-sec.	(AC)	Kansas City-Los Angeles	2
½ 1	" 16-sec.	(AC)	Chicago-Oakland (Tues., Fri., Sun.)	2
½ 1	" 14-sec.	(AC)	Chicago-Carlsbad-Los Angeles	2

Kansas City-Newton,	14 cars;	13 Mon.
Newton-Amarillo	15 "	14 "
Amarillo-Belen	14 "	

[fol. 5552]

Pullman Line

Retu

Train No. 1,

Belen-Los Angeles

	1	B&M (15'RPO)	San Bernardino-Los Angeles (ex. Sunday and Holiday)		
	1	Bage Exp.	Chicago-Los Angeles		
	1	Chair-Women's	(AC-LW)	Chicago-Los Angeles	
	1	"	(AC-LW)	"	"
	1	"	(AC-LW)	"	"
	1	"	(AC)	Kansas City-Oakland	
	1	Diner	(AC)	Chicago-Los Angeles	
	1	Lounge	(AC)	"	"
18½	1	Tourist 14-sec.	(AC)	"	"
2d 18½	1	" 14-sec.	(AC)	"	"
3d 18½	1	" 14-sec.	(AC)	"	"
8½	1	" 16-sec.	(AC)	"	" (Tues., Thurs., Fri., Sun.)
4½	1	Tourist 14-sec.	(AC)	Kansas City-Los Angeles	
5½	1	" 16-sec.	(AC)	Chicago-Oakland (Wed., Sat., Mon.)	
13½	1	" 14-sec.	(AC)	Chicago-Carlsbad-Los Angeles, (25–26 Clovis-Carlsbad)	

Belen-Barstow, 13 cars
Barstow-SanBdno 11 cars, 12 Wed., Fri., Sat., Mon.
SanBdno-Los Angeles 12 cars, 13 Wed., Fri., Sat., Mon., 11 Sun.

Train No. 1,

Barstow-Oakland

	1	Bage Exp.	Barstow-Oakland	
	1	B&M (30'RPO)	"	"
	1	Smoker-Chair	(AC)	" "
	1	Chair	(AC)	Kansas City-Oakland
5½	1	Tourist 16-sec.	(AC)	Chicago-Oakland (off No. 1 Tues., Thurs., Sun.)
39	1	Stnd 8-1-2	(AC)	Chicago-Oakland (off No. 3)
	1	Cafe Obs.		Bakersfield-Oakland

Barstow-Bakersfield, 5 cars; 6 Tues., Thurs., Sun.
Bakersfield-Oakland, 6 cars; 7 Tues., Thurs., Sun.

[fol. 5553]

Pullman Line

Retu

Train No. 2,

Oakland-Barstow

	1	Bage Exp.	Oakland-Barstow	
	1	B&M (30'RPO)	"	"
	1	Smoker-Chair	(AC)	" "
	1	Chair	(AC)	Oakland-Kansas City (for No. 2 Barstow)
5½	1	Tourist 16-sec.	(AC)	Oakland-Chicago (for No. 2 Mon., Wed., Fri.)
39	1	Stnd 8-1-2	(AC)	Oakland-Chicago (for No. 4, Barstow)
	1	Cafe-Obs.	(AC)	Oakland-Bakersfield

Oakland-Bakersfield, 6 cars; 7 Mon., Wed., Fri.
Bakersfield,Barstow, 5 cars; 6 Mon., Wed., Fri.

Train No. 2,

Los Angeles-Belen

1	Bage Exp.		Los Angeles-Chicago	1
1	Chair-Women's	(AC-LW)	" "	1
1	"	(AC-LW)	" "	1
1	"	(AC-LW)	" "	1
1	"	(AC)	Oakland-Kansas City	1
1	Diner	(AC)	Los Angeles-Chicago	1
1	Lounge	(AC)	" "	1
1½	1 Tourist 14-sec.	(AC)	" "	1
1½	1 " 14-sec.	(AC)	" "	1
1½	1 " 14-sec.	(AC)	" "	1
1½	1 " 16-sec.	(AC)	" " (Sun., Tues., Thurs., Sat.)	1
1½	1 " 16-sec.	(AC)	Oakland-Chicago (Mon., Wed., Fri.)	1
1½	1 " 14-sec.	(AC)	Los Angeles-Kansas City	1
1½	1 " 14-sec.	(AC)	Los Angeles-Carlsbad-Chicago, (25-26 Clovis-Carlsbad)	1

Los Angeles-Barstow, 12 cars; 11 Mon., Wed., Fri.
Barstow-Belen, 13 cars

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an

Returns

Train No. 2,

Belen-Kansas City

1	B&M (15'RPO)		Belen-Amarillo	1
1	B&M (30'RPO)		Amarillo-Newton	123
1	Bage Exp.		Los Angeles-Chicago	1
1	Chair-Women's	(AC-LW)	" "	1
1	"	(AC-LW)	" "	1
1	"	(AC-LW)	" "	1
1	"	(AC)	Oakland-Kansas City	1
1	Diner	(AC)	Los Angeles-Chicago	1
1	Lounge	(AC)	" "	1
1½	1 Tourist 14-sec.	(AC)	" "	1
1½	1 " 14-sec.	(AC)	" "	1
1½	1 " 14-sec.	(AC)	" "	1
1½	1 " 16-sec.	(AC)	" " (Mon., Wed., Fri., Sun.)	1
1½	1 " 16-sec.	(AC)	Oakland-Chicago (Tues., Thurs., Sat.)	1
1½	1 " 14-sec.	(AC)	Los Angeles-Kansas City	1
1½	1 " 14-sec.	(AC)	Los Angeles-Carlsbad-Chicago	1

Belen-Newton, 14 cars.
Newton-Kansas Cy, 13 cars.

Train No. 2,

Kansas City-Chicago

1	Bage Exp.		Los Angeles-Chicago	1
1	Chair	(AC-LW)	" "	1
1	"	(AC-LW)	" "	1
1	"	(AC-LW)	" "	1
1	Diner	(AC)	" "	1
1	Lounge	(AC)	" "	1
1½	1 Tourist 14-sec.	(AC)	" "	1
1½	1 " 14-sec.	(AC)	" "	1
1½	1 " 14-sec.	(AC)	" "	1
1½	1 " 16-sec.	(AC)	" " (Tues., Thurs., Sat., Mon.)	1
1½	1 Tourist 16-sec.	(AC)	Oakland-Chicago (Wed., Fri., Sun.)	1
1½	1 " 14-sec.	(AC)	Los Angeles-Carlsbad-Chicago	1

11 cars.

[fol. 5555]

Pullman Line

Re

Train No. 3,

Chicago-Kansas City

	1 Express		New York-Dallas (from Erie ex. Tues. for MKT)	
	1 "		Chicago-Houston (ex. Mon.)	
	1 Bage Exp.		" Los Angeles	
	1 Stge Mail		" Kansas City (ex. Mon.)	
	1 Postal(60'RPO)		" "	
	1 Express		" " (ex. Mon.)	
	1 Smoker-Chair	(AC)	Chicago-Denver (for 13-130 LaJunta)	141-
	1 Chair	(AC)	" Los Angeles	
	1 Diner	(AC)	" "	
	1 Lounge	(AC)	" "	
9	1 Stnd 6-1-4	(AC)	" "	
39	1 " 8-1-2	(AC)	" Oakland	
45	1 2-3 Obs.	(AC)	" Los Angeles	

13 cars; 10 Mon., 12 Tues.

Train No. 3,

Kansas City-LaJunta

	1 B&M (15'RPO)		Newton-LaJunta (ex. Sun.)	
	1 Express		Chicago-Houston (ex. Mon. for 15 Newton)	
	1 Bage-Exp-Mail		Kansas City-Houston (Mon. only for 15 Newton)	
	1 Bage-Exp-Mail		Kansas City-Ft. Worth (ex. Mon. for 15 Newton)	
	1 Express Mail		Kansas City-Oklahoma City (Wed., Thurs., Fri., Sat., for 15 Newton)	
	1 Bage-Exp-Mail		Chicago-Los Angeles (Messenger)	
	1 Bage-Exp-Mail		Kans. City-Denver (for 13-130 LaJunta)	141-1
	1 Smoker-Chair	(AC)	Chicago-Denver (for 13-130 LaJunta)	141-1
	1 Chair	(AC)	" Los Angeles	
	1 Diner	(AC)	" "	
	1 Lounge	(AC)	" "	
9	1 Stnd 6-1-4	(AC)	" "	
39	1 Stnd 8-1-2	(AC)	" Oakland (for No. 1 Barstow)	
3021	1 Stnd 12-1	(AC)	San Angelo-Denver (off No. 6 Newton for 13-130 LaJunta)	141-14-4-5
45	1 2-3 Obs.	(AC)	Chicago-Los Angeles	

Kans. City-Newton; 11 cars; 10 Mon., 12 Wed., Thurs., Fri., Sat.
Newton-LaJunta; 11 cars; 10 Sun.

Train No. 3,

LaJunta-Los Angeles

	1 Bage-Exp-Mail		Chicago-Los Angeles	
	1 Express Mail		Denver-Albuquerque (off 141-14)	8 or
	1 Chair	(AC)	Chicago-Los Angeles	
	1 "	(AC)	Denver-Los Angeles (off 141-14)	4-13-1
10½	1 Tourist 16-sec.	(AC)	Denver-Los Angeles (off 141-14)	4-13-1
760	1 Stnd 10-2	(AC)	Denver-Albuquerque (off 141-14)	4-13-1
11	1 Stnd 8-1-2	(AC)	Denver-Los Angeles (off 141-14)	4-13-1
	1 Diner	(AC)	Chicago-Los Angeles	
	1 Lounge	(AC)	Chicago-Los Angeles	
9	1 Stnd 6-1-4	(AC)	Chicago-Los Angeles	
39	1 Stnd 8-1-2	(AC)	Chicago-Oakland (for No. 1 Barstow)	2
763	1 Stnd 10-2	(AC)	Winslow-Phoenix (for 47 Ash Fork)	42
45	1 2-3 Obs.	(AC)	Chicago-Los Angeles	

LaJunta-Albuqr., 12 cars Ash Fork-Barstow, 10 cars.
Albuqr-Winslow, 10 cars Barstow-Los Angeles, 9 cars.
Winslow-Ash Fork, 11 cars.

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Returns

Train No. 4,

Los Angeles-LaJunta

	1 Bage Exp.		Los Angeles-Chicago	3
	1 Chair	(AC)	Los Angeles-Chicago	3
	1 Chair	(AC)	Los Angeles-Denver (for 13-130)	141-14-3
10½	1 Tourist 16-sec.	(AC)	Los Angeles-Denver (for 13-130)	141-14-3
60	1 Stnd 10-2	(AC)	Albuqr-Denver (for 13-130)	141-14-3
11	1 Stnd 8-1-2	(AC)	Los Angeles-Denver (for 13-130)	141-14-3
	1 Diner	(AC)	Los Angeles-Chicago	3
	1 Lounge	(AC)	Los Angeles-Chicago	3
9	1 Stnd 6-1-4	(AC)	Los Angeles-Chicago	3
39	1 Stnd 8-1-2	(AC)	Oakland-Chicago (off No. 2 Barstow)	3-1
45	1 2-3 Obs.	(AC)	Los Angeles-Chicago	3

Los Angeles, Barstow, 9 cars.
Barstow-Albuquerque, 10 "
Albuquerque-LaJunta, 11 "

Train No. 4,

LaJunta-Kansas City

	1 B&M (15'RPO)		LaJunta-Newton (ex. Sun.)	3
	1 Bage Exp.		Houston-Kansas City (off 16 Newton)	3-15
	1 Stge Mail		Newton-Kansas City	7
	1 Bage Exp.		Los Angeles-Chicago	3
	1 Bage-Exp-Mail		Denver-Kansas City (off 141-14)	3-13-130
	1 Bage-Exp-Mail		Denver-Newton (off 141-14 Tues.)	—
	1 Smoker-Chair		Denver-Chicago (off 141-14)	3-13-130
	1 Chair	(AC)	Los Angeles-Chicago	3
	1 Diner	(AC)	" "	3
	1 Lounge	(AC)	" "	3
9	1 Stnd 6-1-4	(AC)	" "	3
39	1 Stnd 8-1-2	(AC)	Oakland-Chicago	3-1
21	1 Stnd 12-1	(AC)	Denver-San Angelo (off 141-14 for No. 5 Newton)	78-6-3-13-130
45	1 2-3 Obs.	(AC)	Los Angeles-Chicago	3

LaJunta-Newton, 11 cars; 10 Sun., 12 Tues.
Newton-Kansas City, 11 cars.

Train No. 4,

Kansas City-Chicago

	1 Bage-Exp.		Los Angeles-Chicago	3
	1 Smoker-Chair	(AC)	Denver-Chicago	3-13-130
	1 Chair	(AC)	Los Angeles-Chicago	3
	1 Diner	(AC)	" "	3
	1 Lounge	(AC)	" "	3
9	1 Stnd 6-1-4	(AC)	" "	3
39	1 Stnd 8-1-2	(AC)	Oakland-Chicago	3-1
15	1 Stnd 8-1-2	(AC)	Kansas City-Chicago	7
45	1 2-3 Obs.	(AC)	Los Angeles-Chicago	3

9 cars.

[fol. 5557]

Pullman Line

Train No. 5,

Chicago-Kansas City

	2 Express		New York-Kansas City (from M.C. ex. Mon. and day after Holiday)
	1 Stge Mail		Chicago-Kansas City (ex. Sun. and Holiday)
	1 Postal (60' RPO)		Chicago-Kansas City (ex. Sun.)
	1 Bage Exp.		Chicago-Houston
	1 Jim Crow	(AC)	Chicago-Galveston
	1 Chair	(AC)	Chicago-Galveston
	1 "	(AC)	Chicago-Okla. City (Fri., Sat., Sun.)
	1 Diner	(AC)	Chicago-Ft. Worth
	1 Parlor-Club	(AC)	Chicago-Ft. Worth
3008	1 Stnd 8-1-2	(AC)	Chicago-Galveston
41	1 Stnd 8-1-2	(AC)	Chicago-Oklahoma City
34	1 Stnd 10-1-2	(AC)	Chicago-Tulsa (for No. 49 Kans. City)
14	1 Stnd 10-sec. Obs.	(AC)	Chicago-San Antonio (I-GN from Ft. Worth)

13 cars—11 Mon., 12 Sun., 14 Fri., Sat.

Train No. 5,

Kansas City-Ft. Worth

	1 B&M (30' RPO)		Kansas City-Ft. Worth (from Okla. City Sun.)
	1 Bage-Exp-Mail		Kansas City-Okla. City (Sun. only)
	1 Bage-Exp.		Kansas City-Ft. Worth (ex. Mon. and day after Holiday)
	1 Bage Exp.		Chicago-Houston (to Galveston Sunday)
	1 Jim Crow	(AC)	Chicago-Galveston
	1 Chair	(AC)	Chicago-Galveston
	1 "	(AC)	Kansas City-Okla. City (from Chicago Sat., Sun., Mon., to Ft. Worth Sat.)
	1 Diner	(AC)	Chicago-Ft. Worth
	1 Parlor-Club	(AC)	Chicago-Ft. Worth
3008	1 Stnd 8-1-2	(AC)	Chicago-Galveston
41	1 Stnd 8-1-2	(AC)	Chicago-Okla. City
3021	1 Stnd 12-DR	(AC)	Denver-San Angelo (off No. 4 Newton for No. 77 Ft. Worth) 78-6-3-13
14	1 Stnd 10-sec. Obs	(AC)	Chicago-San Antonio (I-GN from Ft. Worth)

Kansas City-Newton, 11 cars, 10 Mon.
Newton-Okla. City, 12 cars, 11 Mon.
Okla. City-Ft. Worth, 10 cars, 9 Mon., 11 Sat.

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Returns

Train No. 5,

Ft. Worth-Galveston

1 Bage-Exp.		Dallas-Clovis (ex. Sun.) (off 66 for 75)	98-91-76-6-65
1 Bage-Exp.		Dallas-Galveston (ex. Sun.) (off 66)	6-65
1 Bage-Exp.		Chicago-Houston (to Galveston Sun.)	6
1 B&M (30'RPO)		Ft. Worth-Galveston	6
1 Jim Crow	(AC)	Chicago- " "	6
1 Chair	(AC)	" " "	6
1 Stnd 8-1-2	(AC)	" " "	6
1 Stnd 10-sec Lounge	(AC)	Dallas-Galveston (off 65 Ft. Worth)	6-65
1 Stnd 10-1-2	(AC)	Dallas-Grand Canyon-Los Angeles, (off 66 Ft. Worth for No. 123, Clovis)	124-98-91-76-6-65
1 Chair	(AC)	Dallas-Los Angeles (off 66 Ft. Worth for No. 123, Clovis)	24-124-98-91-76-6-65
1 Jim Crow Chair	(AC)	Clovis-Houston (off 76 Temple)	6-75-92-97
1 Stnd 10-1-2	(AC)	Oakland-New Orleans (off 76 Temple for GCL Houston)	6-75-92-97-123-23

Ft. Worth-Temple, 10 cars; 8 Sun.
Temple-Houston, 9 cars; 8 Mon.
Houston-Galveston, 6 cars.

Train No. 6,

Galveston-Ft. Worth

1 Bage-Exp.		Clovis-Dallas (off 76 Temple for 65 ex. Mon.)	66-5-75-92-97
1 Bage-Exp.		Galveston-Dallas (for 65 ex. Sun.)	66-5
1 Bage-Exp.		Houston-Chicago (Sun. from Galveston)	5
1 B&M (30'RPO)		Galveston-Ft. Worth	5
1 Jim Crow	(AC)	Galveston-Chicago	5
1 Chair	(AC)	Galveston-Chicago	5
1 Stnd 8-1-2	(AC)	Galveston-Chicago	5
1 Stnd 10-sec Lounge	(AC)	Galveston-Dallas (for No. 65)	66-5
1 Stnd 10-1-2	(AC)	Los Angeles-Grand Canyon-Dallas (off 76 Temple for 65)	66-5-75-92-97-123
1 Chair	(AC)	Los Angeles-Dallas (off 76 Temple for No. 65)	66-5-75-92-97-123-23
1 Jim Crow Chair	(AC)	Houston-Clovis (for No. 75 Temple)	98-91-76-5
1 Stnd 10-1-2	(AC)	New Orleans-Oakland (from GCL Houston for 75 Temple)	24-124-98-91-76-5

Galveston-Houston, 6 cars.
Houston-Temple, 9 cars; 8 Sun.
Temple-Ft. Worth, 10 cars; 8 Mon.

[fol. 5559]

Pullman Line

Train No. 6,

Ft. Worth-Kansas City

	1 B&M (30'RPO)		Ft. Worth-Kansas City (Sun. Newton only)
	1 Bage Exp.		Houston-Chicago (Sun. from Galveston)
	1 Jim Crow	(AC)	Galveston-Chicago
	1 Chair	(AC)	Galveston-Chicago
	1 "	(AC)	Okla. City-Kans. City (Mon. from Ft. Worth to Chicago Thurs., Fri. & Sat.)
41	1 Stnd 8-1-2	(AC)	Okla. City-Chicago
	1 Diner	(AC)	Ft. Worth-Chicago
	1 Parlor-Club	(AC)	Ft. Worth-Chicago
3008	1 Stnd 8-1-2	(AC)	Galveston-Chicago
3021	1 Stnd 12-1	(AC)	San Agelo-Denver (off 78 for No. 3, Newton) 141-14 4
14	1 Stnd 10-sec. Obs.	(AC)	San Antonio-Chicago (from I-GN Ft. Worth)

Ft. Worth-Okla. City, 9 cars; 10 Mon.
Okla. City-Newton, 11 cars.
Newton-Kans. City, 10 cars; 9 Sun.

Train No. 6,

Kansas City-Chicago

	1 Postal (60'RPO)		Kansas City-Chicago (ex. Sun.)
	1 Stge Mail		Kansas City-Chicago (ex. Holidays)
	1 Bage Exp.		Houston-Chicago
	1 Jim Crow	(AC)	Galveston-Chicago
	1 Chair	(AC)	Galveston-Chicago
	1 "	(AC)	Okla. City-Chicago (Thurs., Fri. & Sat.)
41	1 Stnd 8-1-2	(AC)	Okla. City-Chicago
	1 Diner	(AC)	Ft. Worth-Chicago
	1 Parlor-Club	(AC)	Ft. Worth-Chicago
3008	1 Stnd 8-1-2	(AC)	Galveston-Chicago
46	1 Stnd 14-sec.	(AC)	Kansas City-Chicago
34	1 Stnd 10-1-2	(AC)	Tulsa-Chicago (off No. 50)
14	1 Stnd 10-sec. obs.	(AC)	San Antonio-Chicago

12 cars; 11 Sun., 13 Thurs., Fri. and Sat.

Train No. 7,

Chicago-Kansas City

	1 Stge Mail		Chicago-Kansas City (ex. Sun.)
	1 Postal (60'RPO)		Chicago-Kansas City
	2 Stge Mail		Chicago-Los Angeles (1 Sun., 1 Mon.)
	1 Exp.		Chicago-Los Angeles (ex. Sun. & Mon.)
	2 Exp.		New York-Los Angeles (from M.C. ex. Mon.)
	1 Bage Exp.		Chicago-Los Angeles (Messenger).
	1 Coach Exp.		Chicago-Los Angeles
15	1 Stnd 8-1-2	(AC)	Chicago-Kansas City
46	1 Stnd 14-sec.	(AC)	Chicago-Kansas City
7	1 Stnd 10-2	(AC)	Chicago-Kansas City
1	Lounge	(AC)	Chicago-Chillicothe
	1 Cafe Lounge	(AC)	Shopton-Kansas City

Chicago-Chillicothe, 13 cars; 10 Sun., 11 Mon.
Chillicothe-Shopton, 12 cars; 9 Mon., 10 Tues.
Shopton-Kansas City, 13 cars; 10 Mon., 11 Tues.

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Returns

Train No. 7,

Kansas City-Los Angeles

1 Harvey Refgr.	Chicago-Los Angeles (off No. 1, Kans. City Thurs.)	8
1 Stge Mail	Kansas City-Los Angeles	8
1 Exp. Mail	Kansas City-Pueblo (ex. Mon. for 35 LaJunta)	8
1 Postal (60'RPO)	Kansas City-Los Angeles	8
2 Stge Mail	Chicago-Los Angeles (1 Mon., 1 Tues.)	8
1 Exp.	Chicago Los Angeles (ex. Mon. & Tues.)	8
2 Exp.	New York-Los Angeles (ex. Tues.)	DH
1 Bage Exp.	Chicago-Los Angeles (Messenger)	8
1 Coach Exp.	Chicago-Los Angeles	8

Kansas City-La Junta, 10 cars; 7 Mon., 6 Tues., 11 Thurs.
LaJunta-Los Angeles, 9 cars; 6 Mon., 5 Tues., 10 Thurs.

Train No. 8,

Los Angeles-Kansas City

1 Stge Mail (DH)	Los Angeles-Kansas City	7
1 Postal (60'RPO)	Los Angeles-Kansas City	7
1 Stge. Mail	Los Angeles-Kansas City	7
1 Stge. Mail	Los Angeles-Chicago	7
1 Bage Exp.	Los Angeles-Chicago (Messenger)	7
1 Exp.	Los Angeles-Chicago	7
1 Exp. Refgr.	Los Angeles-Chicago (ex. Sun.)	–
1 Harvey Refgr.	Los Angeles-Chicago (Wed.)	1-7
1 Coach Exp.	Los Angeles-Chicago	7

Los Angeles-Albuquerque, 8 cars; 7 Sun., 9 Wed.
Albuquerque-LaJunta, 8 cars; 7 Mon., 9 Thurs.
LaJunta-Kansas City, 8 cars; 7 Tues., 9 Fri.

Train No. 8,

Kansas City-Chicago

1 Stge Mail	Kansas City-Chicago	5
1 Postal (60'RPO)	Kansas City-Chicago	7
1 Stge Mail	Los Angeles-Chicago	7
1 Bage Exp.	Los Angeles-Chicago (Messenger)	7
1 Exp.	Los Angeles-Chicago	7
1 Exp. Refgr.	Los Angeles-Chicago (ex. Tues.)	
1 Harvey Refgr.	Los Angeles-Chicago (Friday)	1-7
1 Coach Exp.	Los Angeles-Chicago	7
1 Stnd 10-2 (AC)	Kansas City-Chicago	7
1 Cafe Lge (AC)	Kansas City-Shopton	7
1 Lounge (AC)	Chillicothe-Chicago	7

Kansas City-Shopton, 9 cars; 8 Tues., 10 Fri.
Shopton-Chillicothe, 8 cars; 7 Wed., 9 Sat.
Chillicothe-Chicago, 9 cars; 8 Wed., 10 Sat.

[fol. 5561]

Pullman Line

Trains 11-12 (Kansas Cityan-Chicagoan)

Chicago-Oklahoma City

Car Numbers West	East		
		RPO 80-81 Chgo-Kans. City	(Kans. City-Chgo No. 20)
119	129	Bage Chair 3492, 3493,	Chicago-Okla. City
116	126	Chair 3107-3108,	" " "
114	124	Club Chair 1398-1399,	" " "
		Diner 1486-1487,	" " "
112	122	Chair 3109-3110-3111,	Chicago-Dallas (15-16-65-66 Okla. City-Dallas
4018	Stnd 14-Sec. (LW)		Kansas City-Dallas, (15-16-65-66 Okla. City-Dallas)
110	112	Parlor Obs. 3241-3242	Chicago-Tulsa (211-212, Kansas City-Tulsa)

No. 11: 7 cars, Chicago-Kansas City
6 " Kansas City-Okla. City
No. 12: 6 " Okla. City-Chicago
Trains 211-212, Kansas City-Tulsa

118	128	Chair	3099
117	127	"	3100
		Diner	1482
110	120	Parlor Obs.	3241-3242 (On 11-12 Chicago-Kans. City)

Train No. 13-130,

LaJunta-Denver

	1	Stge-Mail (DH)		Pueblo-Denver (off No. 35)
	1	Mail Exp.		Kansas City-Denver (off No. 3)
	1	Smoker-Chair		Chicago-Denver (off No. 3)
11	1	Stnd 8-1-2	(AC)	Los Angeles-Denver (off No. 4)
760	1	" 10-2	(AC)	Albuquerque-Denver (off No. 4)
10½	1	Tourist 16-sec.	(AC)	Los Angeles-Denver (off No. 4)
	1	Chair	(AC)	Los Angeles-Denver (off No. 4)
	1	Lounge	(AC)	LaJunta-Denver
3021	1	Stnd 12-1	(AC)	San Angelo-Denver (off No. 3)

LaJunta-Pueblo, 8 cars.
Pueblo-Denver, 9 "

Train No. 141-14

Denver-LaJunta

	1	B&M (30 RPO)		Denver-LaJunta
	1	Bage-Exp-Mail		" Albuquerque (for No. 3)
	1	" " "		" Kansas City (for No. 4)
	1	" " "		" Newton (for No. 4 Mon. only)
	1	Smoker-Chair	(AC)	Denver-Chicago (for No. 4)
3021	1	Stand 12-1	(AC)	" San Angelo (for No. 4)
	1	Lounge	(AC)	" LaJunta
11	1	Stnd 8-1-2	(AC)	" Los Angeles (for No. 3)
766	1	" 10-2	(AC)	Dever-Albuqr. (for No. 3)
10½	1	Tourist 16-sec.	(AC)	Denver-Los Angeles (for No. 3)
	1	Chair	(AC)	" " (for No. 3)

10 cars; 11 Mon.

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man Line

Returns

Trains 13-14,

Albuquerque-El Paso-Albuquerque

1	Bage-Exp.	Albuquerque-El Paso-Albuquerque	
1	B&M (15'RPO)	" " "	
1	Jim Crow (AC)	" " "	
1	Chair (AC)	" " "	
15 1	Stnd 14-Sec. (AC)	" " "	

5 cars.

Train No. 15,

Newton-Ft. Worth

1	Exp.	Chicago-Houston (Mon. from Kans. City, off No. 3)	16–4
1	Bage-Exp-Mail	Kans. City-Ft. Worth (ex. Mon., off No. 3)	16
1	Bage-Exp-Mail	Kans. City-Okla. City (off No. 3 Wed., Thurs., Fri., Sat.)	DH
1	B&M (30'RPO)	Newton-Ft. Worth	16
1	Jim Crow (AC)	Newton-Dallas (for No. 65)	66–16
1	Chair (AC)	Newton-Okla. City	16
1	Chair (AC-LW)	Chicago-Dallas (off 11 Okla. City for No. 65)	66–16–12
18 1	Stnd 14-Sec. (AC-LW)	Kansas City-Dallas (off No. 11 Okla. City for 65),	66–16–12
19 1	Stnd 14-Sec. (AC)	Okla. City-Dallas (for No. 65)	66–16

Newton-Okla. City, 6 cars; 4 Mon., 6 Wed., Thurs, Fri., Sat.
Okla. City-Ft. Worth, 7 cars; 6 Tues.

Train No. 15,

Ft. Worth-Galveston

1	Exp-Bage	Chicago-Houston	16–4
1	B&M (15'RPO)	Ft. Worth-Galveston	16
1	Jim Cros (AC)	" "	16
1	Chair (AC)	" "	16

4 cars.

Train No. 16,

Galveston-Ft. Worth

1	Bage Exp.	Houston-Kans. City (for No. 4 Newton)	3–15
1	B&M (15'RPO)	Galveston-Ft. Worth	15
1	Jim Crow (AC)	" "	15
1	Chair (AC)	" "	15

4 cars.

[fol. 5563]

Pullman Line

Train No. 16,

Ft. Worth-Newton

	1	Bage Exp.	Dallas-Okla. City (off No. 66)
	1	Bage Exp.	Houston-Kans. City (for No. 4 Newton)
	1	B&M (30 RPO)	Ft. Worth-Newton
	1	Jim Cros (AC)	Dallas-Newton (off No. 66)
	1	Chair (AC)	Okla. City-Newton
	1	Chair (AC-LW)	Dallas-Chicago (off 66 for No. 12, Okla. City)
4018	1	Stnd 14-Sec. (AC-LW)	Dallas-Kans. City (off No. 66 for No. 12, Okla. City)
49	1	Stnd 14-Sec. (AC)	Dallas-Okla. City (off No. 66)

Ft. Worth-Oklahoma City 7 cars.
Oklahoma City-Newton, 4 cars.

Trains 17-18 (Super-Chief)

(Light Weight—Air Conditioned)

Departs Chicago Tuesdays
Departs Los Angeles Fridays

(Diesel Locomotive)

	1	Club-Baggage	1386
4014	1	Stnd 17-Roomette	TUBA
4015	1	Stnd 2-DR 4-Compartment 4-DBR	HASTA
2d 4007	1	Stnd 2-DR 2-Compartment 6-DBR	TAOS*
	1	Club-Lounge	1370
	1	Diner	1474
4007	1	Stnd 2-DR 2-Compartment 6-DBR	ORAIBI*
4006	1	Stnd 8-Sect. 2-Compartment 1-DR	LAGUNA*
4008	1	Stnd 2-DR 3-Compartment 1-DBR Observation	NAVAJO*

* Budd Sleepers.

Departs Chicago Saturday
Departs Los Angeles Tuesday

	1	Club-Baggage	1387
4014	1	Stnd 17-Roomette	CHIMAYO
3d 4015	1	Stnd 2-DR 4-Compartment 4-DBR	BACOBI
2d 4015	1	Stnd 2-DR 4-Compartment 4-DBR	TAPACIPA
	1	Club-Lounge	1378
	1	Diner	1488
4015	1	Stnd 2-DR 4-Compartment 4-DBR	NAVA
4006	1	Stnd 8-Sect. 2-Compartment 1-DR	ISLETA*
4016	1	Stnd 4-DR 1-DBR Observation	PUYE

* Budd sleeper.

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an Line

Returns

Train No. 19 (The Chief)

Chicago-Los Angeles

1	Mail Exp.	Chicago-Kansas City	24
1	Stge Mail	Kansas City-Los Angeles	20
1	B&M (30'RPO)	Kansas City-Los Angeles	20
1	Stge Mail	Chicago-Los Angeles (Tuesday only)	DH
1	Club Baggage	" "	20
1	Stnd 8-2-2	Kansas City-Los Angeles	20
1	Stnd 17-Roomette	Chicago-Los Angeles	20
011 1	Stnd 2-DR 4-Comp. 4-DBR.,	Chicago-Los Angeles	20
1	Club Lounge	" "	20
1	Diner	" "	20
011 1	Stnd 2-DR 4-Comp. 4-DBR.,	" "	20
1	Stnd 8-Sec. 2-Comp. 2-DBR.,	" "	20
1	Stnd 2-DR 4-Comp. 4-DBR and 8-sect. 2-Comp. 2-DBR alternating,	Chicago-Grand Canyon-Los Angeles	20
1	Stnd 4-DR 1-DBR Observation,	Chicago-Los Angeles	20

sleeping cars, diner, and club cars Light Weight-Air Conditioned.

10 cars, Chicago-Kansas City, 11 Tues.
12 cars, Kansas City-Los Angeles, 13 Tues.

Train No. 20 (The Chief)

Los Angeles-Chicago

1	Stge Mail	Los Angeles-Kansas City (to Chicago when needed).	19
1	B&M (30'RPO)	Los Angeles-Kansas City	19
1	RPO (60')	Kansas City-Chicago (light weight)	11
1	Club Baggage	Los Angeles "	19
1	Stnd 8-2-2	" Kansas City	19
1	Stnd 17-Roomette,	" Chicago	19
011 1	Stnd 2-DR 4-Comp. 4-DBR.,	Los Angeles-Chicago	19
1	Club-Lounge	Los Angeles-Chicago	19
1	Diner	" "	19
011 1	Stnd 2-DR 4-Comp. 4-DBR.,	" "	19
1	Stnd 8-Sect. 2-Comp. 2-DBR	" "	19
1	Stnd 2-DR 4-Comp. 4-DBR and 8-Sect. 2-Comp. 2-DBR alternating,	Los Angeles-Grand Canyon-Chicago.	19
1	Stnd 4-DR 1-DBR Observation,	Los Angeles-Chicago.	19

sleeping cars, diner, and club cars Light Weight-Air Conditioned.

12 cars, Los Angeles-Kansas City
10 cars Kansas City-Chicago

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ain Line

Returns

Trains 21-22 (El Capitan)

Departs Chicago, Tuesday and Saturday
Departs Los Angeles, Friday and Tuesday

(Diesel Locomotive)

Car Numbers: West	East		
219	229	Baggage Dormitory	32-Seat Chair Car.
218	228	Chair car	52 seats
214	224	Club-Chair Lunchcounter-Dining car.	20 seats
212	222	Chair car	52 seats
240	220	Observation Chair Car	52 seats

[fol. 5566]

Pullman Line

Train No. 23

Chicago-Kansas City

	1	Exp.	Chicago-Oakland (ex. Mon. for M. P. Kans Cy)	
	1	"	" -Kans City (ex. Sun. & Mon.)	
	1	Bage-Exp.	" -Los Angeles	
	1	Smoker-Chair (AC)	Chicago-Albuquerque	
	1	Chair (AC)	" -Los Angeles	
7½	1	Tourist 16-Sec. (AC)	" -Grand Canyon-Los Angeles (No. 123 from Williams)	12
	1	Diner (AC)	Chicago-Los Angeles	
	1	Lounge (AC)	" " "	
25	1	Stnd 10-1-2 (AC)	" -Grand Canyon-Los Angeles (No. 123 from Williams)	12
2	1	Stnd 10-1-2 (AC)	Chicago-Los Angeles (No. 123 Kans. City-Williams)	24-12
31	1	10-sec. Obs. (AC)	Chicago-Los Angeles	

11 cars; 10 Sun., 9 Mon.

Train No. 23

Kansas City-Williams

	1	Bage-Exp.	Chicago-Los Angeles	
	1	Bage-Exp.	Kans City-Denver (ex. Sun.) (for 231-230 La Junta)	241-24
	1	Smoker-Chair (AC)	Chicago-Denver (for 231-230)	241-24
	1	Chair (AC)	" -Los Angeles	
7½	1	Tourist 16-Sec. (AC)	" -Grand Canyon-Los Angeles (No. 123 from Williams)	12
	1	Diner (AC)	Chicago-Los Angeles	
	1	Lounge (AC)	" " "	
25	1	Stnd 10-1-2 (AC)	" -Grand Canyon-Los Angeles (No. 123 from Williams)	12
6	1	Stnd 10-2 (AC)	Kansas City-Denver (for 231-230 La Junta)	241-24
31	1	10-Sec. Obs. (AC)	Chicago-Los Angeles	

Kansas City-La Junta, 10 cars; 9 Sun
La Junta-Albuquerque 7 "
Albuquerque-Williams 7 "

Train No. 23

Williams-Los Angeles

	1	Bage-Exp.	Chicago-Los Angeles	
	1	Chair (AC)	Chicago-Los Angeles	
	1	Chair (AC)	Dallas-Los Angeles (off No. 123 Williams)	24-12 94-76
	1	Diner (AC)	Chicago-Los Angeles	
	1	Lounge (AC)	Chicago-Los Angeles	
6½	1	Tourist 16-Sec. (AC)	Kans City-Los Angeles (off No. 123 Williams)	24
2	1	Stnd 10-1-2 (AC)	Chicago-Los Angeles (off 123 Williams)	24-12
3010	1	Stnd 10-1-2 (AC)	New Orleans-Oakland (off No. 123 Williams)	24-12 91-7
31	1	10-Sec. Obs (AC)	Chicago-Los Angeles	

9 Cars Williams-Barstow
8 Cars Barstow-Los Angeles

Line			Returns
		Train No. 23,	
		Barstow-Oakland	
1 Bage Exp.	Fresno-Oakland (ex. Mon.)		24
1 Bage Exp.	Barstow- "		24
1 B&M (30 RPO)	" "		24
1 Smoker-Chair	(AC) " "		24
1 Stnd 10-1-2	(AC) New Orleans-Oakland		24-124-98-91-76-5
	4 cars; 5 from Fresno, ex. Mon.		
		Train No. 24,	
		Oakland-Barstow	
1 Bage Exp.	Oakland-Fresno (ex. Sun.)		23
1 " "	" Barstow		23
1 B&M (30 RPO)	" "		23
1 Smoker-Chair	(AC) Oakland-Barstow		23
1 Stnd 10-1-2	(AC) " New Orleans		23
	4 cars; 5 to Fresno, ex. Sun.		
		Train No. 24,	
		Los Angeles-Williams	
1 Bage Exp.	Los Angeles-Chicago		23
1 Chair car (AC)	Los Angeles-Chicago		23
1 Chair car (AC)	Los Angeles-Dallas (for 124 Williams)		66-5-75-92-97-123-23
1 Diner (AC)	Los Angeles-Chicago		23
1 Lounge (AC)	Los Angeles-Chicago		23
1 Tourist 16-sec. (AC)	Los Angeles-Kansas City (for No. 124, Williams)		123-23
1 Stnd 10-1-2 (AC)	Los Angeles-Chicago (for No. 124, Williams)		23-123-23
1 Stnd 10-1-2 (AC)	Oakland-New Orleans (for No. 124, Williams)		6-75-92-97-123-23
1 Stnd 10-2 (AC)	Phoenix-Winslow (off 42 Ash Fork)		3-47
1 10-Sec. Obs. (AC)	Los Angeles-Chicago		23
	Los Angeles-Barstow 8 cars		
	Barstow-Ash Fork, 9 "		
	Ash Fork-Williams, 10 "		
		Train No. 24,	
		Williams-Kansas City	
1 Stge Mail (DH)	Albuqr-Kansas City (Can return No. 8 if desired)		7-3
1 Bage-Exp.	Los Angeles-Chicago		23
1 Bage-Exp.	Denver-Kans. City (ex. Sun.) (off 241-240, La Junta)		23-231-230
1 Smoker-Chair	(AC) Denver-Chicago (off 241-240 La Junta)		23-231-230
1 Chair	(AC) Los Angeles-Chicago		23
1 Tourist 16-sec.	(AC) Los Angeles-Grand Canyon-Chicago, (No. 124 Los Angeles-Williams)		23-123
1 Diner	(AC) Los Angeles-Chicago		23
1 Lounge	(AC) Los Angeles-Chicago		23
1 Stnd 10-1-2	(AC) Los Angeles-Grand Canyon-Chicago (No. 124 Los Angeles-Williams)		23-123
1 Stnd 10-2	(AC) Denver-Kans. City (off 241-240 La Junta)		23-231-230
1 Stnd 10-2	(AC) Phoenix-Winslow (off 42 Ash Fork)		3-47
1 10-sec. Obs.	(AC) Los Angeles-Chicago		23

Williams-Winslow, 8 cars; Winslow-Albuqr. 7 cars; Albuqr-La Junta 8 cars.
La Junta-Kans. City 11, cars, 10 Sun.

[fol. 5568]

Pullman Line

Train No. 24,

Kansas City-Chicago

	1 Stge Mail	Kansas City-Chicago		
	1 B&M (60'RPO)	Kansas City-Chicago		
	1 Exp.	Oakland-Chicago (from Mo. Pac. ex. Wed.)		
	1 Bage-Exp.	Los Angeles-Chicago		
	1 Smoker-Chair	(AC)	Denver-Chicago	
	1 Chair	(AC)	Los Angeles-Chicago	
7½	1 Tourist 16-Sec.	(AC)	"	Grand Canyon-Chicago
	1 Diner	(AC)	"	Chicago
	1 Lounge	(AC)	"	"
25	1 Stnd 10-1-2	(AC)	"	Grand Canyon-Chicago
2	1 Stnd 10-1-2	(AC)	"	Chicago (off 124 Kans. City)
31	1 10-sec. Obs.	(AC)	"	"

11 cars; 10 Wed.

Train No. 27,

Kansas City-Oklahoma City

	1 Mail Exp.	Kansas City-Wichita			
	1 Bage Exp.	Kansas City-Dodge City (for 127 Newton)			
	1 B&M (30'RPO)	Newton-Oklahoma City			
	1 Bage-Mail	Kans. City-Oklahoma City			
	1 Exp.	"	"	"	"
	1 Jim Crow (AC)	"	"	"	"
	1 Chair (AC)	"	"	"	"
	1 Chair (AC)	"	"	Dodge City (for No. 127)	
3012	1 Stnd 10-2 (AC)	"	"	Dodge City (for No. 127)	
2d 3013	1 Stnd 8-1-2 (AC)	"	"	Okla. City	
3013	1 Stnd 10-sec. Lounge (AC)	Kans. City-Okla. City			

Kansas City-Newton,	10 cars.
Newton-Wichita,	8 "
Wichita-Okla. City,	7 "

Train No. 28,

Oklahoma City-Kansas City

	1 B&M (30'RPO)	Dodge City-Kans. City (off No. 128, Newton)			
	1 Bage Exp.	"	"	"	"
	1 Bage-Exp-Mail	Wichita-Kansas City			
	1 Bage-Exp-Mail	Wichita-Newton (ex. Mon.)			
	1 B&M (30'RPO)	Okla. City-Newton (ex. Sun.)			
	1 Stge Mail	"	"	Kansas City	
	1 Bage Exp.	"	"	"	"
	1 Jim Crow (AC)	"	"	"	"
	1 Chair (AC)	"	"	"	"
2d 3013	1 Stnd 8-1-2 (AC)	"	"	"	"
3013	1 Stnd 10-sec. Lounge (AC)	Okla. City-Kans. City			
3003	1 Stnd 12-a (AC)	Wichita-Kans. City			
	1 Chair (AC)	Dodge City-Kans. City (off No. 128 Newton)			
3012	1 Stnd 10-2 (AC)	"	"	"	" (" " " " ")

7 cars,	Okla. City-Wichita,	6 Sun.
10 cars,	Wichita-Newton,	8 Mon.
12 cars,	Newton-Kans. City.	

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man Line

Train No. 123

Kansas City-Clovis

				Returns
	1	B&M (30'RPO)	Kans City-Dodge City (for 127 Newton)	128-28
	1	Exp-Mail	Kans City-Dodge City (Ex. Sun for 127 Newton).	128-124
	1	Exp-Mail	Kansas City-Wichita (Ex. Sun).	28
	1	B&M (30'RPO)	Newton-Belen	124-2
	1	Exp-Mail	Kans City-Amarillo	124
	1	Bage Exp.	Kans City-Williams	124
	1	Jim Crow Chair (AC)	Kans City-Clovis	124
	1	Chair (AC)	Kans City-Grand Canyon-Los Angeles	124
6½	1	Tourist 16-Sec (AC)	Kans City-Los Angeles (for No. 23, Williams)	24-124
	1	Diner (AC)	Wellington-Belen	124
	1	Lounge (AC)	Kans City-Gallup	124
2	1	Stnd. 10-1-2 (AC)	Chicago-Los Ang. (off 23 Kans City for 23 Williams)	24-124-24
03	1	Stnd. 12-1 (AC)	Kansas City-Wichita	28

Kansas City-Newton	11 cars, 9 Sun.
Newton-Wichita	10 " 9 Mon.
Wichita-Wellington	8 "
Wellington-Amarillo	9 "
Amarillo-Clovis	8 "

Train No. 123

Clovis-Williams

	1	B&M (30'PRO)	Newton-Belen	124-2
	1	Bage Exp.	Kans City-Williams	124
	1	Chair (AC)	Kans City-Grand Canyon-Los Angeles	124
	1	Chair (AC)	Dallas-Los Angeles (off 97 Clovis for No. 23, Williams)	24-124-98-91-76-6-65
6½	1	Tourist 16-Sec. (AC)	Kans City-Los Angeles (for No. 23 Williams)	24-124
	1	Diner (AC)	Wellington-Belen	124
	1	Lounge (AC)	Kansas City-Gallup	121
2	1	Stnd. 10-1-2 (AC)	Chicago-Los Angeles (For No. 123 Williams)	24-124-24
40	1	Stnd. 10-1-2 (AC)	New Orleans-Oakland (off 97 for No. 23, Williams)	24-124-98-91-76-5
05	1	Stnd. 10-1-2 (AC)	Dallas-Grand Canyon-Los Angeles (off 97, Clovis)	124-98-91-76-6-65

Clovis-Belen	10 cars
Belen-Gallup	8 "
Gallup-Williams	7 "

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Pullman Line

Retu

Train No. 123

Williams-Los Angeles

	1 Bage-Exp.		Williams-Los Angeles
	1 Chair (AC)		Kans. City-Grand Canyon-Los Angeles
7½	1 Tourist 16-Sec.	(AC)	Chicago-Grand Canyon-Los Angeles (No. 23, Chicago-Williams) 124
	1 Diner (AC)		Needles-Los Angeles
	1 Lounge (AC)		Needles-Los Angeles
25	1 Stnd 10-1-2	(AC)	Chicago-Grand Canyon-Los Angeles (No. 23, Chicago-Williams) 124
3005	1 Stnd 10-1-2	(AC)	Dallas-Grand Canyon-Los Ang. 124-98-91-76-6
33	1 10-Sec. Lounge	(AC)	Grand Canyon-Los Angeles

6 cars, Williams-Needles
8 cars, Needles-Los Angeles

Train No. 124

Los Angeles-Williams

	1 Bage-Exp.		Los Angeles-Williams
	1 Chair (AC)		" " -Grand Canyon-Kans City
7½	1 Tourist 16-Sec.	(AC)	" " -Grand Canyon-Chicago (No. 24, Williams-Chicago) 23
	1 Diner (AC)		Los Angeles-Needles
	1 Lounge (AC)		" "
25	1 Stnd 10-1-2	(AC)	" " -Grand Canyon-Chicago (No. 24, Williams-Chicago) 23
3005	1 Stnd 10-1-2	(AC)	Los Angeles-Grand Canyon-Dallas (for 98, Clovis) 66-5-75-92-97
33	1 10-Sec. Lounge	(AC)	Los Angeles-Grand Canyon

8 cars, Los Angeles-Needles
6 cars Needles-Williams

Train No. 124

Williams-Clovis

	1 Bage-Exp.		Williams-Kansas City
	1 B&M (30 RPO)		Belen-Amarillo
	1 Chair	(AC)	Los Angeles-Grand Canyon-Kans City
	1 Chair	(AC)	Los Angeles-Dallas (No. 24 Los Angeles-Williams) 66-5-75-92-97-123
6½	1 Tourist 16-Sec.	(AC)	Los Angeles-Kansas City (No. 24 Los Angeles-Williams) 123
	1 Diner	(AC)	Belen-Wellington
	1 Lounge	(AC)	Gallup-Kansas City
2	1 Stnd 10-1-2	(AC)	Los Angeles-Chicago (off No. 24 Williams for 24 Kans City) 23-123
3010	1 Stnd 10-1-2	(AC)	Oakland-New Orleans (No. 24, Oakland-Wilhams) 6-75-92-97-123
3005	1 Stnd 10-1-2	(AC)	Los Angeles-Grand Canyon-Dallas (for No. 98, Clovis) 66-5-75-92-97-12

Williams-Gallup 7 cars
Gallup-Belen 8 "
Belen-Clovis 10 "

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an Line

Train No. 124,
Clovis-Kansas City

			Returns
1	Stge Mail	Newton-Kansas City (ex. Sun.)	—
1	Stge Mail	Dodge City-Kans. City (off 128, ex. Tues.)	123–127
1	Stge Mail	Amarillo-Kans. City	123
1	B&M (30'RPO)	Amarillo-Newton	1
1	Bage-Exp.	Amarillo-Kansas City (ex. Sun.)	1
1	Bage-Exp.	Williams-Kansas City	123
1	B&M (30'RPO)	Belen-Amarillo	123
1	Jim Crow-Chair	(AC) Clovis-Kansas City	123
1	Chair (AC)	Los Angeles-Grand Canyon-Kansas City	123
1	Tourist 16-sec.	(AC) Los Angeles-Kansas City (No. 24, Los Angeles-Williams)	123–23
1	Diner	(AC) Belen-Wellington	123
1	Lounge	(AC) Gallup-Kansas City	123
1	Stnd 10-1-2	(AC) Los Angeles-Chgo (For 24 Kans City)	23–123–23

Clovis-Amarillo, 8 cars.
Amarillo-Wellington 10 " 9 Sun.
Wellington-Newton, 9 " 8 Mon.
Newton-Kans. City, 10 " 9 Sun., Mon., Tues.

Train No. 127,
Newton-Dodge City

1	B&M (30'RPO)	Kansas City-Dodge City (off No. 123)	128–28
1	Exp. Mail	Kansas City-Dodge City (off No. 123, ex. Mon.)	128–124
1	Bage Exp.	Kansas City-Dodge City (off No. 27)	128–28
1	Smoker-Chair	Newton-Dodge City	128
1	Chair (AC)	Kans. City-Dodge City (off No. 27)	128–28
1	Stnd 10-2 (AC)	Kans. City-Dodge City (off No. 27)	128–28

6 cars; 5 Mon.

Train No. 128,
Dodge City-Newton

1	Stge Mail	Dodge City-Kans. City (for No. 124 ex. Mon.)	123–127
1	B&M (30'RPO)	Dodge City-Kans. City (for No. 28)	123–127
1	Bage Exp.	Dodge City-Kans. City (for No. 28)	27–127
1	Smoker-Chair	Dodge City-Newton	127
1	Chair (AC)	Dodge City-Kans. City (for No. 28)	27–127
1	Stnd 10-2 (AC)	Dodge City-Kans. City (for No. 28)	127

6 cars; 5 Mon.

or car with passenger trailer operates Nos. 127-128 between Dodge City-La Junta.

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an Line

Train 75-92-97,
Temple-Clovis

			Returns
1	Bage-Exp.	Brownwood-San Angelo (for No. 79 Coleman)	78
1	Bage-Exp.	Dallas-Clovis (Mon. Temple-Sweetwater)	98–91–76–6–65
1	B&M (30'RPO)	Temple-Clovis	98–91–76
1	Jim Crow-Chair	(AC) Houston-Clovis (off No. 6 Temple)	98–91–76–5
1	Chair (AC)	Dallas-Los Angeles (off 5 for 123)	24–124–98–91–76–6–65
1	Diner (AC)	Brownwood-Clovis	98–91–76
1	Stnd 10-1-2 (AC)	New Orleans-Oakland (off No. 6 for 123)	24–124–98–91–76–6–65
1	Stnd 10-1-2 (AC)	Dallas-Grand Canyon-Los Angeles, (off No. 5 for 123)	124–98–91–76–6–65

6 cars, Temple-Brownwood
8 cars, Brownwood-Coleman
7 cars, Coleman-Clovis (6 Sweetwater to Clovis Monday)

Train 98-91-76

Clovis-Temple

	1 B&M (30'RPO)	Coleman-Brownwood (off No. 80 for 78)	
	1 Bage-Exp.	Clovis-Dallas (Sun. Sweetwater to Temple)	66-5-75-92
	1 B&M (30'RPO)	Clovis-Temple	75-92
	1 Jim Crow-Chair (AC)	Clovis-Houston (for No. 5 Temple)	6-75-92
	1 Chair (AC)	Los Angeles-Dallas (off 124 for No. 6)	66-5-75-92-97
	1 Diner (AC)	Clovis-Brownwood	75-92
3005	1 Stnd 10-1-2 (AC)	Los Angeles-Grand Canyon-Dallas, (off No. 124 for No. 6)	66-5-75-92-97
3010	1 Stnd 10-1-2 (AC)	Oakland-New Orleans (off No. 124 for No. 5)	6-75-92-97-123

7 cars Clovis-Coleman (6 Clovis to Sweetwater Sunday)
8 cars Coleman-Brownwood
6 cars Brownwood-Temple

Trains 231-230-241-240

	1 Bage-Exp.	Kans. City-Denver-Kans. City (off No. 23 for No. 24)	
	1 Bage-Exp.	La Junta-Denver-La Junta (Mon. only)	
	1 B&M (30'RPO)	La Junta-Denver (returns on 141-14)	
	1 Smoker-chair (AC)	Chicago-Denver-Chicago (off 23 for No. 24)	
	1 Chair (AC)	La Junta-Denver-La Junta	
6	1 Stnd 10-2 (AC)	Kans. City-Denver-Kans. City (off No. 23 for No. 24)	
	1 Cafe-Obs (AC)	La Junta-Denver-La Junta	

La Junta-Denver, 6 cars, 5 Sun.
Denver-La Junta, 5 cars, 4 Sun.

[fol. 5573]

Pullman Line

Train No. 47

Kansas City-Tulsa

	1 B&M (30'RPO)
	1 Bage Exp.
	1 Exp. (ex. Sun.)
	1 Jim Crow (AC)
	1 Chair (AC)
3011	1 Stnd 10-1-2 (AC)

6 cars; 5 Sun.

Pullman Line

Train No. 48

Tulsa-Kansas City

	1 B&M (30'RPO)
	1 Bage Exp.
	1 Jim Crow (AC)
	1 Chair (AC)
3011	1 Stnd 10-1-2 (AC)

6 cars; 5 Sun.

Train No. 49

Kansas City-Tulsa

	1 B&M (30'RPO)	
	1 Bage-Exp.	
	1 Jim Crow (AC)	
	1 Chair (AC)	
34	1 Stnd 10-1-2 (AC)	(off No. 5)
	1 Cafe-Obs. (AC)	

6 cars.

Train No. 50

Tulsa-Kansas City

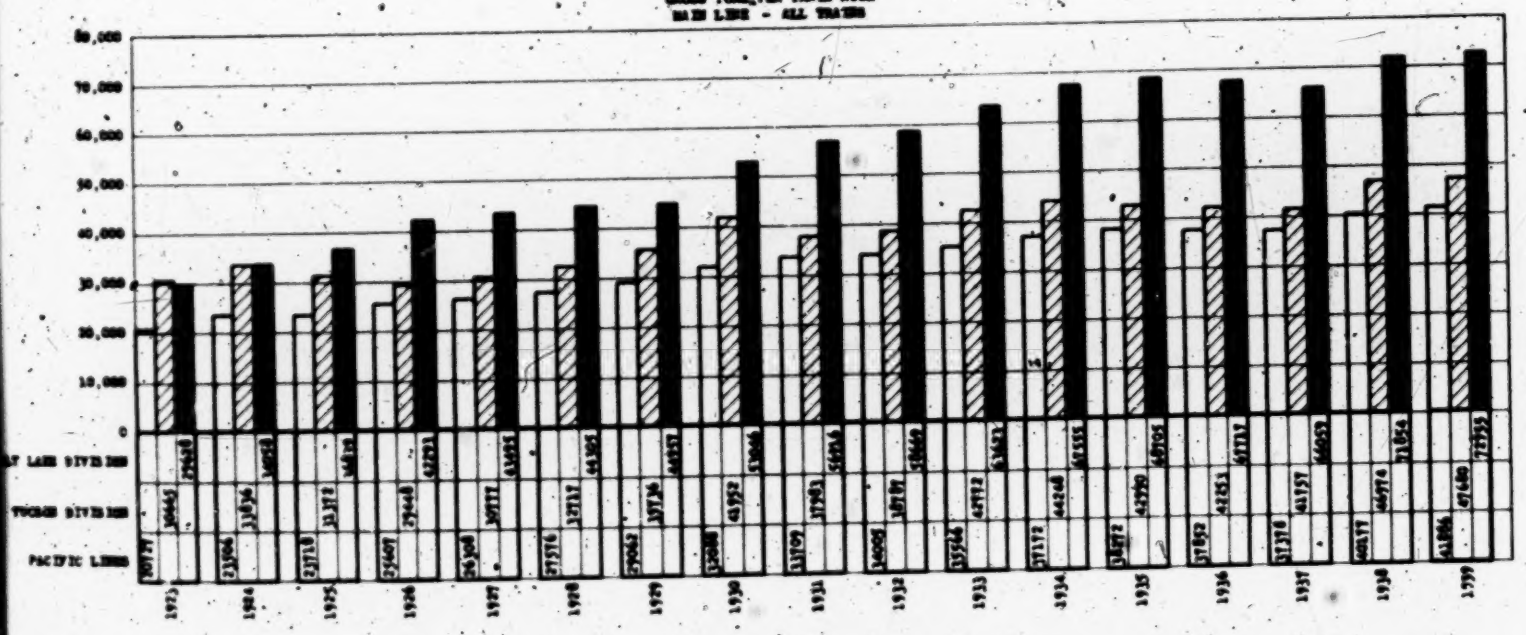
	1 B&M (30'RPO)	
	1 Bage Exp.	
	1 Jim Crow (AC)	
	1 Chair (AC)	
34	1 Stnd 10-1-2 (AC)	Tulsa-Chicago for No. 6)
	1 Cafe-Obs. (AC)	

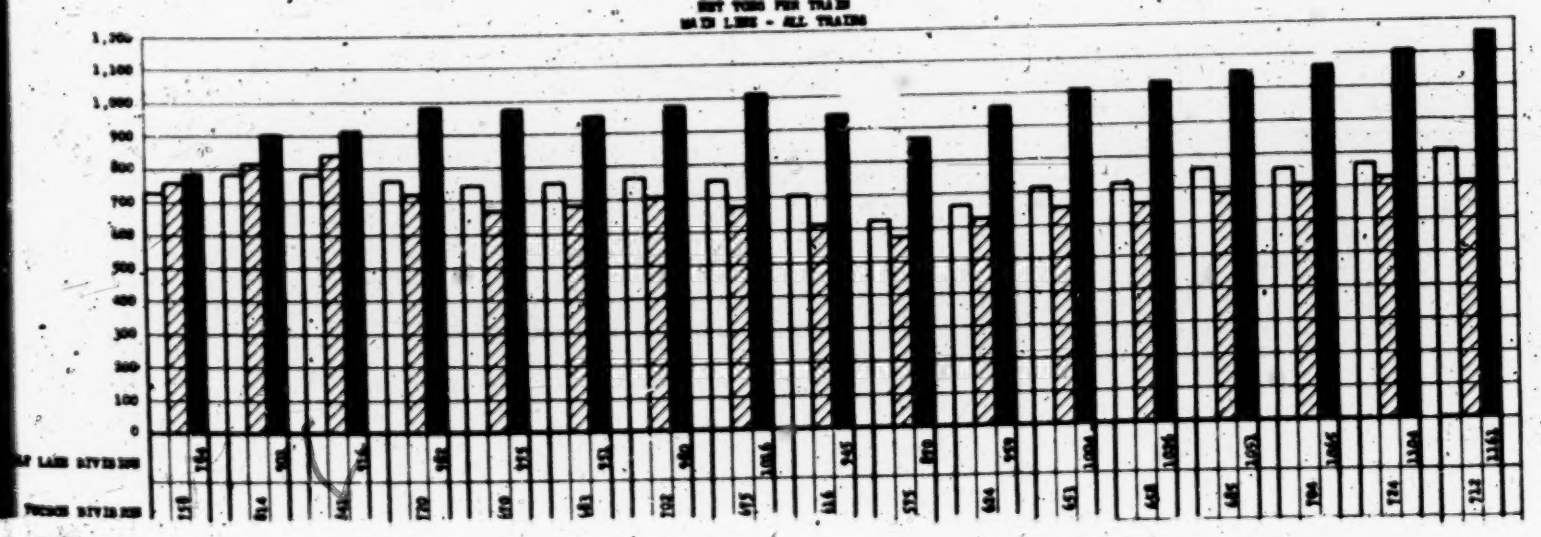
6 cars.

Defendant's Exhibit No. 193 (Witness Sines)
Jan. 21, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

GROSS TON MILES PER TRAIN HOUR AND NET TONS PER TRAIN
SALT LAKE DIVISION, TUCSON DIVISION AND PACIFIC LINES

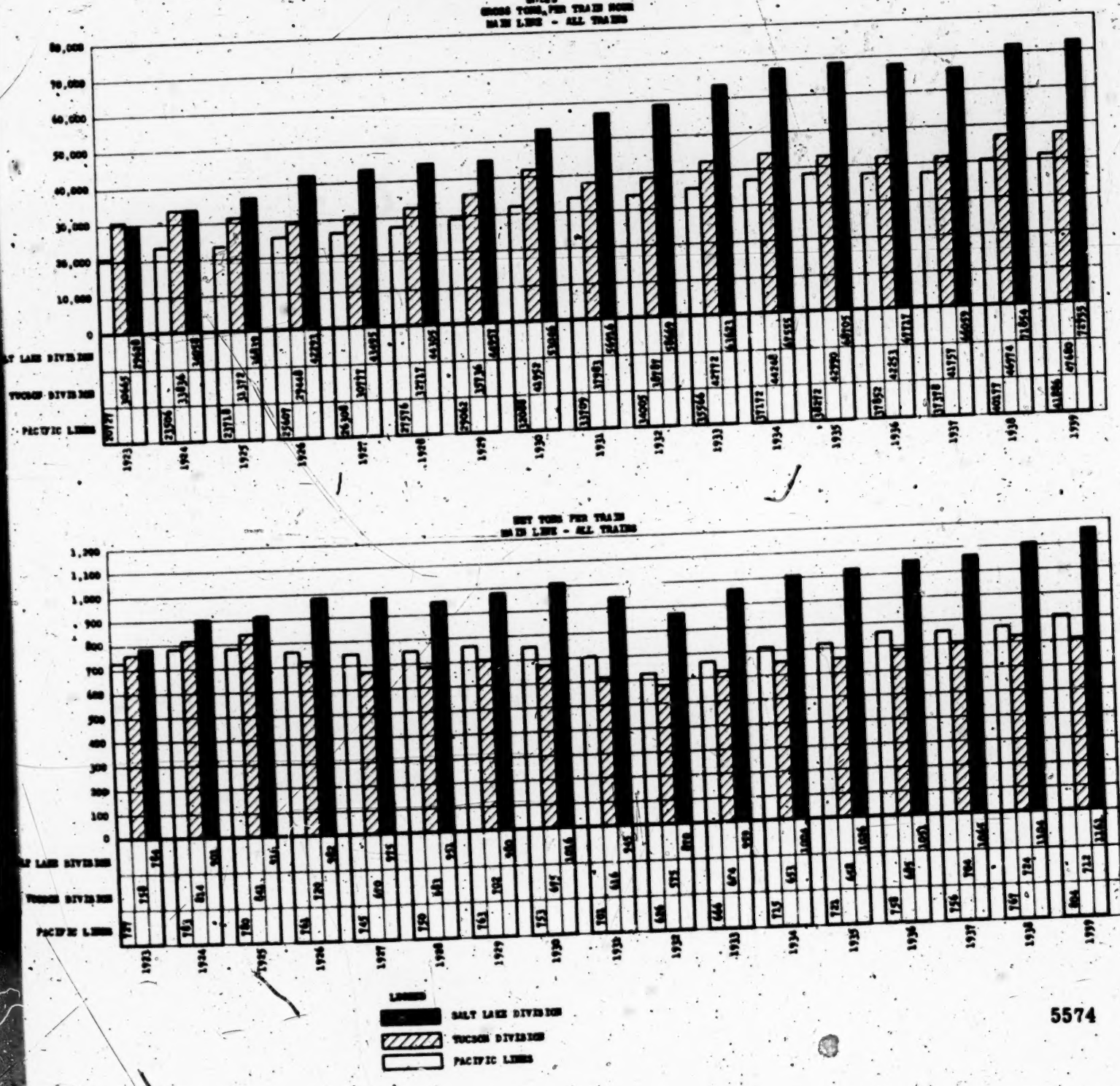




Defendant's Exhibit No. 193 (Witness Sines)
Jan. 21, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

GROSS TON MILES PER TRAIN HOUR AND NET TONS PER TRAIN
SALT LAKE DIVISION, TUCSON DIVISION AND PACIFIC LINES



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Defendant's Exhibit No. 194 (Witness Sines)
Jan. 21, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

CLASSES AND NUMBER OF EMPLOYEES, TUCSON DIVISION
YEARS 1934, 1938 AND 1939

(Data abstracted from "I.C.C. Wage Statistics", Forms A and B, "Monthly Report of Employees, Service, and Compensation", Number of employees who received pay during month - averaged to annual basis.)

LINE NO.	DIVISION NUMBER	REPORTING DIVISION	1934	1938	1939
(a)	(b)	(c)	(d)	(e)	(f)
		I. EXECUTIVES, OFFICIALS, AND STAFF ASSISTANTS			
1	801	Total (executives, officials, and staff assistants)	11	10	11
		II. PROFESSIONAL, CLERICAL AND GENERAL			
2	802 & 902	Total (professional, clerical, and general) daily and hourly basis	122	176	196
		III. MAINTENANCE OF WAY AND STRUCTURES			
3	27	Roadmasters, General Foremen, and Assistants	8	7	8
4	38, 39 & 40	Gang Foremen (Extra Gang, B&B, Sig. & Teleg.) and Section Foremen	74	83	85
5	41	Extra Gang Men	62	87	100
6	42	Section Men (Track and Roadway)	311	298	399
7	46	Signal Men, and Signal Maintainers	32	32	32
8	803 & 903	Total (maintenance of way and structures) daily and hourly basis	662	681	886
		IV. MAINTENANCE OF EQUIPMENT AND STORES			
9	50 & 52	General, Assistant General, & Department Foremen	17	19	20
10	55	Boilermakers	27	40	49
11	56 & 57	Machinists (A and B) and (S and B)	83	98	128
12	61	Shopcrafts	80	99	101
13	70, 71 & 72	Classified and General Laborers	70	105	113
14	804 & 904	Total (maintenance of equipment and stores) daily & hourly basis	501	627	654
		V. TRANSPORTATION (OTHER THAN TRAIN, ENGINE AND YARD)			
15	75 & 76	Chief Train Dispatchers, and Train Dispatchers	9	13	15
16	79,80,81,82,83	Station Agents, Telegraphers, Clerk Telegraphers, & Towermen	70	74	75
17	805 & 905	Total (transportation other than train, engine and yard) daily and hourly basis	188	138	180
		VI. (a). TRANSPORTATION (YARD MASTERS, SWITCHTENDERS, AND HOSTLERS)			
18	806 & 906	Total (transportation - yardmasters, switchtenders and hostlers, daily and hourly basis	21	25	25
19	808 & 908	TOTAL, ALL GROUPS (except train & engine) daily & hourly basis	1,425	1,657	1,864
		VI. (b). TRANSPORTATION (TRAIN AND ENGINE)			
20	111	Road Passenger Conductors	14	17	16
21	113	Road Freight Conductors (through freight)	44	55	59
22	114	Road Freight Conductors (local and way freight)	3	7	8
23	115	Road Passenger Baggagemen	-	3	3
24	116	Road Passenger Brakemen and Flagmen	31	33	32
25	117	Road Freight Brakemen and Flagmen (through freight)	184	230	260
26	118	Road Freight Brakemen and Flagmen (local and way freight)	13	25	25
27	119	Yard Conductors and Yard Foremen	12	18	21
28	120	Yard Brakemen and Yard Helpers	44	89	95
29	121	Road Passenger Engineers and Motormen	20	27	25
30	122	Road Freight Engineers and Motormen (through freight)	65	79	89
31	123	Road Freight Engineers and Motormen (local and way freight)	4	8	8
32	124	Yard Engineers and Motormen	15	22	25
33	125	Road Passenger Firemen and Helpers	15	23	22
34	126	Road Freight Firemen and Helpers (through freight)	84	98	111
35	127	Road Freight Firemen and Helpers (local and way freight)	6	8	9
36	128	Yard Firemen and Helpers	21	22	24
37	907	TOTAL (transportation - train and engine)	600	744	809

No. (a)	DIVISION NUMBER (b)	REPORTING DIVISION (c)	1934 (d)	1938 (e)	1939 (f)
		I. EXECUTIVES, OFFICIALS, AND STAFF ASSISTANTS			
1	801	Total (executives, officials, and staff assistants)	11	10	11
		II. PROFESSIONAL, CLERICAL AND GENERAL			
2	802 & 902	Total (professional, clerical, and general) daily and hourly basis	122	176	196
		III. MAINTENANCE OF WAY AND STRUCTURES			
3	37	Roadmasters, General Foremen, and Assistants	8	7	8
4	38, 39 & 40	Gang Foremen (Extra Gang, B&B, Sig. & Teleg.) and Section Foremen	74	83	85
5	41	Extra Gang Men	68	87	100
6	42	Section Men (Track and Roadway)	351	338	339
7	46	Signal Men, and Signal Maintainers	32	28	28
8	803 & 903	Total (maintenance of way and structures) daily and hourly basis	662	681	868
		IV. MAINTENANCE OF EQUIPMENT AND STORES			
9	50 & 51	General, Assistant General, & Department Foremen	17	19	20
10	55	Boilermakers	27	40	49
11	56 & 57	Carmen (A and B) and (S and B)	83	98	103
12	61	Machinists	80	99	101
13	70, 71 & 72	Classified and General Labourers	70	106	113
14	804 & 904	Total (maintenance of equipment and stores) daily & hourly basis	501	627	654
		V. TRANSPORTATION (OTHER THAN TRAIN, ENGINE AND YARD)			
15	75 & 76	Chief Train Dispatchers, and Train Dispatchers	9	13	15
16	79,80,81,82,83	Station Agents, Telegraphers, Clerk-Telegraphers, & Towermen	70	74	75
17	805 & 905	Total (transportation other than train, engine and yard) daily and hourly basis	138	138	180
		VI. (a). TRANSPORTATION (YARD MASTERS, SWITCHTENDERS, AND HOSTLERS)			
18	806 & 906	Total (transportation - yardmasters, switchtenders and hostlers, daily and hourly basis	21	25	25
19	808 & 908	TOTAL, ALL GROUPS (except train & engine) daily & hourly basis	1,425	1,697	1,854
		VI. (b). TRANSPORTATION (TRAIN AND ENGINE)			
20	111	Road Passenger Conductors	14	17	16
21	113	Road Freight Conductors (through freight)	44	55	59
22	114	Road Freight Conductors (local and way freight)	3	7	8
23	115	Road Passenger Baggagemen	-	3	3
24	116	Road Passenger Brakemen and Flagmen	31	35	40
25	117	Road Freight Brakemen and Flagmen (through freight)	184	210	240
26	118	Road Freight Brakemen and Flagmen (local and way freight)	13	25	25
27	119	Yard Conductors and Yard Foremen	12	18	21
28	120	Yard Brakemen and Yard Helpers	44	89	95
29	121	Road Passenger Engineers and Motormen	20	27	25
30	122	Road Freight Engineers and Motormen (through freight)	65	79	89
31	123	Road Freight Engineers and Motormen (local and way freight)	4	8	8
32	124	Yard Engineers and Motormen	15	22	25
33	125	Road Passenger Firemen and Helpers	15	23	22
34	126	Road Freight Firemen and Helpers (through freight)	84	98	111
35	127	Road Freight Firemen and Helpers (local and way freight)	6	8	9
36	128	Yard Firemen and Helpers	21	22	24
37	907	TOTAL (transportation - train and engine)	600	744	809
38	808 & 908 & 907	GRAND TOTAL, ALL EMPLOYEES	2,025	2,441	2,663
		RECAPITULATION OF LINES NOS. 20 TO 36 - DIVISION NOS. 111 TO 128			
39	121 & 125	Enginemen - passenger service	39	50	47
40	122 & 126	Enginemen - through freight service	150	177	200
41	123 & 127	Enginemen - local freight service	10	16	17
42	124 & 128	Enginemen - yard service	36	44	50
43	111, 115 & 116	Trainmen - passenger service	45	53	49
44	113 & 117	Trainmen - through freight service	228	265	299
45	114 & 118	Trainmen - local freight service	16	32	32
46	119 & 120	Trainmen - yard service	76	107	115
47	907	TOTAL (transportation - train and engine)	600	744	809

Defendant's Exhibit No. 195 (Witness Sines)
Jan. 21, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

INTERSTATE COMMERCE COMMISSION
ORDERS CONCERNING THE MATTER OF

METHOD AND FORM OF RECORDS TO BE KEPT BY CARRIERS RELATING TO THE TIME ON DUTY OF EMPLOYES AND THE MOVEMENT OF TRAINS

INTERSTATE COMMERCE COMMISSION.

ORDER.

At a General Session of the INTERSTATE COMMERCE COMMISSION, held at its office in Washington, D. C., on the second day of May, A. D. 1921.

IN THE MATTER OF METHOD AND FORM OF RECORDS TO BE KEPT BY CARRIERS RELATING TO THE TIME ON DUTY OF EMPLOYEES AND THE MOVEMENT OF TRAINS.

The method and form of records to be kept by carriers relating to the time on duty of employees and the movement of trains having been considered by the Commission:

It is ordered, That the forms hereto attached, entitled—

Time Return and Delay Report of Engine and Train Employees.

Daily Time Report of Employees who by the use of the telegraph or telephone dispatch, report, transmit, receive, or deliver orders pertaining to or affecting train movements.

Dispatcher's Record of Movement of Trains.

Station Record of Train Movements,

be and the same are hereby approved; that a copy of each duly authenticated by the Secretary of the Commission, be filed in its archives, and a second copy thereof, in like manner authenticated, filed in the office of the Bureau of Safety, and that each of said copies so authenticated and filed shall be deemed an original record thereof.

It is further ordered, That the said forms be, and are hereby, prescribed for the use of all common carriers engaged in interstate or foreign commerce by railroad in keeping records of time on duty of its employees in train and engine service; records of delays to trains; records of time on duty of employees who by the use of the telegraph or telephone dispatch, report, transmit, receive, or deliver orders pertaining to or affecting train movements; of Dispatcher's Record of Train Movements; and of Records of Train Movements stations, offices and places reporting train movements; that each and every such carrier, and each and every receiver or operating trustee of any such carrier, be required to make and keep records in conformity therewith, and that a copy of said form be served

with this order upon each and every such carrier and each and every receiver or operating trustee of any such carrier.

It is further ordered, That such forms and accompanying instructions are, and by virtue of this order become the lawful manner according to which such records are to be made and kept; provided, however, that each such carrier may at its option, and with the approval of the Commission, add to such records appropriate blanks for any additional information desired by it.

It is further ordered, That the Order of this Commission entitled "In the Matter of Train Delay Reports," issued on the 12th day of June, A. D. 1912, is hereby rescinded upon the taking effect of this order.

And it is further ordered, That the 1st day of July, 1922, be, and the same is hereby, fixed as the date upon which this order shall become effective,

By the Commission:

[SEAL.]

GEORGE B. MCGINTY,
Secretary.

3

No. .....

..... (Name of railroad.)

TIME RETURN AND DELAY REPORT OF ENGINE AND TRAIN EMPLOYEES.

Date ..... 19.....

Name.	Occupation.	Length of time off duty previous to this trip.	First went on duty.			Finally went off duty.			Total time on duty.	
			Place.	Date.	Time.	Place.	Date.	Time.	Hr.	Min.

Remarks.

DETAILS OF SERVICE.

Train.	Eng.	Departure.			Arrival.			Kind of service (pass., frt., work, head, etc.)
		Station.	Time went on duty.	Time train departed.	Station.	Time train arrived.	Time went off duty.	

I certify this report to be correct.

Signature .....

Occupation .....

(Over.)

INSTRUCTIONS.

1. This report shall be rendered for all engine and train crews including yard and switching crews. Enginemen, firemen, conductors, flagmen, train baggagemen and trainmen shall also use this form when reporting individually. The report shall be rendered and signed by the engineer for the engine crew and by the conductor for the train crew. If there is no engineer or conductor it shall be rendered and signed by the ranking employee whose time is reported thereon. Reports shall be numbered consecutively for each month beginning with No. 1.

2. The report shall be dated as of the date on which the employee first goes on duty.

3. Under "Remarks" shall be shown any irregularities of the hours of duty. If an employee is released from duty for any period between the time of first going on duty and the time finally relieved from duty, such fact must be shown under "Remarks," giving the place at which the release is given, the time at which it began, and the time at which it ended. Time off duty for meals taken by yard crews shall also be shown under "Remarks." If the whole or part of service is deadheading the place at which the deadheading began and ended and the train on which the employee deadheaded will be shown. When a crew or employee is relieved before the completion of a trip the name of the conductor or engineman of the crew relieving or the name of the employee relieving will be shown.

4. Wherever time is shown A. M. or P. M. shall be given.

5. In reporting delays the cause of each delay, the place at which it occurred, the time it began and the time ended shall be given. Delays due to different causes shall be shown separately.

6. All delays to passenger trains shall be shown. Delays to freight trains of less than 10 minutes at any one place need not be shown. Delays to yard and switching crews whose service is confined entirely to yard limits need not be shown.

DELAY REPORT.

Place.	Duration of delay.		Cause of delay.
	Time began.	Time ended.	

4

.....
(Name of railroad.)

STATION RECORD OF TRAIN MOVEMENTS.

EMPLOYEES ON DUTY.

Name.	Occupation.	Went on duty.	Went off duty.
		M	M
		M	M
		M	M
		M	M
		M	M

Place..... Date.....19....

.....Bound. .....Bound.

Train or engine.	Time arrived.	Time departed.	Train or engine.	Time arrived.	Time departed.

INSTRUCTIONS.

1. This record shall be made at each station, tower, office, or place from which the time of arrival, departure, or passing of trains is reported by telegraph or telephone.

2. Each operator, signalman, and leverman shall enter the time he goes on and off duty in the space provided for that purpose.

5

No....

.....
(Name of railroad.)

DAILY TIME REPORT OF EMPLOYEES WHO BY THE USE OF THE TELEGRAPH OR TELEPHONE DISPATCH, REPORT, TRANSMIT, RECEIVE, OR DELIVER ORDERS PERTAINING TO OR AFFECTING TRAIN MOVEMENTS.

Name of tower, place, or station .....

Date.....19.....

Name of employee	Occupation.	Assigned hours.		Time worked.				Length of time on duty.	
		From.	To.	Went on duty.		Went off duty.			
				Date.	Time.	Date.	Time.	Hrs.	Min.

Cause of service in excess of assigned hours: .....

.....

I certify this report to be correct.

Signature.....

INSTRUCTIONS.

1. Telegraph and telephone operators, signalmen, switch tenders, or other employees who by the use of the telegraph or telephone, dispatch, report, transmit, receive, or deliver orders pertaining to or affecting train movements shall fill out this form and it shall include all service performed in whatever capacity. The service of but one employee will be shown on one sheet.

2. The time of train dispatchers whose entire period of duty appears on Dispatcher's Record of Movement of Trains and members of engine and train crews who receive orders by telephone need not be reported on this form.

3. This report shall be dated as of the date on which the employee first goes on duty, and shall be numbered consecutively commencing with No. 1 at the beginning of each month.

6

RECORD OF WEATHER.

Place.	Time.	M.	Time.	M.	Time.	M.	Time.	M.

.....Bound.

.....(Name of railroad.)

.....Division.

DISPATCHER'S RECORD OF MOVEMENT OF TRAINS.

Time table No.....

Place..... Date.....19.....

DISPATCHERS ON DUTY.

.....from.....M. to.....M.
.....from.....M. to.....M.
.....from.....M. to.....M.
.....from.....M. to.....M.

.....Bound.

Engineman.

Time engine crew went on duty.

Conductor.

Time train crew went on duty.

Distance.	Train. Engine. Cars. (Stations.)	Office designation.

Cars.

INSTRUCTIONS.

1. Weather conditions and temperature shall be reported at least once in six hours by and recorded for at least one station on each dispatching district and shall be recorded for such other stations as report weather conditions.
2. Each train dispatcher shall sign his name and record the time of going on and off duty in the space provided.
3. The A. M. or P. M., as the case may be, shall be shown at the initial and final time of each movement.
4. The number of cars in each train shall be shown at least at one station and at such other stations as the carrier may determine.
5. Time of trains passing reporting stations shall be recorded, where trains stop at reporting stations, both arriving and departing time shall be recorded.

108702°—30. Face back of page 5.

Memorandum of extraordinary or unusual occurrence.

INTERSTATE COMMERCE COMMISSION.

ORDER.

At a General Session of the INTERSTATE COMMERCE COMMISSION, held at its office in Washington, D. C., on the 13th day of February, A. D. 1922.

IN THE MATTER OF METHOD AND FORM OF RECORDS TO BE KEPT BY CARRIERS RELATING TO THE TIME ON DUTY OF EMPLOYEES AND THE MOVEMENT OF TRAINS.

The order of this Commission entitled "In the Matter of Method and Form of Records to be kept by Carriers relating to the Time on Duty of Employees and the Movement of Trains," issued on the 2d day of May, A. D. 1921, being under consideration:

It is ordered, That the second paragraph on page 2 of said order of May 2, A. D. 1921, be, and the same is hereby, amended to read "*It is further ordered*, That the order of this Commission entitled 'In the Matter of Train Delay Reports,' issued on the 10th day of June, A. D. 1912, is hereby rescinded upon the taking effect of this order."

And it is further ordered, That a copy of this order be served upon each and every common carrier engaged in interstate or foreign commerce by railroad and every receiver or operating trustee of any such carrier.

By the Commission:

[SEAL.] GEORGE B. MCGINTY,
Secretary.

(7)

SOUTHERN PACIFIC COMPANY—PACIFIC LINES

TIME RETURN AND DELAY REPORT OF ENGINE AND TRAIN EMPLOYES

STATION | DATE | REPORT NO.

NUMBER OF CAR	FIRST WENT ON DUTY			FINALLY WENT OFF DUTY			TOTAL TIME ON DUTY	TOTAL TIME ON TRIP	CAR MILES	TIME CLAIMED							CODE NO.	NAMES	SPACE FOR TIMEKEEPING BUREAU		
	PLACE	DATE	TIME	PLACE	DATE	TIME					1/2-	2/10	DEPARTURE	ARRIVAL	Detailed Time Slip No.				07 C. T.	08 O. T.	09 CREDIT
7	9	10	11	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28			
																		Engr.			
																		Fmn.			
																		-			
																		-			
																		-			
																		-			
																		-			

THIS SPACE RESERVED FOR ENDORSEMENTS

RELEASED			29-A REMARKS	30-CAUSE OF DELAYS
FROM 12	M	D		
TO 12	M	D		

28 TIME OFF FOR TRIPS TO DEPOT	29 TRAIN MILES OF ST	31 TRAIN MILES DEADHEAD ST	32 ENGINES ON ST	33 CAR TRIPPED ST	34 ENGINE ARRIVED AT DESIGNATED POINT FINAL TERMINAL DELAY REPORTS	35 TIME OFF DUTY AT HOME TERMINAL ON TRIP-END POINT
M	M	M	M	M	M	M

TRAIN NO.	ENGINE NO.	DEPARTURE STATION	DEPARTURE TIME LIGHT OR DUTY	DEPARTURE TIME TRAIN DEPARTED	ARRIVAL STATION	ARRIVAL TIME TRAIN ARRIVED	Time Entered on Register Sheet or Delay Report	TIME LIGHT OFF DUTY	Time Spent Under Rule 37 (Not to Exceed 4 Hrs.)	TIME TABLE SPEED	No. Days in Each Mo. of Claim 37	
36	37	38	39	40	41	42	43	44	45	46	100-	101-
			M	M		M	M					
			M	M		M	M					
			M	M		M	M					
			M	M		M	M					

50-GRADE NOTICE DESTINATION TO:	54-I COPY THIS REPORT TO BE FORWARD
	54-DESCRIPTION

DELAY REPORT

58 PLACE	DURATION OF DELAY 59 TIME ENDED	60 TIME ENDED	61 CLAIMED TIME	62 CAUSE OF DELAY—GIVE SEPARATELY EACH DELAY AND AMOUNT OF TIME DUE TO EACH CAUSE

DOUBLE HEADED OVER ARIZONA-NEVADA TERRITORY	63-FROM	64-TO	65-MILES	66-TRAIN OR ENGINE NUMBER	67-TRAIN OR ENGINE NUMBER—DIVISION

68-CAUSE OF DOUBLE HEADING

64 INSTRUCTIONS

1. The report shall be rendered by all engine and train employes in charge of trains, locomotives or motor cars, and by all other employes who perform service in connection with the movement of trains, locomotives or motor cars, except those who are required to report on Form 5-A. Each employe shall report for his own service.

2. The report shall be filed as of the date on which the service was performed.

3. Under "Remarks" shall be shown any irregularities of the trip, including delays, if any, to the train, engine or motor car, and the reasons therefor; the number of the train, engine or motor car on which the employe performed service, if different from that shown in the body of the report; the number of the train, engine or motor car on which the employe left the terminal, if different from that on which he returned; the number of the train, engine or motor car on which the employe left the point at which relieved, if different from that on which he arrived at such point

SOUTHERN PACIFIC COMPANY—PACIFIC LINES

Division Officials: Superintendent / Asst. Superintendent / Trainmaster | Chief Train Dispatcher / Asst. Chief Dispatcher / Asst. Chief Dispatcher

DISPATCHER'S RECORD OF MOVEMENT OF TRAINS

TUCSON DIVISION TIME TABLE No.....

EASTWARD

IDENTIFICATION TRAIN			
Conductor			
Time Train Crew West on Duty			
Tied Up			
Engineer			
Engine			
Time Road Engine Crew West on Duty			
Tied Up			
Engineer			
Engine			
Time 1st Helper Crew West on Duty			
Tied Up			
Helped From—To			
Engineer			
Engine			
Time 2nd Helper Crew West on Duty			
Tied Up			
Helped From—To			
Time Due			

Distance	Stations	Other Desig			
0 0	Tucson	Tu			
19 4	19 4 Vail (Buster)				
26 7	5 3 Pantano (Buster)				
39 7	11 0 Hiroma	Ma			
48 7	9 0 Benson	F			
57 1	8 4 Sibyl (Buster)				
70 8	12 9 Dragoon	Dr			
80 0	10 0 Cochise	Ch			
90 6	10 6 Willcox	Wx			
114 5	23 7 Bowie	Bo			
130 3	15 8 San Simon	Sm			
145 0	14 7 Steins	S			
164 4	19 4 Lordsburg	Od			

WESTWARD

IDENTIFICATION TRAIN			
Conductor			
Time Train Crew West on Duty			
Tied Up			
Engineer			
Engine			
Time Road Engine Crew West on Duty			
Tied Up			
Engineer			
Engine			
Time Helper Crew West on Duty			
Tied Up			
Helped From—To			

Distance	Stations	Other Desig			
0 0	Gila	Gi			
18 9	18 9 Redondo	Le			
43 1	24 2 Maricopa	Jo			
52 1	9 0 Casa Grande	Gr			
81 8	29 7 Picacho	Wa			
88 7	7 9 Red Rock	Ck			
111 2	22 5 Rillito	Ro			
130 5	19 3 Steinfeldt	Rh			
130 5	Tucson	Tu			

WORK TRAINS

Engine	Work Limits	Conductor	Engineer	Time Crew West on Duty: Station	Time Crew West on Duty: Train	Tied Up: Station	Tied Up: Time	Hours at Work

LIVE STOCK

Train	Cars	Description	Destination	Consignee	Loaded	Men in Charge	Where Loaded	Remarks

DEADHEAD CREWS

Name	Crew Ordered On	Caboose On	From	To	For

BENSON FLAGMEN DEADHEADING

Name	Train	From	To	Where Tied Up and Time

3112

(Sheet 6 of 6 sheets)

DISPATCHER'S RECORD OF MOVEMENT OF TRAINS

TUCSON DIVISION TIME TABLE No. ____

Train Dispatchers on duty — from ____ M. to ____ M. / from ____ M. to ____ M. / from ____ M. to ____ M.

Tucson, Arizona ____ 19__

WESTWARD

| IDENTIFICATION TRAIN: Conductor / Time Train Crew Went on Duty / Yard Up / Engineer / Engine / Time Road Engine Crew Went on Duty / Yard Up / Engineer / Engine / Time 1st Helper Crew Went on Duty / Yard Up / Helped From—To / Engineer / Engine / Time 2nd Helper Crew Went on Duty / Yard Up / Helped From—To / Time Due | | |

Engineer Engine Time Road Engine Crew Went on Duty Tied Up Engineer Engine Time 1st Helper Crew Went on Duty Tied Up Helped From—To Engineer Engine Time 2nd Helper Crew Went on Duty Tied Up Helped From—To Time Due			
Distance	Station	Office Desig	
0 0	Tucson	Tu	
19 4	19 4 Vail (Buzzer)		
28 7	9 3 Pantano (Buzzer)		
39 7	11 0 Benson	Bn	
46 7	9 0 Benson	F	
57 1	8 4 Sibyl (Buzzer)		
70 0	12 9 Dragoon	Dr	
80 0	10 0 Cochise	Ch	
90 9	10 9 Willcox	Wc	
114 5	23 7 Bowie	Bo	
130 3	15 8 San Simon	Sn	
145 0	14 7 Steins	Z	
164 4	19 4 Lordsburg	Od	

EASTWARD

IDENTIFICATION TRAIN Conductor Time Train Crew Went on Duty Tied Up Engineer Engine Time Road Engine Crew Went on Duty Tied Up Engineer Engine Time Helper Crew Went on Duty Tied Up Helped From—To		
0 0	Gila	Gb
18 9	18 9 Bonilla	La
43 9	25 0 Maricopa	Ja
63 1	21 0 Casa Grande	Gr
81 8	18 7 Picacho	Wa
95 7	13 9 Red Rock	Ck
111 2	15 5 Stilson	Ra
126 5	14 3 Rockdom	Rk
138 3	Tucson	Tu

WORK TRAINS

Engine	Work Locate	Conductor	Engineer	Time Crews Went on Duty: Station	Time Crews Went on Duty: Train	Tied Up: Station	Tied Up: Time	Hours of Work

LIVE STOCK

Train	Cars	Description	Destination	Consignee	Loaded	Man in Charge	Where Loaded	Balance

DEADHEAD CREWS

Name	Crew Ordered On	Caboose On	From	To	For

BENSON FLAGMEN DEADHEADING

Name	Train	From	To	Where Tied Up and Time

INSTRUCTIONS—1. Weather conditions and temperature shall be reported at least once in six hours by and recorded for at least one station on each division, and shall be recorded for each other station as report weather conditions.

2. Each train dispatcher shall sign the name and record the time of going on and off duty in space provided.

3. The Add or Fill, as the case may be, shall be shown at the head and foot sheet of each manu

Time Road Engine Crew Went on Duty
Tied Up
Engineer
Engine
Time 1st Helper Crew Went on Duty
Tied Up
Helped From—To
Engineer
Engine
Time 2nd Helper Crew Went on Duty
Tied Up
Helped From—To
Time Out

Distance	Station	Other Desig
0 0	Tucson	Tu
19 4	19 4 Vail (Busser)	
28 7	9 3 Pantano (Busser)	
39 7	11 0 Mescal	Ma
48 7	9 0 Benson	F
57 1	8 6 Babyl (Busser)	
70 0	12 9 Dragoon	Dr
80 0	10 0 Cochise	Ch
90 6	10 6 Willcox	Wc
114 [illegible]	23 7 Bowie	Bo
130 3	15 8 San Simon	Sm
143 0	14 7 Steins	S
164 4	19 4 Lordsburg	Od

WESTWARD

IDENTIFICATION
TRAIN
Conductor
Time Train Crew Went on Duty
Tied Up
Engineer
Engine
Time Road Engine Crew Went on Duty
Tied Up
Engineer
Engine
Time Helper Crew Went on Duty
Tied Up
Helped From—To

0 0	Gila	Gi
18 9	18 9 Redrock	Lo
41 1	22 3 Hachenpa	Ja
59 1	21 0 Casa Grande	Ft
81 8	18 7 Picacho	Wa
96 7	15 0 Red Rock	Ch
111 2	15 5 Bilbo	Bo
130 5	14 3 Hachinson	Hi
139 9	Tucson	Tu

LAD CREWS				BENSON FLAGMEN DEADHEADING					EXTRAORDINARY OR UNUSUAL OCCURRENCES	WEATHER				
...ons	From	To	Fol	Name	Train	From	To	Where Tied Up and Time		Place	12:01 A.M.	8:00 A.M.	12:01 P.M.	4:00 P.M.
										Tucson Vail Pantano Mescal Benson Babyl Lordsburg Gila Picacho Ft. Thomas Globe				

...ord the time of going on and off duty to nearest minute.

3. The AM to PM, or the reverse may be, shall be shown in the ... and final time of each movement.

4. The number of cars in each train shall be shown at least at one station and at each other station at the option of the carrier may determine.

5. Time of trains passing reporting stations shall be recorded, where trains stop at reporting stations, both arriving and departing time shall be reported.

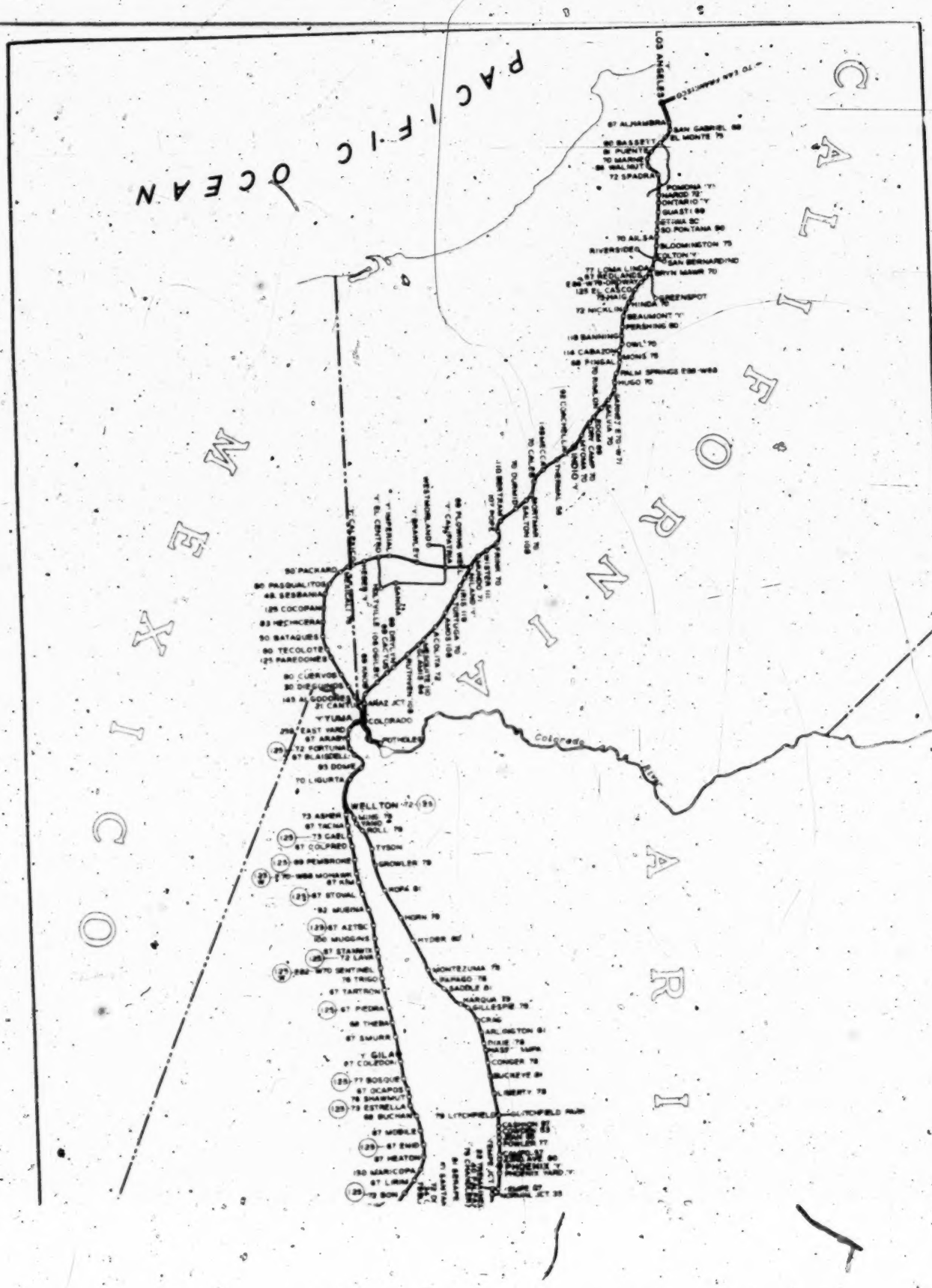
5581

Defendant's Exhibit No. 196 (Witness Sines)
Jan. 21, 1941

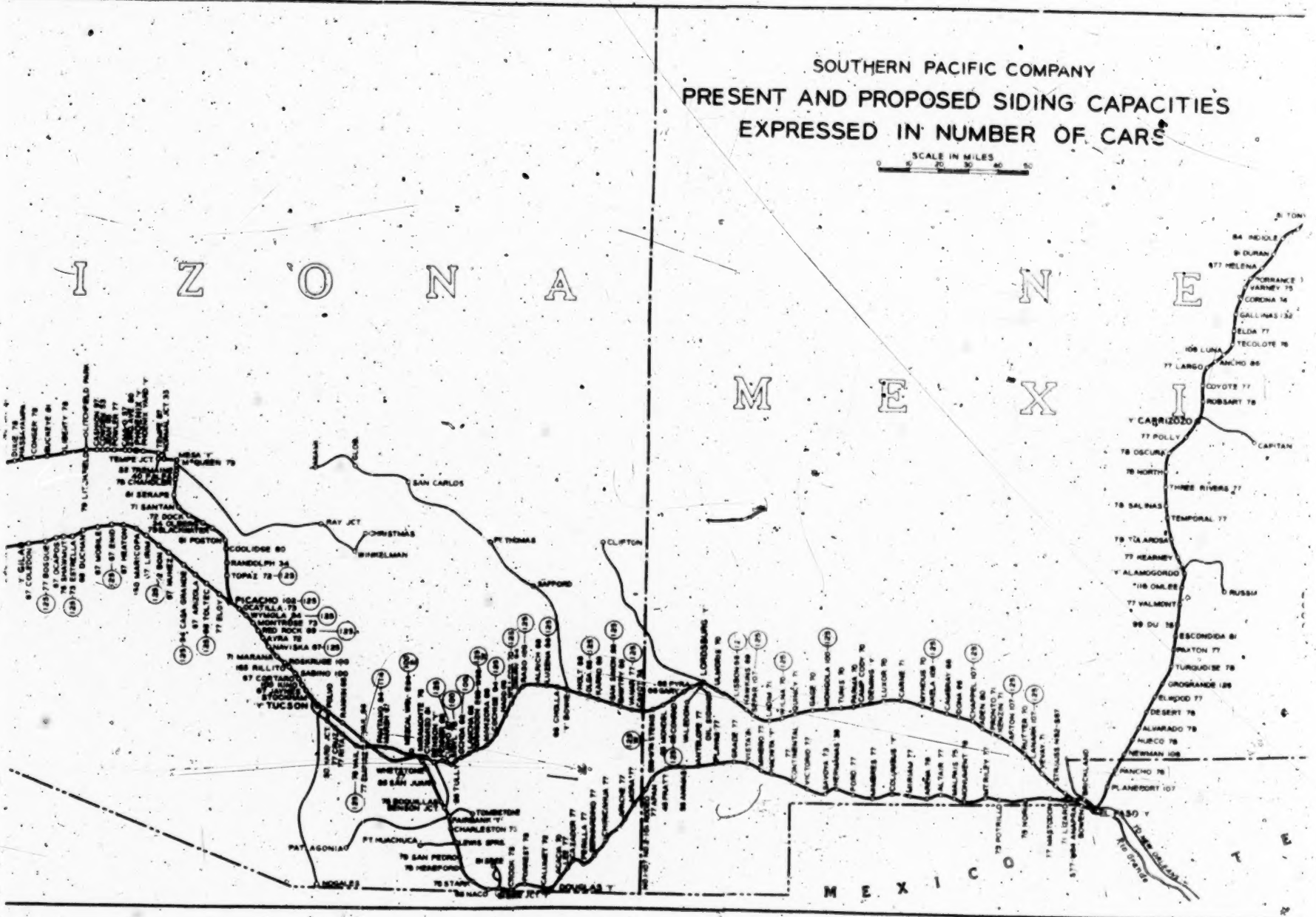
SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH AND OTHER STUDIES
MADE TO DETERMINE EFFECT OF
ARIZONA TRAIN LIMIT LAW ON
FREIGHT AND PASSENGER OPERATIONS

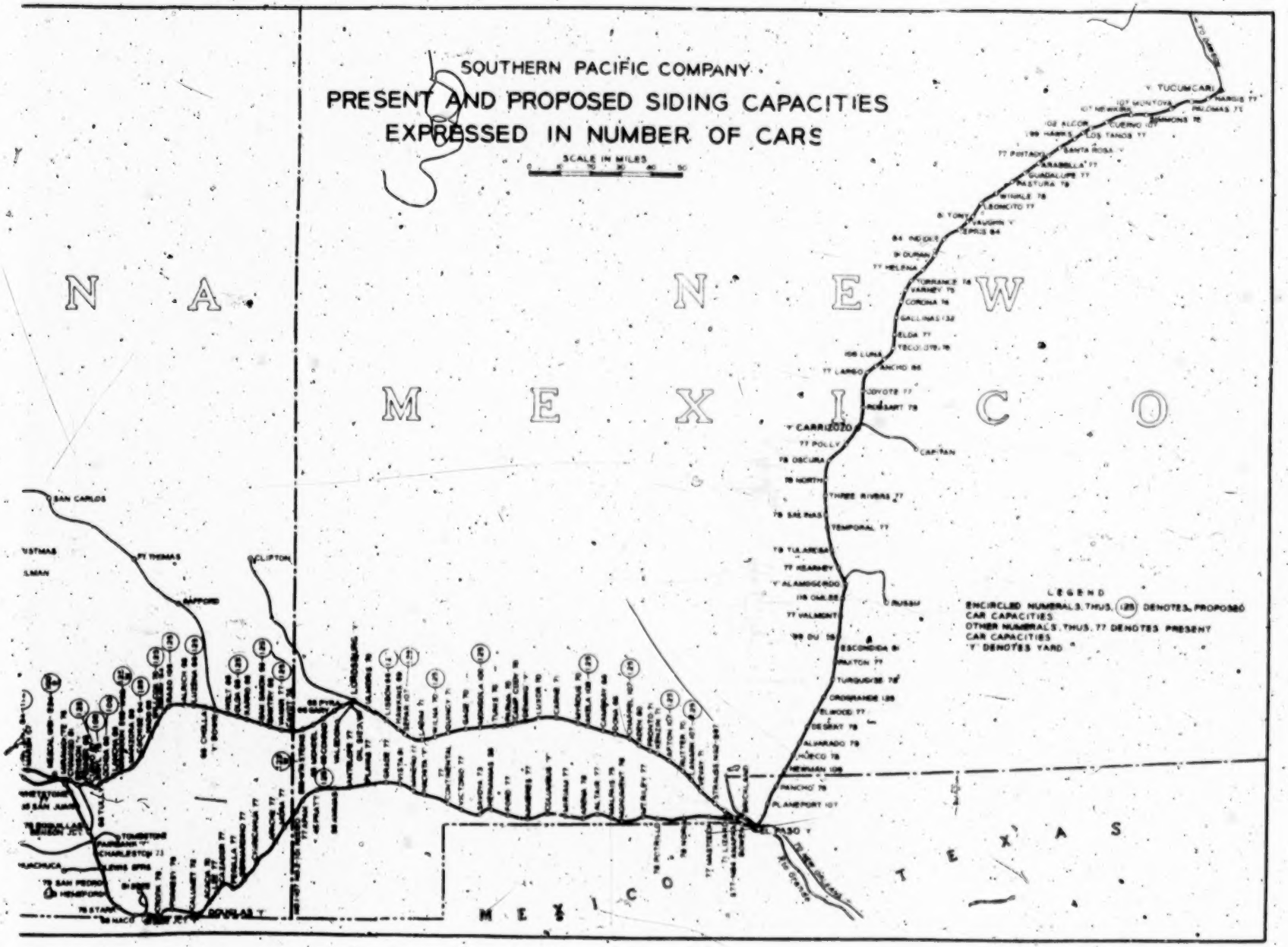
ITEM	TITLE
1	Freight redispatch study, Yuma, Arizona to El Paso, Texas, excluding Phoenix Line, for period June and August, 1938.
2	Passenger redispatch study, Los Angeles, California to El Paso, Texas for year 1938.
3	Analysis of passenger operations, Los Angeles, California to El Paso, Texas for year 1938, showing unnecessary interference, switching delay, adverse routings, reassignment of passenger car space, splitting and consolidation of trains, cancellation of assigned car movements, excess passenger car miles and additional helper service caused by observance of Arizona 14 car limit law.
4	Freight redispatch study, Phoenix, Arizona to Tucson, Arizona, month of December, 1938.
5	Freight redispatch study, Yuma, Arizona to El Paso, Texas for period April 4th to April 30th, 1940, actual operation compared with redispatched operation, observing 70 car restriction and using present power and short sidings.
6	Freight redispatch study, Yuma, Arizona to El Paso, Texas for period April 4th to April 30th, 1940, actual operation compared with redispatched operation, with no restriction and using AC power and long sidings.


PACIFIC OCEAN
CALIFORNIA
ARIZONA
MEXICO
Colorado
LOS ANGELES
SAN GABRIEL
EL MONTE
POMONA
ONTARIO
RIVERSIDE
COLTON
SAN BERNARDINO
BANNING
PALM SPRINGS
INDIO
IMPERIAL
EL CENTRO
BRAWLEY
YUMA
COLORADO
WELLTON
TYSON
HYDER
PARKER
BLYTHE
PALO VERDE
GILLESPIE
CRAIG
DIXIE
CONGER
BUCKEYE
LIBERTY
LITCHFIELD
GLENDALE
PHOENIX
MARICOPA

Defendant's Exhibit No. 197
Jan. 21, 1941



xhibit No. 197
21, 1941



5583

Defendant's Exhibit No. 198 (Witness Garverick)
Jan. 24,.1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

SAMPLE COPY OF WORK SHEET A
(page 169 of 1936 Redispatch Study)

STATEMENT OF Freight TRAINS DIVISION Tucson DIRECTION East BETWEEN Tucson AND Lordsburg MONTH June DAY 18 YEAR 1936

Character of Handling (0)	Train Identification (1)	Time of Departure (2)	Time of Arrival (3)	Train Engine Number (4)	LOCOMOTIVE MILEAGE: Double Header Engine Engine No. (5)	Double Header Engine Miles (6)	Helper Engine Engine No. (7)	Helper Engine Miles (8)	Light Engine to equalize power Engine No. (9)	Light Engine to equalize power Miles (10)	Miles Train (11)	NUMBER OF CARS (EXCLUDING CABOOSE): Out of Terminal Loaded (12)	Out of Terminal Empty (13)	Into Terminal Loaded (14)	Into Terminal Empty (15)	WAGES OF ENGINEMEN: Basic Train Engine (16)	Variable Amounts (17)	Double Header Engine (18)	Helper Engine attached & Light (19)	Light Engine (20)	Dead Heading to equalize crews Miles Allowed (21)	Dead Heading to equalize crews Amount Wages (22)	WAGES OF TRAINMEN: Basic Handling Train (23)	Variable Amounts (24)	Flagmen on Light Engines (25)	Dead Heading to equalize crews Miles Allowed (26)	Dead Heading to equalize crews Amount Wages (27)	Names of Conductors and Engineers Handling Trains (28)
ACTUAL																												
T-310	4/866	12:40 AM	9:40AM	5089	5057	164	Young				164	54	10	54	11	$26.22	$1.33	$26.22	-				$44.80	$1.41				Hunter Hook
T-311	866	8:30 AM	10:15AM	5011			(5322	159	Kennedy		164	65	0	65	0				$20.95									Muse Faust
							(5345	30	Bagley							26.22	1.33		15.07				44.80	-	$6.69 Currier			
ST-418	1/864	8:40 AM	7:45PM	5047			(5302	91	Wheeler (UMDR)																			
							(				164	48	13	48	11		1.88		13.78									Thayer Vaughn
							(5306	30	Richardson							26.22	1.00		6.67				44.80	-				
G-418	2/864	1:40 PM	10:45PM	5001			5317	70	Gamette(UMDR)		164	64	0	64	0		.99		10.28									Forman Fuller
MMR 1/29							5306	30	Richardson							26.22	1.00		6.67				44.80	-				
G-416																	.41		10.48									Sleek Gandy
MMR 1/29	1/864	9:05 PM	8:45AM	5033			5307	70	Rogers (UMDR)		164	68	8	68	8		1.00		6.67				44.80	-				
							5306	30	Richardson							26.22												
ST 414	8/864	6:50 PM	3:50AM	5000			5282	70	Bower (UMDR)		164	88	4	84	8		.71		8.50									Lilac Kempf
							5301	30	Hayes							27.73	.44		11.12				46.67	.89				
C 418	3/864	9:15 PM	5:50AM	5084			5325	159	Dumah		164	66	4	66	4				21.38									Alderbrook Watkins
MMR 2/125							5313	30	Bagley							26.22	1.00		6.68				44.80	-	8.90 Hutchinson			
T 312	4/864	10:40 PM	6.50AM	5021			5769	159	Kennedy		164	93	7	68	7				8.90									Cochran Anderson
							5301	30	Hayes							26.22	1.33		22.25				44.80	1.70	8.13 Gibson			
T 313	5/864	11:10 PM	7:50AM	5089			5308	159	Pritchey		164	65	5	68	5				22.86									Piper Fisher
							5313	30	Bagley							26.22	1.44		5.68				44.80	1.70	8.90 Hutchinson			
																										164	$29.86	Harris & crew deadhead
TOTAL					166		1097				1476	865	44	864	48	297.46	13.08	26.22	187.86				491.87	5.60	27.22	164	29.86	
REDISPATCH																												
T-310	4-866	12:05 AM	10:15AM	4100			5000	91	DF-DR-F then		164	108	8	108	0				15.99									
311							5000	30	DF 05 10:15 PM 4-17							29.22			14.58				44.80					
ST-418	868	9:40 AM	7:45PM	4100			Single				164	48	0	50	0	29.22			-				44.80					
G-418	1-864	1:20 PM	10:55PM	4100			5080	70	UP-DR then		164	88	18	68	19				15.99									
							5000	30	R/DRS							29.22			11.20				44.80					
ST-414	8-864	6:20 PM	3:20AM	4100			5300	159			164	90	0	91	0				8.00									
G-414							5000	30								30.73			28.88				46.67		8.89			
G-418	1-864	9:15 PM	5:50AM	4100			5000	91	UP-DR-F then		164	81	11	81	11				8.00									
							5000	30	DF CD 7:45PM							29.22			14.58				44.80					
T-313	5-864	10:50 PM	7:55AM	4100			Single				164	68	0	65	0	29.22			-				44.80					
T-312	3-864	11:40 PM	8:15AM	4100			5000	91	UP-DR-F then		164	98	0	98	0				7.98									
							5000	30	DF-CD 9:00P							29.22			14.58				44.80					
TOTAL								858			1148	864	39	888	30	208.08			133.08				318.87		8.89			

Defendant's Exhibit No. 199 (Witness Sines)
Jan. 23, 1941.

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

LOS ANGELES, CALIFORNIA TO EL PASO, TEXAS,
ANALYSIS OF PASSENGER OPERATIONS FOR YEAR 1938
SHOWING UNNECESSARY INTERFERENCE, SWITCHING DELAY, ADVERSE ROUTING, REASSIGNMENT OF PASSENGER CAR SPACE, SPLITTING AND CONSOLIDATION OF TRAINS, CANCELLATION OF ASSIGNED CAR MOVEMENTS, EXCESS PASSENGER CAR MILES AND ADDITIONAL HELPER SERVICE CAUSED BY OBSERVANCE OF ARIZONA 14 CAR LIMIT LAW

YEAR 1938

		CHARACTER OF INTERFERENCE (a)	NUMBER OF INSTANCES (b)	NO. OF TRAINS INVOLVED (c)	INSTANCES WHEN DELAYED (d)	AVERAGE MINUTES EACH DELAY	NO. OF CARS SET OUT (e)	NO. OF CARS PICKED UP (f)
SECTION 1	Unnecessary interference to westward trains at El Paso, Texas, Kodom, New Mexico, and Lordsburg, New Mexico, to avoid exceeding the Arizona 14 car limit upon entering the State, or to permit trains to pick up at stations west thereof without exceeding the Arizona 14 car limit	Switch'g	13	23	2	9	29	35
SECTION 2	Unnecessary interference to westward trains at Tucson, Arizona and Phoenix, Arizona, to permit trains to pick up at Tucson and stations west thereof without exceeding the Arizona 14 car limit	Switch'g	74	162	25	14	111	123
SECTION 3a	Unnecessary interference to train No. 6 and other trains at Yuma, Arizona and stations east thereof to avoid exceeding the Arizona 14 car limit	Switch'g	24	31	9	11	31	55
SECTION 3b	Unnecessary interference to train No. 6 and other trains at stations east of Yuma, Arizona, to return cars to proper route or proper train, or to deliver cars to connecting line	Switch'g	9	9	1	9	8	3
SECTION 4a	Unnecessary interference to train No. 4 and other trains at Yuma, Arizona, and stations east thereof, to avoid exceeding the Arizona 14 car limit	Switch'g	16	18	8	12	14	13
SECTION 4b	Unnecessary interference to train No. 4 and other trains at stations east of Yuma, Arizona, to return cars to proper route or proper train, or to deliver to connecting line	Switch'g	4	4	1	3	2	2
SECTION 5a	Unnecessary interference to train No. 44 and other trains at Yuma, Arizona, and stations east thereof to avoid exceeding Arizona 14 car limit	Switch'g	15	16	1	10	16	7
SECTION 5b	Unnecessary interference to train No. 44 and other trains at stations east of Yuma, Arizona, to return cars to proper route or proper train, or to deliver to connecting line	Switch'g	6	6	1	52	0	8
SECTION 6a	Unnecessary interference to trains other than trains Nos. 6, 4 and 44 at Yuma, Arizona, and stations east thereof, to avoid exceeding the Arizona 14 car limit	Switch'g	16	19	2	5	24	13
TOTAL	SECTIONS 3a, 4a, 5a and 6a, INVOLVING EASTWARD TRAINS AT YUMA, FOR COMPARISON WITH SECTION 2 INVOLVING WESTWARD TRAINS AT TUCSON AND PHOENIX.	Switch'g	71	84	20	11	85	88
SECTION 6b	Unnecessary interference to trains other than trains Nos. 6, 4 and 44 at stations east of Yuma, Arizona to return cars to proper route or proper train, or to deliver to connecting line	Switch'g	2	4	3	10	5	5
SECTION 7a	Unnecessary interference to eastward trains at Los Angeles, California, to avoid exceeding the Arizona 14 car limit	Switch'g	7	7	0	-	0	7
SECTION 7b	Unnecessary interference to westward trains at Yuma, Arizona and stations east thereof caused by observance of the 14 car limit within the State of Arizona	Switch'g	32	61	10	26	75	67
	TOTALS		222	359	63	15	315	338

SECTION 8	Unnecessary delay to deadhead equipment at stations Yuma, Arizona to El Paso, Texas, caused by observance of Arizona 14 car limit, due to being set out and later picked up, or to failure to be picked up per schedule.	(a) Character of interference:	Delay
		(b) Number of instances:	45
		(c) Number of trains involved:	89
		(d) Number of cars involved:	51
		(e) Total delay to deadhead cars:	499 hours and 29 minutes
		(f) Average delay per car:	9 hours and 47 minutes
SECTION 9	Unnecessary interference account adversely moving cars via other than the assigned route, or assigned train, to avoid exceeding the Arizona 14 car limit.	(a) Character of interference:	Adverse routing
		(b) Number of instances:	56
		(c) Number of trains involved	112
		(d) Number of cars involved:	67
SECTION 10	Unnecessary interference account cancelling the movement of assigned cars to avoid exceeding the Arizona 14 car limit.	(a) Character of interference:	Cancellation of assigned car movements
		(b) Number of instances:	44
		(c) Number of movements cancelled:	47
		(d) Number of trains involved:	48
		(e) Instances when trains delayed:	6 instances, averaging 1 minutes each
SECTION 11	Helper engine service incurred on Los Angeles Division by reason of westward passenger trains arriving at Yuma, Arizona, with cars belonging to other trains, thereby requiring additional helper service on Los Angeles Division.	(a) Character of interference:	Helper engine service
		(b) Number of instances:	21
		(c) Number of trains involved:	21
		(d) Locomotive helper miles incurred:	1,142
SECTION 12	Unnecessary delay to occupied or loaded cars at stations Yuma, Arizona to El Paso, Texas caused by observance of Arizona 14 car limit, due to being set out and later picked up, or to failure to be picked up per schedule.	(a) Character of interference:	Delay to occupied or loaded cars
		(b) Number of trains involved:	69
		(c) Number of cars delayed:	200
		(d) Total delay to cars involved:	165 hours and 30 minutes
		(e) Average delay per car:	50 minutes
SECTION 13a	Adverse routing to avoid exceeding the 14 car limit resulting in excess car miles.	(a) Character of interference:	Excess car miles
		(b) Number of instances:	60
		(c) Number of cars involved:	62
		(d) Total excess miles incurred:	11,442
SECTION 13b	Adverse routing to avoid exceeding the 14 car limit resulting in saved car miles.	(a) Character of interference:	Car miles saved
		(b) Number of instances:	106
		(c) Number of cars involved:	142
		(d) Total car miles saved:	9,239

NOTE: NET EXCESS CAR MILES INCURRED BY OBSERVANCE OF ARIZONA 14 CAR LAW:

Section 13a, (d) 11,442 excess car miles incurred minus 9,239 car miles saved, section 13b, (d), produces net 2,203 excess car miles

SECTION 14 Unnecessary interference (not otherwise classified) caused by observance of Arizona 14 car limit: Six items involving eight trains as listed on sheet No. 33.

SECTION 1

UNNECESSARY INTERFERENCE TO WESTWARD TRAINS AT EL PASO, TEXAS ROCKO, NEW MEXICO, AND LORDSBURG, NEW MEXICO, TO AVOID EXCEEDING THE ARIZONA 14 CAR LIMIT UPON ENTERING THE STATE, OR TO PERMIT TRAINS TO PICK UP AT STATIONS WEST THEREOF WITHOUT EXCEEDING THE ARIZONA 14 CAR LIMIT

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	STATION (d)	CHARACTER OF INTERFERENCE (e)	AMOUNT OF DELAY (f)	CARS SET OUT (g)	CARS PICKED UP (h)
8	Jan. 28	43 2-5	El Paso, Texas	Split up train 43 into trains 43 and 2nd 5	- -	5 -	- 6
13	Feb. 16	3 X-2103	Rodeo, N.M.	Switching Switching	- -	1 -	- 2
15	Feb. 18	43 1-43	Lordsburg, N.M.	Switching Switching	- -	4 -	- 4
23	Feb. 28	3 X-2103	Rodeo, N.M.	Switching Switching	- -	1 -	- 2
56	May 14	5 43	El Paso, Tex.	Switching Switching	- -	1 -	- 1
111	Aug. 16	1-1 2-1	Lordsburg, N.M.	Switching Switching	- 10 Mins.	5 -	- 6
115	Aug. 27	1-1 2-1	Lordsburg, N.M.	Switching Switching	- 8 Mins.	6 -	- 6
124	Sept 10	43 1	El Paso, Tex.	Switching Switching	- -	1 -	- 1
125	Sept 16	TM-828 1-43	El Paso, Tex.	Switching Switching	- -	1 -	- 1
145	Nov. 26	1 3	El Paso, Tex.	Switching Switching	- -	1 -	- 1
159	Dec. 18	2-1	El Paso, Tex.	Switching	-	-	1
166	Dec. 22	1-43 2-43	El Paso, Tex.	Switching Switching	- -	3 -	- 4
TOTALS 12 ITEMS		23 TRAINS			2 TRAINS 18 MINS. (Average 9 Mins)	29	35

SECTION 2

UNNECESSARY INTERFERENCE TO WESTWARD TRAINS AT TUCSON, ARIZONA, AND PHOENIX, ARIZONA, TO PERMIT TRAINS TO PICK UP AT TUCSON AND STATIONS WEST THEREOF WITHOUT EXCEEDING THE ARIZONA 14 CAR LIMIT

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	STATION (d)	CHARACTER OF INTERFERENCE (e)	AMOUNT OF DELAY (f)	CARS SET OUT (g)	CARS PICKED UP (h)
4	Jan. 2	43 5	Tucson, Ariz.	Sw'g & mail & express trans. -	- 22 mins.	1 -	- 1
9	Feb. 1	43 1	Tucson, Ariz.	Switching Switching	10 mins. -	1 -	3 1
9	Feb. 1	43 3	Phoenix, Ariz.	Switching Switching	- -	2 -	- 2
12	Feb. 15	5 43	Tucson, Ariz.	Switching Switching	- 17 mins.	1 -	- 1
12	Feb. 15	43 1	Tucson, Ariz.	Switching Switching	- -	1 -	- 1
14	Feb. 17	5 43	Tucson, Ariz.	Switching Switching	7 mins. -	1 -	- 1
16	Feb. 18	5 43	Tucson, Ariz.	Switching Switching	18 mins. 12 mins.	1 -	- 1
18	Feb. 22	5 43	Tucson, Ariz.	Switching Switching	- -	1 -	- 2
19	Feb. 23	5 43	Tucson, Ariz.	Switching Switching	5 mins. -	1 -	- 1
20	Feb. 24	5 43	Tucson, Ariz.	Switching Switching	- 5 mins.	1 -	- 1
22	Feb. 27	5 43	Tucson, Ariz.	Switching Switching	- -	1 -	- 1
30	Mar. 13	43 5	Tucson, Ariz.	Switching Switching	- -	- 1	1 -
31	Mar. 15	5 43 1	Tucson, Ariz.	Switching Switching -	- - -	1 1 -	1 - 1
32	Mar. 18	5 43	Tucson, Ariz.	Switching Switching	- 10 mins.	1 -	- 1
33	Mar. 21	5 43 1 1	Tucson, Ariz. Tucson, Ariz. Tucson, Ariz. Phoenix, Ariz.	Switching Switching Switching Switching	- - - -	1 - - 1	- 1 1 -
34	Mar. 22	5 43	Tucson, Ariz.	Switching Switching	- -	1 -	- 1
35	Mar. 23	5 43	Tucson, Ariz.	Switching Switching	- -	1 -	- 1
37	Mar. 24	5 43	Tucson, Ariz.	Switching Switching	- -	1 -	- 1
39	Mar. 28	5	Tucson, Ariz.	Switching	-	1	-
						-	1

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
4	Jan. 2	43 5	Tucson, Ariz.	Sw'g & mail & express trans.	- 22 mins.	1 -	- 1
9	Feb. 1	43 1	Tucson, Ariz.	Switching Switching	10 mins.	1 -	3 1
9	Feb. 1	43 3	Phoenix, Ariz.	Switching Switching	- -	2 -	- 2
12	Feb. 15	5 43	Tucson, Ariz.	Switching Switching	- 17 mins.	1 -	- 1
12	Feb. 15	43 1	Tucson, Ariz.	Switching Switching	- -	1 -	- 1
14	Feb. 17	5 43	Tucson, Ariz.	Switching Switching	7 mins. -	1 -	- 1
16	Feb. 18	5 43	Tucson, Ariz.	Switching Switching	18 mins. 12 mins.	1 -	- 1
18	Feb. 22	5 43	Tucson, Ariz.	Switching Switching	- -	1 -	- 2
19	Feb. 23	5 43	Tucson, Ariz.	Switching Switching	5 mins. -	1 -	- 1
20	Feb. 24	5 43	Tucson, Ariz.	Switching Switching	- 5 mins.	1 -	- 1
22	Feb. 27	5 43	Tucson, Ariz.	Switching Switching	- -	1 -	- 1
30	Mar. 13	43 5	Tucson, Ariz.	Switching Switching	- -	- 1	1 -
31	Mar. 15	5 43 1	Tucson, Ariz.	Switching Switching	- - -	1 1 -	1 - 1
32	Mar. 18	5 43	Tucson, Ariz.	Switching Switching	- 10 mins.	1 -	- 1
33	Mar. 21	5 43 1 1	Tucson, Ariz. Tucson, Ariz. Tucson, Ariz. Phoenix, Ariz.	Switching Switching Switching Switching	- - 1 -	1 - - 1	- 1 1 -
34	Mar. 22	5 43	Tucson, Ariz.	Switching Switching	- -	1 -	- 1
35	Mar. 23	5 43	Tucson, Ariz.	Switching Switching	- -	1 -	- 1
37	Mar. 34	5 43	Tucson, Ariz.	Switching Switching	- -	1 -	- 1
39	Mar. 28	5 43	Tucson, Ariz.	Switching Switching	- 5 mins.	1 -	- 1
40	Mar. 29	43 5 1 1	Tucson, Ariz. Tucson, Ariz. Tucson, Ariz. Phoenix, Ariz.	Switching Switching Switching Switching	- - - -	- 1 - 1	1 - 1 -
41	Mar. 29	1 1	Tucson, Ariz. Phoenix, Ariz.	Switching Switching	- -	- 1	1 -

SECTION 2 (Cont'd)

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	STATION (d)	CHARACTER OF INTERFERENCE (e)	AMOUNT OF DELAY (f)	CARS SET OUT (g)	CARS PICKED UP (h)
43	Apr. 5	1	Tucson, Ariz.	Switching	-	-	1
		1	Phoenix, Ariz.	Switching	-	1	-
44	Apr. 6	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
45	Apr. 7	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
46	Apr. 9	1-5	Phoenix, Ariz.	Switching	38 mins.	1	-
		2-5		Switching	1 hr. 30 M.	-	2
47	Apr. 12	1	Tucson, Ariz.	Switching	-	-	1
		1	Phoenix, Ariz.	Switching	-	1	-
48	Apr. 11	5	Phoenix, Ariz.	Switching	-	1	-
		1		Switching	-	-	1
52	Apr. 16	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
54	Apr. 23	43	Tucson, Ariz.	Switching	-	1	-
		1		Switching	-	-	1
55	Apr. 30	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
59	May 23	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
68	June 9	5	Tucson, Ariz.	Switching	-	2	-
		43		Switching	-	-	2
69	June 11	5	Tucson, Ariz.	Switching	-	2	-
		43		Switching	5 mins.	-	2
72	June 12	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	8 mins.	-	1
77	June 16	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
80	June 21	3	Tucson, Ariz.	Switching	11 mins.	3	-
		X430CW		Switching	-	-	4
81	June 25	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	1	1
		1		Switching	-	-	1
82	June 26	3	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
84	June 30	5	Tucson, Ariz.	Switching	-	2	-
		43		Switching	-	-	2
86	July 4	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
88	July 7	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	8 mins.	-	1
89	July 8	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1

45	Apr. 7	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
46	Apr. 9	1-5	Phoenix, Ariz.	Switching	38 mins.	1	-
		2-5		Switching	1 hr. 50 M.	-	2
47	Apr. 12	1	Tucson, Ariz.	Switching	-	-	1
		1	Phoenix, Ariz.	Switching	-	1	-
48	Apr. 11	5	Phoenix, Ariz.	Switching	-	1	-
		1		Switching	-	-	1
52	Apr. 16	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
54	Apr. 23	43	Tucson, Ariz.	Switching	-	1	-
		1		Switching	-	-	1
55	Apr. 30	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
59	May 23	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
68	June 9	5	Tucson, Ariz.	Switching	-	2	-
		43		Switching	-	-	2
69	June 11	5	Tucson, Ariz.	Switching	-	2	-
		43		Switching	5 mins.	-	2
72	June 12	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	8 mins.	-	1
77	June 16	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
80	June 21	3	Tucson, Ariz.	Switching	11 mins.	3	-
		243008		Switching	-	-	4
81	June 25	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	1	1
		1		Switching	-	-	1
82	June 26	3	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
84	June 30	5	Tucson, Ariz.	Switching	-	2	-
		43		Switching	-	-	2
86	July 4	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
88	July 7	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	8 mins.	-	1
89	July 8	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
90	July 12	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
92	July 13	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
95	July 17	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1

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SECTION 2 (Cont'd)

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	STATION (d)	CHARACTER OF INTERFERENCE (e)	AMOUNT OF DELAY (f)	CARS SET OUT (g)	CARS PICKED UP (h)
98	July 22	5 1	Phoenix, Ariz.	Switching Switching	7 mins. 8 mins.	1 -	- 1
101	Aug. 2	1-3 2-3	Tucson, Ariz.	Switching Switching	- -	4 -	- 4
103	Aug. 4	5 43	Tucson, Ariz.	Switching Switching	- -	1 -	- 1
105	Aug. 5	5 1	Phoenix, Ariz.	Switching Switching	9 mins. -	1 -	- 1
120	Aug. 14	5 43	Tucson, Ariz.	Switching Switching	- -	1 -	- 1
128	Sept 2	5 43	Tucson, Ariz.	Switching Switching	- 8 mins.	1 -	- 1
129	Sept 3	5 1	Phoenix, Ariz.	Switching Switching	5 mins. -	1 -	- 1
130	Sept 3	3 5	Phoenix, Ariz.	Switching Switching	- -	1 -	- 1
123	Sept 9	5 1	Phoenix, Ariz.	Switching Switching	- -	1 -	- 1
126	Sept 27	1 3	Tucson, Ariz.	Switching Switching	- 8 mins.	1 -	- 1
129	Sept 29	5 43	Tucson, Ariz.	Switching Switching	- -	1 -	- 1
132	Oct. 20	5 43	Tucson, Ariz.	Switching Switching	- -	1 -	- 1
140	Nov. 11	5 43	Tucson, Ariz.	Switching Switching	- 5 mins.	1 -	- 1
141	Nov. 12 Nov. 13	3 43	Tucson, Ariz.	Switching Switching	- -	2 -	- 2
142	Nov. 20	1-3 2-3	Tucson, Ariz.	Switching Switching	- -	2 -	- 3
143	Nov. 22	5 43	Tucson, Ariz.	Switching Switching	- -	1 -	- 1
144	Nov. 23	5 1	Phoenix, Ariz.	Switching Switching	- -	1 -	- 1
145	Nov. 26	3 43	Tucson, Ariz.	Switching Switching	- 13 mins.	1 -	- 1
146	Nov. 27	5 43 5 1	Tucson, Ariz. Tucson, Ariz. Phoenix, Ariz. Phoenix, Ariz.	Switching Switching Switching Switching	- - - -	1 - 1 -	- 1 - 1
147	Dec. 1	5 43	Tucson, Ariz.	Switching Switching	- 6 mins.	1 -	- 1
148	Dec. 6	5	Tucson, Ariz.	Switching	-	1	-

125	Aug. 5	5 1	Phoenix, Ariz.	Switching Switching	9 mins.	1 -	- 1
130	Aug. 14	5 43	Tucson, Ariz.	Switching Switching	-	1 -	- 1
118	Sept 2	5 43	Tucson, Ariz.	Switching Switching	- 8 mins.	1 -	- 1
119	Sept 3	5 1	Phoenix, Ariz.	Switching Switching	5 mins.	1 -	- 1
120	Sept 3	3 5	Phoenix, Ariz.	Switching Switching	-	1 -	- 1
123	Sept 9	5 1	Phoenix, Ariz.	Switching Switching	-	1 -	- 1
128	Sept 27	1 3	Tucson, Ariz.	Switching Switching	- 8 mins.	1 -	- 1
129	Sept 29	5 43	Tucson, Ariz.	Switching Switching	-	1 -	- 1
132	Oct. 20	5 43	Tucson, Ariz.	Switching Switching	-	1 -	- 1
140	Nov. 11	5 43	Tucson, Ariz.	Switching Switching	- 5 mins.	1 -	- 1
141	Nov. 12 Nov. 13	3 43	Tucson, Ariz.	Switching Switching	-	2 -	- 2
142	Nov. 20	1-3 2-3	Tucson, Ariz.	Switching Switching	-	2 -	- 3
143	Nov. 22	5 43	Tucson, Ariz.	Switching Switching	-	1 -	- 1
144	Nov. 23	5 1	Phoenix, Ariz.	Switching Switching	-	1 -	- 1
145	Nov. 26	3 43	Tucson, Ariz.	Switching Switching	- 13 mins.	1 -	- 1
146	Nov. 27	5 43 5 1	Tucson, Ariz. Tucson, Ariz. Phoenix, Ariz. Phoenix, Ariz.	Switching Switching Switching Switching	-	1 - 1 -	- 1 - 1
147	Dec. 1	5 43	Tucson, Ariz.	Switching Switching	- 6 mins.	1 -	- 1
148	Dec. 6	5 43	Tucson, Ariz.	Switching Switching	-	1 -	- 1
154	Dec. 16	5 1	Phoenix, Ariz.	Switching Switching	-	1 -	- 1
158	Dec. 17	1-5 2-5 1-5 43	Tucson, Ariz. Tucson, Ariz. Phoenix, Ariz. Phoenix, Ariz.	Switching Switching Switching Switching	-	3 - - 1	- 4 1 -

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SECTION 2 (Cont'd)

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	STATION (d)	CHARACTER OF INTERFERENCE (e)	AMOUNT OF DELAY (f)	CARS SET OUT (g)	CARS PICKED UP (h)
162	Dec. 19	1-5	Tucson, Ariz.	Switching	-	3	-
		2-5		Switching	-	-	4
164	Dec. 20	1-5	Tucson, Ariz.	Switching	-	4	-
		2-5		Switching	-	-	5
169	Dec. 24	1-5	Tucson, Ariz.	Switching	-	1	-
		2-5		Switching	-	-	1
	Dec. 24	43	Tucson, Ariz.	Switching	-	-	1
		1-5		Switching	-	1	-
	Dec. 24	3-5	Phoenix, Ariz.	Switching	-	1	-
		1		Switching	-	-	1
171	Dec. 29	5	Tucson, Ariz.	Switching	-	1	-
		43		Switching	-	-	1
172	Dec. 30	1-5	Tucson, Ariz.	Switching	-	5	1
		2-5		Switching	-	-	5
173	Dec. 30	2-43	Lordsburg, N.M.	Switching	-	8	-
		3-43		Switching	-	-	9
TOTALS 74 ITEMS		162 TRAINS		25 Instances 6 Hrs. 0 Mins. Aver. 14 Mins. each		111	123

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ROUTINE 3a

UNNECESSARY INTERFERENCE TO TRAIN NO. 6 AND OTHER TRAINS AT YUMA, ARIZONA AND STATIONS EAST THEREOF TO AVOID EXCEEDING THE ARIZONA 14 CAR LIMIT

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	STATION (d)	CHARACTER OF INTERFERENCE (e)	AMOUNT OF DELAY (f)	CARS SET OUT (g)	CARS PICKED UP (h)
3	Jan. 1	6	Yuma, Ariz.	Switching	17 mins.	-	-
6	Jan. 17	6	Yuma, Ariz.	Switching	5 mins.	1	-
17	Feb. 22	6	Yuma, Ariz.	Switching	-	-	1
28	Mar. 10	6	Yuma, Ariz.	Switching	5 mins.	-	-
42	Apr. 3	6	Yuma, Ariz.	Switching	10 mins.	-	1
60	May 23	6	Yuma, Ariz.	Switching	-	-	3
65	June 5	6	Yuma, Ariz.	Switching	-	-	2
75	June 14	6	Yuma, Ariz.	Switching	-	-	1
85	July 3	6	Yuma, Ariz.	Switching	-	1	-
91	July 12	6	Yuma, Ariz.	Switching	25 mins.	4	-
100	Aug. 1	6	Yuma, Ariz.	Switching	-	-	1
109	Aug. 13	6	Yuma, Ariz.	Switching	-	-	1
114	Aug. 25	6	Yuma, Ariz.	Switching	-	-	1
122	Sept. 7	6	Yuma, Ariz.	Switching	12 mins.	1	-
130	Oct. 5	6	Yuma, Ariz.	Switching	-	-	1
133	Oct. 21	6	Yuma, Ariz.	Switching	-	-	2
135	Oct. 29	6	Yuma, Ariz.	Switching	-	-	1
138	Nov. 6	6	Yuma, Ariz.	Switching	-	-	2
151	Dec. 13	2-6	Yuma, Ariz.	Switching	-	-	1
	Dec. 13	1-6 2-6	Yuma, Ariz.	Switching Switching	10 mins. -	5 -	- 5
156	Dec. 17	1-6 2-6	Yuma, Ariz.	Switching Switching	4 mins. -	4 -	- 7
161	Dec. 18	1-6 2-6	Yuma, Ariz.	Switching Switching	- -	3 -	- 5
163	Dec. 19	1-6 2-6	Yuma, Ariz.	Switching Switching	- -	4 -	- 6
165	Dec. 20	1-6 2-6	Yuma, Ariz.	Switching Switching	- -	4 -	- 6
167	Dec. 21	1-6 2-6	Yuma, Ariz.	Switching Switching	- 8 mins.	- 4	8 -

ITEM NOS	TRAINS INVOLVED	AMOUNT OF DELAY	CARS SET OUT	CARS PICKED UP

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
3	Jan. 1	6	Yuma, Ariz.	Switching	17 mins.	-	-
6	Jan. 17	6	Yuma, Ariz.	Switching	5 mins.	1	-
17	Feb. 22	6	Yuma, Ariz.	Switching	-	-	1
28	Mar. 10	6	Yuma, Ariz.	Switching	5 mins.	-	-
48	Apr. 3	6	Yuma, Ariz.	Switching	10 mins.	-	1
60	May 23	6	Yuma, Ariz.	Switching	-	-	3
65	June 5	6	Yuma, Ariz.	Switching	-	-	2
75	June 14	6	Yuma, Ariz.	Switching	-	-	1
85	July 3	6	Yuma, Ariz.	Switching	-	1	-
91	July 12	6	Yuma, Ariz.	Switching	25 mins.	4	-
100	Aug. 1	6	Yuma, Ariz.	Switching	-	-	1
109	Aug. 13	6	Yuma, Ariz.	Switching	-	-	1
114	Aug. 25	6	Yuma, Ariz.	Switching	-	-	1
122	Sept. 7	6	Yuma, Ariz.	Switching	12 mins.	1	-
130	Oct. 5	6	Yuma, Ariz.	Switching	-	-	1
133	Oct. 21	6	Yuma, Ariz.	Switching	-	-	2
135	Oct. 29	6	Yuma, Ariz.	Switching	-	-	1
138	Nov. 6	6	Yuma, Ariz.	Switching	-	-	2
151	Dec. 13	3-6	Yuma, Ariz.	Switching	-	-	1
	Dec. 13	1-6 3-6	Yuma, Ariz.	Switching Switching	10 mins. -	5 -	- 5
156	Dec. 17	1-6 3-6	Yuma, Ariz.	Switching Switching	4 mins. -	4 -	- 7
161	Dec. 18	1-6 3-6	Yuma, Ariz.	Switching Switching	- -	3 -	- 5
163	Dec. 19	1-6 3-6	Yuma, Ariz.	Switching Switching	- -	4 -	- 6
165	Dec. 20	1-6 3-6	Yuma, Ariz.	Switching Switching	- -	4 -	- 6
167	Dec. 21	1-6 3-6	Yuma, Ariz.	Switching Switching	- 8 mins.	- 4	8 -

ITEM NOS	TRAINS INVOLVED	AMOUNT OF DELAY	CARS SET OUT	CARS PICKED UP
24	31	9 trains 96 minutes Average 11 mins.	31	55

3123

SECTION 3b

UNNECESSARY INTERFERENCE TO TRAIN NO. 6 AND OTHER TRAINS AT STATIONS EAST OF TUCSON, ARIZONA, TO RETURN CARS TO PROPER ROUTE OR PROPER TRAIN, OR TO DELIVER CARS TO CONNECTING LINE

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	STATION (d)	CHARACTER OF INTERFERENCE (e)	AMOUNT OF DELAY (f)	CARS SET OUT (g)	CARS PICKED UP (h)
3	Jan. 1	6	Tucson, Ariz.	Switching	-	1	-
7	Jan. 18	6	El Paso, Tex.	Switching	-	-	1
26	Mar. 9	6	El Paso, Tex.	Switching	-	1	-
60	May 23	6	El Paso, Tex.	Switching	9 mins.	3	-
116	Aug. 31	6	Tucson, Ariz.	Switching	-	-	1
130	Oct. 5	6	Tucson, Ariz.	Switching	-	1	-
133	Oct. 21	6	El Paso, Tex.	Switching	-	1	-
135	Oct. 29	6	Tucson, Ariz.	Switching	-	1	-
156	Dec. 17	3-6	Tucson, Ariz.	Switching	-	-	1

ITEM NOS	TRAINS INVOLVED	AMOUNT OF DELAY	CARS SET OUT	CARS PICKED UP
9	9	9 minutes	8	3

3121

5593

SECTION 4a

UNNECESSARY INTERFERENCE TO TRAIN NO. 4 AND OTHER TRAINS AT YUMA, ARIZONA, AND STATIONS EAST THEREOF, TO AVOID EXCEEDING THE ARIZONA 14 CAR LIMIT

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	STATION (d)	CHARACTER OF INTERFERENCE (e)	AMOUNT OF DELAY (f)	CARS SET OUT (g)	CARS PICKED UP (h)
1	Dec. 31	4	Yuma, Ariz.	Switching	7 mins.	-	1
5	Jan. 5	4	Yuma, Ariz.	Switching	6 mins.	-	2
6	Jan. 17	4	Yuma, Ariz.	Switching	5 mins.	-	1
7	Jan. 18	4	Yuma, Ariz.	Switching	-	-	1
42	Apr. 3	4	Yuma, Ariz.	Switching	6 mins.	1	-
85	July 3	4	Yuma, Ariz.	Switching	-	1	-
91	July 12	3-4	Yuma, Ariz.	Switching	30 mins.	-	6
	July 12	1-4	Yuma, Ariz.	Switching	-	2	-
102	Aug. 4	4	Yuma, Ariz.	Switching	-	1	-
122	Sept. 7	4	Yuma, Ariz.	Switching	19 mins.	1	1
139	Oct. 5	4	Yuma, Ariz.	Switching	-	1	-
133	Oct. 21	4	Yuma, Ariz.	Switching	-	2	-
	Oct. 21	4	Phoenix, Ariz.	Switching	16 mins.	-	1
135	Oct. 29	4	Yuma, Ariz.	Switching	-	1	-
151	Dec. 13	4	Yuma, Ariz.	Switching	-	1	-
156	Dec. 17	4	Yuma, Ariz.	Switching	-	1	-
161	Dec. 18	4	Yuma, Ariz.	Switching	10 mins.	1	-
167	Dec. 21	4	Yuma, Ariz.	Switching	-	1	-

ITEM NOS.	TRAINS INVOLVED	AMOUNT OF DELAY	CARS SET OUT	CARS PICKED UP
16	18	8 trains; 99 mins. Aver. 12 minutes	14	13

SECTION 4b

UNNECESSARY INTERFERENCE TO TRAIN NO. 4 AND OTHER TRAINS AT STATIONS EAST OF YUMA, ARIZONA, TO RETURN CARS TO PROPER ROUTE OR PROPER TRAIN, OR TO DELIVER TO CONNECTING LINE

ITEM NO. (a)	DATE (b)	STATION (c)	CHARACTER OF INTERFERENCE (d)	AMOUNT OF DELAY (e)	CARS SET OUT (f)	CARS PICKED UP (g)
7	Jan. 18	El Paso, Tex.	Switching	-	1	-
26	Mar. 9	El Paso, Tex.	Switching	-	-	1
133	Oct. 21	Tucson, Ariz.	Switching	-	1	-
135	Oct. 29	Tucson, Ariz.	Switching	3 mins.	-	1
TOTALS 4 ITEMS 4 TRAINS				3 mins. (1 train)	2	2

SECTION 5a

UNNECESSARY INTERFERENCE TO TRAIN NO. 44 AND OTHER TRAINS AT YUMA, ARIZONA, AND STATIONS EAST THEREOF TO AVOID EXCEEDING ARIZONA 14 CAR LIMIT

3	Dec. 31	Yuma, Ariz.	Switching	-	1	-
24	Mar. 8	Yuma, Ariz.	Switching	-	1	-
25	Mar. 9	Yuma, Ariz.	Switching	-	1	-
78	June 18	Yuma, Ariz.	Switching	-	-	2
83	June 27	Yuma, Ariz.	Switching	-	-	1
102	Aug. 4	Yuma, Ariz.	Switching	-	-	1
109	Aug. 13	Yuma, Ariz.	Switching	-	1	-
116	Aug. 31	Tucson, Ariz.	Switching	-	1	-
122	Sept. 7	Yuma, Ariz.	Switching	10 mins.	-	1
131	Oct. 13	Yuma, Ariz.	Switching	-	-	1
152	Dec. 17	Yuma, Ariz.	Switching	-	3	-
	Dec. 17	Tucson, Ariz.	Switching	-	1	-
163	Dec. 19	Yuma, Ariz.	Switching	-	2	-
165	Dec. 20	Yuma, Ariz.	Switching	-	2	-
167	Dec. 21	Yuma, Ariz.	Switching	-	3	-
168	Dec. 22	Yuma, Ariz.	Switching	-	-	1
TOTALS 15 ITEMS 16 TRAINS				10 mins. (1 train)	16	7

SECTION 5b

UNNECESSARY INTERFERENCE TO TRAIN NO. 44 AND OTHER TRAINS AT STATIONS EAST OF YUMA, ARIZONA TO RETURN CARS TO PROPER ROUTE OR PROPER TRAIN, OR TO DELIVER TO CONNECTING LINE

3	Jan. 1	Tucson, Ariz.	Switching	-	-	1
24	Mar. 8	Phoenix, Ariz.	Switching	-	-	1

133	Oct. 21	Tucson, Aris.	Switching	-	1	-
135	Oct. 29	Tucson, Aris.	Switching	3 mins.	-	1
TOTALS 4 ITEMS 4 TRAINS				3 mins. (1 train)	2	2

SECTION 5a

UNNECESSARY INTERFERENCE TO TRAIN NO. 44 AND OTHER TRAINS AT YUMA, ARIZONA, AND STATIONS EAST THEREOF TO AVOID EXCEEDING ARIZONA 14 CAR LIMIT

1	Dec. 31	Yuma, Aris.	Switching	-	1	-
24	Mar. 8	Yuma, Aris.	Switching	-	1	-
25	Mar. 9	Yuma, Aris.	Switching	-	1	-
78	June 18	Yuma, Aris.	Switching	-	-	2
83	June 27	Yuma, Aris.	Switching	-	-	1
102	Aug. 4	Yuma, Aris.	Switching	-	-	1
109	Aug. 13	Yuma, Aris.	Switching	-	1	-
116	Aug. 31	Tucson, Aris.	Switching	-	1	-
122	Sept. 7	Yuma, Aris.	Switching	10 mins.	-	1
131	Oct. 13	Yuma, Aris.	Switching	-	-	1
152	Dec. 17	Yuma, Aris.	Switching	-	3	-
	Dec. 17	Tucson, Aris.	Switching	-	1	-
163	Dec. 19	Yuma, Aris.	Switching	-	2	-
165	Dec. 20	Yuma, Aris.	Switching	-	2	-
167	Dec. 21	Yuma, Aris.	Switching	-	3	-
168	Dec. 22	Yuma, Aris.	Switching	-	-	1
TOTALS 15 ITEMS 16 TRAINS				10 mins. (1 train)	16	7

SECTION 5b

UNNECESSARY INTERFERENCE TO TRAIN NO. 44 AND OTHER TRAINS AT STATIONS EAST OF YUMA, ARIZONA TO RETURN CARS TO PROPER ROUTE OR PROPER TRAIN, OR TO DELIVER TO CONNECTING LINE

3	Jan. 1	Tucson, Aris.	Switching	-	-	1
24	Mar. 8	Phoenix, Aris.	Switching	-	-	1
25	Mar. 9	Phoenix, Aris.	Switching	-	-	1
29	Mar. 11	Phoenix, Aris.	Switching	-	-	1
60	May 23	El Paso, Tex.	Switching	52 mins.	-	3
130	Oct. 5	Tucson, Aris.	Switching	-	-	1
TOTALS 6 ITEMS 6 TRAINS				52 mins. (1 train)	-	8

3126

SECTION 6a

UNNECESSARY INTERFERENCE TO TRAINS OTHER THAN TRAINS NOS. 6, 4 AND 44 AT YUMA, ARIZONA, AND STATIONS EAST THEREOF, TO AVOID EXCEEDING THE ARIZONA 14 CAR LIMIT

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	STATION (d)	CHARACTER OF INTERFERENCE (e)	AMOUNT OF DELAY (f)	CARS SET OUT (g)	CARS PICKED UP (h)
5	Jan. 5	2	Yuma, Ariz.	Switching	-	2	-
17	Feb. 22	2	Yuma, Ariz.	Switching	-	1	-
29	Mar. 11	2	Phoenix, Ariz.	Switching	-	1	-
65	June 5	2	Yuma, Ariz.	Switching	-	2	-
70	June 11	2	Yuma, Ariz.	Switching	5 mins.	4	-
		X2432E	Yuma, Ariz.	Switching	-	-	4
78	June 18	2	Yuma, Ariz.	Switching	5 mins.	2	-
83	June 27	2	Yuma, Ariz.	Switching	-	1	-
85	July 3	2	Yuma, Ariz.	Switching	-	-	2
100	Aug. 1	2	Yuma, Ariz.	Switching	-	1	-
114	Aug. 25	2	Yuma, Ariz.	Switching	-	1	-
131	Oct. 13	2	Yuma, Ariz.	Switching	-	1	-
139	Nov. 9	1-2	Yuma, Ariz.	Switching	-	4	-
		3-2	Yuma, Ariz.	Switching	-	-	5
152	Dec. 15	2	Yuma, Ariz.	Switching	-	1	1
161	Dec. 18	2	Yuma, Ariz.	Switching	-	1	-
167	Dec. 21	2	Yuma, Ariz.	Switching	-	1	-
	Dec. 21	X1643E	Yuma, Ariz.	Switching	-	-	1
168	Dec. 22	2	Yuma, Ariz.	Switching	-	1	-
TOTALS 16 items		19 trains			Aver. 5 Mins. 2 Trains 10 Mins.	24	13

SECTION 6b

UNNECESSARY INTERFERENCE TO TRAINS OTHER THAN TRAINS NOS. 6, 4 AND 44 AT STATIONS EAST OF YUMA, ARIZONA TO RETURN CARS TO PROPER ROUTE OR PROPER TRAIN, OR TO DELIVER TO CONNECTING LINE

38	Mar. 26	2	Lordsburg, N.M.	Switching	6 mins.	1	-
	Mar. 26	CDC Spl	Lordsburg, N.M.	Switching	10 mins.	-	1
70	June 11	2	Lordsburg, N.M.	Switching	15 mins.	-	4
	June 11	X2432E	Lordsburg, N.M.	Switching	-	4	-
TOTALS 2 items		4 trains			Aver. 10 Mins. 3 Trains 31 Mins.	5	5

SECTION 7a

UNNECESSARY INTERFERENCE TO EASTWARD TRAINS AT LOS ANGELES, CALIF. TO AVOID EXCEEDING THE ARIZONA 14 CAR LIMIT

[illegible]							

69	June 5	2	Tuma, Ariz.	Switching	-	2	-
70	June 11	2	Tuma, Ariz.	Switching	5 mins.	4	-
		X2431E	Tuma, Ariz.	Switching	-	-	4
78	June 18	2	Tuma, Ariz.	Switching	5 mins.	2	-
83	June 27	2	Tuma, Ariz.	Switching	-	1	-
85	July 3	2	Tuma, Ariz.	Switching	-	-	2
100	Aug. 1	2	Tuma, Ariz.	Switching	-	1	-
114	Aug. 25	2	Tuma, Ariz.	Switching	-	1	-
131	Oct. 13	2	Tuma, Ariz.	Switching	-	1	-
139	Nov. 9	1-2	Tuma, Ariz.	Switching	-	4	-
		2-2	Tuma, Ariz.	Switching	-	-	5
152	Dec. 15	2	Tuma, Ariz.	Switching	-	1	1
161	Dec. 18	2	Tuma, Ariz.	Switching	-	1	-
167	Dec. 21	2	Tuma, Ariz.	Switching	-	1	-
	Dec. 21	X3643E	Tuma, Ariz.	Switching	-	-	1
168	Dec. 22	2	Tuma, Ariz.	Switching	-	1	-
TOTALS 16 items		19 trains			Aver. 5 Mins. 2 Trains 10 Mins.	24	13

SECTION 6b

UNNECESSARY INTERFERENCE TO TRAINS OTHER THAN TRAINS NOS. 6, 4 AND 44 AT STATIONS EAST OF TUMA, ARIZONA TO RETURN CARS TO PROPER ROUTE OR PROPER TRAIN, OR TO DELIVER TO CONNECTING LINE

38	Mar. 25	2	Lordsburg, N.M.	Switching	6 mins.	1	-
	Mar. 26	CGC Spl	Lordsburg, N.M.	Switching	10 mins.	-	1
70	June 11	2	Lordsburg, N.M.	Switching	15 mins.	-	4
	June 11	X2431E	Lordsburg, N.M.	Switching	-	4	-
TOTALS 2 items		4 trains			Aver. 10 Mins. 3 Trains 31 Mins.	5	5

SECTION 7a

UNNECESSARY INTERFERENCE TO EASTWARD TRAINS AT LOS ANGELES, CALIF. TO AVOID EXCEEDING THE ARIZONA 14 CAR LIMIT

98	July 22	820		Switching	-	-	1
105	Aug. 5	820		Switching	-	-	1
119	Sept. 3	820		Switching	-	-	1
123	Sept. 9	820		Switching	-	-	1
144	Nov. 23	820		Switching	-	-	1
146	Nov. 27	820		Switching	-	-	1
154	Dec. 16	820		Switching	-	-	1
TOTALS 7 items		7 trains					7

3127

SECTION 7b

UNNECESSARY INTERFERENCE TO WESTWARD TRAINS AT YUMA, ARIZONA AND STATIONS WEST THEREOF CAUSED BY OBSERVANCE OF THE 14 CAR LIMIT WITHIN THE STATE OF ARIZONA

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	STATION (d)	CHARACTER OF INTERFERENCE (e)	AMOUNT OF DELAY (f)	CARS SET OUT (g)	CARS PICKED UP (h)
8	Jan. 28	43 2-5	Yuma, Ariz	Consolidating TR 43 & 2-5	- -	- 6	5 -
11	Feb. 14	1-1 2-1	Yuma, Ariz.	Consolidating "	30 mins. -	- 7	7 -
15	Feb. 18	(1-43 (2-43	Yuma, Ariz.	Consolidating "	23 mins. -	4 -	- 4
18	Feb. 22	5 43	Yuma, Ariz.	Switching "	6 mins. -	- 2	2 -
20	Feb. 24	43 5	Yuma, Ariz.	Switching "	10 mins. -	- 1	1 -
46	Apr. 9	1-5 2-5	Yuma, Ariz.	Consolidating & wait for 2-5	1 hr. & 46 mins.	- 2	1 -
80	June 21	3 ZA300W	Yuma, Ariz.	Consolidating "	17 mins. -	- 4	3 -
90	July 12	5 43	Yuma, Ariz.	Switching "	- -	1 -	- 1
97	July 21	5 43	Yuma, Ariz.	Switching "	- -	- 1	1 -
98	July 22	5 820	Indio, Calif.	Switching "	- -	- 1	1 -
101	Aug. 2	1-1 2-1	Yuma, Ariz.	Consolidating "	20 mins. -	- 4	4 -
103	Aug. 4	5 43	Yuma, Ariz.	Switching "	- -	- 3	3 -
105	Aug. 5	5 82C	Colton, Calif.	Switching "	- -	- 1	1 -
115	Aug. 27	1-1 2-1	Yuma, Ariz.	Switching "	12 mins. -	- 6	6 -
119	Sept 3	5 820	Colton, Calif.	Switching "	- -	- 1	1 -
123	Sept. 9	820 5	Colton, Calif.	Switching "	- -	1 -	- 1
125	Sept. 16	TH828 1-43	Yuma, Ariz.	Switching "	- -	- 1	1 -
129	Sept 29	5 43	Yuma, Ariz.	Switching "	- -	- 1	1 -
134	Oct. 22	5 43	Yuma, Ariz.	Switching "	- -	- 1	1 -
142	Nov. 20	1-1 2-3	Yuma, Ariz.	Consolidating "	15 mins. -	- 3	2 -
[illegible]	Nov. [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

11	Feb. 14	1-1 2-1	Yuma, Ariz.	Consolidating "	30 mins. -	- 7	7 -
15	Feb. 18	(1-43 (2-43	Yuma, Ariz.	Consolidating "	23 mins. -	4 -	- 4
18	Feb. 22	5 43	Yuma, Ariz.	Switching "	6 mins. -	- 2	2 -
20	Feb. 24	43 5	Yuma, Ariz.	Switching "	10 mins. -	- 1	1 -
46	Apr. 9	1-5 2-5	Yuma, Ariz.	Consolidating & wait for 2-5	1 hr. & 44 mins.	- 2	1 -
88	June 21	3 X4300W	Yuma, Ariz.	Consolidating "	17 mins. -	- 4	3 -
90	July 12	5 43	Yuma, Ariz.	Switching "	- -	1 -	- 1
97	July 21	5 43	Yuma, Ariz.	Switching "	- -	- 1	1 -
98	July 22	5 820	Indio, Calif.	Switching "	- -	- 1	1 -
101	Aug. 2	1-1 2-1	Yuma, Ariz.	Consolidating "	20 mins. -	- 4	4 -
103	Aug. 4	5 43	Yuma, Ariz.	Switching "	- -	- 3	3 -
105	Aug. 5	5 82C	Colton, Calif.	Switching "	- -	- 1	1 -
115	Aug. 27	1-1 2-1	Yuma, Ariz.	Switching "	12 mins. -	- 6	6 -
119	Sept 3	5 820	Colton, Calif.	Switching "	- -	- 1	1 -
123	Sept. 9	820 5	Colton, Calif.	Switching "	- -	1 -	- 1
125	Sept. 16	TH828 1-43	Yuma, Ariz.	Switching "	- -	- 1	1 -
129	Sept 29	5 43	Yuma, Ariz.	Switching "	- -	- 1	1 -
134	Oct. 22	5 43	Yuma, Ariz.	Switching "	- -	- 1	1 -
142	Nov. 20	1-3 2-3	Yuma, Ariz.	Consolidating "	15 mins. -	- 3	2 -
144	Nov. 23	82C 5	Colton, Calif.	Switching "	- -	1 -	- 1
146	Nov. 27	82K 5	Colton, Calif.	Switching "	- -	1 -	- 1

SECTION 7b (CONTINUED)

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	STATION (d)	CHARACTER OF INTERFERENCE (e)	AMOUNT OF DELAY (f)	CARS SET OUT (g)	CARS PICKED UP (h)
148	Dec. 6	5	Yuma, Arizona.	Switching	-	-	2
		43		"	-	2	-
150	Dec. 13	5	Yuma, Arizona.	Switching	-	-	1
		43		"	-	1	-
154	Dec. 16	820	Colton, California	Switching	-	1	-
		5		"	-	-	1
158	Dec. 17	2-5	Yuma, Arizona, Los Angeles, Calif.	Switching	-	1	1
				"	-	1	-
160	Dec. 18	1-3	Yuma, Arizona	Switching	-	3	-
		2-3		"	-	-	2
162	Dec. 19	2-5	Los Angeles, Calif.	Switching	-	1	-
166	Dec. 22	2-43	Yuma, Arizona	Switching	-	1	1
		2-4	Yuma, Arizona	"	-	-	1
171	Dec. 29	5	Yuma, Arizona	Switching	-	-	1
		43		"	-	1	-
172	Dec. 30	2-5	Los Angeles, Calif.	Switching	-	1	-
173	Dec. 30	2-43	Los Angeles, Calif.	Switching	25 Mins.	-	8
		3-43	Los Angeles, Calif.	"	-	9	-
TOTALS 32 ITEMS		61 TRAINS			Aver. 26 Mins. 10 Trains 264 Mins.	75	67

SECTION 8

UNNECESSARY DELAY TO DEADHEAD EQUIPMENT AT STATIONS YUMA, ARIZONA TO EL PASO, TEXAS, CAUSED BY OBSERVANCE OF ARIZONA 14 CAR LIMIT, DUE TO BEING SET OUT AND LATER PICKED UP, OR TO FAILURE TO BE PICKED UP PER SCHEDULE

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	STATION (d)	CHARACTER OF INTERFERENCE (e)	AMOUNT OF DELAY (f)	DELAY TO EQUIPMENT (g)
2	Jan. 1	12	Yuma, Arizona	-	-	14 hours
5	Jan. 5.	2 4	Yuma, Arizona "	Delay to equipment	-	2 cars 10 hrs. 47 mins. each
12	Feb. 15	43 1	Tucson, Arizona "	- -	- -	9 hrs. 18 mins.
17	Feb. 22	2 6	Yuma, Arizona "	- -	- -	- 10 hrs. 24 mins.
33	Mar. 21	5 1	Tucson, Arizona "	- -	- -	9 hrs. 18 mins. -
40	Mar. 29	5 1	Tucson, Arizona "	- -	- -	9 hrs. 45 mins. -
41	Mar. 31	5 1	Tucson, Arizona "	- -	- -	9 hrs. 30 mins. -
43	Apr. 5	5 1	Tucson, Arizona "	- -	- -	- 9 hrs. 40 mins.
47	Apr. 12	5 1	Tucson, Arizona "	- -	- -	9 hrs. 38 mins. -
48	Apr. 11	5 1	Phoenix, Arizona "	- -	- -	8 hrs. 52 mins. -
54	Apr. 23	43 1	Tucson, Arizona "	- -	- -	- 8 hrs. 8 mins.
65	June 5	2 6	Yuma, Arizona "	- -	- -	2 cars 10 hrs. 43 mins. each
75	June 14	2 6	Yuma, Arizona "	- -	- -	1 car 10 hrs. 25 mins.
78	June 18	2 44	Yuma, Arizona "	- -	- -	1 car 10 hrs. & 25 mins.
81	June 25	43 1	Yuma, Arizona "	- -	- -	1 car 9 hrs. & 35 minutes.
82	June 26	3 43	Tucson, Arizona "	- -	- -	10 hrs. 5 mins. -
83	June 27	2 44	Yuma, Arizona "	- -	- -	9 hrs. 45 mins. -
85	July 3 July 4	4 2	Yuma, Arizona "	- -	- -	14 hours -
	July 3 July 4	6 2	Yuma, Arizona "	- -	- -	14 hours 5 mins. -
98	July 22	5 1	Phoenix, Ariz.	- -	- -	11 hrs. 12 mins. -

12	Feb. 15	43 1	Tucson, Arizona	- -	- -	9 hrs. 18 mins.
17	Feb. 22	2 6	Yuma, Arizona	- -	- -	- 10 hrs. 24 mins.
33	Mar. 21	5 1	Tucson, Arizona	- -	- -	9 hrs. 18 mins. -
40	Mar. 29	5 1	Tucson, Arizona	- -	- -	9 hrs. 45 mins. -
41	Mar. 31	5 1	Tucson, Arizona	- -	- -	9 hrs. 30 mins. -
43	Apr. 5	5 1	Tucson, Arizona	- -	- -	- 9 hrs. 40 mins.
47	Apr. 12	5 1	Tucson, Arizona	- -	- -	9 hrs. 38 mins. -
48	Apr. 11	5 1	Phoenix, Arizona	- -	- -	8 hrs. 52 mins. -
54	Apr. 23	43 1	Tucson, Arizona	- -	- -	- 8 hrs. 8 mins.
65	June 5	2 6	Yuma, Arizona	- -	- -	2 cars 10 hrs. 43 mins. each
75	June 14	2 6	Yuma, Arizona	- -	- -	1 car 10 hrs. 25 mins.
78	June 18	2 44	Yuma, Arizona	- -	- -	1 car 10 hrs. & 25 mins.
81	June 25	43 1	Yuma, Arizona	- -	- -	1 car 9 hrs. & 35 minutes.
82	June 26	3 43	Tucson, Arizona	- -	- -	10 hrs. 5 mins. -
83	June 27	2 44	Yuma, Arizona	- -	- -	9 hrs. 45 mins. -
85	July 3 July 4	4 2	Yuma, Arizona	- -	- -	14 hours -
	July 3 July 4	6 2	Yuma, Arizona	- -	- -	14 hours 5 mins. -
98	July 22	5 1	Phoenix, Ariz.	- -	- -	11 hrs. 12 mins. -
98	July 22	43 1	Tucson, Ariz.	-	-	11 hrs 55 mins. -
100	Aug. 1	2 6	Yuma, Ariz.	- -	- -	10 hrs. 24 mins. -
105	Aug. 5	5 1	Phoenix, Ariz.	- -	- -	9 hrs. 21 mins. -
113	Aug. 20	5 1	Tucson, Ariz.	- -	- -	2 cars 9 hrs. & 43 mins. each

5599

3130

SECTION 8 (Continued)

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	STATION (d)	CHARACTER OF INTERFERENCE (e)	AMOUNT OF DELAY (f)	DELAY TO EQUIPMENT (g)
117	Sept. 1	2	Yuma, Arizona	Delay to Equipment	-	9 hrs. 57 mins.
		6	"	"	-	-
119	Sept. 3	5	Phoenix, Arizona	"	-	9 hrs. 30 mins.
		1	"	"	-	-
120	Sept. 3	3	Phoenix, Arizona	"	-	9 hrs. 55 mins.
		5	"	"	-	-
123	Sept. 9	5	Phoenix, Arizona	"	-	9 hrs. 32 mins.
		1	"	"	-	-
128	Sept. 27	1	Tucson, Arizona	"	-	4 hrs. 35 mins.
		3	"	"	-	-
131	October 13	2	Yuma, Arizona	"	-	9 hrs. 45 mins.
		44	"	"	-	-
138	Nov. 6	2	Yuma, Arizona	"	-	2 cars 10 hrs.
		6	"	"	-	15 mins. each
142	Nov. 12	3	Tucson, Arizona	"	-	2 cars 9 hrs.
	Nov. 13	43	"	"	-	38 mins. each
144	Nov. 23	5	Phoenix, Arizona	"	-	9 hrs. 30 mins.
		1	"	"	-	-
145	Nov. 26	1	El Paso, Texas	"	-	3 hrs. 29 mins.
		3	"	"	-	-
	Nov. 26	3	Tucson, Arizona	"	-	-
	Nov. 27	43	"	"	-	11 hrs. 3 mins.
146	Nov. 27	5	Phoenix, Arizona	"	-	9 hrs. 7 mins.
		1	"	"	-	-
152	Dec. 14	44	Yuma, Arizona	"	-	14 hrs. 29 mins.
	Dec. 15	2	"	"	-	-
154	Dec. 16	5	Phoenix, Arizona	"	-	9 hrs. 15 mins.
		1	"	"	-	-
161	Dec. 18	2	Yuma, Arizona	"	-	11 hrs. 0 mins.
		2-6	"	"	-	-
163	Dec. 19	2	Yuma, Arizona	"	-	2 cars 10 hrs.
		2-6	"	"	-	41 mins. each
165	Dec. 20	44	Yuma, Arizona	"	-	39 minutes
		2-6	"	"	-	-
167	Dec. 21	2	Yuma, Arizona	"	-	13 hrs. 32 mins.
		1-6	"	"	-	-

123	Sept. 9	5 1	Phoenix, Arizona			9 hrs. 32 mins.
128	Sept. 27	1 3	Tucson, Arizona			4 hrs. 35 mins.
131	October 13	2 44	Yuma, Arizona			9 hrs. 45 mins.
138	Nov. 6	2 6	Yuma, Arizona			2 cars 10 hrs. 15 mins. each
142	Nov. 12 Nov. 13	3 43	Tucson, Arizona			2 cars 9 hrs. 38 mins. each
144	Nov. 23	5 1	Phoenix, Arizona			9 hrs. 30 mins.
145	Nov. 26	1 3	El Paso, Texas			3 hrs. 29 mins.
	Nov. 26 Nov. 27	3 43	Tucson, Arizona			11 hrs. 3 mins.
146	Nov. 27.	5 1	Phoenix, Arizona			9 hrs. 7 mins.
152	Dec. 14 Dec. 15	44 2	Yuma, Arizona			14 hrs. 29 mins.
154	Dec. 16	5 1	Phoenix, Arizona			9 hrs. 15 mins.
161	Dec. 18	2 2-6	Yuma, Arizona			11 hrs. 0 mins.
163	Dec. 19	2 2-6	Yuma, Arizona			2 cars 10 hrs. 41 mins. each
165	Dec. 20	44 2-6	Yuma, Arizona			39 minutes
167	Dec. 21	2 1-6	Yuma, Arizona			13 hrs. 32 mins.
		44 1-6	Yuma, Arizona			3 hrs. 15 mins.
		4 X-3643E	Yuma, Arizona			7 hrs. 45 mins.
170	Dec. 29	2 44	Yuma, Arizona			9 hrs. 52 mins.
TOTALS 41 ITEMS		89 TRAINS			51 CARS 499 HOURS 29 MINUTES Average 9 HOURS 48 MINUTES	

5000

SECTION 9

UNNECESSARY INTERFERENCE ACCOUNT ADVERSELY MOVING CARS VIA OTHER THAN THE ASSIGNED ROUTE, OR ASSIGNED TRAIN, TO AVOID EXCEEDING THE ARIZONA FOURTEEN CAR LIMIT.

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	ASSIGNED CARS ADVERSELY ROUTED, OR MOVED IN OTHER THAN ASSIGNED TRAINS (d)	FROM (e)	TO (f)
3	Jan. 1	44 6	San Diego-El Paso coach SP-2436 handled by train No. 6 instead of No. 44.	Yuma, Ariz.	Tucson, Ariz.
4	Jan. 2	43 5	El Paso-Los Angeles baggage car RI-4120 handled by train No. 5 via Gila instead of train No. 43 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
7	Jan. 18	6 4	Los Angeles-St. Louis standard No. 64 (via T&P, El Paso) handled in train No. 4 instead of train No. 6.	Los Angeles, Calif.	El Paso, Texas.
	Jan. 18	6 4	San Diego-New Orleans standard ALAEON handled in train No. 4 instead of train No. 6.	Yuma, Ariz.	El Paso, Texas.
9	Feb. 1	43 5	Mexico City-Los Angeles standard ATHOL SPRINGS returned in train No. 43 via Phoenix instead of train No. 5 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
10	Feb. 4	5 3	Standards car No. 29 and extra car L-1 handled in train No. 3 via Douglas and Phoenix instead of train 5 via Lordsburg and Gila	El Paso, Texas.	Los Angeles, Calif.
12	Feb. 15	43 5	El Paso-Los Angeles coach routed in train No. 43 via Lordsburg and Gila instead of train No. 5 via Douglas and Phoenix.	El Paso, Texas.	Los Angeles, Calif.
	Feb. 15	43 5	El Paso-Los Angeles coach routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
14	Feb. 17	43 5	El Paso-Los Angeles coach SP-2434 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Yuma, Arizona.
16	Feb. 20	43 5	El Paso-Los Angeles coach SP-2002 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
18	Feb. 22	43 5	El Paso-Los Angeles coach T&NO-886 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Yuma, Arizona.
19	Feb. 23	43 5	El Paso-Los Angeles coach SP-2002 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
20	Feb. 24	43 5	El Paso-Los Angeles coach T&NO-403 routed in train No. 43 via Gila instead of train No. 5.	Tucson, Ariz.	Yuma, Arizona.
22	Feb. 27	43 5	El Paso-Los Angeles coach SP-2700 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
26	March 9	4 6	Extra standard GLEN AUBREY destined Chicago via Tucumcari from train No. 4 via Tucumcari to train No. 6 via New Orleans.	Los Angeles, Calif.	El Paso, Texas.
27	March 10	43 5	Mexico City-Los Angeles standard BARRIUS routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
28	March 10	44 6	San Diego-El Paso coach T&NO-864 adversely routed from train No. 44 via Phoenix and Dougl . to train No. 6 via Gila and Lordsburg.	Yuma, Arizona.	El Paso, Texas.
30	March 13	43 5	El Paso-Los Angeles coach SP-2020 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
32	March 18	43	El Paso-Los Angeles coach T&NO-886 routed from train 5 via		

3	Jan. 1	44 6	San Diego-El Paso coach SP-2436 handled by train No. 6 instead of No. 44.	Yuma, Ariz.	Tucson, Ariz.
4	Jan. 2	43 5	El Paso-Los Angeles baggage car RL-4120 handled by train No. 5 via Gila instead of train No. 43 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
7	Jan. 18	6 4	Los Angeles-St. Louis standard No. 64 (via T&P, El Paso) handled in train No. 4 instead of train No. 6.	Los Angeles, Calif.	El Paso, Texas.
	Jan. 18	6 4	San Diego-New Orleans standard ALAZON handled in train No. 4 instead of train No. 6.	Yuma, Ariz.	El Paso, Texas.
9	Feb. 1	43 5	Mexico City-Los Angeles standard ATHOL SPRINGS returned in train No. 43 via Phoenix instead of train No. 5 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
10	Feb. 4	5 3	Standards car No. 29 and extra car L-1 handled in train No. 3 via Douglas and Phoenix instead of train 5 via Lordsburg and Gila	El Paso, Texas.	Los Angeles, Calif.
12	Feb. 15	43 5	El Paso-Los Angeles coach routed in train No. 43 via Lordsburg and Gila instead of train No. 5 via Douglas and Phoenix.	El Paso, Texas.	Los Angeles, Calif.
	Feb. 15	43 5	El Paso-Los Angeles coach routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
14	Feb. 17	43 5	El Paso-Los Angeles coach SP-2434 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Yuma, Arizona.
16	Feb. 20	43 5	El Paso-Los Angeles coach SP-2002 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
18	Feb. 22	43 5	El Paso-Los Angeles coach T&NO-886 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Yuma, Arizona.
19	Feb. 23	43 5	El Paso-Los Angeles coach SP-2002 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
20	Feb. 24	43 5	El Paso-Los Angeles coach T&NO-403 routed in train No. 43 via Gila instead of train No. 5.	Tucson, Ariz.	Yuma, Arizona.
22	Feb. 27	43 5	El Paso-Los Angeles coach SP-2700 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
26	March 9	4 6	Extra standard GLEN AUBREY destined Chicago via Tucumcari from train No. 4 via Tucumcari to train No. 6 via New Orleans.	Los Angeles, Calif.	El Paso, Texas.
27	March 10	43 5	Mexico City-Los Angeles standard BABRIUS routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
28	March 10	44 6	San Diego-El Paso coach T&NO-864 adversely routed from train No. 44 via Phoenix and Dougl[illegible] to train No. 6 via Gila and Lordsburg.	Yuma, Arizona.	El Paso, Texas.
30	March 13	43 5	El Paso-Los Angeles coach SP-2020 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
32	March 18	43 5	El Paso-Los Angeles coach T&NO-886 routed from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
34	March 22	43 5	El Paso-Los Angeles coach T&NO-813 routed from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
35	March 23	43 5	El Paso-Los Angeles coach T&NO-401 routed from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
37	March 24	43 5	El Paso-Los Angeles coach T&NO-402 routed from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
39	March 28	43 5	El Paso-Los Angeles coach T&NO-403 routed from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
40	March 29	43 5	El Paso-Los Angeles coach T&NO-401 routed from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.

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SECTION 9 (Continued)

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	ASSIGNED CARS ADVERSELY ROUTED, OR MOVED IN OTHER THAN ASSIGNED TRAINS (d)	FROM (e)	TO (f)
5'	May 17	44 6	Los Angeles-Tucson coach SP-2434 from train No. 44 via Phoenix to train No. 6 via Gila.	Los Angeles, Calif.	Tucson, Ariz.
63	June 2	43 5	Mexico City-Los Angeles standard BEROSUS from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
67	June 7	43 5	Mexico City-Los Angeles standard ZENO from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
68	June 9	43 5	Mexico City-Los Angeles standard ARISTOTLE and coaches SP-2431 and TANO-401 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
69	June 11	5 43	El Paso-Los Angeles coach TANO-404 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
72	June 12	5 43	Standard No. L-1 from train No. 5 via Douglas and Phoenix to train No. 43 via Lordsburg and Gila.	El Paso, Tex.	Los Angeles, Calif.
	June 12	5 43	Memphis-Los Angeles standard McDADE from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
	June 12	5 43	Mexico City-Los Angeles standard from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
77	June 16	5 43	Mexico City-Los Angeles standard HYPERPIDES and extra tourist 2096 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
81	June 25	5 43	Mexico City-Los Angeles standard HESIOD from El Paso and Mexico City-Los Angeles standard VANHENT from Tucson, routed from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
84	June 30	5 43	2 assigned standards ATHOL SPRINGS and BEROSUS, and one assigned tourist 4008 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
88	July 7	5 43	Mexico City-Los Angeles standard VAN HENT from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
90	July 12	5 43	Mexico City-Los Angeles standard ATHOL SPRINGS from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Yuma, Arizona.
91	July 12	44 6	Four cars adversely routed from train No. 44 to train No. 6.	Los Angeles, Calif.	Yuma, Arizona.
92	July 13	5 43	Extra tourist 2146 from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
94	July 16	5 43	Mexico City-Los Angeles standard BEROSUS from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
97	July 21	5 43	Mexico City-Los Angeles standard HYPERPIDES from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Yuma, Arizona.
103	Aug. 4	5 43	Mexico City-Los Angeles standard STRABO and extra tourist 4253 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Yuma, Arizona.
108	Aug. 13	5 43	Mexico City-Los Angeles standard ZENO from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
110	Aug. 14	5 43	Tourist car 2146 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
118	Sept. 2	5 43	Assigned tourist car 4147 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.

		5	Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
67	June 7	43 5	Mexico City-Los Angeles standard ZEMO from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
68	June 9	43 5	Mexico City-Los Angeles standard ARISTOTLE and coaches SP-2431 and TAMO-401 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
69	June 11	5 43	El Paso-Los Angeles coach TAMO-404 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
72	June 12	5 43	Standard No. L-1 from train No. 5 via Douglas and Phoenix to train No. 43 via Lordsburg and Gila.	El Paso, Tex.	Los Angeles, Calif.
	June 12	5 43	Memphis-Los Angeles standard McDADE from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
	June 12	5 43	Mexico City-Los Angeles standard from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
77	June 16	5 43	Mexico City-Los Angeles standard HYPERPIDES and extra tourist 2074 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
81	June 25	5 43	Mexico City-Los Angeles standard MEXICO from El Paso and Mexico City-Los Angeles standard VANHERT from Tucson, routed from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
84	June 30	5 43	2 assigned standards ATHOL SPRINGS and BEROSUS, and one assigned tourist 4008 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
88	July 7	5 43	Mexico City-Los Angeles standard VAN HERT from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
90	July 12	5 43	Mexico City-Los Angeles standard ATHOL SPRINGS from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Yuma, Arizona.
91	July 12	44 6	Four cars adversely routed from train No. 44 to train No. 6.	Los Angeles, Calif.	Yuma, Arizona.
92	July 13	5 43	Extra tourist 2146 from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
96	July 16	5 43	Mexico City-Los Angeles standard BEROSUS from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
97	July 21	5 43	Mexico City-Los Angeles standard HYPERPIDES from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Yuma, Arizona.
103	Aug. 4	5 43	Mexico City-Los Angeles standard STRABO and extra tourist 4253 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Yuma, Arizona.
108	Aug. 13	5 43	Mexico City-Los Angeles standard ZEMO from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
110	Aug. 14	5 43	Tourist car 2146 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
118	Sept. 2	5 43	Assigned tourist car 4147 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
124	Sept. 10	43 1	Tourist 2023 from train 43 via Lordsburg to train 1 via Lordsburg and Phoenix.	El Paso, Tex.	Los Angeles, Calif.

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SECTION 9 (Continued)

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	ASSIGNED CARS ADVERSELY ROUTED, OR MOVED IN OTHER THAN ASSIGNED TRAINS (d)	FROM (e)	TO (f)
125	Sept. 16	TR-828 2-43	Lounge car RI-3502 from TR-828 to 2nd 43.	El Paso, Texas.	Yuma, Arizona.
127	Sept. 20	5 43	Mexico City-Los Angeles standard CRATONIS from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.
134	Oct. 22	5 43	Mexico City-Los Angeles standard ATHOL SPRINGS from train No. 5 via Phoenix to No. 43 via Gila.	Tucson, Arizona.	Yuma, Arizona.
137	Nov. 3	5 43	Mexico City-Los Angeles standard ZERO from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Yuma, Arizona.
146	Nov. 27	5 43	Coach TARD-400 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.
147	Dec. 1	5 43	Coach TARD-402 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.
148	Dec. 6	5 43	Mexico City-Los Angeles standard ATHOL SPRINGS from Nogales from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Yuma, Arizona.
150	Dec. 13	5 43	Mexico City-Los Angeles standard ZERO from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Yuma, Arizona.
153	Dec. 15	5 43	Mexico City-Los Angeles standard HYPERPIRES from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.
171	Dec. 29	5 43	Mexico City-Los Angeles standard IDYCUS from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Yuma, Arizona.

56 INSTANCES 112 TRAINS INVOLVED

SECTION 9

UNNECESSARY INTERFERENCE ACCOUNT ADVERSELY MOVING CARS VIA OTHER THAN THE ASSIGNED ROUTE, OR ASSIGNED TRAIN, TO AVOID EXCEEDING THE ARIZONA FOURTEEN CAR LIMIT.

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	ASSIGNED CARS ADVERSELY ROUTED, OR MOVED IN OTHER THAN ASSIGNED TRAINS (d)	FROM (e)	TO (f)
3	Jan. 1	44 6	San Diego-El Paso coach SP-2636 handled by train No. 6 instead of No. 44.	Yuma, Ariz.	Tucson, Ariz.
4	Jan. 2	43 5	El Paso-Los Angeles baggage car RI-4120 handled by train No. 5 via Gila instead of train No. 43 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
7	Jan. 18	6 4	Los Angeles-St. Louis standard No. 64 (via T&P, El Paso) handled in train No. 4 instead of train No. 6.	Los Angeles, Calif.	El Paso, Texas.
	Jan. 18	6 4	San Diego-New Orleans standard ALASON handled in train No. 4 instead of train No. 6.	Yuma, Ariz.	El Paso, Texas.
9	Feb. 1	43 5	Mexico City-Los Angeles standard ATHOL SPRINGS returned in train No. 43 via Phoenix instead of train No. 5 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
10	Feb. 4	5 3	Standards car No. 29 and extra car L-1 handled in train No. 3 via Douglas and Phoenix instead of train 5 via Lordsburg and Gila	El Paso, Texas.	Los Angeles, Calif.
12	Feb. 15	43 5	El Paso-Los Angeles coach routed in train No. 43 via Lordsburg and Gila instead of train No. 5 via Douglas and Phoenix.	El Paso, Texas.	Los Angeles, Calif.
	Feb. 15	43 5	El Paso-Los Angeles coach routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
14	Feb. 17	43 5	El Paso-Los Angeles coach SP-2634 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Yuma, Arizona.
16	Feb. 20	43 5	El Paso-Los Angeles coach SP-2002 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
18	Feb. 22	43 5	El Paso-Los Angeles coach T&NO-886 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Yuma, Arizona.
19	Feb. 23	43 5	El Paso-Los Angeles coach SP-2002 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
20	Feb. 26	43 5	El Paso-Los Angeles coach T&NO-603 routed in train No. 43 via Gila instead of train No. 5.	Tucson, Ariz.	Yuma, Arizona.
22	Feb. 27	43 5	El Paso-Los Angeles coach SP-2700 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
26	March 9	4 6	Extra standard GLEN AUBREY destined Chicago via Tucumcari from train No. 4 via Tucumcari to train No. 6 via New Orleans.	Los Angeles, Calif.	El Paso, Texas.
27	March 10	43 5	Mexico City-Los Angeles standard BABRIUS routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
28	March 10	44 6	San Diego-El Paso coach T&NO-864 adversely routed from train No. 44 via Phoenix and Douglas to train No. 6 via Gila and Lordsburg.	Yuma, Arizona.	El Paso, Texas.
30	March 13	43 5	El Paso-Los Angeles coach SP-2020 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
32	March 18	43 5	El Paso-Los Angeles coach T&NO-886 routed from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
34	March 22	43	El Paso		

3	Jan. 1	44 6	San Diego-El Paso coach SP-2436 handled by train No. 6 instead of No. 44.	Yuma, Ariz.	Tucson, Ariz.
4	Jan. 2	43 5	El Paso-Los Angeles baggage car RL-4120 handled by train No. 5 via Gila instead of train No. 43 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
7	Jan. 18	6 4	Los Angeles-St. Louis standard No. 64 (via T&P, El Paso) handled in train No. 4 instead of train No. 6.	Los Angeles, Calif.	El Paso, Texas.
	Jan. 18	6 4	San Diego-New Orleans standard ALAMO handled in train No. 4 instead of train No. 6.	Yuma, Ariz.	El Paso, Texas.
9	Feb. 1	43 5	Mexico City-Los Angeles standard ATHOL SPRINGS returned in train No. 43 via Phoenix instead of train No. 5 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
10	Feb. 4	5 3	Standards car No. 29 and extra car L-1 handled in train No. 3 via Douglas and Phoenix instead of train 5 via Lordsburg and Gila	El Paso, Texas.	Los Angeles, Calif.
12	Feb. 15	43 5	El Paso-Los Angeles coach routed in train No. 43 via Lordsburg and Gila instead of train No. 5 via Douglas and Phoenix.	El Paso, Texas.	Los Angeles, Calif.
	Feb. 15	43 5	El Paso-Los Angeles coach routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
14	Feb. 17	43 5	El Paso-Los Angeles coach SP-2434 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Yuma, Arizona.
16	Feb. 20	43 5	El Paso-Los Angeles coach SP-2002 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
18	Feb. 22	43 5	El Paso-Los Angeles coach T&NO-886 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Yuma, Arizona.
19	Feb. 23	43 5	El Paso-Los Angeles coach SP-2002 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
20	Feb. 26	43 5	El Paso-Los Angeles coach T&NO-403 routed in train No. 43 via Gila instead of train No. 5.	Tucson, Ariz.	Yuma, Arizona.
22	Feb. 27	43 5	El Paso-Los Angeles coach SP-2700 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
26	March 9	4 6	Extra standard GLEN AUBREY destined Chicago via Tucumcari from train No. 4 via Tucumcari to train No. 6 via New Orleans.	Los Angeles, Calif.	El Paso, Texas.
27	March 10	43 5	Mexico City-Los Angeles standard BARRIUS routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.
28	March 10	44 6	San Diego-El Paso coach T&NO-864 adversely routed from train No. 44 via Phoenix and Douglas to train No. 6 via Gila and Lordsburg.	Yuma, Arizona.	El Paso, Texas.
30	March 13	43 5	El Paso-Los Angeles coach SP-2020 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
32	March 18	43 5	El Paso-Los Angeles coach T&NO-886 routed from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
34	March 22	43 5	El Paso-Los Angeles coach T&NO-813 routed from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
35	March 23	43 5	El Paso-Los Angeles coach T&NO-401 routed from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
37	March 24	43 5	El Paso-Los Angeles coach T&NO-402 routed from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
39	March 28	43 5	El Paso-Los Angeles coach T&NO-403 routed from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.
40	March 29	43 5	El Paso-Los Angeles coach T&NO-401 routed from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.

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SECTION 10 (Continued)

ITEM NUMBER (a)	TRAIN NUMBER (b)	DATE (c)	CHARACTER OF INTERFERENCE (d)	AMOUNT OF DELAY (e)
135	44	Oct. 29	Los Angeles-Tucson Coach #P-1958 cancelled Phoenix to Tucson.	-
136	5	Nov. 1	Phoenix-San Diego coach cancelled, Phoenix to Yuma.	-
144	5	Nov. 23	Diner T&SO 927 Cancelled Phoenix to Los Angeles.	-
146	5	Nov. 27	Diner T&SO 915 Cancelled Phoenix to Los Angeles.	-
148	5	Dec. 6	Mexico City-Los Angeles, Standard "Sinaloa" from El Paso cancelled Tucson to Los Angeles.	-
149	2	Dec. 9	Phoenix-Tucson baggage car RI-4139 cancelled.	-
152	44	Dec. 14	San Diego-Phoenix coach cancelled, Yuma to Phoenix.	-
154	5	Dec. 16	Diner T&SO 926 cancelled Phoenix to Los Angeles.	-
155	44	Dec. 16	San Diego-Phoenix coach cancelled, Yuma to Phoenix.	-
	44	Dec. 16	Tucson-Kansas City baggage-express car SF-4052 cancelled, Tucson to El Paso	-
44 ITEMS	48 TRAINS		CARS CANCELLED 47	6 TRAINS 45 MINUTES AVERAGE 7-1/2 MINS.

3136

5605

SECTION 11.

HELPER ENGINE SERVICE INCURRED ON THE LOS ANGELES DIVISION BY REASON OF WESTWARD PASSENGER TRAINS ARRIVING AT YUMA, ARIZONA, WITH CARS BELONGING TO OTHER TRAINS, THEREBY REQUIRING ADDITIONAL HELPER SERVICE ON THE LOS ANGELES DIVISION

Item Number (a)	Date (b)	Train Number (c)	Character of Interference (d)	Number of Loco. Miles Incurred (e)
22	Feb. 27	43	Helper, Garnet to Beaumont	50
32	Mar. 18	43	Helper, Garnet to Beaumont	50
37	Mar. 24	43	Helper, Garnet to Beaumont	50
45	Apr. 7	43	Helper, Garnet to Beaumont	50
52	Apr. 16	43	Helper, Garnet to Beaumont	50
68	June 9	43	Helper, Indio to Beaumont	50
69	June 11	43	Helper, Garnet to Beaumont	50
72	June 12	43	Helper, Indio to Beaumont	96
77	June 16	43	Helper, Indio to Beaumont	50
81	June 25	1	Helper, Garnet to Beaumont	50
84	June 30	43	Helper, Indio to Beaumont	96
92	July 13	43	Helper, Garnet to Beaumont	50
98	July 22	43	Helper, Garnet to Beaumont	50
105	Aug. 5	43	Helper, Garnet to Beaumont	50
-	Aug. 5	1	Helper, Garnet to Beaumont	50
106	Aug. 6	43	Helper, Garnet to Beaumont	50
108	Aug. 13	43	Helper, Garnet to Beaumont	50
112	Aug. 18	43	Helper, Garnet to Beaumont	50
118	Sept. 2	43	Helper, Garnet to Beaumont	50
141	Nov. 13	43	Helper, Garnet to Beaumont	50
147	Dec. 1	43	Helper, Garnet to Beaumont	50
TOTALS 20 ITEMS		21 TRAINS		1142 LOCO. MILES

SECTION 12

UNNECESSARY DELAY TO OCCUPIED OR LOADED CARS AT STATIONS YUMA, ARIZONA TO EL PASO, TEXAS CAUSED BY OBSERVANCE OF ARIZONA 14 CAR LIMIT, DUE TO MIXING SET OUT AND LATER PICKED UP, OR TO FAILURE TO BE PICKED UP PER SCHEDULE

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	STATION (d)	INTERFERENCE (e)	DELAY TO CARS (f)
7	Jan. 18	6 4	El Paso, Texas	Delay to 2 assigned cars	2 cars 30 mins. each
9	Feb. 1	43 5	Tucson, Ariz.	Delay to assigned car	1 car 1 hr. 45 mins.
		43 1	Tucson, Ariz.	Delay to loaded baggage car SP-6238	1 car 8 hrs. 13 mins.
11	Feb. 14	1-1 2-1	Yuma, Arizona	Consolidating 16 cars	46 cars 30 mins. each
15	Feb. 18	1-43 2-43	Yuma, Arizona	Consolidating 16 cars	16 cars 23 mins. each
30	March 13	5 43	Tucson, Ariz.	Delay to assigned coach SP-2020	1 car 3 hrs. 15 mins.
31	March 15	1 43	Tucson, Ariz.	Delay to PFE-604, vegetables, Los Angeles.	1 car 8 hrs. 15 mins.
46	April 9	1-5 2-5	Yuma, Arizona	Delay to 15 assigned cars	15 cars 1 hr. 46 mins each
60	May 23	44	El Paso, Tex.	Delay to 11 assigned cars	11 cars 52 mins. each
63	June 2	5 43	Tucson, Ariz.	Delay to assigned Mexico City-Los Angeles standard BAROSUS	1 car 1 hr. 1 min.
70	June 11	2 X243ZE	Lordsburg, N.M.	Delay to 15 cars	15 cars 15 mins. each
78	June 18	2 44	Yuma, Arizona	Delay to PFE-654, express	1 car 10 hrs. 25 mins.
80	June 21	3 X430OW	Yuma, Arizona	Delay to 16 cars	16 cars 17 mins. each
101	Aug. 2	1-1 2-1	Yuma, Arizona	Delay to 17 cars	17 cars 20 mins. each
115	Aug. 27	1-1 2-1	Yuma, Arizona	Delay to 15 cars	15 cars 12 mins. each
124	Sept. 10	43 1	El Paso, Texas	Extra tourist No. 2023 delayed	1 car 2 hrs. 53 mins.
142	Nov. 20	1-3 2-3	Yuma, Arizona	Delay to 14 cars	14 cars 15 mins. each
151	Dec. 13	1-6 2-6	Yuma, Arizona	Delay to 5 cars	5 cars 11 mins. each
		4 2-6	Yuma, Arizona	Delay to SP-6022	1 car 22 mins.

NO. (a)	DATE (b)	NUMBER (c)	STATION (d)	INTERFERENCE (e)	DELAY TO CARS (f)
7	Jan. 18	6 4	El Paso, Texas	Delay to 2 assigned cars	2 cars 30 mins. each
9	Feb. 1	43 5	Tucson, Ariz.	Delay to assigned car	1 car 1 hr. 45 mins.
		43 1	Tucson, Ariz.	Delay to loaded baggage car SP-6238	1 car 8 hrs. 13 mins.
11	Feb. 14	1-1 2-1	Yuma, Arizona	Consolidating 16 cars	16 cars 30 mins. each
15	Feb. 18	1-43 2-43	Yuma, Arizona	Consolidating 16 cars	16 cars 23 mins. each
30	March 13	5 43	Tucson, Ariz.	Delay to assigned coach SP-2020	1 car 3 hrs. 15 mins.
31	March 15	1 43	Tucson, Ariz.	Delay to PFE-604, vegetables, Los Angeles.	1 car 8 hrs. 15 mins.
46	April 9	1-5 2-5	Yuma, Arizona	Delay to 15 assigned cars	15 cars 1 hr. 46 mins each
60	May 23	44	El Paso, Tex.	Delay to 11 assigned cars	11 cars 52 mins. each
63	June 2	5 43	Tucson, Ariz.	Delay to assigned Mexico City-Los Angeles standard BAROSUS	1 car 1 hr. 1 min.
70	June 11	2 X2432E	Lordsburg, N.M.	Delay to 15 cars	15 cars 15 mins. each
78	June 18	2 44	Yuma, Arizona	Delay to PFE-654, express	1 car 10 hrs. 25 mins.
80	June 21	3 X4300W	Yuma, Arizona	Delay to 16 cars	16 cars 17 mins. each
101	Aug. 2	1-1 2-1	Yuma, Arizona	Delay to 17 cars	17 cars 20 mins. each
115	Aug. 27	1-1 2-1	Yuma, Arizona	Delay to 15 cars	15 cars 12 mins. each
124	Sept. 10	43 1	El Paso, Texas	Extra tourist No. 2023 delayed	1 car 2 hrs. 53 mins.
142	Nov. 20	1-3 2-3	Yuma, Arizona	Delay to 14 cars	14 cars 15 mins. each
151	Dec. 13	1-6 2-6	Yuma, Arizona	Delay to 5 cars	5 cars 11 mins. each
		4 2-6	Yuma, Arizona	Delay to SP-6022	1 car 22 mins.
156	Dec. 17	44 2-6	Yuma, Arizona	Delay to PFE-684, 701	2 cars 45 mins. each
158	Dec. 17	1-5 2-5	Tucson, Arizona	Delay to SP-6318, 5136 5127	3 cars 21 mins. each

SECTION 12 (Continued)

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	STATION (d)	INTERFERENCE (e)	DELAY TO CARS (f)
160	Dec. 18	1 2-3	Phoenix, Ariz.	Delay to NI-4089	1 car 4 hours. 33 Mins.
161	Dec. 18	1-4 2-4	Yuma, Arizona	Delay to 3 cars	3 cars 13 mins. each
162	Dec. 19	1-5 2-5	Tucson, Arizona	Delay to 3 cars	3 cars 2 hrs. 45 mins. each
163	Dec. 19	44 2-4	Yuma, Arizona	Delay to REM-354 and 291	2 cars 47 mins. each
		1-4 2-4	Yuma, Arizona	Delay to 4 cars	4 cars 11 mins. each
164	Dec. 20	1-5 2-5	Tucson, Arizona	Delay to 4 cars	4 cars 10 mins. each
165	Dec. 20	44 2-4	Yuma, Arizona	Delay to WPB-134	1 car 39 mins.
		1-4 2-4	Yuma, Arizona	Delay to 4 cars	4 cars 7 mins. each
167	Dec. 21	44 1-4	Yuma, Arizona	Delay to REM-403 and NI-4106	2 cars 3 hrs. 15 mins. each
168	Dec. 22	4 44	Yuma, Arizona	Delay to SP-6208	1 car 8 hours 36 mins.
169	Dec. 24	1-5 43	Tucson, Arizona	Delay to TNO-114	1 car 1 hour 40 mins.
		1-5 2-5	Tucson, Arizona	Delay to PPB-721	1 car 1 hour 05 mins.
		2-5 1	Phoenix, Arizona	Delay to PPB-721	1 car 12 hours 08 mins.
173	Dec. 30	2-43 3-43	Yuma, Arizona	Delay to 17 cars	17 cars 25 minutes each
TOTALS 31 ITEMS		69 TRAINS			200 CARS 165 HRS. 50 MINS. (Average 50 minutes)

SECTION 13-A

ADVERSE ROUTING TO AVOID EXCEEDING THE 14 CAR LIMIT
RESULTING IN EXCESS CAR MILES

ITEM NO. (a)	DATE (b)	TRAIN NO. (c)	CHARACTER OF INTERFERENCE (d)	FROM (e)	TO (f)	INTRASTATE EXCESS CAR MILES (g)	INTERSTATE EXCESS CAR MILES (h)
6	Jan. 17	6 4	REL 1305 from train No. 6 via Gila, and Lordsburg to train No. 4 via Phoenix and Douglas.	Yuma, Ariz.	El Paso, Texas	73	-
7	Jan. 18	6 4	Standard No. 64 and Standard ALAZON from train No. 6 via Gila & Lordsburg to Train No. 4, via Phoenix and Douglas.	Los Angeles, Cal. Yuma, Ariz.	El Paso, Texas El Paso, Texas	73 73	- -
8	Jan. 28	2-5	SP-2338 coach used as buffer SP-2338 deadhead Yuma-Los Angeles	El Paso, Texas	Yuma, Arizona	391	171 251
9	Feb. 1	43 5	Mexico City-Los Angeles Standard ATHOL SPRINGS, Train 43 via Phoenix instead train No. 5 via Gila.	Tucson, Ariz.	Los Angeles, Cal.	43	-
10	Feb. 4	5 3	Standard car No. 29 and Ex. car 1-1 from train No. 5 via Lordsburg and Gila to train No. 3 via Douglas and Phoenix.	El Paso, Tex.	Los Angeles, Cal.	146	-
12	Feb. 12	43 1	Deadhead Standard EUREKA from train No. 43, via Gila to train No. 1 via Phoenix.	-	-	43	-
13	Feb. 16	3 X2103E	Coach used as buffer for X2103 Douglas-Rodeo and return.	Douglas, Ariz. Rodeo, N.M.	Rodeo, N.M. Douglas, Ariz.	50 50	2 2
15	Feb. 18	1-43 2-43	Coach SP-2029, El Paso to Bowie and return to Lordsburg. This car used as buffer 1-43, Lordsburg to Tucson.	El Paso, Tex. Bowie, Ariz.	Bowie, Ariz. Lordsburg, N.M.	27 27	171 23
21	Feb. 25	1-43 2-43	Coach SP-1401 used as buffer, 2-43	Lordsburg, N.M.	Tucson, Ariz.	140	23
23	Feb. 28	3 X2103	Coach SP-1238 used as buffer.	Douglas, Ariz. Rodeo, N.M.	Rodeo, N.M. Douglas, Ariz.	50 50	2 2
29	Mar. 11	2 44	Los Angeles-Chicago Coach SP-2020 adversely routed in train No. 44 via Douglas instead train No. 2 via Lordsburg.	Tucson, Ariz.	El Paso, Tex.	30	-
31	Mar. 15	43 5	El Paso-Los Angeles mail car SP-5120 adversely from No. 43 via Gila, to train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Cal.	43	-
		43 1	PFE-604 in train No. 1 via Phoenix instead of train No. 43 via Gila.			43	-
38	Mar. 26	2 (CCC (Spl	Tourist car routed from CCC SPECIAL via Gila to train No. 2, via Phoenix.	Los Angeles, Cal.	Lordsburg, N.M.	43	-
46	Apr. 9	2-5	Coach SP-2697 used as buffer	-	-	173	-
54	Apr. 23	43 1	Deadhead Baggage car SP-6206 from train No. 43 via Gila to train No. 1 via Phoenix.	Tucson, Ariz.	Los Angeles, Cal.	43	-
64	June 4	5 43	1 coach from train No. 5 via Douglas to train No. 43 via Lordsburg.	El Paso, Tex.	Tucson, Ariz.	30	-
78	June 18	2 4	PFE-654 from train No. 2 via Lordsburg to train No. 44 via Douglas.	Yuma, Ariz.	El Paso, Tex.	30	-
79	June 19	5 43	Extra coach Tucson-Yuma in train No. 43 via Gila instead of Ex. coach Phoenix-Yuma in train No. 5.	-	-	77	-
80	June 21	3 X-4300	SP-6441 used as buffer	Tucson, Ariz.	Yuma, Ariz.	251	-
81	June 25	43 1	Deadhead standard GLEN SPRING from train No. 43, via Gila to train No. 1 via Phoenix.				

7	Jan. 18	6 4	Standard No. 64 and Standard ALAZON from train No. 6 via Gila & Lordsburg to Train No. 4, via Phoenix and Douglas:	Los Angeles, Cal. Yuma, Ariz.	El Paso, Texas El Paso, Texas	73 73	- -
8	Jan. 28	2-5	SP-2338 coach used as buffer SP-2338 deadhead Yuma-Los Angeles	El Paso, Texas	Yuma, Arizona	391 -	171 251
9	Feb. 1	43 5	Mexico City-Los Angeles Standard ATHOL SPRINGS, Train 43 via Phoenix instead train No. 5 via Gila.	Tucson, Ariz.	Los Angeles, Cal.	43	-
10	Feb. 4	5 3	Standard car No. 29 and Ex. car L-1 from train No. 5 via Lordsburg and Gila to train No. 3 via Douglas and Phoenix.	El Paso, Tex.	Los Angeles, Cal.	146	-
12	Feb. 12	43 1	Deadhead Standard EUREKA from train No. 43, via Gila to train No. 1 via Phoenix.	-	-	43	-
13	Feb. 16	3 X2103E	Coach used as buffer for X2103 Douglas-Rodeo and return.	Douglas, Ariz. Rodeo, N.M.	Rodeo, N.M. Douglas, Ariz.	50 50	2 2
15	Feb. 18	1-43 2-43	Coach SP-2029, El Paso to Bowie and return to Lordsburg. This car used as buffer 1-43, Lordsburg to Tucson.	El Paso, Tex. Bowie, Ariz.	Bowie, Ariz. Lordsburg, N.M.	27 27	171 23
21	Feb. 25	1-43 2-43	Coach SP-1401 used as buffer, 2-43	Lordsburg, N.M.	Tucson, Ariz.	140	23
23	Feb. 28	3 X2103	Coach SP-1238 used as buffer.	Douglas, Ariz. Rodeo, N.M.	Rodeo, N.M. Douglas, Ariz.	50 50	2 2
29	Mar. 11	2 44	Los Angeles-Chicago Coach SP-2020 adversely routed in train No. 44 via Douglas instead train No. 2 via Lordsburg.	Tucson, Ariz.	El Paso, Tex.	30	-
31	Mar. 15	43 5 43 1	El Paso-Los Angeles mail car SP-5120 adversely from No. 43 via Gila, to train No. 5 via Phoenix, PFE-604 in train No. 1 via Phoenix instead of train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Cal.	43 43	- -
38	Mar. 26	2 (CCC (Spl	Tourist car routed from CCC SPECIAL via Gila to train No. 2, via Phoenix.	Los Angeles, Cal.	Lordsburg, N.M.	43	-
46	Apr. 9	2-5	Coach SP-2697 used as buffer	-	-	173	-
54	Apr. 23	43 1	Deadhead Baggage car SP-6206 from train No. 43 via Gila to train No. 1 via Phoenix.	Tucson, Ariz.	Los Angeles, Cal.	43	-
64	June 4	5 43	1 coach from train No. 5 via Douglas to train No. 43 via Lordsburg.	El Paso, Tex.	Tucson, Ariz.	30	-
78	June 18	2 4	PFE-654 from train No. 2 via Lordsburg to train No. 44 via Douglas.	Yuma, Ariz.	El Paso, Tex.	30	-
79	June 19	5 43	Extra coach Tucson-Yuma in train No. 43 via Gila instead of Ex. coach Phoenix-Yuma in train No. 5.	-	-	77	-
80	June 21	3 X-4300	SP-6441 used as buffer	Tucson, Ariz.	Yuma, Ariz.	251	-
81	June 23	43 1	Deadhead standard GLEN ERIEL from train No. 43, via Gila to train No. 1 via Phoenix.	Tucson, Ariz.	Los Angeles, Cal.	43	-
85	July 3	6 2	1 deadhead Standard CHERBOURG from train No. 6 via Gila to train No. 2 via Phoenix.	Yuma, Arizona.	El Paso, Tex.	43	-
93	July 15	5 43	Ex. Coach TANO-869, Tucson-Yuma in train No. 43 via Gila instead of Ex. coach Phoenix-Yuma in train No. 5.	-	-	77	-
94	July 16	5 43	Same as 93, Car SP-2049	-	-	77	-
98	July 27	820 5	Deadhead Diner SP-10152, train No. 820, to fill assigned car in train No. 5.	Los Angeles, Cal. Indio, Calif.	Indio, Calif. Los Angeles, Cal.	- -	129 129

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SECTION 13-A (Continued)

TRAIN NO. (a)	DATE (b)	TRAIN NO. (c)	CHARACTER OF INTERFERENCE (d)	FROM (e)	TO (f)	INTERMEDIATE RECORD CAR MILES (g)	INTERMEDIATE RECORD CAR MILES (h)
	July 22	43 1	Deadhead Standard DINING from train No. 43 via Gila to train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Cal.	43	-
103	Aug. 4	5 43	Same as 93, Car SP-2045.	Tucson, Ariz.	Yuma, Ariz.	77	-
105	Aug. 5	5 43	Same as 93, Car SP-2333.	-	-	77	-
	Aug. 5	820 5	Deadhead Diner SP-10138, Train 820, to fill assigned car in train No. 5.	Los Angeles, Cal. Colton, Calif.	Colton, Calif. Los Angeles, Cal.	- -	57 57
106	Aug. 6	5 43	Same as 93, Car SP-2049.	-	-	77	-
108	Aug. 13	5 43	Rr. Coach SP-2170 Tus-L.A. in No. 43 via Gila instead of ex. coach Phoenix-Los Angeles in train No. 5 via Phoenix.	-	-	77	-
111	Aug. 16	2-1 2-1	Coach SP-1369 used as buffer. Replace Lordsburg protection coach.	Lordsburg, N.M. Tucson, Ariz.	Los Angeles, Cal. Lordsburg, N.M.	434 141	274 23
112	Aug. 18	5 43	Same as 108, Car SP-1958.	-	-	77	-
118	Sept. 2	5 43	Same as 108, Car SP-1968.	-	-	77	-
119	Sept. 3	820 5	Deadhead Diner SP-10127, Train 820, to fill assd. car in train No. 5.	Los Angeles, Cal. Colton, Calif.	Colton, Calif. Los Angeles, Cal.	- -	57 57
121	Sept. 6	2-6	Coach SP-1240 used as buffer and returned to Tucson.	Tucson, Ariz. Lordsburg, N.M.	Lordsburg, N.M. Tucson, Ariz.	121 120	23 23
122	Sept. 7	6 4	PFE 350 express from train No. 6, via Gila and Lordsburg to train No. 4, via Phoenix and Douglas.	Yuma, Ariz.	El Paso, Tex.	73	-
123	Sept. 9	820 5	Deadhead diner 10038, Train 820 to fill assd. car in train No. 5.	Los Angeles, Calif. Colton, Calif.	Colton, Calif. Los Angeles, Calif.	- -	57 57
124	Sept. 10	43 1	Tourist car 2023 from train No. 43, Lordsburg to Gila, to train No. 1, via Lordsburg and Phoenix.	El Paso, Tex.	Los Angeles, Calif.	43	-
126	Sept. 16	1 2-43	SP-1240 used as buffer.	El Paso, Tex. Lordsburg, N.M.	Lordsburg, N.M. Tucson, Ariz.	- 140	148 23
139	Nov. 9	1-2	Coach 2712 used as buffer.	Yuma, Ariz.	El Paso, Tex.	435	170
142	Nov. 20	1-3	Coach SP 2517 used as buffer.	Tucson, Ariz.	Yuma, Ariz.	294	-
144	Nov. 23	820 5	Deadhead diner 10152, train No. 820 to fill assigned car in train No. 5.	Los Angeles, Calif. Colton, Calif.	Colton, Calif. Los Angeles, Calif.	- -	57 57
145	Nov. 26	1 3	SP-6457, Deadhead baggage car from train No. 1, via Lordsburg to train No. 3 via Douglas.	El Paso, Tex.	Tucson, Ariz.	30	-
146	Nov. 27	820 5	Deadhead Diner 10157, Train 820, to fill assigned car in train No. 5.	Los Angeles, Cal. Colton, Calif.	Colton, Calif. Los Angeles, Cal.	- -	57 57
154	Dec. 16	820 5	Deadhead Diner 10038, train No. 820 to fill assigned car in train No. 5.	Los Angeles, Cal. Colton, Calif.	Colton, Calif. Los Angeles, Calif.	- -	57 57
158	Dec. 17	43 2-5	REX 291 from train No. 43 via Gila to 2-5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.	43	-
158	Dec. 17	2-5	SP-2334 used as buffer. SP-1202 used as buffer	Tucson, Ariz. Yuma, Ariz.	Yuma, Ariz. Los Angeles, Calif.	294 -	- 251
159	Dec. 18	2-1	SP-1511 used as buffer.	El Paso, Tex.	Phoenix, Ariz.	261	171
160	Dec. 18	2-3	SP-1511 used as buffer.	Phoenix, Ariz.	Yuma, Ariz.	173	-
162	Dec. 19	2-5	SP-1146 used as buffer.	Tucson, Ariz.	Los Angeles, Calif.	294	251

105	Aug. 5	5 43	Same as 73, Car SP-2333.	-	-	77	-
	Aug. 5	820 5	Deadhead Diner SP-10136, Train 820, to fill assigned car in train No. 5.	Los Angeles, Cal. Colton, Calif.	Colton, Calif. Los Angeles, Cal.	- -	57 57
106	Aug. 6	5 43	Same as 73, Car SP-2049.	-	-	77	-
109	Aug. 13	5 43	Rr. Coach SP-2170 Tus-L.A. in No. 43 via Gila instead of ex. coach Phoenix-Los Angeles in train No. 5 via Phoenix.	-	-	77	-
111	Aug. 16	2-1 2-1	Coach SP-1369 used as buffer. Replace Lordsburg protection coach.	Lordsburg, N.M. Tucson, Ariz.	Los Angeles, Cal. Lordsburg, N.M.	434 161	274 23
112	Aug. 18	5 43	Same as 108, Car SP-1958.	-	-	77	-
118	Sept. 2	5 43	Same as 108, Car SP-1968.	-	-	77	-
119	Sept. 3	820 5	Deadhead Diner SP-10127, Train 820, to fill need. car in train No. 5.	Los Angeles, Cal. Colton, Calif.	Colton, Calif. Los Angeles, Cal.	- -	57 57
121	Sept. 6	2-6	Coach SP-1240 used as buffer and returned to Tucson.	Tucson, Ariz. Lordsburg, N.M.	Lordsburg, N.M. Tucson, Ariz.	121 120	23 23
122	Sept. 7	6 4	PFE 550 express from train No. 6, via Gila and Lordsburg to train No. 4, via Phoenix and Douglas.	Yuma, Ariz.	El Paso, Tex.	73	-
123	Sept. 9	820 5	Deadhead diner 10038, Train 820 to fill need. car in train No. 5.	Los Angeles, Calif. Colton, Calif.	Colton, Calif. Los Angeles, Calif.	- -	57 57
124	Sept. 10	43 1	Tourist car 2023 from train No. 43, Lordsburg to Gila, to train No. 1, via Lordsburg and Phoenix.	El Paso, Tex.	Los Angeles, Calif.	43	-
126	Sept. 16	1 2-43	SP-1240 used as buffer.	El Paso, Tex. Lordsburg, N.M.	Lordsburg, N.M. Tucson, Ariz.	- 140	188 23
139	Nov. 9	1-2	Coach 2712 used as buffer.	Yuma, Ariz.	El Paso, Tex.	435	170
142	Nov. 20	1-3	Coach SP 2517 used as buffer.	Tucson, Ariz.	Yuma, Ariz.	294	-
144	Nov. 23	820 5	Deadhead diner 10132, train No. 820 to fill assigned car in train No. 5.	Los Angeles, Calif. Colton, Calif.	Colton, Calif. Los Angeles, Calif.	- -	57 57
145	Nov. 26	1 3	SP-6457, Deadhead baggage car from train No. 1, via Lordsburg to train No. 3 via Douglas.	El Paso, Tex.	Tucson, Ariz.	30	-
146	Nov. 27	820 5	Deadhead Diner 10157, Train 820, to fill assigned car in train No. 5.	Los Angeles, Cal. Colton, Calif.	Colton, Calif. Los Angeles, Cal.	- -	57 57
154	Dec. 16	820 5	Deadhead Diner 10038, train No. 820 to fill assigned car in train No. 5.	Los Angeles, Cal. Colton, Calif.	Colton, Calif. Los Angeles, Calif.	- -	57 57
158	Dec. 17	43 2-5	REX 291 from train No. 43 via Gila to 2-5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.	43	-
158	Dec. 17	2-5	SP-2334 used as buffer. SP-1202 used as buffer	Tucson, Ariz. Yuma, Ariz.	Yuma, Ariz. Los Angeles, Calif.	294 -	- 251
159	Dec. 18	2-1	SP-1511 used as buffer.	El Paso, Tex.	Phoenix, Ariz.	261	171
160	Dec. 18	2-3	SP-1511 used as buffer.	Phoenix, Ariz.	Yuma, Ariz.	173	-
162	Dec. 19	2-5	SP-1146 used as buffer.	Tucson, Ariz.	Los Angeles, Calif.	294	251
164	Dec. 20	2-5	SP-2305 used as buffer.	Tucson, Ariz.	Los Angeles, Calif.	294	251
	Dec. 20	43 2-5	PFE-614 from 2-5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
	Dec. 20	43 1-5	SP-4318 from 1-5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-

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SECTION 13-A (Continued)

ITEM NO. (a)	DATE (b)	TRAIN NO. (c)	CHARACTER OF INTERFERENCE (d)	FROM (e)	TO (f)	INTRASTATE EXCESS CAR MILES (g)	INTERSTATE EXCESS CAR MILES (h)
166	Dec. 22 Dec. 23	2-43 (2-4 (864	Coach SP-3196 used as buffer Return SP-3196 Tucson- El Paso via Phoenix and Lordsburg.	El Paso, Texas.	Tucson, Ariz.	391	171
	Dec. 22	2-43	Coach SP-1511 used as buffer.	Tucson, Ariz.	El Paso, Tex.	435	170
168	Dec. 22	2 44	SP-6208 from train No. 2 via Lordsburg to Train No. 44 via Douglas.	Tucson, Ariz.	Los Angeles, Cal.	-	251
170	Dec. 29	2 44	Deadhead Tourist 2079 from train No. 2 via Lordsburg to train No. 44 via Douglas.	Tucson, Ariz.	El Paso, Texas	30	-
172	Dec. 30	1-5	SP-6334 used as buffer	Tucson, Ariz.	El Paso, Texas	30	-
173	Dec. 30	3-43	SP-6208 used as buffer	Phoenix, Ariz.	Los Angeles, Cal.	173	251
				-	-	303	-
TOTALS 68 ITEMS		109 TRAINS	68 CARS			7,402	4,040
						TOTAL 11,442	

3142

5611

[illegible] 13-b

[illegible] REFERRED TO AFTER ASSIGNING THE 24 CAR LIMIT
[illegible] IN LOADED CAR MILES

ITEM No. (a)	DATE (b)	TRAIN NUMBER (c)	CHARACTER OF INFORMATION (d)	FROM (e)	TO (f)	INFORMATION CAR MILES SAVED (g)	INFORMATION CAR MILES SAVED (h)
3	Jan. 1	44 6	San Diego-El Paso coach SP-2436 from train No. 44 via Phoenix to train No. 6 via Gila.	Yuma, Arizona.	Tucson, Arizona	43	-
4	Jan. 2	43	Rock Island baggage car 4130 from train No. 43 via Phoenix to train No. 5 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
8	Jan. 28	(43 (2-5	Splitting No. 43 at El Paso and operating 5 cars on 2nd No. 5 via Lordsburg and Gila.	El Paso, Tex.	Yuma; Arizona.	346	-
9	Feb. 1	43 1-5	Mexico City-Los Angeles standard ATHEL SPRINGS from train No. 43 via Phoenix to train No. 5 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
12	Feb. 15	43 5	El Paso-Los Angeles coach from train No. 5 via Phoenix and Douglas to train No. 43 via Lordsburg and Gila.	El Paso, Tex.	Los Angeles, Calif.	73	-
	Feb. 15	43 5	Coach TAHO-871 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
14	Feb. 17	43 5	Assigned coach SP-2434 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Yuma, Arizona.	43	-
16	Feb. 20	43 5	Assigned coach SP-2002 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
17	Feb. 22	2 6	Deadhead standard FORT MICHEE transferred from train No. 2 via Phoenix to train No. 6 via Gila.	Yuma, Arizona.	Tucson, Ariz.	43	-
18	Feb. 22	43 5	El Paso-Los Angeles coach TAHO-886 and car horses routed train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Yuma, Arizona.	86	-
19	Feb. 23	43 5	El Paso-Los Angeles coach SP-2002 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.	43	-
20	Feb. 26	43 5	El Paso-Los Angeles coach TAHO-403 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Yuma, Arizona.	43	-
22	Feb. 27	43 5	El Paso-Los Angeles coach SP-2700 routed in train No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.	43	-
24	March 8	44	Los Angeles-Chicago lounge car SP-1570 cancelled Yuma to Phoenix.	Yuma, Arizona.	Phoenix, Ariz.	173	-
		1	Lounge car SP-2918 not picked up at Phoenix.	Phoenix, Ariz.	Yuma, Arizona.	173	-
25	March 9	44	San Diego-El Paso coach cancelled.	Yuma, Arizona.	El Paso, Tex.	468	167
		44	Lounge Car Los Angeles-Chicago cancelled.	Yuma, Arizona.	Phoenix, Ariz.	173	-
		1	Lounge Car not used.	Phoenix, Ariz.	Yuma, Arizona.	173	-
26	March 9	6 4	Extra standard CLEE ARNOT routed in train No. 6 via Gila and Lordsburg instead of train No. 4 via Phoenix and Douglas.	Los Angeles, Calif.	El Paso, Tex.	73	-
27	March 10	43 5	Mexico City-Los Angeles standard BARRIE adversely in No. 43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.	43	-
28	March 10	44 6	San Diego-El Paso coach TAHO-844 routed in train No. 6 via Gila and Lordsburg instead of train No. 44 via Phoenix and Douglas.	Yuma, Arizona.	El Paso, Tex.	73	-
30	March 13	5 43	El Paso-Los Angeles coach SP-2020 routed in train No.43 via Gila instead of train No. 5 via Phoenix.	Tucson, Ariz.	Los Angeles, Calif.	43	-
32	March 18	43 5	El Paso-Los Angeles coach TAHO-886 routed from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
33	March 21	43 5	PFE-454, vegetables, routed from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	CHARACTER OF INTERFERENCE (d)	FROM (e)	TO (f)	INTRASTATE CAR MILES SAVED (g)	INTERSTATE CAR MILES SAVED (h)
34	March 22	43 5	El Paso-Los Angeles coach TAMO-813 routed from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
35	March 23	43 5	El Paso-Los Angeles coach TAMO-401 routed from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
36	March 24	44	San Diego-El Paso coach cancelled.	Yuma, Arizona.	Los Angeles, Calif.	468	167
37	March 24	43 5	El Paso-Los Angeles coach, TAMO-402 routed from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
39	March 28	43 5	El Paso-Los Angeles coach TAMO-403 routed from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
40	March 29	43 5	El Paso-Los Angeles coach TAMO-401 routed from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
42	April 3	6 4	Deadhead tourist SAN JUAN from train No. 4 via Phoenix to train No. 6 via Gila.	Yuma, Arizona.	Tucson, Arizona.	43	-
44	April 6	5 43	Deadhead standard GLEN MAWR from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
45	April 7	5 43	Deadhead horse car SP-7238 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
52	April 16	5 43	Extra baggage car TAP-1126 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
55	April 30	5 43	Car SAN JOSE from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
56	May 14	5 43	Car SSR-1522, express, from train No. 5 via Douglas and Phoenix to train No. 43 via Lordsburg and Gila.	El Paso, Tex.	Los Angeles, Calif.	73	-
57	May 17	6 44	Los Angeles-Tucson coach SP-2434 from train No. 44 via Phoenix to train No. 6 via Gila.	Los Angeles, Calif.	Tucson, Arizona.	43	-
59	May 23	43 5	Deadhead standard GLEN TARSAN from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
60	May 23	6 44	3 cars horses from train No. 44 via Phoenix and Douglas to train No. 6 via Gila and Lordsburg.	Yuma, Arizona.	El Paso, Texas.	219	-
63	June 2	5 43	Mexico City-Los Angeles standard BEMOSUS from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
65	June 5	2 6	Deadhead standards McLAUGHLIN and SAN PEDRO from train No. 2 via Phoenix to train No. 6 via Gila.	Yuma, Arizona.	Tucson, Arizona.	86	-
67	June 7	5 43	Mexico City-Los Angeles standard ZERO from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
68	June 9	5 43	Mexico City-Los Angeles standard ARISTOTLE and two coaches SP-2431 and TAMO-401 from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	129	-
69	June 11	5 43	Assigned coach TAMO-404 and extra coach SP-1957 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	86	-
72	June 12	5 43	Standard L-1 from train No. 5 via Douglas and Phoenix to train No. 43 via Lordsburg and Gila.	El Paso, Tex.	Los Angeles, Calif.	73	-
		5 43	Mexico City-Los Angeles standard BEMOSUS and Memphis Los Angeles standard McBABE from train 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	86	-
75	June 14	2 6	Deadhead tourist No. 2076 from train 2 via Phoenix to train No. 6 via Gila.	Yuma, Arizona.	El Paso, Texas.	43	-
77	June 16	5 43	Mexico City-Los Angeles standard HYPERPIPES and extra tourist No. 2076 from train 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	86	-

SECTION 13-G (Continued)

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	CHARACTER OF INFORMATION (d)	FROM (e)	TO (f)	INTRASTATE CAR MILES RATED (g)	INTERSTATE CAR MILES RATED (h)
80	June 21	3	El Paso-Los Angeles coach cancelled.	El Paso, Tex	Tucson, Ariz.	167	173
		3 RA3007	5 cars in X-4300-W via Gila from No. 3 via Phoenix.	Tucson, Ariz.	Yuma, Arizona.	215	-
81	June 25	5 43	2 assigned standards HERIOD and VAN HORN from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	86	-
82	June 26	3 43	Deadhead diner SP-10153 from train No. 3 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
84	June 30	5 43	2 assigned standards ATHOL SPRINGS and HEROSUS and 1 assigned tourist No. 4008 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	129	-
86	July 4	5 43	Extra tourist No. 4258 from train 5 via Phoenix to train 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
88	July 7	5 43	Mexico City-Los Angeles standard VAN HORN and extra coach SP-2534 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	86	-
89	July 8	5 43	Deadhead diner 10042 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
90	July 12	5 43	Mexico City-Los Angeles standard ATHOL SPRINGS from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Yuma, Arizona.	43	-
91	July 12	2-6 44	4 cars from train No. 44 via Douglas to train 2nd 6 via Lordsburg.	Tucson, Ariz.	El Paso, Texas.	120	-
		4 2-6	2 deadhead Pullmans from train 4 via Douglas to train 2nd 6 via Lordsburg.	Tucson, Ariz.	El Paso, Texas.	60	-
92	July 13	5 43	Extra tourist No. 2146 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
94	July 16	5 43	Mexico City-Los Angeles standard HEROSUS from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
95	July 17	5 43	Deadhead prison car No. 2707 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
97	July 21	5 43	Mexico City-Los Angeles standard HYPERPIDES from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Yuma, Arizona.	43	-
100	Aug. 1	2 6	Deadhead car 2904 from train No. 2 via Phoenix to train No. 6 via Gila.	Yuma, Arizona.	Tucson, Arizona.	43	-
103	Aug. 4	5 43	Mexico City-Los Angeles standard STRABO and one assigned tourist No. 4253 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Yuma, Arizona.	86	-
108	Aug. 13	5 43	Mexico City-Los Angeles standard XENO from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
109	Aug. 13	6 44	Deadhead lounge car SP-2912 from train No. 44 via Phoenix and Douglas to train No. 6 via Gila and Lordsburg.	Yuma, Arizona.	El Paso, Texas.	73	-
110	Aug. 14	5 43	Tourist car No. 2146 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
114	Aug. 25	2 6	Deadhead tourist No. 4258 from train No. 2 via Phoenix to train No. 6 via Gila.	Yuma, Arizona.	Tucson, Arizona.	43	-
115	Aug. 27	1 X31228	6 cars from train No. 1 via Phoenix to train Extra 3122 West via Gila.	Tucson, Arizona.	Yuma, Arizona.	258	-
116	Aug. 31	44	San Diego-Phoenix coach cancelled.	Yuma, Arizona.	Phoenix, Arizona.	174	-
		44 6	Car LAM-3720 from train No. 44 via Douglas to train No. 6 via Lordsburg.	Tucson, Arizona.	El Paso, Texas.	30	-

SECTION 13-B (Continued)

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	CHARACTER OF INTERFERENCE (d)	FROM (e)	TO (f)	INTRASTATE CAR MILES SAVED (g)	INTERSTATE CAR MILES SAVED (h)
117	Sept. 1	6	Deadhead tourist No. 4006 from train No. 2 via Phoenix to train No. 6 via Gila.	Yuma, Arizona.	Tucson, Ariz.	43	-
118	Sept. 2	5 43	Assigned tourist No. 4147 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
127	Sept. 20	5 43	Mexico City-Los An[illegible] standard CHATUKEE from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
129	Sept. 29	5 43	PFE-172 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Yuma, Arizona.	43	-
130	Oct. 5	4 6	MP-3386 from train 4 via Phoenix to train 6 via Gila.	Yuma, Arizona.	Tucson, Arizona.	43	-
132	Oct. 20	5 43	One deadhead standard GLEN CANYON from train 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
133	Oct. 21	4 6	MP-3349 from train 4 via Phoenix and Douglas to train 6 via Gila and Lordsburg.	Yuma, Arizona.	El Paso, Texas.	73	-
134	Oct. 22	5 43	Standard ATHOL SPRINGS from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Yuma, Arizona.	43	-
135	Oct. 29	44	Los Angeles-Tucson coach SP-1978 cancelled	Phoenix, Arizona.	Tucson, Arizona.	121	-
		4 6	ATASF-4082 from train No. 4 via Phoenix to train No. 6 via Gila.	Yuma, Arizona.	Tucson, Arizona.	83	-
136	Nov. 1	3	Phoenix-San Diego coach cancelled.	Phoenix, Ariz.	Yuma, Arizona.	176	-
137	Nov. 3	5 43	Mexico City-Los Angeles standard XERO from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
138	Nov. 6	2 6	Two deadhead standards GLEN FEE and GLEN ASHDALE, from train No. 2 via Phoenix to train No. 6 via Gila.	Yuma, Arizona.	Tucson, Arizona.	43	-
140	Nov. 11	5 43	Deadhead tourist No. 4185 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
141	Nov. 12	3 43	2 deadhead diners SP-10026 and SP-10138 from train No. 3 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
143	Nov. 22	5 43	SP-7244 express from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
145	Nov. 26	3 43	Deadhead car SP-6457 from train No. 3 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Yuma, Arizona.	43	-
146	Nov. 27	5 43	Coach T&SD-400 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
147	Dec. 1	5 43	Coach T&SD-402 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
148	Dec. 6	5 43	Mexico City-Los Angeles standard ATHOL SPRINGS and deadhead standard SISSONIDES from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Yuma, Arizona.	86	-
150	Dec. 13	5 43	Mexico City-Los Angeles standard XERO from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Yuma, Arizona.	43	-
153	Dec. 15	5 43	Mexico City-Los Angeles standard HYPERFIDES from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
155	Dec. 16	44 2	Tucson-Kansas City baggage-express car SP-6052 from train No. 44 via Douglas to train No. 2 via Lordsburg.	Tucson, Arizona.	El Paso, Texas.	30	-
156	Dec. 17	44 2-6	Deadhead standard GLENN FERRY from train No. 44 via Douglas to second No. 6 via Lordsburg.	Tucson, Arizona.	El Paso, Texas.	30	-
		44 2-6	PFE 684 and PFE 701 from train 44 via Phoenix and Douglas to 2-6 via Gila and Lordsburg	Yuma, Arizona.	El Paso, Texas.	146	-

118	Sept. 2	5 43	Assigned tourist No. 4147 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
127	Sept. 20	5 43	Mexico City-Los Angeles standard CRATUNIS from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
129	Sept. 29	5 43	PFE-172 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Yuma, Arizona.	43	-
130	Oct. 5	4 6	MP-3386 from train 4 via Phoenix to train 6 via Gila.	Yuma, Arizona.	Tucson, Arizona.	43	-
132	Oct. 20	5 43	One deadhead standard GLEN CANYON from train 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
133	Oct. 21	4 6	MP-3349 from train 4 via Phoenix and Douglas to train 6 via Gila and Lordsburg.	Yuma, Arizona.	El Paso, Texas.	73	-
134	Oct. 22	5 43	Standard ATHOL SPRINGS from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Yuma, Arizona.	43	-
135	Oct. 29	44	Los Angeles-Tucson coach SP-1978 cancelled	Phoenix, Arizona.	Tucson, Arizona.	121	-
		4 6	AT&SF-4002 from train No. 4 via Phoenix to train No. 6 via Gila.	Yuma, Arizona.	Tucson, Arizona.	43	-
136	Nov. 1	3	Phoenix-San Diego coach cancelled.	Phoenix, Ariz.	Yuma, Arizona.	194	-
137	Nov. 3	5 43	Mexico City-Los Angeles standard ZERO from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Ariz.	Los Angeles, Calif.	43	-
138	Nov. 6	2 6	Two deadhead standards GLEN FEE and GLEN ASHDALE, from train No. 2 via Phoenix to train No. 6 via Gila.	Yuma, Arizona.	Tucson, Arizona.	43	-
140	Nov. 11	5 43	Deadhead tourist No. 4185 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
141	Nov. 12	3 43	2 deadhead diners SP-10026 and SP-10138 from train No. 3 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
143	Nov. 22	5 43	SP-7244 express from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
145	Nov. 26	3 43	Deadhead car SP-6457 from train No. 3 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Yuma, Arizona.	43	-
146	Nov. 27	5 43	Coach T&NO-400 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
147	Dec. 1	5 43	Coach T&NO-402 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
148	Dec. 6	5 43	Mexico City-Los Angeles standard ATHOL SPRINGS and deadhead standard SIMONIDES from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Yuma, Arizona.	86	-
150	Dec. 13	5 43	Mexico City-Los Angeles standard ZERO from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Yuma, Arizona.	43	-
153	Dec. 15	5 43	Mexico City-Los Angeles standard HYPERPIDES from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
155	Dec. 16	44 2	Tucson-Kansas City baggage-express car SP-6052 from train No. 44 via Douglas to train No. 2 via Lordsburg.	Tucson, Arizona.	El Paso, Texas.	30	-
156	Dec. 17	44 2-6	Deadhead standard GLENS FERRY from train No. 44 via Douglas to second No. 6 via Lordsburg.	Tucson, Arizona.	El Paso, Texas.	30	-
		44 2-6	PFE 684 and PFE 701 from train 44 via Phoenix and Douglas to 2-6 via Gila and Lordsburg	Yuma, Arizona.	El Paso, Texas.	146	-
161	Dec. 18	2	Deadhead tourist 4037 from train No. 2 via Phoenix to second No. 6 via Gila.	Yuma, Arizona.	El Paso, Texas.	43	-
	Dec. 18	4 2-6	Deadhead tourist 4262 from train No. 4 via Phoenix and Douglas to second No. 6 via Gila and Lordsburg	Yuma, Arizona	El Paso, Texas.	73	-

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SECTION 13-B (Continued)

ITEM NO. (a)	DATE (b)	TRAIN NUMBER (c)	CHARACTER OF INTERFERENCE (d)	FROM (e)	TO (f)	INTRASTATE CAR MILES SAVED (g)	INTERSTATE CAR MILES SAVED (h)
163	Dec. 19	2 2-6	Deadhead tourists 4187 and 4238 from train No. 2 via Phoenix to train second No. 6 via Gila.	Yuma, Arizona.	El Paso, Texas.	86	-
		44 2-6	REX-354 and 291 from train No. 44 via Phoenix and Douglas to train second No. 6 via Gila and Lordsburg.	Yuma, Arizona.	El Paso, Texas.	146	-
165	Dec. 20	44 2-6	MPB-134 and deadhead tourist 4237 from train No. 44 via Phoenix and Douglas to second No. 6 via Gila and Lordsburg.	Yuma, Arizona.	El Paso, Texas.	146	-
167	Dec. 21	2 1-6	[illegible] and standard GLEN TILT from train No. 2 via Phoenix to train second No. 6 via Gila.	Yuma, Arizona.	El Paso, Texas.	73	-
		44 1-6	REX-403, RI-4106 and deadhead tourist 4127 from train No. 44 via Phoenix and Douglas to second No. 6 via Gila and Lordsburg.	Yuma, Arizona.	El Paso, Texas.	219	-
169	Dec. 24	1-5 43	TAMD-114 from train 1st No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
171	Dec. 29	5 43	Mexico City -Los Angeles standard IBTCUS from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Yuma, Arizona.	43	-
		5 43	Deadhead baggage SP-6032 from train No. 5 via Phoenix to train No. 43 via Gila.	Tucson, Arizona.	Los Angeles, Calif.	43	-
TOTALS 95 ITEMS		148 TRAINS				8,132	507
						TOTAL 9,239	

SECTION 14

UNNECESSARY INTERFERENCE (NOT OTHERWISE CLASSIFIED) CAUSED BY OVER-USE OF ARIZONA 14 CAR LIMIT

ITEM NUMBER (a)	DATE (b)	TRAIN NUMBER (c)	CHARACTER OF INTERFERENCE (d)
38	3-26	CCC Spl.	CCC Spl., Main 1108, consist called for 15 cars Los Angeles to El Paso, necessary deadhead tourist car CHERRYVALE, Los Angeles to Lordsburg, in train 2, in advance of CCC Special, passengers in CCC Special rearranged in 14 remaining cars at Los Angeles and reassigned to space in tourist car CHERRYVALE at Lordsburg where this car was placed in CCC Special.
60	5-23	44	Train No. 4 delayed El Paso 25 minutes follow train No. 44 account train No. 44 delayed El Paso to pick up three Tucumcari routed cars from train No. 6
122	9-7	43	Held out of station at Yuma 43 minutes account trains No. 44 and 4 switching
124	9-16	43 1	Tourist car, 2023, with fifteen interstate passengers, Chicago to Los Angeles, transferred from train No. 43 to Train No. 1 at El Paso, train No. 43 arriving Los Angeles 1:15 PM September 11th, train No. 1 arriving Los Angeles 5:00 PM September 11th. Each passenger arrived Los Angeles three hours forty-five minutes late based on train No. 43's arrival at Los Angeles.
125	9-16	TH-828	TH-828 arrived El Paso from Tucumcari with 15 cars destined Los Angeles. Account car limit lounge car EX-1508 cut out of this train and deadheaded El Paso to Yuma where it was placed in TH-828. TH-828 had 14 cars El Paso to Yuma, and 15 cars Yuma to Los Angeles.
133	10-21	44 4	Account car limit Phoenix to Tucson, CCC party of 4 cars split. Train No. 44 picked up ATSF-1653 baggage and coaches SP-1572 and SP-1690. Train No. 4 picked up baggage car ATSF-1794.

3148

5617

Defendant's Exhibit No. 200 (Witness Herbert)
Jan. 23, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

GRADE CROSSINGS WITHIN THE STATE OF ARIZONA

AS REPORTED TO CORPORATION COMMISSION OF THE STATE OF ARIZONA

YEAR ENDED DECEMBER 31, 1939 BY SOUTHERN PACIFIC COMPANY, AND

NUMBER AT END OF YEARS 1930 TO 1938, INCLUSIVE

LINE NO.	KIND OF PROTECTION	NUMBER AT BEGINNING YEAR 1939	NO. ADDED DURING YEAR 1939	NO. ELIMINATED DURING 1939	NUMBER AT END OF YEAR 1939	NUMBER AT END OF YEAR								
						1938	1937	1936	1935	1934	1933	1932	1931	1930
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)
1	Gates, with or without other protection, operated 24 hours per day	-	-	-	-	-	-	-	-	1	1	1	1	1
2	Gates, with or without other protection, operated less than 24 hours per day	-	-	-	-	-	-	-	-	1	1	1	1	1
3	Watchman, alone or with protection other than gates, on duty 24 hours per day	-	-	-	-	-	-	-	-	-	-	3	3	3
4	Watchman, alone or with protection other than gates, on duty less than 24 hours per day	1	-	-	1	1	3	1	1	1	1	3	3	3
5	Both audible and visible signals, without other protection	36	-	1	35	36	32	30	30	30	30	30	30	27
6	Audible signals only	1	-	-	1	1	1	1	2	2	2	4	4	4
7	Visible signals only	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Special fixed signs or barriers, with or without standard fixed signs	21	-	-	21	21	21	23	23	24	24	24	26	22
9	Standard fixed signs only	595	-	1	594	595	595	601	605	617	620	663	668	675
10	Otherwise unprotected	2	-	-	2	2	2	-	-	-	-	-	-	-
11	TOTAL	656	-	2	654	656	654	656	661	676	679	729	736	736

Defendant's Exhibit No. 201 (Witness H.P. Herbert)
Jan. 23, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

GRADE CROSSINGS WITHIN THE STATE OF NEVADA

AS REPORTED TO THE PUBLIC SERVICE COMMISSION OF THE STATE OF NEVADA

YEAR ENDED DECEMBER 31, 1939 BY SOUTHERN PACIFIC COMPANY, AND

NUMBER AT END OF YEARS 1930 TO 1938, INCLUSIVE

LINE NO.	KIND OF PROTECTION	NUMBER AT BEGINNING YEAR 1939	NO. ADDED DURING YEAR 1939	NO. ELIMINATED DURING 1939	NUMBER AT END OF YEAR 1939	NUMBER AT END OF YEAR								
						1938	1937	1936	1935	1934	1933	1932	1931	1930
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)
1	Gates, with or without other protection, operated 24 hours per day	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Gates, with or without other protection, operated less than 24 hours per day	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Watchman, alone or with protection other than gates, on duty 24 hours per day	4	-	-	4	4	4	4	4	4	4	4	4	3
4	Watchman, alone or with protection other than gates, on duty less than 24 hours per day	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Both audible and visible signals, without other protection	11	9	-	20	11	11	11	12	12	11	11	11	11
6	Audible signals only	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Visible signals only	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Special fixed signs or barriers, with or without standard fixed signs	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Standard fixed signs only	197	-	18	179	197	197	197	197	197	208	215	213	214
10	Otherwise unprotected	-	8	-	8	-	-	-	-	-	-	-	-	-
11	TOTAL	212	17	18	211	212	212	212	213	213	223	230	228	228

Defendant's Exhibit No. 202 (Witness Herbert)
Jan. 23, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

YUMA, ARIZONA TO EL PASO, TEXAS
INCREASED INVESTMENT IN RIGHT HIGHWAYS
INCIDENT TO LOOP TRACK OPERATION

LINE NO.	LOCATION	MILE POST LOCATION	PRESENT LENGTH (Feet)	PRESENT LENGTH (Cars)	PROPOSED LENGTH (Feet)	PROPOSED LENGTH (Cars)	LENGTH OF EXTENSION (Feet)	LENGTH OF EXTENSION EAST OR WEST	MISCELLANEOUS MOVING POLE AND PIPE LINES AND OTHER SUBJECT.	GRADING	TRACK	BRIDGES	SIGNALS	TOTAL COST	COST PER TRACK FOOT
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(k)	(l)	(j)	(k)	(l)	(m)	(n)
1	Yuma (Yard)	732.7	-	-	6,530	125	6,530	-	-	$ 1,000	$18,000	$ -	$ 6,000	$25,000	$3.83
2	Fortuna	743.7	3,800	72	6,530	125	2,730	East	$ 200	600	7,633	112	4,825	13,370	4.90
3	Hallsten	770.0	3,688	72	6,530	125	2,842	East	-	1,200	8,334	-	1,000	10,534	3.71
4	Coal	780.1	3,800	73	6,530	125	2,730	East	-	280	4,961	1,600	2,225	11,066	4.05
5	Pembroke	788.6	3,699	69	6,530	125	2,831	East	-						
6	Schmidt	792.6	4,439	88	6,530	125	2,071	East	-	300	7,208	1,500	4,075	13,083	4.62
7	Shovel	800.5	3,487	67	6,530	125	3,043	East	-	450	5,353	112	1,875	7,790	3.76
8	Antes	811.9	3,588	67	6,530	125	3,002	East	-	220	7,725	2,500	3,500	12,995	4.25
9	Love	822.0	3,748	72	6,530	125	2,982	East	-	875	7,625	4,000	1,975	14,475	4.82
10	Sentinel	826.1	4,032	78	6,989	125	2,977	East	-	441	8,248	3,000	5,347	17,036	6.12
11	Piedra	839.9	3,514	67	6,530	125	3,016	East	-	600	7,513	2,160	5,450	15,725	5.32
12	Gila (Yard)	855.7	(1,280	229	16,927	321	5,437	(- E)	-	375	8,232	520	3,650	12,876	4.27
			(4,511	88	6,530	125	2,029	(- E)	25	3,140	20,552	708	6,700	31,125	4.07
13	Draper	865.1	3,946	77	6,530	125	2,584	East	-	260	6,605	-	2,325	9,190	3.56
14	Estrella	874.6	3,914	73	6,530	125	2,616	East	-	280	7,355	-	4,800	12,435	4.75
15	Enid	888.4	3,481	67	6,530	125	3,049	East	-	300	7,777	-	1,800	9,877	3.35
16	Rex	907.7	3,859	72	6,530	125	2,671	East	-	240	6,879	4,350	1,875	13,344	5.00
17	Casa Grande	918.8	4,838	94	6,530	125	1,692	East	-						
18	Toltec	928.4	3,529	68	6,530	125	3,011	East	-	100	4,490	2,200	1,875	8,665	5.12
19	Picacho (Sid-Out Track)	937.5	(1,370	20	1,696	22	326	East)	200	450	7,647	3,200	1,875	13,172	4.37
	(Siding)		(5,073	102	6,530	125	1,457	East)		425	6,283	1,400	2,300	10,408	5.95
20	Symala	944.2	4,783	94	6,530	125	1,747	East	-						
21	Red Rock	951.4	3,589	69	6,461	125	2,901	East	-	300	4,563	1,300	4,800	10,963	6.38
22	Ruvidoso	958.4	3,502	67	6,539	125	3,028	East	-	750	7,378	5,500	6,950	20,578	7.09
23	Tucson Yard (Ice Track Lead)	983.9	3,800	80	5,130	112	1,330	East	180	420	7,688	4,350	2,300	14,758	4.87
										500	8,210	-	2,000	10,860	8.17
24	Vail	1009.7	3,969	76	6,530	125	2,561	East	-						
25	Fortuna	1012.6	4,314	84	6,039	114	1,705	East	-	1,645	6,549	20	40	8,254	3.32
26	Hassel	1023.6	4,722	94	5,[illegible]	100	658	East	-	2,700	4,460	216	2,300	9,676	5.68
27	Curve	1038.5	4,500	87	6,530	125	2,030	East	-	550	1,906	-	3,500	5,956	9.05
									50	560	5,253	1,340	4,800	12,003	5.91
28	Riley	1041.0	4,048	78	5,380	100	1,332	East	-						
29	Cohen	1047.3	3,530	66	5,380	100	1,850	East	-	390	4,322	85	4,825	9,621	7.22
30	Dragoon	1053.9	3,982	68	6,530	125	2,938	East	-	2,310	4,814	956	2,300	10,380	5.61
31	Cochise	1063.9	4,767	91	6,530	125	1,763	East	-	750	8,241	20	3,325	12,336	4.20
									-	450	4,602	20	4,025	9,097	5.16
32	Hillcox	1074.7	3,706	70	6,530	125	2,824	East	-						
33	Rand	1082.6	5,362	105	6,530	125	1,168	East	-	500	7,190	1,950	3,825	13,065	4.63
34	Lawson	1091.0	3,479	66	6,250	125	2,771	East	-	980	3,150	4,400	3,400	11,930	102.21
35	Elgin	1105.0	3,922	66	6,530	125	3,028	East	-	2,400	7,051	3,200	3,850	16,511	5.96
									50	720	7,688	4,000	3,825	16,283	5.38
36	San Simon	1114.2	3,695	66	6,530	125	3,025	East	-						
37	Vance	1121.8	4,006	77	6,530	125	2,525	East	-	780	7,705	2,350	3,850	14,685	4.84
38	Steins	1128.9	3,895	72	6,530	125	2,675	East	-	1,500	7,131	1,800	7,525	17,956	7.11
39	Conrad	1136.5	3,683	65	6,530	125	3,047	East	-	1,050	7,699	5,316	2,900	16,965	6.27
									-	1,790	7,735	2,400	3,825	15,710	5.16
40	Lordsburg Yard	1148.3	(3,402	74	6,530	125	2,678	East)	1,000						
			(3,795	73	6,530	125	2,735	East)		785	17,721	3,842	4,000	27,338	5.05
41	Lisbon	1159.0	3,515	66	6,530	125	3,015	East	-	600	7,657	-	4,200	12,457	4.13
42	Separ	1168.0	5,416	107	6,530	125	1,114	East	-	240	3,018	-	4,875	8,133	7.30
43	Wilna	1179.6	3,700	70	6,530	125	2,830	East	-						
44	Rincopia	1193.2	5,056	100	6,530	125	1,474	East	-	225	7,877	880	4,875	13,777	4.87
45	Alamo	1209.6	5,416	108	6,530	125	1,114	East	-	400	3,897	112	1,875	6,284	4.26
									-	100	3,018	-	4,875	7,993	7.18
46	Chappel	1243.0	5,379	107	6,530	125	1,151	East	-	120	3,108	96	1,850	5,174	4.50
47	Afton	1259.4	5,400	107	6,530	125	1,130	East	-	150	3,027	-	1,850	5,027	4.48
48	Lenark	1269.5	5,411	107	6,530	125	1,119	East	-	100	3,030	-	1,850	4,980	4.45
49	TOTAL						132,868		1,675	35,251	336,039	70,014	147,887	630,866	

LINE NO.	LOCATION	RAIL POST LOCATION	PRESENT LENGTH	PRESENT LENGTH	PROPOSED LENGTH	PROPOSED LENGTH	REFERENCE		RAIL AND FITTINGS AND OTHER STRUCT.	GRADING	TRACK	BRIDGES	SIGNALS	TOTAL COST	COST PER TRACK FOOT
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(k)	(l)	(j)	(k)	(l)	(m)	(n)
1	Toma (Yard)	732.7	-	-	6,530	125	6,530	-	-	$ 1,000	$18,000	$ -	$ 6,000	$25,000	$3.83
2	Portona	743.7	3,800	72	6,530	125	2,730	East	$ 200	600	7,633	112	4,825	13,370	4.90
3	Bullton	770.0	3,668	72	6,530	125	2,862	East	-	1,200	8,334	-	1,800	10,534	3.72
4	Coal	780.1	3,830	73	6,530	125	2,730	East	-	880	6,961	1,400	2,225	11,066	4.05
5	Pochonte	788.6	3,699	69	6,530	125	2,831	East	-	300	7,208	1,500	4,075	13,083	4.62
6	Rabbit	792.6	4,429	83	6,530	125	2,971	East	-	450	5,353	112	1,875	7,790	3.76
7	Shovel	800.5	3,697	69	6,530	125	3,843	East	-	220	7,725	1,500	3,500	12,895	4.25
8	Axton	811.9	3,528	67	6,530	125	3,082	East	-	875	7,625	4,000	1,975	14,475	4.88
9	Love	822.0	3,748	72	6,530	125	2,782	East	-	441	8,848	3,000	5,347	17,036	6.12
10	Sentinel	826.1	4,032	78	6,989	125	2,977	East	-	600	7,515	2,160	5,450	15,725	5.32
11	Pinden	839.9	3,514	67	6,530	125	3,016	East	-	375	8,331	520	3,450	12,676	4.27
12	Gila (Yard)	855.7	(11,280	289	16,927	353	5,437	(-E)	25	3,140	20,552	708	6,700	31,125	4.07
			(4,511	86	6,530	125	2,039	(-E)							
13	Reagan	865.1	3,946	77	6,530	125	2,984	East	-	260	6,605	-	2,325	9,190	3.96
14	Batrella	874.6	3,924	73	6,530	125	2,836	East	-	280	7,355	-	4,800	12,435	4.75
15	Reid	888.4	3,681	67	6,530	125	3,039	East	-	300	7,777	-	1,800	9,877	3.25
16	Ben	907.7	3,859	72	6,530	125	2,971	East	-	240	6,879	4,350	1,875	13,344	5.00
17	Casa Grande	918.8	4,838	94	6,530	125	1,692	East	-	100	4,490	2,200	1,875	8,665	5.12
18	Tolton	928.4	3,529	68	6,530	125	3,011	East	-	450	7,457	3,200	1,875	13,172	4.37
19	Picacho (Sid-Cut Track) (Siding)	937.5	(1,370	20	1,696	22	326	East)	200	425	6,283	1,400	2,300	10,608	5.95
			(5,077	102	6,530	125	1,457	East)							
20	Ryanla	944.2	4,783	94	6,530	125	1,747	East	-	300	4,963	1,300	4,800	10,963	4.28
21	Red Rock	953.4	3,990	69	6,451	125	2,931	East	-	750	7,378	5,500	6,990	20,598	7.89
22	Ruvida	958.4	3,502	67	6,530	125	3,028	East	-	420	7,688	4,350	2,300	14,758	4.87
23	Tucson Yard (Ice Track Lead)	983.9	3,800	80	5,130	112	1,330	East	150	500	8,226	-	2,000	10,860	8.17
24	Vail	1008.7	3,969	76	6,530	125	2,561	East	-	1,615	6,349	20	40	8,254	3.22
25	Fortuna	1012.6	4,314	82	6,038	114	1,705	East	-	2,700	4,460	216	2,300	9,676	5.68
26	Shovel	1023.6	4,722	94	5,380	100	658	East	-	550	1,906	-	3,300	5,956	9.05
27	Curve	1038.5	4,500	87	6,530	125	2,030	East	30	360	5,253	1,340	4,800	12,003	5.51
28	Sibyl	1043.0	4,048	78	5,380	100	1,332	East	-	390	4,322	84	4,825	9,621	7.22
29	Odina	1047.3	3,530	66	5,380	100	1,830	East	-	2,310	4,814	936	2,300	10,380	5.61
30	Dragoon	1053.9	3,592	68	6,530	125	2,938	East	-	730	8,241	20	3,325	12,336	4.80
31	Cochise	1063.9	4,797	94	6,530	125	1,743	East	-	450	4,602	80	4,025	9,097	5.16
32	Hillcox	1074.7	3,706	70	6,530	125	2,824	East	-	500	7,280	1,550	3,825	13,065	4.63
33	Rose	1082.6	5,362	105	6,530	125	1,168	East	-	980	3,150	4,400	3,400	11,930	10.21
34	Lawson	1091.0	3,479	66	6,530	125	2,771	East	-	2,400	7,063	3,800	3,850	16,511	5.96
35	Elgo	1105.0	3,502	66	6,530	125	3,028	East	30	720	7,688	4,000	3,825	16,283	5.38
36	San Simon	1114.2	3,492	66	6,530	125	3,035	East	-	780	7,705	2,350	3,850	14,685	4.84
37	Vesar	1121.8	4,086	77	6,530	125	2,525	East	-	1,300	7,131	1,800	7,325	17,956	7.11
38	Shaine	1128.9	3,855	74	6,530	125	2,675	East	-	1,050	7,699	3,316	2,900	14,965	6.27
39	Concord	1136.5	3,483	66	6,530	125	3,047	East	-	1,750	7,735	2,400	3,825	15,710	5.16
40	Lordsburg Yard	1148.3	(2,852	74	6,530	125	2,678	East)	1,000	785	17,711	3,842	4,000	27,338	5.05
			(3,795	73	6,530	125	2,725	East)							
41	Lisbon	1159.0	5,515	66	6,530	125	3,015	East	-	600	7,497	-	4,800	12,497	4.13
42	Separ	1168.0	5,436	107	6,530	125	1,114	East	-	240	3,018	-	4,875	8,133	7.30
43	Wilna	1179.6	3,700	70	6,530	125	2,830	East	-	225	7,877	800	4,875	13,777	4.87
44	Mangula	1193.2	5,056	100	6,530	125	1,474	East	-	400	3,897	112	1,875	6,284	4.26
45	Akela	1209.6	5,436	108	6,530	125	1,114	East	-	100	3,018	-	4,875	7,993	7.18
46	Chappel	1243.0	5,379	107	6,530	125	1,151	East	-	120	3,108	96	1,850	5,174	4.50
47	Afton	1259.4	5,400	107	6,530	125	1,130	East	-	150	3,097	-	1,850	5,097	4.48
48	Lemark	1269.5	5,411	107	6,530	125	1,139	East	-	100	3,030	-	1,850	4,980	4.45
49	TOTAL						120,868		1,675	35,251	336,039	70,036	167,887	630,886	
50	Tepee (Phoenix Line)	971.4	3,689	72	6,530	125	2,841	East	-	740	7,232	2,460	2,325	12,737	4.68
51	TOTAL INCLUDING PHOENIX LINE						125,703		1,675	35,991	343,271	72,474	170,212	623,623	
52	CONTINGENCIES 10%													62,362	
53	GRAND TOTAL													685,985	5.46

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[fol. 5621] DEFENDANTS EXHIBIT No. 204 (Witness Browning) Jan. 23, 1941

Chronological History of Freight Car Interchange Rule Requirements to which Cars Must Conform to Render Them Acceptable in Interchange, from September 1, 1911 to January 1, 1941 with Respect to Following Items:

Air Brakes
Axles
Brake Beams
Brake Beam Hangers
Couplers
Draft Gears
Trucks
Underframes
Wheels

[fol. 5622] Air Brakes

Rule effective September 1, 1911 (See Code revised 1911, page 26):

Delivering Company Responsible

"Rule 53. All freight cars offered in interchange must be equipped with air brakes.

"After September 1, 1912, all freight cars offered in interchange must be equipped with M. C. B. Standard 1¼-inch train line, angle cocks and quick action triple valve.

"After September 1, 1912, all freight cars offered in interchange not equipped with pressure retaining valves."

Rule amended effective September 1, 1912, to read (See Code revised 1912, page 35):

Delivering Company Responsible

"Rule 53. All freight cars offered in interchange must be equipped with air brakes, angle cocks, quick action triple valves, M. C. B. Standard 1¼-inch train line and pressure retaining valves."

Rule amended effective October 1, 1913, to read (See Code revised 1913, page 29):

Delivering Company Responsible

"Rule 53. All freight cars offered in interchange must be equipped with air brakes having 1¼-inch air brake pipe and angle cocks; also quick action triple valve, pressure retaining valve and an efficient hand brake."

Rule 53 relocated as Section (a) of Rule 3, effective October 1, 1914 and amended to read (See Code revised 1914, page 5):

"Rule 3 (a). Cars will not be accepted in interchange unless equipped with air brakes having 1¼-inch air brake pipe and angle cocks; also quick-action triple valve, pressure retaining valve and an efficient hand brake."

Rule amended effective October 1, 1917, to read (See [fol. 5623] Code revised 1917, page 12):

"Rule 3. (a) Cars will not be accepted in interchange unless equipped with air brakes having 1¼ inch air-brake pipe and angle cocks; also quick-action triple valve, pressure-retaining valve and an efficient hand brake.

"Cars built after January 1, 1919, must be equipped with M. C. B. standard triple valves."

Rule amended effective November 1, 1919, to read (See Code revised 1919, page 11):

"Rule 3 (a) Cars will not be accepted in interchange unless equipped with air brakes having 1¼ inch air-brake pipe and angle cocks; also quick-action triple valve, pressure-retaining valve and an efficient hand brake.

"Cars built after January 1, 1919, must be equipped with A. R. A. standard triple valves."

Rule amended effective January 1, 1925, to read (See Code revised 1924, page 18):

"Rule 3. (a) Cars will not be accepted in interchange unless equipped with air brakes having 1¼ inch air-

brake pipe and angle cocks; also quick-action triple valve, pressure-retaining valve and an efficient hand brake.

"Cars built after January 1, 1919, must be equipped with A. R. A. Standard triple valves.

"Cars built new or rebuilt after March 1, 1924, shall have the hand brake arrangement with respect to braking power in accordance with the standard adopted in 1924."

Rule entirely rearranged for better reference effective January 1, 1927, to read (See Code revised 1926, pages 19 and 21):

"Rule 3. Cars not conforming to the following re- [fol. 5624] quirements will not be accepted in interchange, or from car owners, as specified:

"(a) (1). Air brakes, including quick action triple valves, pressure retaining valve, 1¼ inch air brake pipe and angle cocks, required on all cars. In interchange.

"(a) (2). A. R. A. Standard triple valves required on all cars built on or after January 1, 1919. In interchange.

"(h). Hand brake arrangement must be efficient on all cars. On all cars built new or rebuilt after March 1, 1925, the braking power shall conform to the standard adopted in 1924. In interchange."

Paragraph (a) (2) amended effective July 1, 1928, to read (See Supplement No. 1 to Code revised 1927, page 4):

"(a) (2). A. R. A. Standard triple valves required on all cars built new on or after January 1, 1919, and on all cars rebuilt on or after July 1, 1928. In interchange."

Rule amended effective January 1, 1929, to read (See Code revised 1928, pages 15 and 16):

"Rule 3. Cars not conforming to the following requirements will not be accepted in interchange, or from car owners, as specified:

"(a) (1). Air brakes, including quick action triple valve, pressure retaining valve, 1¼ inch air brake pipe

and angle cocks, required on all cars. In interchange.

"(a) (2). Air brakes, including centrifugal dirt collector, in addition to above details, required on all cars built new or rebuilt on and after June 1, 1928. From owners.

"(a) (3). A. R. A. Standard triple valves required on all cars built new on or after January 1, 1919, and on all cars rebuilt on or after July 1, 1928. In interchange.

"(h). Hand brake arrangement must be efficient on [fol. 5625] all cars. On all cars built new or rebuilt after March 1, 1925, the braking power shall conform to the standard adopted in 1924. In interchange."

Effective date of requirement contained in Paragraph (a) (2) was extended from June 1, 1929, to August 1, 1929, and extension announced in Supplement No. 1 to Code revised 1928, page 3.

Rule amended effective January 1, 1933, to read (See Code revised 1932, pages 15 and 17):

"Rule 3. Cars not conforming to the following requirements will not be accepted in interchange, or from car owners, as specified:

"(a) (1) Air Brakes, including quick action triple valve, pressure retaining valve, 1¼ inch air brake pipe and angle cocks, required on all cars. In interchange.

"(a) (2) Air brakes, location of retaining valves in accordance with A. R. A. Standard, required on all cars built new or rebuilt on or after August 1, 1933.

"(a) (3) Air brakes, including centrifugal dirt collector, in addition to above details, required on all cars built new or rebuilt on or after August 1, 1929. From owners.

"(a) (4) A. R. A. Standard triple valves required on all cars built new on or after January 1, 1919, and on all cars rebuilt on or after July 1, 1928. In interchange.

"Note: Cars equipped with new experimental design of air brake equipment designated as 'AB,' and stenciled 'AB brake experimental' will be accepted in interchange on or after November 15, 1932."

"(h) Hand brake arrangement must be efficient on all cars. On all cars built new or rebuilt after March 1, 1925, the braking power shall conform to the standard adopted in 1924. In interchange."

[fol. 3626] Rule amended effecting January 1, 1934, to read: (See Code revised 1933, pages 15 and 18):

"Rule 3. Cars not conforming to the following requirements will not be accepted in interchange, or from car owners, as specified:

"(a) (1) Air brakes, including quick action triple valve, pressure retaining valve, 1¼ inch air brake pipe and angle cocks, required on all cars. In interchange.

"(a) (2) Air brakes, location of retaining valves in accordance with A. R. A. Standard, required on all cars built new or rebuilt on or after August 1, 1933.

"(a) (3) Air brakes, including centrifugal dirt collector, in addition to above details, required on all cars built new or rebuilt on or after August 1, 1929. From owners.

"(a) (4) Air brakes meeting requirements of A. R. A. Specifications for Air Brakes adopted in 1933, required on all cars built new on or after September 1, 1933. From Owners. Air brakes meeting requirements of A. R. A. Specifications for air brakes adopted in 1933, or A. R. A. standard triple valves required on all cars built new between January 1, 1919, and September 1, 1933, and on all cars rebuilt on or after July 1, 1928. In Interchange.

"NOTE: The design of air brake equipment designated as 'AB' meets all of the requirements of the A. R. A. Specifications for air brakes adopted in 1933. Cars built prior to September 1, 1933, and equipped with 'AB' brakes should be so stenciled; for cars built after September 1, 1933, the date built will govern.

"(h) (1) Hand brake arrangement must be efficient on all cars. On all cars built new or rebuilt after March 1, 1925, the braking power shall conform to the standard adopted in 1924. In Interchange.

"(h) (2) Hand brake connection between brake staff and rod, must be of chain, effective January 1, 1935. From owners.

[fol. 5627] Rule amended effective January 1, 1935 to read (See Code revised 1934, pages 15 and 18):

"Rule 3. No car of an untried type, whether built new, altered or changed, shall be offered or accepted in interchange, nor accepted from car owner, until its size, capacity and design shall have been approved by the Transportation and Mechanical Divisions of the Association of American Railroads.

"In addition to the foregoing, all cars must conform to the following requirements to render them acceptable in interchange, or from car owner, as specified:

"(a) (1) Air brakes, including quick action triple valve, pressure retaining valve, 1¼ inch air brake pipe and angle cocks, required on all cars. In interchanges.

"(a) (2) Air brakes, location of retaining valves in accordance with A. R. A. standard, required on all cars built new or rebuilt on or after August 1, 1933. From owners.

"(a) (3) Air brakes, including centrifugal dirt collector, in addition to above details, required on all cars built new or rebuilt on or after August 1, 1929. From owners.

"(a) (4) Air brakes meeting requirements of A. R. A. Specifications for Air Brakes adopted in 1933, required on all cars built new on or after September 1, 1933. From owners. Air brakes meeting requirements of A. R. A. Specifications for air brakes adopted in 1933 or A. R. A. standard triple valves, required on all cars built new between January 1, 1919, and September 1, 1933, and on all cars rebuilt on or after July 1, 1928. In interchange. On and after January 1, 1945, all freight cars in interchange service must be equipped with air brakes meeting the requirements of the A. R. A. Specification for Air Brakes adopted in 1933. Each car owner shall make a report quarterly to the Association of American Railroads show- [fol. 5628] ing by months the number of freight cars acquired and the number of freight cars on which brake equipment is converted, which information will be filed quarterly with the Interstate Commerce Commission and the Coordinator.

"NOTE: The design of air brake equipment designated as 'AB' meets all of the requirements of the A. R. A. Specifications for air brakes adopted in 1933. Cars built prior to September 1, 1933, and equipped with 'AB' brakes should be so stenciled; for cars built after September 1, 1933, the date built will govern.

"(h) (1) Hand brake arrangement must be efficient on all cars. On all cars built new or rebuilt after March 1, 1925, the braking power shall conform to the standard adopted in 1924. In interchange.

"(h) (2) Hand brake connection between brake staff and rod, must be of chain, effective January 1, 1936. From owners."

Rule amended effective August 1, 1935 by addition of new fifth paragraph, reading as follows (See Supplement No. 2 to Code revised 1934, page 3):

"(a) (5) Air brake triple valves on cars having annual air brake cleaning performed on or after January 1, 1935, as indicated by air brake stenciling, must be equipped with graduating springs (piece Nos. 18286 or QT 369). In interchange."

Section (h) of rule amended effective January 1, 1936, to read (See Code revised 1935, page 19):

"(h) (1) Hand brake arrangement must be efficient on all cars. On all cars built new or rebuilt after March 1, 1925, the braking power shall conform to the standard adopted in 1924. In interchange.

"(h) (2) Hand brake connection between brake staff [fol. 5629] and rod, must be of chain, effective January 1, 1936. From owners.

"(h) (3) Hand brakes, geared, applied to cars built new on or after March 1, 1936, must comply with the requirements of the A. A. R. Specification. All new installations of geared hand brakes made by car owner on or after March 1, 1936, must comply with the requirement of the A. A. R. Specification. From owners."

Section (h) of rule amended effective January 1, 1937, to read (See Code revised 1936, page 19):

"(h) (1) Hand brake arrangement must be efficient on all cars. On all cars built new or rebuilt after March 1, 1925, the braking power shall conform to the standard adopted in 1924. In interchange.

"(h) (2) Hand brake connection between brake staff and rod, must be of chain, effective January 1, 1936. From owners.

"(h) (3) Hand brakes, geared, complying with the requirements of the A. A. R. Specifications for Geared Hand Brakes, required on all cars built new on or after January 1, 1937. All new installations of geared hand brakes made by car owner on or after March 1, 1936, must comply with the requirements of the A. A. R. Specification. From owners."

Rule amended effective January 1, 1939, to read (See Code revised 1938, pages 15, 16 and 20):

"Rule 3. No car of an untried type, whether built new, altered or changed, shall be offered or accepted in interchange, nor accepted from car owner, until its size, capacity and design shall have been approved by the Transportation and Mechanical Divisions of the Association of American Railroads.

"In addition to the foregoing, all cars must conform to the following requirements to render them acceptable in interchange, or from car owner, as specified:

"Note—the terms "cars built new" and "cars re- [fol. 5630] built" as specified in the various requirements of this rule, are defined in Section E of Rule 112.

"(a) (1) Air brakes, including quick action triple valve, pressure retaining valve, 1¼ inch air brake pipe and angle cocks, required on all cars. In interchange.

"(a) (2) Air brakes, location of retaining valves in accordance with A. A. R. Standard, required on all cars built new or rebuilt on or after August 1, 1933. In interchange.

"Note—It is recommended that when cars built new or rebuilt prior to August 1, 1933, receive Class I general repairs, retaining valves be located in accordance with A. A. R. Standard.

"(a) (3) Air brakes, including centrifugal dirt collector, in addition to above details, required on all cars built new or rebuilt on or after August 1, 1929. In interchange.

"(a) (4) Air brakes meeting requirements of A. A. R. Specifications for Air Brakes adopted in 1933, required on all cars built new on or after September 1, 1933, and on all cars rebuilt on or after August 1, 1937. From owners. Air brakes meeting requirements of A. A. R. Specifications for air brakes adopted in 1933 or A. A. R. standard triple valves, required on all cars built new between January 1, 1919, and September 1, 1933, and, on all cars rebuilt between July 1, 1928, and August 1, 1937. In interchange. On and after January 1, 1945, all freight cars in interchange service must be equipped with air brakes meeting the requirements of the A. A. R. Specification for Air Brakes adopted in 1933. Each car owner shall make a report quarterly to the Association of American Railroads showing by months the number of freight cars acquired and the number of freight cars on which brake equipment is converted, which information will be filed quarterly [fol. 5631] with the Interstate Commerce Commission.

"Note—The design of air brake equipment designated as 'AB' meets all of the requirements of the A. A. R. Specifications for Air Brakes adopted in 1933. Cars built prior to September 1, 1933, and equipped with 'AB' brakes should be so stenciled; for cars built on or after September 1, 1933, and rebuilt on or after August 1, 1937, the date or rebuilt will govern.

"(h) (1) Hand brake arrangement must be efficient on all cars. On all cars built new or rebuilt between March 1, 1925 and January 1, 1937, the braking power shall conform to the standard adopted in 1924, or car equipped with geared hand brake complying with the requirements of the A. A. R. Specifications for Geared Hand Brakes. In interchange.

"(h) (2) Hand brake connection between brake staff and rod, must be of chain. From owners.

"(h) (3) Hand brakes, geared, complying with the requirements of the A. A. R. Specifications for Geared

Hand Brakes, required on all cars built new on or after January 1, 1937. All new installations of geared hand brakes made by car owner on or after March 1, 1936, must comply with the requirements of the A. A. R. Specifications. From Owners."

Paragraph (a) (4) of this rule was amended in Supplement No. 1 to Code revised 1938, issued July, 1939, to read (See Supplement No. 1 to Code revised 1938, page 3):

"(a) (4) Air brakes meeting requirements of A. A. R. Specifications for air brakes adopted in 1933, required on all cars built new on or after September 1, 1933, and on all cars rebuilt on or after August 1, 1937. From owners. Air brakes meeting requirements of A. A. R. Specifications for air brakes adopted in 1933 or A. A. R. standard triple valves, required on all cars built new between January 1, 1919 and Sep- [fol. 5632] tember 1, 1933, and, on all cars rebuilt between July 1, 1928, and August 1, 1937. In interchange. On and after January 1, 1945, all freight cars in interchange service must be equipped with air brakes meeting the requirements of the A. A. R. Specification for Air Brakes adopted in 1933. Each car owner shall make a report semi-annually to the Association of American Railroads showing by months the number of freight cars acquired and the number of freight cars on which brake equipment is converted, which information will be filed semi-annually with the Interstate Commerce Commission.

"Note—The design of air brake equipment designated as 'AB' meets all of the requirements of the A. A. R. Specifications for Air Brakes adopted in 1933. Cars built prior to September 1, 1933, and equipped with 'AB' brakes should be so stenciled; for cars built on or after September 1, 1933, and rebuilt on or after August 1, 1937, the date built or rebuilt will govern."

[fol. 5633] *Axles*

The Interchange Rules effective September 1, 1911, carried no requirement as to type of axles required on cars in interchange service.

Effective October 1, 1915 a new rule was added to the Code, to read (See page 519 of 1915 M. C. B. Proceeding):

"Rule 3. (d). Cars built after October 1, 1915, with axles other than M. C. B. Standard, will not be accepted in interchange.

"Cars built prior to October 1, 1915, will not be accepted in interchange after October 1, 1917 unless equipped with M. C. B. Standard axles."

Effective date of second paragraph of Section (d), Rule 3, was extended from October 1, 1917 to October 1, 1920, in Code effective October 1, 1916. (See Code revised 1916, page 12.)

New last paragraph added to Section (d) of Rule 3, in Code effective October 1, 1917, to read (See Code revised 1917, page 14):

"After October 1, 1920, cars will not be accepted in interchange with axles of less capacity than required by the sum of the light weight and the marked capacity of the car."

Rule amended effective November 1, 1919, to read (See Code revised 1919, page 12):

"Rule 3 (d) Cars built after October 1, 1915, with axles other than A. R. A. Standard, will not be accepted in interchange.

"Cars built prior to October 1, 1915, will not be accepted in interchange after October 1, 1920, unless equipped with A. R. A. Standard axles.

"After October 1, 1920, cars will not be accepted in interchange with axles of less capacity than required by the sum of the light weight and marked capacity of the car."

Effective date of second paragraph of Section (d) of Rule 3 was extended from October 1, 1920, to October 1, 1922, in Code effective November 1, 1920 (See Code revised 1920, [fol. 5634] page 15).

Effective date of second paragraph of Section (d) of Rule 3 was extended from October 1, 1922 to January 1, 1924, in Code effective January 1, 1923 (See Code revised 1922, page 15).

Effective date of second paragraph of Section (d) of Rule 3 was extended from January 1, 1924 to January 1, 1926, in Code effective January 1, 1924 (See Code revised 1923, page 14).

Effective date of second paragraph of Section (d) of Rule 3 was extended from January 1, 1926 to January 1, 1928, in Code effective January 1, 1926 (See Code revised 1925, page 20).

Effective January 1, 1927, Section (d) of Rule 3 was relocated as Paragraphs (3), (4) and (5) of Section (a) of same rule, to read (See Code revised 1926, page 19):

"(a) (3) Axles, A. R. A. Standard, required on all cars built on or after October 1, 1915. In interchange.

"(a) (4) Axles, A. R. A. Standard, will be required, effective January 1, 1928, on all cars built prior to October 1, 1915. In interchange.

"(a) (5) Axles must be of not less capacity than required by the sum of the light weight and the marked capacity of car, on all cars. In Interchange."

Effective date of Paragraph (a) (4) of Rule 3 was extended from January 1, 1928 to January 1, 1929, in Supplement No. 1 to Code revised 1926, issued in July, 1927 (See Supplement No. 1 to Code revised 1926, page 4).

Rule amended effective January 1, 1929 to read (See Code revised 1928, page 15):

"(a) (4) Axles, A. R. A. Standard, required on all cars built new or rebuilt on or after October 1, 1915, and on all cars rebuilt on or after July 1, 1928. In interchange.

[fol. 5635] "(a) (5) Axles, A. R. A. Standard, will be required effective January 1, 1930, on all cars built prior to October 1, 1915. In interchange.

"(a) (6) Axles must be of not less capacity than required by the sum of the light weight and the marked capacity of car, on all cars. In interchange."

Rule amended effective January 1, 1930, to read (See Code revised 1929, page 15):

"(a) (4) Axles, A. R. A. Standard, required on all cars, except cars of 70,000 lb. capacity built prior to October 1, 1915. In interchange.

"(a) (5) Axles, A. R. A. Standard, will be required on all cars of 70,000 lb. capacity, effective January 1, 1935. In interchange.

"(a) (6) Axles must be of not less capacity than required by the sum of the light weight and the load limit markings of car, on all cars. In interchange."

Paragraphs (4), (5) and (6) of Section (a) of Rule 3 relocated as new paragraphs (5), (6) and (7) effective January 1, 1932. (See Code revised 1932, page 15.)

Effective date of Paragraph (a) (6) of Rule 3 extended from January 1, 1935 to January 1, 1936, in Supplement No. 1 to Code revised 1933 issued in July, 1934 (See Supplement No. 1, page 2).

Paragraphs (5), (6) and (7) of Section (a) of Rule 3 relocated as new Paragraphs (6), (7) and (8), and effective date of new Paragraph (7) extended from January 1, 1936 to January 1, 1937, effective August 1, 1935, in Supplement No. 2 to Code revised 1934 issued in July, 1935 (See Supplement No. 2, page 2).

Effective date of Paragraph (a) (7) extended from January 1, 1937 to January 1, 1938 in Supplement No. 2 to Code [fol. 5636] revised 1936, issued in *in* July, 1937 (See Supplement No. 2, Page 2).

Rule amended effective January 1, 1938, to read (See Code revised 1937, page 16):

"Rule 3. (a) (6) Axles, A. A. R. Standard, required on all cars. In interchange.

"(a) (7) Axles must be of not less capacity than required by the sum of the light weight and the load limit markings of car, on all cars. In interchange.

Rule amended effective January 1, 1939, to read (See Code revised 1938, page 16):

"Rule 3. (a) (5) Axles, A. A. R. Standard, of not less capacity than required by the sum of the light weight and the load limit markings of car, required on all cars. In interchange."

[fol. 5637] Brake Beams

The Interchange Rules effective September 1, 1911, carried no requirement as to type of brake beams required on cars in interchange service.

Effective October 1, 1914, a new rule was added to the Code, to read (See Code revised 1914, page 5):

"Rule 3. (c) Cars built after October 1, 1914, will not be accepted in interchange unless equipped with either the No. 1 or the No. 2 M. C. B. Standard brake beams and so marked plainly on strut by stamping or casting on."

Rule amended effective October 1, 1916, to read (See Code revised 1916, pages 10 and 12):

"Rule 3. (c) Cars built after October 1, 1914, and prior to January 1, 1917, will not be accepted in interchange unless equipped with either the No. 1 or the No. 2 M. C. B. Standard brake beam, as indicated by the light weight of the car.

"Cars built after January 1, 1917, must be equipped with metal brake beams of not less than the capacity of the No. 2 M. C. B. Standard, or stronger, as the conditions may require.

"All of the brake beams referred to shall have the letters 'M. C. B.' and proper number plainly stamped or cast on strut, as required by the specifications.

"After October 1, 1918, cars will not be accepted in interchange unless equipped with all-metal brake beams."

Rule amended effective October 1, 1917, to read (See Code revised 1917, pages 12 and 14):

"Rule 3 (c) Cars built after October 1, 1914, and prior to January 1, 1917, will not be accepted in interchange unless equipped with either the No. 1 or the No. 2 M. C. B. Standard brake beam, as indicated by the [fol. 5638] light weight of the car.

"No. 1 M. C. B. Standard brake beams must not be used on cars having a light weight in excess of 35,000 lbs.

"Cars built after January 1, 1917, must be equipped with metal brake beams of not less than the capacity of the No. 2 M. C. B. Standard, or stronger, as the conditions may require.

"All of the brake beams referred to shall have the letters 'M. C. B.' and proper number plainly stamped or cast on strut, as required by the specifications.

"After October 1, 1920, cars will not be accepted in interchange unless equipped with all-metal brake beams.

"After January 1, 1918, all brake beams applied to new cars shall be in accordance, in all respects, with the requirements of dimensions shown on Sheets M. C. B. 17 and 17-A, Standards."

Rule amended effective November 1, 1918, to read (See Code revised 1918, pages 13 and 14):

"Rule 3. (c) Cars built after October 1, 1914, and prior to January 1, 1917, will not be accepted in interchange unless equipped with either the No. 1 or the No. 2 M. C. B. brake beam, as indicated by the light weight of the car; the No. 1 beam must not be used on cars having a light weight in excess of 35,000 lb.

"Cars built after January 1, 1917, or cars receiving general repairs after October 1, 1918, must be equipped with metal brake beams of not less than the capacity of the No. 2 M. C. B., or stronger, as the conditions may require.

"All of the M. C. B. brake beams referred to shall have the letters 'M. C. B.' and proper number plainly stamped or cast on strut, as required by the specifications.

"After October 1, 1920, cars will not be accepted in interchange unless equipped with all-metal brake beams. [fol. 5639] "After January 1, 1918, all brake beams applied to new cars shall be in accordance, in all respects, with the requirements of dimensions shown on Sheets M. C. B. 17 and 17-A, Standards."

Rule amended effective November 1, 1919, to read (See code revised 1919, pages 11 and 12):

"Rule 3 (c). Cars built after October 1, 1914, and prior to January 1, 1917, will not be accepted in interchange unless equipped with either the No. 1 or the No. 2 A. R. A. brake beam, as indicated by the light weight of the car; the No. 1 beam must not be used on cars having a light weight in excess of 35,000 lb.

"Cars built after January 1, 1917, or cars receiving general repairs after October 1, 1918, must be equipped with metal brake beams of not less than the capacity of

the No. 2 A. R. A., or stronger, as the conditions may require.

"All of the A. R. A. brake beams referred to shall have the letters 'A. R. A.' and proper number plainly stamped or cast on strut, as required by the specifications.

"Note—Where brake beams already have the letters 'M. C. B.' stamped or cast on the strut, they will be considered as complying with this rule.

"After October 1, 1920, cars will not be accepted in interchange unless equipped with all-metal brake beams.

"After January 1, 1918, all brake beams applied to new cars shall be in accordance, in all respects, with the requirements of dimensions shown on Sheets A. R. A. 17, 17-A and 17-B, Standards."

Rule amended effective January 1, 1922, to read (See Code revised 1921, page 14):

"Rule 3 (c). Cars built after October 1, 1914, and prior to January 1, 1917, will not be accepted in interchange unless equipped with either the No. 1 or the [fol. 5640] No. 2 A. R. A. brake beam, as indicated by the light weight of the car; the No. 1 beam must not be used on cars having a light weight in excess of 35,000 lb-.

"Cars built after January 1, 1917, or cars receiving general repairs after October 1, 1918, must be equipped with metal brake beams of not less than the capacity of the No. 2 A. R. A., or stronger, as the conditions may require.

"All of the A. R. A. brake beams referred to shall have the letters 'A. R. A.' and proper number plainly stamped or cast on strut, as required by the specifications.

"Note—Where brake beams have the letters 'M. C. B.' stamped or cast on the strut, they will be considered as complying with this rule.

"Cars will not be accepted in interchange unless equipped with all-metal brake beams.

"After January 1, 1918, all brake beams applied to new cars shall be in accordance, in all respects, with the requirements of dimensions shown in the A. R. A. Manual of Standard and Recommended Practice."

Second paragraph of Section (c) of Rule 3 amended effective January 1, 1923, to read (See Code revised 1922, page 14):

"Rule 3 (c) (Second paragraph) Cars built after January 1, 1917, or cars receiving general repairs after October 1, 1918, must be equipped with metal brake beams of not less than the capacity of the No. 2 A. R. A. brake beam."

Rule amended and relocated as Section (b) of Rule 3 effective January 1, 1927, to read (See Code revised 1926, pages 19 and 20):

"Rule 3. (b) (1). Brake beams, A. R. A., on all cars built on or after January 1, 1917, must be of not less than the capacity of the No. 2 beam. In interchange.

"(b) (2). Brake beams, A. R. A., on all cars built on or after October 1, 1914, and prior to January 1, 1917, having light weight of *of* 35,000 lbs. or under [fol. 5641] must be of not less capacity than the No. 1 beam; if in excess of 35,000 lbs., not less than capacity of the No. 2 beam. In interchange.

"(b) (3). The A. R. A. brake beams referred to must conform to requirements of the Manual of Standard and Recommended Practice, including the letters 'A. R. A.' and class number cast or stamped on strut; the letters 'M. C. B.' is previously cast or stamped on strut will be considered as meeting this requirement.

"(b) (4). Brake beams, metal, required on all cars. In interchange.

"(b) (5). Brake beams, A. R. A., of not less capacity than the No. 2 shall be applied to all cars receiving general repairs.

"(b) (6). Brake beams on all cars built on or after September 1, 1909, must be hung from the trucks, effective January 1, 1928. From owners."

Effective date of Paragraph (b) (6) of Rule 3 was extended from January 1, 1928 to January 1, 1929, in Supplement No. 1 to Code revised 1926, issued July, 1927 (See Supplement No. 1 to Code revised 1926, page 4).

Paragraphs (1) and (6) of Section (b) of Rule 3 were amended effective July 1, 1928, to read (See Supplement No. 1 to Code revised 1927, page 2):

"Rule 3. (b) (1). Brake beams, A. R. A., on all cars built new on or after January 1, 1917, and on all cars rebuilt on or after July 1, 1928, must be of not less than the capacity of the No. 2 beam. In interchange.

"(b) (6). Brake beams, A. R. A., on all cars built new on or after September 1, 1909, and on all cars rebuilt on or after July 1, 1928, must be hung from the trucks, effective January 1, 1930. From owners."

Effective date of Paragraph (b) (6) of Rule 3 was extended from January 1, 1930 to January 1, 1931, and an- [fol. 5642] nounced in Supplement No. 1 to Code revised 1928, page 3.

Effective date of Paragraph (b) (6) of Rule 3 was extended from January 1, 1931 to January 1, 1932 and announced in Supplement No. 1 to Code revised 1929, page 3.

Rule amended effective January 1, 1931, to read (See Code revised 1930, pages 15 and 16):

"Rule 3. (b) (1) Brake beams, A. R. A., on all cars built new on or after January 1, 1917, and on all cars rebuilt on or after July 1, 1928, must be of not less than the capacity of the No. 2 beam. In interchange.

"(b) (2) The A. R. A. brake beam referred to must conform to requirements of the Manual of Standard and Recommended Practice, including the letters 'A. R. A.' and class number cast or stamped on the strut; the letters 'M. C. B.' if previously cast or stamped on strut will be considered as meeting this requirement.

"(b) (3) Brake beams, metal, required on all cars. In interchange.

"(b) (4) Brake beams, A. R. A., of not less capacity than the No. 2, shall be applied to all cars receiving general repairs.

"(b) (5) Brake beams on all cars built new on or after September 1, 1909, and on all cars rebuilt on or after July 1, 1928, must be hung from the trucks, effective January 1, 1932. From owners."

Rule amended effective January 1, 1935, to read (See Code revised 1934, pages 15 and 16):

"Rule 3. (b) (1) Brake beams, A. R. A. Standard No. 15 or A. R. A. No. 3, required on all cars built new on or after January 1, 1935. In interchange.

"(b) (2) Brake beams, A. R. A., of not less than the capacity of the No. 2 beam, required on all cars. In interchange.

"(b) (3) The A. R. A. brake beams referred to must conform to requirements of the Manual of Standard and Recommended Practice, including the letters 'A. [fol. 5643] R. A. and class number cast or stamped on strut; the letters 'M. C. B.', if previously cast or stamped on strut will be considered as meeting this requirement.

"(b) (4) Brake beams on all cars built new on or after September 1, 1909, and on all cars rebuilt on or after July 1, 1928, must be hung from the trucks, effective January 1, 1932. From owners."

Paragraph (b) (1) of Rule 3 amended effective August 1, 1937, to read (See Supplement No. 1 to Code revised 1936, page 3):

"(b) (1) Brake beams, A. A. R. Standard No. 15 or A. A. R. No. 3 required on all cars built new on or after January 1, 1935, and on all cars rebuilt on or after August 1, 1937. In interchange."

Paragraph (b) (4) of Rule 3 amended effective January 1, 1939, to read (See Code revised 1938, page 17):

"(b) (4) Brake beams on all cars built new on or after September 1, 1909, and on all cars rebuilt on or after July 1, 1928, must be hung from the trucks. In interchange."

[fol. 5644] Brake Beam Hangers

The interchange rules effective September 1, 1911 carried no requirement as to type of brake beam hangers required on cars in interchange.

Effective January 1, 1930, a new rule was added to the Code, to read (See Code revised 1929, page 16):

"Rule 3. (b) (7). Brake beam hangers and brake beam hanger pins conforming to A. R. A. Standard required on all cars built new or rebuilt on or after January 1, 1930. From owners.

"(b) (8) Brake beam hangers designed with eyes which are not formed solid, prohibited, effective January 1, 1933, on all cars. From owners."

Paragraph (b) (7) of Rule 3 amended effective August 1, 1930, to read (See Supplement No. 1 to Code revised 1929, page 4):

"Rule 3. (b) (7) Brake beam hangers and brake beam hanger pins conforming to A. R. A. Recommended Practice, or equivalent in strength, required on all cars built new or rebuilt on or after January 1, 1930. From owners."

Effective January 1, 1931, Paragraphs (7) and (8) of Section (b) of Rule 3 were relocated as new Paragraphs (6) and (7) (See Code revised 1930, page 16).

Effective date of Paragraph (b) (7) of Rule 3 was extended from January 1, 1933 to January 1, 1934 and announced in Supplement No. 2 to Code revised 1931, page 2.

Effective date of Paragraph (b) (7) of Rule 3 was extended from January 1, 1934, to January 1, 1935, and announced in Suppleemnt No. 1 to Code revised 1932, page 2.

Effective date of Paragraph (b) (7) of Rule 3 was extended from January 1, 1935 to January 1, 1936, and announced in Supplement No. 1 to Code revised 1933, page 2. [fol. 5645] Effective date of Paragraph (b) (7) of Rule 3 was extended from January 1, 1936 to January 1, 1937, and announced in Supplement No. 2 to Code revised 1934, page 2.

Effective date of Paragraph (b) (7) of Rule 3 was extended from January 1, 1937 to January 1, 1938, and announced in Supplement No. 1 to Code revised 1935, page 2.

Rule amended effective January 1, 1938, to read (See Code revised 1937, page 17):

"Rule 3. (b) (5) Brake beam hangers and brake beam hanger pins conforming to A. A. R. Recommended

Practice or equivalent in strength, required on all cars built new or rebuilt on or after January 1, 1930. From owners.

"(b) (6) Brake beam hangers designed with eyes which are not formed solid, prohibited on all cars. From owners."

[fol. 5646] Couplers

The Interchange Rules in effect from September 1, 1911 to October 1, 1914, contained no provisions with respect to type of couplers required on cars in interchange.

A new rule, 3(b), was added to the Code effective October 1, 1914, to read (See Code revised 1914, page 5):

"Rule 3. (b) Cars will not be accepted in interchange equipped with stem or spindle coupler attachments."

Amended effective October 1, 1917, to read (See Code revised 1917, page 12):

"Rule 3. (b) Cars will not be acepted in interchange equipped with stem or spindle coupler attachments or American continuous draft rods."

A new Paragraph (m) was added to Rule 3 effective November 1, 1918, to read (See Code revised 1918, page 16):

"Rule 3. (m) Cars built after January 1, 1919, must be equipped with coupler operating lever connected direct with coupler lock or lock lift without the use of links, clevises or chains."

A new paragraph, (o), was added to Rule 3 effective November 1, 1920, to read (See Code revised 1920, page 18):

"Rule 3. (o) Cars built after November 1, 1920, will not be accepted in interchange unless equipped with 6 inch by 8 inch shank A. R. A. Standard Type 'D' couplers."

Rule 3 (b) amended effective January 1, 1923, to read (See Code revised 1922, page 14):

"Rule 3. (b) Cars will not be accepted in interchange equipped with stem or spindle coupler attachments or American continuous draft rods.

"After January 1, 1924, cars equipped with couplers having riveted yoke without lugs will not be accepted in interchange."

[fol. 5647] Effective data of second paragraph of Rule 3 (b) was etxended to January 1, 1925 on June 15, 1923.

Rule 3 (o) was amended effective January 1, 1924, to read (See Code revised 1923, page 17):

"Rule 3. (o) Cars built after November 1, 1920, will not be accepted from owner unless equipped with 6 in. by 8 in. shank A. R. A. Standard Type 'D' couplers."

Rule 3 (b), second paragraph, amended effective January 1, 1925, to read (See Code revised 1924, page 19):

"Rule 3. (b) (Second paragraph) After January 1, 1926, cars equipped with couplers having riveted yoke without lugs, where such yokes are riveted directly to the coupler, will not be accepted in interchange.

Effective January 1, 1925, former Paragraph (o) of Rule 3 relocated as new Paragraph (p).

Effective date of second paragraph of Rule 3 (b) extended to January 1, 1927 in July, 1925.

Rule amended effective January 1, 1927, to read (See Code revised 1926, pages 20 and 21):

"Rule 3. (c) (1) Couplers, A. R. A. Standard Type 'D' with 6x8 shank, required on all cars built on or after November 1, 1920. From owners.

"(c) (2). Couplers having stem or spindle attachments, or American continuous draft rods, prohibited on all cars. In interchange.

"(c) (3). Couplers having riveted yokes without lugs, where such yokes are riveted directly to the coupler, prohibited, effective January 1, 1928, on all cars. In interchange.

"(c) (4). Coupler operating levers connected direct with coupler lock or lift without the use of links, clevises, clevis pins or chains, required on all cars built on or after January 1, 1919. In interchange."

[fol. 5648] Effective date of Paragraph (c) (3) of Rule 3 extended to January 1, 1929, in July, 1927.

A new paragraph, (c) (5), was added to Rule 3 effective January 1, 1928, to read (See Code revised 1927, page 16):

"Rule 3. (c) (5). Coupler operating levers connected direct with coupler lock or lift without the use of links, clevises, clevis pins or chains, shall be applied to all cars when replacing broken or missing levers where practicable, or when cars receive general repairs."

Effective July 1, 1928, Paragraphs (c-1), (c-4), (c-5) and (c-6) of Rule 3 were amended to read as follows (See Supplement No. 1 to Code revised 1927, pages 4 and 5):

"Rule 3. (c) (1). Couplers, A. R. A. Standard Type 'D' with 6 x 8 inch shank required on all cars built new on or after November 1, 1920; and A. R. A. Standard Type 'D' with 5 x 7 or 6 x 8 inch shanks, required on all cars rebuilt on or after July 1, 1928. From owners.

"(c) (4). Couplers having liner blocks applied between butt and riveted yoke, if not integral with either butt or yoke, prohibited, effective January 1, 1929, on all cars. In interchange.

"(c) (5). Coupler operating levers connected direct with coupler lock or lift without the use of links, clevises, clevis pins or chains, required on all cars built new on or after January 1, 1919, and on all cars rebuilt on or after July 1, 1928. In interchange.

"(c) (6) Coupler operating levers connected direct with coupler lock or lift without the use of links, clevises, clevis pins or chains shall be applied to all cars when replacing broken or missing levers where practicable, or when cars receive general repairs.

Rule amended effective January 1, 1932, to read (See Code revised 1931, pages 16 and 17):

"Rule 3. (c) (1). Couplers, A. R. A. Standard Type [fol. 5649] 'E' with 6¼ x 8 inch shank, or A. R. A. Alternate Standard 6¼ x 8 inch swivel type, required on all cars built new on or after August 1, 1932. From owners.

"(c) (2) Couplers, A. R. A. Standard Type 'E' with 6¼ x 8 inch shank, or A. R. A. Standard Type 'D' with 6 x 8 inch shank or A. R. A. Alternate Standard 6¼ x 8 swivel type, or couplers having Type 'D' head designed

with swivel or radial butt, required on all cars built new between November 1, 1920 and August 1, 1932. From owners.

"(c) (3) Couplers, A. R. A. Standard Type 'E' with 5 x 7 or 6¼ x 8 inch shank, or A. R. A. Alternate Standard swivel type, or A. R. A. Standard Type 'D' with 5 x 7 or 6 x 8 inch shank or couplers having Type 'D' head designed with swivel or radial butt, required on all cars rebuilt on or after July 1, 1928. From owners.

"(c) (4) Couplers having stem or spindle attachments, or American continuous draft rods, prohibited on all cars. In interchange.

"(c) (5) Couplers having riveted yokes without lugs, where such yokes are riveted directly to the coupler, prohibited, effective January 1, 1929, on all cars. In interchange.

"(c) (6) Couplers having liner blocks applied between butt and riveted yoke, if not integral with either butt or yoke, prohibited, effective January 1, 1929, on all cars. In interchange.

"(c) (7) Coupler operating levers connected direct with coupler lock or lift without the use of links, clevises, clevis pins or chains, required on all cars built new on or after January 1, 1919, and on all cars rebuilt on or after July 1, 1928. In interchange.

"(c) (8) Coupler operating levers connected direct with coupler lock or lift without the use of links, clevises, clevis pins or chains, shall be applied to all cars when replacing broken or missing levers where practicable, or when cars receive general repairs."

[fol. 5650] Effective dates of Paragraphs (c-1) and (c-2) of Rule 3 were extended to January 1, 1933 in July, 1932.

A new Paragraph (c-9) was added to Rule 3 effective January 1, 1933, to read (See Code revised 1932, page 17):

"Rule 3. (c) (9). Coupler operating rigging of the rotating type handle (which pulls out and up through an arc similar to type shown on Plate B of the United States Safety Appliance specifications), required on all cars built new or rebuilt on or after August 1, 1933.

"Note—It is recommended that where cars built prior to August 1, 1933, receive Class I general repairs, and new couplers are applied, that the rotating type handle of uncoupling rigging be applied."

Effective date of Paragraph (c-1) extended to August 1, 1933 on December 31, 1932.

Effective January 1, 1933, Paragraph (c-2) of Rule 3 was amended to read (See Supplement No. 1 to Code revised 1932, page 3):

"Rule 3. (c) (2). Couplers, A. R. A. Standard Type 'E' with 6¼ x 8 inch shank, or A. R. A. Standard Type 'D' with 6 x 8 inch shank, or A. R. A. Alternate Standard 6¼ x 8 inch swivel type, or couplers having Type 'D' head designed with swivel or radial butt, required on all cars built new, between November 1, 1920 and August 1, 1933. From owners."

Paragraphs (c-5) and (c-9) amended effective January 1, 1935, to read (See Code revised 1934, page 17):

"Rule 3. (c) .(5) Couplers having riveted yokes without lugs, where such yokes are riveted directly to the coupler, prohibited. In interchange.

"(c) (9) Coupler operating rigging of the rotating type handle (which pulls out and up through an arc similar to type shown on Plate B of the United States Safety Appliance specifications); required on all cars built new or rebuilt on or after August 1, 1933.

"Note—It is recommended that where cars built prior to August 1, 1933, receive Class I general repairs and new couplers are applied, that the rotating type [fol. 5651] handle of uncoupling rigging be applied."

A new Paragraph (c-10) was added to Rule 3 effective August 1, 1936, to read (See Supplement No. 1 to Code revised 1935, page 3):

"Rule 3. (c) (10) Coupler, Type 'D', cast after August 1, 1936, prohibited, effective January 1, 1937, on all cars. In interchange."

Paragraphs (c-1) and (c-3) amended, effective August 1, 1937, to read (See Supplement No. 1 to Code revised 1936, page 3):

"Rule 3. (c) (1) Couplers, A. A. R. Standard Type 'E' with 6¼ x 8 inch shank, or A. A. R. Alternate Standard 6¼ x 8 inch swivel type, required on all cars built new on or after August 1, 1933, and on all

cars rebuilt on or after August 1, 1937, except that on rebuilt cars 6 x 8 inch type 'D' couplers may be used. Where limitations in underframe construction on rebuilt cars make it impractical to apply 6¼ x 8 inch shank type 'E' or 6 x 8 inch shank type 'D' couplers, 5 x 7 inch shank types 'D' or 'E' couplers with key attachments are permissible. From owners.

"(c) (3) Couplers, A. A. R. Standard Type 'E' with 5 x 7 or 6¼ x 8 inch shank, or A. A. R. Alternate Standard swivel type, or A. R. R. Standard Type "D" with 5 x 7 or 6 x 8 inch shank, or couplers having Type "D" head designed with swivel or radial butt, required on all cars rebuilt between July 1, 1928 and August 1, 1937. From owners."

Effective August 1, 1938, new Paragraphs (c-11) and (c-12) were added to Rule 3, to read (See Supplement No. 2 to Code revised 1937, page 3):

"Rule 3. (c) (11) Couplers, former Standard or Temporary Standard having 5 x 5 inch shanks, prohibited, effective January 1, 1940, on all cars. From owners.

"(c) (12) Couplers, former Standard (Except Type D) or temporary Standard having 5x7 inch shanks, prohibited, effective January 1, 1942, on all cars. From owners."

Paragraphs (c-7) and (c-8) of Rule 3 amended effective January 1, 1939, to read (See Code revised 1938, page 18):

[fol. 5652] "Rule 3. (c) (7) Coupler operating levers connected direct with coupler lock or lift without the use of links, clevises, clevis pins, or chains, required on all cars built new between January 1, 1919 and August 1, 1933, and on all cars rebuilt between July 1, 1928 and August 1, 1933. In interchange.

"(c) (8) Coupler operating levers connected direct with coupler lock or lift without the use of links, clevises, clevis pins or chains, shall be applied to all cars built prior to January 1, 1919, when replacing broken or missing levers where practicable, or when cars receive general repairs, preferably as specified in note following Paragraph (9)."

Effective date of Paragraph (c-11) extended to January 1, 1941 on August 1, 1939; and further extended to January 1, 1942 on August 1, 1940.

[fol. 5653] *Draft Gears*

The Interchange Rules effective September 1, 1911, contain no provisions as to type of draft gears required on cars in interchange.

Effective January 1, 1934, a new rule was added to the Code, to read (See Code revised 1933, page 17):

"Rule 3. (d) (1). Draft gear, complying with A. R. A. Standard specifications for draft gears for freight service including certificate of approval, required on all cars built new on or after January 1, 1934. From owners.

"(d) (2). Draft gear, new, when applied to any car on or after January 1, 1934, shall, when practicable, comply with the foregoing specifications."

Note added to Paragraph (d) (1) of Rule 3, effective January 1, 1935, to read (See Code revised 1934, page 17):

"Note—The words 'draft gear,' as used in this rule, do not cover cushion unde frame construction."

Paragraph (d) (2) of Rule 3, amended effective January 1, 1935, to read (See Code revised 1934, page 17):

"Rule 3. (d) (2). Draft gear, new, when applied to any car on or after January 1, 1935, shall comply with the foregoing specifications unless the pocket dimensions of the car are such that an approved gear cannot be applied."

Paragraph (d) (1) of Rule 3 amended effective August 1, 1937, to read (See Supplement No. 1 to Code revised 1936, page 3):

"Rule 3. (d) (1). Draft gears complying with A. A. R. Standard specifications for draft gears for freight service including certificate of approval, required on all cars built new on or after January 1, 1934, and on all cars rebuilt on or after August 1, 1937, except that on rebuilt cars where limitations in underframe construc-
[fol. 5654] tion make it impractical to apply approved types of friction draft gears, non-approved types ac-

ceptable to the Committee on Couplers and Draft Gears are permissible. From owners."

[fol. 5655] *Trucks*

The Interchange Rules in effect from September 1, 1911 to January 1, 1928, contained no provisions with respect to type of trucks required under cars in interchange.

Effective January 1, 1928, a new rule was added as Paragraph (t) (1) to Rule 3, reading (See Code revised 1927, page 17):

"Rule 3. (t) (1). Truck side frames, cast-steel, conforming to A. R. A. Specifications, required on all cars built on or after July 1, 1928. From owners."

Rule amended effective January 1, 1929, to read (see Code revised 1928, page 17):

"Rule 3. (t) (1). Trucks, new, shall be equipped with cast-steel side frames conforming to A. R. A. Specifications, when applied to new or rebuilt car bodies on or after October 1, 1929. From owners."

Rule amended and new Paragraph (t) (2) added, effective August 1, 1929, to read (See Supplement No. 1 to Code revised 1928, pages 4 and 5):

"Rule 3. (t) (1). Trucks, new, when applied to any car on or after October 1, 1929, shall be equipped with cast-steel side frames conforming to current A. R. A. Specifications, and shall have month and year manufactured, also the letters 'A. R. A.', followed by the year date of specification, cast on the outer face. From owners.

"(t) (2). Trucks, second hand, when applied to car bodies built new or rebuilt on or after January 1, 1930, shall be equipped with cast-steel side frames.

"Note—Cast-steel side frames on such secondhand trucks should preferably comply with current A. R. A. Specifications, but existing cast-steel side frames of other design and specification may be used. However, when same are replaced with new cast-steel side frames, by car owner, such new frames shall comply with current A. R. A. specifications."

[fol. 5656] New paragraph (t) (3) added, effective August 1, 1930, to read (See Supplement No. 1 to Code revised 1929, page 4):

"Rule 3. (t) (3). Trucks with arch bars, prohibited, effective January 1, 1936, under all cars. From owners."

Effective August 1, 1935, note following Paragraph (t) (2) was modified, new Paragraph (t) (3) and note added, and former Paragraph (t) (3) modified and relocated as Paragraph (t) (4), to read (See Supplement No. 1 to Code revised 1934, page 4):

"Rule 3. (t) (2). Trucks, secondhand, when applied to car bodies built new or rebuilt on or after January 1, 1930, shall be equipped with cast-steel side frames. From owners.

"Note—Cast-steel side frames on such second hand trucks should preferably comply with current A. A. R. Specifications, but existing cast-steel side frames of other design and specification may be used provided such frames comply with the provisions of Paragraph (3). When same are replaced with new cast-steel side frames, by car owner such new frames shall comply with current A. A. R. Specifications.

"(t) (3). Truck side frames, cast-steel, secondhand, must not be substituted for any other side frames (Cast-steel, pressed or structural steel or arch bar type) unless entirely free from cracks, fractures, excessive wear or porosity, or welds not performed and marked strictly in accordance with Rule 23. Secondhand side frames of older designs, such as those having 'T' or 'L' section compression or tension members, must be confined to owner's equipment and then only when such frames have been removed from same owner's equipment, or for replacements in kind on foreign cars.

"Note—To determine if such secondhand frames are suitable for further service, thorough cleaning and careful inspection must be made. Frames having any of the above defects, or which are otherwise unsuitable [fol. 5657] for re-application, are to be immediately destroyed.

"(t) (4) Trucks, with arch bars, prohibited, effective January 1, 1938, under all cars. From owners."

Paragraph (t) (3) of Rule 3 amended, effective January 1, 1937, to read (See Code revised 1936, page 21):

"Rule 3. (t) (3) Truck side frames, cast-steel, secondhand, must not be substituted for any other side frames (cast-steel, pressed or structural steel or arch bar type) unless entirely free from cracks, fractures, excessive wear, excessive corrosion, or porosity, or welds not performed and marked strictly in accordance with Rule 23. Secondhand side frames of older designed, such as those having 'T' or 'L' section compression or tension members, must be confined to owner's equipment and then only when such frames have been removed from same owner's equipment, or for replacements in kind on foreign cars.

"Note—To determine if such secondhand frames are suitable for further service, thorough cleaning and careful inspection must be made. Frames having any of the above defects, or which are otherwise unsuitable for re-application, are to be immediately destroyed."

Rule amended effective January 1, 1938, to read (See Code revised 1937, pages 21 and 22):

"Rule 3. (t) (1) Trucks, new, when applied to any car on or after March 1, 1930, shall be equipped with cast-steel side frames conforming to current A. A. R. Specifications, and shall have month and year manufactured, also the letters 'A. A. R.' or 'A. R. A.', followed by the year date of specification, cast on the outer face. From owners.

"(t) (2-a) Trucks, secondhand, when applied to car bodies built new or rebuilt between January 1, 1930 and August 1, 1937, shall be equipped with cast-steel side frames. From owners.

"Note—Cast-steel side frames on such secondhand [fol. 5658] trucks should preferably comply with current A. A. R. Specifications, but existing cast-steel side frames of other design and specification may be used provided such frames comply with the provisions

of Paragraph (3). When same are replaced with new cast-steel side frames, by car owner, such new frames shall comply with current A. A. R. Specifications.

"(t) (2-b) Trucks, secondhand, when applied to car bodies built new or rebuilt on or after August 1, 1937, shall be equipped with U section cast-steel side frames. From owners.

"Note—U section cast-steel side frames on such secondhand trucks should preferably comply with current A. A. R. Specifications, but existing U section cast-steel side frames of other specifications may be used providing such frames comply with provisions of first sentence of Paragraph (3). When same are replaced with new cast-steel side frames, by car owner, such new frames shall comply with current A. A. R. Specifications.

"(t) (3) Truck side frames, cast-steel, secondhand, must not be substituted for any other side frames (cast-steel, pressed or structural steel or arch bar type) unless entirely free from cracks, fractures, excessive wear, excessive corrosion, or porosity, or welds not performed and marked strictly in accordance with Rule 23. Secondhand side frames of older designs, such as those having 'T' or 'L' section compression or tension members, must be confined to owner's equipment, and then only when such frames have been removed from same owner's equipment, or for replacements in kind on foreign cars.

"Note—To determine if such secondhand frames are suitable for further service, thorough cleaning and careful inspection must be made. Frames having any of the above defects, or which are otherwise unsuitable for re-application are to be immediately destroyed.

"(t) (4) Trucks with arch bars, prohibited, effective July 1, 1938, under all cars. From owners."

[fol. 5659] Paragraph (t) (3) amended, effective January 1, 1939, to read (See Code, revised 1938, page 22):

"Rule 3. (t) (3) Truck side frames, cast-steel, secondhand, must not be substituted for any other side

frames (cast-steel, pressed or structural steel or arch bar type) unless entirely free from cracks, fractures, excessive wear, excessive corrosion, or porosity, or welds not performed and marked strictly in accordance with Rule 23. Secondhand side frames of older designs, such as those having 'T' or 'L' section compression or tension members, must be confined to owner's equipment and then only when such frames have been removed from same owner's equipment, or for replacement in kind on foreign cars. Effective January 1, 1940, the application of welded side frames will be prohibited: However, this provision does not require the removal from owned cars, or permit the removal from foreign cars, of such welded side frames welded and applied prior to January 1, 1940, unless defective.

"Note—To determine if such secondhand frames are suitable for further service, thorough cleaning and careful inspection must be made. Frames having any of the above defects, or which are otherwise unsuitable for re-application, are to be immediately destroyed."

Effective date of Paragraph (t) (4) extended to July 1, 1939, in December, 1938.

Effective date of Paragraph (t) (4) extended to December 31, 1939, in May, 1939.

Effective date of Paragraph (t) (3) extended to January 1, 1941 in August, 1939.

Note added to Paragraph (t) (4) effective January 1, 1940, and the paragraph amended to read (See Supplement No. 1 to Code revised 1940, page 2):

"Rule 3. (t) (4) Trucks, with arch bars, prohibited under all cars. In interchange.

"Note—The movement of cars equipped with arch [fol. 5660] bar trucks must be confined to owner's rails, except that they are acceptable in interchange from owner for loading or for unloading within the same terminal switching district in which the interchange occurs, providing that no road haul is involved in such movement, and providing that cars so interchanged will be immediately returned to owner's rails when loading or unloading is accomplished.

"Cars equipped with arch bar trucks are acceptable for movement between plants located in the same switching district, providing no road haul is involved.

"Locomotive cranes, locomotive tenders, and derricks built prior to January 1, 1940 and equipped with arch bar trucks, may be accepted in interchange or from owners prior to January 1, 1941, and moved under such controlled speeds as may be required by handling railroad. Effective January 1, 1941, such equipment will be prohibited in interchange. (This paragraph does not apply to contractors' work equipment other than mentioned above.)

Effective date of Paragraph (t) (3) extended to January 1, 1942 on August 1, 1940.

Paragraph (t) (4) and note amended effective January 1, 1941, to read (See Code revised 1940, page 22):

"Rule 3. (t) (4). Trucks, with arch bars, prohibited under all cars, locomotive cranes, locomotive tenders and derricks. In interchange.

"Note—The movement of cars equipped with arch bars must be confined to owner's rails, except that they are acceptable in interchange from owner for loading or for unloading within the same terminal switching district in which the interchange occurs, providing that no road haul is involved in such movement, and providing that cars so interchanged will be immediately returned to owner's rails when loading or unloading is [fol. 5661] accomplished.

"Cars equipped with arch bar trucks are acceptable for movement between plants located in the same switching district, providing no road haul is involved."

[fol. 5662] *Underframes*

The Interchange Rules effective September 1, 1911, contain no provisions with respect to underframe requirements on cars in interchange.

A new rule was added effective January 1, 1927, to read (See Code revised 1926, page 24):

"Rule 3. (U) (1) Underframe, steel, on all cars (other than tank cars) built on or after January 1, 1927, must have center sills with a minimum cross sectional area of

24 square inches between the draft back stops. From owners.

"(U) (2) Underframe, etc.: Effective January 1, 1929, all cars built prior to January 1, 1927, must be equipped with either steel underframe, or steel center sills, or wood or metal draft arms extending beyond the body bolster, or metal draft arms extending to metal body bolster and securely riveted to same. From owners."

Effective date of Paragraph (U) (2) extended to January 1, 1930, on August 1, 1927.

Rule amended effective January 1, 1929, to read (See Code revised 1928, pages 18 and 19):

"Rule 3. (U) (1). Underframe, steel, on all cars (other than tank cars) built new on or after January 1, 1927, or rebuilt on or after July 1, 1928, must have center sills with a minimum cross sectional area of 24 square inches between the draft back stops. A tolerance of one square inch below minimum will be considered as meeting this requirement. From owners.

"(U) (2). Underframe, etc.: Effective January 1, 1931, no car of all-wood construction (now defined as Class F under Rule 112) will be accepted. From owners.

"(U) (3). Underframe, etc.: Effective January 1 [fol. 5663] 1934, no car of all-wood underframe equipped with metal draft arms extending 24 inches or more beyond center line of body bolster (now defined as Class E-4 under Rule 112) will be accepted. From owners."

Effective date of Paragraph (U) (2) extended to January 1, 1933, on August 1, 1930.

Paragraph (U) (1) of Rule 3 amended effective January 1, 1930 to read (See Code revised 1929, page 19):

"Rule 3. (U) (1). Underframe, steel, having center sills with a minimum cross sectional area of 24 square inches between the draft back stops, required on all cars (other than tank cars) built new on or after January 1, 1927, or rebuilt on or after July 1, 1928. From owners. A tolerance of one square inch below minimum will be considered as meeting this requirement."

Note added following Paragraph (U) (1) effective January 1, 1931, to read (See Code revised 1930, page 20):

"Note—A steel underframe, as contemplated in this requirement, is an underframe not dependent upon truss rods for support, having steel center sills with a minimum cross sectional area of 24 square inches, steel body bolsters and steel cross bearers, suitably tied together. If end sills or side sills are used, they must also be of steel."

Effective date of Paragraph (U) (2) extended to January 1, 1934 on August 1, 1932.

Effective dates of Paragraphs (U) (2) and (U) (3) extended to January 1, 1935 on August 1, 1933.

Effective date of Paragraph (U) (3) extended to January 1, 1936 on August 1, 1934.

Note added following Paragraph (U) (1) effective August [fol. 5664] 1, 1934, to read (See Supplement No. 1 to Code revised 1933, page 5):

"Note—this requirement does not apply to the A. R. A. steel sheathed wood lined box car adopted as Standard in 1932, having center sills of 'Z' bar section design."

Effective date of Paragraph (U) (3) extended to January 1, 1937 on January 1, 1936.

Note following Paragraph (U) (1) amended effective August 1, 1935 to read (See Supplement No. 2 to Code revised 1934, page 5):

"Note—this requirement does not apply to cars built since June 1, 1932, having center sills of A. A. R. 'Z' bar section design of same type as used in A. A. R. steel sheathed wood lined box car adopted as Standard in 1932."

Rule amended August 1, 1934, by addition of new Paragraph (U) (4) to Rule 3, to read (See Supplement No. 1 to Code revised 1936, page 4):

"Rule 3. (U) (4) Underframe, etc.: Effective January 1, 1940, no car of wood underframe construction, having metal center sills, or having continuous metal drafts secured to wood center sills, will be accepted, un-

less such metal center sills or metal drafts have one top or bottom cover plate from bolster to bolster. From owners."

Effective date of Paragraph (U) (3) extended to April 1, 1937, on March 15, 1937.

Paragraph (U) (2) of Rule 3 amended effective January 1, 1939, to read (See Code revised 1938, page 24):

"Rule 3. (U) (2). Underframe, etc.: No car of all-wood construction will be accepted. In interchange."

Effective date of Paragraph (U) (4) extended to January 1, 1941 on August 1, 1939.

Paragraph (U) (3) of Rule 3 amended effective January [fol. 5665] 1, 1940 to read (See Code revised 1939, page 24):

"Rule 3. (U) (3). Underframe, etc.: No car of all-wood underframe equipped with metal draft arms extending 24 inches or more beyond center line of body bolster, will be accepted. In interchange."

Effective date of Paragraph (U) (4) extended to January 1, 1942 on August 1, 1940.

[fol. 5666] *Wheels*

The Interchange Rules effective September 1, 1911, contain no provisions with respect to types of wheels required on cars in interchange.

A new rule was added to the Code effective January 1, 1925, to read (See Code revised 1924, page 23):

"Rule 3. (N). A car will not be accepted in interchange if any of its wheels have the letter 'C' chipped out of the legent 'M. C. B.' or the letter 'R' chipped out of the legend 'A. R. A.'.

"(O) Cars will not be accepted from owner which have cast-iron wheels cast after January 1, 1925, of nominal weight of less than 650, 700 and 750 lbs.

"Note—The letters A. R. A. shall not be put upon any wheel which is of less weight than the standards of the A. R. A. or which is made to any specifications with requirements less than those prescribed in the A. R. A. Specifications for cast iron wheels."

A new rule was added to the Code effective January 1, 1935, to read (See Code revised 1934, page 119):

"Rule 70. (c) A. R. A. double plate shall not be substituted for A. R. A. single plate cast-iron wheels. (This does not apply in case of one single plate and one double plate wheel mounted on same axle.) Defect card is not required for such improper substitution of wheels. (See Rule 98, Section (c-5), for charges and credits.)"

A new rule was added to the Code effective January 1, 1937, to read (See Code revised 1936, pages 53 and 54):

"Rule 19. In making repairs to foreign cars, the following materials must not be used: Wheels which have been condemned by out-of-round Rule 73-A, if reclaimed by grinding."

[fol. 5666a] Rule 19 amended effective January 1, 1938, to read (See Code revised 1937, page 57):

"Rule 19. In making repairs to foreign cars, the following materials must not be used:

"Cast-iron wheels which have been condemned by out-of-round Rule 73-A, if reclaimed by grinding.

"Cast-iron wheels, double plate design, if cast prior to January 1, 1921."

Defendant's Exhibit No. 205 (Witness Herbert)
Jan. 23, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

YUMA, ARIZONA TO EL PASO, TEXAS
INCREASED INVESTMENT IN WATER, ROUNDHOUSE AND SHOP FACILITIES
INCIDENT TO ADOPTION OF LONG TRAIN PROGRAM

	YUMA, ARIZ. (a)	TUCSON, ARIZ. (b)	EL PASO, TEX. (c)	BENSON, ARIZ. (d)	TOTAL (e)
I. Extend 5 Stalls and Pits 65 Feet at YUMA AND TUCSON; and Build 7 New Stalls and Pits to Roundhouse Over Existing Radial Tracks at EL PASO:					
(1) Extend pits and track	$10 000	$10 000	$28 000		
(2) Superstructure	14 000	14 000	14 255		
(3) Outside connections, pipe lines and electric wiring	800	800	900		
(4) Blowdown line, etc.	1 000	1 000	2 500		
(5) Clearing site	1 500	1 500	-		
(6) Incidentals, timber work, store expense and contingencies	2 000	2 000	2 100		
TOTAL	29 300	29 300	77 755		$136 355
II. Install 126 Foot Turntables at YUMA AND TUCSON, to Replace Existing 100 Foot Turntables:					
(1) New 126 ft. turntable complete with trucks and motors	19 000	19 000	-		
(2) Excavation	5 500	5 500	-		
(3) Concrete work and paving	12 914	12 914	-		
(4) Falsework	5 255	5 255	-		
(5) Install table	1 950	1 950	-		
(6) Foreign freight	1 450	1 450	-		
(7) Incidentals (timber deck, rail, stone, contingencies, etc.)	5 147	5 147	-		
(8) Track	2 000	-	-		
TOTAL	53 216	51 216	-		$104 432
III. Transfer T&NO Erection Shop to Pacific Lines Property, EL PASO:					
(1) Clearing site for new location	-	-	6 235		
(2) Tearing down erection shop	-	-	13 065		
(3) Tearing down machine shop	-	-	9 380		
(4) Rebuilding erection shop	-	-	72 723		
(5) Rebuilding machine shop	-	-	47 144		
(6) Foundations for machinery	-	-	6 815		
(7) Pipe line and electric lines	-	-	2 716		
(8) Moving and installing machinery	-	-	32 432		
(9) Track work	-	-	15 535		
TOTAL			206 045		206 045
IV. Install Additional Water Column and 65,000 gallon tank	-	-	-	$7 000	7 000
GRAND TOTAL					$453 832

5667

Defendant's Exhibit No. 207 (Witness Judson)
Jan. 24, 1941

EXPLANATION OF SYMBOLS USED
UNDER HEADING "AVERAGE CONSIST"

A - Perishable Loads
B - Other Loads
C - Empty cars and includes cabooses
D - Total all cars

NORTHERN PACIFIC RAILWAY COMPANY

TYPICAL EXAMPLES OF FREIGHT TRAINS HANDLED
BETWEEN OTHER TERMINALS, OCTOBER 1st to 10th INCLUSIVE 1939

From (a)	To (b)	Distance Miles (c)	Ruling Grade (d)	70 cars or less: No. of Trains (e)	Type of Locomotives (f)	Average Consist A (g)	B (h)	C (i)	D (j)	Tons (k)	71 cars to 100 cars: No. of Trains (l)	Type of Locomotives (m)	Average Consist A (n)	B (o)	C (p)	D (q)	Tons (r)	101 cars to 125 cars: No. of Trains (s)	Type of Locomotives (t)	Average Consist A (u)	B (v)	C (w)	D (x)	Tons (y)	Maximum Cars Per Train (zz)
Dickinson,N.D.	Glendive,Mont.	106	1.00	21	Mallet	1	19	21	41	1,294	12	Mallet	2	31	48	81	2,485	-	-	-	-	-	-	-	90
"	"	106	1.00	4	Mikado	1	9	18	28	802	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40
"	"	106	1.00	1	Northern	-	33	1	34	1,521	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34
Glendive, Mont.	Dickinson,N.D.	106	1.00	6	Mallet	-	56	3	59	3,688	26	Mallet	10	69	3	82	4,194	-	-	-	-	-	-	-	88
"	"	106	1.00	4	Mikado	-	12	3	15	770	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
"	"	106	1.00	1	Northern	18	26	1	45	2,001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45
Livingston,Mont.	Logan,Mont.	49	1.80	9	Mikado	1	27	19	47	1,848	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70
Logan, Mont.	Livingston,Mont.	59	1.90	7	Mikado	-	18	21	39	1,193	1	Mikado	1	34	40	75	2,315	-	-	-	-	-	-	-	75
Bozeman,Mont.	Logan, Mont.	24	1.00	2	Pacific	-	7	18	25	895	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29
"	"	24	1.00	1	Ten Wheels	-	8	19	27	885	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27
Logan, Mont.	Bozeman, Mont.	24	1.00	1	Pacific	-	1	6	7	180	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7
"	"	24	1.00	1	Ten Wheels	-	5	7	12	332	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12
Logan, Mont.	Helena, Mont.	74	1.00	4	Mikado	-	26	20	46	1,991	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49
Helena, Mont.	Logan, Mont.	74	1.00	4	Mikado	-	9	42	51	1,292	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70
Livingston,Mont.	Helena, Mont.	123	1.80	15	Mallet	-	30	18	48	2,169	16	Mallet	2	46	33	81	2,988	1	Mallet	-	34	77	111	4,660	111
Helena, Mont.	Livingston,Mont.	133	1.90	1	Mallet	6	63	1	70	3,428	34	Mallet	11	65	8	84	4,007	-	-	-	-	-	-	-	92
Helena, Mont.	Missoula, Mont.	119	2.20	15	Mallet	1	33	11	45	2,099	15	Mallet	1	38	41	80	2,704	1	Mallet	1	24	76	101	3,090	101
"	"	119	2.20	3	Mikado	-	7	25	32	1,052	1	Mikado	-	11	74	85	2,721	-	-	-	-	-	-	-	85
Missoula, Mont.	Helena, Mont.	119	1.40	1	Mallet	17	43	8	68	3,518	30	Mallet	10	65	12	87	4,059	1	Mallet	14	68	24	106	4,835	106
"	"	119	1.40	1	Mikado	-	37	17	54	3,033	2	Mikado	6	61	19	88	4,207	-	-	-	-	-	-	-	94
Garrison, Mont.	Missoula, Mont.	68	Down	7	Mikado	1	20	27	48	1,685	1	Mikado	-	34	41	75	2,335	-	-	-	-	-	-	-	75
Missoula, Mont.	Garrison, Mont.	68	.40	9	Mikado	-	22	21	43	1,483	-	-	-	-	-	-	-	-	-	-	-	-	-	-	63
Drummond, Mont.	Missoula, Mont.	49	Down	4	Ten Wheels	-	17	7	24	1,340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51
Missoula,Mont.	Drummond, Mont.	49	.40	4	Ten Wheels	-	1	17	18	411	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23
TOTAL TRAINS		267		126							138							3							
PER CENT OF ALL TRAINS		100		47.2							51.7							1.1							
AVERAGE CARS PER TRAIN		63.7		41							83							106							

5668

Defendant's Exhibit No. 208. (Witness Judson)
Jan. 24, 1941

NORTHERN PACIFIC RAILWAY COMPANY

MAXIMUM NUMBER OF CARS HANDLED IN VARIOUS MAIN LINE PASSENGER TRAINS, OCTOBER 1ST TO 10TH, 1939, INCLUSIVE

	TRAIN NO. 1 - WEST	MILES	CARS PER TRIP													TOTAL TRIPS
			5	6	7	8	9	10	11	12	13	14	15	16	17 & OVER	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)
1	St. Paul to Fargo	252	-	-	-	-	-	-	-	4	3	2	1	-	-	10
2	Fargo to Billings	642	-	-	-	-	-	-	-	3	5	3	-	-	-	10
3	Billings to Butte	235	-	-	-	-	-	-	-	7	2	-	1	-	-	10
4	Butte to Spokane	378	-	-	-	-	-	-	-	7	3	-	-	-	-	10
5	Spokane to Pasco	146	-	-	-	-	-	-	-	1	8	1	-	-	-	10
6	Pasco to Yakima	89	-	-	-	-	-	9	1	-	-	-	-	-	-	10
7	Yakima to Auburn	139	-	-	-	-	-	9	1	-	-	-	-	-	-	10
8	Auburn to Seattle	22	-	-	-	-	3	7	-	-	-	-	-	-	-	10
9	TOTAL	1,903	-	-	-	-	3	25	2	22	21	5	2	-	-	80
10	PERCENT OF TOTAL		-	-	-	-	3.75	31.25	2.50	27.50	26.25	6.25	2.50	-	-	
11	TOTAL TRAINS OVER 14 CARS											2	or	2.50%		
12	TOTAL TRAINS 14 CARS OR UNDER											78	or	97.50%		
13	TOTAL TRAINS											80	or	100.00%		
	TRAIN NO. 2 - EAST															
14	Fargo to St. Paul	252	-	-	-	-	-	-	-	-	5	4	1	-	-	10
15	Billings to Fargo	642	-	-	-	-	-	-	-	-	5	4	1	-	-	10
16	Butte to Billings	235	-	-	-	-	-	-	-	-	-	-	2	4	4	10
17	Spokane to Butte	378	-	-	-	-	-	-	-	-	2	5	2	-	1	10
18	Pasco to Spokane	146	-	-	-	-	-	2	-	5	2	1	-	-	-	10
19	Yakima to Pasco	89	-	-	-	-	-	2	2	3	2	-	1	-	-	10
20	Auburn to Yakima	139	-	-	-	-	-	-	2	3	2	2	-	1	-	10
21	Seattle to Auburn	22	-	-	-	-	-	-	3	3	2	2	-	-	-	10
22	TOTAL	1,903	-	-	-	-	-	4	7	14	20	18	7	5	5	80
23	PERCENT OF TOTAL		-	-	-	-	-	5.00	8.75	17.50	25.00	22.50	8.75	6.25	6.25	
24	TOTAL TRAINS OVER 14 CARS											17	or	21.25%		
25	TOTAL TRAINS 14 CARS OR UNDER											63	or	78.75%		
26	TOTAL TRAINS											80	or	100.00%		

	TRAIN NO. 3 - WEST	MILES	CARS PER TRIP													TOTAL TRIPS
			5	6	7	8	9	10	11	12	13	14	15	16	17 & OVER	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)
1	St. Paul to Fargo	252	-	-	-	-	-	1	1	3	2	3	-	-	-	10
2	Fargo to Billings	642	-	-	-	1	1	3	2	1	2	-	-	-	-	10
3	Billings to Logan	164	-	-	-	-	1	1	4	4	-	-	-	-	-	10
4	Logan to Spokane	451	-	-	1	4	4	-	1	-	-	-	-	-	-	10
5	Spokane to Pasco	146	4	3	2	1	-	-	-	-	-	-	-	-	-	10
6	Pasco to Yakima	89	-	4	3	1	1	-	-	-	1	-	-	-	-	10
7	Yakima to Auburn	139	-	-	4	4	-	1	-	-	-	1	-	-	-	10
8	Auburn to Seattle	22	-	-	4	5	-	1	-	-	-	-	-	-	-	10
9	TOTAL	1,905	4	7	14	16	7	7	8	8	5	4	-	-	-	80
10	PERCENT OF TOTAL		5.00	8.75	17.50	20.00	8.75	8.75	10.00	10.00	6.25	5.00	-	-	-	
11	TOTAL TRAINS OVER 14 CARS											0	or	0.00%		
12	TOTAL TRAINS 14 CARS OR UNDER											80	or	100.00%		
13	TOTAL TRAINS											80	or	100.00%		
	TRAIN NO. 4 - EAST															
14	Fargo to St. Paul	252	-	-	-	-	-	1	4	-	4	-	1	-	-	10
15	Billings to Fargo	642	-	-	-	1	4	1	3	-	1	-	-	-	-	10
16	Logan to Billings	164	-	-	4	4	2	-	-	-	-	-	-	-	-	10
17	Spokane to Logan	451	-	1	1	3	2	2	-	1	-	-	-	-	-	10
18	Pasco to Spokane	146	6	4	-	-	-	-	-	-	-	-	-	-	-	10
19	Yakima to Pasco	89	5	5	-	-	-	-	-	-	-	-	-	-	-	10
20	Auburn to Yakima	139	5	3	2	-	-	-	-	-	-	-	-	-	-	10
21	Seattle to Auburn	22	6	2	2	-	-	-	-	-	-	-	-	-	-	10
22	TOTAL	1,905	22	15	9	8	8	4	7	1	5	-	1	-	-	80
23	PERCENT OF TOTAL		27.50	18.75	11.25	10.00	10.00	5.00	8.75	1.25	6.25	-	1.25	-	-	
24	TOTAL TRAINS OVER 14 CARS											1	or	1.25%		
25	TOTAL TRAINS 14 CARS OR UNDER											79	or	98.75%		
26	TOTAL TRAINS											80	or	100.00%		

SUMMARY

TOTAL TRAINS OVER 14 CARS	20	or	6.25%
TOTAL TRAINS 14 CARS OR UNDER	300	or	93.75%
TOTAL TRAINS	320	or	100.00%

Defendant's Exhibit No. 209 (Witness Garverick)
Jan. 24, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

BASIS RATES OF PAY FOR STANDARD ROAD AND SWITCH
RUNS OF THE THROUGH AND RED CLOVER DIVISIONS

LINE NO.	BASIS / CLASS	Engineers									Trainmen	
		Gen. (a)	Sr. (b)	Pass (c)	Sr. (d)	Pass (e)	Pass (f)	Pass (g)	Sr. (h)	Ass't (i)	3-Asst. (j)	3-Asst. (k)
					SOUTHERN PACIFIC AGREEMENT							
1	BASIS (THROUGH) 100 MILES	$15.01	$15.07	$15.31	$15.71	$15.71	$15.99	$15.99	$15.99	$17.82		
2	BASIS (LOCAL) 100 MILES	15.93	15.99	16.23	16.63	16.63	16.91	16.91	16.91	18.74	-	$16.99
											-	17.63
	MERCED											
	TUBA-GILA											
3	121 Miles (Through)	18.46	18.53	18.81	19.20	19.20	19.47	19.47	19.47	21.32	-	20.74
4	121 Miles (Local)	19.39	19.47	19.77	20.19	20.19	20.50	20.50	20.50	22.39	-	21.90
	TUBA-YUMA(3)											
5	170 Miles (Through)	25.12	25.20	25.64	27.14	27.14	27.42	27.42	27.42	31.08	-	43.27
6	170 Miles (Local)	27.72	27.82	28.24	28.94	28.94	29.42	29.42	29.42	32.61	-	46.00
	GILA-YUMA(3)											
7	128 Miles (Through)	19.21	19.29	19.60	20.11	20.11	20.47	20.47	20.47	22.81	-	32.00
8	128 Miles (Local)	20.39	20.48	20.76	21.29	21.29	21.64	21.64	21.64	23.99	-	35.26
	PHOENIX-YUMA(3)											
9	120 Miles (Through)	18.01	18.08	18.37	18.85	18.85	19.19	19.19	19.19	21.36	-	29.99
10	120 Miles (Local)	19.12	19.19	19.48	19.96	19.96	20.29	20.29	20.29	22.49	-	33.14
11	BASIS (THROUGH) 100 MILES	-	-	-	-	-	-	-	-	-		
12	BASIS (LOCAL) 100 MILES	-	-	-	-	-	-	-	-	-	$16.37	$17.31
											21.82	27.84
	MERCED											
	TUBA-LORDSBURG											
13	364 Miles (Through)	34.62	34.71	35.10	35.76	35.76	36.22	36.22	36.22	39.22	-	44.50
14	364 Miles (Local)	36.33	36.42	36.82	37.27	37.27	37.73	37.73	37.73	30.73	-	45.67
	EL PASO-LORDSBURG											
15	349 Miles (Through)	32.35	32.43	32.81	33.41	33.41	33.83	33.83	33.83	36.55	30.65	40.44
16	349 Miles (Local)	33.93	33.83	34.18	34.78	34.78	35.19	35.19	35.19	37.92	32.61	41.67
	TUBA-DOUGLAS THROUGH											
17	230 Miles (Through)	34.52	34.44	35.21	36.13	36.13	36.78	36.78	36.78	40.79	-	42.42
18	230 Miles (Local)	36.24	36.78	37.33	38.25	38.25	38.89	38.89	38.89	43.10	-	44.03
	LORDSBURG-DOUGLAS THROUGH											
19	100 Miles (Through)	15.01	15.07	15.31	15.71	15.71	15.99	15.99	15.99	17.82	-	27.14
20	100 Miles (Local)	15.93	15.99	16.23	16.63	16.63	16.91	16.91	16.91	18.74	-	27.84
	EL PASO-DOUGLAS THROUGH											
21	100 Miles (Through)	15.01	15.07	15.31	15.71	15.71	15.99	15.99	15.99	17.82	20.37	27.14
22	100 Miles (Local)	15.93	15.99	16.23	16.63	16.63	16.91	16.91	16.91	18.74	21.22	27.84
23	TUBA-DOUGLAS THROUGH 139 Miles (Through) Helper	20.86	20.95	21.28	21.84	21.84	22.23	22.23	22.23	24.77	-	-
24	GILA-BENSON THROUGH 38 Miles (Through) Helper	5.70	5.73	5.82	5.97	5.97	6.08	6.08	6.08	6.78	-	-
25	SAN SIMON-BENSON THROUGH 29 Miles (Through) Helper	4.35	4.37	4.44	4.56	4.56	4.64	4.64	4.64	5.23	-	-
					EL PASO AND SOUTHWESTERN AGREEMENT							
26	BASIS (THROUGH) 100 MILES	15.07	15.07	15.31	15.62	15.62	15.99	15.99	15.99	15.99	20.37	27.14
27	BASIS (LOCAL) 100 MILES	16.00	16.00	16.26	16.55	16.55	16.92	16.92	16.92	16.92	21.89	28.86
	MERCED											
	DOUGLAS-EL PASO											
28	227 Miles (Through)	32.70	32.70	33.22	33.99	33.99	34.70	34.70	34.70	34.70	44.44	58.89
29	227 Miles (Local)	34.72	34.72	35.24	35.91	35.91	36.72	36.72	36.72	36.72	47.09	62.43
	TUBA-DOUGLAS											
30	122 Miles (Through)	18.84	18.84	19.14	19.53	19.53	19.99	19.99	19.99	19.99	25.71	33.93
31	122 Miles (Local)	20.00	20.02	20.30	20.69	20.69	21.15	21.15	21.15	21.15	27.26	36.01

(a) = Rates of pay to above cover a single help from initial to turning point and return. If no other service performed within 8 hours from initial call, crew will be allowed the minimum of 100 miles. Helper crews may be called for more than one trip within the 8 hour provision and allowed total mileage made with a minimum of 100 miles.

SUPERSEDES SEC. 7 RAILWAY'S RATES OF PAY

3	143 Miles (Through)	18.46	18.53	18.81	19.38	19.38	19.67	19.67	19.67	21.72	:	30.74
4	143 Miles (Local)	19.59	19.67	19.95	20.45	20.45	20.80	20.80	20.80	22.87	:	31.98
	TUCSON-PHOENIX											
5	124 Miles (Through)	16.12	16.20	16.44	17.10	17.10	17.02	17.02	17.02	18.05	:	43.47
6	124 Miles (Local)	17.11	17.20	17.28	18.14	18.14	18.06	18.06	18.06	19.11	:	44.68
	GILA-YUMA											
7	128 Miles (Through)	19.05	19.07	19.40	20.11	20.11	20.47	20.47	20.47	21.81	:	32.09
8	128 Miles (Local)	20.19	20.46	20.78	21.49	21.49	21.84	21.84	21.84	23.19	:	33.36
	PHOENIX-YUMA											
9	120 Miles (Through)	18.05	18.08	18.37	18.82	18.82	19.19	19.19	19.19	21.18	:	37.77
10	120 Miles (Local)	19.18	19.19	19.48	19.96	19.96	20.39	20.39	20.39	22.49	:	39.14
11	BASIS (THROUGH) 100 MILES	-	-	-	-	-	-	-	-	-	[illegible]	[illegible]
12	BASIS (LOCAL) 100 MILES	-	-	-	-	-	-	-	-	-	21.32	37.84
	DISTRICT											
	TUCSON-LORDSBURG											
13	264 Miles (Through)	24.62	24.71	25.10	25.76	25.76	26.22	26.22	26.22	29.22	-	44.50
14	264 Miles (Local)	25.33	25.28	25.62	26.27	26.27	26.73	26.73	26.73	30.73	-	45.87
	EL PASO-LORDSBURG											
15	149 Miles (Through)	22.35	22.45	22.81	23.41	23.41	23.83	23.83	23.83	25.55	30.65	40.44
16	149 Miles (Local)	23.73	23.83	24.18	24.78	24.78	25.19	25.19	25.19	27.32	31.51	41.67
	TUCSON-GUAYS TERMINUS											
17	230 Miles (Through)	24.22	24.44	24.82	25.43	25.43	25.78	25.78	25.78	40.77	-	42.42
18	230 Miles (Local)	25.24	25.78	27.33	26.05	26.05	26.89	26.89	26.89	43.10	-	44.03
	LORDSBURG-GUAYS TERMINUS											
19	160 Miles (Through)	15.01	15.07	15.31	15.71	15.71	15.99	15.99	15.99	17.82	-	27.14
20	160 Miles (Local)	15.93	15.99	16.23	16.63	16.63	16.91	16.91	16.91	18.74	-	27.84
	EL PASO-GUAYS TERMINUS											
21	160 Miles (Through)	15.01	15.07	15.31	15.71	15.71	15.99	15.99	15.99	17.82	20.57	27.14
22	160 Miles (Local)	15.93	15.99	16.23	16.63	16.63	16.91	16.91	16.91	18.74	21.32	27.84
	TUCSON-GUAYS TERMINUS											
23	139 Miles (Through) Helper	20.86	20.95	21.28	21.84	21.84	22.23	22.23	22.23	24.77	-	-
	GILA-DOUGLAS TERMINUS											
24	38 Miles (Through) Helper	5.74¢	5.72¢	5.84¢	5.97¢	5.97¢	6.08¢	6.08¢	6.08¢	6.77¢	-	-
	SAN SIMON-DOUGLAS TERMINUS											
25	79 Miles (Through) Helper	4.35¢	4.37¢	4.46¢	4.56¢	4.56¢	4.64¢	4.64¢	4.64¢	5.17¢	-	-
	EL PASO AND [illegible]											
26	BASIS (THROUGH) 100 MILES	15.01	15.07	15.31	15.62	15.62	15.99	15.99	15.99	15.99	20.57	27.14
27	BASIS (LOCAL) 100 MILES	16.09	16.09	16.34	16.75	16.75	16.98	16.98	16.98	16.98	21.89	28.86
	DISTRICT											
	DOUGLAS-EL PASO											
28	317 Miles (Through)	20.70	20.70	21.02	21.50	21.50	21.70	21.70	21.70	21.70	44.64	58.89
29	317 Miles (Local)	21.72	21.72	22.04	22.51	22.51	22.72	22.72	22.72	22.72	47.09	62.03
	TUCSON-DOUGLAS											
30	187 Miles (Through)	18.84	18.84	19.14	19.63	19.63	19.99	19.99	19.99	19.99	25.13	33.93
31	187 Miles (Local)	20.00	20.00	20.30	20.77	20.69	21.15	21.15	21.15	21.15	27.38	36.07

ϕ = Rates of pay as shown cover a single help from initial to terminal point and return. If no other service performed within 8 hours from initial call, crew will be allowed the minimum of 100 miles. Helper crews may be called for more than one trip within the 8 hour provision and allowed total mileage made with a minimum of 100 miles.

ADDITIONAL DAILY PAYMENTS BASED ON PAY

DISTRICTS: TUCSON-GILA-YUMA-PHOENIX-GILA-YUMA-PHOENIX-TUCSON

Conductor - 87.14 - Through Freight
" 7.77 - Local Freight
Trainmen - 7.52 - Through Freight
" 8.18 - Local Freight

DISTRICTS: TUCSON-DOUGLAS-DOUGLAS-EL PASO

Conductor - 87.43 - Through Freight
" 7.97 - Local Freight
Trainmen - 6.97 - Through Freight
" 6.97 - Local Freight

DISTRICTS: TUCSON-LORDSBURG-TUCSON-GUAYS-LORDSBURG-GUAYS-LORDSBURG-EL PASO

Conductor - 87.43 - Through Freight
" 7.98 - Local Freight
Trainmen - 6.97 - Through Freight
" 6.98 - Local Freight

DEFINITIONS
(Southern Pacific Agreement)

ENGINEERS: On freight trains - Engineer 87.53 per 100 miles
" " " - Firemen 5.88 " " "
On pass. trains - Engineer 6.88 per 100 miles
" " " - Firemen 4.82 " " "

TRAINMEN - If service is performed within 24 hours from time called to deadhead - two-thirds of mileage shown for run. If no service is performed within 24 hours from time called to deadhead - amount shown for 100 miles or two-thirds of mileage shown for runs, whichever is the greater.

3193

Defendant's Exhibit No. 210 (Witness Bohnstingel)
Jan. 28, 1941

SOUTHERN PACIFIC COMPANY

PACIFIC LINES

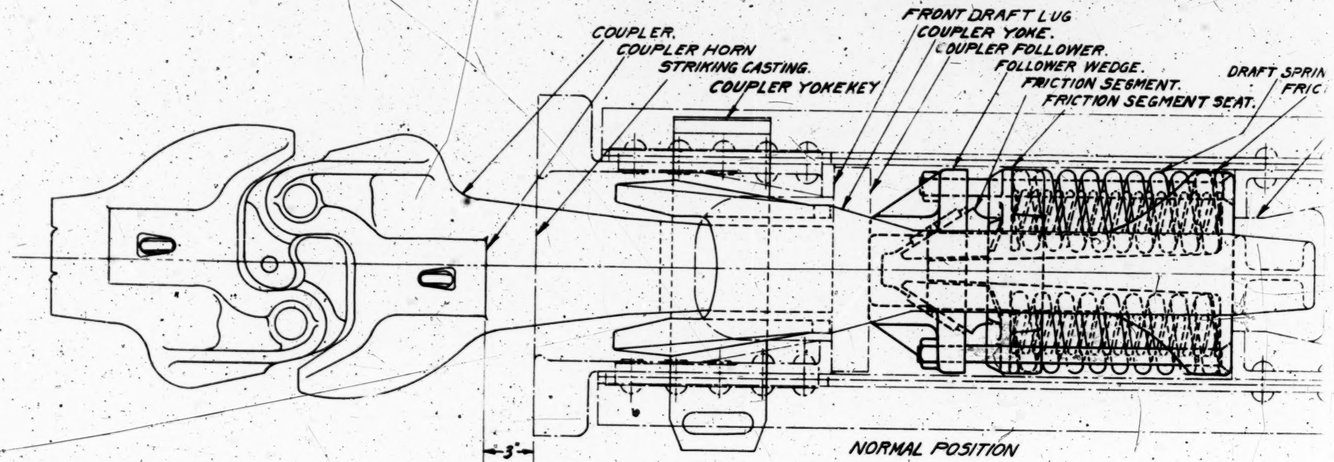
COMPARATIVE POSITION

OF

COUPLER UNDER MAXIMUM DRAFT GEAR TRAVEL

NORMAL BUFF AND PULL

REPRESENTING NATIONAL M-17, M-17-A, AND M-17A (CERTIFIED) DRAFT GEARS



ohnstingel)

C COMPANY

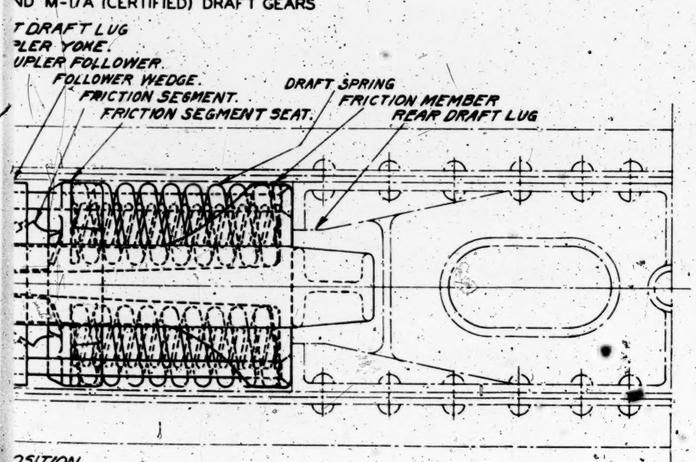
NES

POSITION

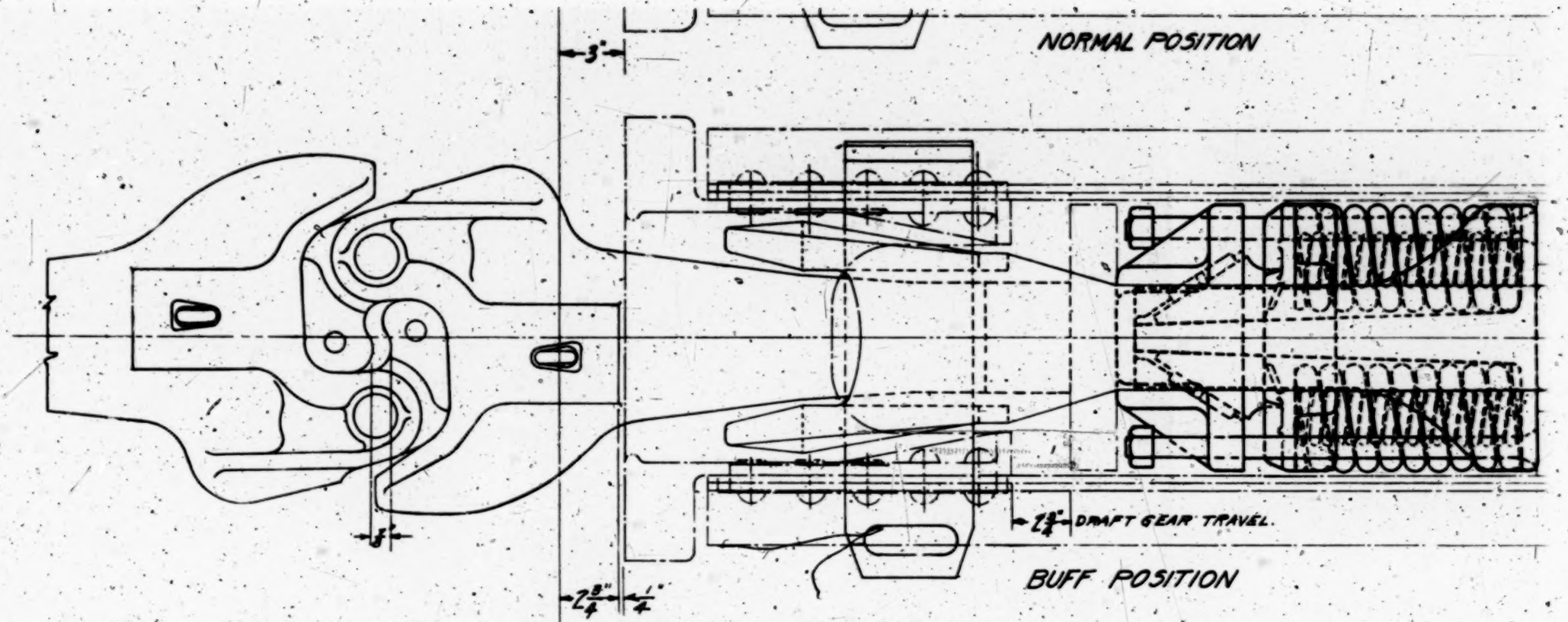
DRAFT GEAR TRAVEL

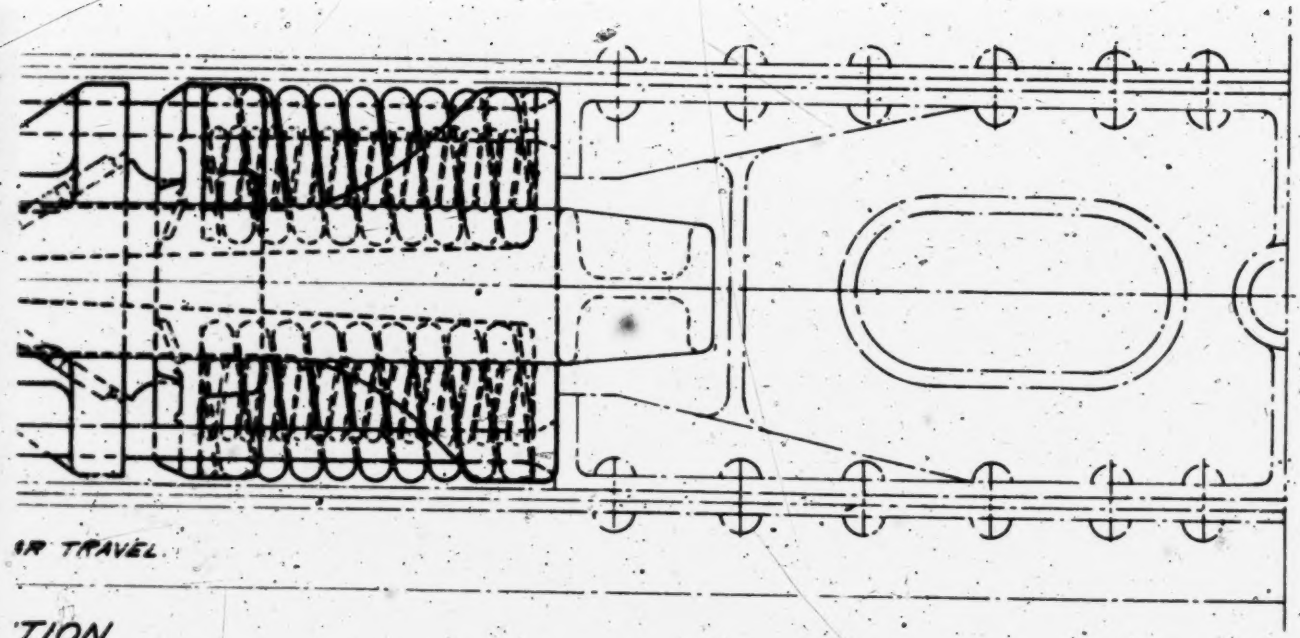
AND PULL

ND M-17A (CERTIFIED) DRAFT GEARS



OSITION


NORMAL POSITION
3"
3"
2 3/4"
1/4"
2 3/4" DRAFT GEAR TRAVEL.
BUFF POSITION
3"
2 3/4"
2 3/4"
PULL POSITION



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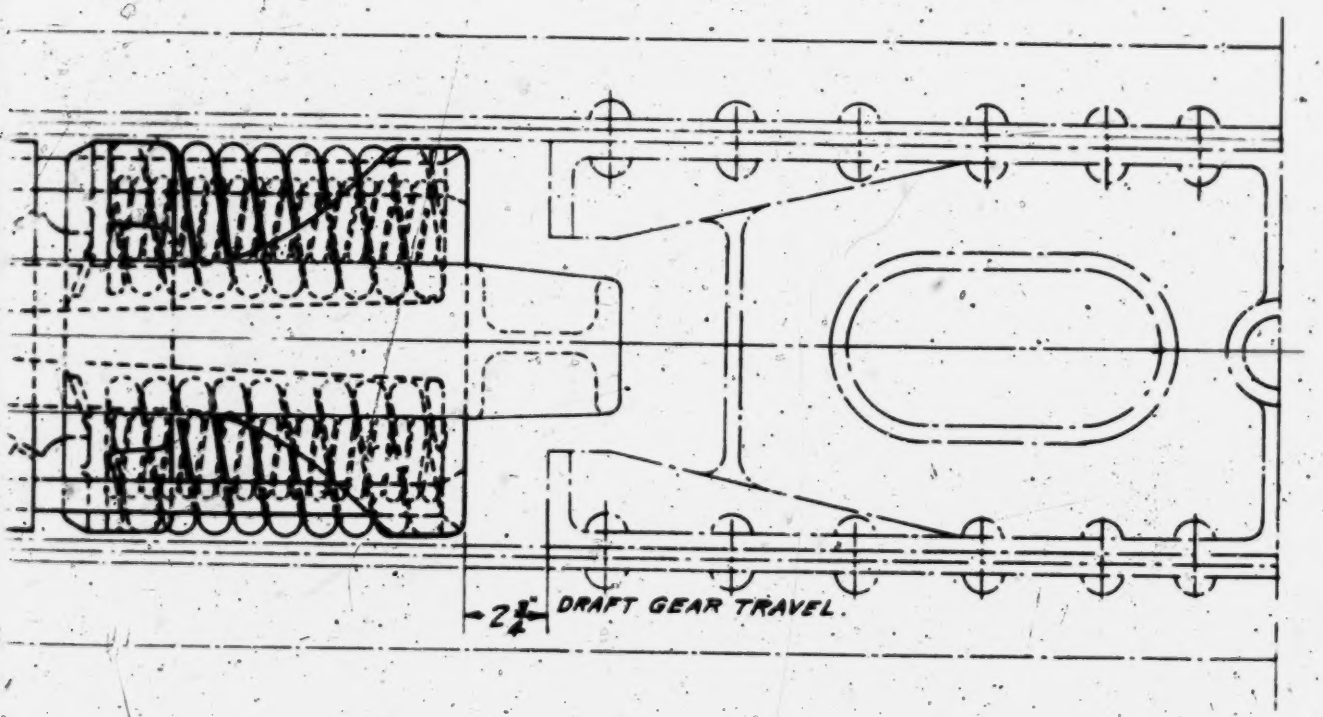

Defendant's Exhibit No. 211 (Witness Sines)
Jan. 28, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

NUMBER OF PASSENGER TRAINS OF DIFFERENT LENGTHS
BETWEEN EL PASO, TEXAS AND TUCUMCARI, NEW MEXICO
YEAR 1939

TRAIN NO. (a)	TRAIN NAME (b)	7 (c)	8 (d)	9 (e)	10 (f)	11 (g)	12 (h)	13 (i)	14 (j)	15 (k)	16 (l)	17 & OVER (m)	TOTAL (n)
	WEST												
3	Golden State Limited												
	Tucumcari - El Paso	-	-	-	-	1	128	179	37	11	9	-	365
43	Californian												
	Tucumcari - El Paso	-	3	1	104	146	64	22	10	9	4	2	365
	TOTAL WEST	-	3	1	104	147	192	201	47	20	13	2	730
	PER CENT OF TOTAL	-	.41	.14	14.25	20.14	26.30	27.53	6.44	2.74	1.78	.27	100%
	EAST												
4	Golden State Limited												
	El Paso - Tucumcari	-	-	-	-	6	133	176	37	8	3	1	364
44	Californian												
	El Paso - Tucumcari	-	-	7	104	118	82	30	18	3	2	-	364
	TOTAL EAST	-	-	7	104	124	215	206	55	11	5	1	728
	PER CENT OF TOTAL	-	-	.56	14.29	17.03	29.53	28.30	7.55	1.51	.69	.14	100%

RECAPITULATION			
	TOTAL TRAINS	TOTAL OVER 14	PER CENT OF TOTAL
WEST	730	35	4.79
EAST	728	17	2.34
TOTAL	1,458	52	3.57

Defendant's Exhibit No. 212 (Witness Sines)
Jan. 28, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

TUCSON AND SALT LAKE DIVISIONS

LOCOMOTIVE ASSIGNMENT AS OF NOVEMBER 30, 1940

LINE NO. (a)	TYPE (b)	WHEEL ARRANGEMENT (WHYTE SYSTEM) (c)	NUMBERS (NOT CONTINUOUS) (d)	SALT LAKE DIVISION FREIGHT (e)	SALT LAKE DIVISION PASSENGER (f)	TUCSON DIVISION FREIGHT (g)	TUCSON DIVISION PASSENGER (h)
1	Mogul 4,6,9,11	2-6-0	1624 - 1833	1	-	9	-
2	Ten Wheel 1,23,26,28,37	4-6-0	2105 - 2344	8	-	-	2
3	Pacific 3,5,12	4-6-2	2432 - 3129	-	-	-	4
4	Consolidation 8,9,10	2-8-0	2521 - 2858	5	-	7	-
5	Mikado 2,4	2-8-2	3202 - 3230	2	-	4	-
6	Mikado 5,6	2-8-2	3242 - 3258	3	-	-	-
7	Mikado 7,8,9	2-8-2	3306 - 3323	-	-	9	-
8	F-1	2-10-2	3611 - 3652	-	-	11	-
9	F-3	2-10-2	3657 - 3662	2	-	1	-
10	F-4	2-10-2	3669 - 3727	16	-	15	-
11	F-5	2-10-2	3729 - 3766	16	-	1	-
12	Articulated-Consolidation 1,2,3	2-8-8-2	4002 - 4046	17	-	-	-
13	Mountain 1,3,4,5	4-8-2	4306 - 4376	-	15	-	11
14	Golden State 1	4-8-4	4405 - 4407	-	2	-	-
15	Southern Pacific 1, 2, 3	4-10-2	5002 - 5045	-	-	11	-
	TOTAL			70	17	68	17
	TOTAL FREIGHT AND PASSENGER			87		85	

5673

Defendant's Exhibit No. 213 (Witness Sines)
Jan. 28, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

LENGTHS AND CAPACITIES OF
MAIN LINE SIDINGS IN ARIZONA

YUMA-ARIZONA STATE LINE TO ARIZONA-NEW MEXICO STATE LINE
VIA GILA AND BOWIE
YEAR 1912

STATION (a)	CLEAR LENGTH (b)	CAPACITY (c)
Yuma	-	Yard
Patio	37,340	Yard
Ivalon	8,024	180 cars, engine and caboose
Araby	3,200	70 cars, engine and caboose
Blaisdell	3,197	70 cars, engine and caboose
Dome	3,605	79 cars, engine and caboose
Ligurta	3,185	70 cars, engine and caboose
Adonde	3,200	70 cars, engine and caboose
Wellton	3,202	70 cars, engine and caboose
Tacna	3,200	70 cars, engine and caboose
Colfred	3,200	70 cars, engine and caboose
Pembroke	3,399	75 cars, engine and caboose
Mohawk	4,475	99 cars, engine and caboose
Kim	3,200	70 cars, engine and caboose
Stoval	3,220	70 cars, engine and caboose
Musina	3,100	68 cars, engine and caboose
Aztec	4,556	101 cars, engine and caboose
Stanwix	3,211	70 cars, engine and caboose
Delosa	Spur	
Sentinel	5,785	129 cars, engine and caboose
Tarton	3,212	70 cars, engine and caboose
Piedra	3,214	70 cars, engine and caboose
Thebe	3,213	70 cars, engine and caboose
Smurr	3,215	70 cars, engine and caboose
Gila	22,675	Yard
Coledon	3,212	70 cars, engine and caboose
Bosque	3,211	70 cars, engine and caboose
Quapos	3,209	70 cars, engine and caboose
Estrella	3,795	84 cars, engine and caboose
Buchan	3,200	70 cars, engine and caboose
Mobile	3,207	70 cars, engine and caboose
Enid	3,193	70 cars, engine and caboose
Heaton	3,209	70 cars, engine and caboose
Maricopa	12,465	Yard
Lirim	3,147	69 cars, engine and caboose
Bon	3,559	78 cars, engine and caboose
Nunez	3,200	70 cars, engine and caboose
Casa Grande	6,397	143 cars, engine and caboose
Arimola	3,199	70 cars, engine and caboose
Toltec	3,225	70 cars, engine and caboose
Eloy	3,229	70 cars, engine and caboose
Picacho	3,402	75 cars, engine and caboose
Wymola	3,136	69 cars, engine and caboose
Red Rock	7,393	165 cars, engine and caboose
Maviska	3,202	70 cars, engine and caboose
Marana	3,400	75 cars, engine and caboose
Rillito	3,400	75 cars, engine and caboose
Cortaro	3,209	70 cars, engine and caboose
Jaynes	3,205	70 cars, engine and caboose
Stockham	3,212	70 cars, engine and caboose
Tucson	45,097	Yard
Polvo	3,192	70 cars, engine and caboose
Wilmot	3,205	70 cars, engine and caboose
Rankin	3,206	70 cars, engine and caboose
Esmond	3,240	71 cars, engine and caboose
Vail	5,425	121 cars, engine and caboose
Irene	3,200	70 cars, engine and caboose
Pantano	5,212	116 cars, engine and caboose
Buell	3,198	70 cars, engine and caboose
Amole	3,210	70 cars, engine and caboose
Mescal	6,400	143 cars, engine and caboose
Chemiso	3,200	70 cars, engine and caboose
Benson	25,285	Yard
Fenner	3,201	70 cars, engine and caboose
Curvo	3,197	70 cars, engine and caboose
Sibyl	3,218	70 cars, engine and caboose
Tully	3,823	84 cars, engine and caboose
Ochoa	3,210	70 cars, engine and caboose
Lancha	3,200	70 cars, engine and caboose
Dragoon	7,823	175 cars, engine and caboose
Manzoro	3,200	70 cars, engine and caboose
Cochise	7,737	173 cars, engine and caboose
Hado	3,200	70 cars, engine and caboose
Willcox	8,132	182 cars, engine and caboose
Drury	3,130	68 cars, engine and caboose
Raso	5,022	111 cars, engine and caboose
Alrich	3,286	72 cars, engine and caboose
Luzena	3,167	69 cars, engine and caboose
Cholla	3,208	70 cars, engine and caboose
Bowie	14,700	Yard
Holt	3,218	70 cars, engine and caboose
Olga	3,184	69 cars, engine and caboose
Karro	3,206	70 cars, engine and caboose
San Simon	4,512	100 cars, engine and caboose
Bawtry	3,222	70 cars, engine and caboose
Vanar	3,193	69 cars, engine and caboose
Cavot	3,558	78 cars, engine and caboose

SOURCE: Southern Pacific Co., Tucson Division's
Timetable No. 71 (Effective Sunday
December 22nd, 1912)

CAPACITY BASED ON: Locomotive 80 feet
Caboose 40 feet
Cars 44 feet

5674

Defendant's Exhibit No. 214 (Witness Sines)
Jan. 28, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

MAIN LINE FREIGHT TRAINS OF VARIOUS LENGTHS
OPERATED BETWEEN YUMA, ARIZONA AND EL PASO, TEXAS
VIA GILA, ARIZONA, AND LORDSBURG, NEW MEXICO, AND
VIA DOUGLAS, ARIZONA, OVER SOUTH LINE
DURING JUNE AND AUGUST, 1938
ACTUAL OPERATIONS COMPARED WITH REDISPATCHED

			ACTUAL										REDISPATCH									
			50 AND LESS	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	101 TO 110	111 TO 120	121 TO 130	TOTAL	50 AND LESS	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	101 TO 110	111 TO 120	121 TO 130	TOTAL
			(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)
YUMA - GILA (123 Miles)	JUNE	EAST	6	21	201	-	-	-	-	-	-	228	1	13	17	17	28	66	16	7	-	165
		WEST	3	19	229	-	-	-	-	-	-	251	-	3	9	27	84	27	11	10	53	164
	AUGUST	EAST	2	32	105	-	-	-	-	-	-	139	3	10	16	14	17	48	1	-	-	109
		WEST	2	29	122	-	-	-	-	-	-	153	-	11	18	38	23	11	4	2	9	116
TOTAL - EAST AND WEST JUNE AND AUGUST			13	101	657	-	-	-	-	-	-	771	4	37	60	96	92	152	32	19	62	554
PER CENT. OF TOTAL			1.69	13.10	85.21	-	-	-	-	-	-	100.00	0.72	6.68	10.83	17.33	16.61	27.44	5.77	3.43	11.19	100.00
GILA - TUCSON (128 Miles)	JUNE	EAST	4	27	195	-	-	-	-	-	-	226	2	10	14	15	28	66	21	6	-	162
		WEST	3	12	229	-	-	-	-	-	-	250	-	1	9	27	25	27	6	6	60	163
	AUGUST	EAST	5	25	108	-	-	-	-	-	-	138	4	8	15	15	18	46	1	1	-	108
		WEST	2	25	126	-	-	-	-	-	-	153	1	9	25	33	23	11	6	-	9	117
TOTAL - EAST AND WEST JUNE AND AUGUST			14	95	658	-	-	-	-	-	-	767	7	28	63	90	94	150	36	13	69	550
PER CENT. OF TOTAL			1.82	12.39	85.79	-	-	-	-	-	-	100.00	1.27	5.09	11.46	16.36	17.09	27.27	6.55	2.36	12.55	100.00
TUCSON-LORDSBURG (164 Miles East) (163 Miles West)	JUNE	EAST	11	19	196	-	-	-	-	-	-	226	1	4	14	5	20	62	38	9	3	156
		WEST	4	22	229	2	-	-	-	-	-	257	-	4	11	11	38	6	12	6	73	161
	AUGUST	EAST	2	5	124	2	-	-	-	-	-	133	3	5	11	6	15	36	21	3	-	100
		WEST	9	42	89	-	-	-	-	-	-	140	-	9	29	18	12	12	12	5	7	104
TOTAL - EAST AND WEST JUNE AND AUGUST			26	88	638	4	-	-	-	-	-	756	4	22	65	40	85	116	83	23	83	521
PER CENT. OF TOTAL			3.44	11.64	84.39	0.53	-	-	-	-	-	100.00	0.77	4.22	12.48	7.68	16.31	22.27	15.93	4.41	15.93	100.00
LORDSBURG-EL PASO (148 Miles East) (159 Miles West)	JUNE	EAST	16	23	142	6	7	19	3	-	-	216	32	5	14	6	23	44	43	10	5	182
		WEST	15	16	78	2	-	100	8	-	-	219	1	2	19	5	31	38	9	7	77	189
	AUGUST	EAST	1	8	83	4	6	11	9	-	-	122	4	5	18	4	21	23	18	3	5	101
		WEST	10	36	42	2	2	26	3	-	-	121	3	15	31	3	8	32	12	1	-	105
TOTAL - EAST AND WEST																						

	WEST	9	92	89	-	-	-	-	-	-	140	-	9	29	18	12	12	12	5	7	104
TOTAL - EAST AND WEST JUNE AND AUGUST		26	89	638	4	-	-	-	-	-	756	4	22	65	40	86	116	85	23	85	581
PER CENT. OF TOTAL		3.44	11.64	84.39	0.53	-	-	-	-	-	100.00	0.77	4.22	12.48	7.68	16.31	22.27	15.93	4.41	15.93	100.00
LORDSBURG-EL PASO JUNE	EAST	16	23	142	6	7	19	3	-	-	216	32	5	14	6	43	44	43	10	5	182
(148 Miles East)	WEST	15	15	78	2	-	100	8	-	-	219	1	2	19	5	31	38	9	7	77	189
(159 Miles West)																					
AUGUST	EAST	1	8	83	4	6	11	9	-	-	122	4	5	18	4	21	23	18	3	5	101
	WEST	10	36	42	2	2	26	3	-	-	121	3	15	31	3	6	32	18	1	-	109
TOTAL - EAST AND WEST JUNE AND AUGUST		42	85	345	14	15	156	23	-	-	678	40	27	82	18	83	137	88	21	87	577
PER CENT. OF TOTAL		6.19	12.24	50.89	2.07	2.21	23.01	3.39	-	-	100.00	6.93	4.68	14.21	3.12	14.39	23.74	14.21	3.64	15.08	100.00
GRAND TOTAL (YUMA-EL PASO)		95	367	2,298	18	15	156	23	-	-	2,972	55	114	270	244	384	585	233	76	301	2,802

RECAPITULATION

TOTAL TRAINS OVER 70 CARS	212	7.13%
TOTAL TRAINS 70 CARS AND UNDER	2,760	92.87%
TOTAL TRAINS	2,972	100.00%

\# Departed Lordsburg with 71 and 74 cars, reduced to 70 cars east of State Line.
\#\# Departed Tucson with 70 cars each. Picked up cars east of State Line.

RECAPITULATION

TOTAL TRAINS OVER 70 CARS	1,983	80.06%
TOTAL TRAINS 70 CARS AND UNDER	459	19.94%
TOTAL TRAINS	2,802	100.00%

TUCSON-DOUGLAS JUNE	EAST	16	10	4	-	-	-	-	-	-	30	14	10	5	1	-	-	-	-	-	30
(125 Miles East)	WEST	6	9	15	-	-	-	-	-	-	30	1	5	8	3	2	9	2	-	-	30
(124 Miles West)																					
AUGUST	EAST	22	3	6	-	-	-	-	-	-	31	15	5	9	1	1	-	-	-	-	31
	WEST	4	14	13	-	-	-	-	-	-	31	4	13	11	-	1	2	-	-	-	31
TOTAL - EAST AND WEST JUNE AND AUGUST		48	36	38	-	-	-	-	-	-	122	34	33	33	5	4	11	2	-	-	122
PER CENT. OF TOTAL		39.34	29.51	31.15	-	-	-	-	-	-	100.00	27.87	27.05	27.05	4.10	3.28	9.01	1.64	-	-	100.00
DOUGLAS-EL PASO JUNE	EAST	25	4	1	-	-	-	-	-	-	30	26	2	1	1	-	-	-	-	-	30
(217 Miles East)	WEST	4	8	16	-	-	1	1	-	-	30 #	1	3	10	-	4	10	2	-	-	30
(218 Miles West)																					
AUGUST	EAST	22	6	3	-	-	-	-	-	-	31	16	7	7	-	1	-	-	-	-	31
	WEST	2	4	25	-	-	-	-	-	-	31	2	5	21	-	-	3	-	-	-	31
TOTAL - EAST AND WEST JUNE AND AUGUST		53	22	45	-	-	1	1	-	-	122	45	17	39	1	5	13	2	-	-	122
PER CENT. OF TOTAL		43.44	18.03	36.89	-	-	0.82	0.82	-	-	100.00	36.88	13.93	31.97	0.82	4.10	10.66	1.64	-	-	100.00
DOUGLAS-BISBEE JCT. JUNE	EAST	15	11	-	-	-	-	-	-	-	26	15	11	-	-	-	-	-	-	-	26
(22 Miles)	WEST	6	6	14	-	-	-	-	-	-	26	4	4	10	1	3	2	2	-	-	26
AUGUST	EAST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	WEST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL - EAST AND WEST JUNE AND AUGUST		21	17	14	-	-	-	-	-	-	52	19	15	10	1	3	2	2	-	-	52
PER CENT. OF TOTAL		40.39	32.69	26.92	-	-	-	-	-	-	100.00	36.54	28.84	19.23	1.92	5.77	3.85	3.85	-	-	100.00
GRAND TOTAL (TUCSON-EL PASO)		122	75	97	-	-	1	1	-	-	296	98	65	82	7	12	26	6	-	-	296

RECAPITULATION

TOTAL TRAINS OVER 70 CARS	2	0.68%
TOTAL TRAINS 70 CARS AND UNDER	294	99.32%
TOTAL TRAINS	296	100.00%

\# Departed El Paso with 95 cars, reduced to 70 cars at Rodeo.
\#\# Departed El Paso with 101 cars, reduced to 80 cars at Rodeo.

RECAPITULATION

TOTAL TRAINS OVER 70 CARS	51	17.23%
TOTAL TRAINS 70 CARS AND UNDER	245	82.77%
TOTAL TRAINS	296	100.00%

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Supp. Ct.

Vol. VII

TRANSCRIPT OF RECORD

(Pages 3199 to 3309)

Supreme Court of the United States

OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY, APPELLANT,

vs.

STATE OF ARIZONA, EX REL. JOE CONWAY, ATTORNEY GENERAL OF THE STATE OF ARIZONA

APPEAL FROM THE SUPERIOR COURT OF THE STATE OF ARIZONA, COUNTY OF PIMA

FILED APRIL 12, 1944.

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY, APPELLANT,

vs.

STATE OF ARIZONA, EX REL. JOE CONWAY, ATTORNEY GENERAL OF THE STATE OF ARIZONA

APPEAL FROM THE SUPERIOR COURT OF THE STATE OF ARIZONA, COUNTY OF PIMA

VOL. VII

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JUDD & DETWEILER (INC.), PRINTERS, WASHINGTON, D. C., JULY 20, 1944.

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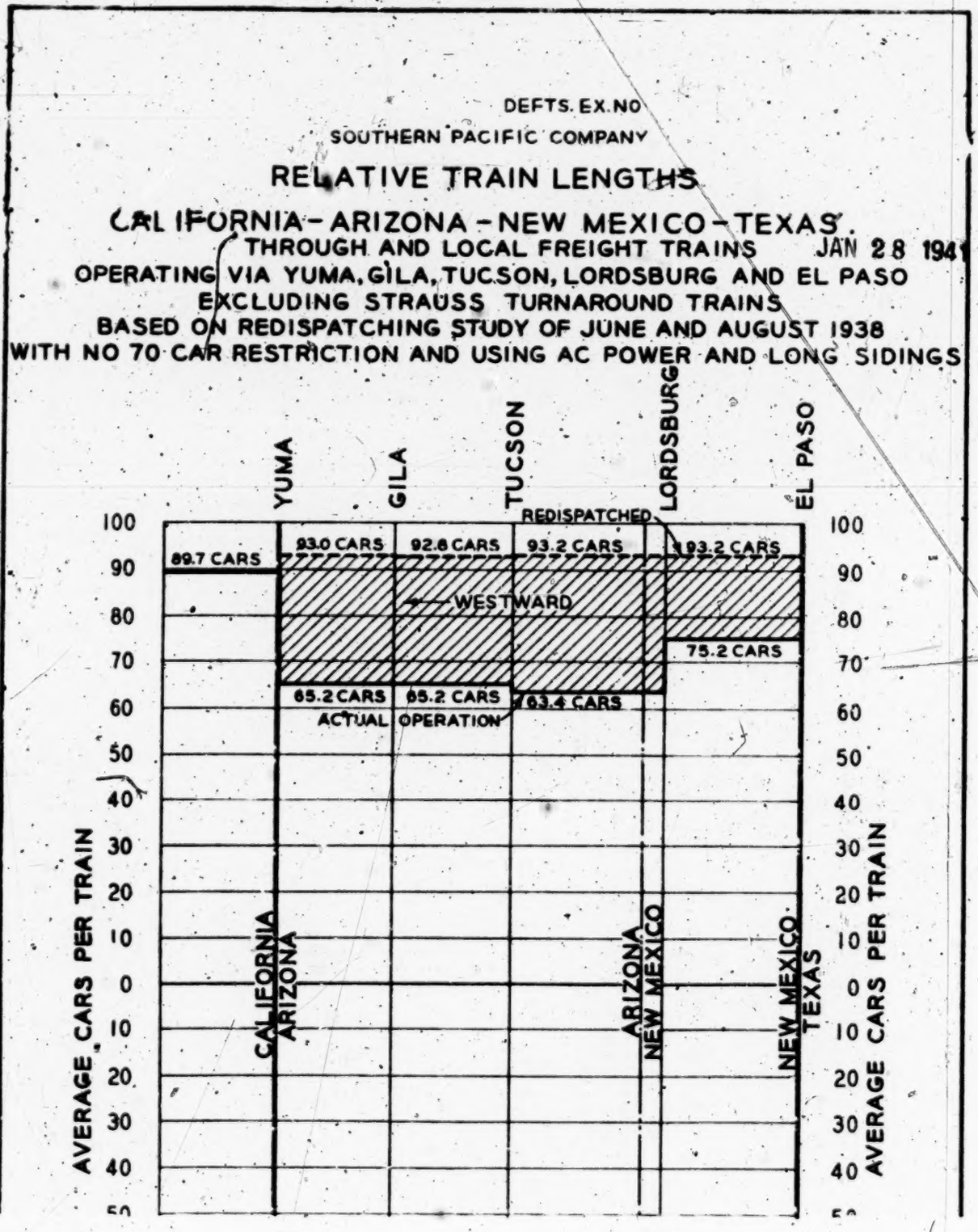
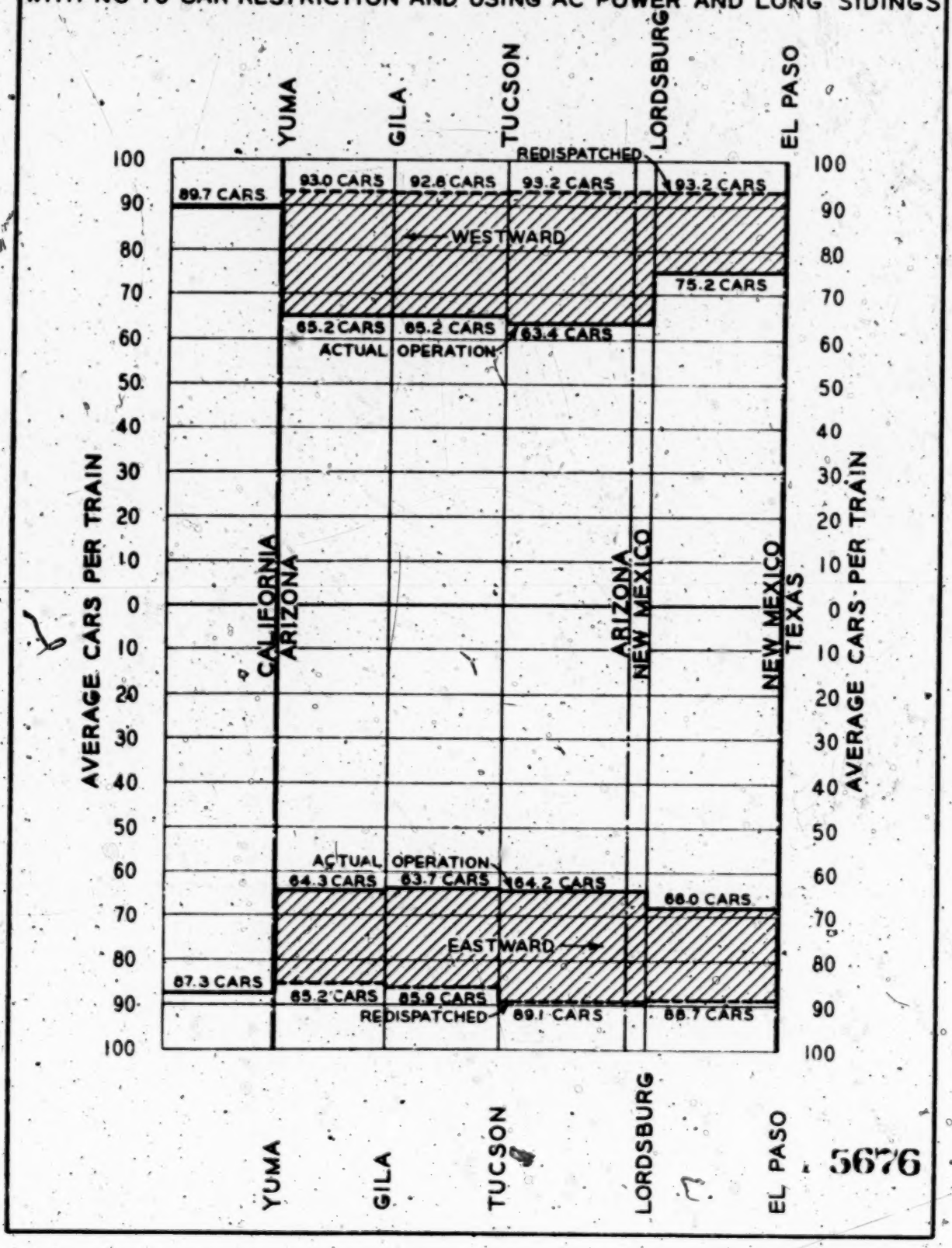
Defendant's Exhibit No. 215 (Witness Sines)
Jan. 28, 1941



EXCLUDING STRAUSS TURNAROUND TRAINS
BASED ON REDISPATCHING STUDY OF JUNE AND AUGUST 1938
WITH NO 70 CAR RESTRICTION AND USING AC POWER AND LONG SIDINGS



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Defendant's Exhibit No. 216 (Witness Masson)
Jan. 29, 1941

SOUTHERN PACIFIC COMPANY - Pacific Lines

Annual Report to the Interstate Commerce Commission — Report for the Year ended December 31, 1939

641. REVENUE FREIGHT CARRIED DURING THE YEAR†

Give the particulars asked concerning the commodities carried on the respondent's road during the year, the revenue from which is included in account No. [illegible] "Freight" revenue, classifying them in accordance with the Interstate Commerce Commission's Order of November 22, 1927, in the Manual of Commodity Statistics, effective on January 1, 1928, as amended by Order of December 14, 1938.

Classes 10-1 [illegible] include carload traffic only, all L. C. L. traffic being included in class [illegible].

Information as to tons, cars, and revenue of forwarder traffic should be reported against commodity class designation [illegible] unless clerical labor, class 701-A may be reported against forwarding companies or their subsidiaries [illegible] strictly [illegible] originate not less than approximately 80 percent of [illegible] respondent's line. The term "Forwarder traffic" [illegible] consigned by or to a forwarder, i. e., a company, firm, or individual recognized as engaged in the business of collecting and accumulating less-than-carload shipments into consolidated carloads without an ownership interest in the property so handled.

A "carload" for the purpose of this report should consist of a shipment of not less than 10,000 pounds of one commodity from one consignor to one consignee. Where mixed carload ratings are provided in classifications or tariffs, a mixed carload should be treated as a carload within the meaning of this paragraph, provided such shipment is from one consignor to one consignee at one destination, or in the case of shipments upon which stop-overs are permitted, from one consignor to two or more consignees, each at a different destination; and provided the shipment is waybilled at, and the charges are collected upon, the basis of the carload rate applicable. In such cases the shipment should be treated as a carload of that commodity which forms the major portion of the shipment in weight.

Line	Commodity group or class	Revenue Freight Originating on Respondent's Road				Revenue Freight Received from Connecting Carriers				Total Revenue Freight Carried			
		Terminating on line		Delivered to connecting carriers		Terminating on line		Delivered to connecting carriers					
		Number of carloads (b)	Number of tons (2,000 lb.) (c)	Number of carloads (d)	Number of tons (2,000 lb.) (e)	Number of carloads (f)	Number of tons (2,000 lb.) (g)	Number of carloads (h)	Number of tons (2,000 lb.) (i)	Number of carloads (j)	Number of tons (2,000 lb.) (k)		
	(a)												
1	GROUP I. PRODUCTS OF AGRICULTURE (C. L.)	2,786	108 379	295	11 689	1,824	82 509	513	26 104	5,358	228 621		
2		545	19 194	116	4 013	1,555	149 319	691	28 929	4,907	201 455		
3		620	21 242	52	1 680	201	6 566	10	288	883	29 776		
4		5,235	184 150	684	26 650	153	5 434	128	5 735	6,200	221 969		
5	Barley and rye	1,324	46 669	320	11 967	500	15 719	66	2 515	2,210	76 870		
6	Rice	--	848	4	197	24	743	2	65	50	1 823		
7	Grain, n. o. s.	3,113	81 359	459	12 804	4,538	119 735	515	18 673	8,705	231 971		
8	Flour, [illegible]	97	2 564	44	1 184	52	1 539	4	120	197	5 407		
9	Meal, corn	80	2 018	9	148	158	4 483	1	25	248	6 674		
10	Flour and meal, edible, n. o. s.	284	3 929	155	2 838	977	17 821	60	1 097	1,476	25 685		
11	Cereal food preparations, edible, n. o. s.	4,295	113 235	2,133	62 477	3,674	98 492	485	13 313	10,587	287 517		
12	Mill products, n. o. s.	2,293	31 211	275	3 484	252	4 133	38	609	2,768	39 437		
70	Hay and alfalfa	41	900	19	503	8	110	7	88	75	1 201		
71	Straw	22	289	-	-	92	1 902	-	-	114	2 191		
72	Tobacco, leaf	12,800	158 771	741	18 538	203	4 453	271	7 334	14,015	189 096		
73	Cotton in bales	260	4 777	144	3 254	9	163	13	275	426	8 469		
74	Cotton linters, nolls, and regins	1,414	47 600	72	1 924	42	1 212	2	46	1,530	50 782		
75	Cottonseed	840	27 234	333	8 332	333	9 008	4	147	1,510	44 721		
76	Cottonseed meal and cake	2,365	41 641	20,725	372 242	655	11 288	7,253	130 134	30,998	555 305		
77	Oranges and grapefruit	598	10 341	7,651	134 186	188	2 831	4,579	79 110	13,016	226 468		
78	Lemons, limes, and citrus fruits, n. o. s.	1,391	21 466	38	696	1,220	21 531	716	13 344	3,365	57 037		
79	Apples, fresh	1,751	18 452	543	5 751	976	10 786	620	6 832	3,890	41 821		
80	Bananas	21	212	62	626	3	29	10	160	96	1 027		
81	Berries, fresh	324	3 626	12,811	143 664	28	320	1,069	18 052	14 232	159 662		
82	Cantaloupes and melons, n. o. s.	1,074	21 602	14,487	243 899	161	2 574	1,621	27 265	17,343	285 340		
83	Grapes, fresh	2,793	46 464	1,811	27 192	614	10 412	53	750	5,271	84 818		
84	Peaches, fresh	1,339	16 612	1,276	15 938	140	1 737	14	183	2,769	34 470		
85	Watermelons	3,344	63 032	8,295	137 604	1,074	21 538	959	16 098	13,672	238 272		
87	Fruits, fresh, domestic, n. o. s.	3	36	155	2 464	5	70	69	934	232	3 504		
88	Fruits, fresh, tropical, n. o. s.	5,172	87 315	3,990	63 707	1,398	24 062	1,123	17 644	11,683	192 728		
89	Potatoes, other than sweet	62	828	825	11 505	23	312	127	1 735	1,037	14 380		
90	Cabbage	1,099	16 945	761	11 885	67	1 009	141	2 140	2,068	31 979		
91	Onions	[illegible]	[illegible]	[illegible]	25 876	357	4 157	1,280	15 005	4,171	46 741		
						[illegible]	[illegible]	[illegible]	109 767	85,593	1 023 861		

641. REVENUE FREIGHT CARRIED DURING THE YEAR†—Continued

In stating the number of tons received from connecting carriers, all shipments should be included that, so far as apparent from the information on the waybills or abstracts of waybills, have been received from connecting rail carriers either directly or indirectly. Shipments from boat lines should also be included when identified as having had previous rail transportation by United States rail carriers or as moving on joint through bills of lading by coastwise water carriers and railways.

Tonnage originating on switching roads connecting directly or indirectly with respondent's line should be regarded as tonnage originated by respondent.

Import traffic and traffic from outlying possessions of the United States received from water carriers should be regarded as originating at the port of entry.

All other tonnage should be treated as originating on line, including finished products from transit points.

The terms "delivered to connecting carriers" and "received from connecting carriers" as used in "Freight revenue" means reporting carrier's freight revenue without adjustment for absorptions or corrections.

In the note on page 518 show the aggregate amount of charges for protective services to perishable freight (without segregation of any portion thereof credited to account No. 101, Freight revenue) and the name of each rail carrier on whose rails protective service to perishable freight was performed for which the charges are credited, will report the amount of charges for such services. Tariff charges for specific services performed in transit, or at destination, which are not included in the line haul (standard) charges from the point at which the commodity is first applicable, and which are collected from the consignee or consignor should be reported by the carrier to which such

GHT CARRIED DURING THE YEAR†—Continued

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The terms "delivered to connecting carriers" and "terminating on line" should be understood in a manner consistent with the above definitions of "received from connecting carriers" and "originating on line."

"Freight revenue" means reporting carrier's gross freight revenue without adjustment for absorptions or corrections.

In the note on page 518 show the aggregate of the gross charges for protective services to perishable freight (without deduction for any proportion thereof credited to account No. 101, "Freight"). The carrier on whose rails protective service to perishable freight originates, or to which the charges are credited, will report the gross tariff charges for such services. Tariff charges for specific services performed at origin, in transit, or at destination, which are not included in the established (standard) charges from the point at which the protective service was first applicable, and which are collected from shippers or consignees, should be reported by the carrier to which such charges accrue.

Connecting carriers: Number of tons (2,000 lb.) (i)		Total Revenue Freight Carried: Number of carloads (j)	Number of tons (2,000 lb.) (k)		Freight revenue (dollars) (l)		Class No.
26	104	5,358	228	621	840	175	10
28	929	4,907	201	455	888	588	20
	288	883	29	776	121	724	30
5	735	6,200	221	969	445	466	40
2	515	2,210	76	870	277	124	41
	65	50	1	823	7	794	42
18	673	8,705	231	971	830	537	50
	120	127	5	407	10	661	51
	25	248	6	614	33	483	52
1	097	1,476	25	685	177	378	60
13	313	10,587	287	517	711	478	61
	609	2,768	39	437	110	264	70
	88	75	1	201	5	140	71
-		114	2	191	18	515	80
7	334	14,015	189	096	965	286	90
	275	426	8	469	52	985	91
	46	1,530	50	782	101	037	100
	147	1,510	44	721	158	367	101
130	134	30,998	555	305	5 817	618	110
79	110	13,016	226	468	2 186	908	111
13	344	3,365	57	037	398	164	120
6	832	3,890	41	821	382	294	130
	160	96	1	027	10	066	131
12	052	14 232	159	662	2 189	131	132
27	265	17,343	295	340	3 020	171	134
	750	5,271	84	818	463	362	135
	183	2,769	34	470	337	582	136
16	928	13,672	238	272	1 963	741	137
	934	232	3	504	36	687	138
17	644	11,683	192	728	1 351	449	139
1	735	1,037	14	380	182	234	140
2	140	2,068	31	878			

with the Interstate Commerce Commission's Order of November 22, 1927, in the Matter of Freight Commodity Statistics, effective on January 1, 1928, as amended by order of December 14, 1928.

Classes 10 to 701 should include carload traffic only, all L. C. L. traffic being included in class 710.

Information as to carloads, tons, and revenue of forwarder traffic included in class 701 should be reported against commodity class designated 701-A. To avoid undue clerical labor, class 701-A may be restricted to the principal forwarding companies or their subsidiaries originating in the aggregate not less than approximately 80 percent of such traffic handled on respondent's line. The term "Forwarder traffic" means freight traffic consigned by or to a forwarder, i. e., a company,

A "carload" for the purpose of this report should consist of a shipment of not less than 10,000 pounds of one commodity from one consignor to one consignee. Where mixed carload ratings are provided in classifications or tariffs, a mixed carload should be treated as a carload within the meaning of this paragraph, provided such shipment is from one consignor to one consignee at one destination, or in the case of shipments upon which stop-overs are permitted, from one consignor to two or more consignees, each at a different destination; and provided the shipment is waybilled as, and the charges are collected upon, the basis of the carload rate applicable. In such cases the shipment should be treated as a carload of that commodity which forms the major portion of the shipment in weight.

Class No.	Commodity group or class	Revenue Freight Originating on Respondent's Road						Revenue Freight Received from Connecting Carriers						Total Revenue Freight Carried					
		Terminating on line			Delivered to connecting carriers			Terminating on line			Delivered to connecting carriers								
		Number of carloads	Number of tons (2,000 lb.)		Number of carloads	Number of tons (2,000 lb.)		Number of carloads	Number of tons (2,000 lb.)		Number of carloads	Number of tons (2,000 lb.)		Number of carloads	Number of tons (2,000 lb.)				
	(a)	(b)	(c)		(d)	(e)		(f)	(g)		(h)	(i)		(j)	(k)				
	GROUP I. Products of Agriculture (C. L.)																		
10	Wheat	2,786	108	379	295	11	629	1,824	82	509	513	26	104	5,358	228	621			
20	Corn	545	19	194	116	4	013	3,555	149	319	691	28	929	4,907	201	455			
30	Oats	620	21	242	52	1	680	201	6	566	10		288	883	29	776			
40	Barley and rye	5,235	184	150	684	26	650	153	5	434	128	5	735	6,200	221	969			
41	Rice	1,324	46	669	320	11	967	500	15	719	66	2	515	2,210	76	870			
42	Grain, n. o. s.	20		818	4		197	24		743	2		65	50	1	823			
50	Flour, wheat	3,113	81	359	459	12	804	4,558	119	735	575	18	673	8,705	231	971			
51	Meal, corn	97	2	564	44	1	184	52	1	539	4		180	197	5	407			
52	Flour and meal, edible, n. o. s.	80	2	018	9		148	158	4	483	1		25	248	6	674			
60	Cereal food preparations, edible, n. o. s.	284	3	929	155	8	838	977	17	821	60	1	097	1,476	25	685			
61	Mill products, n. o. s.	4,295	113	235	2,133	62	477	3,674	98	492	485	13	313	10,587	287	517			
70	Hay and alfalfa	2,203	31	211	275	3	484	252	4	133	38		609	2,768	39	437			
71	Straw	41		500	19		503	8		110	7		88	75	1	201			
80	Tobacco, leaf	22		289	-		-	92	1	902	-		-	114	2	191			
90	Cotton in bales	12,800	158	771	741	18	538	203	4	453	271	7	334	14,015	189	096			
91	Cotton linters, nolls, and regins	260	4	777	144	3	254	9		163	13		275	426	8	469			
100	Cottonseed	1,414	47	600	72	1	924	42	1	212	2		46	1,530	50	782			
101	Cottonseed meal and cake	840	27	234	333	8	332	333	9	008	4		147	1,510	44	721			
110	Oranges and grapefruit	2,365	41	641	20,725	372	242	655	11	288	7,253	130	134	30,998	555	305			
111	Lemons, limes, and citrus fruits, n. o. s.	598	10	341	7,651	134	186	188	2	831	4,579	79	110	13,016	226	468			
120	Apples, fresh	1,391	21	466	38		696	1,220	21	531	716	13	344	3,365	57	037			
121	Bananas	1,751	18	452	543	5	751	976	10	786	620	6	832	3,890	41	821			
122	Berries, fresh	21		212	62		626	3		29	10		160	96	1	027			
130	Cantaloupes and melons, n. o. s.	324	3	626	12,811	143	664	28		320	1,069	12	052	14 232	159	662			
131	Grapes, fresh	1,074	21	692	14,487	243	899	161	2	574	1,621	27	265	17,343	295	340			
132	Peaches, fresh	2,793	46	464	1,811	27	192	614	10	412	53		750	5,271	84	818			
133	Watermelons	1,339	16	612	1,276	15	938	240	1	737	14		183	2,769	34	470			
137	Fruits, fresh, domestic, n. o. s.	3,344	63	032	8,295	137	604	1,074	21	538	959	16	098	13,672	238	272			
139	Fruits, fresh, tropical, n. o. s.	3		36	155	2	464	5		70	69		934	232	3	504			
150	Potatoes, other than sweet	5,172	87	315	3,990	63	707	1,398	24	062	1,123	17	644	11,683	192	728			
160	Cabbage	62		828	825	11	595	23		312	127	1	735	1,037	14	380			
161	Onions	1,099	16	945	761	11	885	67	1	009	141	2	140	2,068	31	979			
162	Tomatoes	140	1	703	2,394	25	876	357	4	157	1,280	15	005	4,171	46	741			
163	Vegetables, fresh, n. o. s.	1,773	21	471	74,206	886	098	543	6	525	9,071	109	767	85,593	1	023	861		
180	Beans and peas, dried	686	17	756	1,941	59	660	138	3	535	451	14	044	3,216	94	995			
181	Fruits, dried or evaporated	5,149	125	863	2,895	94	632	928	23	109	64	2	032	9,036	245	636			
182	Vegetables, dry, n. o. s.	124	2	161	235	3	719	14		218	51		797	424	6	895			
190	Vegetable-oil cake and meal; except cottonseed	229	5	834	310	7	398	46	1	805	9		374	594	15	41			
191	Peanuts	21		357	2		60	222	4	187	19		351	264	4	9			
192	Flaxseed	634	20	028	4		118	37	1	196	-		-	675	21	34			
193	Sugar beets	22,379	879	810	2,959	119	012	894	33	631	-		-	26,232	1	032	45		
194	Products of agriculture, n. o. s.	5,049	117	116	4,093	104	544	811	20	629	363	10	824	10,316		253	173		
200	Total Products of Agriculture	93,439	2 394	610	168,324	2 643	498	27,157	730	832	32,532	566	938	321,452	6	335	878		

† Not required from switching and terminal companies.

Tonnage originating on switching roads connecting directly or indirectly with respondent's line should be regarded as tonnage originated by respondent.

Import traffic and traffic from outlying possessions of the United States received from water carriers should be regarded as originating at the port of entry.

All other tonnage should be treated as originating on line, including finished products from transit points.

without adjustment for absorptions or correcti

In the note on page 518 show the aggregat protective services to perishable freight (witho portion thereof credited to account No. 101, on whose rails protective service to perishabl which the charges are credited, will report t such services. Tariff charges for specific ser in transit, or at destination, which are not i (standard) charges from the point at which t first applicable, and which are collected fro should be reported by the carrier to which suc

† Not required from switching and terminal companies.

Steam Railway Corporations—Operating—A.

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tions of "received from connecting carriers" and "originating on line."

"Freight revenue" means reporting carrier's gross freight revenue without adjustment for absorptions or corrections.

In the note on page 518 show the aggregate of the gross charges for protective services to perishable freight (without deduction for any proportion thereof credited to account No. 101, "Freight"). The carrier on whose rails protective service to perishable freight originates, or to which the charges are credited, will report the gross tariff charges for such services. Tariff charges for specific services performed at origin, in transit, or at destination, which are not included in the established (standard) charges from the point at which the protective service was first applicable, and which are collected from shippers or consignees, should be reported by the carrier to which such charges accrue.

ITEMS	TOTAL REVENUE FREIGHT CARRIED				FREIGHT REVENUE (Dollars)		Class No.
CONNECTING CARRIERS	Number of tons (2,000 lb.) (f)	Number of carloads (g)	Number of tons (2,000 lb.) (h)		(i)		
	26 104	5,358	228 621		840 175		1
	28 929	4,907	201 455		888 588		2
	288	883	29 776		121 724		3
	5 735	6,200	221 969		445 466		4
	2 515	2,210	76 870		271 124		41
	65	59	1 823		7 794		5
	18 673	8,705	231 971		830 537		6
	220	197	5 407		10 641		7
	25	248	6 674		33 483		8
	1 097	1,476	25 685		177 378		9
	13 313	10,589	287 517		711 478		10
	609	2,768	39 437		110 264		11
	88	75	1 201		5 140		12
	-	114	2 191		18 515		13
	7 334	14,015	189 096		965 286		14
	275	426	8 469		52 985		15
	46	1,530	50 782		101 037		16
	147	1,510	44 721		158 367		17
	130 134	30,998	555 305	5	817 618		18
	79 110	13,016	226 468	2	186 508		19
	13 344	3,365	57 037		398 164		20
	6 832	3,890	41 821		382 294		21
	160	96	1 027		10 066		22
	12 052	14 232	159 662	2	189 131		23
	27 265	17,343	295 340	3	020 171		24
	750	5,271	84 818		463 362		25
	183	2,769	34 470		337 582		26
	16 098	13,672	238 272	1	963 741		27
	934	232	3 504		36 687		28
	17 644	11,683	192 726	1	381 449		29
	1 735	1,037	14 380		182 234		30
	2 140	2,068	31 979		08 112		31
	15 005	4,171	46 741		17 071		32
	109 767	85,593	1 023 861	12	873 139		33
	14 044	3,216	94 995		699 070		34
	2 032	9,036	245 636	1	181 642		35
	797	424	6 895		59 321		36
	374	594	15 41		27 617		37
	351	264	4 95		35 071		38
	-	675	21 34		53 511		39
	-	26,232	1 032 45	4	073 495		40
	10 824	10,316	253 173	1	446 285		41
	566 938	321,452	6 335 878	42	319 343		700

required from switching and terminal companies.

541. REVENUE FREIGHT CARRIED DURING THE YEAR †—Continued

Class No.	Commodity group or class (a)	Revenue Freight Originating on Respondent's Road: Terminating on Line — Number of carloads (b)	Terminating on Line — Number of tons (2,000 lb.) (c)	Delivered to Connecting Carriers — Number of carloads (d)	Delivered to Connecting Carriers — Number of tons (2,000 lb.) (e)	Revenue Freight Received from Connecting Carriers: Terminating on Line — Number of carloads (f)	Terminating on Line — Number of tons (2,000 lb.) (g)	Delivered to Connecting Carriers — Number of carloads (h)	Delivered to Connecting Carriers — Number of tons (2,000 lb.) (i)	Total Revenue Freight Carried — Number of carloads (j)	Number of tons (2,000 lb.) (k)
	GROUP II. Animals and Products (C. L.)										
170	Horses, mules, ponies, and asses	233	2 737	118	1 354	180	2 104	23	248	554	6 446
180	Cattle and calves, single-deck	10,993	128 646	5,091	53 745	6,633	78 820	1,292	13 612	24,009	274 823
181	Calves, double-deck	338	4 658	421	5 108	248	3 991	130	1 640	1,137	15 397
190	Sheep and goats, single-deck	156	1 199	55	392	64	432	15	121	290	2 142
191	Sheep and goats, double-deck	2,619	34 520	2,781	28 515	1,705	20 380	183	1 947	7,288	85 365
200	Hogs, single-deck	137	1 303	32	298	60	537	3	29	232	2 165
201	Hogs, double-deck	311	5 184	7	63	1,413	19 720	17	219	1,748	25 182
210	Fresh meats, n. o. s.	1,196	16 209	13	163	126	1 627	15	333	1,350	18 332
220	Meats, cured, dried, or smoked	117	2 051	9	160	1,315	24 278	7	199	1,448	26 688
231	Butterine and margarine	60	1 249	3	33	15	200	31	394	117	1 876
232	Packing-house products, edible, n. o. s., not including canned meat	442	6 467	24	394	247	3 786	11	208	724	10 854
240	Poultry, live	-	-	7	105	50	362	9	68	66	53
241	Poultry, dressed	223	1 784	362	5 842	90	1 269	21	323	596	9 219
250	Eggs	95	881	68	1 075	134	1 827	205	3 258	502	7 041
260	Butter	39	681	32	493	364	5 089	2	32	437	6 295
261	Cheese	265	4 883	22	499	137	2 001	18	282	442	7 664
262	Wool	336	3 751	275	4 449	8	107	11	135	630	8 442
270	Hides, green	115	3 062	194	6 735	14	369	7	259	330	10 421
271	Leather	2	10	56	756	3	40	-	-	61	807
280	Fish or sea-animal oil	745	27 202	1,334	40 188	65	1 999	35	1 088	2,179	70 477
281	Animals, live, n. o. s.	-	-	1	15	2	45	-	-	3	60
290	Animal products, n. o. s. (other than fertilizers and fertilizer materials)	1,658	43 800	1,943	53 175	497	11 302	118	3 048	4,216	111 324
299	Total Animals and Products	19,388	290 877	12,848	203 597	13,370	180 285	2,153	27 443	48,359	701 567
	GROUP III. Products of Mines (C. L.)										
300	Anthracite coal		-		-	90	4 289	-	-	90	4 289
310	Bituminous coal	389	11 350	991	30 938	3,351	119 444	1,619	76 247	6,290	237 979
320	Coke	427	15 257	58	1 842	1,052	40 669	202	6 824	1,739	64 592
330	Iron ore	60	1 425	-	-	17	938	-	-	77	4 363
331	Copper ore and concentrates	18,214	1 017 835	94	5 525	24,541	1 630 493	16	605	42,865	2 654 453
332	Lead ore and concentrates	377	18 926	1	32	121	5 093	1	50	500	24 101
333	Zinc ore and concentrates	-	-	156	8 440	10	447	170	8 590	336	17 471
339	Ores and concentrates, n. o. s.	3,573	197 827	738	35 500	1,030	50 553	695	33 118	6,036	316 998
340	Gravel and sand (other than glass or molding)	37,117	2 102 778	967	52 094	2,872	164 172	22	1 113	40,977	2 320 157
341	Stone, broken, ground, or crushed	10,609	587 607	471	24 824	716	36 523	286	15 633	12,082	604 586
342	Stone, rough, n. o. s.	53	2 098	20	791	48	1 642	2	57	123	4 588
343	Stone, finished, n. o. s.	9	82	4	78	34	1 162	7	376	54	1 718
350	Petroleum, crude	1,178	54 098	32	1 555	-	-	30	1 115	1,240	56 768
370	Asphalt (natural, by-product, or petroleum)	6,592	239 398	1,959	66 648	762	27 696	395	14 839	9,708	330 541
380	Salt	6,784	260 212	489	14 238	249	7 282	7	331	7,469	281 905
390	Phosphate rock, crude (ground or not ground)	3	127	2	30	135	6 519	1	40	140	6 716
391	Sulphur (brimstone)	384	16 258	13	300	37	1 724	18	768	452	19 058
392	Products of mines, n. o. s.	12,315	637 655	1,839	68 278	6,285	328 401	1,777	82 433	22,216	1 136 767
3999	Total Products of Mines	97,964	5 084 893	7,833	333 113	41,349	2 426 907	5,248	248 137	152,394	8 087 050

IGHT CARRIED DURING THE YEAR†—Continued

RAILWAYS (CONNECTING CARRIERS)			TOTAL REVENUE FREIGHT CARRIED				Freight revenue (dollars)			Class No.
Number of tons (2,000 lb.) (f)			Number of carloads (j)	Number of tons (2,000 lb.) (k)			(l)			
		248	554		6	443		67	082	170
	13	612	24,089		274	823	1	721	371	180
	1	640	1,137		15	397		115	651	181
		121	290		2	144		14	701	190
	1	947	7,268		85	362		549	804	191
		29	232		2	167		33	985	195
		219	1,748		25	186		203	341	201
		333	1,350		18	332		99	892	210
		199	1,448		26	688		142	357	220
		394	117		1	876		24	473	221
		208	724		10	855		87	531	230
		68	66			535		10	840	240
		323	596		9	218		148	638	241
	3	258	502		7	041		72	236	260
		32	437		6	295		82	821	270
		282	442		7	665		98	741	271
		135	630		8	442		60	436	280
		259	330		10	425		68	743	290
	-		61			806		9	462	291
	1	088	2,179		70	477		334	666	300
	-		3			60			418	301
	3	048	4,816		111	325		589	665	310
	27	443	48,359		701	562	4	716	854	[310]
	-		90		4	289		12	255	320
	76	247	6,290		237	979		573	513	330
	6	824	1,739		64	592		179	613	340
	-		77		4	363		6	695	350
		605	42,865	2	654	458		830	337	360
		20	500		24	101		99	805	361
	8	590	336		17	477		67	731	362
	33	118	6,036		316	998		660	271	370
	1	113	40,977	2	320	157	1	203	105	380
	15	631	12,082		604	585		328	114	381
		57	123		4	588		17	959	390
		376	54		1	718		10	397	391
	1	115	1,240		56	768		22	225	400
	14	839	9,708		330	541	1	099	957	410
		331	7,469		281	903		434	611	420
		40	140		6	716		17	403	430
		768	452		19	050		37	808	431
	82	433	22,816	1	136	767	1	879	530	440
	248	137	152,394	8	087	050	7	481	329	[440]

641. REVENUE FREIGHT CARRIED DURING THE YEAR †—Continued

Class No.	Commodity group or class (a)	Revenue Freight Originating on Respondent's Road: Terminating on line — Number of carloads (b)	Terminating on line — Number of tons (2,000 lb.) (c)	Delivered to connecting carriers — Number of carloads (d)	Delivered to connecting carriers — Number of tons (2,000 lb.) (e)	Revenue Freight Received from Connecting Carriers: Terminating on line — Number of carloads (f)	Terminating on line — Number of tons (2,000 lb.) (g)	Delivered to connecting carriers — Number of carloads (h)	Delivered to connecting carriers — Number of tons (2,000 lb.) (i)	Total Revenue Freight Carried — Number of carloads (j)	Number of tons (2,000 lb.) (k)
	GROUP IV. Products of Forests (C. L.)										
420	Logs	73,583	2 761 056	2,516	79 150	8,345	286 756	14	521	84,458	3 127
421	Posts, poles, and piling	2,694	80 730	3,766	111 267	806	22 375	251	6 996	7,517	222
422	Wood (fuel)	6,632	224 793	46	880	892	29 777	9	292	7,579	255
423	Ties, railroad	424	17 589	382	15 356	128	4 625	479	15 931	1,413	53
424	Pulpwood	7,611	248 949	4	180	394	13 126	-	-	8,009	256
425	Lumber, shingles, and lath	27,929	890 658	40,508	1 213 087	13,456	407 379	13,210	379 166	95,103	2 890
426	Box, crate, and cooperage materials	9,010	213 736	3,719	90 046	4,153	92 625	952	21 813	17,834	417
427	Veneer and built-up wood	672	18 444	841	22 815	1,167	34 801	365	11 767	3,045	87
428	Rosin	16	446	-	-	7	226	1	5	24	
429	Turpentine	15	243	5	131	29	793	5	127	54	1
430	Crude rubber (not reclaimed)	12	302	167	5 065	11	340	3	121	193	
431	Products of forests, n. o. s.	442	8 104	316	6 678	804	16 970	228	5 731	1,790	3
200	TOTAL PRODUCTS OF FORESTS	129,040	4 458 989	52,270	1 544 655	30,192	909 793	15,517	442 470	227,019	7 35
	GROUP V. Manufactures and Miscellaneous (C. L.)										
440	Petroleum oils, refined, and all other gasolines	23,058	701 886	7,060	207 312	5,389	153 959	600	17 174	36,107	1 08
441	Fuel, road, and petroleum residual oils, n. o. s.	21,159	909 225	6,287	259 367	5,478	237 007	455	17 596	33,379	1 42
442	Lubricating oils and greases	4,395	114 071	1,306	28 725	873	18 706	256	6 682	6,830	16
443	Petroleum products, n. o. s.	67	1 596	5	72	109	2 499	2	45	183	
450	Cottonseed oil	1,053	33 125	179	5 328	765	23 585	108	3 343	2,105	6
451	Linseed oil	298	5 744	93	2 828	115	3 130	21	611	427	1
452	Vegetable oils, n. o. s.	331	9 849	1,613	49 223	207	6 453	318	9 734	2,469	7
470	Sugar (beet or cane)	8,514	331 292	5,779	201 528	727	32 500	152	6 065	15,172	57
471	Table syrups and edible molasses	18	348	21	604	546	19 146	31	919	616	2
472	Molasses, blackstrap and beet resid	1,851	100 354	64	2 786	281	13 460	7	231	2,203	11
473	Iron, pig	133	6 906	-	-	621	35 873	300	17 317	1,054	6
480	Iron and steel, rated 6th class in official classification, n. o. s.	60	2 636	1	28	5	120	-	-	66	
481	Rails, fastenings, frogs, and switches	332	12 892	200	8 433	167	8 245	55	2 456	754	3
482	Cast-iron pipe and fittings	293	7 104	15	356	283	10 012	11	383	602	1
483	Iron and steel pipe and fittings, n. o. s.	1,245	33 113	229	4 570	1,048	36 914	168	6 118	2,690	8
484	Iron and steel: Nails and wire, not woven	1,931	33 541	185	5 520	252	9 125	34	1 343	1,502	4
485	Iron and steel, rated 5th class in official classification, n. o. s. (also tin and terne plate)	6,376	203 931	882	24 835	5,587	229 851	570	20 178	13,415	47
490	Copper: Ingot, matte, and pig	313	17 771	1,043	55 881	245	13 602	1,126	61 459	2,787	14
491	Copper, brass, and bronze: Bar, sheet, and pipe	2,459	146 197	2,308	123 835	18	484	12	444	4,797	27
492	Lead and zinc: Ingot, pig, or bar	356	14 757	156	7 176	302	14 970	48	2 410	862	
493	Aluminum: Ingot, pig, or slab	11	248	-	-	-	-	1	20	12	
500	Machinery and boilers	759	13 213	574	12 547	1,290	28 285	381	7 567	3,004	
510	Cement, natural or Portland (building)	11,139	452 915	2,712	121 184	1,715	70 786	728	38 051	16,294	6
511	Brick, common	132	3 803	13	433	10	338	1	32	156	
512	Brick, n. o. s., and building tile	920	26 163	78	2 220	354	13 084	98	3 498	1,450	
513	Artificial stone, n. o. s.	45	1 617	22	574	3	82	-	-	70	
520	Lime, common (quick or slaked)	1,223	37 361	708	29 277	565	13 553	5	138	2,501	
521	Plaster (stucco or gypsum) and dry kalsomine	937	21 520	159	3 589	1,875	44 594	197	5 188	3,168	
530	Sewer pipe and drain tile (not metal)	413	7 362	108	1 943	98	2 324	12	251	631	
		61	736	[illegible]	[illegible]	359	7 035	75	1 246	530	

841. REVENUE FREIGHT CARRIED DURING THE YEAR †—Continued

Received from Connecting Carriers				Delivered to Connecting Carriers			Total Revenue Freight Carried				Freight revenue (dollars)			Class No.
Item		Number of carloads (b)		Number of tons (2,000 lb.) (c)			Number of carloads (d)		Number of tons (2,000 lb.) (e)			(f)		
	756	14			521		84,458	3	127	483	1	398	994	
	375	251		6	996		7,517		221	368	1	109	181	
	777	9			292		7,579		255	742		171	520	
	625	479	1	15	931		1,413		53	441		227	949	
	126	-		-			8,009		256	255		224	989	
	375	13,210		379	166		95,103	2	890	290	12	623	307	
	625	952		21	813		17,834		418	220	2	380	775	
	801	365		11	767		3,045		87	827		547	670	
	226	1			5		24			677		4	924	
	793	5			127		54		1	294		14	201	
	340	3			121		193		5	827		59	681	
	970	228		5	731		1,790		37	483		212	295	
	793	15,517		442	470		227,019	7	355	907	18	975	486	
	959	600		17	174		36,107	1	080	331	4	067	746	
	007	455		17	596		33,379	1	423	195	5	361	950	
	706	256		6	682		6,830		168	184		631	794	
	499	2			45		183		4	212		25	375	
	585	108		3	343		2,105		65	381		414	153	
	130	21			611		427		12	313		51	657	
	453	318		9	734		2,469		75	259		424	179	
	500	152		6	065		15,172		571	385	2	364	327	
	146	31			919		616		21	017		158	688	
	460	7			231		2,203		116	831		240	388	
	873	300		17	317		1,054		60	096		185	357	
	120	-		-			66		2	784		5	248	
	245	55		2	456		754		32	026		227	906	
	012	11			383		602		17	855		98	027	
	914	168		6	118		2,690		80	715		534	864	
	125	34		1	343		1,502		49	529		230	949	
	851	570		20	178		13,415		478	795	2	159	361	
	602	1,126		61	459		2,727		148	713		496	712	
	484	12			444		4,797		270	960		677	636	
	970	48		2	410		862		39	313		158	523	
		1			20		12			268		1	206	
	285	381		7	567		3,004		61	612		696	792	
	786	728		38	051		16,294		682	936	1	719	414	
	338	1			32		156		4	606		8	800	
	084	98		3	498		1,450		44	965		156	356	
	82	-		-			70		2	273		9	387	
	551	5			138		2,501		80	327		215	096	
	594	197		5	788		3,168		75	491		178	538	
	324	12			257		631		11	886		90	287	
	035	75		1	246		530		9	564		131	635	
	142	1			14		38			370		5	137	
	421	103		2	160		1,255		27	280		295	264	
							169		5	780		19	726	

	(a)	Number of carloads (b)	Number of tons (2,000 lb.) (c)	Number of carloads (d)	Number of tons (2,000 lb.) (e)	Number of carloads (f)	Number of tons (2,000 lb.) (g)	Number of carloads (h)	Number of tons (2,000 lb.) (i)	Number of carloads (j)
	GROUP IV. Products of Forests (C. L.)									
409	Logs	73,583	2 761 056	2,516	79 150	8,345	286 756	14	521	84,458
421	Posts, poles, and piling	2,694	80 730	3,766	111 267	806	22 315	251	6 996	7,527
422	Wood (fuel)	6,632	224 793	46	880	892	29 777	9	292	7,579
430	Ties, railroad	424	17 529	382	15 356	128	4 625	479	15 931	1,413
438	Pulpwood	7,611	242 949	4	180	394	13 126	-	-	8,009
439	Lumber, shingles, and lath	27,929	890 658	40,508	1 213 087	13,456	407 379	13,210	379 166	95,103
451	Box, crate, and cooperage materials	9,010	213 736	3,719	90 046	4,153	92 625	952	21 813	17,834
452	Veneer and built-up wood	672	18 444	841	22 815	1,167	34 801	365	11 767	3,045
440	Resin	16	446	-	-	7	226	1	5	24
441	Turpentine	15	243	5	131	29	793	5	127	54
443	Crude rubber (not reclaimed)	12	301	167	5 065	11	340	3	121	193
448	Products of forests, n. o. s.	442	8 104	316	6 678	804	16 970	228	5 731	1,790
399	TOTAL PRODUCTS OF FORESTS	129,040	4 458 989	52,270	1 544 655	30,192	909 793	15,517	442 470	227,019
	GROUP V. Manufactures and Miscellaneous (C. L.)									
480	Petroleum oils, refined, and all other gasolines	23,058	701 886	7,060	207 312	5,389	153 959	600	17 174	36,107
481	Fuel, road, and petroleum residual oils, n. o. s.	21,159	909 225	6,287	259 367	5,478	237 007	455	17 596	33,379
482	Lubricating oils and greases	4,395	114 071	1,306	28 725	873	18 706	256	6 682	6,830
483	Petroleum products, n. o. s.	67	1 596	5	72	109	2 499	2	45	183
460	Cottonseed oil	1,053	33 125	179	5 326	765	23 585	108	3 343	2,105
461	Linseed oil	198	5 744	93	2 828	115	3 130	21	611	427
462	Vegetable oils, n. o. s.	331	9 849	1,613	49 223	207	5 453	318	9 734	2,469
470	Sugar (beet or cane)	8,514	331 292	5,779	201 528	727	32 500	152	6 065	15,172
471	Table sirups and edible molasses	18	348	21	604	546	19 146	31	919	616
473	Molasses, blackstrap and beet residual	1,851	100 354	64	2 786	281	13 460	7	231	2,203
480	Iron, pig	133	6 906	-	-	621	35 873	300	17 317	1,054
491	Iron and steel, rated 6th class in official classification, n. o. s.	60	2 636	1	28	5	120	-	-	66
505	Rails, fastenings, frogs, and switches	332	12 892	200	8 433	167	8 245	55	2 456	754
510	Cast-iron pipe and fittings	293	7 104	15	356	283	10 012	11	383	602
511	Iron and steel pipe and fittings, n. o. s.	1,245	33 113	229	4 570	1,048	36 914	168	6 118	2,690
513	Iron and steel: Nails and wire, not woven	1,031	33 541	185	5 520	252	9 125	34	1 343	1,502
515	Iron and steel, rated 5th class in official classification, n. o. s. (also tin and terne plate)	6,376	203 931	882	24 835	5,587	229 851	570	20 178	13,415
520	Copper: Ingot, matte, and pig	313	17 771	1,043	55 881	245	13 602	1,126	61 459	2,727
521	Copper, brass, and bronze: Bar, sheet, and pipe	2,459	146 197	2,308	123 835	18	484	1*	444	4,797
522	Lead and zinc: Ingot, pig, or bar	356	14 757	156	7 176	302	14 970	48	2 410	862
523	Aluminum: Ingot, pig, or slab	11	248	-	-	-	-	1	20	12
530	Machinery and boilers	759	13 213	574	12 547	1,290	28 285	381	7 567	3,004
540	Cement, natural or Portland (building)	11,139	452 915	2,712	121 184	1,715	70 786	728	38 051	16,294
550	Brick, common	132	3 803	13	433	10	338	1	32	156
551	Brick, n. o. s., and building tile	920	26 163	78	2 220	354	13 084	98	3 498	1,450
559	Artificial stone, n. o. s.	45	1 617	22	574	3	82	-	-	70
560	Lime, common (quick or slaked)	1,223	37 361	708	29 277	565	13 551	5	138	2,501
561	Plaster (stucco or wall) and dry kalsomine	937	21 520	159	3 589	1,875	44 594	197	5 788	3,168
570	Sewer pipe and draintile (not metal)	413	7 362	108	1 943	98	2 324	12	257	631
580	Agricultural implements and parts, n. o. s.	61	736	25	547	359	7 035	75	1 246	530
581	Vehicles, horse-drawn, and parts, n. o. s.	13	190	9	114	25	142	1	14	38
582	Tractors and parts	219	3 739	92	1 960	841	19 421	103	2 160	1,255
583	Railway car wheels, axles, and trucks	116	4 217	33	976	17	484	3	103	169
588	Automobiles (passenger)	11,327	69 863	6,302	38 366	4,230	26 050	895	5 723	22,754
591	Autotrucks	1,860	11 892	1,429	9 439	800	6 553	70	561	4,159
593	Automobiles and autotrucks, K. D. and parts, n. o. s.	376	7 293	114	2 822	9,251	175 353	72	1 341	9,813
598	Automobile and autotruck tires	570	10 592	340	6 522	514	10 485	396	8 361	1,820
610	Furniture, metal	341	3 504	163	1 814	270	3 709	36	466	810
611	Furniture, other than metal	1,126	8 972	350	2 959	1,754	16 530	366	3 312	3,596
620	Beverages	3,683	95 954	4,015	112 673	2,795	68 614	1,497	42 474	11,970
	Carried forward	108,513	3 467 402	44,682	1 338 366	49,754	1 377 061	9,211	295 620	212,160

† Not required from switching and terminal companies.

STEAM RAILWAY CORPORATIONS—OPERATING—A

† Not required from switching and terminal companies.

	Number of carloads (h)	(1,000 lb.) (i)		carloads (j)	(1,000 lb.) (k)		(l)		
756	14		521	84,458	1	127 483	1	398	994
375	251	6	996	7,527		221 368	1	109	281
777	9		292	7,579		255 742		171	520
625	479	15	931	1,413		53 441		227	949
126	-	-		8,009		256 255		224	989
379	13,210	379	166	95,103	2	890 290	12	683	307
625	952	21	813	17,834		418 220	2	380	775
801	365	11	767	3,045		87 827		547	670
226	1		5	24		677		4	924
793	5		127	54		1 294		14	201
340	3		121	193		5 827		59	681
970	226	5	731	1,790		37 493		212	295
793	15,515	442	470	227,019	7	355 907	18	975	486
959	600	17	174	36,107	1	080 331	4	067	746
007	455	17	596	33,379	1	423 195	5	361	950
706	256	6	682	6,830		168 284		631	794
499	2		45	183		4 212		25	375
585	108	3	343	2,105		65 381		414	153
130	21		611	427		12 313		51	657
453	318	9	734	2,469		75 259		424	179
500	152	6	065	15,172		571 385	2	364	327
146	31		919	616		21 017		158	688
460	7		231	2,203		116 831		240	388
873	300	17	317	1,054		60 096		185	357
120	-	-		66		2 784		5	248
245	55	2	456	754		32 026		227	906
012	11		383	602		17 855		98	027
914	168	6	118	2,690		80 725		534	864
125	34	1	343	1,502		49 529		230	949
851	570	20	178	13,415		478 795	2	159	361
602	1,126	61	459	3,727		148 713		496	712
484	12		444	4,797		270 960		677	636
970	48	2	410	862		39 313		158	523
	1		20	12		268		1	206
285	381	7	567	3,004		61 612		696	792
786	728	38	051	16,294		682 936	1	719	414
338	1		32	156		4 606		8	800
084	98	3	498	1,450		44 965		156	356
82	-	-		70		2 273		9	387
551	5		138	2,501		80 327		215	096
594	197	5	788	3,168		75 491		178	538
324	12		257	631		11 886		50	287
035	75	1	246	530		9 564		131	635
142	1		14	38		370		5	137
421	103	2	160	1,255		27 280		295	264
484	3		103	169		5 780		19	726
050	895	5	723	22,754		140 002	2	593	437
553	10		561	4,159		28 445		481	829
353	72	1	341	9,813		186 809	2	155	997
485	396	8	361	1,829		35 960		368	944
709	36		466	810		9 493		107	281
530	366	3	382	3,596		31 773		523	659
614	1,497	42	474	11,970		319 715	2	103	212
061	9,211	295	620	212,160	6	478 449	30	336	837

(h)—A.

‡ Not required from switching and terminal companies.

SOUTHERN PACIFIC COMPANY - Pacific Lines

541. REVENUE FREIGHT CARRIED DURING THE YEAR†—Concluded

Class No.	Commodity group or class (a)	Revenue Freight Originating on Respondent's Road: Terminating on line — Number of carloads (b)	Terminating on line — Number of tons (2,000 lb.) (c)	Delivered to connecting carriers — Number of carloads (d)	Delivered to connecting carriers — Number of tons (2,000 lb.) (e)
	GROUP V. MANUFACTURES AND MISCELLANEOUS (C. L.)—Con.				
	Brought forward	108,513	3 467 402	44,682	1 338 366
520	Ice	3,133	70 562	39	883
540	Fertilizers, n. o. s.	2,436	70 627	419	10 992
550	Newsprint paper	345	7 633	203	6 555
551	Printing paper, n. o. s.	336	7 437	109	2 599
560	Alcohol, denatured or wood	127	2 635	13	220
561	Sulphuric acid	3,398	166 811	15	397
562	Explosives, n. o. s.	419	7 480	622	11 003
570	Cotton cloth and cotton fabrics, n. o. s.	66	955	50	723
571	Bagging and bags, burlap, gunny, or jute	400	7 712	255	5 384
580	Canned food products, n. o. s.	8,752	204 121	7,830	227 880
590	Tobacco, manufactured products	15	305	20	360
591	Paints in oil and varnishes	349	7 095	197	4 130
592	Furnace slag	37	1 689	1	51
593	Scrap iron and scrap steel	5,124	233 283	335	15 262
594	Paper bags and wrapping paper	893	18 081	1,005	23 199
595	Paperboard, pulpboard, and wallboard (paper)	569	14 131	36	840
596	Building paper and prepared roofing materials	1,687	34 635	570	12 939
597	Building woodwork (millwork)	559	8 256	1,118	24 590
598	Soap and washing compounds	958	19 070	323	7 050
599	Glass, flat, other than plate	8	101	-	-
700	Glass: Bottles, jars, and jelly glasses	3,510	76 083	1,648	25 452
701	Manufactures and miscellaneous, n. o. s.	50,436	1 025 015	12,302	281 407
[illegible]	TOTAL MANUFACTURES AND MISCELLANEOUS	192,078	5 451 029	71,592	2 010 282
[illegible]	GRAND TOTAL, CARLOAD TRAFFIC	532,503	17 679 798	312,867	6 735 105
	GROUP VI. L. C. L. FREIGHT				
710	All L. C. L. freight	x x x x x x x	445 201	x x x x x x x	118 960
[illegible]	GRAND TOTAL, CARLOAD AND L. C. L. TRAFFIC	x x x x x x x	18 124 999	x x x x x x x	6 854 065
701-A	Forwarder traffic included in Class 701*	1,654	19 737	250	4 000

Note.—Gross charges for protective services to perishable freight, without deduction for any proportion thereof credited to account No. 101, "Freight":

(a) Charges for service for the protection against heat — $ 5,487,519

(b) Charges for service for the protection against cold — $ 4,426

Note:

Statement of tonnage and revenue by commodities of revenue freight for Southern Pacific Steamship Lines is given on pages 519 A and 519 B.

541. REVENUE FREIGHT CARRIED DURING THE YEAR†—Concl

Revenue Freight Received from Connecting Carriers: Terminating on line — Number of carloads (f)	Terminating on line — Number of tons (2,000 lb.) (g)	Delivered to connecting carriers — Number of carloads (h)	Delivered to connecting carriers — Number of tons (2,000 lb.) (i)	Total Revenue Freight: Number of carloads (j)	Num (j)
49,754	1 377 061	9,211	295 620	212,160	6
-	-	-	-	3,172	
4,276	202 395	1,891	91 782	9,024	
150	4 288	123	3 271	821	
890	21 177	30	682	1,365	
85	2 327	3	69	228	
193	9 846	79	3 943	3,685	
421	6 265	185	2 909	1,647	
298	5 639	114	2 423	528	
28	634	7	119	690	
2,297	66 655	703	21 630	19,582	
1,309	27 638	29	582	1,373	
163	4 558	43	1 230	752	
1	50	-	-	39	
237	11 538	17	799	5,713	
684	15 113	65	1 598	2,647	
712	18 298	197	5 627	1,514	
194	4 879	60	1 631	2,511	
390	9 609	187	5 043	2,254	
255	5 597	37	873	1,573	
258	9 104	114	4 423	380	
243	4 264	219	3 806	5,420	
31,180	666 281	5,406	166 295	99,324	2
94,018	2 473 216	18,720	614 355	376,402	10
206,086	6 721 033	74,170	1 893 343	1,125,626	33
x x x x x x x	79 347	x x x x x x x	14 877	x x x x x x x	
x x x x x x x	6 800 380	x x x x x x x	1 908 220	x x x x x x x	33
5,757	81 020	38	524	7,699	

541. REVENUE FREIGHT CARRIED DURING THE YEAR†—Concluded

Received from Connecting Carriers — Number of tons (2,000 lb.)	Delivered to Connecting Carriers — Number of carloads (h)	Delivered to Connecting Carriers — Number of tons (2,000 lb.) (i)	Total Revenue Freight Carried — Number of carloads (j)	Total Revenue Freight Carried — Number of tons (2,000 lb.) (k)	Freight revenue (dollars) (l)	Class No.
7 061	9,211	295 620	212,160	6 478 449	30 336 837	
-	-	-	3,172	71 445	81 110	630
22 395	1,891	91 782	9,024	375 796	1 216 541	640
4 288	123	3 271	821	21 747	147 417	650
21 177	30	682	1,365	31 895	245 887	651
2 327	3	69	228	5 251	19 214	660
9 846	79	3 943	3,685	180 997	345 592	661
6 265	185	2 909	1,647	27 657	276 845	662
5 639	114	2 423	528	9 740	90 662	670
634	7	119	690	13 849	83 537	671
6 655	703	21 630	19,582	530 286	3 063 497	680
7 638	29	582	1,373	28 885	350 749	690
4 558	43	1 230	752	16 923	118 593	691
50	-	-	39	1 790	3 724	692
1 538	17	799	5,713	260 882	525 178	693
5 113	65	1 598	2,647	57 991	454 006	694
8 298	197	5 627	1,514	38 896	188 291	695
4 879	60	1 631	2,511	54 084	299 224	696
9 609	187	5 043	2,254	47 498	284 253	697
5 597	37	873	1,573	32 590	196 011	698
9 104	114	4 423	380	13 628	98 359	6 0
4 264	219	3 806	5,420	109 605	422 149	7 0
6 281	5,406	166 295	99,324	2 138 998	11 568 563	01
3 216	18,720	614 355	376,402	10 548 882	50 416 237	[illegible]
21 033	74,170	1 893 343	1,125,626	33 029 279	123 909 249	[illegible]
9 347	x x x x x x	14 877	x x x x x x	658 385	9 669 888	710
10 380	x x x x x x	1 908 220	x x x x x x	33 687 664	133 579 137	[illegible]
1 020	38	524	7,699	105 281	1 360 643	701-A

941. REVENUE FREIGHT CARRIED DURING THE YEAR—WITHIN THE STATE*

Give the particulars called for concerning the commodities carried on the respondent's road during the year, the revenue from which is includible in account No. 101, "Freight", classifying them in accordance with the Interstate Commerce Commission's Order in the Matter of Freight Commodity Statistics, effective January 1, 1938, as amended by order of December 14, 1938.

In stating the number of tons received from connecting carriers, include all shipments that, so far as apparent from the information on the waybills or abstracts of waybills, have been received from connecting rail carriers either directly or indirectly. Shipments from boat lines should also be included when identified as having had previous rail transportation by United States rail carriers or as moving on joint through bills of lading by coastwise water carriers and railways.

Tonnage originating on switching roads connecting directly or indirectly with respondent's line should be regarded as tonnage originated by respondent. Import traffic and traffic from outlying possessions of the United States received from water carriers should be regarded as originating at the port of entry. All other tonnage should be treated as originating on line, including finished products from transit points.

If the application of these instructions results in any marked deviation from the respondent's past practice, that fact should be stated in a footnote in order that proper allowance can be made in interpreting the statistics.

Particulars for Classes Nos. 10 to 701 should include carload traffic only, all less than carload traffic being included in Class No. 710.

Information as to carloads and tons of forwarder traffic included in Class 701 should be reported against commodity class designated 701-A. To avoid undue clerical labor, Class 701-A may be restricted to the principal forwarding companies or their subsidiaries originating in the aggregate not less than approximately 80 percent of such traffic handled on respondent's line. The term "Forwarder traffic" is defined in the third paragraph of instructions for Schedule No. 541 on page No. 512.

Class No.	Commodity (a)	Revenue Freight Originating on Respondent's Road Within the State: Number of carloads (b)	Number of tons (2,000 lb.) (c)	All Other Revenue Freight Carried Within the State†: Number of carloads (d)	Number of tons (2,000 lb.) (e)	Total Revenue Freight Carried Within the State: Number of carloads (f)	Number of tons (2,000 lb.) (g)	Total Revenue Freight Terminating on Respondent's Road Within the State: Number of carloads (h)	Number of tons (2,000 lb.) (i)
	GROUP I. Products of Agriculture (C. L.)								
10	Wheat	36	1 460	410	21 528	446	22 988	81	3 632
20	Corn	56	1 862	564	23 368	620	25 230	117	4 593
30	Oats	1	40	37	1 161	38	1 201	11	365
40	Barley and rye	5	210	98	4 288	103	4 498	9	367
41	Rice	-	-	534	17 122	534	17 122	17	590
42	Grain, n. o. s.	-	-	5	158	5	158	-	-
50	Flour, wheat	38	441	647	17 023	685	17 464	588	14 366
51	Meal, corn	-	-	23	652	23	652	8	222
52	Flour and meal, edible, n. o. s.	-	-	10	279	10	279	8	216
60	Cereal food preparations, edible, n. o. s.	2	75	465	6 927	467	7 002	81	1 395
61	Mill products, n. o. s.	534	15 548	576	16 348	1,110	31 896	188	5 270
70	Hay and alfalfa	787	9 698	6	65	793	9 763	95	1 290
71	Straw	22	285	14	420	36	705	5	62
80	Tobacco, leaf	-	-	71	1 439	71	1 439	-	-
90	Cotton in bales	4,439	65 668	701	18 548	5,140	84 216	2 781	26 913
91	Cotton linters, nolls, and regins	180	4 488	17	338	197	4 826	-	-
100	Cottonseed	878	28 922	43	1 159	921	30 081	849	27 930
101	Cottonseed meal and cake	649	21 002	6	182	655	21 184	6	176
110	Oranges and grapefruit	1,189	19 124	17,427	314 100	18,616	333 224	7	108
111	Lemons, limes, and citrus fruits, n. o. s.	3	53	9,210	156 935	9,213	156 988	2	32
120	Apples, fresh	-	-	342	6 198	342	6 198	102	1 714
121	Bananas	-	-	297	3 359	297	3 359	272	3 070
122	Berries, fresh	4	40	-	-	4	40	-	-
123	Cantaloupes and melons, n. o. s.	2,290	27 584	9,095	100 399	11,385	127 983	-	-
124	Grapes, fresh	3	35	1,683	26 595	1,686	26 630	14	147
125	Peaches, fresh	-	-	83	1 122	83	1 122	15	208
126	Watermelons	-	-	152	1 901	152	1 901	11	136
127	Fruits, fresh, domestic, n. o. s.	1	21	349	5 131	350	5 152	6	104
128	Fruits, fresh, tropical, n. o. s.	1	9	63	905	64	914	2	19
130	Potatoes, other than sweet	15	169	1,758	28 605	1,773	28 774	196	2 986
140	Cabbage	97	1 436	562	7 902	659	9 338	-	-
141	Onions	-	-	334	5 065	334	5 065	4	61
142	Tomatoes	-	-	2,456	28 144	2,456	28 144	4	50
143	Vegetables, fresh, n. o. s.	9,103	109 852	32,141	387 013	41,244	496 865	150	1 693
150	Beans and peas, dried	1	10	1,228	37 719	1,229	37 729	33	703
151	Fruits, dried or evaporated	-	-	647	20 894	647	20 894	10	144
152	Vegetables, dry, n. o. s.	-	-	33	573	33	573	1	17
160	Vegetable oil cake and meal, except cottonseed	1	34	20	708	21	742	5	126
161	Peanuts			185	3 481	185	3 481	-	-

Report for the Year ended December 31, 1939

SOUTHERN PACIFIC COMPANY - Pacific

STATE OF ARIZONA

Defendant's Exhibit No. 217 (Witne
Jan. 29, 1941

State Commerce Form—Steam

128	Fruits, fresh, tropical, n. o. s.	1			9	93		905	94		9	-				
129	Potatoes, other than sweet	15			169	1,758		28	605	1,773		28	774	196		2	986
140	Cabbage	97		1	436	562		7	902	659		9	338	-		-	
141	Onions	-		-		334		5	065	334		5	065	4			61
142	Tomatoes	-		-		2,456		28	144	2,456		28	144	4			50
143	Vegetables, fresh, n. o. s.	9,103		109	852	32,441		387	013	41,244		496	865	150		1	693
150	Beans and peas, dried	1			10	1,228		37	719	1,229		37	729	33			703
151	Fruits, dried or evaporated	-		-		647		20	894	647		20	894	10			144
152	Vegetables, dry, n. o. s.	-		-		33			573	33			573	1			17
160	Vegetable-oil cake and meal, except cottonseed	1			34	20			708	21			742	5			126
161	Peanuts	-		-		185		3	481	185		3	481	-		-	
162	Flaxseed	93		2	846	-		-		93		2	846	-		-	
163	Sugar beets	99		3	403	4			101	103		3	504	-		-	
164	Products of agriculture, n. o. s.	240		5	290	1,676		47	823	1,916		53	113	125		2	989
[165]	TOTAL PRODUCTS OF AGRICULTURE	20,767		319	605	83,972	1	315	678	104 739	1	635	283	5,803		101	694
	GROUP II. ANIMALS AND PRODUCTS (C. L.)																
170	Horses, mules, ponies, and asses	174		2	008	84			970	258		2	974	20			237
180	Cattle and calves, single-deck	6,052		67	030	5,049		55	969	11,101		122	999	3,299		37	464
181	Calves, double-deck	387		5	075	419		6	187	806		11	262	83		1	070
190	Sheep and goats, single-deck	11			93	19			147	30			240	16			141
191	Sheep and goats, double-deck	542		6	931	362		4	468	904		11	399	290		5	177
200	Hogs, single-deck	-		-		25			214	25			214	6			49
201	Hogs, double-deck	-		-		628		8	709	628		8	709	211		3	113
210	Fresh meats, n. o. s.	226		2	165	132		1	822	358		3	987	309		3	053
220	Meats, cured, dried, or smoked	6			51	121		2	511	127		2	562	43			641
221	Butterine and inargarine	-		-		31			392	31			392	-		-	
222	Packing-house products, edible, n. o. s., not including canned meats	19			210	242		3	132	261		3	342	212		2	533
230	Poultry, live	-		-		9			68	9			68	-		-	
231	Poultry, dressed	-		-		52			748	52			748	-		-	
240	Eggs	-		-		50			666	50			666	2			24
250	Butter	-		-		48			642	48			642	3			46
251	Cheese	-		-		67			959	67			959	13			165
260	Wool	13			217	4			71	17			288	-		-	
270	Hides, green	41		1	417	97		3	384	138		4	801	-		-	
271	Leather	-		-		5			81	5			81	-		-	
280	Fish or sea-animal oil	-		-		421		11	864	421		11	864	-		-	
281	Animals, live, n. o. s.	-		-		-		-		-		-		-		-	
290	Animal products, n. o. s. (other than fertilizer and fertilizer materials)	66		1	662	599		16	078	665		17	740	20			529
[310]	TOTAL ANIMALS AND PRODUCTS	7,537		86	855	8,464		119	082	16,001		205	937	4,527		54	242
	GROUP III. PRODUCTS OF MINES (C. L.)																
300	Anthracite coal	-		-		89		4	263	89		4	263	89		4	263
310	Bituminous coal	-		-		678		21	379	678		21	379	658		20	716
311	Coke	-		-		381		14	327	381		14	327	88		3	241
320	Iron ore	1			56	-		-		1			56	1			56
330	Copper ore and concentrates	17,963	1	002	484	24,557	1	631	162	42,520	2	633	646	42,476	2	631	504
331	Lead ore and concentrates	372		18	754	2			84	374		18	838	1			47
332	Zinc ore and concentrates	137		7	490	98		5	277	235		12	767	-		-	
333	Ores and concentrates, n. o. s.	3 544		196	061	943		48	907	4,487		244	968	1,413		79	164
340	Gravel and sand (other than glass or molding)	142		7	716	58		3	105	200		10	821	84		4	477
351	Stone, broken, ground, or crushed	36		2	081	14			580	50		2	661	40		2	192
352	Stone, rough, n. o. s.	10			308	7			251	17			559	-		-	
353	Stone, finished, n. o. s.	-		-		13			566	13			566	1			46
370	Petroleum, crude	1			31	30		1	110	31		1	141	1			25
	Carried forward	22.206	1	234	981	26,870	1	731	011	49,076	2	965	992	44,852	2	745	731

* Not required from switching and terminal companies. † Trans-State traffic may be given in a footnote without subdivision by commodities, but if possible by direction of movement.

941. REVENUE FREIGHT CARRIED DURING THE YEAR—WITHIN THE STATE*—Concluded

Class No.	Commodity (a)	Revenue Freight Originating on Respondent's Road Within the State: Number of carloads (b)	Number of tons (2,000 lb.) (c)	All Other Revenue Freight Carried Within the State: Number of carloads (d)	Number of tons (2,000 lb.) (e)	Total Revenue Freight Carried Within the State: Number of carloads (f)	Number of tons (2,000 lb.) (g)	Total Revenue Freight Terminating on Respondent's Road Within the State: Number of carloads (h)	Number of tons (2,000 lb.) (i)
	GROUP III. Products of Mines (C. L.)—Contd. Brought forward	22,406	1 234 981	26,870	1 731 011	49,076	2 965 992	44,852	2 745 731
370	Asphalt (natural, byproduct, or petroleum)	-	-	673	24 539	673	24 539	529	19 456
380	Salt	-	-	251	7 960	251	7 960	219	6 993
390	Phosphate rock, crude (ground or not ground)	-	-	1	30	1	30	-	-
391	Sulphur (brimstone)	-	-	48	2 179	48	2 179	4	176
392	Products of mines, n. o. s.	338	17 607	1,839	81 501	2,177	99 108	345	18 173
(390)	TOTAL PRODUCTS OF MINES	22,544	1 252 588	29,682	1 847 220	52,226	3 099 808	45,949	2 790 529
	GROUP IV. Products of Forests (C. L.)								
400	Logs	-	-	-	-	-	-	-	-
401	Posts, poles, and piling	3	45	1,955	69 977	1,958	70 022	1,312	46 078
402	Wood (fuel)	4	160	13	580	17	740	17	740
410	Ties, railroad	-	-	339	11 661	339	11 661	89	3 231
420	Pulpwood	-	-	-	-	-	-	-	-
430	Lumber, shingles, and lath	26	591	5,839	158 327	5,865	158 918	1,517	40 327
431	Box, crate, and cooperage materials	1	17	900	21 170	901	21 187	505	11 906
432	Veneer and built-up wood	1	5	182	5 151	183	5 156	47	1 313
440	Rosin	-	-	8	230	8	230	-	-
441	Turpentine	-	-	35	957	35	957	1	22
442	Crude rubber (not reclaimed)	-	-	161	4 886	161	4 886	-	-
443	Products of forests, n. o. s.	3	82	335	7 670	338	7 752	44	785
(400)	TOTAL PRODUCTS OF FORESTS	38	900	9,767	280 609	9,805	281 509	3,532	104 402
	GROUP V. Manufactures and Miscellaneous (C. L.)								
460	Petroleum oils, refined, and all other gasolines	1	15	5,167	148 731	5,168	148 746	4,784	139 113
461	Fuel, road, and petroleum residual oils, n. o. s.	1	25	10,208	447 451	10,209	447 476	9,680	427 499
462	Lubricating oils and greases	2	13	961	21 231	963	21 244	267	4 609
469	Petroleum products, n. o. s.	-	-	17	442	17	442	3	99
480	Cottonseed oil	375	11 543	777	23 928	1,152	35 471	4	75
481	Linseed oil	1	18	32	911	33	929	7	185
482	Vegetable oil, n. o. s.	1	30	1,249	38 364	1,250	38 394	26	786
470	Sugar (beet or cane)	1	5	2,318	83 450	2,319	83 455	285	7 476
471	Table sirups and edible molasses	-	-	330	11 130	330	11 130	37	1 294
472	Molasses, blackstrap and beet residual	-	-	44	1 973	44	1 973	20	914
480	Iron, pig	-	-	2	105	2	105	-	-
481	Iron and steel, rated 8th class in official classification, n. o. s.	-	-	1	40	1	40	-	-
500	Rails, fastenings, frogs, and switches	2	89	268	12 661	270	12 750	57	2 446
510	Cast-iron pipe and fittings	-	-	142	4 882	142	4 882	62	2 168
511	Iron and steel pipe and fittings, n. o. s.	11	152	642	21 254	653	21 406	330	10 583
512	Iron and steel: Nails and wire, not woven	5	45	164	5 990	169	6 035	62	2 031
513	Iron and steel, rated 8th class in official classification, n. o. s. (also tin and terneplate)	54	1 222	3,021	124 059	3,075	125 281	333	10 262
520	Copper: Ingot, matte, and pig	1,172	65 339	791	44 054	1,963	109 393	298	17 054
521	Copper, brass, and bronze: Bar, sheet, and pipe	2,549	149 345	505	27 512	3,054	176 857	5	178
522	Lead and zinc: Ingot, pig, or bar	46	1 778	150	7 187	196	8 965	-	-
530	Aluminum: Ingot, pig, or slab	-	-	-	-	-	-	-	-
536	Machinery and boilers	26	595	1,040	22 319	1,066	22 914	141	3 111
540	Cement, natural or Portland (building)	1	30	2,014	82 426	2,015	82 456	1,549	57 785
550	Brick, common	-	-	12	386	12	386	9	298
	Brick, n. o. s., and building tile	8	345	310	11 384	318	11 729	186	6 983

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690	Iron, pig	-		-		1		40										
691	Iron and steel, rated 6th class in official classification, n. o. s.	2			89	268		12	661	270		12	750	57		2	446	
692	Rails, fastenings, frogs, and switches	-		-		142		4	882	142		4	882	62		2	168	
693	Cast-iron pipe and fittings	11			152	642		21	254	653		21	406	330		10	583	
694	Iron and steel pipe and fittings, n. o. s.	5			65	164		5	990	169		6	035	62		2	031	
695	Iron and steel: Nails and wire, not woven	54		1	222	3,021		124	059	3,075		125	281	333		10	262	
696	Iron and steel, rated 6th class in official classification, n. o. s. (also tin and terneplate)	1,172		44	339	791		44	054	1,963		109	393	298		17	054	
697	Copper: Ingot, matte, and pig	2,549		117	345	505		27	512	3,054		176	857	5			178	
698	Copper, brass, and bronze: Bar, sheet, and pipe																	
699	Lead and zinc: Ingot, pig, or bar	46		1	778	150		7	187	196		8	965					
700	Aluminum: Ingot, pig, or slab	-		-		-		-		-		-		-		-		
701	Machinery and boilers	26			595	1,040		22	319	1,066		22	914	141		3	111	
702	Cement, natural or Portland (building)	1			30	2,014		82	426	2,015		82	456	1,549		57	785	
703	Brick, common	-		-		12			386	12			386	9			298	
704	Brick, n. o. s., and building tile	8			345	310		11	384	318		11	729	186		6	983	
705	Artificial stone, n. o. s.	27		1	157	1			29	28		1	186	27		1	157	
706	Lime, common (quick or slaked)	686		31	531	39			673	725		32	204	226		8	639	
707	Plaster (stucco or wall) and dry kalsomine	72		2	003	247		6	266	319		8	269	199		4	570	
708	Sewer pipe and drain tile (not metal)	1			15	73		1	618	74		1	633	68		1	467	
709	Agricultural implements and parts, n. o. s.	3			21	238		4	463	241		4	484	25			419	
710	Vehicles, horse-drawn, and parts, n. o. s.	-		-		8			86	8			86	1			8	
711	Tractors and parts	14			230	429		9	651	443		9	881	42			828	
712	Railway car wheels, axles, and trucks	2			108	17			601	19			709	4			103	
713	Automobile (passenger)	2			14	2,178		13	407	2,180		13	421	778		4	699	
714	Autotrucks	1			7	560		4	208	561		4	215	306		2	096	
715	Automobiles and autotrucks, K. D. and parts, n. o. s.	-		-		3,131		61	012	3,131		61	012	2			21	
716	Automobile and autotruck tires	1			6	706		15	341	707		15	347	7			93	
717	Furniture, metal	1			8	140		1	734	141		1	742	37			490	
718	Furniture, other than metal	1			5	1,252		11	441	1,253		11	446	197		1	775	
719	Beverages	7			52	2,572		66	501	2,579		66	553	538		11	062	
720	Ice	86		1	806	-		-		86		1	806	86		1	806	
721	Fertilizers, n. o. s.	347		9	026	1,564		77	418	1,911		86	444	152		6	510	
722	Newsprint paper	-		-		108		3	117	108		3	117	60		1	792	
723	Printing paper, n. o. s.	-		-		246		6	028	246		6	028	10			176	
724	Alcohol, denatured or wood	-		-		20			641	20			641	-		-		
725	Sulphuric acid	1,490		74	762	130		6	505	1,620		81	267	1,559		77	990	
726	Explosives, n. o. s.	295		7	408	83		1	295	378		8	703	166		3	623	
727	Cotton cloth and cotton fabrics, n. o. s.	-		-		332		6	264	332		6	264	10			252	
728	Bagging and bags, burlap, gunny, or jute	1			9	72		1	651	73		1	660	36			787	
729	Canned food products, n. o. s.	268		3	469	3,696		112	075	3,964		115	544	903		20	902	
730	Tobacco, manufactured products	-		-		958		20	267	958		20	267	-		-		
731	Paints in oil and varnishes	-		-		81		2	204	81		2	204	14			519	
732	Furnace slag	-		-		1			50				50	-		-		
733	Scrap iron and scrap steel	445		21	194	218		11	209	663		32	403	112		5	105	
734	Paper bags and wrapping paper	2			16	442		10	405	444		10	421	115		2	577	
735	Paperboard, pulpboard, and wallboard (paper)	1			10	369		9	467	370		9	477	50		1	337	
736	Building paper and prepared roofing materials	1			5	246		5	616	247		5	621	157		3	218	
737	Building woodwork (millwork)	-		-		427		8	962	427		8	962	53		1	020	
738	Soap and washing compounds	.2			10	309		6	110	311		6	120	206		3	770	
739	Glass, flat, other than plate	-		-		311		11	389	311		11	389	18			651	
740	Glass: Bottles, jars, and jelly glasses	177		2	719	558		9	715	735		12	434	49			943	
741	Manufactures and miscellaneous, n. o. s.	591		13	827	18,277		385	116	18,868		398	943	3,568		77	503	
[740]	TOTAL MANUFACTURES AND MISCELLANEOUS	8,780		400	007	70,204		2 034	405	78,984	2	434	412	27,931		942	857	
[800]	GRAND TOTAL, CARLOAD TRAFFIC	59,666	2	059	955	202,089		5 596	994	261,755	7	656	949	87,742	3	993	724	
	GROUP VI. L. C. L. FREIGHT																	
710	All L. C. L. freight			14	487			66	736			81	223			35	664	
[800]	GRAND TOTAL, CARLOAD AND L. C. L. TRAFFIC		2	074	442			5 663	730		7	738	172		4	029	388	
701-A	Forwarder traffic included in Class 701**	4			60	1,710		20	552	1,714		20	612	703		6	407	

*Not required from switching and terminal companies. † Trans-State traffic may be given in a footnote without subdivision by commodities, but if possible by direction of movement. **Not required for Class II roads.

941. REVENUE FREIGHT CARRIED DURING THE YEAR—WITHIN THE STATE*

Give the particulars called for concerning the commodities carried on the respondent's road during the year, the revenue from which is includible in account No. 101, "Freight", classifying them in accordance with the Interstate Commerce Commission's Order in the Matter of Freight Commodity Statistics, effective January 1, 1928, as amended by order of December 14, 1938.

In stating the number of tons received from connecting carriers, include all shipments that, so far as apparent from the information on the waybills or abstracts of waybills, have been received from connecting rail carriers either directly or indirectly. Shipments from boat lines should also be included when identified as having had previous rail transportation by United States rail carriers or as moving on joint through bills of lading by coastwise water carriers and railways.

Tonnage originating on switching roads connecting directly or indirectly with respondent's line should be regarded as tonnage originated by respondent. Import traffic and traffic from outlying possessions of the United States received from water carriers should be regarded as originating at the port of entry. All other tonnage should be treated as originating on line, including finished products from transit points.

If the application of these instructions results in any marked deviation from the respondent's past practice, that fact should be stated in a footnote in order that proper allowance can be made in interpreting the statistics.

Particulars for Classes Nos. 10 to 701 should include carload traffic only, all less than carload traffic being included in Class No. 710.

Information as to carloads and tons of forwarder traffic included in Class 701 should be reported against commodity class designated 701-A. To avoid undue clerical labor, Class 701-A may be restricted to the principal forwarding companies or their subsidiaries originating in the aggregate not less than approximately 80 percent of such traffic handled on respondent's line. The term "Forwarder traffic" is defined in the third paragraph of instructions for schedule No. 541 on page No. 513.

Class No.	Commodity	Revenue Freight Originating on Respondent's Road Within the State			All Other Revenue Freight Carried Within the State†			Total Revenue Freight Carried Within the State			Total Revenue Freight Terminating on Respondent's Road Within the State		
		Number of carloads	Number of tons (2,000 lb.)		Number of carloads	Number of tons (2,000 lb.)		Number of carloads	Number of tons (2,000 lb.)		Number of carloads	Number of tons (2,000 lb.)	
	(a)	(b)	(c)		(d)	(e)		(f)	(g)		(h)	(i)	
	GROUP I. Products of Agriculture (C. L.)												
10	Wheat	41	2	003	424	22	406	465	24	409	-	-	
20	Corn	-	-		651	26	739	651	26	739	9		318
21	Oats	1		20	51	1	628	52	1	648	4		95
40	Barley and rye	-	-		100	4	329	100	4	329	-	-	
41	Rice	-	-		522	16	740	522	16	740	-	-	
42	Grain, n. o. s.	-	-		5		158	5		158	-	-	
50	Flour, wheat	1		20	447	11	857	448	11	877	67	1	520
51	Meal, corn	-	-		26		742	26		742	-	-	
52	Flour and meal, edible, n. o. s.	-	-		5		158	5		158	-	-	
60	Cereal food preparations, edible, n. o. s.	-	-		500	7	799	500	7	799	-	-	
61	Mill products, n. o. s.	1		20	1,107	31	132	1,108	31	152	71	1	738
70	Hay and alfalfa	-	-		84	1	267	84	1	267	37		570
71	Straw	-	-		26		587	26		587	-	-	
80	Tobacco, leaf	-	-		71	1	439	71	1	439	-	-	
90	Cotton in bales	25		308	911	23	557	936	23	865	-	-	
91	Cotton linters, noils, and regins	-	-		103	2	397	103	2	397	-	-	
100	Cottonseed	-	-		15		431	15		431	1		20
101	Cottonseed meal and cake	-	-		177	4	074	177	4	074	75	1	655
110	Oranges and grapefruit	-	-		17,691	318	431	17,691	318	431	3		52
111	Lemons, limes, and citrus fruits, n. o. s.	-	-		9,210	156	940	9,210	156	940	-	-	
120	Apples, fresh	-	-		299	5	591	299	5	591	3		51
121	Bananas	-	-		767	8	491	767	8	491	1		11
122	Berries, fresh	-	-		5		49	5		49	-	-	
123	Cantaloupes and melons, n. o. s.	-	-		11,384	127	963	11,384	127	963	-	-	
124	Grapes, fresh	-	-		1,671	26	481	1,671	26	481	-	-	
125	Peaches, fresh	-	-		70		939	70		939	-	-	
126	Watermelons	-	-		125	1	569	125	1	569	2		24
127	Fruits, fresh, domestic, n. o. s.	-	-		349	5	144	349	5	144	-	-	
128	Fruits, fresh, tropical, n. o. s.	-	-		64		917	64		917	-	-	
130	Potatoes, other than sweet	-	-		1,664	27	430	1,664	27	430	5		87
140	Cabbage	-	-		640	9	038	640	9	038	-	-	
141	Onions	-	-		336	5	109	336	5	109	-	-	
142	Tomatoes	-	-		1,999	22	693	1,999	22	693	-	-	
143	Vegetables, fresh, n. o. s.	-	-		40,852	492	318	40,852	492	318	-	-	
150	Beans and peas, dried	17		488	1,190	36	720	1,207	37	208	1		10
151	Fruits, dried or evaporated	-	-		637	20	749	637	20	749	-	-	

132	Fruits, fresh, tropical, n. o. s.	-		-		1,664	27	430	1,664		27	430		5		87
139	Potatoes, other than sweet	-		-		640	9	038	640		9	038		-		
140	Cabbage	-		-		336	5	109	336		5	109		-		
144	Onions	-		-		1,999	22	693	1,999		22	693		-		
147	Tomatoes	-		-		40,852	492	318	40,852		492	318		-		
148	Vegetables, fresh, n. o. s.															
130	Beans and peas, dried	17			488	1,190	36	720	1,207		37	208		1		10
131	Fruits, dried or evaporated	-		-		637	20	749	637		20	749		-		
132	Vegetables, dry, n. o. s.	-		-		32		556	32			556		-		
138	Vegetable-oil cake and meal, except cottonseed	-		-		22		753	22			753		1		20
141	Peanuts	-		-		185	3	481	185		3	481		-		
142	Flaxseed	-		-		-		-	-			-		-		
143	Sugar beets	-		-		5		123	5			123		-		
144	Products of agriculture, n. o. s.	-		-		1,742	48	986	1,742		48	986		-		
[200]	TOTAL PRODUCTS OF AGRICULTURE	86		2	859	96,164	1	477	911	96,250	1	480	770	280	6	171
	GROUP II. ANIMALS AND PRODUCTS (C. L.)															
170	Horses, mules, ponies, and asses	21			246	104	1	184	125		1	430		-		
180	Cattle and calves, single-deck	2,231		23	025	6,111	65	502	8,342		88	527		244	2	638
181	Calves, double-deck	109		1	380	722	9	914	831		11	294		48		650
190	Sheep and goats, single-deck	17			124	22		173	39			297		2		12
191	Sheep and goats, double-deck	216		2	067	500	6	594	876		8	661		37		370
200	Hogs, single-deck	-		-		26		222	26			222		-		
201	Hogs, double-deck	-		-		682	9	522	682		9	522		-		
210	Fresh meats, n. o. s.	-		-		214	2	819	214		2	819		-		
220	Meats, cured, dried, or smoked	-		-		337	5	215	337		5	215		-		
221	Butterine and margarine			-		11		392	11			392		-		
222	Packing-house products, edible, n. o. s., not including canned meats			-		263	3	258	263		3	258		-		
230	Poultry, live	-		-		9		68	9			68		-		
231	Poultry, dressed	-		-		53		760	53			760		-		
240	Eggs	-		-		74		934	74			934		-		
250	Butter	-		-		47		624	47			624		-		
251	Cheese	-		-		69		978	69			978		-		
260	Wool	37			616	16		283	53			899		-		
270	Hides, green	-		-		139	4	837	139		4	837		-		
271	Leather	-		-		-		62	4			62		-		
280	Fish or sea-animal oil	-		-		421	11	865	421		11	865		1		5
281	Animals, live, n. o. s.	-		-		-		-	-			-		-		
282	Animal products, n. o. s. (other than fertilizer and fertilizer materials)	-		-		638	17	066	638		17	066		-		
[210]	TOTAL ANIMALS AND PRODUCTS	2,631		27	458	10,642	142	272	13,273		169	730		332	3	675
	GROUP III. PRODUCTS OF MINES (C. L.)															
290	Anthracite coal	-		-		85	4	263	89		4	263		-		
300	Bituminous coal	1,207		38	859	862	28	363	2,069		67	222		415	15	188
310	Coke	-		-		531	20	564	531		20	564		3		102
320	Iron ore	59		3	367	-	-		59		3	367		-		
330	Copper ore and concentrates	252		15	380	4	25	564	709		40	944		5		182
331	Lead ore and concentrates	2			44	374	18	840	376		18	884		-		
332	Zinc ore and concentrates	-		-		324	16	956	324		16	956		-		
333	Ores and concentrates, n. o. s.	23		1	104	3,028	165	686	3,051		166	790		-		
340	Gravel and sand (other than glass or molding)	-		-		71	3	811	71		3	811		11		636
341	Stone, broken, ground, or crushed	-		-		298	16	181	298		16	181		2		90
342	Stone, rough, n. o. s.	-		-		17		559	17			559		-		
343	Stone, finished, n. o. s.	-		-		13		566	13			566		-		
349	Petroleum, crude	3			140	1,172	53	656	1,175		53	796		1,146	52	581
	Carried forward	1,546		58	894	7,236	355	009	8,782		413	903		1,582	68	879

* Not required from switching and terminal companies. † Trans-State traffic may be given in a footnote without subdivision by commodities, but if possible by direction of movement.

941. REVENUE FREIGHT CARRIED DURING THE YEAR—WITHIN THE STATE—Concluded

Class No.	Commodity (a)	Revenue Freight Originating on Respondent's Road Within the State: Number of carloads (b)	Number of tons (2,000 lb.) (c)	All Other Revenue Freight Carried Within the State: Number of carloads (d)	Number of tons (2,000 lb.) (e)	Total Revenue Freight Carried Within the State: Number of carloads (f)	Number of tons (2,000 lb.) (g)	Total Revenue Freight Terminating on Respondent's Road Within the State: Number of carloads (h)	Number of tons (2,000 lb.) (i)
	GROUP III. PRODUCTS OF MINES (C. L.)—Contd.								
	Brought forward	1,546	58 894	7,236	355 009	8,782	413 903	1,582	68 879
375	Asphalt (natural, byproduct, or petroleum)	-	-	148	5 226	148	5 226	45	1 646
380	Salt	-	-	159	4 294	159	4 294	37	1 075
390	Phosphate rock, crude (ground or not ground)	-	-	1	30	1	30	-	-
391	Sulphur (brimstone)	-	-	46	2 125	46	2 125	-	-
399	Products of mines, n. o. s.	365	17 714	1,932	86 243	2,297	103 957	56	3 021
1529	TOTAL PRODUCTS OF MINES	1,911	76 608	9,522	452 927	11,433	529 535	1,720	74 621
	GROUP IV. PRODUCTS OF FORESTS (C. L.)								
409	Logs	3,505	103 278	-	-	3,505	103 278	3,505	103 278
401	Posts, poles, and piling	322	13 059	369	12 958	691	24 017	100	2 931
402	Wood (fuel)	501	21 526	-		501	21 526	3	150
410	Ties, railroad	49	1 921	233	7 707	282	9 628	15	350
420	Pulpwood	-	-	-	-	-	-	-	-
430	Lumber, shingles, and lath	681	18 294	4,427	119 960	5,108	138 254	135	3 071
431	Box, crate, and cooperage materials	29	730	283	6 672	312	7 402	1	39
432	Veneer and built-up wood	-	-	147	4 142	147	4 142	8	192
440	Rosin	-	-	8	230	8	230	-	-
441	Turpentine	-	-	40	1 082	40	1 082	-	-
442	Crude rubber (not reclaimed)	-	-	161	4 886	161	4 886	-	-
443	Products of forests, n. o. s.	15	446	356	8 092	371	8 538	4	154
1530	TOTAL PRODUCTS OF FORESTS	5,102	159 254	6,024	163 729	11,126	322 983	3,771	110 165
	GROUP V. MANUFACTURES AND MISCELLANEOUS (C. L.)								
450	Petroleum oils, refined, and all other gasolines	-	-	2,000	52 955	2,000	52 955	706	18 844
451	Fuel, road, and petroleum residual oils, n. o. s.	70	3 225	793	32 473	863	35 698	92	3 297
452	Lubricating oils and greases	-	-	862	19 505	862	19 505	35	605
453	Petroleum products, n. o. s.	-	-	17	443	17	443	-	-
460	Cottonseed oil	1	31	777	23 927	778	23 958	-	-
461	Linseed oil	-	-	26	749	26	749	-	-
462	Vegetable oil, n. o. s.	-	-	1,230	37 786	1,230	37 786	-	-
470	Sugar (beet or cane)	-	-	2,020	75 010	2,020	75 010	17	521
471	Table sirups and edible molasses	-	-	335	11 283	335	11 283	3	81
472	Molasses, blackstrap and beet residual	-	-	24	1 058	24	1 058	-	-
480	Iron, pig	-	-	2	105	2	105	-	-
481	Iron and steel, rated 8th class in official classification, n. o. s.	-	-	1	41	1	41	-	-
500	Rails, fastenings, frogs, and switches	8	310	237	11 311	245	11 621	81	3 644
510	Cast-iron pipe and fittings	-	-	121	4 099	121	4 099	3	42
511	Iron and steel pipe and fittings, n. o. s.	-	-	728	25 536	728	25 536	125	5 095
512	Iron and steel: Nails and wire, not woven	-	-	190	6 819	190	6 819	10	282
513	Iron and steel, rated 8th class in official classification, n. o. s. (also tin and terneplate)	-	-	2,961	122 706	2,961	122 706	25	672
520	Copper: Ingot, matte, and pig	-	-	1,975	109 963	1,975	109 963	-	-
521	Copper, brass, and bronze: Bar, sheet, and pipe	-	-	3,119	180 033	3,119	180 033	-	-
522	Lead and zinc: Ingot, pig, or bar	-	-	287	14 266	287	14 266	-	-
523	Aluminum: Ingot, pig, or slab	-	-	-	-	-	-	-	-
530	Machinery and boilers	3	44	1,016	22 161	1,019	22 205	22	555
540	Cement, natural or Portland (building)	-	-	1,186	52 281	1,186	52 281	127	4 815
550	Brick, common	18	615	7	226	25	841	7	228
551	Brick, n. o. s., and building tile	45	1 613	231	8 556	276	10 169	15	530
552	Artificial stone, n. o. s.	-	-	8	253	8	253	-	-
560	Lime, common (quick or slaked)	-	-	399	19 025	399	19 025	2	30
561	Plaster (stucco or wall) and fire brick, etc.	-	-	146	4 425	146	4 425		

STATE CORPORATION FORM—STRAW

810	Coal, anthracite, other, and coke	-			-											
811	Cast-iron pipe and fittings	-			-	121	4	099	121		4	099	3			42
812	Iron and steel pipe and fittings, n. o. s.	-			-	728	25	536	728		2	536	125		5	095
813	Iron and steel: Nails and wire, not woven	-			-	190	6	819	190		6	819	10			282
814	Iron and steel, wire fifth class in official classification, n. o. s. (galv. tin and terneplate)	-			-	2,961	122	706	2,961		122	706	25			672
820	Copper: Ingot, matte, and pig	-			-	1,975	109	963	1,975		109	963	-		-	
821	Copper, brass, and bronze: Bar, sheet, and pipe	-			-	3,119	180	033	3,119		180	033	-		-	
822	Lead and zinc: Ingot, pig, or bar	-			-	287	14	266	287		14	266	-		-	
823	Aluminum: Ingot, pig, or slab	-			-	-			-				-		-	
830	Machinery and boilers	3			44	1,016	22	161	1,019		2	205	22			555
831	Cement, natural or Portland (building)	-			-	1,186	52	281	1,186		52	281	127		4	815
832	Brick, common	18			615	7		226	25			841	7			228
833	Brick, n. o. s., and building tile	45		1	613	231	8	556	276		10	169	15			530
834	Artificial stone, n. o. s.	-			-	8		253	8			253	-		-	
840	Lime, common (quick or slaked)	-			-	399	19	025	399		19	025	2			30
841	Plaster (stucco or wall) and dry kalsomine	-			-	146	4	425	146		4	425	27			637
842	Sewer pipe and drain tile (not metal)	-			-	37		650	37			650	18			267
850	Agricultural implements and parts, n. o. s.	-			-	243	4	585	243		4	585	-		-	
851	Vehicles, horse-drawn, and parts, n. o. s.	-			-	10		118	10			118	-		-	
852	Tractors and parts	-			-	439	9	803	439		9	803	4			66
853	Railway car wheels, axles, and trucks	1			8	10		221	11			229	1			8
860	Automobile (passenger)	-			-	1,731	10	646	1,731		10	646	78			458
861	Autotrucks	-			-	365	2	966	365		2	966	29			179
862	Automobiles and autotrucks, K. D. and parts, n. o. s.	-			-	3,142	61	275	3,142		61	275			-	
863	Automobile and autotruck tires	-			-	704	15	304	704		15	304	-		-	
870	Furniture, metal	-			-	125	1	574	125		1	574	-		-	
871	Furniture, other than metal	-			-	1,123	10	376	1,123		10	376	-		-	
880	Beverages	7			-	2,462	65	225	2,462		65	225	5			110
881	Ice	1			20	2		36	3			56	2			36
882	Fertilizers, n. o. s.	1			40	1,420	71	398	1,421		71	398	1			40
890	Newsprint paper	-			-	54	1	456	54		1	456	-		-	
891	Printing paper, n. o. s.	-			-	239	5	901	239		5	901	-		-	
892	Alcohol, denatured or wood	-			-	20		641	20			641	-		-	
893	Sulphuric acid	-			-	61	3	273	61		3	273	-		-	
894	Explosives, n. o. s.	-			-	136	3	557	136		3	557	9			142
899	Cotton cloth and cotton fabrics, n. o. s.	-			-	369	6	859	369		6	859	-		-	
901	Bagging and bags, burlap, gunny, or jute	-			-	51	1	138	51		1	138	-		-	
910	Canned food products, n. o. s.	-			-	3,293	103	138	3,293		103	138	10			253
911	Tobacco, manufactured products	-			-	958	20	267	958		20	267	1			35
912	Paints in oil and varnishes	-			-	86	2	478	86		2	478	7			284
913	Furnace slag	-			-	1		50	1			50	-		-	
920	Scrap iron and scrap steel	38		1	206	306	14	384	344		15	590	-		-	
921	Paper bags and wrapping paper	-			-	345	8	227	345		8	227	3			71
922	Paperboard, pulpboard, and wallboard (paper)	-			-	375	9	586	375		9	586	14			323
923	Building paper and prepared roofing materials	-			-	112	3	004	112		3	004	12			276
927	Building woodwork (millwork)	-			-	377	7	998	377		7	998	5			97
928	Soap and washing compounds	-			-	148	3	283	148		3	283	9			159
934	Glass, flat, other than plate	-			-	311	11	389	311		11	389	-		-	
935	Glass: Bottles, jars, and jelly glasses	3			47	683	11	402	686		11	449	4			83
701	Manufactures and miscellaneous, n. o. s.	72		1	429	18,049	379	845	18,121		381	274	189		17	422
[illegible]	TOTAL MANUFACTURES AND MISCELLANEOUS	261		8	588	58,485	1	689 008	58,746	1	697	596	1,698		60	212
[illegible]	GRAND TOTAL, CARLOAD TRAFFIC	9,991		274	767	180,837	3	925 847	190,828	4	200	614	7,801		254	844
	GROUP V: L. C. L. FREIGHT															
710	All L. C. L. freight				434			58 781			59	215			4	409
[illegible]	GRAND TOTAL, CARLOAD AND L. C. L. TRAFFIC			275	201		3	984 628		4	259	829			259	253
701 A	Forwarder traffic included in Class 701**	-		-		2,437	29	922	2,437		29	922	-		-	

*Not required from switching and terminal companies. † Trade-State traffic may be given in a footnote without subdivision by commodities, but if possible by direction of movement. **Not required for Class II roads.

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941. REVENUE FREIGHT CARRIED DURING THE YEAR—WITHIN THE STATE*

Give the particulars called for concerning the commodities carried on the respondent's road during the year, the revenue from which is includible in account No. 101, "Freight", classifying them in accordance with the Interstate Commerce Commission's Order in the Matter of Freight Commodity Statistics, effective January 1, 1928, as amended by order of December 14, 1939.

In stating the number of tons received from connecting carriers, include all shipments that, so far as apparent from the information on the waybills or abstracts of waybills, have been received from connecting rail carriers either directly or indirectly. Shipments from boat lines should also be included when identified as having had previous rail transportation by United States rail carriers or as moving on joint through bills of lading by connecting water carriers and railways.

Tonnage originating on switching roads connecting directly or indirectly with respondent's line should be regarded as tonnage originated by respondent. Import traffic and traffic from outlying possessions of the United States received from water carriers should be regarded as originating at the port of entry. All other tonnage should be treated as originating on line, including finished products from transit points.

If the application of these instructions results in any marked deviation from the respondent's past practice, that fact should be stated in a footnote in order that proper allowance can be made in interpreting the statistics.

Particulars for Classes Nos. 10 to 701 should include carload traffic only, all less than carload traffic being included in Class No. 710.

Information as to carloads and tons of forwarder traffic included in Class 701 should be reported against commodity class designated 701-A. To avoid undue clerical labor, Class 701-A may be restricted to the principal forwarding companies or their subsidiaries originating in the aggregate not less than approximately 90 percent of such traffic handled on respondent's line. The term "Forwarder traffic" is defined in the third paragraph of instructions for schedule No. 941 on page No. 812.

Class No.	Commodity (a)	Revenue Freight Originating on Respondent's Road Within the State			All Other Revenue Freight Carried Within the State†			Total Revenue Freight Carried Within the State			Total Revenue Freight Terminating on Respondent's Road Within the State			
		Number of carloads (b)	Number of tons (2,000 lb.) (c)		Number of carloads (d)	Number of tons (2,000 lb.) (e)		Number of carloads (f)	Number of tons (2,000 lb.) (g)		Number of carloads (h)	Number of tons (2,000 lb.) (i)		
	GROUP I Products of Agriculture (C. I.)													
10	Wheat	30	1	071	971	49	323	1 001	50	394	24			863
20	Corn	-	-		3,023	127	890	3,023	127	890	8			320
30	Oats	-	-		89	3	037	89	3	037	4			121
40	Barley and rye	12		396	105	4	591	117	4	987	15			482
41	Rice	-	-		71	3	298	71	3	298	-		-	
42	Grain, n. o. s.	-	-		15		468	15		468	-		-	
50	Flour, wheat	2		25	687	18	452	689	18	477	89		2	411
51	Meal, corn	-	-		22		689	22		689	2			60
52	Flour and meal, edible, n. o. s.	-	-		70	2	090	70	2	090	-		-	
60	Cereal food preparations, edible, n. o. s.	-	-		427	8	286	427	8	286	1			5
61	Mill products, n. o. s.	111	2	940	554	15	947	665	18	887	66		1	765
70	Hay and alfalfa	45		814	24		381	69	1	195	15			318
71	Straw	-	-		-	-		-	-		-		-	
80	Tobacco, leaf	-	-		21		463	21		463	-		-	
90	Cotton in bales	-	-		62	1	701	62	1	701	-		-	
91	Cotton linters, nouls, and regins	-	-		4		92	4		92	-		-	
100	Cottonseed	1		36	-	-		1		36	-		-	
101	Cottonseed meal and cake	-	-		76	1	946	76	1	946	31			831
110	Oranges and grapefruit	-	-		4,901	88	461	4,901	88	461	20			338
111	Lemons, limes, and citrus fruits, n. o. s.	-	-		290	4	954	290	4	954	-		-	
120	Apples, fresh	-	-		367	6	894	367	6	894	12			203
121	Bananas	-	-		144	1	511	144	1	511	48			497
122	Berries, fresh	-	-		8		143	8		143	-		-	
123	Cantaloupes and melons, n. o. s.	-	-		2,000	22	171	2,000	22	171	4			45
124	Grapes, fresh	-	-		12,876	219	146	12,876	219	146	3			45
125	Peaches, fresh	-	-		1,573	23	560	1,573	23	560	3			36
126	Watermelons	-	-		210	2	629	210	2	629	4			51
127	Fruits, fresh, domestic, n. o. s.	-	-		8,531	142	104	8,531	142	104	-		-	
128	Fruits, fresh, tropical, n. o. s.	-	-		136	2	151	136	2	151	-		-	
130	Potatoes, other than sweet	29		527	2,407	37	246	2,436	37	773	8			135
140	Cabbage	-	-		22		305	22		305	-		-	
141	Onions	29		439	224	3	395	253	3	834	2			30
143	Tomatoes	-	-		1,316	14	258	1,316	14	258	2			25
148	Vegetables, fresh, n. o. s.	-	-		35,865	425	105	35,865	425	105	4			42
150	Beans and peas, dried	1		12	976	30	141	977	30	153	2			60
151	Fruits, dried or evaporated	-	-		1,710	56	221	1,710	56	221	1			32
152	Vegetables, dry, n. o. s.	-	-		62		958	62		958	1			15
153	Vegetable oil cake and meal	-												

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126	Watermelons	-		-		8,521		442	404	8,521		442	404	-		-	
127	Fruits, fresh, domestic, n. o. s.	-		-		136		2	151	136		2	151	-		-	
128	Fruits, fresh, tropical, n. o. s.	29		527		2,407		37	246	2,436		37	773	8			135
130	Potatoes, other than sweet	-		-		22			305	22			305	-		-	
140	Cabbage	29		439		224		3	395	253		3	834	2			30
141	Onions	-		-		1,316		14	258	1,316		14	258	2			25
142	Tomatoes	-		-		35,865		425	105	35,865		425	105	4			42
143	Vegetables, fresh, n. o. s.																

150	Beans and peas, dried	1		12		976		30	141	977		30	153	2			60
151	Fruits, dried or evaporated	-		-		1,710		56	221	1,710		56	221	1			32
152	Vegetables, dry, n. o. s.	-		-		62			958	62			958	1			15
160	Vegetable-oil cake and meal, except cottonseed	-		-		32		1	341	32		1	341	-		-	
161	Peanuts	-		-		19			383	19			383	-		-	
162	Flaxseed	-		-		2			67	2			67	-		-	
163	Sugar beets	487		18 071		1			23	488		18	094	-		-	
164	Products of agriculture, n. o. s.	3		106		1,959		47	979	1,962		48	085	43			910
[200]	TOTAL PRODUCTS OF AGRICULTURE	750		24 437		81,852		1 369	800	82,602		1 394	237	412		9	640
	GROUP II. ANIMALS AND PRODUCTS (C. L.)																
170	Horses, mules, ponies, and asses	33		391		41			478	74			869	5			33
180	Cattle and calves, single-deck	2,125		26 359		2,301		29	198	4,426		55	557	695		8	331
181	Calves, double-deck	11		149		23			327	34			476	7			98
190	Sheep and goats, single-deck	25		177		66			428	91			605	21			142
191	Sheep and goats, double-deck	503		5 808		2,502		25	995	3,005		31	803	185		2	526
200	Hogs, single-deck	4		36		38			361	42			397	2			17
201	Hogs, double-deck	-		-		676		9	397	676		9	397	15			201
210	Fresh meats, n. o. s.	-		-		29			430	29			430	-		-	
220	Meats, cured, dried, or smoked	-		-		992		19	008	992		19	008	28			487
221	Butterine and margarine	-		-		17			229	17			229	-		-	
222	Packing-house products, edible, n. o. s., not including canned meats	-		-		78		1	343	78		1	343	3			46
230	Poultry, live	-		-		56			454	56			454	-		-	
231	Poultry, dressed	-		-		362		5	828	362		5	828	-		-	
240	Eggs	-		-		285		4	476	285		4	476	-		-	
250	Butter	-		-		231		3	433	231		3	433	4			57
251	Cheese	-		-		82		1	422	82		1	422	-		-	
260	Wool	67		918		247		3	847	314		4	765	-		-	
270	Hides, green	1		15		54		1	784	55		1	799	-		-	
271	Leather	-		-		48			613	48			613	-		-	
280	Fish or sea-animal oil	-		-		404		11	939	404		11	939	-		-	
281	Animals, live, n. o. s.	-		-		1			15	1			15	-		-	
290	Animal products, n. o. s. (other than fertilizer and fertilizer materials)	16		406		1,190		31	973	1,206		32	379	4			113
[300]	TOTAL ANIMALS AND PRODUCTS	2,785		34 259		9,723		152	978	12,508		187	237	969		12	071
	GROUP III. PRODUCTS OF MINES (C. L.)																
310	Anthracite coal	-		-		1			26	1			26	-		-	
320	Bituminous coal	14		637		3,365		141	424	3,379		142	061	619		23	586
330	Coke	3		126		443		15	669	446		15	795	3			85
331	Iron ore	-		-		2			121	2			121	-		-	
332	Copper ore and concentrates	87		5 147		5			269	92		5	416	-		-	
333	Lead ore and concentrates	-		-		1			50	1			50	-		-	
334	Zinc ore and concentrates	-		-		9			406	9			406	-		-	
335	Ores and concentrates, n. o. s.	452		21 762		595		28	574	1,047		50	336	2			55
336	Gravel and sand (other than glass or molding)	3		129		8			303	11			432	4			137
341	Stone, broken, ground, or crushed	39		1 912		24		1	145	63		3	057	9			318
343	Stone, rough, n. o. s.	-		-		16			737	16			737	-		-	
344	Stone, finished, n. o. s.	-		-		16			628	16			628	1			45
350	Petroleum, crude	-		-		1			31	1			31	-		-	
	Carried forward	598		29 713		4,486		189	383	5,094		219	096	638		24	226

* Not required from switching and terminal companies. † Trans-State traffic may be given in a footnote without subdivision by commodities, but if possible by direction of movement.

941. REVENUE FREIGHT CARRIED DURING THE YEAR—WITHIN THE STATE—Concluded

Class No.	Commodity (a)	Revenue Freight Originating on Respondent's Road Within the State: Number of carloads (b)	Number of tons (2,000 lb.) (c)	All Other Revenue Freight Carried Within the State: Number of carloads (d)	Number of tons (2,000 lb.) (e)	Total Revenue Freight Carried Within the State: Number of carloads (f)	Number of tons (2,000 lb.) (g)	Total Revenue Freight Terminating on Respondent's Road Within the State: Number of carloads (h)	Number of tons (2,000 lb.) (i)
	GROUP III. Products of Mines (C. L.)—Contd.								
	Brought forward	598	29 713	4,486	189 383	5,084	219 096	638	24 226
370	Asphalt (natural, byproduct, or petroleum)	1	12	913	33 272	914	33 284	231	7 996
380	Salt	1	24	109	3 550	110	3 574	47	1 880
390	Phosphate rock, crude (ground or not ground)	-	-	116	5 579	116	5 579	-	-
391	Sulphur (brimstone)	-	-	8	142	8	142	1	5
392	Products of mines, n. o. s.	518	28 628	749	34 802	1,267	63 430	8	330
[420]	TOTAL PRODUCTS OF MINES	1,118	58 377	6,381	266 728	7,499	325 105	925	34 437
	GROUP IV. Products of Forests (C. L.)								
400	Logs	-	-	8	285	8	285	1	46
401	Posts, poles, and piling	-	-	1,568	43 733	1,568	43 733	53	1 421
402	Wood (fuel)	5	80	423	9 144	428	9 224	401	8 585
410	Ties, railroad	-	-	243	9 919	243	9 919	10	301
420	Pulpwood	-	-	-	-	-	-	-	-
430	Lumber, shingles, and lath	125	3 315	33,566	973 751	33,691	977 066	577	15 715
431	Box, crate, and cooperage materials	16	533	2,789	66 652	2,805	67 185	-	-
432	Veneer and built-up wood	-	-	713	19 293	713	19 293	6	124
440	Rosin	-	-	-	-	-	-	-	-
441	Turpentine	-	-	-	-	-	-	-	-
442	Crude rubber (not reclaimed)	-	-	12	439	12	439	-	-
443	Products of forests, n. o. s.	1	15	262	5 733	263	5 748	5	89
[430]	TOTAL PRODUCTS OF FORESTS	147	3 943	39,584	1 128 949	39,731	1 132 892	1,053	26 281
	GROUP V. Manufactures and Miscellaneous (C. L.)								
450	Petroleum oils, refined, and all other gasolines	-	-	3,771	114 908	3,771	114 906	2,227	71 437
451	Fuel, road, and petroleum residual oils, n. o. s.	1	39	7,243	326 471	7,244	326 510	6,414	298 006
452	Lubricating oils and greases	-	-	429	8 293	429	8 293	57	695
458	Petroleum products, n. o. s.	-	-	70	1 521	70	1 521	-	-
460	Cottonseed oil	-	-	126	3 870	126	3 870	1	16
461	Linseed oil	-	-	13	376	13	376	-	-
462	Vegetable oil, n. o. s.	-	-	699	21 295	699	21 295	-	-
470	Sugar (beet or cane)	-	-	2,294	86 600	2,294	86 600	7	281
471	Table sirups and edible molasses	-	-	217	7 583	217	7 583	-	-
472	Molasses, blackstrap and beet residual	-	-	87	4 038	87	4 038	-	-
486	Iron, pig	-	-	837	48 304	837	48 304	-	-
491	Iron and steel, rated 8th class in official classification, n. o. s.	-	-	3	74	3	74	-	-
500	Rails, fastenings, frogs, and switches	1	68	108	5 072	109	5 140	49	2 077
510	Cast-iron pipe and fittings	-	-	115	4 091	115	4 091	4	123
511	Iron and steel pipe and fittings, n. o. s.	1	5	359	11 338	360	11 343	28	517
513	Iron and steel: Nails and wire, not woven	-	-	95	3 482	95	3 482	5	150
512	Iron and steel, rated 8th class in official classification, n. o. s. (also tin and terneplate)	1	15	2,031	81 112	2,032	81 127	80	1 593
520	Copper: Ingot, matte, and pig	-	-	578	30 929	578	30 929	-	-
521	Copper, brass, and bronze: Bar, sheet, and pipe	-	-	7	230	7	230	-	-
522	Lead and zinc: Ingot, pig, or bar	-	-	86	4 461	86	4 461	2	10
523	Aluminum: Ingot, pig, or slab	-	-	1	20	1	20	-	-
530	Machinery and boilers	11	340	713	14 687	724	15 027	43	872
540	Cement, natural or Portland (building)	-	-	554	16 790	554	16 790	390	11 329
550	Brick, common	-	-	1	34	1	34	-	-

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819	[illegible]																	
820	Copper: Ingot, matte, and pig	-			-		578		30	929	578		30	929	-			-
821	Copper, brass, and bronze: Bar, sheet, and pipe	-			-		7			230	7			230	-			-
822	Lead and zinc: Ingot, pig, or bar	-			-		86		4	461	86		4	461	2			10
823	Aluminum: Ingot, pig, or slab	-			-		1			20	1			20	-			-
830	Machinery and boilers	11			340		713		14	687	724		15	027	43			872
840	Cement, natural or Portland (building)	-			-		554		16	790	554		16	790	390		11	329
850	Brick, common	-			-		1			34	1			34	-			-
851	Brick, n. o. s., and building tile	18			403		149		5	496	167		5	899	37		1	184
852	Artificial stone, n. o. s.	2			84		5			85	7			169	2			28
860	Lime, common (quick or slaked)	-			-		127		3	232	127		3	232	99		2	465
861	Plaster (stucco or wall) and dry kalsomine	1			19		170		4	944	171		4	963	23			616
870	Sewer pipe and drain tile (not metal)	-			-		54			887	54			887	44			714
880	Agricultural implements and parts, n. o. s.	-			-		134		2	677	134		2	677	2			46
881	Vehicles, horse-drawn, and parts, n. o. s.	-			-		8			76	8			76	1			7
882	Tractors and parts	3			26		338		8	210	341		8	236	12			195
883	Railway car wheels, axles, and trucks	-			-		7			204	7			204	-			-
889	Automobile (passenger)	-			-		3,170		19	522	3,170		19	522	327		2	001
891	Autotrucks	-			-		773		5	878	773		5	878	104			698
892	Automobiles and autotrucks, K. D. and parts, n. o. s.	-					6,004		112	588	6,004		112	588	1			5
893	Automobile and autotruck tires	-					209		4	218	209		4	218	1			6
910	Furniture, metal	1			5		142		1	977	143		1	982	1			6
911	Furniture, other than metal	-			-		725		6	921	725		6	921	8			73
920	Beverages	30			266		3,865		106	260	3,895		106	526	130		2	502
930	Ice	58		1	274		-		-		58		1	274	27			561
940	Fertilizers, n. o. s.	88		3	057		302		11	026	390		14	083	2			11
950	Newsprint paper	-			-		204		6	854	204		6	854	26			779
951	Printing paper, n. o. s.	-			-		278		6	959	278		6	959	-		-	
960	Alcohol, denatured or wood	-			-		16			368	16			368	-		-	
961	Sulphuric acid	-			-		1			16	1			16	-		-	
962	Explosives, n. o. s.	11			112		200		4	118	211		4	230	47			838
970	Cotton cloth and cotton fabrics, n. o. s.	-			-		51		1	027	51		1	027	-		-	
971	Bagging and bags, burlap, gunny, or jute	-			-		132		2	908	132		2	908	-		-	
980	Canned food products, n. o. s.	2			23		4,423		141	739	4,425		141	762	86		1	801
990	Tobacco, manufactured products	-			-		375		7	829	375		7	829	-		-	
991	Paints in oil and varnishes	-			-		131		3	166	131		3	166	4			25
992	Furnace slag	3			17		-		-		3			17	-		-	
993	Scrap iron and scrap steel	136		6	197		64		2	813	200		9	010	-		-	
994	Paper bags and wrapping paper	1			5		734		17	090	735		17	095	17			415
995	Paperboard, pulpboard, and wallboard (paper)	-			-		124		2	936	124		2	936	25			553
996	Building paper and prepared roofing materials	2			29		233		5	483	235		5	511	32			624
997	Building woodwork (millwork)	33			851		656		15	158	689		16	009	9			227
998	Soap and washing compounds	-			-		137		4	393	187		4	393	11			229
999	Glass, flat, other than plate	-			-		47		1	731	47		1	731	-		-	
700	Glass: Bottles, jars, and jelly glasses	38			464		380		6	163	418		6	627	18			335
701	Manufactures and miscellaneous, n. o. s.	109		2	414		13,751		267	953	13,860		270	367	446		7	205
(940)	TOTAL MANUFACTURES AND MISCELLANEOUS	551		15	712		58,606	1	588	482	59,157	1	604	194	10,849		411	255
(800)	GRAND TOTAL, CARLOAD TRAFFIC	5,351		136	728		196,146	4	506	937	201,497	4	643	665	14,208		493	684
	GROUP VI. L. C. L. FREIGHT																	
710	All L. C. L. freight	#####		4	068	#####			65	575	#####		69	643	#####		18	687
(900)	GRAND TOTAL, CARLOAD AND L. C. L. TRAFFIC	#####		140	796	#####		4	572	512	#####	4	713	308	#####		512	371
701-A	Forwarder traffic included in Class 701**	-		-			4,103		59	240	4,103		59	240	3			46

*Not required from switching and terminal companies. † Trans-State traffic may be given in a lump sum without subdivision by commodities, but if possible by direction of movement. **Not required for Class II roads.

STATE COMMERCE FORM—STEAM

5686

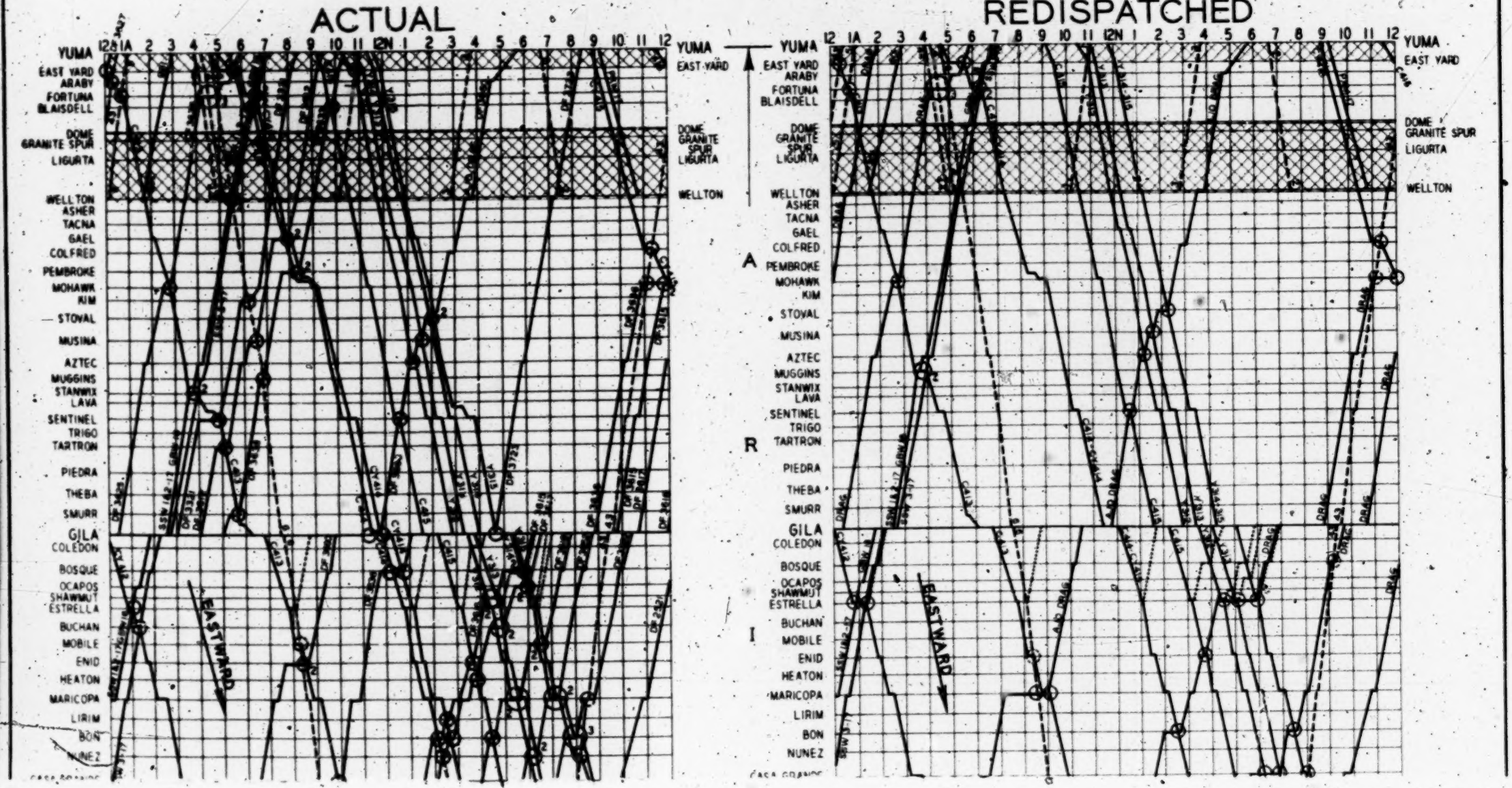
Defendant's Exhibit No. 220 (Witness Sines)
Jan. 29, 1941

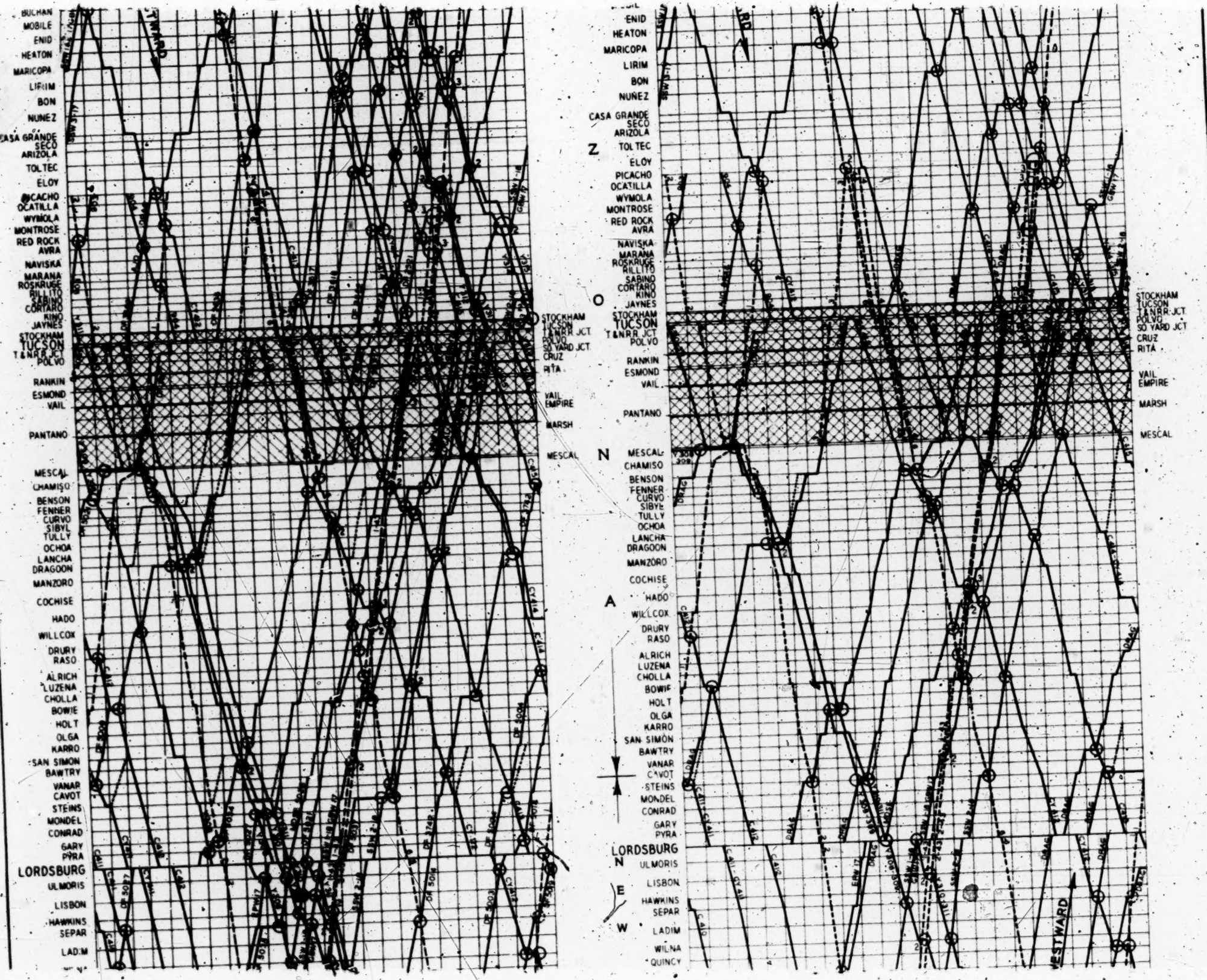
SOUTHERN PACIFIC COMPANY

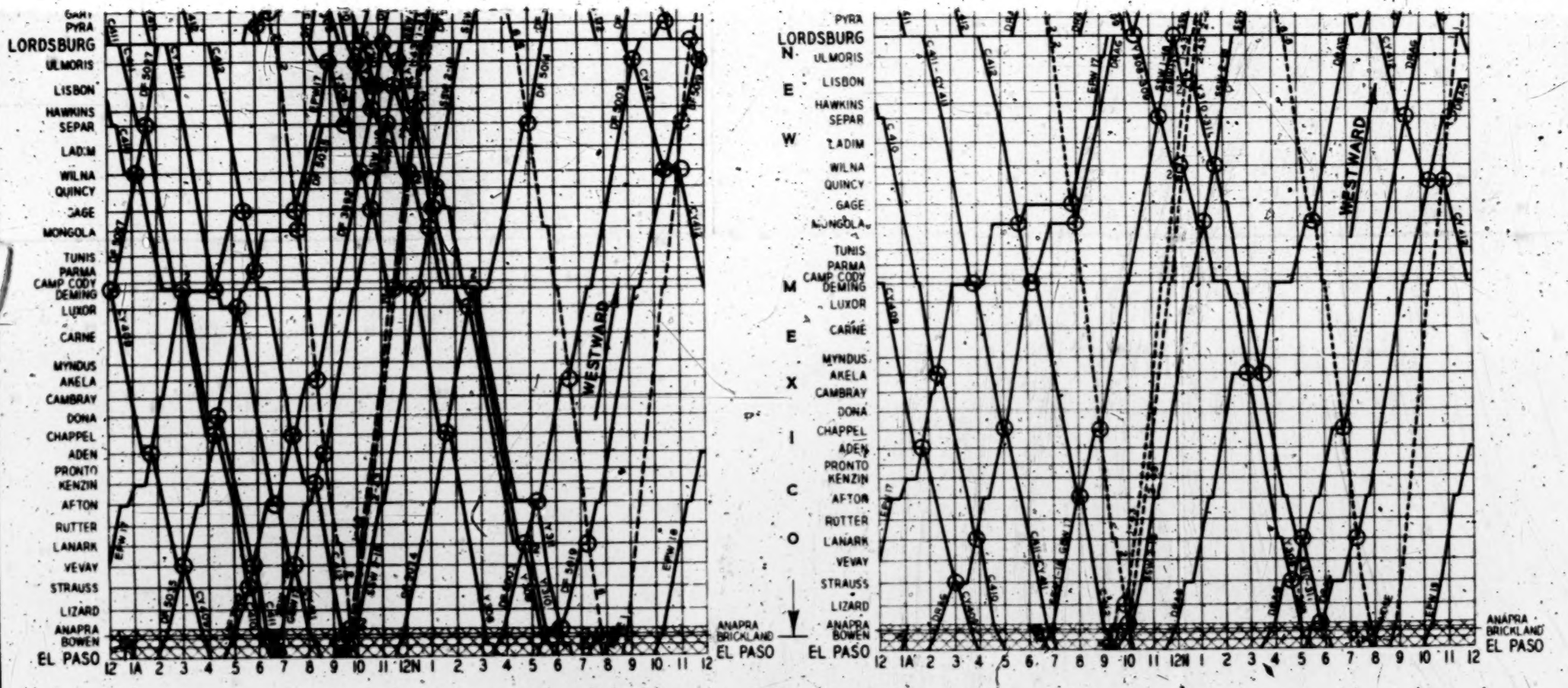
YUMA, ARIZONA TO EL PASO, TEXAS.

JUNE 18, 1938

TRAIN MOVEMENTS




BUCHAN
MOBILE
ENID
HEATON
MARICOPA
LIRIM
BON
NUNEZ
CASA GRANDE
SECO
ARIZOLA
TOLTEC
ELOY
PICACHO
OCATILLA
WYMOLA
MONTROSE
RED ROCK
AVRA
NAVISKA
MARANA
ROSKRUGE
RILLITO
SABINO
CORTARO
KINO
JAYNES
STOCKHAM
TUCSON
T&NRR JCT
POLVO
RANKIN
ESMOND
VAIL
PANTANO
MESCAL
CHAMISO
BENSON
FENNER
CURVO
SIBYL
TULLY
OCHOA
LANCHA
DRAGOON
MANZORO
COCHISE
HADO
WILLCOX
DRURY
RASO
ALRICH
LUZENA
CHOLLA
BOWIE
HOLT
OLGA
KARRO
SAN SIMON
BAWTRY
VANAR
CAVOT
STEINS
MONDEL
CONRAD
GARY
PYRA
LORDSBURG
ULMORIS
LISBON
HAWKINS
SEPAR
LADIM
WILNA
QUINCY
STOCKHAM
TUCSON
T&NRR JCT
POLVO
SO YARD JCT
CRUZ
RITA
VAIL
EMPIRE
MARSH
MESCAL
EASTWARD
WESTWARD



STATIONS ON RIGHT OF CHARTS ARE STATIONS ON WESTWARD TRACK.

INDICATES DOUBLE TRACK.

——— " FREIGHT TRAINS.

– – – – " PASSENGER TRAINS.

– · – · – " HELPERS AND LIGHT ENGINES.

○ " MEET } NUMERALS PLACED ALONG SIDE OF CIRCLE INDICATES NUMBER OF MEETS OR PASSES.

◌ " PASS }

★ DOES NOT INCLUDE MEETS OR PASSES WITH LIGHT HELPER MOVEMENTS.

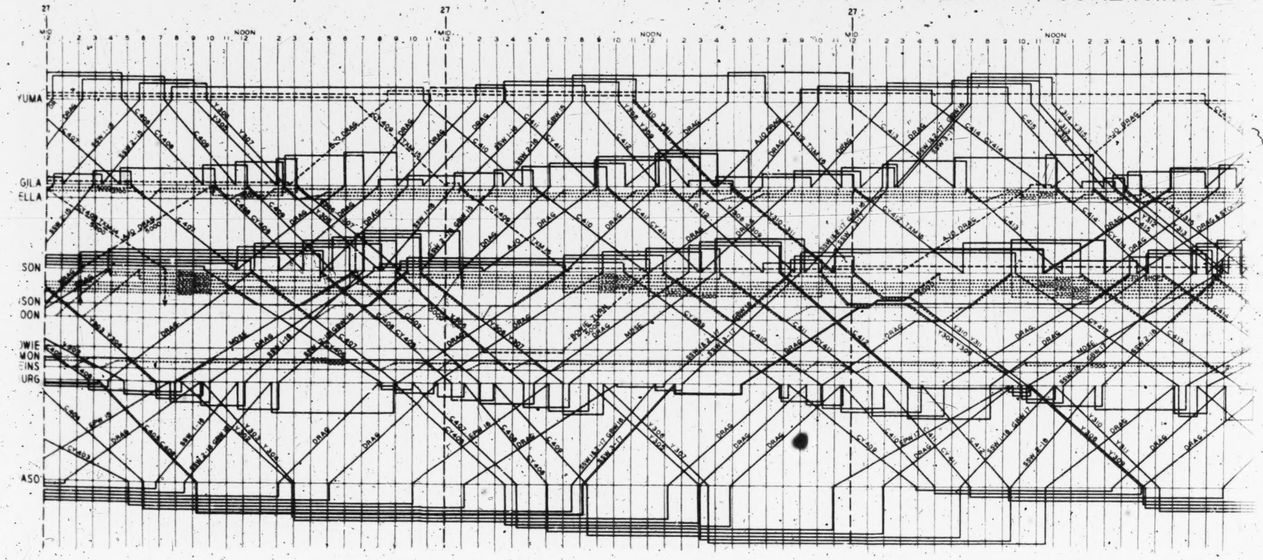
ACTUAL		REDISPATCHED
41	NUMBER OF TRAINS EASTWARD	32
48	NUMBER OF TRAINS WESTWARD	34
0	NUMBER OF LIGHT ENGINE MOVEMENTS	0
1	NUMBER OF LIGHT HELPER MOVEMENTS EASTWARD	0
15	NUMBER OF LIGHT HELPER MOVEMENTS WESTWARD	12
232	NUMBER OF MEETS	123
22	NUMBER OF PASSES	15
254	★TOTAL NUMBER OF MEETS AND PASSES	138

5687

Defendant's Exhibit No. 222 (Witness Sines)
Jan. 29, 1941

SOUTHERN PACIFIC COMPANY
PACIFIC LINES

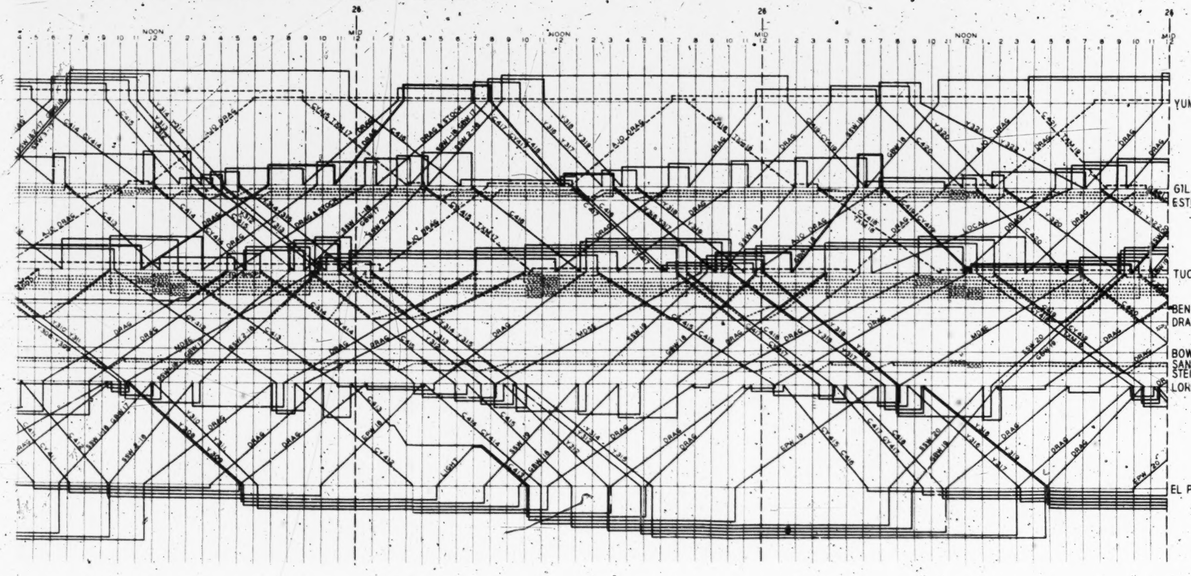
YUMA, ARIZONA – EL PASO, TEXAS VIA GILA
LOCOMOTIVE REQUIREMEN
FOR
LONG TRAIN OPERATION JUNE 16TH. TO



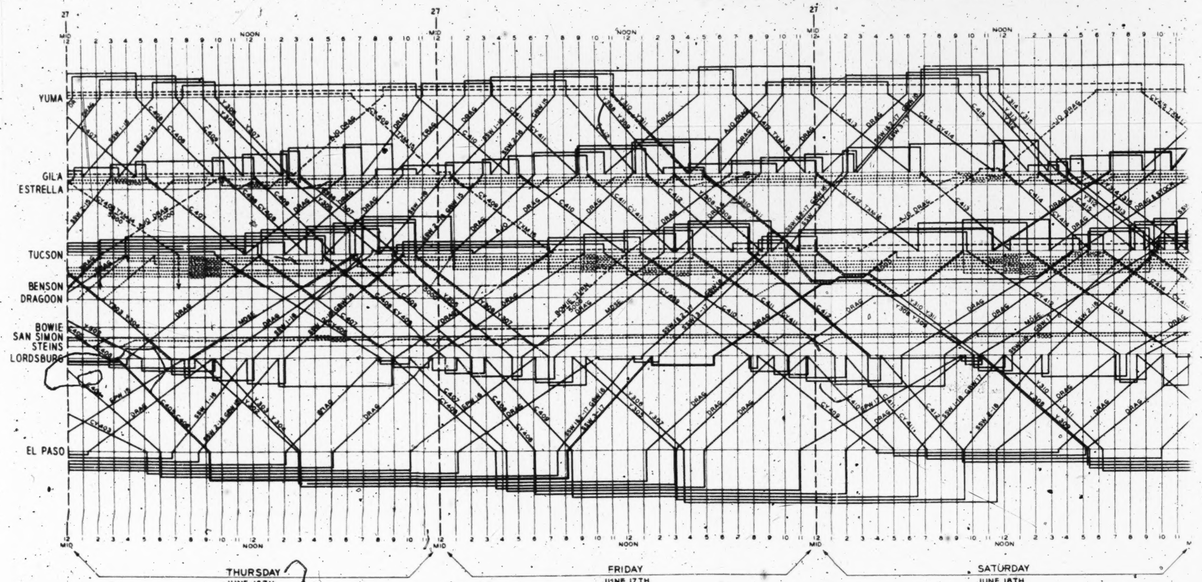
Defendant's Exhibit No. 222 (Witness Sines)
Jan. 29, 1941

SOUTHERN PACIFIC COMPANY
PACIFIC LINES

– PASO, TEXAS VIA GILA AND LORDSBURG.
)MOTIVE REQUIREMENTS
FOR
)PERATION JUNE 16TH. TO 20TH., 1938



YUMA, ARIZONA – EL PASO, TEXAS VIA GILA A
LOCOMOTIVE REQUIREMENTS
FOR
LONG TRAIN OPERATION JUNE 16TH. TO



TRAINS LEAVING TERMINALS (YUMA, GILA, TUCSON, LORDSBURG AND EL PASO) DAILY.

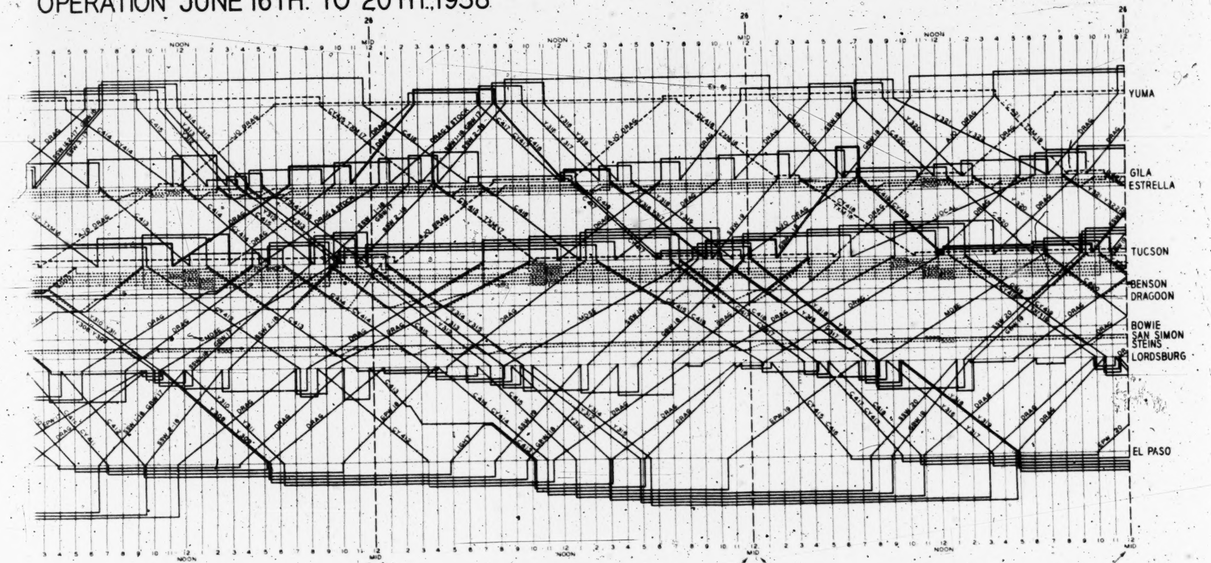
THURSDAY JUNE 16TH.
TRAINS EASTWARD 22
WESTWARD 25
TOTAL 47

FRIDAY JUNE 17TH.
TRAINS EASTWARD 23
WESTWARD 26
TOTAL 49

SATURDAY JUNE 18TH.
TRAINS EASTWARD 27
WESTWARD 26
TOTAL 53

LEGEND
AC LOCOMOTIVES
FI LOCOMOTIVES
HELPER LOCOMOT

EL PASO, TEXAS VIA GILA AND LORDSBURG.
COMOTIVE REQUIREMENTS
FOR
OPERATION JUNE 16TH. TO 20TH., 1938



SATURDAY JUNE 18TH.
TRAINS EASTWARD 27
WESTWARD 26
TOTAL 53

LEGEND
AC LOCOMOTIVES - 4100 TYPE
FI LOCOMOTIVES - 3800 TYPE EXCEPT AS NOTED
HELPER LOCOMOTIVES - ALL TYPES AS NOTED

SUNDAY JUNE 19TH.
TRAINS EASTWARD 21
WESTWARD 23
TOTAL 44

MONDAY JUNE 20TH.
TRAINS EASTWARD 23
WESTWARD 26
TOTAL 49

TOTAL 5 DAYS
TRAINS EASTWARD 118
WESTWARD 128
TOTAL 242

5688

Defendant's Exhibit No. 223 (Witness Sines)
Jan. 29, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

LOCOMOTIVE ASSIGNMENT, WEIGHT AND INVESTMENT
YUMA, ARIZONA TO EL PASO, TEXAS
(INCLUDING THE DOUGLAS LINE AND EXCLUDING THE PHOENIX LINE)
JUNE - 1938

	ASSIGNMENT			
	DISTRICT (a)	TYPE (b)	ACTUAL (c)	REDISPATCHED (d)
(1)	Yuma - Tucson via Gila	MK-2,4 2-8-2	3	-
		MK-7,8,9 2-8-2	3	-
		C-9,10 2-8-0	3	-
		P-1 2-10-2	20	3
		P-3, 4, 5 2-10-2	7	-
(2)	Gila - Estrella Helper	MK-7,8,9 2-8-2	5	-
		P-3, 4, 5 2-10-2	-	1
		SP-1,2, 3 4-10-2	-	2
(3)	Tucson - El Paso via Lordsburg	SP-1,2, 3 4-10-2	25	-
(4)	Tucson - Dragoon Helper	MK-7,8, 9 2-8-2	Included in Yuma-Tucson and Tucson-El Paso Districts	3
		P-3, 4, 5 2-10-2		2
		SP-1,2, 3 4-10-2		4
		C-9, 10 2-8-0		1
(5)	San Simon Helper	MK-7,8, 9 2-8-2	3	-
		SP-1,2, 3 4-10-2	-	2
(6)	Yuma - El Paso via Gila and Lordsburg	AC-8 4-8-8-2	-	30
(7)	Tucson - El Paso, South Line	SP-1,2, 3 4-10-2	3	3
		MK-7,8, 9 2-8-2	2	2
(8)	TOTAL		74	55

	RECAPITULATION OF ASSIGNMENTS, AND COMPUTATION OF TOTAL WEIGHT AND INVESTMENT						
	TYPE (e)		AVERAGE LIGHT WEIGHT LOCOMOTIVE & TENDER (f)	ACTUAL ASSIGNMENT (g)	ACTUAL TOTAL WEIGHT (h)	REDISPATCHED ASSIGNMENT (i)	REDISPATCHED TOTAL WEIGHT (j)
(9)	MK-2, 4	2-8-2	315,200 lbs.	3	945,600 lbs.	-	-
(10)	MK-7,8,9	2-8-2	375,640 lbs.	13	4,883,320 lbs.	5	1,878,200 lbs.
(11)	C-9, 10	2-8-0	267,280 lbs.	3	801,840 lbs.	1	267,280 lbs.

	DISTRICT (a)	TYPE (b)	ACTUAL (c)	REDISPATCHED (d)
(1)	Yuma - Tucson via Gila	MK-2,4 2-8-2 MK-7,8,9 2-8-2 C-9,10 2-8-0 F-1 2-10-2 F-3, 4, 5 2-10-2	3 3 3 20 7	- - - 5 -
(2)	Gila - Estrella Helper	MK-7,8,9 2-8-2 F-3, 4, 5 2-10-2 SP-1,2, 3 4-10-2	5 - -	- 1 2
(3)	Tucson - El Paso via Lordsburg	SP-1,2, 3 4-10-2	25	-
(4)	Tucson - Dragoon Helper	MK-7,8, 9 2-8-2 F-3, 4, 5 2-10-2 SP-1,2, 3 4-10-2 C-9, 10 2-8-0	Included in Yuma-Tucson and Tucson-El Paso Districts	3 2 4 1
(5)	San Simon Helper	MK-7,8, 9 2-8-2 SP-1,2, 3 4-10-2	3 -	- 2
(6)	Yuma - El Paso via Gila and Lordsburg	AC-8 4-8-8-2	-	30
(7)	Tucson - El Paso, South Line	SP-1,2, 3 4-10-2 MK-7,8, 9 2-8-2	3 2	3 2
(8)	TOTAL		74	55

RECAPITULATION OF ASSIGNMENTS, AND COMPUTATION OF TOTAL WEIGHT AND INVESTMENT

	TYPE (e)	AVERAGE LIGHT WEIGHT LOCOMOTIVE & TENDER (f)	ACTUAL ASSIGNMENT (g)	ACTUAL TOTAL WEIGHT (h)	REDISPATCHED ASSIGNMENT (i)	REDISPATCHED TOTAL WEIGHT (j)
(9)	MK-2, 4 2-8-2	315,200 lbs.	3	945,600 lbs.	-	-
(10)	MK-7,8,9 2-8-2	378,640 lbs.	13	4,883,320 lbs.	5	1,878,200 lbs.
(11)	C-9, 10 2-8-0	267,280 lbs.	3	801,840 lbs.	1	267,280 lbs.
(12)	F-1 2-10-2	382,940 lbs.	20	7,654,800 lbs.	3	1,148,220 lbs.
(13)	F-3,4, 5 2-10-2	445,520 lbs.	7	3,118,640 lbs.	3	1,336,560 lbs.
(14)	SP-1,2,3 4-10-2	511,700 lbs.	28	14,327,600 lbs.	11	5,628,700 lbs.
(15)	AC-8 4-8-8-2	753,800 lbs.	-	-	30	22,614,000 lbs.
(16)	TOTAL		74	31,731,800 lbs.	53	32,878,960 lbs.
(17)	DECREASE IN LOCOMOTIVE ASSIGNMENT, ...		21			
(18)	INCREASE IN LOCOMOTIVE WEIGHT, ...		1,141,160 lbs.			
(19)	INCREASE IN LOCOMOTIVE INVESTMENT, ...		1,141,160 lbs. @ $0.849/ = $			

/ - AC-8 locomotives purchased 1939 weight 753,800 lbs. locomotive and tender.
Estimated 1940 price, each, $188,000; Average per pound $0.249.

5689

3212

Defendant's Exhibit No. 224 (Witness Sines)
Jan. 29, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

TUCSON AND RIO GRANDE DIVISIONS
THROUGH FREIGHT - POOL SERVICE.
ADDITIONAL CABOOSES AND CABOOSE INVESTMENT
REQUIRED BY ARIZONA TRAIN LIMIT LAW

LINE NO.	DISTRICT	MONTH	ACTUAL HANDLING			REDISPATCHED HANDLING		
			TRAIN MILES	NUMBER ASSIGNED CABOOSES	AVERAGE MONTHLY MILES	TRAIN MILES	AVERAGE MONTHLY MILES	NUMBER ASSIGNED CABOOSES
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
(1)	Yuma-Gila District	June	58,917	18	3,273	40,490	3,273	13
(2)	Gila-Tucson District	June	60,928	18	3,385	41,600	3,385	13
(3)	Tucson-Lordsburg	June	78,428	23	3,410	51,727	3,410	16
(4)	Lordsburg-El Paso	June	63,945	18	3,553	47,636	3,553	14
(5)	TOTAL MONTH OF JUNE, 1938		262,218	77	3,405	181,453	3,405	56
(6)	DIFFERENCE IN NUMBER OF CABOOSES REQUIRED							21
(7)	Yuma-Gila District	August	35,916	11	3,265	27,675	3,265	9
(8)	Gila-Tucson District	August	37,248	13	2,865	28,800	2,865	10
(9)	Tucson-Lordsburg District	August	44,582	13	3,429	33,352	3,429	10
(10)	Lordsburg-El Paso District	August	36,207	12	3,017	30,651	3,017	10
(11)	TOTAL MONTH OF AUGUST, 1938		153,953	49	3,142	120,478	3,142	39
(12)	DIFFERENCE IN NUMBER OF CABOOSES REQUIRED							10
(13)	ADDITIONAL CABOOSE INVESTMENT - 21 @ $3,414 =							$71,694

Defendant's Exhibit No. 225 (Witness B.S. Sines)
Jan. 29, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

YUMA, ARIZONA - EL PASO, TEXAS
SUMMARY OF INVESTMENT CHARGES AND ANNUAL CHARGES
INCIDENT TO ADOPTION OF LONG TRAIN OPERATION

	TOTAL INVESTMENT	INTEREST		MAINTENANCE		DEPRECIATION		TOTAL ANNUAL CHARGES
		RATE	AMOUNT	RATE	AMOUNT	RATE	AMOUNT	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
Siding Extensions - 125,703 Track Feet	$ 685,988	4.00%	$27,439	10¢ per track ft.	$12,570	-	-	$40,009
Round House and Shop Facilities	453,832	4.00%	18,153	2.20%	9,984	-	-	28,137
Locomotive Investment	284,149	4.00%	11,366	-	-	2.90%	$8,240	19,606
Caboose Investment (Decrease)	D 71,094	4.00%	D 2,858	4.93%	D 3,535	3.27%	D2,344	D 8,747
TOTAL	$1,352,272		$54,090		$19,019		$5,896	$79,005

D = Decrease

5691

Defendant's Exhibit No. 226 (Witness B.S. Sines)
Jan. 29, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY - OPERATING STATISTICS
YUMA, ARIZONA TO EL PASO, TEXAS
EXCLUDING PHOENIX LINE
FOR PERIOD JUNE AND AUGUST, 1938

	NUMBER OF TRAINS (a)	TRAIN MILES (b)	OTHER LOCOMOTIVE MILES (c)	TOTAL LOCOMOTIVE MILES (d)	NUMBER OF CARS (e)	CARS PER TRAIN (f)
NORTH LINE						
I - Yuma - Gila						
Actual	771	94,833	4,223	99,056	49,940	64.8
Redispatch	554	68,165	1,678	69,843	49,373	89.1
Saving for period	217	26,668	2,545	29,213	(1) 567	24.3
II - Gila - Tucson						
Actual	787	98,176	16,518	114,694	49,468	64.5
Redispatch	550	70,400	10,746	81,146	49,178	89.4
Saving for period	237	27,776	5,772	33,548	(2) 290	24.9
III - Tucson - Lordsburg						
Actual	756	123,010	60,675	183,694	48,340	63.8
Redispatch	521	85,079	39,418	124,497	47,499	91.2
Saving for period	235	37,931	21,457	59,377	(3) 741	27.4
IV - Lordsburg-El Paso (Through trains only)						
Actual	674	100,084	563	100,647	48,256	71.6
Redispatch	521	77,335	1,728	79,063	47,399	91.0
Saving for period	153	22,749	(1) 1,165	21,584	(4) 856	19.4
V - El Paso-Strauss (Turnaround trains only)						
Actual	4	68	-	68	200	(5) 100.0
Redispatch	56	952	-	952	2,800	(5) 100.0
Saving for period	(1) 52	(1) 884	-	(1) 884	(1) 2,600	
VI - TOTAL NORTH LINE						
Actual	2,972	416,171	82,179	498,339	196,103	(6) 66.0
Redispatch	2,202	301,931	53,570	355,501	196,249	(6) 90.1
Saving for period	770	114,240	28,609	142,838	(1) 146	24.1
SOUTH LINE						
VII - Tucson - Douglas						
Actual	127	15,128	-	15,128	5,958	46.8
Redispatch	122	15,128	-	15,128	6,876	56.4
Saving for period	-	-	-	-	(7) 918	7.6
VIII - Douglas-Bisbee Jct. (Turnaround trains only)						
Actual	52	1,208	-	1,208	2,851	54.8
Redispatch	52	1,208	-	1,208	3,082	59.3
Saving for period	-	-	-	-	(8) 231	4.5
IX - Douglas - El Paso						
Actual	122	26,396	-	26,396	5,965	48.1
Redispatch	122	26,396	-	26,396	6,763	55.4

	NUMBER OF TRAINS (a)	TRAIN MILES (b)	OTHER LOCOMOTIVE MILES (c)	TOTAL LOCOMOTIVE MILES (d)	Number OF CARS (e)	Cars PER TRAIN (f)
NORTH LINE						
I - Yuma - Gila						
Actual	771	94,833	4,223	99,056	49,940	64.8
Redispatch	554	68,165	1,678	69,843	49,373	89.1
Saving for period	217	26,668	2,545	29,213	(1) 567	24.3
II - Gila - Tucson						
Actual	787	98,176	16,518	114,694	49,468	64.5
Redispatch	550	70,400	10,746	81,146	49,178	89.4
Saving for period	237	27,776	5,772	33,548	(2) 290	24.9
III - Tucson - Lordsburg						
Actual	756	123,010	60,675	183,694	48,340	63.8
Redispatch	521	85,079	39,418	124,497	47,499	91.2
Saving for period	235	37,931	21,257	59,377	(3) 741	27.4
IV - Lordsburg-El Paso (Through trains only)						
Actual	674	100,084	563	100,647	48,255	71.6
Redispatch	521	77,335	1,728	79,063	47,399	91.0
Saving for period	153	22,749	(1) 1,165	21,584	(4) 856	19.4
V - El Paso-Strauss (Turnaround trains only)						
Actual	4	66	-	66	200	(5) 100.0
Redispatch	56	952	-	952	2,800	(5) 100.0
Saving for period	(1) 52	(1) 886	-	(1) 886	(1) 2,600	
VI - TOTAL NORTH LINE						
Actual	2,972	416,171	82,179	498,339	196,103	(6) 66.0
Redispatch	2,202	301,931	53,570	355,501	196,249	(6) 90.1
Saving for period	770	114,240	28,609	142,838	(1) 146	24.1
SOUTH LINE						
VII - Tucson - Douglas						
Actual	122	15,128	-	15,128	5,958	48.8
Redispatch	122	15,128	-	15,128	6,876	56.4
Saving for period	-	-	-	-	(7) 918	7.6
VIII - Douglas-Bisbee Jct. (Turnaround trains only)						
Actual	52	1,208	-	1,208	2,851	54.8
Redispatch	52	1,208	-	1,208	3,082	59.3
Saving for period	-	-	-	-	(8) 231	4.5
IX - Douglas - El Paso						
Actual	122	26,596	-	26,596	5,865	48.1
Redispatch	122	26,596	-	26,596	6,763	55.4
Saving for period	-	-	-	-	(9) 898	7.3
X - TOTAL SOUTH LINE						
Actual	296	42,932	-	42,932	14,674	(10) 49.5
Redispatch	296	42,932	-	42,932	16,721	(10) 56.9
Saving for period	-	-	-	-	(1) 2,047	7.4
XI - TOTAL NORTH AND SOUTH LINES						
Actual	3,268	459,103	82,179	541,271	210,777	(11) 64.7
Redispatch	2,498	344,863	53,570	398,433	212,970	(11) 85.6
Saving for period	770	114,240	28,609	142,838	2,193	21.9
XII - PER CENT CHANGE, SAVING vs. ACTUAL	23.6%	24.9%	34.8%	26.4%	-	33.8%
XIII - SAVING FOR YEAR (Saving for period increased in ratio of 19.6% to 100%)	4,004	638,560	159,918	795,424	-	

(1) = INCREASE

5692

3215

(1) YUMA - GILA DISTRICT: Decrease of 618 engine water cars and 25 deadhead cabooses, and increase of 70 loads which moved via Phoenix Line in actual operation and via Gila Line in redispatched operation, produces net decrease of 567 cars.

(2) GILA - TUCSON DISTRICT: Decrease of 328 engine water cars and 34 deadhead cabooses, and increase of 70 loads which moved via Phoenix Line in actual operation and via Gila Line in redispatched operation, produces net decrease of 290 cars.

(3) TUCSON-LORDSBURG DISTRICT: Decrease of 23 deadhead cabooses, 231 east empties and 642 west empties, which moved North Line in actual operation but South Line in redispatched operation, offset by an increase of 155 west empties which reached Tucson on the redispatch but which were left at Bowie on the actual, produces a net decrease of 741 cars.

(4) LORDSBURG-EL PASO DISTRICT: Decrease of 231 east empties and 642 west empties which moved North Line in actual operation but South Line in redispatched, offset by an increase of 17 deadhead cabooses in redispatched operation, produces net decrease of 856 cars.

(5) EL PASO - STRAUSS DISTRICT: Average cars per train computed for Strauss turnarounds in westward direction only (two trains in actual, and 28 trains in redispatch) as eastward trains were without cars.

(6) TOTAL NORTH LINE: Average cars per train computed, omitting El Paso-Strauss turnaround trains and cars handled by those trains.

(7) TUCSON - DOUGLAS DISTRICT: Increase of 231 east empties, and 642 west empties which moved North Line in actual operation but South Line in redispatched, plus 20 westward empties which reached Tucson on the redispatch but which were left at Douglas on the actual, plus 25 west empties which reached Tucson on the redispatch, but which were left at Rodeo on the actual in order to comply with the law, produces total increase of 918 cars.

(8) DOUGLAS - BISBEE JCT. (Turnaround trains only): Increase of 231 empties handled Douglas to Bisbee Jct., by redispatched turnaround trains to avoid helping redispatched through westward trains Douglas to Bisbee Jct.

(9) DOUGLAS - EL PASO DISTRICT: Increase of 231 east empties and 642 west empties which moved North Line in actual operation but South Line in redispatched, plus 25 westward empties which reached Douglas (and Tucson) on the redispatch, but which were left at Rodeo on the actual in order to comply with the law, produces a total increase of 898 cars.

(10) TOTAL SOUTH LINE: Average cars per train computed omitting Douglas-Bisbee Jct., turnaround trains and cars handled by those trains.

(11) TOTAL NORTH AND SOUTH LINES: Average cars per train computed omitting Strauss and Douglas-Bisbee Jct., turnaround trains and cars handled by those trains:-

ACTUAL:	4 Strauss turns with		200 cars
	52 Douglas-Bisbee Jct. turns		2,851 cars
	56 trains omitted with		3,051 cars
REDISPATCH:	56 Strauss turns with		2,800 cars
	52 Douglas-Bisbee Jct. turns		3,082 cars
	108 trains omitted with		5,882 cars

DERIVATION OF RATIO - 17.89%

	GROSS TON MILES (Thousands)	
	YEAR 1938	PERIOD JUNE AND AUGUST
Yuma - Tucson	2,044,436	488,345
Tucson - Lordsburg	1,747,885	308,788
Lordsburg - El Paso	1,586,795	279,795
Tucson - El Paso vi Douglas	457,857	75,158
TOTAL	6,404,373	1,146,086
Per Cent total period June and August to year 1938		17.890%

Defendant's Exhibit No. 227 (Witness Sines)
~~xxxxxx~~ Jan. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

ARRIVAL TIME AT EL PASO, TEXAS
OF FRUIT BLOCKS AND MANIFEST SECTIONS, ACTUAL
OPERATION COMPARED WITH REDISPATCHED OPERATION,
WITH NO RESTRICTION AND USING AC POWER AND LONG
SIDINGS.

MONTHS OF JUNE AND AUGUST, 1938

SUMMARY

JUNE, 1938

(1)	NUMBER OF TRAINS ARRIVING EL PASO - ACTUAL,	200
(2)	NUMBER OF TRAINS ARRIVING EL PASO - REDISPATCHED,	147
(3)	NUMBER OF BLOCKS AND MANIFEST SECTIONS INVOLVED - ACTUAL,	231
	REDISPATCHED,	221
(4)	NUMBER OF REDISPATCHED BLOCKS ARRIVING EL PASO -	
	(a) AT SAME TIME AS ACTUAL BLOCKS,	14
	(b) IN ADVANCE OF ACTUAL BLOCKS,	126
	(c) LATER THAN ACTUAL BLOCKS,	92
(5)	TOTAL TIME -	
	(a) IN ADVANCE OF ACTUAL,	119 HOURS 13 MINUTES
	(b) LATER THAN ACTUAL,	81 HOURS 23 MINUTES
(6)	AVERAGE TIME OF 126 BLOCKS IN ADVANCE OF ACTUAL,	57 MINUTES
(7)	AVERAGE TIME OF 91 BLOCKS LATER THAN ACTUAL,	53 MINUTES

AUGUST, 1938

(1)	NUMBER OF TRAINS ARRIVING EL PASO - ACTUAL,	117
(2)	NUMBER OF TRAINS ARRIVING EL PASO - REDISPATCHED,	95
(3)	NUMBER OF BLOCKS AND MANIFEST SECTION INVOLVED - ACTUAL,	147
	REDISPATCHED,	141
(4)	NUMBER OF REDISPATCHED BLOCKS ARRIVING EL PASO -	
	(a) AT SAME TIME AS ACTUAL BLOCKS,	18
	(b) IN ADVANCE OF ACTUAL BLOCKS,	75
	(c) LATER THAN ACTUAL BLOCKS,	54
(5)	TOTAL TIME -	
	(a) IN ADVANCE OF ACTUAL,	117 HOURS 40 MINUTES
	(b) LATER THAN ACTUAL,	44 HOURS 31 MINUTES
(6)	AVERAGE TIME OF 75 BLOCKS IN ADVANCE OF ACTUAL,	1 HOUR 34 MINUTES
(7)	AVERAGE TIME OF 54 BLOCKS LATER THAN ACTUAL,	49 MINUTES

MONTHS OF JUNE AND AUGUST, 1938

SUMMARY

JUNE, 1938

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(6)	AVERAGE TIME OF 75 BLOCKS IN ADVANCE OF ACTUAL,	1 HOUR 34 MINUTES
(7)	AVERAGE TIME OF 54 BLOCKS LATER THAN ACTUAL,	49 MINUTES

A = ARIZONA PERISHABLE BLOCK

C = COLTON FRUIT BLOCK

Y = YUMA PERISHABLE BLOCK

CY = COLTON OVERFLOW ON YUMA BLOCK ON COLTON SCHEDULE

M = MEXICAN PERISHABLE

SSE = SUNSET EAST MANIFEST

5634

3241

JUNE 1956

DATE (a)	PERISHABLE BLOCK OR MANIFEST IDENTIFICATION (b)	ACTUAL ARRIVAL EL PASO (c)	PERISHABLE BLOCK OR MANIFEST IDENTIFICATION (d)	REDISPATCHED ARRIVAL EL PASO (e)	REDISPATCHED IN ADVANCE OF ACTUAL (f)	REDISPATCHED LATER THAN ACTUAL (g)	OPERATIONS SAME AS ACTUAL (h)
2	C 365	2:10 AM	C 365	2:05 AM	5 Mins		
	Y 357	# 3:25 PM	Y 357)		15 Mins		
	Y 358	# 3:55 PM	Y 358)	# 3:10 PM	45 Mins		
3	CY 365	1:55 AM	CY 365)			4 Hrs 50 Mins	
	C 366	3:45 AM	C 366)	3:45 AM		3 Hrs 00 Mins	
	C 367	9:30 AM	C 367	9:45 AM		15 Mins	
	Y 359	# 2:35 PM	Y 359)			1 Hr 10 Mins	
	Y 360	# 3:15 PM	Y 360)	# 3:55 PM		30 Mins	
4	CY 367)		CY 367)			50 Mins	
	C 368)	4:00 AM	C 368)	4:20 AM		20 Mins	
	C 369	6:45 AM	C 369)			1 Hr 20 Mins	
	CY 369	9:00 AM	CY 369)	8:05 AM	55 Mins		
	C 370	10:15 AM	C 370	10:15 AM			Same
	Y 361	# 4:00 PM	Y 361)			2 Hrs 3 Mins	
	Y 362	# 7:05 PM	Y 362)	# 6:05 PM	1 Hr 00 Mins		
5	CY 370)		CY 370)		45 Mins		
	C 371)	5:45 AM	C 371)	5:00 AM	45 Mins		
	C 372	7:00 AM	C 372	6:20 AM	40 Mins		
	C 373	9:30 AM	C 373)		30 Mins		
	CY 373	10:30 AM	CY 373)	9:00 AM	1 Hr 30 Mins		
	Y 363	# 3:35 PM	Y 363)			5 Mins	
	Y 364	# 4:15 PM	Y 364)	# 3:30 PM	45 Mins		
6	CY 373-A	4:55 AM	CY 373-A	4:20 AM	35 Mins		
	C 374	8:50 AM	C 374	7:30 AM	1 Hr 20 Mins		
	C 375	9:05 AM	C 375)		10 Mins		
	CY 375	9:10 AM	CY 375)	8:55 AM	15 Mins		
	C 376	10:35 AM	C 376	10:35 AM			Same
	Y 365)		Y 365)		57 Mins		
	Y 366)	# 3:40 PM	Y 366)	# 2:43 PM	57 Mins		
	Y 367	# 6:33 PM	Y 367	# 3:35 PM	2 Hrs 55 Mins		
7	CY 376	5:20 AM	CY 376)			3 Hrs 30 Mins	
	C 377	6:20 AM	C 377)	7:45 AM		1 Hr 25 Mins	
	C 378	8:15 AM	C 378	9:05 AM		50 Mins	
	C 379	11:30 AM	C 379	11:00 AM	30 Mins		
	Y 368)		Y 368	# 7:35 PM		1 Hr 35 Mins	
	Y 369)	# 5:56 PM	Y 369)		3 Hrs 31 Mins		
	Y 370	# 6:35 PM	Y 370)	# 2:35 PM	4 Hrs 00 Mins		
8	C 380	2:20 AM	C 380	3:00 AM		10 Mins	
	C 381	11:00 AM	C 381	9:35 AM	1 Hr 25 Mins		
	Y 371	# 4:30 PM	Y 371)			42 Mins	
	Y 372	# 4:50 PM	Y 372)	# 5:12 PM		22 Mins	
	Y 373	# 5:55 PM	Y 373)			35 Mins	
	Y 374	# 6:32 PM	Y 374)	# 6:23 PM	9 Mins		
9	CY 381	1:20 PM	CY 381	1:00 PM	20 Mins		
	C 382	1:50 PM	C 382	1:30 PM	20 Mins		
	C 383	2:05 PM	C 383)			5 Mins	
	C 384	2:10 PM	C 384)	2:10 PM			Same
	Y 375)		Y 375	# 5:23 PM	58 Mins		
	Part Y 376)	# 5:56 PM		(5:29 PM)	26 Mins		
	Part Y 376)		Y 376)		1 Hr 46 Mins		
	Y 377)	# 7:15 PM	Y 377)	# 5:29 PM	1 Hr 46 Mins		
	Y 378	# 7:25 PM	Y 378	# 5:55 PM	1 Hr 30 Mins		
10	CY 384	6:55 AM	Part CY 384)		35 Mins		
	C 385	7:05 AM	C 385)	6:20 AM	45 Mins		
			Part CY 384)			1 Hr 50 Mins	
	C 386	9:05 AM	C 384)	8:45 AM	20 Mins		
	C 387	11:35 AM	C 387)			5 Mins	
	C 388	12:45 PM	C 388)	11:40 AM	1 Hr 05 Mins		
	Y 379)		Y 379)		1 Hr 12 Mins		
	Part Y 380)	# 4:05 PM	Y 380)	# 2:53 PM	1 Hr 12 Mins		
	Part Y 380)			(2:53 PM)	3 Hr 12 Mins		
	Y 381)	# 6:05 PM	Y 381	# 5:15 PM	50 Mins		
	Y 382	# 6:46 PM	Y 382)		30 Mins		
	Y 383	# 7:30 PM	Y 383)	# 6:28 PM	52 Mins		
11	CY 388)		CY 388)			5 Mins	
	C 389)	4:30 AM	C 389)	4:55 AM		5 Mins	
	C 390	6:40 AM	C 390	7:00 AM		20 Mins	
	C 391	12:25 PM	CY 391)			1 Hr 5 Mins	

4	CY 367)						20 Mins
	C 368)	4:00 AM	C 368)	4:20 AM			1 Hr 20 Mins
	C 369	6:45 AM	C 369)				
	CY 369	9:00 AM	CY 369)	8:05 AM	50 Mins		Same
	C 370	10:15 AM	C 370	10:15 AM			
	Y 861	# 4:00 PM	Y 861)				2 Hrs 5 Mins
	Y 862	# 7:05 PM	Y 862)	# 6:05 PM	1 Hr 00 Mins		
5	CY 370)		CY 370)		45 Mins		
	C 371)	5:45 AM	C 371)	5:00 AM	45 Mins		
	C 372	7:00 AM	C 372	6:20 AM	40 Mins		
	C 373	9:30 AM	C 373)		30 Mins		
	CY 373	10:30 AM	CY 373)	9:00 AM	1 Hr 30 Mins		
	Y 863	# 3:35 PM	Y 863)				5 Mins
	Y 864	# 4:15 PM	Y 864)	# 3:30 PM	45 Mins		
6	CY 373-A	4:35 AM	CY 373-A	4:30 AM	25 Mins		
	C 374	6:50 AM	C 374	7:30 AM	1 Hr 20 Mins		
	C 375	9:05 AM	C 375)		10 Mins		
	CY 375	9:10 AM	CY 375)	8:55 AM	15 Mins		
	C 376	10:35 AM	C 376	10:35 AM			Same
	Y 865)		Y 865)		57 Mins		
	Y 866)	# 3:40 PM	Y 866)	# 2:45 PM	57 Mins		
	Y 867	# 6:33 PM	Y 867	# 5:30 PM	2 Hrs 55 Mins		
7	CY 376	5:30 AM	CY 376)				2 Hrs 25 Mins
	C 377	6:30 AM	C 377)	7:45 AM			1 Hr 25 Mins
	C 378	8:15 AM	C 378	9:05 AM			50 Mins
	C 379	11:30 AM	C 379	11:00 AM	30 Mins		
	Y 868)		Y 868	# 7:35 PM			1 Hr 38 Mins
	Y 869)	# 5:56 PM	Y 869)		3 Hrs 21 Mins		
	Y 870	# 6:35 PM	Y 870)	# 5:35 PM	4 Hrs 00 Mins		
8	C 380	8:30 AM	C 380	3:00 AM			10 Mins
	C 381	11:00 AM	C 381	9:35 AM	1 Hr 25 Mins		
	Y 871	# 4:30 PM	Y 871)				42 Mins
	Y 872	# 4:50 PM	Y 872)	# 5:12 PM			22 Mins
	Y 873	# 5:55 PM	Y 873)				25 Mins
	Y 874	# 6:32 PM	Y 874)	# 6:23 PM	9 Mins		
9	CY 381	1:20 PM	CY 381	1:00 PM	20 Mins		
	C 382	1:50 PM	C 382	1:30 PM	20 Mins		
	C 383	2:05 PM	C 383)				5 Mins
	C 384	2:10 PM	C 384)	2:10 PM			Same
	Y 875)		Y 875	# 5:23 PM	32 Mins		
	Part Y 876)	# 5:55 PM		(5:29 PM)	26 Mins		
	Part Y 876)		Y 876)		1 Hr 46 Mins		
	Y 877)	# 7:15 PM	Y 877)	# 5:29 PM	1 Hr 46 Mins		
	Y 878	# 7:25 PM	Y 878	# 5:55 PM	1 Hr 30 Mins		
10	CY 384	6:55 AM	Part CY 384)		35 Mins		
	C 385	7:05 AM	C 385)	6:20 AM	45 Mins		
			Part CY 384)				1 Hr 50 Mins
	C 386	9:05 AM	C 386)	8:45 AM	20 Mins		
	C 387	11:35 AM	C 387)				5 Mins
	C 388	12:45 PM	C 388)	11:40 AM	1 Hr 05 Mins		
	Y 879)		Y 879)		1 Hr 12 Mins		
	Part Y 880)	# 4:05 PM	Y 880)	# 2:53 PM	1 Hr 12 Mins		
	Part Y 880)			(2:53 PM)	3 Hr 12 Mins		
	Y 881)	# 5:05 PM	Y 881	# 5:15 PM	50 Mins		
	Y 882	# 6:48 PM	Y 882)		20 Mins		
	Y 883	# 7:20 PM	Y 883)	# 6:20 PM	52 Mins		
11	CY 388)		CY 388)				5 Mins
	C 389)	4:50 AM	C 389)	4:55 AM			5 Mins
	C 390	6:40 AM	C 390	7:00 AM			20 Mins
	C 391	12:25 PM	CY 391)				1 Hr 5 Mins
	CY 391	1:10 PM	C 391)	1:30 PM			20 Mins
	Y 884)		Y 884	# 5:43 PM	1 Hr 10 Mins		
	Part Y 885)	# 4:55 PM	Y 885)	(4:29 PM)	34 Mins		
	Part Y 885)		)		51 Mins		
	Y 886	# 5:20 PM	Y 886)	# 4:29 PM	51 Mins		
	Y 887	# 6:40 PM	Y 887)				25 Mins
	Y 888	# 7:30 PM	Y 888)	# 7:05 PM	37 Mins		
12	CY 391-A	6:25 AM	CY 391-A	5:50 AM	35 Mins		
	C 392	8:35 AM	C 392)		1 Hr 30 Mins		
	C 393	9:10 AM	C 393)	7:05 AM	2 Hr 05 Mins		
	C 394	11:00 AM	C 394	8:15 AM	2 Hrs 45 Mins		
	C 395	12:10 PM	C 395	11:55 AM	15 Mins		
	Y 889	# 2:20 PM	Y 889	# 2:30 PM			10 Mins
	Y 890	# 4:00 PM	Y 890)				Same
	Y 891	# 4:08 PM	Y 891)	# 4:00 PM	8 Mins		

- Ice House Arrival

5695

JUNE 1936

DATE (a)	PERISHABLE BLOCK OR MANIFEST IDENTIFICATION (b)	ACTUAL ARRIVAL EL PASO (c)	PERISHABLE BLOCK OR MANIFEST IDENTIFICATION (d)	RED DISPATCHED ARRIVAL EL PASO (e)	RED DISPATCHED IN ADVANCE OF ACTUAL (f)	RED DISPATCHED LATER THAN ACTUAL (g)	OPERATIONS SAME AS ACTUAL (h)
							Same
13	CY 395	6:00 AM	CY 395	6:00 AM			
	C 396	6:25 AM	C 396	4:00 PM	2 Hrs 25 Mins		
	C 397	7:45 AM	C 397)			20 Mins	
	CY 397	8:25 AM	CY 397)	8:00 AM	20 Mins		
	SHE 3-11	11:50 AM	SHE 3-11)		25 Mins		
	C 398	12:05 PM	C 398)	11:25 AM	40 Mins		
	Y 292	# 2:45 PM	Y 292	# 2:50 PM		5 Mins	
	Y 293	# 4:30 PM	Y 293)			80 Mins	
	Y 294	# 5:10 PM	Y 294)	# 4:59 PM	11 Mins		
						3 Hrs 50 Mins	
14	C 399	4:10 AM	C 399)			10 Mins	
	CY 399	7:50 AM	CY 399)	8:00 AM		35 Mins	
	C 400	7:26 AM	C 400	8:30 AM		10 Mins	
	C 401	12:35 PM	C 401)				
	CY 401	1:30 PM	CY 401)	12:45 PM	45 Mins		
	Y 295)		Y 295	# 5:05 PM	84 Mins		
	Y 296)	# 5:27 PM	Y 296)			1 Hr 35 Mins	
	Y 297	# 6:55 PM	Y 297)	# 7:02 PM		7 Mins	
						30 Mins	
15	C 402	6:05 AM	C 402	6:35 AM		45 Mins	
	C 403	8:05 AM	C 403)				Same
	CY 403	8:50 AM	CY 403)	8:50 AM			
	Y 298	# 3:38 PM	Y 298	# 3:43 PM	55 Mins		
	Y 299	# 4:15 PM	Y 299)		15 Mins		
	Y 300	# 4:35 PM	Y 300)	# 4:00 PM	35 Mins		
	Y 301	# 5:25 PM	Y 301	# 6:00 PM		30 Mins	
16	CY 403-A	5:40 AM	CY 403-A	8:10 AM	30 Mins		
	C 404	6:35 AM	C 404	6:05 AM	30 Mins		
	C 405	8:30 AM	C 405)			45 Mins	
	C 406	8:50 AM	C 406)	9:15 AM		25 Mins	
	Y 302	# 2:50 PM	Y 302	# 3:32 PM	27 Mins		
	Y 303	# 3:15 PM	Y 303)		3 Mins		
	Y 304	# 4:30 PM	Y 304)	# 2:45 PM	1 Hr 45 Mins		
17	CY 406	3:40 AM	CY 406	3:26 AM	5 Mins		
	C 407	4:00 AM	C 407	4:15 AM		15 Mins	
	C 408	6:10 AM	C 408)		5 Mins		
	CY 408	8:30 AM	CY 408)	6:05 AM	25 Mins		
	C 409	8:50 AM	C 409	8:25 AM	25 Mins		
	Y 305	# 3:00 PM	Y 305	# 3:45 PM	15 Mins		
	Y 306	# 3:11 PM	Y 306)			5 Mins	
	Y 307	# 4:36 PM	Y 307)	# 3:14 PM	1 Hr 18 Mins		
18	CY 409	4:05 AM	CY 409	3:56 AM	10 Mins		
	C 410	6:30 AM	C 410	8:00 AM	1 Hr 30 Mins		
	C 411	8:40 AM	C 411)			80 Mins	
	CY 411	8:30 AM	CY 411)	7:05 AM	1 Hr 25 Mins		
	C 412	9:45 AM	C 412	9:30 AM	25 Mins		
	Y 308	# 3:12 PM	Y 308)			1 Hr 56 Mins	
	Y 309	# 5:24 PM	Y 309)	# 5:09 PM	80 Mins		
	Y 310	# 5:40 PM	Y 310			14 Mins	
	Y 311	# 6:15 PM	Y 311)	# 5:54 PM	21 Mins		
19	CY 412	3:45 AM	CY 412	3:35 AM	20 Mins		
	Part C 413		C 413	10:15 AM		40 Mins	
	C 414)	9:25 AM	C 414)			45 Mins	
	Part C 413			(10:15 AM)	1 Hr 25 Mins		
	CY 414)	#11:40 AM	CY 414)	#10:30 AM	1 Hr 30 Mins		
	C 415	12:40 PM	C 415	12:45 PM		5 Mins	
	Y 312	# 3:30 PM	Y 312	# 3:36 PM	15 Mins		
	Y 313	# 4:36 PM	Y 313	# 4:21 PM	14 Mins		
	Y 314	# 5:00 PM	Y 314)			3 Mins	
	Y 315	# 5:30 PM	Y 315)	# 5:02 PM	17 Mins		
						35 Mins	
20	CY 415)		CY 415)			25 Mins	
	C 416)	5:40 AM	C 416)	6:15 AM			
	C 417	9:30 AM	C 417)		24 Mins		
	CY 417	#10:35 AM	CY 417)	# 9:35 AM	1 Hr 29 Mins		
	C 418	11:10 AM	C 418	10:40 AM	30 Mins		
	Y 316	# 2:30 PM	Y 316)			31 Mins	
				# 2:51 PM		19 Mins	

	C 401	1:30 PM	CY 401)	12:45 PM	45 Mins		
	CY 401		Y 295	# 5:05 PM	24 Mins		
	Y 295)		Y 296)			1 Hr 35 Mins	
	Y 296)	# 5:27 PM	Y 297)	# 7:02 PM		7 Mins	
	Y 297	# 6:55 PM					
						30 Mins	
15	C 402	6:05 AM	C 402	8:35 AM		45 Mins	
	C 403	8:05 AM	C 403)				Same
	CY 403	8:50 AM	CY 403)	8:50 AM			
	Y 298	# 3:38 PM	Y 298	# 8:45 PM	55 Mins		
	Y 299	# 4:15 PM	Y 299)		15 Mins		
	Y 300	# 4:35 PM	Y 300)	# 4:00 PM	25 Mins		
	Y 301	# 5:35 PM	Y 301	# 6:00 PM		35 Mins	
16	CY 403-A	5:40 AM	CY 403-A	5:10 AM	30 Mins		
	C 404	6:35 AM	C 404	6:05 AM	30 Mins		
	C 405	8:30 AM	C 405)			45 Mins	
	C 406	8:50 AM	C 406)	9:15 AM		80 Mins	
	Y 302	# 2:59 PM	Y 302	#.3:32 PM	27 Mins		
	Y 303	#.3:15 PM	Y 303)		30 Mins		
	Y 304	# 4:50 PM	Y 304)	# 2:45 PM	1 Hr 45 Mins		
17	CY 406	3:40 AM	CY 406	3:35 AM	5 Mins		
	C 407	4:00 AM	C 407	4:15 AM		15 Mins	
	C 408	6:10 AM	C 408)		5 Mins		
	CY 408	6:30 AM	CY 408)	6:05 AM	25 Mins		
	C 409	8:50 AM	C 409	8:25 AM	20 Mins		
	Y 305	# 3:00 PM	Y 305	# 2:45 PM	15 Mins		
	Y 306	# 3:11 PM	Y 306)			5 Mins	
	Y 307	# 4:34 PM	Y 307)	# 3:15 PM	1 Hr 15 Mins		
18	CY 409	4:05 AM	CY 409	3:55 AM	10 Mins		
	C 410	6:30 AM	C 410	5:00 AM	1 Hr 30 Mins		
	C 411	6:40 AM	C 411)			25 Mins	
	CY 411	8:30 AM	CY 411)	7:05 AM	1 Hr 25 Mins		
	C 412	9:45 AM	C 412	9:20 AM	20 Mins		
	Y 308	# 3:12 PM	Y 308)			1 Hr 55 Mins	
	Y 309	# 5:38 PM	Y 309)	# 5:07 PM	20 Mins		
	Y 310	# 5:40 PM	Y 310			14 Mins	
	Y 311	# 6:15 PM	Y 311)	# 6:54 PM	21 Mins		
19	CY 412	3:45 AM	CY 412	3:25 AM	20 Mins		
	Part C 413 ##		C 413	10:15 AM		40 Mins	
	C 414)	9:25 AM	C 414)			45 Mins	
	Part C 413 ##		)	(10:15 AM)	1 Hr 25 Mins		
	CY 414)	#11:40 AM	CY 414)	#10:20 AM	1 Hr 20 Mins		
	C 415	12:40 PM	C 415	12:45 PM		5 Mins	
	Y 312	# 2:20 PM	Y 312	# 2:35 PM	15 Mins		
	Y 313	# 4:35 PM	Y 313	# 4:51 PM	14 Mins		
	Y 314	# 5:00 PM	Y 314)			3 Mins	
	Y 315	# 5:20 PM	Y 315)	# 5:08 PM	17 Mins		
20	CY 415)		CY 415)			35 Mins	
	C 416)	5:40 AM	C 416)	6:15 AM		35 Mins	
	C 417	9:30 AM	C 417)		38 Mins		
	CY 417	#10:35 AM	CY 417)	# 8:35 AM	1 Hr 59 Mins		
	C 418	11:10 AM	C 418	10:40 AM	30 Mins		
	Y 316	# 2:20 PM	Y 316)			31 Mins	
	Y 317	# 3:38 PM	Y 317)	# 2:51 PM		19 Mins	
	Y 318	# 4:40 PM	Y 318)		5 Mins		
	Y 319	# 4:55 PM	Y 319)	# 4:35 PM	20 Mins		
21	CY 418	4:40 AM	CY 418	4:25 AM	15 Mins		
	C 419	5:00 AM	C 416)		25 Mins		
	CY 419	# 8:38 AM	CY 419)	# 4:24 AM	1 Hr 06 Mins		
	C 420	8:20 AM	C 420	9:10 AM		50 Mins	
	Y 321	# 2:59 PM	Y 321)			2 Hrs 21 Mins	
	Y 322	# 3:25 PM	Y 322)	# 4:30 PM		1 Hr 35 Mins	
	Y 320	# 5:58 PM	Y 320	# 2:59 PM	3 Hrs 29 Mins		

- Ice House Arrival

- Consolidated at Cushray account engine failure

5696

3219

JUNE 1958

DATE	FORWARDED BLOCK OR MANIFEST IDENTIFICATION	ACTUAL ARRIVAL EL PASO	FORWARDED BLOCK OR MANIFEST IDENTIFICATION	REDISPATCHED ARRIVAL EL PASO	RED ISPATCHED IN ADVANCE OF ACTUAL	RED ISPATCHED LATER THAN ACTUAL	OPERATIONS SAME AS ACTUAL
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
22	C 421)		C 421	10:40 PM (21st)	7 Hrs 35 Mins		
	C 422)	6:15 AM	C 422)		15 Mins		
	CT 422	# 6:15 AM	CT 422)	# 6:30 AM	15 Mins		
	Y 385	#10:35 AM	Y 385)				Same
	Y 386	#12:10 PM	Y 386)	#10:35 AM	1 Hr 15 Mins		
	Y 387	1:20 PM	Y 387	2:20 PM		1 Hr 20 Mins	
23	CT 422-A	4:40 AM	CT 422-A)			1 Hr 55 Mins	
	C 423	6:20 AM	C 423)	6:35 AM		15 Mins	
	C 424	9:25 AM	C 424	11:05 AM		1 Hr 40 Mins	
	Y 388	# 3:43 PM	Y 388	# 3:10 PM		27 Mins	
	Y 389	3:58 PM	Y 389)			1 Hr 05 Mins	
	Y 390	# 3:15 PM	Y 390)	# 4:07 PM	15 Mins		
24	CT 424	6:00 AM	CT 424	6:00 AM			Same
	C 425	6:40 AM	C 425)			1 Hr 00 Mins	
	C 426	7:00 AM	C 426)	7:40 AM		40 Mins	
	C 427	8:25 AM	C 427	9:15 AM		50 Mins	
	Y 389)		Y 389	# 5:30 PM	10 Mins		
	Part Y 390)	# 3:40 PM	Y 390)	(6:46 PM)		3 Hrs 06 Mins	
	Part Y 390)		)		29 Mins		
	Y 391)	# 7:15 PM	Y 391)	# 6:46 PM	29 Mins		
25	CT 427)		CT 427	4:35 AM	2 Hrs 25 Mins		
	C 428)	7:00 AM	C 428)			2 Hrs 05 Mins	
	C 429	8:45 AM	C 429)	9:05 AM		20 Mins	
	C 430	11:10 AM	C 430	11:30 AM		20 Mins	
	Y 333	# 2:45 PM	Y 333	# 2:50 PM		5 Mins	
	Y 353	# 3:03 PM	Y 353)			50 Mins	
	Y 354	# 3:55 PM	Y 354)	# 3:55 PM			Same
26	C 431	7:00 AM	C 431)			1 Hr 30 Mins	
	CT 430	7:40 AM	CT 430)	8:30 AM		50 Mins	
	C 432	8:50 AM	C 432	9:10 AM		20 Mins	
	C 433	11:30 AM	C 433	11:10 AM	10 Mins		
	Y 356)		Y 356 #	(5:14 PM)	6 Mins		
	Part Y 357)	# 5:20 PM	Y 357)			3 Hrs 17 Mins	
	Part Y 357)		)			27 Mins	
	Part Y 358)	# 6:40 PM	Y 358)	# 7:37 PM		57 Mins	
	Part Y 358)					47 Mins	
	Y 359)	# 6:50 PM	Y 359 #	# 5:14 PM	1 Hr 36 Mins		
27	CT 433	3:55 AM	CT 433	3:30 AM	25 Mins		
	C 434	6:20 AM	C 434	6:50 AM	1 Hr 30 Mins		
	C 435	9:30 AM	C 435	8:45 AM	50 Mins		
	C 436	11:25 AM	C 436)				Same
	CT 436	11:45 AM	CT 436)	11:35 AM	10 Mins		
	Y 359)		Y 359)		40 Mins		
	Part Y 360)	# 4:45 PM	Y 360	# 4:05 PM	40 Mins		
	Part Y 360)			(4:05 PM)	55 Mins		
	Y 361)	# 9:00 PM	Y 361)			1 Hr 32 Mins	
	Y 362	# 6:50 PM	Y 362)	6:32 PM	8 Mins		
28	Part CT 436-A)		CT 436-A	4:35 AM	3 Hrs 15 Mins		
	C 437)	7:30 AM	C 437	8:10 AM	1 Hr 40 Mins		
	Part CT 436-A)			(4:35 AM)	4 Hrs 56 Mins		
	C 438)	9:30 AM	C 438	8:00 AM	1 Hr 30 Mins		
	C 439	10:40 AM	C 439)			1 Hr 35 Mins	
	C 440	12:15 PM	C 440)	12:15 PM			Same
	Y 363)		Y 363)		30 Mins		
	Part Y 364)	# 4:30 PM	Y 364)	# 4:08 PM	22 Mins		
	Y 365)	# 5:45 PM	Y 365)			1 Hr 1 Min	
	Part Y 364)		)	(4:08 PM)	1 Hr 41 Mins		
	Y 366	# 6:30 PM	Y 366)	# 6:44 PM	6 Mins		
29	C 441	4:35 AM	C 441	4:40 AM	15 Mins		
	C 442	10:10 AM	C 442	9:45 AM	25 Mins		
	Y 367	# 3:30 PM	Y 367)			1 Hr 28 Mins	
	Y 368	# 4:31 PM	Y 368)	# 5:18 PM		27 Mins	
	Y 369	# 6:30 PM	Y 369)			15 Mins	
	Y 370	# 6:45 PM	Y 370)	# 6:45 PM			Same
30	CT 442	1:40 AM	CT 442	2:20 AM		40 Mins	
	C 443	6:10 AM	C 443)		3 Mins		
	CT 443	# 7:35 AM	CT 443)	# 8:07 AM	1 Hr 48 Mins		

	Y 326	# 3:45 PM	Y 326	# 3:10 PM		1 Hr 08 Mins	
	Y 327	3:56 PM	Y 327)				
	Y 328	# 3:15 PM	Y 328)	# 4:07 PM	13 Mins		Same
24	CT 434	6:00 AM	CT 434	8:00 AM			
	C 435	6:40 AM	C 435)			1 Hr 00 Mins	
	C 436	7:00 AM	C 436)	7:40 AM		40 Mins	
	C 437	8:25 AM	C 437	9:15 AM		50 Mins	
	Y 329)		Y 329	# 3:20 PM	10 Mins		
	Part Y 330)	# 3:40 PM	Y 330)	(4:46 PM)		3 Hrs 06 Mins	
	Part Y 330)		)		20 Mins		
	Y 331)	# 7:15 PM	Y 331)	# 8:46 PM	20 Mins		
25	JT 427)		CT 427	6:35 AM	2 Hrs 20 Mins		
	C 428)	7:00 AM	C 428)			2 Hrs 05 Mins	
			)				
	C 429	8:45 AM	C 429)	9:05 AM		20 Mins	
	C 430	11:10 AM	C 430	11:30 AM		20 Mins	
	Y 332	# 3:45 PM	Y 332	# 3:50 PM		5 Mins	
	Y 333	# 3:05 PM	Y 333)			50 Mins	
	Y 334	# 3:55 PM	Y 334)	# 3:55 PM			Same
26	C 431	7:00 AM	C 431)				
	CT 430	7:40 AM	CT 430)	8:30 AM		1 Hr 30 Mins	
	C 432	8:30 AM	C 432	9:10 AM		40 Mins	
	C 433	11:20 AM	C 433	11:10 AM	10 Mins	20 Mins	
	Y 336)		Y 336 #	(5:14 PM)	4 Mins		
	Part Y 337)	# 3:20 PM	Y 337)			3 Hrs 17 Mins	
	Part Y 337)		)			57 Mins	
	Part Y 338)	# 6:40 PM	Y 338)	# 7:57 PM		57 Mins	
	Part Y 338)					47 Mins	
	Y 335)	# 6:50 PM	Y 335 #	# 5:14 PM	1 Hr 36 Mins		
27	CT 435	3:55 AM	CT 435	3:30 AM	25 Mins		
	C 434	8:20 AM	C 434	4:50 AM	1 Hr 35 Mins		
	C 435	9:35 AM	C 435	8:45 AM	50 Mins		
	C 436	11:35 AM	C 436)				Same
	CT 436	11:45 AM	CT 436)	11:35 AM	10 Mins		
	Y 339)		Y 339)		40 Mins		
	Part Y 340)	# 4:45 PM	Y 340	# 4:05 PM	40 Mins		
	Part Y 340)			(4:05 PM)	55 Mins		
	Y 341)	# 5:00 PM	Y 341)			1 Hr 38 Mins	
	Y 342	# 6:40 PM	Y 342)	6:32 PM	8 Mins		
28	Part CT 436-A)		CT 436-A	4:35 AM	3 Hrs 15 Mins		
	C 437)	7:50 AM	C 437	8:10 AM	1 Hr 40 Mins		
	Part CT 436-A)			(4:35 AM)	4 Hrs 58 Mins		
	C 438)	9:30 AM	C 438	8:00 AM	1 Hr 30 Mins		
	C 439	10:40 AM	C 439)			1 Hr 36 Mins	
	C 440	12:15 PM	C 440)	12:15 PM			Same
	Y 343)		Y 343)		26 Mins		
	Part Y 344)	# 6:20 PM	Y 344)	# 4:08 PM	20 Mins		
	Y 345)	# 5:45 PM	Y 345)			1 Hr 1 Min.	
	Part Y 344)		)	(4:08 PM)	1 Hr 41 Mins		
	Y 346	# 6:50 PM	Y 346)	# 6:14 PM	6 Mins		
29	C 441	4:55 AM	C 441	4:40 AM	15 Mins		
	C 442	10:10 AM	C 442	9:45 AM	25 Mins		
	Y 347	# 3:50 PM	Y 347)			1 Hr 28 Mins	
	Y 348	# 4:21 PM	Y 348)	# 5:18 PM		57 Mins	
	Y 349	# 6:30 PM	Y 349)			15 Mins	
	Y 350	# 6:48 PM	Y 350)	# 6:45 PM			Same
30	CT 442	1:40 AM	CT 442	2:50 AM		40 Mins	
	C 443	8:10 AM	C 443)		3 Mins		
	CT 443	# 7:55 AM	CT 443)	# 6:07 AM	1 Hr 46 Mins		
	C 444	10:50 AM	C 444	11:15 AM		25 Mins	
	Part Y 351)		Y 351)			1 Hr. 8 Mins	
	Y 352)	# 3:55 PM	Y 352)	# 4:57 PM		1 Hr. 8 Mins	
	Y 353)	# 5:30 PM	Y 353			51 Mins	
	Part Y 351)		)	(4:57 PM)	33 Mins		
	Y 354	# 6:17 PM	Y 354)	# 6:21 PM		4 Mins	
	CT 444)		CT 444)				Same
	A 88)	#11:40 PM	A 88)	#11:40 PM			Same

- Ice House arrival

- Consolidated (Y-336 and Y-338)

3920

AUGUST 1938

DATE (a)	PERISHABLE BLOCK OR MANIFEST IDENTIFICATION (b)	ACTUAL ARRIVAL EL PASO (c)	PERISHABLE BLOCK OR MANIFEST IDENTIFICATION (d)	REDISPATCHED ARRIVAL EL PASO (e)	REDISPATCHED IN ADVANCE OF ACTUAL (f)	REDISPATCHED LATER THAN ACTUAL (g)	OPERATIONS SAME AS ACTUAL (h)
2	C 534	10:10 AM	C 534	7:35 AM	2 Hrs 35 Mins		
	C 535	11:15 AM	C 535	10:10 AM	1 Hr 05 Mins		
3	A 124)		A 124)			50 Mins	
	C 536)	12:15 AM	C 536)	1:05 AM		50 Mins	
	C 537	11:15 AM	C 537)				Same
	CY 537	11:50 AM	CY 537)	11:15 AM	35 Mins		
	A 125)		A 125)		15 Mins		
	CY 537-A)	9:25 PM	CY 537-A)	9:10 PM	15 Mins		
4	C 538	4:25 AM	C 538	4:40 AM		15 Mins	
	C 539	9:35 AM	C 539)			50 Mins	
	CY 539	10:25 AM	CY 539)	10:25 AM			Same
	A 126)		A 126)		15 Mins		
	CY 539-A)	7:50 PM	CY 539-A)	7:35 PM	15 Mins		
5	C 540	8:55 AM	C 540	6:25 AM	2 Hrs 30 Mins		
	C 541	9:25 AM	C 541)			25 Mins	
	CY 541	10:40 AM	CY 541)	9:50 AM	50 Mins		
	C 542	11:05 AM	C 542	10:20 AM	45 Mins		
	A 127)		A 127)				Same
	CY 542)	10:15 PM	CY 542)	10:15 PM			Same
6	C 543)		C 543	3:55 AM	3 Hrs 45 Mins		
	Part C 544)	7:40 AM	C 544	6:50 AM	50 Mins		
	Part C 544)			(6:50 AM)	2 Hrs 35 Mins		
	C 545)	9:25 AM	C 545)		10 Mins		
	CY 545	10:50 AM	CY 545)	9:15 AM	1 Hr 35 Mins		
	A 128)		A 128)		15 Mins		
	CY 545-A)	11:20 PM	CY 545-A)	11:05 PM	15 Mins		
7	C 546	7:10 AM	C 546	7:20 AM		10 Mins	
	C 547	7:30 AM	C 547	7:45 AM		15 Mins	
	C 548	9:55 AM	C 548)		15 Mins		
	CY 548	11:15 AM	CY 548)	9:40 AM	1 Hr 35 Mins		
	A 129)		A 129)			20 Mins	
	CY 548-A)	10:25 PM	CY 548-A)	10:45 PM		20 Mins	
8	C 549)		C 549	4:35 AM	6 Hrs 20 Mins		
	C 550)	10:55 AM	C 550)		20 Mins		
	CY 550	12:25 PM	CY 550)	10:35 AM	1 Hr 50 Mins		
	C 551	1:45 PM	C 551	1:10 PM	35 Mins		
9	CY 551	5:00 AM	CY 551	5:00 AM			Same
	C 552	5:10 AM	C 552	5:10 AM			Same
	C 553	9:45 AM	C 553)			30 Mins	
	CY 553	10:20 AM	CY 553)	10:15 AM	5 Mins		
	C 554	11:40 AM	C 554	11:00 AM	40 Mins		
10	C 555	5:15 AM	C 555)			4 Hrs 00 Mins	
	C 556	9:05 AM	C 556)	9:15 AM		10 Mins	
	C 557	9:25 AM	C 557	10:40 AM		1 Hr 15 Mins	
11	CY 557)		CY 557	3:50 AM	2 Hrs 05 Mins		
	Part C 558)	5:55 AM	C 558	4:30 AM	1 Hr 25 Mins		
	Part C 558)				3 Hrs 20 Mins		
	C 559)	7:50 AM	C 559)			1 Hr 25 Mins	
	CY 559	9:00 AM	CY 559)	9:15 AM		15 Mins	
12	Part CY 559-A)		CY 559-A	3:10 AM	2 Hrs 05 Mins		
	C 560)	5:15 AM	C 560	5:15 AM			Same
	Part CY 559-A)			(3:10 AM)	5 Hrs 40 Mins		
	C 561)	8:50 AM	C 561	8:50 AM			Same
	C 562	10:30 AM	C 562)			30 Mins	
	CY 562	11:00 AM	CY 562)	11:08 AM			Same
13	Part CY 562-A)		Part CY 562-A)			5 Mins	
	C 563)	5:50 AM	C 563	5:55 AM		5 Mins	
	Part CY 562-A)		Part CY 562-A)		1 Hr 00 Mins		
	C 564)	7:50 AM	C 564)	6:50 AM	1 Hr 00 Mins		
	CY 565	12:50 PM	CY 565)			55 Mins	
	C 565	1:39 PM	C 565)	1:45 PM		15 Mins	
14	Part CY 565-A)		CY 565-A)			45 Mins	
	C 566)	6:20 AM	C 566)	7:05 AM		45 Mins	
	Part CY 565-A)			(7:05 AM)	10 Mins		
	C 567)	7:15 AM	C 567)			30 Mins	
	CY 567	9:15 AM	CY 567)	7:45 AM	1 Hr 30 Mins		
	C 568	11:15 AM	C 568	11:35 AM		20 Mins	

	A 126)		A 126)		15 Mins		
	GY 539-A)	7:30 PM	GY 539-A)	7:35 PM	15 Mins		
5	C 540	8:55 AM	C 540	6:25 AM	2 Hrs 30 Mins		
	C 541	9:25 AM	C 541)			25 Mins	
	GY 541	10:40 AM	GY 541)	9:50 AM	50 Mins		
	C 542	11:05 AM	C 542	10:20 AM	45 Mins		Same
	A 127)		A 127)				Same.
	GY 542)	10:15 PM	GY 542)	10:15 PM			
6	C 543)		C 543	3:55 AM	3 Hrs 45 Mins		
	Part C 544)	7:40 AM	C 544	6:50 AM	50 Mins		
	Part C 544)			(6:50 AM)	2 Hrs 35 Mins		
	C 545)	9:25 AM	C 545)		10 Mins		
	GY 545	10:50 AM	GY 545)	9:15 AM	1 Hr 35 Mins		
	A 128)		A 128)		15 Mins		
	GY 545-A)	11:20 PM	GY 545-A)	11:05 PM	15 Mins		
7	C 546	7:10 AM	C 546	7:20 AM		10 Mins	
	C 547	7:30 AM	C 547	7:45 AM		15 Mins	
	C 548	9:55 AM	C 548)		15 Mins		
	GY 548	11:15 AM	GY 548)	9:40 AM	1 Hr 35 Mins		
	A 129)		A 129)			20 Mins	
	GY 548-A)	10:25 PM	GY 548-A)	10:45 PM		20 Mins	
8	C 549)		C 549	4:35 AM	6 Hrs 20 Mins		
	C 550)	10:55 AM	C 550)		20 Mins		
	GY 550	12:25 PM	GY 550)	10:35 AM	1 Hr 50 Mins		
	C 551	1:45 PM	C 551	1:10 PM	35 Mins		
9	GY 551	5:00 AM	GY 551	5:00 AM			Same
	C 552	5:10 AM	C 552	5:10 AM			Same
	C 553	9:45 AM	C 553)			30 Mins	
	GY 553	10:20 AM	GY 553)	10:15 AM	5 Mins		
	C 554	11:40 AM	C 554	11:00 AM	40 Mins		
10	C 555	5:15 AM	C 555)			4 Hrs 00 Mins	
	C 556	9:05 AM	C 556)	9:15 AM		10 Mins	
	C 557	9:25 AM	C 557	10:40 AM		1 Hr 15 Mins	
11	GY 557)		GY 557)	3:50 AM	2 Hrs 05 Mins		
	Part C 558)	5:55 AM	C 558	4:30 AM	1 Hr 25 Mins		
	Part C 558)				3 Hrs 20 Mins		
	C 559)	7:50 AM	C 559)			1 Hr 25 Mins	
	GY 559	9:00 AM	GY 559)	9:15 AM		15 Mins	
12	Part GY 559-A)		GY 559-A	3:10 AM	2 Hrs 05 Mins		
	C 560)	5:15 AM	C 560	5:15 AM			Same
	Part GY 559-A)			(3:10 AM)	5 Hrs 40 Mins		
	C 561)	8:50 AM	C 561	8:50 AM			Same
	C 562	10:30 AM	C 562)			30 Mins	
	GY 562	11:00 AM	GY 562)	11:00 AM			Same
13	Part GY 562-A)		Part GY 562-A)			5 Mins	
	C 563)	5:50 AM	C 563)	5:55 AM		5 Mins	
	Part GY 562-A)		Part GY 562-A)		1 Hr 00 Mins		
	C 564)	7:50 AM	C 564)	6:50 AM	1 Hr 00 Mins		
	GY 565	12:50 PM	GY 565)			55 Mins	
	C 565	1:30 PM	C 565)	1:45 PM		15 Mins	
14	Part GY 565-A)		GY 565-A)			45 Mins	
	C 566)	6:20 AM	C 566)	7:05 AM		45 Mins	
	Part GY 565-A)			(7:05 AM)	10 Mins		
	C 567)	7:15 AM	C 567)			30 Mins	
	GY 567	9:15 AM	GY 567)	7:45 AM	1 Hr 30 Mins		
	C 568	11:15 AM	C 568	11:35 AM		20 Mins	
15	GY 568)		GY 568)		2 Hrs 10 Mins		
	C 569)	8:50 AM	C 569)	6:40 AM	2 Hrs 10 Mins		
	C 570	9:00 AM	C 570	9:00 AM			Same
	C 571	9:30 AM	C 571)			1 Hr 50 Mins	
	GY 571	11:25 AM	GY 571)	11:20 AM	5 Mins		
16	BSE 4-13)		BSE 4-13)				Same
	C 572)	5:00 AM	C 572)	5:00 AM			Same
	C 573	7:30 AM	C 573)			3 Hrs 25 Mins	
	BSE 3-14	1:30 PM	BSE 3-14)	10:55 AM	2 Hrs 35 Mins		

3221

AUGUST 1938

DATE (a)	PERISHABLE BLOCK OR MANIFEST IDENTIFICATION (b)	ACTUAL ARRIVAL EL PASO (c)	PERISHABLE BLOCK OR MANIFEST IDENTIFICATION (d)	REDISPATCHED ARRIVAL EL PASO (e)	REDISPATCHED IN ADVANCE OF ACTUAL (f)	REDISPATCHED LATER THAN ACTUAL (g)	OPERATIONS SAME AS ACTUAL (h)
17	C 574	5:20 AM	C 574	5:20 AM			Same
	CY 573)		CY 573)			30 Mins	
	C 575)	1:10 PM	C 575)			30 Mins	
	CY 575	2:20 PM	CY 575)	1:40 PM	40 Mins		
18	CY 575-A	12:20 AM	CY 575-A	12:20 AM			Same
	C 576	5:30 AM	C 576	4:05 AM	1 Hr 25 Mins		
	C 577	12:05 PM	C 577	1:00 PM		55 Mins	
19	CY 577	4:05 AM	CY 577)			3 Hrs 25 Mins	
	C 578	5:10 AM	C 578)	7:30 AM		2 Hrs 20 Mins	
	C 579	10:10 AM	C 579	9:15 AM	55 Mins		
	C 580	10:25 AM	C 580)			40 Mins	
	CY 580	11:15 AM	CY 580)	11:05 AM	10 Mins		
20	C 581	6:25 AM	C 581	5:30 AM	55 Mins		
	CY 580-A	9:15 AM	CY 580-A	10:15 AM		1 Hr 00 Mins	
	C 582	10:50 AM	C 582	10:30 AM	20 Mins		
	C 583	12:15 PM	C 583)			20 Mins	
	CY 583	12:35 PM	CY 583)	12:35 PM			Same
21	Part CY 583-A)		CY 583-A	2:25 AM	4 Hrs 30 Mins		
	C 584)	6:45 AM	C 584	4:55 AM	1 Hr 50 Mins		
	Part CY 583-A)			(2:25 AM)	8 Hrs 35 Mins		
	C 585)	10:50 AM	C 585	9:20 AM	1 Hr 30 Mins		
	C 586	11:00 AM	C 586)		1 Hr 15 Mins		
	CY 586	11:05 AM	CY 586)	9:45 AM	1 Hr 20 Mins		
22	CY 586-A	6:35 AM	CY 586-A	6:20 AM	15 Mins		
	C 587	6:45 AM	C 587	6:45 AM			Same
	C 588	10:30 AM	C 588)			1 Hr 00 Mins	
	C 589	11:15 AM	C 589)	11:30 AM		15 Mins	
	C 590	12:15 PM	C 590	1:05 PM		50 Mins	
23	CY 590)		CY 590)		50 Mins		
	C 591)	5:05 AM	C 591)	4:15 AM	50 Mins		
	C 592	6:25 AM	C 592)			1 Hr 25 Mins	
	CY 592	8:50 AM	CY 592)	7:50 AM	1 Hr 00 Mins		
	C 593	11:10 AM	C 593	11:10 AM			Same
24	C 594	5:30 AM	C 594	5:00 AM	30 Mins		
	C 595	8:09 AM	C 595)			51 Mins	
	C 596	8:50 AM	C 596)	9:00 AM		10 Mins	
25	C 597	4:15 AM	C 597	6:05 AM		1 Hr 50 Mins	
	CY 596	5:15 AM	CY 596	5:15 AM			Same
	C 598	8:05 AM	C 598)			40 Mins	
	CY 598	8:25 AM	CY 598)	8:45 AM		20 Mins	
26	C 599	6:45 AM	C 599)			5 Mins	
	Part CY 598-A)		CY 598-A)	6:50 AM	4 Hrs 55 Mins		
	C 600)	11:45 AM	C 600)		5 Mins		
	C 601	12:30 PM	C 601)	11:40 AM	50 Mins		
	Part CY 598-A)			(6:50 AM)	6 Hrs 50 Mins		
	C 602)	1:40 PM	C 602	1:55 PM		15 Mins	
27	CY 602)		CY 602	4:40 AM	2 Hrs 15 Mins		
	C 603)	6:55 AM	C 603	7:20 AM		25 Mins	
	C 604	9:05 AM	C 604)			1 Hr 55 Mins	
	C 605	10:40 AM	C 605)	11:00 AM		20 Mins	
	CY 605	11:40 AM	CY 605)			1 Hr 20 Mins	
	C 606	1:20 PM	C 606)	1:00 PM	20 Mins		
28	CY 606)		CY 606)		15 Mins		
	C 607)	6:10 AM	C 607)	5:55 AM	15 Mins		
	C 608	6:35 AM	C 608	6:40 AM		5 Mins	
	C 609	10:30 AM	C 609)			55 Mins	
	CY 609	10:50 AM	CY 609)	11:25 AM		35 Mins	
29	CY 609-A)		CY 609-A)		15 Mins		
	C 610)	5:45 AM	C 610)	5:30 AM	15 Mins		
	C 612	9:30 AM	C 611)			10 Mins	
	CY 611	10:40 AM	CY 611)	9:40 AM	1 Hr 00 Mins		
	C 612	11:10 AM	C 612	11:20 AM		10 Mins	
30	C 613	6:35 AM	C 613	6:25 AM	10 Mins		
	CY 612)		CY 612	8:20 AM	2 Hrs 30 Mins		
	C 614)	10:50 AM	C 614)		1 Hr 05 Mins		

	Ct 58-A	9:15 AM	CT 580-A	10:13 AM		1 Hr 00 Mins	
	C 582	10:50 AM	C 582	10:30 AM	20 Mins		
	C 583	12:15 PM	C 583)			20 Mins	
	CT 583	12:35 PM	CT 583)	12:35 PM			Same
21	Part CT 583-A)		CT 583-A	2:15 AM	4 Hrs 30 Mins		
	C 584)	6:45 AM	C 584	4:55 AM	1 Hr 50 Mins		
	Part CT 583-A)			(2:15 AM)	8 Hrs 35 Mins		
	C 585)	10:50 AM	C 585	3:20 AM	1 Hr 30 Mins		
	C 586	11:00 AM	C 586)		1 Hr 15 Mins		
	CT 586	11:05 AM	CT 586)	9:45 AM	1 Hr 20 Mins		
22	CT 586-A	6:35 AM	CT 586-A	6:20 AM	15 Mins		
	C 587	6:45 AM	C 587	6:45 AM			Same
	C 588	10:30 AM	C 588)			1 Hr 00 Mins	
	C 589	11:15 AM	C 589)	11:30 AM		15 Mins	
	C 590	12:15 PM	C 590	1:05 PM		50 Mins	
23	CT 590)		CT 590)		50 Mins		
	C 591)	5:05 AM	C 591)	4:15 AM	50 Mins		
	C 592	6:25 AM	C 592)			1 Hr 25 Mins	
	CT 592	8:50 AM	CT 592)	7:50 AM	1 Hr 00 Mins		
	C 593	11:10 AM	C 593	11:10 AM			Same
24	C 594	5:30 AM	C 594	5:00 AM	30 Mins		
	C 595	8:09 AM	C 595)			51 Mins	
	C 596	8:50 AM	C 596)	9:00 AM		10 Mins	
25	C 597	4:13 AM	C 597	6:05 AM		1 Hr 50 Mins	
	CT 596	5:15 AM	CT 596	5:15 AM			Same
	C 598	8:05 AM	C 598)			40 Mins	
	CT 598	8:25 AM	CT 598)	8:45 AM		20 Mins	
26	C 599	8:45 AM	C 599)			5 Mins	
	Part CT 598-A)		CT 598-A)	6:50 AM	4 Hrs 55 Mins		
	C 600)	11:45 AM	C 600)		5 Mins		
	C 601	12:30 PM	C 601)	11:40 AM	50 Mins		
	Part CT 598-A)			(6:50 AM)	6 Hrs 50 Mins		
	C 602)	1:40 PM	C 602	1:55 PM		15 Mins	
27	CT 602)		CT 602	4:40 AM	2 Hrs 15 Mins		
	C 603)	6:55 AM	C 603	7:20 AM		25 Mins	
	C 604	9:05 AM	C 604)			1 Hr 55 Mins	
	C 605	10:40 AM	C 605)	11:00 AM		20 Mins	
	CT 605	11:40 AM	CT 605)			1 Hr 20 Mins	
	C 606	1:20 PM	C 606)	1:00 PM	20 Mins		
28	CT 606)		CT 606)		15 Mins		
	C 607)	6:10 AM	C 607)	5:55 AM	15 Mins		
	C 608	6:35 AM	C 608	6:40 AM		5 Mins	
	C 609	10:30 AM	C 609)			55 Mins	
	CT 609	10:50 AM	CT 609)	11:25 AM		35 Mins	
29	CT 609-A)		CT 609-A)		15 Mins		
	C 610)	5:45 AM	C 610)	5:30 AM	15 Mins		
	C 611	9:30 AM	C 611)			10 Mins	
	CT 611	10:40 AM	CT 611)	9:40 AM	1 Hr 00 Mins		
	C 612	11:10 AM	C 612	11:20 AM		10 Mins	
30	C 613	6:35 AM	C 613	6:25 AM	10 Mins		
	CT 612)		CT 612	8:20 AM	2 Hrs 30 Mins		
	C 614)	10:50 AM	C 614)		1 Hr 05 Mins		
	C 615	11:00 AM	C 615)	9:45 AM	1 Hr 15 Mins		
31	C 616	1:40 AM	C 616	12:40 AM	1 Hr 00 Mins		
	C 617	8:50 AM	C 617)		10 Mins		
	CT 617	12:10 PM	CT 617)	8:40 AM	Hrs 30 Mins		
	CT 617-A)		CT 617-A	10:20 PM	7 Hrs 45 Mins		
	C 618)	6:05 AM	C 618	5:35AM	30 Mins		

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Defendant's Exhibit No. 228 (Witness Sines)
Jan. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

ARRIVAL TIME AT YUMA, ARIZONA
OF "SSW" AND "GBW" WESTWARD MANIFEST TRAINS -
ACTUAL OPERATION COMPARED WITH REDISPATCHED
OPERATION, WITH NO RESTRICTION AND USING AC
POWER AND LONG SIDINGS.

MONTHS OF JUNE AND AUGUST, 1938

SUMMARY

JUNE, 1938

(1) NUMBER OF TRAINS ARRIVING YUMA - ACTUAL,	58
(2) NUMBER OF TRAINS ARRIVING YUMA - REDISPATCHED,	57
(3) NUMBER OF BLOCKS AND MANIFEST SECTIONS INVOLVED,	76
(4) NUMBER OF REDISPATCHED BLOCKS ARRIVING YUMA -	
(a) AT SAME TIME AS ACTUAL BLOCKS,	34
(b) IN ADVANCE OF ACTUAL BLOCKS,	26
(c) LATER THAN ACTUAL BLOCKS,	16
(5) TOTAL TIME -	
(a) IN ADVANCE OF ACTUAL,	11 HOURS 5 MINUTES
(b) LATER THAN ACTUAL,	5 HOURS 15 MINUTES
(6) AVERAGE TIME OF 26 BLOCKS IN ADVANCE OF ACTUAL	26 MINUTES
(7) AVERAGE TIME OF 16 BLOCKS LATER THAN ACTUAL,	20 MINUTES

AUGUST, 1938

(1) NUMBER OF TRAINS ARRIVING YUMA - ACTUAL,	64
(2) NUMBER OF TRAINS ARRIVING YUMA - REDISPATCHED,	63
(3) NUMBER OF BLOCKS AND MANIFEST SECTIONS INVOLVED,	75
(4) NUMBER OF REDISPATCHED BLOCKS ARRIVING YUMA -	
(a) AT SAME TIME AS ACTUAL BLOCKS,	36
(b) IN ADVANCE OF ACTUAL BLOCKS,	24
(c) LATER THAN ACTUAL BLOCKS,	15
(5) TOTAL TIME -	
(a) IN ADVANCE OF ACTUAL,	11 HOURS 10 MINUTES
(b) LATER THAN ACTUAL	6 HOURS
(6) AVERAGE TIME OF 24 BLOCKS IN ADVANCE OF ACTUAL,	28 MINUTES
(7) AVERAGE TIME OF 16 BLOCKS LATER THAN ACTUAL,	24 MINUTES

SSW = SUNSET WEST MANIFEST

GBW = GOLD BALL WEST MANIFEST

JUNE 1938

DATE (a)	MANIFEST IDENTIFICATION (b)	ACTUAL ARRIVAL TUBA (c)	MANIFEST IDENTIFICATION (d)	REDISPATCHED ARRIVAL TUBA (e)	REDISPATCHED IN ADVANCE OF ACTUAL (f)	REDISPATCHED LATER THAN ACTUAL (g)	REDISPATCHED SAME AS ACTUAL (h)
2	SSW 1	8:05 AM	SSW 1	8:05 AM			Same
	GSW 31	8:30 AM	GSW 31	8:50 AM		20 mins	
3	SSW 2	6:20 AM	SSW 2	6:30 AM		10 mins.	
	GSW 1	9:10 AM	GSW 1	8:45 AM	25 mins		
4	SSW 3	6:00 AM	SSW 3	6:00 AM			Same
	GSW 2	7:30 AM	GSW 2	8:00 AM		30 mins.	
5	SSW 4)		(SSW 4)		25 mins		
	GSW 3)	7:50 AM	(GSW 3)	7:25 AM	25 mins.		
6	SSW 5	6:30 AM	SSW 5	6:55 AM		25 mins	
	GSW 4	10:10 AM	GSW 4	10:20 AM		10 mins.	
7	SSW 6	7:20 AM	SSW 6	7:35 AM		15 mins	
	GSW 5	8:50 AM	GSW 5	8:50 AM			Same
8	SSW 7	8:50 AM	SSW 7	8:00 AM	50 mins.		
	GSW 6	8:55 AM	GSW 6	8:40 AM	15 mins.		
9	SSW 1-8)		(SSW 1-8)				Same
	GSW 7)	7:20 AM	(GSW 7)	7:20 AM			Same
	SSW 2-8	8:05 AM	SSW 2-8	8:05 AM			Same
10	SSW 1-9)		(SSW 1-9)				Same
	GSW 1-8)	7:25 AM	(GSW 1-8)	7:25 AM			Same
	SSW 2-9)		(SSW 2-9)		35 mins.		
	GSW 2-8)	11:05 AM	(GSW 2-8)	10:30 AM	35 mins		
11	SSW 1-10)		(SSW 1-10)				Same
	GSW 9)	7:20 AM	(GSW 9)	7:20 AM			Same
	SSW 2-10	10:25 AM	SSW 2-10	10:10 AM	5 mins.		
12	SSW 1-11)		(SSW 1-11)		25 Mins.		
	GSW 10)	7:25 AM	(GSW 10)	7:00 AM	25 mins.		
	SSW 2-11	10:05 AM	SSW 2-11	9:50 AM	15 mins.		
13	SSW 1-12)		(SSW 1-12)			5 mins.	
	GSW 11)	6:35 AM	(GSW 11)	6:40 AM		5 mins	
	SSW 2-12	9:15 AM	SSW 2-12	9:15 AM			Same
14	SSW 1-13)		(SSW 1-13)			1 hr. 5 mins.	
	GSW 12)	6:45 AM	(GSW 12)	7:50 AM		1 hr. 5 mins.	
	SSW 2-13	7:50 AM	(SSW 2-13)	(7:50 AM)			Same
	SSW 3-13	11:25 AM	SSW 3-13	11:25 AM			Same
15	SSW 14	5:55 AM	SSW 14	5:55 AM			Same
	GSW 13	7:30 AM	GSW 13	7:30 AM			Same
16	SSW 1-15)		(SSW 1-15)				Same
	GSW 14)	5:45 AM	(GSW 14)	5:45 AM			Same
	SSW 2-15	7:25 AM	SSW 2-15	7:40 AM		15 mins	
17	SSW 1-16	6:00 AM	SSW 1-16	6:00 AM			Same
	SSW 2-16)		(SSW 2-16)				Same
	GSW 15)	7:30 AM	(GSW 15)	7:30 AM			Same
18	SSW 1-2-17)		(SSW 1-2-17)		10 mins.		
	GSW 16)	7:00 AM	(GSW 16)	6:50 AM	10 mins.		
	SSW 3-17	7:10 AM	SSW 3-17	7:00 AM	10 mins.		
19	SSW 1-18)		(SSW 1-18)				Same
	GSW 17)	7:45 AM	(GSW 17)	7:45 AM			Same
	SSW 2-18	9:00 AM	SSW 2-18	8:35 AM	25 mins.		
20	SSW 19	6:40 AM	SSW 19	6:55 AM		15 mins.	
	GSW 18	10:15 AM	GSW 18	10:25 AM		10 mins.	
21	SSW 20	6:25 AM	SSW 20	6:25 AM			Same
	GSW 19	7:30 AM	GSW 19	7:30 AM			Same
22	SSW 1-21)		(SSW 1-21)		15 mins.		

	GBW 3)	7:50 AM	(GBW 3)	7:25 AM	25 mins.		
6	SBW 5	6:30 AM	SBW 5	6:55 AM		25 mins	
	GBW 4	10:10 AM	GBW 4	10:20 AM		10 mins.	
7	SBW 6	7:20 AM	SBW 6	7:35 AM		15 mins	
	GBW 5	8:50 AM	GBW 5	8:50 AM			Same
8	SBW 7	8:50 AM	SBW 7	8:00 AM	50 mins.		
	GBW 6	8:55 AM	GBW 6	8:40 AM	15 mins.		
9	SBW 1-8)		(SBW 1-8)				Same
	GBW 7)	7:20 AM	(GBW 7)	7:20 AM			Same
	SBW 2-8	8:05 AM	SBW 2-8	8:05 AM			Same
10	SBW 1-9)		(SBW 1-9)				Same
	GBW 1-8)	7:25 AM	(GBW 1-8)	7:25 AM			Same
	SBW 2-9)		(SBW 2-9)		35 mins.		
	GBW 2-8)	11:05 AM	(GBW 2-8)	10:30 AM	35 mins		
11	SBW 1-10)		(SBW 1-10)				Same
	GBW 9)	7:20 AM	(GBW 9)	7:20 AM			Same
	SBW 2-10	10:15 AM	SBW 2-10	10:10 AM	5 mins.		
12	SBW 1-11)		(SBW 1-11)		25 Mins.		
	GBW 10)	7:25 AM	(GBW 10)	7:00 AM	25 mins.		
	SBW 2-11	10:05 AM	SBW 2-11	9:50 AM	15 mins.		
13	SBW 1-12)		(SBW 1-12)			5 mins.	
	GBW 11)	6:35 AM	(GBW 11)	6:40 AM		5 mins.	
	SBW 2-12	9:15 AM	SBW 2-12	9:15 AM			Same
14	SBW 1-13)		(SBW 1-13)			1 hr: 5 mins.	
	GBW 12)	6:45 AM	(GBW 12)	7:50 AM		1 hr. 5 mins.	
	SBW 2-13	7:50 AM	(SBW 2-13)	(7:50 AM)			Same
	SBW 3-13	11:25 AM	SBW 3-13	11:25 AM			Same
15	SBW 14	5:55 AM	SBW 14	5:55 AM			Same
	GBW 13	7:30 AM	GBW 13	7:30 AM			Same
16	SBW 1-15)		(SBW 1-15)				Same
	GBW 14)	5:45 AM	(GBW 14)	5:45 AM			Same
	SBW 2-15	7:45 AM	SBW 2-15	7:40 AM		15 mins.	
17	SBW 1-16	6:00 AM	SBW 1-16	6:00 AM			Same
	SBW 2-16)		(SBW 2-16)				Same
	GBW 15)	7:30 AM	(GBW 15)	7:30 AM			Same
18	SBW 1-2-17)		(SBW 1-2-17)		10 mins.		
	GBW 16)	7:00 AM	(GBW 16)	6:50 AM	10 mins.		
	SBW 3-17	7:10 AM	SBW 3-17	7:00 AM	10 mins.		
19	SBW 1-18)		(SBW 1-18)				Same
	GBW 17)	7:45 AM	(GBW 17)	7:45 AM			Same
	SBW 2-18	9:00 AM	SBW 2-18	8:35 AM	25 mins.		
20	SBW 19	6:40 AM	SBW 19	6:55 AM		15 mins.	
	GBW 18	10:15 AM	GBW 18	10:25 AM		10 mins.	
21	SBW 20	6:25 AM	SBW 20	6:25 AM			Same
	GBW 19	7:30 AM	GBW 19	7:30 AM			Same
22	SBW 1-21)		(SBW 1-21)		15 mins.		
	GBW 20)	6:00 AM	(GBW 20)	5:45 AM	15 mins		
	SBW 2-21	6:30 AM	SBW 2-21	6:25 AM	5 mins.		
23	SBW 1-2-22)		(SBW 1-2-22)				Same
	GBW 21)	5:10 AM	(GBW 21)	5:10 AM			Same
	SBW 3-22	7:30 AM	SBW 3-22	7:30 AM			Same
24	SBW 1-23	3:15 AM	SBW 1-23	3:15 AM			Same
	SBW 2-23)		(SBW 2-23)			5 mins.	
	GBW 22)	10:05 AM	(GBW 22)	10:10 AM		5 mins.	
25	SBW 24	9:10 AM	SBW 24	8:40 AM	30 mins		
	GBW 23	10:05 AM	GBW 23	9:45 AM	20 mins.		

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JUNE 1938

DATE (a)	MANIFEST IDENTIFICATION (b)	ACTUAL ARRIVAL YUMA (c)	MANIFEST IDENTIFICATION (d)	REDISPATCHED ARRIVAL YUMA (e)	REDISPATCHED IN ADVANCE OF ACTUAL (f)	REDISPATCHED LATER THAN ACTUAL (g)	REDISPATCHED SAME AS ACTUAL (h)
26	SSW 1-25)		(SSW 1-25)		1 hr. 15 mins.		
	GSW 24)	5:45 AM	(GSW 24)	4:30 AM	1 hr. 15 mins.		
	SSW 2-25	9:25 AM	SSW 2-25	9:25 AM			Same
27	SSW 1-26)		(SSW 1-26)		10 mins.		
	GSW 25)	6:40 AM	(GSW 25)	6:30 AM	10 mins.		
	SSW 2-26	10:05 AM	SSW 2-26	9:10 AM	55 mins.		
28	SSW 27	6:10 AM	SSW 27	5:50 AM	20 mins.		
	GSW 26	9:00 AM	GSW 26	9:00 AM			Same
29	SSW 28	8:40 AM	SSW 28	8:55 AM		15 mins.	
	GSW 27	9:20 AM	GSW 27	9:20 AM			Same
30	SSW 1-29	5:55 AM	SSW 1-29	5:55 AM			Same
	SSW 2-29)		(SSW 2-29)				Same
	GSW 28)	7:50 AM	(GSW 28)	7:50 AM			Same
			AUGUST 1938				
2	SSW 1-1	6:00 AM	SSW 1-1	6:00 AM			Same
	SSW 2-1)		(SSW 2-1)				Same
	GSW 1-31)	6:25 AM	(GSW 1-31)	6:25 AM			Same
	GSW 2-31	2:30 PM	GSW 2-31	2:50 PM		20 mins.	
3	SSW 2	5:55 AM	SSW 2	5:55 AM			Same
	GSW 1	7:35 AM	GSW 1	7:35 AM			Same
4	SSW 3)		(SSW 3)		10 mins.		
	GSW 1-2)	5:35 AM	(GSW 1-2)	5:25 AM	10 mins.		
	GSW 2-2	7:30 AM	GSW 2-2	7:20 AM	10 mins.		
5	SSW 4)		(SSW 4)		10 mins.		
	GSW 1-3)	7:05 AM	(GSW 1-3)	6:55 AM	10 mins.		
	GSW 2-3	9:20 AM	GSW 2-3	9:10 AM			Same
6	SSW 5)		SSW 5)		25 mins.		
	GSW 1-4)	6:40 AM	GSW 1-4)	6:15 AM	25 mins.		
	GSW 2-4	6:55 AM	GSW 2-4	6:35 AM	20 mins.		
7	SSW 6	3:35 AM	SSW 6	3:35 AM			Same
	GSW 5	7:45 AM	GSW 5	7:45 AM			Same
8	SSW 7	6:15 AM	SSW 7	6:25 AM		10 mins.	
	GSW 6	7:25 AM	GSW 6	7:25 AM			Same
9	SSW 8	3:15 AM	SSW 8	3:15 AM			Same
	GSW 7	7:15 AM	GSW 7	7:15 AM			Same
10	SSW 9)		(SSW 9)			25 mins	
	GSW 1-8)	3:35 AM	(GSW 1-8)	4:00 AM		25 mins	
	GSW 2-8	6:20 AM	GSW 2-8	6:20 AM			Same
11	SSW 10)		(SSW 10)				Same
	GSW 1-9)	6:00 AM	(GSW 1-9)	6:00 AM			Same
	GSW 2-9	7:15 AM	GSW 2-9	7:15 AM			Same
12	SSW 11)		(SSW 11)				Same
	GSW 1-10)	4:30 AM	(GSW 1-10)	4:30 AM			Same
	GSW 2-10	6:20 AM	GSW 2-10	6:20 AM			Same
13	SSW 12	6:25 AM	SSW 12	5:55 AM	30 mins.		
	GSW 11	6:45 AM	GSW 11	6:35 AM	10 mins.		
14	SSW 13)		(SSW 13)		10 mins.		
	GSW 12)	6:20 AM	(GSW 12)	6:10 AM	10 mins		
15	SSW 14	6:35 AM	SSW 14	6:05 AM	30 mins.		
	GSW 13	9:25 AM	GSW 13	9:55 AM		30 mins.	

29	SSW 28 GBW 27	8:40 AM 9:20 AM	SSW 28 GBW 27	8:55 AM 9:20 AM		15 mins.	Same
30	SSW 1-29 SSW 2-29) GBW 28)	5:55 AM 7:50 AM	SSW 1-29 (SSW 2-29) (GBW 28)	5:55 AM 7:50 AM			Same Same Same

AUGUST 1938

2	SSW 1-1 SSW 2-1) GBW 1-31) GBW 2-31	6:00 AM 6:25 AM 2:30 PM	SSW 1-1 (SSW 2-1) (GBW 1-31) GBW 2-31	6:00 AM 6:25 AM 2:50 PM		20 mins.	Same Same Same
3	SSW 2 GBW 1	5:55 AM 7:35 AM	SSW 2 GBW 1	5:55 AM 7:35 AM			Same Same
4	SSW 3) GBW 1-2) GBW 2-2	5:35 AM 7:30 AM	(SSW 3) (GBW 1-2) GBW 2-2	5:25 AM 7:20 AM	10 mins. 10 mins. 10 mins.		
5	SSW 4) GBW 1-3) GBW 2-3	7:05 AM 9:10 AM	(SSW 4) (GBW 1-3) GBW 2-3	6:55 AM 9:10 AM	10 mins. 10 mins.		Same
6	SSW 5) GBW 1-4) GBW 2-4	6:40 AM 6:55 AM	SSW 5) GBW 1-4) GBW 2-4	6:15 AM 6:35 AM	25 mins. 25 mins. 20 mins.		
7	SSW 6 GBW 5	3:35 AM 7:45 AM	SSW 6 GBW 5	3:35 AM 7:45 AM			Same Same
8	SSW 7 GBW 6	6:15 AM 7:25 AM	SSW 7 GBW 6	6:25 AM 7:25 AM		10 mins.	Same
9	SSW 8 GBW 7	3:15 AM 7:15 AM	SSW 8 GBW 7	3:15 AM 7:15 AM			Same Same
10	SSW 9) GBW 1-8) GBW 2-8	3:35 AM 6:20 AM	(SSW 9) (GBW 1-8) GBW 2-8	4:00 AM 6:20 AM		25 mins 25 mins	Same
11	SSW 10) GBW 1-9) GBW 2-9	6:00 AM 7:15 AM	(SSW 10) (GBW 1-9) GBW 2-9	6:00 AM 7:15 AM			Same Same Same
12	SSW 11) GBW 1-10) GBW 2-10	4:30 AM 6:20 AM	(SSW 11) (GBW 1-10) GBW 2-10	4:30 AM 6:20 AM			Same Same Same
13	SSW 12 GBW 11	6:25 AM 6:45 AM	SSW 12 GBW 11	5:55 AM 6:35 AM	30 mins. 10 mins.		
14	SSW 13) GBW 12)	6:20 AM	(SSW 13) (GBW 12)	6:10 AM	10 mins. 10 mins		
15	SSW 14 GBW 13	6:35 AM 9:25 AM	SSW 14 GBW 13	6:05 AM 9:55 AM	30 mins.	30 mins.	
16	SSW 15 GBW 14	2:30 AM 5:55 AM	SSW 15 GBW 14	2:30 AM 5:55 AM			Same Same
17	SSW 16) GBW 1-15) GBW 2-15	6:35 AM 8:15 AM	(SSW 16) (GBW 1-15) GBW 2-15	5:50 AM 8:05 AM	45 mins. 45 mins. 10 mins.		
18	SSW 17 GBW 16	6:00 AM 7:15 AM	SSW 17 GBW 16	6:00 AM 6:15 AM	1 hr.		Same
19	SSW 18 GBW 17	6:10 AM 6:45 AM	SSW 18 GBW 17	4:30 AM 7:00 AM	1 hr. 40 mins	15 mins.	

8225

AUGUST 1938

DATE (a)	MANIFEST IDENTIFICATION (b)	ACTUAL ARRIVAL YUMA (c)	MANIFEST IDENTIFICATION (d)	REDISPATCHED ARRIVAL YUMA (e)	REDISPATCHED IN ADVANCE OF ACTUAL (f)	REDISPATCHED LATER THAN ACTUAL (g)	REDISPATCHED SAME AS ACTUAL (h)
20	SSW 19	6:30 AM	SSW 19	6:25 AM	5 mins.		
	GBW 18	8:40 AM	GBW 18	8:40 AM			Same
21	SSW 20)		(SSW 20)			45 mins.	
	GBW 1-19)	6:30 AM	(GBW 1-19)	7:15 AM		45 mins.	
	GBW 2-19	12:50 PM	GBW 2-19	1:05 PM		15 mins.	
	GBW 3-19	2:55 PM	GBW 3-19	3:45 PM		50 mins.	
22	SSW 21	6:00 AM	SSW 21	6:00 AM			Same
	GBW 1-20	9:25 AM	GBW 1-20	9:25 AM			Same
	GBW 2-20	2:45 PM	GBW 2-20	2:45 PM			Same
23	SSW 22	2:10 AM	SSW 22	2:10 AM			Same
	GBW 1-21	7:30 AM	GBW 1-21	6:35 AM	55 mins.		
	GBW 2-21	6:05 PM	GBW 2-21	6:10 PM		5 mins.	
24	SSW 23	2:35 AM	SSW 23	2:35 AM			Same
	GBW 22	8:20 AM	GBW 22	7:50 AM	30 mins.		
25	SSW 24)		(SSW 24)				Same
	GBW 1-23)	6:00 AM	(GBW 1-23)	6:00 AM			Same
	GBW 2-23	9:30 AM	GBW 2-23	9:30 AM			Same
26	SSW 25	6:20 AM	SSW 25	6:20 AM			Same
	GBW 24	7:50 AM	GBW 24	7:00 AM	50 mins.		
27	SSW 26	6:30 AM	SSW 26	6:30 AM			Same
	GBW 25	8:10 AM	GBW 25	8:50 AM		40 mins.	
28	SSW 27	7:00 AM	SSW 27	7:00 AM			Same
	GBW 26	7:15 AM	GBW 26	7:15 AM			Same
29	SSW 28	5:50 AM	SSW 28	5:50 AM			Same
	GBW 27	6:50 AM	GBW 27	7:05 AM		15 mins.	
30	SSW 29	1:50 AM	SSW 29	1:40 AM	10 mins.		
	GBW 1-28	5:50 AM	(GBW 1-28)			10 mins.	
	GBW 2-28	6:50 AM	(GBW 2-28)	6:00 AM	50 mins.		
31	SSW 30	5:55 AM	SSW 30	5:55 AM			Same
	GBW 29	7:30 AM	GBW 29	7:40 AM		10 mins.	

5703

efendant's Exhibit No. 229 (Witness Sines)
Jan. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY WAGE DATA

TUCSON, ARIZONA TO EL PASO, TEXAS
FOR PERIOD JUNE AND AUGUST, 1938

	NO. OF TRAINS	TRAIN MILES	TRAINMEN'S WAGES			LOCOMOTIVE MILES	ENGINEMEN'S WAGES			TOTAL WAGES		
			BASIC	VARIABLE	TOTAL		BASIC	VARIABLE	TOTAL	BASIC	VARIABLE	TOTAL
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
NORTH LINE												
(1) TUSA - GILA												
ACTUAL	771	94,833	$84,937.26	$1,373.95	$86,311.23	99,056	$15,686.75	$1,337.29	$16,964.04	$40,564.03	$2,711.24	$43,275.27
REDISPATCHED	554	68,165	17,629.99	1,040.95	18,670.94	69,843	12,234.19	1,105.34	13,339.53	29,864.18	2,146.29	32,010.47
SAVING FOR PERIOD	217	26,668	7,307.27	333.00	7,640.29	29,213	3,392.56	231.95	3,624.51	10,699.85	564.95	11,264.80
(2) GILA - TUCSON												
ACTUAL	767	98,176	25,960.62	2,611.53	28,572.15	114,694	19,796.59	1,891.37	21,687.96	45,757.21	4,502.90	50,260.11
REDISPATCHED	550	70,400	18,226.85	1,986.40	20,153.25	81,146	15,441.41	1,544.86	16,986.27	33,668.26	3,471.26	37,139.52
SAVING FOR PERIOD	217	27,776	7,733.77	685.13	8,418.90	33,548	4,355.18	346.51	4,701.69	12,088.95	1,031.64	13,120.59
(3) TUCSON-LORDSBURG												
ACTUAL	756	123,010	35,778.99	1,673.95	37,452.94	183,874	30,962.70	1,526.76	32,489.46	66,741.69	3,200.71	69,942.40
REDISPATCHED	521	85,079	24,320.15	1,205.53	25,525.68	126,497	23,309.26	1,205.55	24,514.81	47,629.41	2,411.08	50,040.49
SAVING FOR PERIOD	235	37,931	11,458.84	468.42	11,927.06	59,377	7,653.44	321.21	7,974.65	19,112.08	789.63	19,901.71
(4) LORDSBURG-EL PASO (Thru Trains Only)												
ACTUAL	674	100,084	23,541.33	3,603.28	27,144.61	100,647	16,315.69	2,247.41	18,563.10	39,857.02	5,850.69	45,707.71
REDISPATCHED	521	77,319	20,861.16	3,238.64	24,099.80	79,063	14,313.43	1,988.61	16,302.04	35,174.59	5,227.25	40,401.84
SAVING FOR PERIOD	153	22,749	2,680.17	364.64	3,044.81	21,584	2,002.26	258.80	2,261.06	4,682.43	623.44	5,305.87
(5) EL PASO - STRAUSS												
ACTUAL	4	68	27.14	4.51	31.65	68	15.99	4.16	20.15	43.13	8.67	51.80
REDISPATCHED	56	952	379.84	47.46	427.30	952	223.84	28.00	251.84	603.68	75.46	679.14
INCREASE FOR PERIOD	52	884	352.70	42.95	395.65	884	207.85	23.84	231.69	560.55	66.79	627.34
(6) TOTAL - NORTH LINE												
ACTUAL	2,972	416,171	110,245.36	9,267.22	119,512.58	498,339	82,717.72	7,006.99	89,724.11	192,963.08	16,274.22	209,237.29
REDISPATCHED	2,202	301,931	81,418.19	7,458.98	88,877.17	355,501	65,522.13	5,872.36	71,394.49	146,940.32	13,331.34	160,271.66
SAVING FOR PERIOD	770	114,240	28,827.17	1,808.24	30,635.41	142,838	17,195.59	1,134.63	18,330.22	46,022.76	2,942.87	48,965.63
SOUTH LINE												
(7) TUCSON-DOUGLAS (Thru Trains Only)												
ACTUAL	122	15,128	4,380.73	644.76	5,025.49	15,128	2,496.10	396.87	2,892.97	6,876.83	1,041.63	7,918.46
REDISPATCHED	122	15,128	4,380.73	644.76	5,025.49	15,128	2,534.40	402.93	2,937.33	6,915.13	1,047.69	7,962.82
INCREASE FOR PERIOD	-	-	-	-	-	-	38.30	6.06	44.36	38.30	6.06	44.36
(8) DOUGLAS-RISING JUNCTION												
ACTUAL	52	1,208	746.92	102.40	849.32	1,208	413.48	61.43	474.91	1,160.40	163.83	1,324.23
REDISPATCHED	52	1,208	746.92	102.40	849.32	1,208	419.92	62.38	482.30	1,166.84	164.78	1,331.62
INCREASE FOR PERIOD	-	-	-	-	-	-	6.44	0.95	7.39	6.44	0.95	7.39
(9) DOUGLAS - EL PASO												
ACTUAL	122	26,596	6,144.30	652.48	6,796.78	26,596	4,318.96	369.87	4,688.83	10,463.26	1,022.35	11,485.61
REDISPATCHED	122	26,596	6,567.17	686.30	7,253.47	26,596	4,365.49	373.83	4,739.32	10,932.66	1,060.13	11,992.79
INCREASE FOR PERIOD	-	-	422.87	33.82	456.69	-	46.53	3.96	50.49	469.40	37.78	507.18
(10) TOTAL - SOUTH LINE												
ACTUAL	296	42,932	11,271.95	1,399.64	12,671.59	42,932	7,228.54	828.17	8,056.71	18,500.49	2,227.81	20,728.30
REDISPATCHED	296	42,932	11,694.82	1,433.46	13,128.28	42,932	7,319.81	839.14	8,158.95	19,014.63	2,272.60	21,287.23
INCREASE FOR PERIOD	-	-	422.87	33.82	456.69	-	91.27	10.97	102.24	514.14	44.79	558.93
(11) TOTAL - NORTH AND SOUTH LINES												
ACTUAL	3,268	459,103	121,517.31	10,666.86	132,184.17	541,271	89,946.26	7,835.16	97,781.42	211,463.57	18,502.02	229,965.59
REDISPATCHED	2,498	343,863	93,113.01	8,892.44	102,005.45	398,433	72,841.94	6,711.50	79,553.44	165,954.95	15,603.94	181,558.89
SAVING FOR PERIOD	770	114,240	28,404.30	1,774.42	30,178.72	142,838	17,104.32	1,123.66	18,227.98	45,508.62	2,898.08	48,406.70
(12) Saving for year (saving for period increased in ratio of 17.89% to 100%)	4,304	638,569	158,771.94	9,918.30	168,690.44	798,424	35,608.27	6,280.94	101,889.21	254,380.21	16,199.44	270,579.65
(13) Railroad Retirement and Unemployment Insurance Tax; 5.63% Trainmen - 5.44% Enginemen					9,531.00				5,542.77			15,073.77

NORTH LINE												
(1) TUSA - GILA												
ACTUAL	772	94,833	$24,937.28	$1,373.95	$26,311.23	99,056	$15,626.75	$1,337.29	$16,964.04	$40,564.03	$2,711.24	$43,275.27
REDISPATCHED	554	68,165	17,629.99	1,040.95	18,670.94	69,843	12,234.19	1,105.36	13,339.53	29,864.18	2,146.29	32,010.47
SAVING FOR PERIOD	217	26,668	7,307.29	333.00	7,640.29	29,213	3,392.56	231.93	3,624.51	10,699.85	564.95	11,264.80
(2) GILA - TUCSON												
ACTUAL	767	98,176	25,360.62	2,611.53	28,572.15	114,634	19,736.58	1,891.37	21,687.95	43,737.21	4,502.90	50,260.11
REDISPATCHED	550	70,400	18,226.85	1,926.40	20,153.25	81,146	15,441.61	1,544.86	16,986.27	33,668.26	3,471.26	37,139.52
SAVING FOR PERIOD	217	27,776	7,733.77	685.13	8,418.90	33,548	4,355.18	346.51	4,701.69	12,088.95	1,031.64	13,120.59
(3) TUCSON--LORDSBURG												
ACTUAL	736	123,010	35,778.99	1,673.95	37,452.94	183,874	30,962.70	1,526.76	32,489.46	66,741.69	3,200.71	69,942.40
REDISPATCHED	521	85,079	24,130.35	1,205.53	25,335.88	126,497	23,309.26	1,305.55	24,614.81	47,629.61	2,411.08	50,040.69
SAVING FOR PERIOD	235	37,931	11,458.64	468.42	11,927.06	59,377	7,653.44	321.21	7,974.65	19,112.08	789.63	19,901.71
(4) LORDSBURG-EL PASO (Thru Trains Only)												
ACTUAL	674	100,084	23,541.33	3,603.28	27,144.61	100,647	16,335.69	2,947.41	18,563.10	39,851.02	5,850.69	45,707.71
REDISPATCHED	521	77,335	20,861.16	3,238.64	24,099.80	79,083	14,313.43	1,988.61	16,302.04	35,174.59	5,227.25	40,401.84
SAVING FOR PERIOD	153	22,749	2,680.17	364.64	3,044.81	21,584	2,002.26	258.80	2,261.06	4,682.43	623.44	5,305.87
(5) EL PASO - STRAUSS												
ACTUAL	4	68	27.14	4.51	31.65	68	15.99	4.16	20.15	43.13	8.67	51.80
REDISPATCHED	56	952	379.84	47.46	427.30	952	223.84	28.00	251.84	603.68	75.46	679.14
INCREASE FOR PERIOD	52	884	352.70	42.95	395.65	884	207.85	23.84	231.69	560.55	66.79	627.34
(6) TOTAL - NORTH LINE												
ACTUAL	2,972	416,171	110,245.36	9,267.22	119,512.58	498,339	82,717.72	7,006.99	89,724.71	192,963.08	16,274.21	209,237.29
REDISPATCHED	2,202	301,931	81,418.19	7,458.98	88,877.17	355,501	65,522.13	5,872.36	71,394.49	146,940.32	13,331.34	160,271.66
SAVING FOR PERIOD	770	114,240	28,827.17	1,808.24	30,635.41	142,838	17,195.59	1,134.63	18,330.22	46,022.76	2,942.87	48,965.63
SOUTH LINE												
(7) TUCSON-DOUGLAS (Thru Trains Only)												
ACTUAL	122	15,128	4,380.73	644.76	5,025.49	15,128	2,496.10	396.87	2,892.97	6,876.83	1,041.63	7,918.46
REDISPATCHED	122	15,128	4,380.73	644.76	5,025.49	15,128	2,534.40	402.93	2,937.33	6,915.13	1,047.69	7,962.82
INCREASE FOR PERIOD	-	-	-	-	-	-	38.30	6.06	44.36	38.30	6.06	44.36
(8) DOUGLAS-BISBEE JUNCTION												
ACTUAL	52	1,208	746.92	102.40	849.32	1,208	413.48	61.43	474.91	1,160.40	163.83	1,324.23
REDISPATCHED	52	1,208	746.92	102.40	849.32	1,208	419.92	62.38	482.30	1,166.84	164.78	1,331.62
INCREASE FOR PERIOD	-	-	-	-	-	-	6.44	0.95	7.39	6.44	0.95	7.39
(9) DOUGLAS - EL PASO												
ACTUAL	122	26,596	6,144.30	652.48	6,796.78	26,596	4,318.96	369.87	4,688.83	10,463.26	1,022.35	11,485.61
REDISPATCHED	122	26,596	6,567.17	686.30	7,253.47	26,596	4,365.49	373.83	4,739.32	10,932.66	1,060.13	11,992.79
INCREASE FOR PERIOD	-	-	422.87	33.82	456.69	-	46.53	3.96	50.49	469.40	37.78	507.18
(10) TOTAL - SOUTH LINE												
ACTUAL	296	42,932	11,271.95	1,399.64	12,671.59	42,932	7,228.54	828.17	8,056.71	18,500.49	2,227.81	20,728.30
REDISPATCHED	296	42,932	11,694.82	1,433.46	13,128.28	42,932	7,319.81	839.16	8,158.95	19,014.63	2,272.60	21,287.23
INCREASE FOR PERIOD	-	-	422.87	33.82	456.69	-	91.27	10.97	102.24	514.14	44.79	558.93
(11) TOTAL - NORTH AND SOUTH LINES												
ACTUAL	3,268	459,103	121,517.31	10,666.86	132,184.17	541,271	89,946.26	7,835.16	97,781.42	211,463.57	18,502.02	229,965.59
REDISPATCHED	2,498	344,863	93,113.01	8,892.44	102,005.45	398,433	72,841.94	6,711.50	79,553.44	165,954.95	15,603.94	181,558.89
SAVING FOR PERIOD	770	114,240	28,404.30	1,774.42	30,178.72	142,838	17,104.32	1,123.66	18,227.98	45,508.62	2,898.08	48,406.70
(12) Saving for year (saving for period increased in ratio of 17.89% to 100%)	4,304	638,569	158,771.94	9,918.50	168,690.44	798,424	95,608.27	6,280.94	101,889.21	254,320.21	16,199.44	270,519.65
(13) Railroad Retirement and Unemployment Insurance Tax; 5.65% Trainmen - 5.44% Enginemen					9,531.00				5,542.77			15,073.77
(14) GRAND TOTAL					178,221.44				107,431.98			285,653.42

	GAINS THE HELP (Thousands)	
	YEAR 1938 (m)	TOTAL PERIOD JUNE AND AUGUST 1938 m)
TUSA - TUCSON	2,644,436	482,145
TUCSON - LORDSBURG	1,747,885	308,788
LORDSBURG - EL PASO	1,538,795	279,795
TUCSON - EL PASO VIA DOUGLAS	457,857	75,358
TOTAL	6,[illegible] 373	1,146,086
PER CENT TOTAL PERIOD JUNE AND AUGUST TO YEAR 1938	17 %	

Defendant's Exhibit No. 230 (Witness Sines)
Jan. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

LOS ANGELES, CALIFORNIA TO EL PASO, TEXAS
PASSENGER DESPATCH STUDY FOR YEAR 1938.
STATISTICS OF OPERATION OF SECOND AND EXTRA SECTIONS
OF PASSENGER TRAINS CAUSED BY OBSERVANCE OF
ARIZONA 14-CAR LIMIT LAW.

TRAIN NO. (a)	LIMITS (b)	TIMES (c)	TRAIN MILES (d)	LOCOMOTIVE MILES PRINCIPAL (e)	LOCOMOTIVE MILES LIGHT & HELPER (f)	LOCOMOTIVE MILES TOTAL (g)
EASTWARD						
2	Yuma, Arizona to El Paso, Texas, via Phoenix and Bowie, 605 miles	1	605	605	0- 139	466
	Yuma, Arizona to Lordsburg, New Mexico via Gila, 415 miles	1	415	415	0- 164	251
4	Yuma, Arizona to El Paso, Texas via Phoenix and Bowie, 605 miles	1	605	605	212	817
6	Yuma, Arizona to El Paso, Texas via Gila and Bowie, 562 miles	6	3,372	3,372	0- 648	2,724
	Tucson, Arizona to Lordsburg, New Mexico, 164 miles	1	164	164	-	164
	TOTAL EASTWARD	10	5,161	5,161	0- 639	4,522
WESTWARD						
1	El Paso, Texas to Yuma, Arizona, via Bowie and Phoenix, 605 miles	1	605	605	121	726
	Lordsburg, New Mexico to Los Angeles, Calif., via Phoenix, 708 miles	1	708	708	403	1,111
	Lordsburg, New Mexico to Yuma, Arizona via Gila, 665 miles	1	414	414	164	578
	Deadhead equipment train Yuma to Tucson in opposite direction, 251 miles	1	251	251	-	251
	Tucson to Yuma via Phoenix, 294 miles	2	588	588	120	708
3	El Paso, Texas to Yuma, Arizona via Douglas and Phoenix, 635 miles	1	635	635	-	635
	El Paso, Texas to Tucson, Arizona via Douglas, 341 miles	1	341	341	343	684
	Tucson, Arizona to Yuma, Arizona via Phoenix, 294 miles	1	294	294	295	589
	Tucson, Arizona to Yuma, Arizona via Gila, 251 miles	1	251	251	251	502
5	El Paso, Texas to Yuma, Arizona via Bowie and Gila, 562 miles	1	562	562	311	873
	Tucson, Arizona to Los Angeles, Calif., via Phoenix, 545 miles	3	1,635	1,635	510	2,145
	Phoenix, Arizona to Los Angeles, Calif., 424 miles	1	424	424	101	525
	Phoenix, Arizona to Yuma, Arizona, 174 miles	1	174	174	-	174
43	El Paso, Texas to Los Angeles, Calif., via Bowie and Gila, 813 miles	1	813	813	485	1,298
	Lordsburg, New Mexico to Yuma, Arizona via Gila, 414 miles	2	828	828	709	1,537
	Lordsburg, New Mexico to Tucson, Arizona, 163 miles	2	326	326	328	654
	Douglas, Ariz.-Rodeo, New Mexico turnaround trains, 104 miles per round trip	2	208	208	-	208
	Colton-Indio California helper service	-	-	-	1,140	1,140
	TOTAL WESTWARD	23	9,057	9,057	5,281	14,338
	TOTAL EASTWARD AND WESTWARD	33	14,218	14,218	4,642	18,860

Partial offset to saving of 545 train miles by elimination of second No. 5 from Tucson, Arizona to Los Angeles, California on December 19, 1938, would be the addition of 150 motor car miles Phoenix to Picacho and return to handle passengers moving on train No. 43 via Gila instead of second No. 5 via Phoenix. 0- 150 motor car miles

0- indicates offset

Defendant's Exhibit No. 231 (Witness Sines)
Jan. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

LOS ANGELES, CALIFORNIA, TO EL PASO, TEXAS
SAVING IN PASSENGER TRAIN SERVICE AND
COSTS ACCOUNT DISCONTINUANCE OF 14 CAR LIMIT
ON PASSENGER TRAINS IN ARIZONA

YEAR 1938

		TOTAL (I)	BETWEEN LOS ANGELES, CALIFORNIA AND TUBA, ARIZONA (II)			BETWEEN TUBA, ARIZONA AND EL PASO, TEXAS (III)			
	SWEAR PASSENGER TRAIN SERVICE								
(1)	Train miles saved	14,218	1,506			12,712			
(2)	Locomotive miles saved	17,720	1,915			15,805			
(3)	Costs:	ITEM	QUANTITY (a)	UNIT COST (b)	TOTAL COST (c)	QUANTITY (a)	UNIT COST (b)	TOTAL COST (c)	TOTAL (d)
	(3-A) Fuel	Locomotive Miles	1,915	$0.1898	$ 349	15,805	$0.0910	$1,438	
	(3-B) Enginemen	Wages - Direct	-	-	278	-	-	2,501	
	(3-C) Trainmen	Wages - Direct	-	-	263	-	-	2,309	
	(3-D) Enginehouse	Locomotive Miles	1,915	0.0198	38	15,805	0.0198	313	
	(3-E) Other Locomotive Supplies	Locomotive Miles	1,915	0.0234	45	15,805	0.0234	370	
	(3-F) Locomotive Repairs	Locomotive Miles	1,915	0.1560	299	15,805	0.1560	2,466	
	(3-G) TOTAL				$1,172			$9,397	$10,569
	HELPER LOCOMOTIVE SERVICE								
(4)	Helper locomotive mileage saved, Colton to Indio			1,140					
(5)	Costs:								
	(5-A) Fuel	Locomotive Miles	1,140	$0.1898	$ 148				
	(5-B) Enginemen	Wages-No Saving	-	-	-				
	(5-C) Trainmen	Wages-No Saving	-	-	-				
	(5-D) Enginehouse	Locomotive Miles	1,140	0.0198	23				
	(5-E) Other Locomotive Supplies	Locomotive Miles	1,140	0.0234	27				
	(5-F) Locomotive Repairs	Locomotive Miles	1,140	0.1560	178				
	(5-G) TOTAL				$ 376				$376
(6)	TOTAL								$10,945
	GASOLINE MOTOR CAR OPERATION								
(7)	Motor car miles added Phoenix to Picacho and return						150		
(8)	Cost (deduction from saving) car miles					150	$0.4049	$61	61
(9)	NET SAVING IN PASSENGER COSTS ACCOUNT DISCONTINUANCE ARIZONA 14 CAR LIMIT								$10,884

5706

Defendant's Exhibit No. 232 (Witness Sines)
Jan. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

PASSENGER REDISPATCH STUDY - YEAR 1938
LOS ANGELES, CALIFORNIA TO EL PASO, TEXAS
EXTRA-TERRITORIAL EFFECT OF ARIZONA TRAIN LIMIT LAW
BETWEEN LOS ANGELES, CALIFORNIA AND YUMA, ARIZONA,
AND ARIZONA-NEW MEXICO STATE LINE AND EL PASO, TEXAS

DISTRICT		
1 - Los Angeles, California to Yuma, Arizona		
Refer to Exhibit No		
Train miles saved	1,506	
Estimated monetary saving		$1,172
Helper locomotive miles saved	1,140	
Estimated monetary saving		$ 376
2 - Arizona-New Mexico State Line to El Paso, Texas		
Refer to Exhibits No. 230 and 231		
Train miles saved	2,396	
Estimated monetary saving 2,396 train miles times $0.7392 (*) equals		$1,771
3 - TOTAL		$3,319

(*) - Exhibit No. 231 shows saving of $9,397 Yuma, Arizona to El Paso, Texas and 12,712 train miles eliminated; equals $0.7392 per train mile saved.

Defendant's Exhibit No. 233 (Witness Sines)
Jan. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY - OPERATING STATISTICS

TUCSON - PHOENIX

MONTH OF DECEMBER, 1938

LINE NO.		NUMBER OF TRAINS (a)	TRAIN MILES (b)	LOCOMOTIVE MILES (c)	NUMBER OF CARS (d)	CARS PER TRAIN (e)
	TUCSON-PHOENIX (THROUGH)					
1	Actual handling	118	14,176	14,416	6,812	57.7
2	Redispatched handling	97	11,656	11,656	6,812	70.2
3	Saving for month	21	2,520	2,760	-	-
	PHOENIX ROUSTABOUT					
4	Actual handling	-	-	-	-	-
5	Redispatched handling	4	254	254	-	-
6	Increase for month	4	254	254	-	-
	SUMMARY					
7	Actual handling	118	14,176	14,416	6,812	-
8	Redispatched handling	101	11,910	11,910	6,812	-
9	Saving for month	17	2,266	2,506	-	-

Defendant's Exhibit No. 234 (Witness Sines)
Jan. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

MAIN LINE FREIGHT TRAINS OF VARIOUS LENGTHS
OPERATED BETWEEN YUMA, ARIZONA AND EL PASO, TEXAS
VIA GILA, ARIZONA, AND LORDSBURG, NEW MEXICO, AND
VIA DOUGLAS, ARIZONA, OVER SOUTH LINE
DURING PERIOD APRIL 4TH TO APRIL 30TH, 1940, INCLUSIVE
ACTUAL OPERATION COMPARED WITH REDISPATCHED OPERATION,
OBSERVING 70-CAR RESTRICTION AND USING PRESENT POWER AND SHORT SIDINGS

		ACTUAL								REDISPATCH							
		50 AND LESS (a)	51 TO 60 (b)	61 TO 70 (c)	71 TO 80 (d)	81 TO 90 (e)	91 TO 100 (f)	101 TO 110 (g)	TOTAL (h)	50 AND LESS (i)	51 TO 60 (j)	61 TO 70 (k)	71 TO 80 (l)	81 TO 90 (m)	91 TO 100 (n)	101 TO 110 (o)	TOTAL (p)
YUMA - GILA (123 Miles)	EAST	6	20	137	7	4	1	-	175	6	16	154	-	-	-	-	176
	WEST	2	34	89	13	19	45	-	202	2	29	192	-	-	-	-	223
	TOTAL	8	54	226	20	23	46	-	377	8	45	346	-	-	-	-	399
PER CENT OF TOTAL		2.12	14.32	59.95	5.31	6.10	12.20	-	100	2.01	11.28	86.71	-	-	-	-	100
GILA - TUCSON (126 Miles)	EAST	10	18	135	11	4	1	-	179	6	20	154	-	-	-	-	180
	WEST	3	24	104	6	25	41	-	203	2	24	198	-	-	-	-	224
	TOTAL	13	42	239	17	29	42	-	382	8	44	352	-	-	-	-	404
PER CENT OF TOTAL		3.40	11.00	62.56	4.45	7.59	11.00	-	100	1.98	10.89	87.13	-	-	-	-	100
TUCSON - LORDSBURG (164 Miles East) (163 Miles West)	EAST	16	31	144	6	1	-	-	198	16	30	153	-	-	-	-	199
	WEST	21	54	40	#37	58	5	-	215	21	54	159	-	-	-	-	234
	TOTAL	37	85	184	#43	59	5	-	413	37	84	312	-	-	-	-	433
PER CENT OF TOTAL		8.96	20.58	44.55	10.41	14.29	1.21	-	100	8.55	19.40	72.05	-	-	-	-	100
LORDSBURG - EL PASO (148 Miles East) (149 Miles West)	EAST	23	26	112	8	8	10	1	188	23	25	115	5	9	11	-	188
	WEST	2	34	72	4	4	70	4	190	2	32	74	3	5	69	5	190
	TOTAL	25	60	184	12	12	80	5	378	25	57	189	8	14	80	5	378
PER CENT OF TOTAL		6.61	15.87	48.68	3.17	3.18	21.17	1.32	100	6.62	15.08	50.00	2.12	3.70	21.16	1.32	100
GRAND TOTAL (YUMA - EL PASO)		83	241	833	#92	123	173	5	1,550	78	230	1,199	8	14	80	5	1,614

RECAPITULATION

TOTAL TRAINS OVER 70 CARS	393	25.35%
TOTAL TRAINS 70 CARS AND UNDER	1,157	74.65%
TOTAL TRAINS	1,550	100.00%

One train departed Lordsburg with 71 cars; reduced to 70 cars at State Line

RECAPITULATION

TOTAL TRAINS OVER 70 CARS	107	6.63%
TOTAL TRAINS 70 CARS AND UNDER	1,507	93.37%
TOTAL TRAINS	1,614	100.00%

TUCSON - DOUGLAS (125 Miles East) (124 Miles West)	EAST	15	5	14	1	-	-	-	35	14	6	15	-	-	-	-	35
	WEST	5	4	23	2	2	-	-	36	5	4	27	-	-	-	-	36
	TOTAL	20	9	37	3	2	-	-	71	19	10	42	-	-	-	-	71
PER CENT OF TOTAL		28.16	12.68	52.11	4.23	2.82	-	-	100	26.76	14.09	59.15	-	-	-	-	100
DOUGLAS - EL PASO (217 Miles East) (218 Miles West)	EAST	26	2	1	-	-	-	-	29	27	2	-	-	-	-	-	29
	WEST	3	3	14	-	# 5	# 2	# 1	28	3	3	18	-	##1	##2	##1	28
	TOTAL	29	5	15	-	# 5	# 2	# 1	57	30	5	18	-	##1	##2	##1	57
PER CENT OF TOTAL		50.88	8.77	26.32	-	8.77	3.51	1.75	100	52.63	8.77	31.58	-	1.75	3.51	1.76	100
DOUGLAS - BISBEE JCT. (22 Miles)	EAST	1	2	20	-	1	-	-	24	1	2	21	-	-	-	-	24
	WEST	-	4	12	8	-	-	-	24	-	4	20	-	-	-	-	24

		AND LESS (a)	50 60 (b)	70 70 (c)	70 80 (d)	70 90 (e)	100 (f)	110 (g)	TOTAL (h)	LESS (i)	60 (j)	70 (k)	80 (l)	90 (m)	100 (n)	110 (o)	TOTAL (p)
YUMA - GILA (123 Miles)	EAST	6	20	137	7	4	1	-	175	6	16	154	-	-	-	-	176
	WEST	2	34	89	13	19	45	-	202	2	29	192	-	-	-	-	223
	TOTAL	8	54	226	20	23	46	-	377	8	45	346	-	-	-	-	399
PER CENT OF TOTAL		2.12	14.32	59.95	5.31	6.10	12.20	-	100	2.01	11.28	86.71	-	-	-	-	100
GILA - TUCSON (128 Miles)	EAST	10	18	135	11	6	1	-	179	6	20	154	-	-	-	-	180
	WEST	3	24	104	6	25	41	-	203	2	24	198	-	-	-	-	224
	TOTAL	13	42	239	17	29	42	-	382	8	44	352	-	-	-	-	404
PER CENT OF TOTAL		3.40	11.00	62.56	4.45	7.59	11.00	-	100	1.98	10.89	87.13	-	-	-	-	100
TUCSON - LORDSBURG (164 Miles East) (163 Miles West)	EAST	16	31	144	6	1	-	-	198	16	30	153	-	-	-	-	199
	WEST	21	54	40	#37	58	5	-	215	21	54	159	-	-	-	-	234
	TOTAL	37	85	184	#43	59	5	-	413	37	84	312	-	-	-	-	433
PER CENT OF TOTAL		8.96	20.58	44.55	10.41	14.29	1.21	-	100	8.55	19.40	72.05	-	-	-	-	100
LORDSBURG - EL PASO (148 Miles East) (149 Miles West)	EAST	23	26	112	8	8	10	1	188	23	25	115	5	9	11	-	188
	WEST	2	34	72	4	4	70	4	190	2	32	74	3	5	69	5	190
	TOTAL	25	60	184	12	12	80	5	378	25	57	189	8	14	80	5	378
PER CENT OF TOTAL		6.61	15.87	48.68	3.17	3.18	21.17	1.32	100	6.62	15.08	50.00	2.12	3.70	21.16	1.32	100
GRAND TOTAL (YUMA - EL PASO)		83	241	833	#92	123	173	5	1,550	78	230	1,199	8	14	86	5	1,614

RECAPITULATION

TOTAL TRAINS OVER 70 CARS	393	25.35%
TOTAL TRAINS 70 CARS AND UNDER	1,157	74.65%
TOTAL TRAINS	1,550	100.00%

One train departed Lordsburg with 71 cars; reduced to 70 cars at State Line

RECAPITULATION

TOTAL TRAINS OVER 70 CARS	107	6.63%
TOTAL TRAINS 70 CARS AND UNDER	1,507	93.37%
TOTAL TRAINS	1,614	100.00%

TUCSON - DOUGLAS (12) Miles East) (134 Miles West)	EAST	15	5	14	1	-	-	-	35	14	6	15	-	-	-	-	35
	WEST	5	4	23	2	2	-	-	36	5	4	27	-	-	-	-	36
	TOTAL	20	9	37	3	2	-	-	71	19	10	42	-	-	-	-	71
PER CENT OF TOTAL		28.16	12.68	52.11	4.23	2.82	-	-	100	26.76	14.09	59.15	-	-	-	-	100
DOUGLAS - EL PASO (217 Miles East) (218 Miles West)	EAST	26	2	1	-	-	-	-	29	27	2	-	-	-	-	-	29
	WEST	3	3	14	-	ß 5	ß 2	ß 1	28	3	3	18	-	##1	##2	##1	28
	TOTAL	29	5	15	-	ß 5	ß 2	ß 1	57	30	5	18	-	##1	##2	##1	57
PER CENT OF TOTAL		50.88	8.77	26.32	-	8.77	3.51	1.75	100	52.63	8.77	31.58	-	1.75	3.51	1.76	100
DOUGLAS - BISBEE JCT. (22 Miles)	EAST	1	2	20	-	1	-	-	24	1	2	21	-	-	-	-	24
	WEST	-	4	12	8	-	-	-	24	-	4	20	-	-	-	-	24
	TOTAL	1	6	32	8	1	-	-	48	1	6	41	-	-	-	-	48
PER CENT OF TOTAL		2.08	12.50	66.67	16.67	2.08	-	-	100	2.08	12.50	85.42	-	-	-	-	100
GRAND TOTAL (TUCSON - EL PASO)		50	20	84	11	ß 8	ß 2	ß 1	176	50	21	101	-	## 1	## 2	## 1	176

RECAPITULATION

TOTAL TRAINS OVER 70 CARS	22	12.50%
TOTAL TRAINS 70 CARS AND UNDER	154	87.50%
TOTAL TRAINS	176	100.00%

ß- 1 train in each bracket (total 3) reduced to less than 70 cars east of Arizona State Line.

Reduced to 70 cars or less east of Arizona State Line

RECAPITULATION

TOTAL TRAINS OVER 70 CARS	4	2.27%
TOTAL TRAINS 70 CARS AND UNDER	172	97.73%
TOTAL TRAINS	176	100.00%

5709

32231

Defendant's Exhibit No. 235 (Witness Sines
Jan. 30, 1941

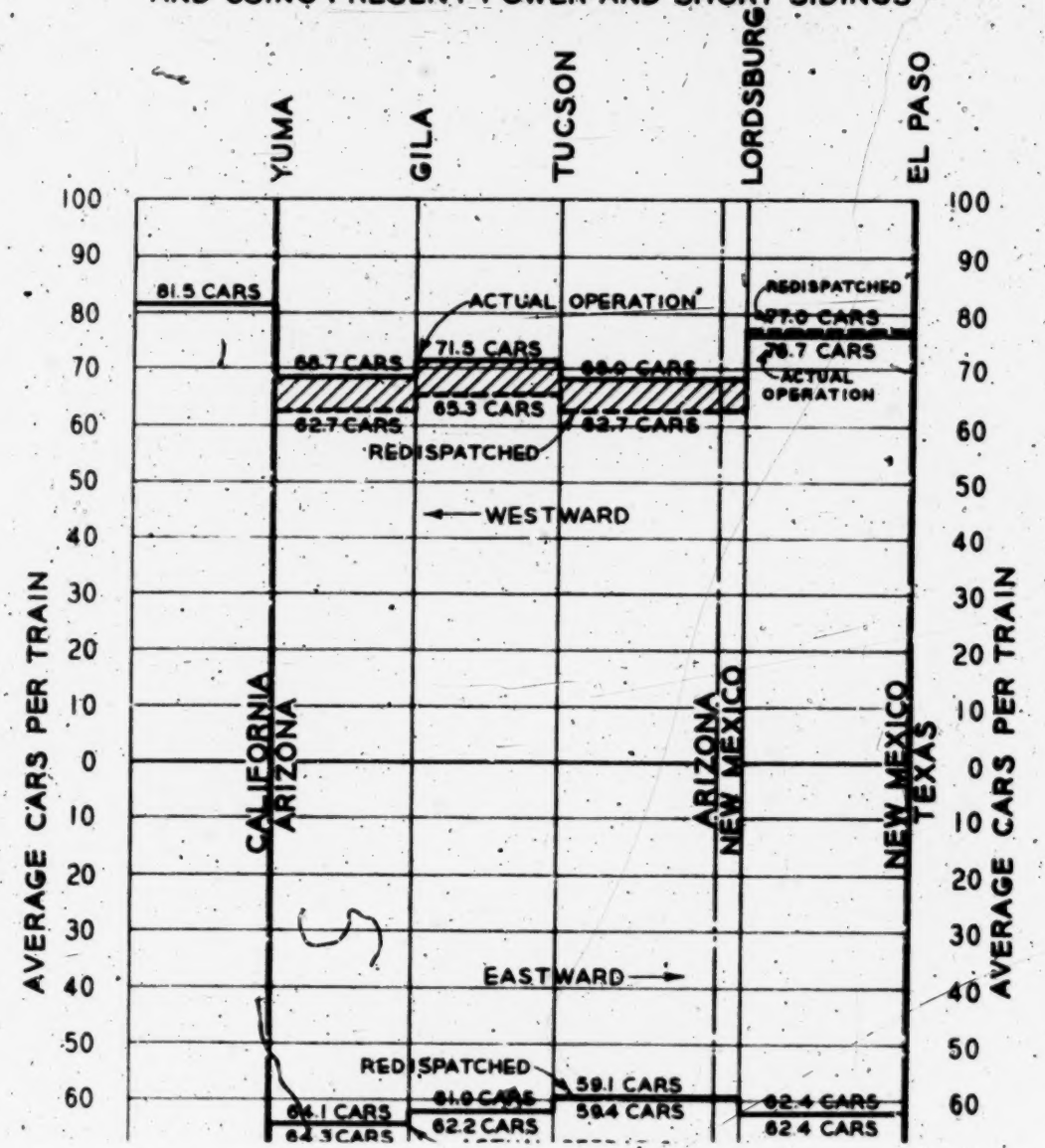
SOUTHERN PACIFIC COMPANY

RELATIVE TRAIN LENGTHS

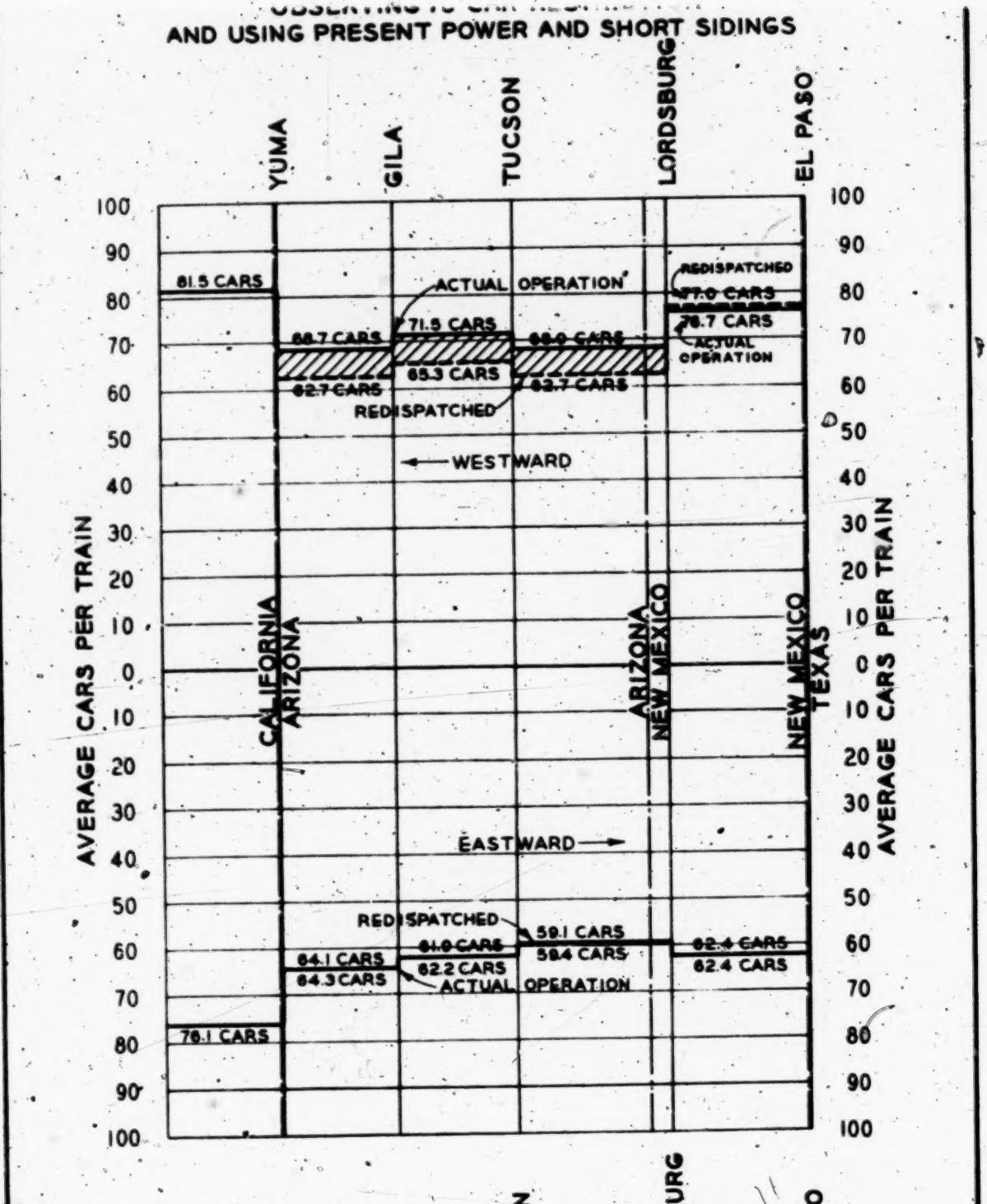
CALIFORNIA - ARIZONA - NEW MEXICO - TEXAS

THROUGH AND LOCAL FREIGHT TRAINS JAN 30 194

OPERATING VIA YUMA, GILA, TUCSON, LORDSBURG AND EL PASO
BASED ON REDISPATCHING STUDY OF APRIL 1940
OBSERVING 70 CAR RESTRICTION
AND USING PRESENT POWER AND SHORT SIDINGS



AND USING PRESENT POWER AND SHORT SIDINGS



Defendant's Exhibit No. 236 (Witness Sines)
Jan. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY - OPERATING STATISTICS
TUCSON, ARIZONA TO EL PASO, TEXAS
FOR PERIOD APRIL 4TH TO APRIL 30TH, 1940
ACTUAL OPERATION COMPARED WITH REDISPATCHED OPERATION,
OBSERVING 70 CAR RESTRICTION AND USING PRESENT POWER AND SHORT SIDINGS

	NUMBER OF TRAINS (a)	TRAIN MILES (b)	OTHER LOCOMOTIVE MILES (c)	TOTAL LOCOMOTIVE MILES (d)	NUMBER OF CARS (e)	CARS PER TRAIN (f)
NORTH LINE						
I - Tucson - Gila						
Redispatch	399	48,077	5,145	84,222	23,279	58.4
Actual	377	46,371	2,784	49,155	22,123	58.6
Increase for period	22	2,706	2,361	5,067	(1) 156	(D) 3.2
II - Gila - Tucson						
Redispatch	404	51,822	9,697	61,440	23,771	58.8
Actual	382	49,746	7,991	57,737	23,643	57.1
Increase for period	22	2,816	1,676	4,492	(2) 128	(D) 3.3
III - Tucson - Lordsburg						
Redispatch	432	70,889	31,126	101,684	26,647	61.1
Actual	413	67,318	31,284	98,702	25,376	60.9
Increase for period	20	3,211	(D) 268	2,982	(3) 71	(D) 2.8
IV - Lordsburg - El Paso						
Redispatch	378	36,134	281	36,365	24,267	63.8
Actual	378	36,134	281	36,365	24,210	63.6
Increase for period	-	-	-	-	(4) 57	.2
V - TOTAL NORTH LINE						
Redispatch	1,614	227,322	46,978	273,700	103,964	64.4
Actual	1,550	219,569	43,280	260,979	103,452	66.7
Increase for period	64	8,753	3,698	12,721	(5) 412	(D) 2.3
SOUTH LINE						
VI - Tucson-Douglas (Through trains only)						
Redispatch	71	8,808	810	9,618	3,282	49.7
Actual	71	8,808	810	9,618	3,277	50.4
Increase for period	-	-	-	-	(6)(D) 48	(D) .7
VII - Douglas-Bisbee Jct. (Turnaround trains only)						
Redispatch	48	1,080	-	1,080	3,108	64.7
Actual	48	1,080	-	1,080	3,171	66.1
Increase for period	-	-	-	-	(7)(D) 63	(D) 1.4
VIII - Douglas - El Paso						
Redispatch	89	12,436	218	12,644	3,977	47.0
Actual	89	12,436	218	12,644	3,734	44.0
Increase for period	-	-	-	-	(8)(D) 89	(D) 1.0
IX - TOTAL SOUTH LINE						
Redispatch	176	22,279	1,028	23,307	9,313	(9)46.5
Actual	176	22,279	1,028	23,307	9,482	(9)49.3
Increase for period	-	-	-	-	(D) 169	(9)(D)2.8
X - TOTAL NORTH AND SOUTH LINES						
Redispatch	1,790	249,601	47,406	297,007	113,179	(10)63.2
Actual	1,726	240,848	43,418	284,286	112,934	(10)65.4
Increase for period	64	8,753	3,988	12,721	245	(10)(D) 2.2

D - Indicates Decrease

(1) Yuma - Gila District: Increase 80 additional engine water cars east, 80 additional deadhead caboose, 81 additional engine water cars west, and 80 west empties which moved via Phoenix Line in actual operation, and via Gila line in redispatched operation, total 156 cars.

(2) Gila - Tucson District: Increase 12 additional deadhead caboose east, 81 additional engine water cars west, and 80 west empties which moved via Phoenix line in actual operation and via Gila line in redispatched operation, total 173 cars.

(3) Tucson - Lordsburg District: Increase 14 additional deadhead caboose and 57 west empties which moved via south line in actual operation and via north line in redispatched operation, total 71 cars.

(4) Lordsburg-El Paso District: Increase 57 west empties which moved via south line in actual operation and via north line in redispatched operation.

(5) Increase - sum of (1), (2), (3) and (4) in column (c) on sheet 1.

(6) Tucson-Douglas (Through trains only): Decrease account 57 west empties which moved via south line in in actual and via north line in redispatched operation, and 8 loads, 4 empties, which moved on eastward Bisbee Jct. turnaround train in actual operation and on eastward through train in redispatched operation, produce net difference of 49 cars.

(7) Douglas-Bisbee District (Turnaround trains only): Decrease account 33 west empties from Douglas and 20 west empties from Calumet which were moved on turnaround trains in actual operation, and by through trains in redispatched operation, and 8 loads, 4 empties which were moved by an eastward turnaround train in actual operation and by a through eastward train in redispatched operation, total 65 cars.

(8) Douglas-El Paso District: Account 57 west empties which moved via south line in actual operation and north line in redispatched operation.

(9) Average cars per train computed for total south line omitting 48 Douglas - Bisbee Jct. turnaround trains and cars handled by these trains. (Actual 3,171 cars; redispatched 3,106 cars.)

(10) Average cars per train computed for total north and south lines omitting 48 Douglas - Bisbee Jct. turnaround trains and cars handled by these trains. (Actual 3,171 cars, redispatched 3,106 cars.)

Defendant's Exhibit No. 237 (Witness Sines)
Jan. 30, 1941

JAN 30 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

ARRIVAL TIME AT EL PASO, TEXAS, OF FRUIT BLOCKS AND MANIFEST SECTIONS

ACTUAL OPERATION COMPARED WITH REDISPATCHED OPERATION, OBSERVING 70-CAR RESTRICTION

AND USING PRESENT POWER AND SHORT SIDINGS

APRIL 4TH TO MAY 1ST, INCLUSIVE, 1940

SUMMARY

(1) NUMBER OF TRAINS ARRIVING EL PASO - ACTUAL, ...	165
(2) NUMBER OF TRAINS ARRIVING EL PASO - REDISPATCH, ...	165
(3) NUMBER OF BLOCKS AND MANIFEST SECTIONS INVOLVED - ACTUAL, ...	183
REDISPATCH, . .	185
(4) NUMBER OF REDISPATCHED BLOCKS ARRIVING EL PASO:	
(a) AT SAME TIME AS ACTUAL BLOCKS,.	134
(b) IN ADVANCE OF ACTUAL BLOCKS,.	40
(c) LATER THAN ACTUAL BLOCKS, ...	11
(5) TOTAL TIME	
(a) IN ADVANCE OF ACTUAL, ...	38 Hrs. 55 Mins.
(b) LATER THAN ACTUAL,.	8 Hrs. 10 Mins.
(6) AVERAGE TIME OF 40 BLOCKS IN ADVANCE OF ACTUAL, (MINUTES),. . . .	58
(7) AVERAGE TIME OF 11 BLOCKS LATER THAN ACTUAL, (MINUTES),. . . .	45

A = ARIZONA PERISHABLE BLOCK
C = COLTON PERISHABLE BLOCK
Y = YUMA PERISHABLE BLOCK
CY = COLTON OVERFLOW OR YUMA BLOCK ON COLTON SCHEDULE
CYA = SECOND COLTON OVERFLOW OR SECOND YUMA BLOCK ON COLTON SCHEDULE
M = MEXICAN PERISHABLE
SSE = SUNSET EAST MANIFEST

DATE (a)	PERISHABLE BLOCK OR MANIFEST IDENTIFICATION (b)	ACTUAL ARRIVAL EL PASO (c)	PERISHABLE BLOCK OR MANIFEST IDENTIFICATION (d)	REDISPATCHED ARRIVAL EL PASO (e)	OPERATIONS SAME AS ACTUAL (f)	REDISPATCHED IN ADVANCE OF ACTUAL (g)	REDISPATCHED LATER THAN ACTUAL (h)
4-4 -40	A 87	7:35 PM	A 87	7:35 PM	Same		
	A 88	9:30 PM	A 88	9:30 PM	Same		
4-5 -40	CEA 211)		CEA 211)		Same		
	C 212)	7:50 AM	C 212)	7:50 AM	Same		
	C 213	8:00 AM	C 213	8:00 AM	Same		
	C 214	11:55 AM	C 214	11:55 AM	Same		
	CX 214	1:25 PM	CX 214	1:25 PM	Same		
	Y 213	6:40 PM	Y 213	6:40 PM	Same		
	A 89	8:25 PM	A 89	8:25 PM	Same		
	A 90	9:00 PM	A 90	9:00 PM	Same		
4-6 -40	CEA 214	7:30 AM	CEA 214	7:30 AM	Same		
	C 215	7:40 AM	C 215	7:40 AM	Same		
	C 216	8:50 AM	C 216	8:50 AM	Same		
	C 217	12:30 PM	C 217	12:30 PM	Same		
	Y 214	5:00 PM	Y 214	5:00 PM	Same		
	A 91	7:10 PM	A 91	7:10 PM	Same		
4-7- 40	CX 217	5:05 AM	(Part CX 227)				1 Hr. 30 Min
	C 218	10:40 AM	(C 218)	6:35 AM		4 Hr. 05 Min	
	C 219	11:45 AM	(Part CX 227)				3 Hr. 30 Min
			(C 219)	8:15 AM		3 Hr. 30 Min	
		(11:45 AM)	CX 219	8:35 AM		3 Hr. 10 Min	
	C 220	2:15 PM	C 220	2:15 PM	Same		
	Y 215	6:05 PM	Y 215	5:55 PM		10 Min.	
	A 92	8:45 PM	A 92	8:45 PM	Same		
	B 17	9:25 PM	B 17	9:10 PM		15 Min.	
4-8- 40	CX 220	8:25 AM	CX 220	8:25 AM	Same		
	C 221	9:40 AM	C 221	8:35 AM		1 Hr. 05 Min	
	C 222	11:45 AM	C 222	9:40 AM		2 Hr. 05 Min	
	C 223	12:15 PM	C 223	12:15 PM	Same		
	CX 223	1:40 PM	CX 223	1:40 PM	Same		
	Y 216	6:55 PM	Y 216	6:55 PM	Same		
	A 93	7:00 PM	A 93	7:00 PM	Same		
4-9- 40	CEA 223	6:10 AM	CEA 223	6:10 AM	Same		
	C 224	8:15 AM	C 224	6:20 AM		1 Hr. 55 Min	
	C 225	11:15 AM	C 225	7:50 AM		3 Hr. 25 Min.	
	C 226	12:35 PM	C 226	1:15 PM			40 Min.
	A 94	8:00 PM	A 94	8:00 PM	Same		
	Y 217	9:20 PM	Y 217	8:05 PM		1 Hr. 15 Min	
							1 Hr.

	Y 213	[illegible]	[illegible]	[illegible]				
	A 89	8:25 PM	A 89	8:25 PM	Same			
	A 90	9:00 PM	A 90	9:00 PM	Same			
4-6 -40	CHA 214	7:30 AM	CHA 214	7:30 AM	Same			
	C 215	7:40 AM	C 215	7:40 AM	Same			
	C 216	8:50 AM	C 216	8:50 AM	Same			
	C 217	12:30 PM	C 217	12:30 PM	Same			
	Y 214	5:00 PM	Y 214	5:00 PM	Same			
	A 91	7:10 PM	A 91	7:10 PM	Same			
4-7- 40	CX 227	5:05 AM	(Part CX 227	6:35 AM		4 hr. 05 Min	1 Hr. 30 Min	
	C 218	10:40 AM	C 218)					
	C 219	11:45 AM	(Part CX 227	8:15 AM		3 Hr. 30 Min	3 Hr. 10 Min	
		(11:45 AM)	C 219	8:35 AM		3 Hr. 10 Min		
			CX 229					
	C 220	2:15 PM	C 220	2:15 PM	Same			
	Y 215	6:05 PM	Y 215	5:55 PM		10 Min.		
	A 92	8:45 PM	A 92	8:45 PM	Same			
	B 17	9:25 PM	B 17	9:10 PM		15 Min.		
4-8- 40	CX 220	8:25 AM	CX 220	8:25 AM	Same			
	C 221	9:40 AM	C 221	8:35 AM		1 Hr. 05 Min		
	C 222	11:45 AM	C 222	9:40 AM		2 Hr. 05 Min		
	C 223	12:15 PM	C 223	12:15 PM	Same			
	CX 223	1:40 PM	CX 223	1:40 PM	Same			
	Y 216	6:55 PM	Y 216	6:55 PM	Same			
	A 93	7:00 PM	A 93	7:00 PM	Same			
4-9- 40	CHA 225	6:10 AM	CHA 225	6:10 AM	Same			
	C 224	8:15 AM	C 224	6:20 AM		1 Hr. 55 Min		
	C 225	11:15 AM	C 225	7:50 AM		3 Hr. 25 Min		
	C 226	12:35 PM	C 226	1:15 PM			40 Min.	
	A 94	8:00 PM	A 94	8:00 PM	Same			
	Y 217	9:20 PM	Y 217	8:05 PM		1 Hr. 15 Min		
4-10-40	CX 226	6:00 AM	CX 226	7:00 AM			1 Hr.	
	C 227	7:45 AM	C 227	7:35 AM		10 Min.		
	Y 218		Y 218		Same			
	A 95	7:25 PM	A 95	7:25 PM	Same			
4-11-40	B 18	1:10 AM	B 18	1:10 AM	Same			
	CX 227	7:00 AM	CX 227	7:00 AM	Same			
	C 228	7:05 AM	C 228	7:05 AM	Same			
	C 229	8:40 AM	C 229	8:40 AM	Same			
	C 230	9:55 AM	C 230	9:55 AM	Same			
	Y 219	6:40 PM	Y 219	6:40 PM	Same			
	A 96	6:55 PM	A 96	6:55 PM	Same			

DATE (a)	PREDICABLE BLOCK OR MANIFEST IDENTIFICATION (b)	ACTUAL ARRIVAL EL PASO (c)	PREDICABLE BLOCK OR MANIFEST IDENTIFICATION (d)	REDISPATCHED ARRIVAL EL PASO (e)	OPERATIONS SAME AS ACTUAL (f)	REDISPATCHED IN ADVANCE OF ACTUAL (g)	REDISPATCHED LATER THAN ACTUAL (h)
4-13-40	CX 230	8:45 AM	CX 230	8:45 AM	Same		
	C 231	8:50 AM	C 231	8:50 AM	Same		
	C 232	10:10 AM	C 232	10:10 AM	Same		
	CX 232	11:25 AM	CX 232	11:40 AM			15 Min.
	C 233	1:00 PM	C 233	12:20 PM		40 Min.	
	Y 220	6:50 PM	Y 220	6:50 PM	Same		
	A 97	7:25 PM	A 97	7:25 PM	Same		
4-13-40	C 234	6:40 AM	C 234	6:40 AM	Same		
	CX 233	7:50 AM	CX 233	7:50 AM	Same		
	C 235	8:25 AM	C 235	8:25 AM	Same		
	CX 235	8:30 AM	CX 235	8:30 AM	Same		
	C 236	12:40 PM	C 236	12:40 PM	Same		
	Y 221	6:15 PM	Y 221	6:15 PM	Same		
	A 98	6:45 PM	A 98	6:45 PM	Same		
4-14-40	Part CX 236) C 237)	5:55 AM	Part CX 236) C 237)	5:05 AM		50 Min. 50 Min.	
	Part CX 236) C 238)	7:25 AM	Part CX 236) C 238)	7:10 AM		15 Min. 15 Min.	
	CX 238	8:15 AM	CX 238	7:35 AM		40 Min.	
	C 239	2:25 PM	C 239	1:55 PM		30 Min.	
	Y 222	7:00 PM	Y 222	7:05 PM			05 Min.
	A 99	7:30 PM	A 99	7:30 PM	Same		
4-15-40	Part CX 239) C 240)	6:55 AM	Part CX 239) C 240)	6:55 AM	Same Same		
	Part CX 239) CX 240)	7:45 AM	Part CX 239) CX 240)	7:45 AM	Same Same		
	C 241	8:10 AM	C 241	8:10 AM	Same		
	C 242	8:40 AM	C 242	8:40 AM	Same		
	CX 242	11:20 AM	CX 242	11:20 AM	Same		
	Y 223	6:45 PM	Y 223	6:45 PM	Same		
	A 100	7:20 PM	A 100	7:20 PM	Same		
4-16-40	Part CXA 242) C 243)	7:40 AM	Part CXA 242) C 243)	7:20 AM		20 Min. 20 Min.	
	Part CXA 242) C 244)	11:15 AM	Part CXA 242) C 244)	11:15 AM	Same Same		
	CX 244	11:50 AM	CX 244	11:50 AM	Same		
	C 245	12:15 PM	C 245	12:15 PM	Same		
	Y 224) CX 245)	1:15 PM	Y 224) CX 245)	1:15 PM	Same Same		
	SHE 4-14	5:15 PM	SHE 4-14	5:15 PM	Same		
	[illegible]	7:20 PM	A 101	7:10 PM	Same		

	CX 233	7:50 AM	CX 233	7:50 AM	Same		
	C 235	8:25 AM	C 235	8:25 AM	Same		
	CX 235	8:30 AM	CX 235	8:30 AM	Same		
	C 236	12:40 PM	C 236	12:40 PM	Same		
	Y 221	6:15 PM	Y 221	6:15 PM	Same		
	A 98	6:45 PM	A 98	6:45 PM	Same		
4-14-40	Part CX 236) C 237)	5:55 AM	Part CX 236) C 237)	5:05 AM		50 Min. 50 Min.	
	Part CX 236) C 238)	7:25 AM	Part CX 236) C 238)	7:10 AM		15 Min. 15 Min.	
	CX 238	8:15 AM	CX 238	7:35 AM		40 Min.	
	C 239	2:25 PM	C 239	1:55 PM		30 Min.	
	Y 222	7:00 PM	Y 222	7:05 PM			05 Min.
	A 99	7:30 PM	A 99	7:30 PM	Same		
4-15-40	Part CX 239) C 240)	6:55 AM	Part CX 239) C 240)	6:55 AM	Same Same		
	Part CX 239) CX 240)	7:45 AM	Part CX 239) CX 240)	7:45 AM	Same Same		
	C 241	8:10 AM	C 241	8:10 AM	Same		
	C 242	8:40 AM	C 242	8:40 AM	Same		
	CX 242	11:20 AM	CX 242	11:20 AM	Same		
	Y 223	6:45 PM	Y 223	6:45 PM	Same		
	A 100	7:20 PM	A 100	7:20 PM	Same		
4-16-40	Part CXA 242) C 243)	7:40 AM	Part CXA 242) C 243)	7:20 AM		20 Min. 20 Min.	
	Part CXA 242) C 244)	11:15 AM	Part CXA 242) C 244)	11:15 AM	Same Same		
	CX 244	11:50 AM	CX 244	11:50 AM	Same		
	C 245	12:15 PM	C 245	12:15 PM	Same		
	Y 224) CX 245)	1:15 PM	Y 224) CX 245)	1:15 PM	Same Same		
	BBB 4-14	5:15 PM	BBB 4-14	5:15 PM	Same		
	A 101	7:30 PM	A 101	7:30 PM	Same		
4-17-40	C 246	8:25 AM	C 246	8:25 AM	Same		
	C 247	9:45 AM	C 247	9:45 AM	Same		
	Y 225	6:00 PM	Y 225	6:00 PM	Same		
	A 102	8:25 PM	A 102	8:25 PM	Same		
4-18-40	CX 247	5:30 AM	CX 247	5:40 AM			10 Min.
	C 248	5:55 AM	C 248	6:10 AM			15 Min.
	C 249	7:05 AM	C 249	8:00 AM			55 Min.
	C 250	20:55 AM	C 250	20:40 AM		15 Min.	

32332

Date (a)	Preliminary block or earliest identification (b)	Actual arrival El Paso (c)	Preliminary block or earliest identification (d)	Scheduled arrival El Paso (e)	Operations same as actual (f)	Registered in advance of actual (g)	Registered later than actual (h)
4-10-40	Y 226	5:35 PM	Y 226	5:15 PM		20 Min.	
	A 203	7:40 PM	A 203	7:30 PM		20 Min.	
4-20-40	C 251 Part CZ 250	5:50 AM	C 251 Part CZ 250	5:55 AM			05 Min. 05 Min.
	Part CZ 250 C 252	6:40 AM	Part CZ 250 C 252	6:40 AM	Same Same		
	CZ 252	7:10 AM	CZ 252	7:10 AM	Same		
	C 253	11:20 AM	C 253	11:20 AM	Same		
	Y 227	5:20 PM	Y 227	5:20 PM	Same		
	A 204	9:20 PM	A 204	9:20 PM	Same		
4-21-40	Part CZ 253 C 254	5:30 AM	Part CZ 253 C 254	5:30 AM	Same Same		
	Part CZ 253 C 255	7:00 AM	Part CZ 253 C 255	7:00 AM	Same Same		
	C 256	8:10 AM	C 256	8:10 AM	Same		
	CZ 256	10:25 AM	CZ 256	10:25 AM	Same		
	Y 228	6:05 PM	Y 228	6:05 PM	Same		
	A 205	6:45 PM	A 205	6:45 PM	Same		
4-22-40	Part CZA 256 C 257	5:35 AM	Part CZA 256 C 257	5:35 AM	Same Same		
	Part CZA 256 C 258	6:20 AM	Part CZA 256 C 258	6:20 AM	Same Same		
	CZ 258	6:25 AM	CZ 258	6:25 AM	Same		
	C 259	9:45 AM	C 259	9:45 AM	Same		
	CZ 259	11:20 AM	CZ 259	11:20 AM	Same		
	Y 229	7:10 PM	Y 229	6:50 PM		20 Min.	
	A 206	8:20 PM	A 206	7:55 PM		25 Min.	
4-23-40	CZA 259	3:30 AM	CZA 259	3:30 AM	Same		
	C 260	5:50 AM	C 260	5:50 AM	Same		
	C 261	7:00 AM	C 261	6:40 AM		20 Min.	
	C 262	8:05 AM	C 262	8:05 AM	Same		
	CZ 262	9:35 AM	CZ 262	9:35 AM	Same		
	Y 230	6:10 PM	Y 230	6:10 PM	Same		
	A 207	6:15 PM	A 207	6:15 PM	Same		
4-23-40	Part C 264 C 263	8:30 AM	Part C 264 C 263	8:30 AM	Same Same		
	Part C 264 CZA 262	11:40 AM	Part C 264 CZA 262	11:40 AM	Same Same		
	C 265	12:35 PM	C 265	12:35 PM	Same		
	CZ 265	12:40 PM	CZ 265	12:40 PM	Same		
	A 208 Y 231	8:25 PM	A 208 Y 231	8:25 PM	Same Same		
4-24-40	C 266	5:15 AM	C 266	5:15 AM	Same		
	CZ 266	5:55 AM	CZ 266	5:55 AM	Same		

	Y 227	5:20 PM	Y 227	5:20 PM	Same		
	A 204	9:20 PM	A 204	9:20 PM	Same		
4-20-40	Part GZ 253) C 254)	5:30 AM	Part GZ 253 C 254	5:30 AM	Same Same		
	Part GZ 253) C 255)	7:00 AM	Part GZ 253) C 255)	7:00 AM	Same Same		
	C 256	8:20 AM	C 256	8:20 AM	Same		
	GZ 256	10:25 AM	GZ 256	10:25 AM	Same		
	Y 228	6:05 PM	Y 228	6:05 PM	Same		
	A 205	6:45 PM	A 205	6:45 PM	Same		
4-21-40	Part CZA 256) C 257)	5:35 AM	Part CZA 256) C 257)	5:35 AM	Same Same		
	Part CZA 256) C 258)	6:20 AM	Part CZA 256) C 258)	6:20 AM	Same Same		
	GZ 258	6:25 AM	GZ 258	6:25 AM	Same		
	C 259	9:45 AM	C 259	9:45 AM	Same		
	GZ 259	11:20 AM	GZ 259	11:20 AM	Same		
	Y 229	7:10 PM	Y 229	6:50 PM		20 Min.	
	A 206	8:20 PM	A 206	7:55 PM		25 Min.	
4-22-40	CZA 259	3:30 AM	CZA 259	3:30 AM	Same		
	C 260	5:50 AM	C 260	5:50 AM	Same		
	C 261	7:00 AM	C 261	6:40 AM		20 Min.	
	C 262	8:05 AM	C 262	8:05 AM	Same		
	GZ 262	9:35 AM	GZ 262	9:35 AM	Same		
	Y 230	6:10 PM	Y 230	6:10 PM	Same		
	A 207	6:15 PM	A 207	6:15 PM	Same		
4-23-40	Part C 264) C 263)	8:30 AM	Part C 264) C 263)	8:30 AM	Same Same		
	Part C 264) CZA 262)	11:40 AM	Part C 264) CZA 262)	11:40 AM	Same Same		
	C 265	12:35 PM	C 265	12:35 PM	Same		
	GZ 265	12:40 PM	GZ 265	12:40 PM	Same		
	A 208) Y 231)	8:25 PM	A 208) Y 231)	8:25 PM	Same Same		
4-24-40	C 266	5:15 AM	C 266	5:15 AM	Same		
	GZ 266	5:55 AM	GZ 266	5:55 AM	Same		
	C 267	10:35 AM	C 267	10:15 AM		20 Min.	
	Y 232	6:20 PM	Y 232	6:10 PM	Same		
4-25-40	GZ 267	6:30 AM	GZ 267	6:30 AM	Same		
	C 268	6:45 AM	C 268	6:45 AM	Same		
	C 269	8:50 AM	C 269	7:40 AM		1 Hr. 10 Min	
	GZ 269	9:30 AM	GZ 269	9:30 AM	Same		

DATE (a)	PERISHABLE BLOCK OR MANIFEST IDENTIFICATION (b)	ACTUAL ARRIVAL EL PASO (c)	PERISHABLE BLOCK OR MANIFEST IDENTIFICATION (d)	REDISPATCHED ARRIVAL EL PASO (e)	OPERATIONS SAME AS ACTUAL (f)	REDISPATCHED IN ADVANCE OF ACTUAL (g)	REDISPATCHED LATER THAN ACTUAL (h)
4-25-40	Y 233	5:20 PM	Y 233	5:20 PM	Same		
	M 29	7:30 PM	M 29	7:30 PM	Same		
4-26-40	C 270	6:20 AM	C 270	6:20 AM	Same		
	CYA 269	8:55 AM	CYA 269	7:25 AM		1 Hr. 30 Min	
	C 271	9:15 AM	C 271	8:50 AM		25 Min.	
	CY 271	10:45 AM	CY 271	9:40 AM		1 Hr. 05 Min	
	C 272	10:55 AM	C 272	10:55 AM	Same		
	CY 272	11:20 AM	CY 272	11:00 AM		20 Min.	
	Y 235	7:30 PM	Y 235	7:30 PM	Same		
	Y 234	7:40 PM	Y 234	7:40 PM	Same		
4-27-40	CYA 272	5:10 AM	CYA 272	4:10 AM		60 Min.	
	C 273	7:30 AM	C 273	7:30 AM	Same		
	C 274	7:40 AM	C 274	7:40 AM	Same		
	CY 274	10:25 AM	CY 274	10:25 AM	Same		
	C 275	10:50 AM	C 275	10:50 AM	Same		
	CY 275	11:10 AM	CY 275	11:00 AM		10 Min.	
	Y 236	6:20 PM	Y 236	5:40 PM		40 Min.	
	Y 237	6:35 PM	Y 237	5:55 PM		40 Min.	
4-28-40	CYA 275	6:15 AM	CYA 275	6:15 AM	Same		
	C 276	6:45 AM	C 276	6:45 AM	Same		
	C 277	8:55 AM	C 277	8:55 AM	Same		
	C 278	11:05 AM	C 278	10:35 AM		30 Min.	
	CY 278	11:35 AM	CY 278	1.:35 AM	Same		
	Y 238	5:15 PM	Y 238	5:15 PM	Same		
	M 20	7:05 PM	M 20	7:05 PM	Same		
4-29-40	CYA 278	4:40 AM	CYA 278	4:40 AM	Same		
	C 279	5:20 AM	C 279	5:20 AM	Same		
	C 280	6:10 AM	C 280	6:10 AM	Same		
	C 281	10 35 AM	C 281	8:40 AM		1 Hr. 55 Min	
	CY 281	10:50 AM	CY 281	9:30 AM		1 Hr. 20 Min	
	Y 239	5:50 PM	Y 239	5:50 PM	Same		
4-30-40	CYA 281	3:55 AM	CYA 281	3:55 AM	Same		
	C 282	5:55 AM	C 282	5:40 AM		15 Min.	
	C 283	7:10 AM	C 283	7:10 AM	Same		
	CY 283	7:30 AM	[illegible]283	7:30 AM	Same		
	Y 240	6:45 PM	Y 240	6:45 PM	Same		
5-1 -40	CYA 283	5:00 AM	CYA 283	5:00 AM	Same		

Defendant's Exhibit No. 238 (Witness Sines)
Jan. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

ARRIVAL TIME AT YUMA, ARIZONA
OF "SSW" AND "GBW" WESTWARD MANIFEST TRAINS
ACTUAL OPERATION COMPARED WITH REDISPATCHED
OPERATION, OBSERVING 70-CAR RESTRICTION AND
USING PRESENT POWER AND SHORT SIDINGS.

MONTH OF APRIL, 1940

(1)	NUMBER OF TRAINS ARRIVING YUMA - ACTUAL,	89
(2)	NUMBER OF TRAINS ARRIVING YUMA - REDISPATCHED,	89
(3)	NUMBER OF BLOCKS AND MANIFSST SECTIONS INVOLVED,	96
(4)	NUMBER OF REDISPATCHED BLOCKS ARRIVING YUMA -	
	(a) AT SAME TIME AS ACTUAL BLOCKS,	82
	(b) IN ADVANCE OF ACTUAL BLOCKS,	8
	(c) LATER THAN ACTUAL BLOCKS,	6
(5)	TOTAL TIME -	
	(a) IN ADVANCE OF ACTUAL,	4 HOURS 10 MINUTES
	(b) LATER THAN ACTUAL,	1 HOUR 15 MINUTES
(6)	AVERAGE TIME OF 8 BLOCKS IN ADVANCE OF ACTUAL,	31 MINUTES
(7)	AVERAGE TIME OF 6 BLOCKS LATER THAN ACTUAL,	13 MINUTES

SSW = SUNSET WEST MANIFEST

GBW = GOLD BALL WEST MANIFEST

APRIL 1940

DATE (a)	MANIFEST IDENTIFICATION (b)	ACTUAL ARRIVAL TIME (c)	MANIFEST IDENTIFICATION (d)	REDISPATCHED ARRIVAL TIME (e)	REDISPATCHED IN ADVANCE OF ACTUAL (f)	REDISPATCHED LATER THAN ACTUAL (g)	REDISPATCHED SAME AS ACTUAL (h)
5	[redacted] 4	3:45 AM	[redacted] 4	3:45 AM			
	[redacted] 1-3	5:45 AM	[redacted] 1-3	5:45 AM			
	[redacted] 2-3	6:20 AM	[redacted] 2-3	6:20 AM			
	[redacted] 3-3	20:45 AM	[redacted] 3-3	20:45 AM			
6	[redacted] 5	6:20 AM	[redacted] 5	6:20 AM			
	[redacted] 1-4	6:35 AM	[redacted] 1-4	6:35 AM			
	[redacted] 2-4	7:15 AM	[redacted] 2-4	7:15 AM			
	[redacted] 3-4	20:35 AM	[redacted] 3-4	20:35 AM			
7	[redacted] 6	6:30 AM	[redacted] 6	6:30 AM			
	[redacted] 1-5	6:40 AM	[redacted] 1-5	6:40 AM			
	[redacted] 2-5	9:00 AM	[redacted] 2-5	9:00 AM			
8	[redacted] 7	6:00 AM	[redacted] 7	5:30 AM	30 Mins.		
	[redacted] 1-6	7:35 AM	[redacted] 1-6	7:35 AM			
	[redacted] 2-6	9:15 AM	[redacted] 2-6	9:15 AM			
	[redacted] 3-6	9:25 AM	[redacted] 3-6	9:25 AM			
9	[redacted] 1-8	4:25 AM	[redacted] 1-8	4:00 AM	25 Mins.		
	[redacted] 1-7	5:45 AM	[redacted] 1-7	5:55 AM		10 Mins.	
	[redacted] 2-7	20:45 AM	[redacted] 2-7	9:45 AM	60 Mins.		
	[redacted] 2-8		[redacted] 2-8		20 Mins.		
	[redacted] 3-7	11:55 AM	[redacted] 3-7	11:35 AM	20 Mins.		
10	[redacted] 9	2:55 AM	[redacted] 9	2:55 AM			
	[redacted] 1-8	5:35 AM	[redacted] 1-8	5:45 AM		10 Mins.	
	[redacted] 2-8	6:40 AM	[redacted] 2-8	6:40 AM			
	[redacted] 3-8	8:10 AM	[redacted] 3-8	7:50 AM	20 Mins.		
11	[redacted] 10		[redacted] 10				
	[redacted] 1-9	5:05 AM	[redacted] 1-9	5:05 AM			
	[redacted] 2-9	6:20 AM	[redacted] 2-9	6:20 AM			
	[redacted] 3-9	7:20 AM	[redacted] 3-9	7:20 AM			
12	[redacted] 11	3:30 AM	[redacted] 11	3:30 AM			
	[redacted] 1-10	6:20 AM	[redacted] 1-10	6:20 AM			
	[redacted] 2-10	7:30 AM	[redacted] 2-10	7:30 AM			
13	[redacted] 12	6:20 AM	[redacted] 12	6:20 AM			
	[redacted] 1-11	8:15 AM	[redacted] 1-11	8:15 AM			
	[redacted] 2-11	9:55 AM	[redacted] 2-11	9:55 AM			
14	[redacted] 13	3:45 AM	[redacted] 13	3:45 AM			
	[redacted] 1-12	5:20 AM	[redacted] 1-12	5:20 AM			
	[redacted] 2-12	6:25 AM	[redacted] 2-12	6:25 AM			
15	[redacted] 14		[redacted] 14				
	[redacted] 1-13	5:40 AM	[redacted] 1-13	5:40 AM			
	[redacted] 2-13	6:50 AM	[redacted] 2-13	6:50 AM			
	[redacted] 3-13	7:25 AM	[redacted] 3-13	7:25 AM			
16	[redacted] 15		[redacted] 15				
	[redacted] 1-14	5:45 AM	[redacted] 1-14	5:45 AM			
	[redacted] 2-14	6:15 AM	[redacted] 2-14	6:15 AM			
	[redacted] 3-14	6:45 AM	[redacted] 3-14	6:45 AM			
	[redacted] 4-14	9:05 AM	[redacted] 4-14	9:05 AM			
17	[redacted] 16	5:40 AM	[redacted] 16	5:40 AM			
	[redacted] 1-15	8:25 AM	[redacted] 1-15	8:25 AM			
	[redacted] 2-15	9:40 AM	[redacted] 2-15	9:45 AM		5 Mins.	
18	[redacted] 17	4:15 AM	[redacted] 17	4:15 AM			
	[redacted] 1-16	6:05 AM	[redacted] 1-16	6:05 AM			
	[redacted] 2-16	9:30 AM	[redacted] 2-16	9:45 AM		15 Mins.	
20	[redacted] 18	3:20 AM	[redacted] 18	3:35 AM		15 Mins.	
	[redacted] 1-17	6:00 AM	[redacted] 1-17	6:00 AM			
	[redacted] 2-17	9:35 AM	[redacted] 2-17	9:35 AM			

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APRIL 1940

DATE (a)	MANIFEST IDENTIFICATION (b)	ACTUAL ARRIVAL TUBA (c)	MANIFEST IDENTIFICATION (d)	REDISPATCHED ARRIVAL TUBA (e)	REDISPATCHED IN ADVANCE OF ACTUAL (f)	REDISPATCHED LATER THAN ACTUAL (g)	REDISPATCHED SAME AS ACTUAL (h)
20	SSW 19		SSW 19				Same
	GSW 1-18	6:00 AM	GSW 1-18	6:00 AM			Same
	GSW 2-18	6:50 AM	GSW 2-18	6:50 AM			Same
	GSW 3-18	7:50 AM	GSW 3-18	7:50 AM			Same
	GSW 4-18	10:00 AM	GSW 4-18	10:00 AM			Same
21	SSW 20	4:10 AM	SSW 20	4:10 AM			Same
	GSW 1-19	5:10 AM	GSW 1-19	5:10 AM			Same
	GSW 2-19	9:05 AM	GSW 2-19	9:05 AM			Same
22	SSW 1-21	2:30 AM	SSW 1-21	2:30 AM			Same
	GSW 1-20	5:30 AM	GSW 1-20	5:30 AM			Same
	GSW 2-20	8:15 AM	GSW 2-20	8:15 AM			Same
	SSW 2-21	1:30 PM	SSW 2-21	1:50 PM		20 Mins.	
23	SSW 22	2:35 AM	SSW 22	2:35 AM			Same
	GSW 1-21	7:55 AM	GSW 1-21	7:55 AM			Same
	GSW 2-21	9:35 AM	GSW 2-21	9:35 AM			Same
24	SSW 23	4:05 AM	SSW 23	4:05 AM			Same
	GSW 1-22	6:10 AM	GSW 1-22	6:10 AM			Same
	GSW 2-22	6:55 AM	GSW 2-22	6:55 AM			Same
	GSW 3-22	7:35 AM	GSW 3-22	7:35 AM			Same
25	SSW 24	3:25 AM	SSW 24	3:25 AM			Same
	GSW 1-23	5:45 AM	GSW 1-23	5:45 AM			Same
	GSW 2-23	7:05 AM	GSW 2-23	7:05 AM			Same
26	SSW 1-25	5:40 AM	SSW 1-25	5:40 AM			Same
	GSW 1-24	6:00 AM	GSW 1-24	6:00 AM			Same
	SSW 2-25		SSW 2-25				Same
	GSW 2-24	7:30 AM	GSW 2-24	7:30 AM			Same
27	SSW 26		SSW 26				Same
	GSW 1-25	5:50 AM	GSW 1-25	5:50 AM			Same
	GSW 2-25	6:00 AM	GSW 2-25	6:00 AM			Same
	GSW 3-25	7:20 AM	GSW 3-25	7:20 AM			Same
28	SSW 27	4:35 AM	SSW 27	3:30 AM	.65 Mins.		
	GSW 1-26	6:20 AM	GSW 1-26	6:20 AM			Same
	GSW 2-26	6:50 AM	GSW 2-26	6:40 AM	10 Mins.		
29	SSW 1-28	3:10 AM	SSW 1-28	3:10 AM			Same
	GSW 1-27	5:45 AM	GSW 1-27	5:45 AM			Same
	GSW 2-27	7:05 AM	GSW 2-27	7:05 AM			Same
	SSW 2-28	9:10 AM	SSW 2-28	9:10 AM			Same
30	SSW 1-29	5:50 AM	SSW 1-29	5:50 AM			Same
	GSW 1-28	6:20 AM	GSW 1-28	6:20 AM			Same
	GSW 2-28	7:55 AM	GSW 2-28	7:55 AM			Same
	SSW 2-29	9:00 AM	SSW 2-29	9:00 AM			Same

Defendant's Exhibit No. 239 (Witness Sines)
Jan. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY WAGE DATA,
YUMA, ARIZONA TO EL PASO, TEXAS
FOR PERIOD APRIL 6 TO APRIL 30, 1940.
ACTUAL OPERATION COMPARED WITH REDISPATCHED OPERATION
OBSERVING 70 CAR RESTRICTION AND USING PRESENT POWER AND SHORT SIDINGS

	NO. OF TRAINS	TRAIN MILES	TRAINMEN'S WAGES			LOCOMOTIVE MILES	ENGINEMEN'S WAGES			TOTAL WAGES		
			BASIC	VARIABLE	TOTAL		BASIC	VARIABLE	TOTAL	BASIC	VARIABLE	TOTAL
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
NORTH LINE												
(1) YUMA - GILA												
REDISPATCHED	309	49,077	$13,439.66	$1,145.62	$14,585.28	54,222	$ 8,772.06	$ 949.22	$ 9,721.28	$ 22,211.72	$ 2,094.84	$ 24,306.56
ACTUAL	377	48,371	12,335.33	1,098.81	13,415.84	49,155	7,946.33	896.93	8,843.26	20,279.66	1,979.44	22,259.10
INCREASE FOR PERIOD	32	8,708	1,104.33	63.12	1,169.44	5,067	825.73	52.29	878.02	1,932.06	115.40	2,047.46
(2) GILA - TUCSON												
REDISPATCHED	406	51,568	13,980.34	1,222.85	15,173.22	61,449	10,449.78	988.76	11,438.54	24,400.12	2,211.64	26,611.76
ACTUAL	362	46,766	12,984.75	1,156.28	14,141.03	56,757	9,795.30	934.91	10,730.21	22,780.05	2,091.19	24,871.24
INCREASE FOR PERIOD	22	2,816	995.59	66.60	1,062.19	4,692	654.48	53.85	708.33	1,620.07	120.45	1,740.52
(3) TUCSON - LORDSBURG												
REDISPATCHED	435	70,529	20,747.19	908.67	21,655.86	101,664	17,173.39	1,076.03	18,249.42	37,920.58	1,984.70	39,905.28
ACTUAL	413	67,318	19,559.30	868.54	20,427.84	96,708	16,718.63	1,088.51	17,747.14	36,277.93	1,957.05	38,174.98
INCREASE FOR PERIOD	20	3,211	1,187.89	40.13	1,228.02	2,968	454.76	47.52	502.28	1,642.65	87.65	1,730.30
(4) LORDSBURG-EL PASO (Through trains only)												
REDISPATCHED	378	56,134	15,169.73	1,887.90	15,057.63	56,365	9,070.15	1,236.74	10,306.89	22,239.88	3,124.64	25,364.52
ACTUAL	378	56,134	15,169.73	1,887.90	15,057.63	56,365	9,070.15	1,236.74	10,306.89	22,239.88	3,124.64	25,364.52
INCREASE FOR PERIOD	-	-	-	-	-	-	-	-	-	-	-	-
(5) TOTAL NORTH LINE												
REDISPATCHED	1,614	227,328	61,306.92	5,160.09	66,471.99	273,700	45,465.38	4,250.75	49,716.13	106,772.30	9,415.82	116,188.12
ACTUAL	1,550	218,589	58,047.11	4,986.23	63,042.34	260,979	43,530.41	4,097.09	47,627.50	101,577.52	9,092.52	110,669.84
INCREASE FOR PERIOD	64	8,733	3,259.81	169.86	3,429.65	12,721	1,934.97	153.66	2,088.63	5,194.78	323.30	5,518.08
SOUTH LINE												
(6) TUCSON - DOUGLAS												
REDISPATCHED	71	8,613	2,598.48	356.87	2,955.35	9,613	1,786.80	390.42	2,176.62	4,384.68	747.29	5,131.97
ACTUAL	71	8,613	2,598.48	356.87	2,955.35	9,613	1,786.80	390.42	2,176.62	4,384.68	747.29	5,131.97
INCREASE FOR PERIOD	-	-	-	-	-	-	-	-	-	-	-	-
(7) DOUGLAS - SIBBEE JUNCTION												
REDISPATCHED	48	1,050	625.94	54.83	680.77	1,050	349.22	42.71	391.93	975.16	97.54	1,072.70
ACTUAL	48	1,050	625.94	54.83	680.77	1,050	349.22	42.71	391.93	975.16	97.54	1,072.70
INCREAS FOR PERIOD	-	-	-	-	-	-	-	-	-	-	-	-
(8) DOUGLAS - EL PASO												
REDISPATCHED	57	12,426	3,068.55	250.32	3,318.87	12,644	2,202.25	178.13	2,380.38	5,270.80	428.45	5,699.25
ACTUAL	59	12,426	3,077.39	250.32	3,327.71	12,644	2,202.25	178.13	2,380.38	5,279.64	428.45	5,708.09
INCREASE FOR PERIOD	-	-	8.84	-	8.84	-	-	-	-	8.84	-	8.84
(9) TOTAL SOUTH LINE												
REDISPATCHED	176	22,279	6,292.97	662.02	6,954.99	23,307	4,337.67	611.26	4,948.93	10,630.64	1,273.28	11,903.92
ACTUAL	178	22,279	6,301.81	662.02	6,963.83	23,307	4,337.67	611.26	4,948.93	10,639.48	1,273.28	11,912.76
INCREASE FOR PERIOD	-	-	8.84	-	8.84	-	-	-	-	8.84	-	8.84
(10) SUMMARY												
REDISPATCHED	1,790	249,601	67,599.89	5,827.79	73,426.98	297,007	49,803.05	4,862.01	54,665.06	117,402.94	10,689.10	128,092.04
ACTUAL	1,728	240,868	64,349.92	5,657.25	70,008.17	284,286	47,868.08	4,708.35	52,576.43	112,217.00	10,365.60	122,582.60
INCREASE FOR PERIOD	64	8,733	3,250.97	169.84	3,420.81	12,721	1,934.97	153.66	2,088.63	5,185.94	323.50	5,509.44
(11) Railroad Retirement and Unemployment Insurance Tax; 5.94% Trainmen, 5.73% Engineers					205.80				119.68			325.48
(12) GRAND TOTAL					3,626.61				2,208.31			5,834.92

Defendant's Exhibit No. 240 (Witness Sines)
Jan. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

MAIN LINE FREIGHT TRAINS OF VARIOUS LENGTHS
OPERATED BETWEEN YUMA, ARIZONA AND EL PASO, TEXAS
VIA GILA, ARIZONA, AND LORDSBURG, NEW MEXICO, AND
VIA DOUGLAS, ARIZONA, OVER SOUTH LINE
DURING PERIOD APRIL 4TH TO APRIL 30TH, 1940, INCLUSIVE
ACTUAL OPERATION COMPARED WITH REDISPATCHED OPERATION,
WITH NO RESTRICTIONS AND USING AC POWER AND LONG SIDINGS.

		ACTUAL										REDISPATCH									
		50 AND LESS (a)	51 TO 60 (b)	61 TO 70 (c)	71 TO 80 (d)	81 TO 90 (e)	91 TO 100 (f)	101 TO 110 (g)	111 TO 120 (h)	121 TO 130 (i)	TOTAL (j)	50 AND LESS (k)	51 TO 60 (l)	61 TO 70 (m)	71 TO 80 (n)	81 TO 90 (o)	91 TO 100 (p)	101 TO 110 (q)	111 TO 120 (r)	121 TO 130 (s)	TOTAL (t)
YUMA - GILA (123 Miles)	EAST	6	20	137	7	4	1	-	-	-	175	6	9	23	18	24	33	17	3	1	134
	WEST	2	34	89	13	19	45	-	-	-	202	1	4	25	18	51	25	14	6	18	162
	TOTAL	8	54	226	20	23	46	-	-	-	377	7	13	48	36	75	58	31	9	19	296
PER CENT OF TOTAL		2.12	14.32	59.95	5.31	6.10	12.20	-	-	-	100	2.37	4.39	16.21	12.16	25.34	19.60	10.47	3.04	6.42	100
GILA - TUCSON (128 Miles)	EAST	10	18	135	11	4	1	-	-	-	179	6	10	14	22	20	42	17	2	1	134
	WEST	3	24	106	6	25	41	-	-	-	203	1	2	16	19	65	25	7	9	17	161
	TOTAL	13	42	239	17	29	42	-	-	-	382	7	12	30	41	85	67	24	11	18	295
PER CENT OF TOTAL		3.40	11.00	62.56	4.45	7.59	11.00	-	-	-	100	2.37	4.07	10.17	13.90	28.81	22.71	8.14	3.73	6.10	100
TUCSON - LORDSBURG (164 Miles East) (163 Miles West)	EAST	16	31	144	6	1	-	-	-	-	198	14	20	22	12	22	25	34	2	-	151
	WEST	21	54	40	#37	58	5	-	-	-	215	1	1	14	42	36	15	12	13	26	160
	TOTAL	37	85	184	#43	59	5	-	-	-	413	15	21	36	54	58	40	46	15	26	311
PER CENT OF TOTAL		8.96	20.58	44.55	10.41	14.29	1.21	-	-	-	100	4.82	6.75	11.58	17.37	18.65	12.86	14.79	4.82	8.36	100
LORDSBURG - EL PASO (148 Miles East) (149 Miles West)	EAST	23	26	112	8	8	10	1	-	-	188	36	13	22	11	19	26	32	6	-	165
	WEST	2	34	72	4	4	70	4	-	-	190	-	5	29	15	45	25	12	9	29	169
	TOTAL	25	60	184	12	12	80	5	-	-	378	36	18	51	26	64	51	44	15	29	334
PER CENT OF TOTAL		6.61	15.87	48.68	3.17	3.18	21.17	1.32	-	-	100	10.78	5.39	15.27	7.79	19.16	15.27	13.17	4.49	8.68	100
GRAND TOTAL YUMA - EL PASO		83	241	833	#92	123	173	5	-	-	1,550	65	64	165	157	282	216	145	50	92	1,236

RECAPITULATION

TOTAL TRAINS OVER 70 CARS	393	25.35%
TOTAL TRAINS 70 CARS AND UNDER	1,157	74.65%
TOTAL TRAINS	1,550	100.00%

One train departed Lordsburg with 71 cars; reduced to 70 cars at State Line.

RECAPITULATION

TOTAL TRAINS OVER 70 CARS	942	76.21%
TOTAL TRAINS 70 CARS AND UNDER	294	23.79%
TOTAL TRAINS	1,236	100.00%

TUCSON - DOUGLAS (125 Miles East) (124 Miles West)	EAST	15	5	14	1	-	-	-	-	-	35	15	5	14	1	-	-	-	-	-	35
	WEST	5	4	23	2	2	-	-	-	-	36	5	4	23	2	2	-	-	-	-	36
	TOTAL	20	9	37	3	2	-	-	-	-	71	20	9	37	3	2	-	-	-	-	71
PER CENT OF TOTAL		28.16	12.68	52.11	4.23	2.82	-	-	-	-	100	28.16	12.68	52.11	4.23	2.82	-	-	-	-	
DOUGLAS - EL PASO (217 Miles East) (216 Miles West)	EAST	24	2	1	-	-	-	-	-	-	29	26	2	1	-	-	-	-	-	-	29
	WEST	5	3	14	-	#5	#2	#1	-	-	28	3	3	14	-	#5	#2	#1	-	-	28
	TOTAL	29	5	15	-	#5	#2	#1	-	-	57	29	5	15	-	#5	#2	#1	-	-	57
PER CENT OF TOTAL		50.88	8.77	26.32	-	8.77	3.51	1.75	-	-	100	50.88	8.77	26.32	-	8.77	3.51	1.75	-	-	100
DOUGLAS - BISBEE JCT. (22 Miles)	EAST	1	2	20	-	1	-	-	-	-	24	1	2	20	-	1	-	-	-	-	24
	WEST	-	4	12	8	-	-	-	-	-	24	-	4	12	8	-	-	-	-	-	24
	TOTAL	1	6	32	8	1	-	-	-	-	48	1	6	32	8	1	-	-	-	-	48
PER CENT OF TOTAL		2.08	12.50	66.67	16.67	2.08	-	-	-	-	100	2.08	12.50	66.67	16.67	2.08	-	-	-	-	100
GRAND TOTAL TUCSON - EL PASO		50	20	84	11	#8	#2	#1	-	-	176	50	20	84	11	#8	#2	#1	-	-	176

RECAPITULATION

TOTAL TRAINS OVER 70 CARS	22	12.50%
TOTAL TRAINS 70 CARS AND UNDER	154	87.50%
TOTAL TRAINS	176	100.00%

- One train in each bracket (total 3) reduced to less than 70 cars east of Arizona State Line.

RECAPITULATION

TOTAL TRAINS OVER 70 CARS	22	12.50%
TOTAL TRAINS 70 CARS AND UNDER	154	87.50%
TOTAL TRAINS	176	100.00%

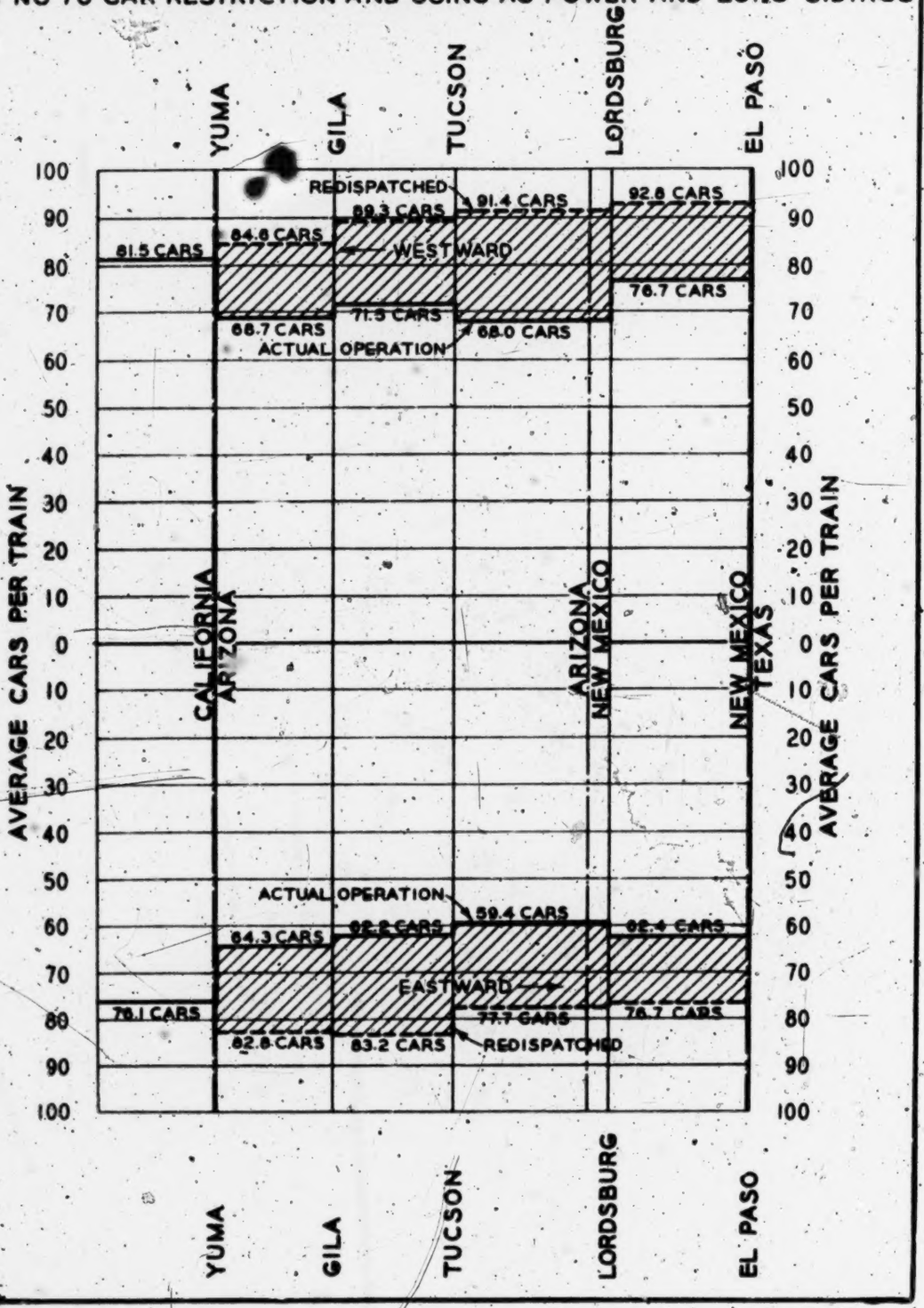
Defendant's Exhibit No. 241 (Witness Sines)
Jan. 30, 1941

SOUTHERN PACIFIC COMPANY

RELATIVE TRAIN LENGTHS

CALIFORNIA - ARIZONA - NEW MEXICO - TEXAS

THROUGH AND LOCAL FREIGHT TRAINS
OPERATING VIA YUMA, GILA, TUCSON, LORDSBURG AND EL PASO
EXCLUDING STRAUSS TURNAROUND TRAINS
BASED ON REDISPATCHING STUDY OF APRIL 1940
WITH NO 70 CAR RESTRICTION AND USING AC POWER AND LONG SIDINGS



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Defendant's Exhibit No. 242 (Witness Sines)
Jan. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY - OPERATING STATISTICS
YUMA, ARIZONA TO EL PASO, TEXAS
FOR PERIOD APRIL 4TH TO APRIL 30TH, 1940
ACTUAL OPERATION COMPARED WITH REDISPATCHED OPERATION,
WITH NO RESTRICTIONS ALSO USING AS POWER AND LONG SUNDAYS

	NUMBER OF TRAINS (a)	TRAIN MILES (b)	OTHER LOCOMOTIVE MILES (c)	TOTAL LOCOMOTIVE MILES (d)	NUMBER OF CARS (e)	CARS PER TRAIN (f)
NORTH LINE						
I - Yuma - Gila						
Actual	377	46,371	2,764	49,135	20,123	54.6
Redispatch	394	36,408	2,776	39,184	24,504	59.8
Decrease for period	21	9,963	8	9,971	(1) 319	17.2
II - Gila - Tucson						
Actual	388	48,764	7,991	56,757	25,843	67.1
Redispatch	395	37,480	6,700	44,180	25,527	64.8
Decrease for period	87	11,136	1,291	12,427	(2) 116	19.4
III - Tucson - Lordsburg						
Actual	413	57,318	31,384	88,702	36,376	63.9
Redispatch	311	30,645	17,928	48,577	26,360	84.8
Decrease for period	102	16,673	13,456	30,128	(3) 16	20.9
IV - Lordsburg-El Paso (Through trains only)						
Actual	378	56,134	231	56,365	26,310	69.6
Redispatch	310	46,037	225	46,260	26,313	84.9
Decrease for period	68	10,097	506	9,605	(4)(I) 3	15.3
V - El Paso-Stevens (Turnaround trains only)						
Actual	-	-	-	-	-	-
Redispatch	86	480	-	480	1,057	(5) 58.1
Decrease for period	(I) 86	(I) 480	-	(I) 480	(I) 1,057	(5) 58.1
VI - TOTAL NORTH LINE						
Actual	1,980	218,889	42,390	260,979	108,452	56.7
Redispatch	1,926	171,140	28,231	199,371	104,061	(6) 55.0
Decrease for period	314	47,449	14,159	61,608	(I) 609	(6) 18.3
SOUTH LINE						
VII - Tucson-Douglas (Through trains only)						
Actual	71	8,803	810	9,613	3,577	50.4
Redispatch	71	8,803	810	9,613	3,577	50.4
Decrease for period	-	-	-	-	-	-
VIII - Douglas-Hidden Jct. (Turnaround trains only)						
Actual	48	1,080	-	1,080	3,171	66.1
Redispatch	48	1,080	-	1,080	3,171	66.1
Decrease for period	-	-	-	-	-	-
IX - Douglas - El Paso						
Actual	87	12,428	218	12,644	2,734	48.0
Redispatch	87	12,426	218	12,644	2,734	48.0
Decrease for period	-	-	-	-	-	-
X - TOTAL SOUTH LINE						
Actual	196	22,279	1,028	23,307	9,482	(7) 49.3
Redispatch	196	22,279	1,028	23,307	9,482	(7) 49.3
Decrease for period	-	-	-	-	-	-
XI - TOTAL NORTH AND SOUTH LINES						
Actual	1,726	240,888	43,418	284,286	118,934	(8) 65.4
Redispatch	1,412	193,419	29,259	222,678	113,543	(8) 61.6
Decrease for period	314	47,449	14,159	61,608	(I) 609	(8) 18.3

I - Indicates Increase

(1) Yuma - Gila District: Decrease of 156 engine water cars east, and 167 west; increase of four deadhead cabooses east. Total decrease of 319 cars on the redispatched trains.

(2) Gila - Tucson District: Decrease of 112 engine water cars and 4 deadhead cabooses.

(3) Tucson-Lordsburg District: Decrease of 14 deadhead cabooses east and 2 west. Total decrease of 16 cars on the redispatched trains.

(4) Lordsburg-El Paso District: Increase of 2 deadhead cabooses east, and 1 west. Total increase of 3 cars on the redispatched trains.

(5) El Paso - Strauss: Average cars per train (redispatch) computed for Strauss turnarounds by omitting 12 trains in the eastward direction as these trains handled none of the 1,057 cars, (all of these cars moved westward).

(6) Average cars per train (redispatch) computed omitting 24 El Paso - Strauss turnaround trains and 1,057 cars handled by these trains.

(7) Average cars per train computed for total south line omitting 48 Douglas - Bisbee Jct. turnaround trains and 3,171 cars handled by these trains.

(8) Average cars per train for total north and south lines omitting Strauss, and Douglas - Bisbee Jct., turnaround trains and cars handled by these trains.

ACTUAL	No Strauss turnarounds	
	48 Douglas-Bisbee Jct. turnarounds with	3,171 cars
	Total 48 trains omitted	3,171 cars omitted
REDISPATCH	24 Strauss turnarounds with	1,057 cars
	48 Douglas-Bisbee Jct. turnarounds with	3,171 cars
	Total 72 trains omitted	4,228 cars omitted

Defendant's Exhibit No. 243 (Witness Sines)
Jan. 30, 1941

[redacted]
(Public Line)

ACTUAL TIME AT EL PASO, TEXAS
OF FIRST BLOCKS AND HAULOFF SECTIONS

APRIL 4TH TO MAY 3RD, INCLUSIVE, 1940

EASTBOUND AS POSTED

SUMMARY

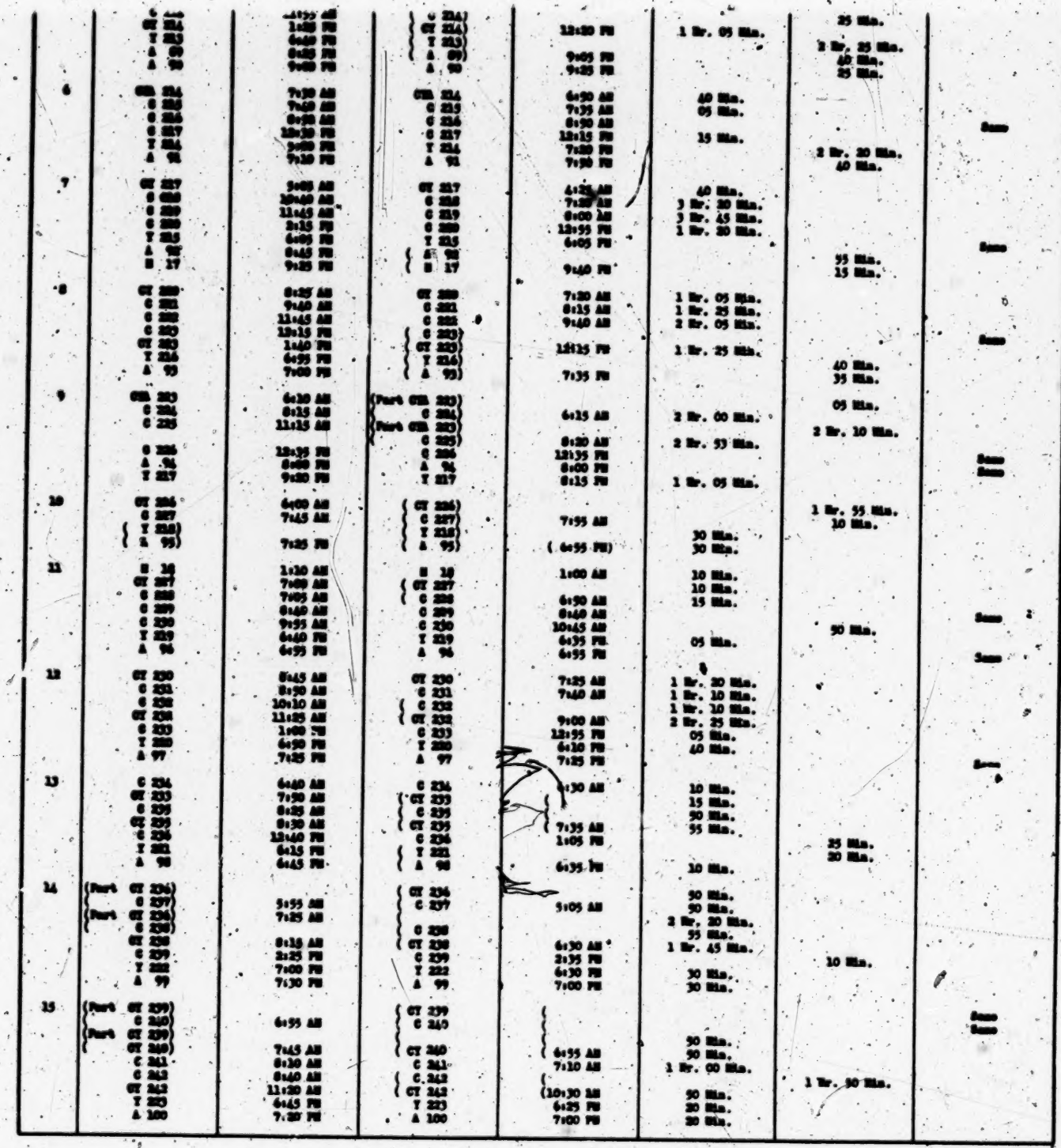
(1)	NUMBER OF TRAINS ARRIVING EL PASO - ACTUAL	240
(2)	NUMBER OF TRAINS ARRIVING EL PASO - SCHEDULED	232
(3)	NUMBER OF BLOCKS AND HAULOFF SECTIONS INVOLVED - ACTUAL	205
(4)	NUMBER OF BLOCKS AND HAULOFF SECTIONS INVOLVED - SCHEDULED	179
(5)	NUMBER OF SCHEDULED BLOCKS ARRIVING EL PASO -	
	(a) AT SAME TIME AS ACTUAL BLOCKS	33
	(b) IN ADVANCE OF ACTUAL BLOCKS	105
	(c) LATER THAN ACTUAL BLOCKS	40
(6)	TOTAL TIME -	
	(a) IN ADVANCE OF ACTUAL	77 HRS. 15 MINS.
	(b) LATER THAN ACTUAL	18 HRS. 00 MINS.
(7)	AVERAGE TIME OF 105 BLOCKS IN ADVANCE OF ACTUAL (MINUTES)	96
(8)	AVERAGE TIME OF 40 BLOCKS LATER THAN ACTUAL (MINUTES)	48

A = ARIZONA INTERMEDIATE BLOCK
C = COLTON INTERMEDIATE BLOCK
T = TUCSON INTERMEDIATE BLOCK
CT = COLTON OVERLAP ON TUCSON BLOCK OR COLTON SUPERIOR
CTA = COLTON OVERLAP OVERLAP ON SECOND TUCSON BLOCK OR COLTON SUPERIOR
H = HAULOFF INTERMEDIATE
EBS = EASTBOUND SAN BERNARDINO

5726

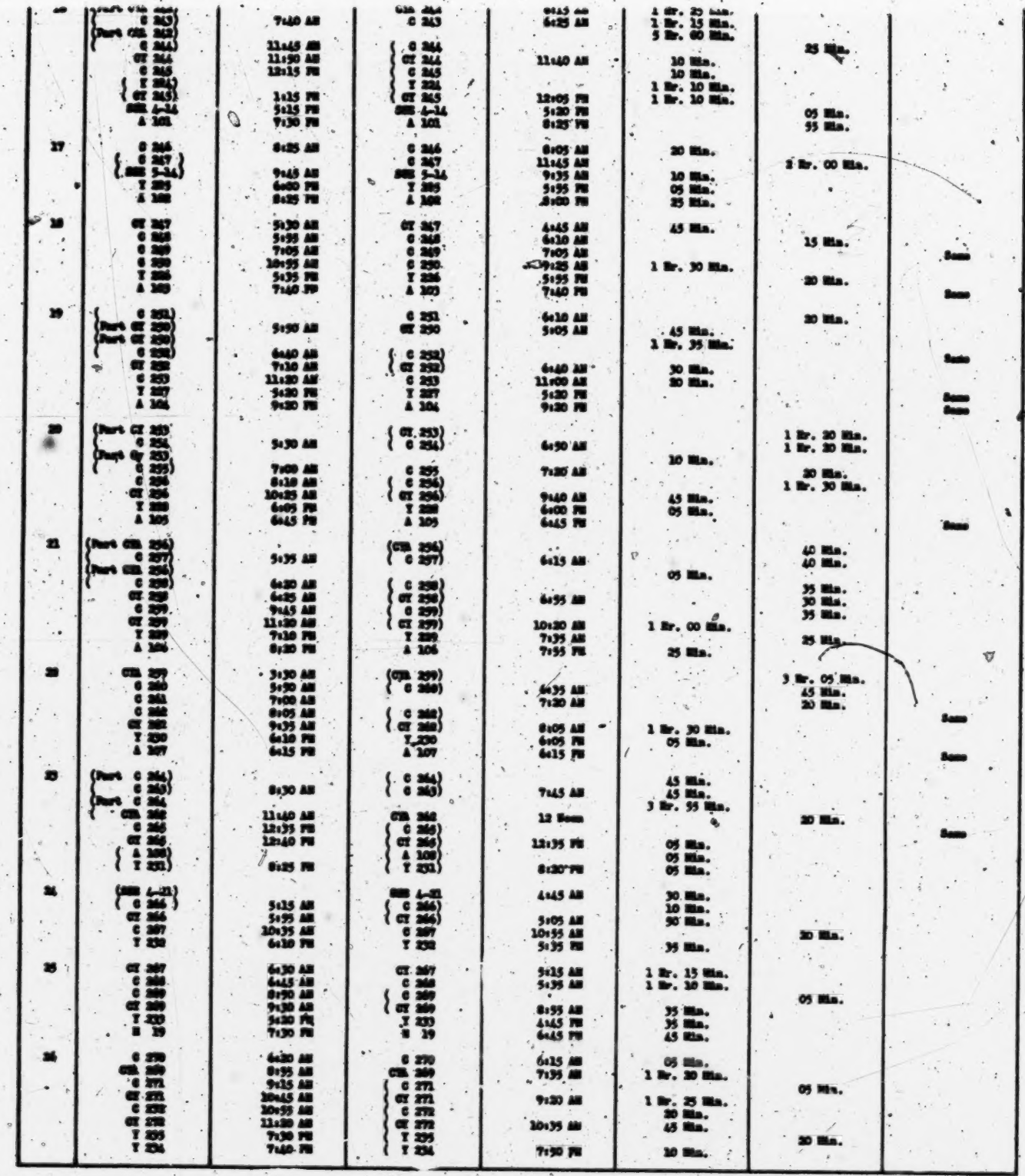
APRIL 1940

DATE (a)	PERMISSABLE BLOCK OR DESTROY IDENTIFICATION (b)	ACTUAL ARRIVAL AT PADO (c)	PERMISSABLE BLOCK OR DESTROY IDENTIFICATION (d)	REDESPATCHED ARRIVAL AT PADO (e)	REDESPATCHED IN ADVANCE OF ACTUAL (f)	REDESPATCHED LATER THAN ACTUAL (g)	OPERATIONS SAME AS ACTUAL (h)
							Same
4	A 87	7:35 PM	A 87	7:35 PM			
	A 88	9:30 PM	A 88	9:10 PM	20 Min.		
5	(CTA 211)	7:50 AM	CTA 211	5:55 AM	1 Hr. 55 Min.		
	C 212		C 212	6:00 AM	1 Hr. 50 Min.		
	C 213	8:00 AM	C 213	7:50 AM	10 Min.		
	C 214	11:55 AM	C 214			25 Min.	
	CT 214	1:25 PM	CT 214	12:20 PM	1 Hr. 05 Min.		
	Y 213	6:40 PM	Y 213			2 Hr. 25 Min.	
	A 89	8:25 PM	A 89	9:05 PM		40 Min.	
	A 90	9:00 PM	A 90	9:25 PM		25 Min.	
6	CTA 214	7:30 AM	CTA 214	6:50 AM	40 Min.		
	C 215	7:40 AM	C 215	7:35 AM	05 Min.		
	C 216	8:50 AM	C 216	8:30 AM			Same
	C 217	12:30 PM	C 217	12:15 PM	15 Min.		
	Y 214	5:00 PM	Y 214	7:30 PM		2 Hr. 30 Min.	
	A 91	7:10 PM	A 91	7:30 PM		40 Min.	
7	CT 217	5:05 AM	CT 217	4:25 AM	40 Min.		
	C 218	10:40 AM	C 218	7:20 AM	3 Hr. 20 Min.		
	C 219	11:45 AM	C 219	8:00 AM	3 Hr. 45 Min.		
	C 220	2:15 PM	C 220	12:55 PM	1 Hr. 20 Min.		
	Y 215	6:05 PM	Y 215	6:05 PM			Same
	A 92	8:45 PM	A 92			55 Min.	
	B 17	9:25 PM	B 17	9:40 PM		15 Min.	
8	CT 220	8:25 AM	CT 220	7:20 AM	1 Hr. 05 Min.		
	C 221	9:40 AM	C 221	8:15 AM	1 Hr. 25 Min.		
	C 222	11:45 AM	C 222	9:40 AM	2 Hr. 05 Min.		
	C 223	12:15 PM	C 223				Same
	CT 223	1:40 PM	CT 223	12:15 PM	1 Hr. 25 Min.		
	Y 216	6:55 PM	Y 216			40 Min.	
	A 93	7:00 PM	A 93	7:35 PM		35 Min.	
9	CTA 223	6:10 AM	(Part CTA 223)			05 Min.	
	C 224	8:15 AM	C 224	6:15 AM	2 Hr. 00 Min.		
	C 225	11:15 AM	(Part CTA 223)			2 Hr. 10 Min.	
			C 225	8:20 AM	2 Hr. 55 Min.		
	C 226	12:35 PM	C 226	12:35 PM			Same
	A 94	8:00 PM	A 94	8:30 PM			Same
	Y 217	9:20 PM	Y 217	8:15 PM	1 Hr. 05 Min.		
10	CT 226	6:00 AM	CT 226			1 Hr. 55 Min.	
	C 227	7:45 AM	C 227	7:55 AM		10 Min.	
	Y 218		Y 218		30 Min.		
	A 95	7:25 PM	A 95	(8:55 PM)	30 Min.		
11	B 18	1:10 AM	B 18	1:00 AM	10 Min.		
	CT 227	7:00 AM	CT 227		10 Min.		
	C 228	7:05 AM	C 228	6:50 AM	15 Min.		
	C 229	8:40 AM	C 229	8:40 AM			Same
	C 230	9:35 AM	C 230	10:45 AM		50 Min.	
	Y 219	6:40 PM	Y 219	6:35 PM	05 Min.		
	A 96	6:55 PM	A 96	6:55 PM			Same
12	CT 230	8:45 AM	CT 230	7:25 AM	1 Hr. 20 Min.		
	C 231	8:50 AM	C 231	7:40 AM	1 Hr. 10 Min.		
	C 232	10:10 AM	C 232		1 Hr. 10 Min.		
	CT 232	11:25 AM	CT 232	9:00 AM	2 Hr. 25 Min.		
	C 233	1:00 PM	C 233	12:55 PM	05 Min.		
	Y 220	6:50 PM	Y 220	6:10 PM	40 Min.		
	A 97	7:25 PM	A 97	7:25 PM			Same
13	C 234	6:40 AM	C 234	6:30 AM	10 Min.		
	CT 233	7:50 AM	CT 233		15 Min.		
	C 235	8:25 AM	C 235		50 Min.		
	CT 235	8:30 AM	CT 235	7:35 AM	55 Min.		
	C 236	12:40 PM	C 236	1:05 PM		25 Min.	
	Y 221	6:15 PM	Y 221			30 Min.	
	A 98	6:45 PM	A 98	6:35 PM	10 Min.		
14	(Part CT 236)		CT 236		30 Min.		
	C 237	5:55 AM	C 237	5:05 AM	50 Min.		
	(Part CT 236)	7:25 AM			2 Hr. 20 Min.		
	C 238		C 238		55 Min.		
	CT 238	8:15 AM	CT 238	6:30 AM	1 Hr. 45 Min.		
	C 239	2:25 PM	C 239	2:35 PM		10 Min.	
	Y 222	7:00 PM	Y 222	6:30 PM	30 Min.		
	A 99	7:30 PM	A 99	7:00 PM	30 Min.		
15	(Part CT 239)		CT 239				Same
	C 240	6:55 AM	C 240				Same
	(Part CT 239)				50 Min.		
	CT 240	7:45 AM	CT 240	6:55 AM	50 Min.		
	C 241	8:10 AM	C 241	7:10 AM	1 Hr. 00 Min.		



APRIL 1949

DAY (a)	PASSENGER TRAIN OR ENGINE DESIGNATION (b)	ARRIVED ARRIVE TA HERE (c)	DEPARTURE TRAIN OR ENGINE DESIGNATION (d)	DEPARTED DEPART TA HERE (e)	DELAYED IN ARRIVAL OF ARRIVAL (f)	DELAYED LATER THAN ARRIVAL (g)	OPERATING BASIS AS ARRIVAL (h)
26		7:40 AM		6:15 AM	1 Hr. 25 Min.		
				6:25 AM	1 Hr. 15 Min.		
					1 Hr. 00 Min.		
		11:40 AM				25 Min.	
		11:50 AM		11:40 AM	10 Min.		
		12:15 PM			10 Min.		
					1 Hr. 10 Min.		
		1:15 PM		12:05 PM	1 Hr. 10 Min.		
		5:35 PM		5:20 PM		05 Min.	
		7:30 PM		6:25 PM		55 Min.	
27		6:25 AM		6:05 AM	20 Min.		
				11:45 AM		2 Hr. 00 Min.	
		9:45 AM		9:35 AM	10 Min.		
		6:00 PM		5:55 PM	05 Min.		
		6:25 PM		6:00 PM	25 Min.		
28		5:30 AM		6:45 AM	45 Min.		
		5:55 AM		6:10 AM		15 Min.	
		7:05 AM		7:05 AM			
		10:55 AM		9:25 AM	1 Hr. 30 Min.		
		5:55 PM		5:55 PM		20 Min.	
		7:40 PM		7:40 PM			
29		5:50 AM		6:10 AM		20 Min.	
				5:05 AM	45 Min.		
		6:40 AM			1 Hr. 35 Min.		
		7:10 AM		6:40 AM	30 Min.		
		11:00 AM		11:00 AM	20 Min.		
		5:20 PM		5:20 PM			
		9:20 PM		9:20 PM			
30		5:30 AM		6:50 AM		1 Hr. 20 Min.	
						1 Hr. 10 Min.	
		7:00 AM		7:20 AM	30 Min.		
		8:10 AM				20 Min.	
		10:25 AM		9:40 AM	45 Min.	1 Hr. 30 Min.	
		6:05 PM		6:05 PM	05 Min.		
		6:45 PM		6:45 PM			
31		5:35 AM		6:15 AM		40 Min.	
					15 Min.	40 Min.	
		6:35 AM				35 Min.	
		6:55 AM		6:55 AM		30 Min.	
		9:45 AM				35 Min.	
		11:40 AM		10:20 AM	1 Hr. 00 Min.		
		7:10 PM		7:35 AM		25 Min.	
		6:30 PM		7:55 PM	25 Min.		
32		5:30 AM		6:35 AM		3 Hr. 05 Min.	
		5:50 AM		7:20 AM		45 Min.	
		7:40 AM				20 Min.	
		8:40 AM		8:05 AM	1 Hr. 30 Min.		
		9:55 AM		6:05 PM	05 Min.		
		6:10 PM		6:15 PM			
		6:15 PM					
33		8:30 AM		7:45 AM	45 Min.		
					45 Min.		
		11:40 AM		12 Noon	3 Hr. 55 Min.		
		12:35 PM				20 Min.	
		12:40 PM		12:35 PM	05 Min.		
					05 Min.		
		8:20 PM		8:20 PM	05 Min.		
34				4:45 AM	30 Min.		
		5:35 AM			10 Min.		
		5:55 AM		6:05 AM	50 Min.		
		10:55 AM		10:55 AM		20 Min.	
		6:30 PM		5:35 PM	35 Min.		
35		6:30 AM		5:15 AM	1 Hr. 15 Min.		
		6:45 AM		5:30 AM	1 Hr. 10 Min.		
		8:50 AM				05 Min.	
		9:50 AM		8:55 AM	35 Min.		
		5:30 PM		6:45 PM	35 Min.		
		7:30 PM		6:45 PM	45 Min.		
36		6:30 AM		6:15 AM	05 Min.		
		8:55 AM		7:35 AM	1 Hr. 20 Min.		
		9:25 AM				05 Min.	
		10:45 AM		9:20 AM	1 Hr. 25 Min.		
		10:55 AM			20 Min.		
		11:05 AM			45 Min.		



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(Sheet 4 of 4 sheets)

APRIL 1940

DATE (a)	PERISHABLE BLOCK OR MANIFEST IDENTIFICATION (b)	ACTUAL ARRIVAL EL PASO (c)	PERISHABLE BLOCK OR MANIFEST IDENTIFICATION (d)	REDISPATCHED ARRIVAL EL PASO (e)	REDISPATCHED IN ADVANCE OF ACTUAL (f)	REDISPATCHED LATER THAN ACTUAL (g)	OPERATIONS SAME AS ACTUAL (h)
27	CTA 272	5:10 AM	CTA 272				
	C 273	7:30 AM	C 273	6:50 AM	40 Min.	1 Hr. 40 Min.	
	C 274	7:40 AM	C 274				
	CI 274	10:25 AM	CI 274	8:30 AM	1 Hr. 55 Min.	50 Min.	
	C 275	10:50 AM	C 275		1 Hr. 50 Min.		
	CI 275	11:10 AM	CI 275	9:00 AM	2 Hr. 10 Min.		
	T 236	6:20 PM	T 236			25 Min.	
	T 237	6:35 PM	T 237	6:45 PM		10 Min.	
28	CTA 277	6:15 AM	CTA 277				
	C 276	6:45 AM	C 276	7:05 AM		50 Min.	
	C 277	8:55 AM	C 277	9:30 AM		20 Min.	
	C 278	11:05 AM	C 278			35 Min.	
	CI 278	11:35 AM	CI 278	10:45 AM	20 Min.		
	T 238	5:15 PM	T 238	5:20 PM	50 Min.		
	B 20	7:05 PM	B 20	6:55 PM		05 Min.	
29	CTA 278	4:40 AM	CTA 278		10 Min.		
	C 279	5:20 AM	C 279	7:35 AM		2 Hr. 55 Min.	
	C 280	6:10 AM	C 280	7:40 AM		2 Hr. 15 Min.	
	C 281	10:35 AM	C 281			1 Hr. 30 Min.	
	CI 281	10:50 AM	CI 281	8:40 AM	1 Hr. 55 Min.		
	T 239	5:50 PM	T 239	6:35 PM	2 Hr. 10 Min.		
30	CTA 281	3:55 AM	CTA 281	3:50 AM		15 Min.	
	C 282	5:55 AM	C 282	6:00 AM	05 Min.		
	C 283	7:10 AM	C 283			05 Min.	
	CI 283	7:30 AM	CI 283	7:25 AM		15 Min.	
	T 240	6:45 PM	T 240	6:55 PM	05 Min.		
						10 Min.	
				MAY 1940			
1	CTA 283	5:00 AM	CTA 283	5:20 AM		20 Min.	

5729

3251

Defendant's Exhibit No. 244 (Witness Sines)
Jan. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

ARRIVAL TIME AT YUMA, ARIZONA
OF "SSW" AND "GBW" WESTWARD MANIFEST TRAINS
ACTUAL OPERATION COMPARED WITH REDISPATCHED
OPERATION, WITH NO RESTRICTION AND USING AC
POWER AND LONG SIDINGS

MONTH OF APRIL 1940

(1)	NUMBER OF TRAINS ARRIVING YUMA - ACTUAL,	89
(2)	NUMBER OF TRAINS ARRIVING YUMA - REDISPATCHED,	88
(3)	NUMBER OF BLOCKS AND MANIFEST SECTIONS INVOLVED,	96
(4)	NUMBER OF REDISPATCHED BLOCKS ARRIVING YUMA -	
	(a) AT SAME TIME AS ACTUAL BLOCKS,	55
	(b) IN ADVANCE OF ACTUAL BLOCKS,	24
	(c) LATER THAN ACTUAL BLOCKS,	17
(5)	TOTAL TIME -	
	(a) IN ADVANCE OF ACTUAL,	8 HR.20 MINS.
	(b) LATER THAN ACTUAL,	6 HR.40 MINS.
(6)	AVERAGE TIME OF 24 BLOCKS IN ADVANCE OF ACTUAL, (MINS.)	21
(7)	AVERAGE TIME OF 17 BLOCKS LATER THAN ACTUAL, (MINS.)	23

SSW = SUNSET WEST MANIFEST

GBW = GOLD BALL WEST MANIFEST

APRIL 1940

DATE (a)	MANIFEST IDENTIFICATION (b)	ACTUAL ARRIVAL TIME (c)	MANIFEST IDENTIFICATION (d)	REDISPATCHED ARRIVAL TIME (e)	REDISPATCHED IN ADVANCE OF ACTUAL (f)	REDISPATCHED LATER THAN ACTUAL (g)	REDISPATCHED SAME AS ACTUAL (h)
5	SSW 4	3:45 AM	SSW 4	3:45 AM			
	GSW 1-3	5:45 AM	GSW 1-3	5:45 AM			Same
	GSW 2-3	6:20 AM	GSW 2-3	6:40 AM			Same
	GSW 3-3	10:45 AM	GSW 3-3	10:45 AM		20 Mins.	
6	SSW 5	6:10 AM	SSW 5	6:10 AM			Same
	GSW 1-4	6:35 AM	GSW 1-4	6:20 AM	15 Mins.		
	GSW 2-4	7:15 AM	GSW 2-4	7:05 AM	10 Mins.		
	GSW 3-4	10:35 AM	GSW 3-4	10:35 AM			Same
7	SSW 6	6:30 AM	SSW 6	6:30 AM			Same
	GSW 1-5	6:40 AM	GSW 1-5	6:55 AM		15 Mins.	
	GSW 2-5	9:00 AM	GSW 2-5	9:00 AM			Same
8	SSW 7	6:00 AM	SSW 7	6:00 AM			Same
	GSW 1-6	7:35 AM	GSW 1-6	7:20 AM	15 Mins.		
	GSW 2-6	9:15 AM	GSW 2-6	9:15 AM			Same
	GSW 3-6	9:25 AM	GSW 3-6		10 Mins.		
9	SSW 1-8	4:25 AM	SSW 1-8	3:40 AM	45 Mins.		
	GSW 1-7	5:45 AM	GSW 1-7	5:40 AM	5 Mins.		
	GSW 2-7	10:45 AM	GSW 2-7	9:55 AM	50 Mins.		
	(SSW 2-8)	11:55 AM	(SSW 2-8)	11:45 AM	10 Mins.		
	(GSW 3-7)		(GSW 3-7)		10 Mins.		
10	SSW 9	2:55 AM	SSW 9	2:55 AM			
	GSW 1-8	5:35 AM	GSW 1-8	5:55 AM		20 Mins.	Same
	GSW 2-8	6:40 AM	GSW 2-8	6:40 AM			Same
	GSW 3-8	8:10 AM	GSW 3-8	8:10 AM			Same
11	(SSW 10)	5:05 AM	(SSW 10)	5:05 AM			
	(GSW 1-9)		(GSW 1-9)				Same
	GSW 2-9	6:20 AM	GSW 2-9	6:20 AM			Same
	GSW 3-9	7:20 AM	GSW 3-9	7:35 AM			Same
12	SSW 11	3:30 AM	SSW 11	3:30 AM		15 Mins.	
	GSW 1-10	6:20 AM	GSW 1-10	6:20 AM			Same
	GSW 2-10	7:30 AM	GSW 2-10	7:30 AM			Same
							Same
13	SSW 12	6:20 AM	SSW 12	6:15 AM	5 Mins.		
	GSW 1-11	8:15 AM	GSW 1-11	8:15 AM			Same
	GSW 2-11	9:55 AM	GSW 2-11	9:40 AM	15 Mins.		
14	SSW 13	3:45 AM	SSW 13	4:00 AM		15 Mins.	
	GSW 1-12	5:20 AM	GSW 1-12	5:20 AM			Same
	GSW 2-12	6:25 AM	GSW 2-12	6:50 AM		25 Mins.	
15	(SSW 14)	5:40 AM	(SSW 14)	5:40 AM			
	(GSW 1-13)		(GSW 1-13)				Same
	GSW 2-13	6:50 AM	GSW 2-13	6:50 AM			Same
	GSW 3-13	7:25 AM	GSW 3-13	7:25 AM			Same
16	(SSW 15)	5:45 AM	(SSW 15)	5:45 AM			Same
	(GSW 1-14)		(GSW 1-14)				Same
	GSW 2-14	6:15 AM	GSW 2-14	5:55 AM	20 Mins.		
	GSW 3-14	6:45 AM	GSW 3-14	6:45 AM			Same
	GSW 4-14	9:05 AM	GSW 4-14	9:05 AM			Same
17	SSW 16	5:40 AM	SSW 16	5:40 AM			

6	SSW 5	6:10 AM	SSW 5	6:10 AM			Same
	GSW 1-4	6:35 AM	GSW 1-4	6:20 AM	15 Mins.	-	
	GSW 2-4	7:15 AM	GSW 2-4	7:05 AM	30 Mins.		
	GSW 3-4	10:35 AM	GSW 3-4	10:35 AM			Same
7	SSW 6	6:30 AM	SSW 6	6:30 AM			Same
	GSW 1-5	6:40 AM	GSW 1-5	6:55 AM		15 Mins.	
	GSW 2-5	9:00 AM	GSW 2-5	9:00 AM			Same
8	SSW 7	6:00 AM	SSW 7	6:00 AM			Same
	GSW 1-6	7:35 AM	GSW 1-6	7:20 AM	15 Mins.		
	GSW 2-6	9:15 AM	GSW 2-6	9:15 AM			Same
	GSW 3-6	9:25 AM	GSW 3-6		10 Mins.		
9	SSW 1-8	4:25 AM	SSW 1-8	3:40 AM	45 Mins.		
	GSW 1-7	5:45 AM	GSW 1-7	5:40 AM	5 Mins.		
	GSW 2-7	10:45 AM	GSW 2-7	9:55 AM	50 Mins.		
	(SSW 2-8)	11:55 AM	(SSW 2-8)	11:45 AM	10 Mins.		
	(GSW 3-7)		(GSW 3-7)		10 Mins.		
10	SSW 9	2:55 AM	SSW 9	2:55 AM			Same
	GSW 1-8	5:35 AM	GSW 1-8	5:55 AM		20 Mins.	
	GSW 2-8	6:40 AM	GSW 2-8	6:40 AM			Same
	GSW 3-8	9:10 AM	GSW 3-8	8:10 AM			Same
11	(SSW 10)	5:05 AM	(SSW 10)	5:05 AM			Same
	(GSW 1-9)		(GSW 1-9)				Same
	GSW 2-9	6:20 AM	GSW 2-9	6:20 AM			Same
	GSW 3-9	7:20 AM	GSW 3-9	7:35 AM		15 Mins.	
12	SSW 11	3:30 AM	SSW 11	3:30 AM			Same
	GSW 1-10	6:20 AM	GSW 1-10	6:20 AM			Same
	GSW 2-10	7:30 AM	GSW 2-10	7:30 AM			Same
13	SSW 12	6:20 AM	SSW 12	6:15 AM	5 Mins.		
	GSW 1-11	8:15 AM	GSW 1-11	8:15 AM			Same
	GSW 2-11	9:55 AM	GSW 2-11	9:40 AM	15 Mins.		
14	SSW 13	3:45 AM	SSW 13	4:00 AM		15 Mins.	
	GSW 1-12	5:20 AM	GSW 1-12	5:20 AM			Same
	GSW 2-12	6:25 AM	GSW 2-12	6:50 AM		25 Mins.	
15	(SSW 14)	5:40 AM	(SSW 14)	5:40 AM			Same
	(GSW 1-13)		(GSW 1-13)				Same
	GSW 2-13	6:50 AM	GSW 2-13	6:50 AM			Same
	GSW 3-13	7:25 AM	GSW 3-13	7:25 AM			Same
16	(SSW 15)	5:45 AM	(SSW 15)	5:45 AM			Same
	(GSW 1-14)		(GSW 1-14)				Same
	GSW 2-14	6:15 AM	GSW 2-14	5:55 AM	20 Mins.		
	GSW 3-14	6:45 AM	GSW 3-14	6:45 AM			Same
	GSW 4-14	9:05 AM	GSW 4-14	9:05 AM			Same
17	SSW 16	5:40 AM	SSW 16	5:40 AM			Same
	GSW 1-15	8:25 AM	GSW 1-15	6:45 AM	1 Hr.40 Mins.		
	GSW 2-15	9:40 AM	GSW 2-15	9:40 AM			Same
18	SSW 17	4:15 AM	SSW 17	5:30 AM		1 Hr.15 Mins.	
	GSW 1-16	6:05 AM	GSW 1-16	6:05 AM			Same
	GSW 2-16	9:30 AM	GSW 2-16	9:10 AM	20 Mins.		
19	SSW 18	3:20 AM	SSW 18	4:10 AM		50 Mins.	
	GSW 1-17	6:00 AM	GSW 1-17	6:00 AM			Same
	GSW 2-17	9:35 AM	GSW 2-17	9:35 AM			Same

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APRIL 1940

DATE (a)	MANIFEST IDENTIFICATION (b)	ACTUAL ARRIVAL YUMA (c)	MANIFEST IDENTIFICATION (d)	REDISPATCHED ARRIVAL YUMA (e)	REDISPATCHED IN ADVANCE OF ACTUAL (f)	REDISPATCHED LATER THAN ACTUAL (g)	REDISPATCHED SAME AS ACTUAL (h)
20	(SSW 19)	6:00 AM	(SSW 19)	5:50 AM	10 Mins.		
	(GBW 1-18)		(GBW 1-18)		10 Mins.		
	GBW 2-18	6:50 AM	GBW 2-18	6:35 AM	15 Mins.		
	GBW 3-18	7:50 AM	GBW 3-18	8:30 AM		40 Mins.	
	GBW 4-18	10:00 AM	GBW 4-18	10:00 AM			Same
21	SSW 20	4:10 AM	SSW 20	4:00 AM	10 Mins.		
	GBW 1-19	5:10 AM	GBW 1-19	5:40 AM		30 Mins.	
	GBW 2-19	9:05 AM	GBW 2-19	9:05 AM			Same
22	SSW 1-21	2:30 AM	SSW 1-21	2:20 AM	10 Mins.		
	GBW 1-20	5:30 AM	GBW 1-20	5:35 AM		5 Mins.	
	GBW 2-20	8:15 AM	GBW 2-20	8:15 AM			Same
	SSW 2-21	1:30 PM	SSW 2-21	1:55 PM		25 Mins.	
23	SSW 22	2:35 AM	SSW 22	2:35 AM			Same
	GBW 1-21	7:55 AM	GBW 1-21	7:55 AM			Same
	GBW 2-21	9:35 AM	GBW 2-21	9:35 AM			Same
24	SSW 23	4:05 AM	SSW 23	4:05 AM			Same
	GBW 1-22	6:10 AM	GBW 1-22	6:10 AM			Same
	GBW 2-22	6:55 AM	GBW 2-22	6:55 AM			Same
	GBW 3-22	7:35 AM	GBW 3-22	7:40 AM		5 Mins.	
25	SSW 24	3:25 AM	SSW 24	3:40 AM		15 Mins.	
	GBW 1-23	5:45 AM	GBW 1-23	5:45 AM			Same
	GBW 2-23	7:05 AM	GBW 2-23	7:05 AM			Same
26	SSW 1-25	5:40 AM	SSW 1-25	5:40 AM			Same
	GBW 1-24	6:00 AM	GBW 1-24	6:00 AM			Same
	(SSW 2-25)	7:30 AM	(SSW 2-25)	7:30 AM			Same
	(GBW 2-24)		(GBW 2-24)				Same
27	(SSW 26)	5:50 AM	(SSW 26)	5:40 AM	10 Mins.		
	(GBW 1-25)		(GBW 1-25)		10 Mins.		
	GBW 2-25	6:00 AM	GBW 2-25	5:50 AM	10 Mins.		
	GBW 3-25	7:20 AM	GBW 3-25	7:20 AM			Same
28	SSW 27	4:35 AM	SSW 27	4:35 AM			Same
	GBW 1-26	6:20 AM	GBW 1-26	6:45 AM		25 Mins.	
	GBW 2-26	6:50 AM	GBW 2-26	6:50 AM			Same
29	SSW 1-28	3:10 AM	SSW 1-28	3:10 AM			Same
	GBW 1-27	5:45 AM	GBW 1-27	5:45 AM			Same
	GBW 2-27	7:05 AM	GBW 2-27	7:15 AM		10 Mins.	
	SSW 2-28	9:10 AM	SSW 2-28	7:55 AM	1 Hr.15 Mins.		
30	SSW 1-29	5:50 AM	SSW 1-29	5:40 AM	10 Mins.		
	GBW 1-28	6:20 AM	GBW 1-28	6:30 AM		10 Mins.	
	GBW 2-28	7:55 AM	GBW 2-28	7:55 AM			Same
	SSW 2-29	9:00 AM	SSW 2-29	9:00 AM			Same

5731-A

Defendant's Exhibit No. 245 (Witness Sines)
Jan. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY WAGE DATA
TUSA, ARIZONA TO EL PASO, TEXAS
FOR PERIOD APRIL 4TH TO APRIL 30TH, 1940
ACTUAL OPERATION COMPARED WITH REDISPATCHED OPERATION, WITH NO RESTRICTION AND USING AC POWER AND LONG SIDINGS

	NO. OF TRAINS	TRAIN MILES	TRAINMEN'S WAGES			LOCOMOTIVE MILES	ENGINEMEN'S WAGES			TOTAL WAGES		
			BASIC	VARIABLE	TOTAL		BASIC	VARIABLE	TOTAL	BASIC	VARIABLE	TOTAL
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
SOUTH LINE												
(1) TUSA - GILA												
ACTUAL	377	46,771	$12,333.33	$1,082.51	$13,415.84	49,155	$7,946.33	$ 896.93	$8,843.26	$20,279.66	$1,979.44	$22,259.10
REDISPATCHED	296	36,408	9,816.36	867.92	10,684.28	39,184	6,992.61	795.95	7,788.56	16,808.97	1,663.87	18,472.84
SAVING FOR PERIOD	81	9,963	2,516.97	214.59	2,731.56	9,971	953.72	100.98	1,054.70	3,470.69	315.57	3,786.26
(2) GILA - TUCSON												
ACTUAL	382	48,766	12,984.75	1,156.28	14,141.03	56,757	9,795.30	934.91	10,730.21	22,780.05	2,091.19	24,871.24
REDISPATCHED	295	32,630	80,064.92	912.12	10,977.04	44,930	8,549.63	816.57	9,365.20	18,613.55	1,728.69	20,342.24
SAVING FOR PERIOD	87	11,136	2,919.83	244.16	3,163.99	12,427	1,246.67	118.34	1,365.01	4,166.50	362.50	4,529.00
(3) TUCSON - LORDSBURG												
ACTUAL	413	67,318	19,599.30	868.54	20,427.84	98,702	16,718.63	1,028.51	17,747.14	36,277.93	1,897.05	38,174.98
REDISPATCHED	311	50,645	14,579.42	670.96	15,250.38	68,577	12,957.53	827.33	13,784.86	27,536.95	1,498.29	29,035.24
SAVING FOR PERIOD	102	16,673	4,979.88	197.58	5,177.46	30,125	3,761.10	201.18	3,962.28	8,740.98	398.76	9,139.74
(4) LORDSBURG - EL PASO												
ACTUAL	378	56,134	13,189.73	1,867.90	15,057.63	56,365	9,070.15	1,236.74	10,306.89	22,259.88	3,124.64	25,384.52
REDISPATCHED	310	46,037	12,009.56	1,789.74	13,799.30	46,860	8,494.54	1,160.97	9,655.51	20,504.10	2,950.71	23,454.81
SAVING FOR PERIOD	68	10,097	1,180.17	98.16	1,258.33	9,505	575.61	75.77	651.38	1,755.78	173.93	1,909.71
(5) EL PASO & SYRACUSE												
ACTUAL	-	-	-	-	-	-	-	-	-	-	-	-
REDISPATCHED	24	420	162.82	20.34	183.16	420	95.94	12.00	107.94	258.76	32.34	291.10
INCREASE FOR PERIOD	24	420	162.82	20.34	183.16	420	95.94	12.00	107.94	258.76	32.34	291.10
(6) TOTAL - SOUTH LINE												
ACTUAL	1,550	218,989	58,047.11	4,995.23	63,042.34	260,979	43,530.41	4,097.09	47,627.50	101,577.52	9,092.32	110,669.84
REDISPATCHED	1,236	171,140	46,633.08	4,261.08	50,894.16	199,771	37,089.25	3,612.82	40,702.07	83,722.33	7,873.90	91,596.23
SAVING FOR PERIOD	314	47,849	11,414.03	734.15	12,148.18	61,208	6,441.16	484.27	6,925.43	17,855.19	1,218.42	19,073.61
SOUTH LINE												
(7) TUCSON - DOUGLAS												
ACTUAL	71	8,803	2,598.48	356.87	2,955.35	9,613	1,786.20	390.42	2,176.62	4,384.68	747.29	5,131.97
REDISPATCHED	71	8,803	2,598.48	356.87	2,955.35	9,613	1,786.20	390.42	2,176.62	4,384.68	747.29	5,131.97
SAVING FOR PERIOD	-	-	-	-	-	-	-	-	-	-	-	-
(8) DOUGLAS - BISBEE JUNCTION												
ACTUAL	48	1,050	625.94	54.83	680.77	1,050	349.22	42.71	391.93	975.16	97.54	1,072.70
REDISPATCHED	48	1,050	625.94	54.83	680.77	1,050	349.22	42.71	391.93	975.16	97.54	1,072.70
SAVING FOR PERIOD	-	-	-	-	-	-	-	-	-	-	-	-
(9) DOUGLAS - EL PASO												
ACTUAL	57	12,436	3,077.39	250.32	3,327.71	12,644	2,202.25	178.13	2,380.38	5,279.64	428.45	5,708.09
REDISPATCHED	57	12,436	3,077.39	250.32	3,327.71	12,644	2,202.25	178.13	2,380.38	5,279.64	428.45	5,708.09
SAVING FOR PERIOD	-	-	-	-	-	-	-	-	-	-	-	-
(10) TOTAL - SOUTH LINE												
ACTUAL	176	22,279	6,301.81	662.02	6,963.83	23,307	4,337.67	611.26	4,948.93	10,639.48	1,273.28	11,912.76
REDISPATCHED	176	22,279	6,301.81	662.02	6,963.83	23,307	4,337.67	611.26	4,948.93	10,639.48	1,273.28	11,912.76
SAVING FOR PERIOD	-	-	-	-	-	-	-	-	-	-	-	-
(11) TOTAL - SOUTH AND SOUTH LINES												
ACTUAL	1,726	241,268	64,348.92	5,657.25	70,006.17	284,286	47,868.08	4,708.35	52,576.43	112,217.00	10,365.60	122,582.60
REDISPATCHED	1,412	193,419	52,934.89	4,923.10	57,857.99	223,078	41,426.92	4,224.08	45,651.00	94,361.81	9,148.18	103,509.99
SAVING FOR PERIOD	314	47,849	11,414	734.15	12,148.18	61,208	6,441.16	484.27	6,925.43	17,855.19	1,218.42	19,073.61
(12) Railroad Retirement and Unemployment Insurance Tax: 5.94% Trainmen, 5.73% Enginemen					722.60				396.83			1,118.43
(13) GRAND TOTAL					12,869.78				7,322.26			20,192.04

Defendant's Exhibit No. 246 (Witness Sines)
~~June 30, 1941~~ Jan. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

STATE OF ARIZONA

STATISTICS IN CONNECTION
WITH PASSENGER TRAINS EXCEEDING 14 CARS IN LENGTH
OPERATED DURING MARCH AND APRIL, 1940

TRAIN NUMBER (a)	LIMITS (b)	TIMES (c)	TRAIN MILES (d)	CAR MILES (e)
EASTWARD				
2	Yuma to Arizona-New Mexico State Line via Phoenix and Bowie, 435 miles	1	435	6,846
	Yuma to Tucson via Phoenix, 294 miles	4	1,176	18,228
	Phoenix to Tucson, 121 miles	6	726	11,011
	Willcox to Arizona-New Mexico State Line, 50 miles	1	50	800
4	Yuma to Arizona-New Mexico State Line via Phoenix and Douglas, 469 miles	4	1,876	29,026
	Yuma to Tucson via Phoenix, 294 miles	1	294	4,410
	Phoenix to Arizona-New Mexico State Line via Douglas, 296 miles	7	2,072	31,376
	Phoenix to Tucson, 121 miles	1	121	1,936
	Tucson to Arizona-New Mexico State Line via Douglas, 175 miles	1	175	2,625
6	Yuma to Arizona-New Mexico State Line via Gila and Bowie, 392 miles	2	784	12,152
	Yuma to Tucson via Gila, 251 miles	4	1,004	15,060
	Tucson to Bowie, 115 miles	1	115	1,725
44	Yuma to Phoenix, 173 miles	1	173	2,595
	Yuma to Phoenix and Tucson to Arizona-New Mexico State Line via Douglas, 348 miles	2	696	10,961
	Phoenix to Tucson, 121 miles	1	121	1,815
	Tucson to Arizona-New Mexico State Line via Douglas, 175 miles	1	175	2,625
	TOTAL EASTWARD	36	9,993	158,991
WESTWARD				
1	Arizona-New Mexico State Line to Tucson via Bowie, 140 miles	3	420	6,580
	Arizona-New Mexico State Line to Willcox, 50 miles	1	50	800
	Arizona-New Mexico State Line to Yuma via Bowie and Gila, 391 miles	2	782	12,261
3	Tucson to Arlington via Phoenix, 186 miles	1	186	2,811
5	Arizona-New Mexico State Line to Yuma via Douglas and Phoenix, 468 miles	1	468	7,314
	Phoenix to Yuma, 173 miles	6	1,038	15,943
	Tucson to Yuma via Phoenix, 294 miles	10	2,940	45,449
	TOTAL WESTWARD	24	5,884	90,758
	TOTAL EASTWARD AND WESTWARD	62	15,877	249,749

Defendant's Exhibit No. 247 (Witness Barker)
Feb. 4, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

FREIGHT CARS
EQUIPPED WITH FRICTION DRAFT GEAR
JANUARY 1ST, 1941

	CLASS (1)	NUMBER OWNED JANUARY 1ST, 1941 (2)	NUMBER EQUIPPED (3)	PER CENT OF CARS EQUIPPED WITH FRICTION DRAFT GEAR (4)
	INTERCHANGE CARS			
(1)	Box	14,606	13,274	90.88
(2)	Automobile	5,606	5,023	89.60
(3)	Furniture	402	402	100.00
(4)	Stock	2,814	1,789	63.57
(5)	Flat	4,602	2,421	52.61
(6)	Gondolas	5,363	4,663	86.95
(7)	Ballast	2,503	1,316	52.58
(8)	Tanks	1,951	1,557	79.81
(9)	Refrigerator	20	20	100.00
(10)	Miscellaneous	20	17	85.00
(11)	TOTAL	37,887	30,482	80.46
	CARS CONFINED TO HOME LINES			
(12)	Logging	2,005	81	4.04

JANUARY 1ST, 1941

	CLASS	NUMBER OWNED JANUARY 1ST, 1941	NUMBER EQUIPPED	PER CENT OF CARS EQUIPPED WITH FRICTION DRAFT GEAR
	(1)	(2)	(3)	(4)
	INTERCHANGE CARS			
(1)	Box	14,606	13,274	90.88
(2)	Automobile	5,606	5,023	89.60
(3)	Furniture	402	402	100.00
(4)	Stock	2,814	1,789	63.57
(5)	Flat	4,602	2,421	52.61
(6)	Gondolas	5,363	4,663	86.95
(7)	Ballast	2,503	1,316	52.58
(8)	Tanks	1,951	1,557	79.81
(9)	Refrigerator	20	20	100.00
(10)	Miscellaneous	20	17	85.00
(11)	TOTAL	37,887	30,482	80.46
	CARS CONFINED TO HOME LINES			
(12)	Logging	2,005	81	4.04
(13)	Caboose	686	106	15.45
(14)	Narrow Gauge	206	-	-
(15)	TOTAL	2,897	187	6.45
(16)	GRAND TOTAL	40,784	30,669	75.20

Defendant's Exhibit No. 248 (Witness Sines)
Feb. 4, 1941

TOTAL ROAD MILEAGE AS OF DECEMBER 31, 1939
AND FREIGHT TRAIN CAR MILES AND REVENUE PASSENGER MILES
OPERATED DURING YEAR 1939
CLASS I RAILROADS OF UNITED STATES AND OF CERTAIN RAILROADS
CONCERNING WHICH INDIVIDUAL WITNESSES HAVE HERETOFORE
TESTIFIED ON THE SUBJECT OF OPERATING COSTS

LINE NO.	NAME OF WITNESS (a)	VOLUME NO. OF TRANSCRIPT (b)	BEGINNING PAGE OF TRANSCRIPT (c)	NAME OF RAILROAD (d)	AVERAGE MILEAGE OF ROAD OPERATED (e)	EXHIBIT NUMBER (f)	FRT. TRAIN CAR MILES OPERATED (THOUSANDS) (g)	PAGE REFERENCE PRELIMINARY ABSTRACT I.C.C. STATISTICS OF RAILWAYS, 1939 (h)	REVENUE PASSENGER MILES (THOUSANDS) (i)
1	Parmelee	3 - 4	272	All Class I Railroads of U. S.	232,026	22	22,323,792	19	22,651,334
2	Porter	2	180	New York Central RR Co.	10,940	12	1,785,682	19	2,698,905
3	Kirk	3 - 4	375	Missouri Pacific RR Co.	7,146	25	611,218	21	261,873
4	Young	4-5-6	480	Illinois Central RR.	6,537	29	717,812	20	596,937
5	Burs	6 - 7	722	Great Northern Ry. Co.	7,976	47	543,341	21	1,180
6	Gregory	6 - 7	739	Northern Pacific Ry. Co.	6,425	49	509,282	21	227,796
7	Siddall	6 - 7	755	Rock Island Lines	7,941	52	536,918	21	448,069
8	Oakley	6 - 7	766	Erie Railroad	2,259	56	529,875	19	318,416
9	Millard	7	780	St. Louis Southwestern Ry. Lines	1,678	60	137,774	21	17,966
10	Snell	7	801	Chicago & Northwestern Ry. Co.	8,346	64	470,645	21	696,071
11	Albert	7	817	Pennsylvania RR.	9,990	68	2,053,868	20	3,147,222
12	Collin	8	906	Union Pacific RR Co.	9,901	79	1,188,135	21	1,087,776
13	Hammond	9 -10	1,137	Boston and Maine RR.	1,916	87	190,867	19	369,814
14	Kiley	10	1,280	Chicago, Milwaukee, St. Paul & Pacific RR.	10,912	96	885,756	21	645,456
15	White	11	1,394	Chicago, Burlington & Quincy RR. Co.	8,282	103	659,609	21	544,510
16	Wilbur	12-14	1,586	Chesapeake & Ohio Ry. Co.	3,065	121	765,685	20	145,613
17	McDonald	15-16	1,735	Atchison, Topeka & Santa Fe System	13,454	131	1,010,208	21	1,083,309
18	Mason	12-17 19	1,585	Southern Pacific Co. - Pacific Lines	8,559	168	968,184	21	1,481,394
19	TOTAL OF LINES (2) TO (18) INCLUSIVE				125,686	-	13,178,145	-	13,601,934
20	PERCENTAGE OF LINE (19) TO LINE (1)				54.2%	-	59.0%		60.0%

SOURCE: Column (e) from Defendant's exhibits heretofore admitted in evidence as listed in column (f).

Columns (g) and (i) from I.C.C. Abstract of Railway Statistics for the year 1939; specific page reference being shown in column (h) for individual railroads.

Lines (19) and (20) are computations.

Defendant's Exhibit No. 249 (Witness Sines)
Feb. 4, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

COMPARISONS BETWEEN TUCSON DIVISION, PACIFIC LINES, AND SALT LAKE DIVISION
SHOWING TRENDS IN FREIGHT TRAIN AND LOCOMOTIVE LOADING,
AND EFFECT ON FUEL CONSUMPTION

	TOTAL PERCENTAGE CHANGE FOR TWO PERIODS 1924-25 TO 1928-29 AND 1930-31 TO 1938-39		
	TUCSON DIVISION	PACIFIC LINES	SALT LAKE DIVISION
	(a)	(b)	(c)
Percentage Increase in Cars per Train	D 0.43	14.73	30.61
Percentage Increase in Gross Ton Miles per Train Mile	3.95	18.70	35.42
Percentage Increase in Gross Ton Miles per Locomotive Mile	3.96	20.87	36.57
Percentage Decrease in Pounds of Fuel per 1000 Gross Ton Miles	D 12.62	D 22.38	D 26.06

D - Indicates Decrease.

SOURCE: Southern Pacific Company Forms 522 and 521.

TUCSON DIVISION

M A I N A N D B R A N C H

YEAR	TRAIN MILES	LOCOMOTIVE MILES	CAR MILES	GROSS TON MILES EXCL. LOCO. AND TENDER(THOUS)	NET TONS FUEL	CARS PER TRAIN	GROSS TON MILES PER TRAIN MILE	GROSS TON MILES PER LOCO.MILE	POUNDS OF FUEL PER 1000. GROSS TON MILES
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
1924	1,262,381	1,465,166	68,155,950	2,600,029	130,982	54.0	2,060	1,775	101
1925	1,391,255	1,632,384	76,665,581	2,923,849	156,624	55.1	2,102	1,791	107
1926	1,611,795	1,905,654	85,919,165	3,235,642	168,526	53.3	2,007	1,698	104
1927	1,678,797	1,961,675	86,995,112	3,261,458	169,820	51.8	1,943	1,663	104
1928	1,675,049	1,936,486	88,703,729	3,307,074	168,214	53.0	1,974	1,708	102
1929	1,796,663	2,067,906	97,958,307	3,712,182	182,344	54.5	2,066	1,795	98
1930	2,123,339	2,588,817	123,148,585	4,496,375	263,235	58.0	2,118	1,737	117
1931	1,840,825	2,224,187	106,102,112	3,865,806	233,251	57.6	2,100	1,738	121
1932	1,564,526	1,875,511	90,835,368	3,274,761	187,383	58.1	2,093	1,746	114
1933	1,464,477	1,733,409	85,258,453	3,110,006	171,808	58.2	2,123	1,794	110
1934	1,680,188	2,002,585	98,411,317	3,624,314	197,819	58.6	2,157	1,810	109
1935	1,992,926	2,403,539	115,720,793	4,326,429	239,736	58.1	2,171	1,800	111
1936	2,356,102	2,849,929	131,108,594	5,020,317	278,951	55.6	2,131	1,762	111
1937	2,581,764	3,137,449	141,701,698	5,490,250	310,261	54.9	2,115	1,740	114
1938	2,199,250	2,707,470	129,999,600	5,007,078	274,167	59.1	2,277	1,849	110
1939	2,463,209	3,017,392	142,465,627	5,499,410	295,824	57.8	2,233	1,823	108
TOTAL 1924-25	2,653,636	3,097,550	144,821,531	5,523,878	287,606	54.6	2,082	1,783	104.1
TOTAL 1928-29	3,471,712	4,004,392	186,662,036	7,019,256	350,558	53.8	2,022	1,753	99.9
		Per Cent Change 2 Years 1924-25 Compared With 2 Years 1928-29				D 1.47	D 2.88	D 1.68	D 4.03
TOTAL 1930-31	3,964,164	4,813,004	229,250,727	8,362,181	496,486	57.8	2,109	1,737	118.7
TOTAL 1938-39	4,662,459	5,724,862	272,465,227	10,506,488	569,991	58.4	2,253	1,835	108.5
		Per Cent Change 2 Years 1930-31 Compared With 2 Years 1938-39				1.04	6.83	5.64	D 8.59
		TOTAL Per Cent Change for the Two Periods Compared.				D 0.43	3.95	3.96	D 12.62

5737

D - Indicates Decrease

PACIFIC LINES

MAIN AND BRANCH

YEAR	TRAIN MILES	LOCOMOTIVE MILES	CAR MILES	GROSS TON MILES EXCL. LOCO. AND TENDER (THOUS)	NET TONS FUEL	CARS PER TRAIN	GROSS TON MILES PER TRAIN MILE	GROSS TON MILES PER LOCO. MILE	POUNDS OF FUEL PER 1000 GROSS TON MILES
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
1924	17,121,585	22,060,845	777,176,907	29,512,517	2,327,668	44.6	1,694	1,338	158
1925	18,057,330	22,971,801	855,651,964	32,239,921	2,436,573	47.4	1,785	1,403	151
1926	18,337,924	23,208,580	893,269,657	33,754,671	2,453,873	48.7	1,841	1,454	145
1927	18,701,635	23,235,661	922,352,883	34,812,162	2,457,371	49.3	1,861	1,498	141
1928	19,454,353	24,046,586	974,681,918	36,736,121	2,521,243	50.1	1,883	1,528	137
1929	19,744,417	24,400,528	995,278,305	37,989,651	2,571,448	50.4	1,924	1,557	135
1930	16,873,073	20,606,190	885,135,380	33,367,924	2,201,046	52.5	1,978	1,619	132
1931	14,124,510	16,754,896	726,276,911	27,129,918	1,782,810	51.4	1,921	1,620	131
1932	12,352,250	14,447,238	611,317,532	22,509,048	1,462,072	49.5	1,822	1,558	130
1933	11,427,188	13,409,326	578,050,895	21,547,351	1,367,946	50.6	1,886	1,607	127
1934	13,082,480	15,631,286	689,298,323	25,953,989	1,532,726	52.7	1,984	1,660	123
1935	14,175,528	16,987,006	758,411,843	28,840,309	1,758,721	53.5	2,035	1,698	122
1936	17,507,446	21,397,174	922,782,455	35,579,016	2,188,897	52.7	2,032	1,663	123
1937	19,207,708	23,758,059	1,005,960,516	38,838,343	2,436,311	52.4	2,022	1,635	125
1938	16,119,057	19,555,827	870,462,516	33,644,736	2,017,947	54.0	2,077	1,720	120
1939	17,299,613	21,032,526	962,123,716	37,603,623	2,170,975	55.6	2,174	1,788	115
TOTAL 1924-25	35,178,915	45,032,646	1,632,828,871	61,752,438	4,764,241	46.0	1,741	1,371	154.3
TOTAL 1928-29	39,198,770	48,447,114	1,969,960,223	74,726,072	5,092,691	50.3	1,906	1,542	136.3
		Per Cent Change 2 Years 1924-25 Compared With 2 Years 1928-29				9.35	9.48	12.47	D 11.67
TOTAL 1930-31	30,997,583	37,361,086	1,611,412,291	60,497,842	3,983,856	52.0	1,952	1,619	131.7
TOTAL 1938-39	33,418,670	40,588,353	1,832,586,232	71,248,359	4,188,922	54.8	2,132	1,755	117.6
		Per Cent Change 2 Years 1930-31 Compared With 2 Years 1938-39				5.38	9.22	8.40	D 10.71
		TOTAL Per Cent Change for the Two Periods Compared				14.73	18.70	20.87	D 22.38

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D - Indicates Decrease

SALT LAKE DIVISION

MAIN AND BRANCH

YEAR	TRAIN MILES	LOCOMOTIVE MILES	CAR MILES	GROSS TON MILES EXCL. LOCO. AND TENDER (THOUS	NET TONS FUEL	CARS PER TRAIN	GROSS TON MILES PER TRAIN MILE	GROSS TON MILES PER LOCO. MILE	POUNDS OF FUEL PER 1000 GROSS TON MILES
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
1924	2,512,265	2,875,894	129,683,119	5,052,658	253,572	51.6	2,011	1,757	100
1925	2,687,730	3,107,340	154,884,285	5,891,284	272,946	57.6	2,192	1,896	93
1926	2,485,971	2,883,667	156,867,337	6,018,202	251,924	63.1	2,421	2,087	84
1927	2,582,291	3,000,773	169,857,262	6,520,017	265,521	65.8	2,526	2,173	81
1928	2,878,615	3,377,900	190,565,082	7,286,721	300,327	66.2	2,531	2,157	82
1929	2,843,361	3,389,927	185,351,583	7,180,618	300,274	65.2	2,526	2,118	84
1930	2,560,519	3,100,575	184,335,235	7,100,425	297,118	72.0	2,773	2,290	84
1931	2,104,285	2,469,858	153,386,367	5,777,372	245,377	72.9	2,746	2,339	85
1932	1,864,231	2,137,112	136,893,195	5,032,436	213,831	73.4	2,699	2,355	85
1933	1,712,262	1,968,741	129,286,939	4,841,197	201,691	75.5	2,827	2,459	83
1934	1,897,770	2,184,319	151,195,773	5,637,970	224,135	79.7	2,971	2,581	80
1935	2,010,254	2,320,863	154,261,993	5,955,649	239,365	76.7	2,963	2,566	80
1936	2,477,279	2,831,042	183,451,764	7,233,395	286,873	74.1	2,920	2,555	79
1937	2,574,550	2,978,435	190,062,342	7,504,868	298,905	73.8	2,915	2,520	80
1938	2,087,211	2,389,220	164,148,112	6,500,398	245,163	78.6	3,114	2,721	75
1939	2,293,710	2,652,842	186,211,865	7,449,707	270,246	81.2	3,248	2,808	73
TOTAL 1924-25	5,199,995	5,983,234	284,567,404	10,943,942	526,518	54.7	2,105	1,829	96.2
TOTAL 1928-29	5,721,976	6,767,827	375,916,665	14,467,339	600,601	65.7	2,528	2,138	83.0
		Per Cent Change 2 Years 1924-25 Compared With 2 Years 1928-29				20.11	20.10	16.89	D 13.72
TOTAL 1930-31	4,664,804	5,570,433	337,721,602	12,877,797	542,495	72.4	2,761	2,312	84.3
TOTAL 1938-39	4,380,921	5,042,062	350,359,977	13,950,105	515,409	80.0	3,184	2,767	73.9
		Per Cent Change 2 Years 1930-31 Compared With 2 Years 1938-39				10.50	15.32	19.68	D 12.34
		TOTAL Per Cent Change for the Two Periods Compared				30.61	35.42	36.57	D 26.06

D - Indicates Decrease

5739

Defendant's Exhibit No. 250 (Witness Sines)
Feb. 4, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

YUMA, ARIZONA TO LORDSBURG, NEW MEXICO
FUEL CONSUMPTION COMPARISONS AND ESTIMATED ECONOMIES
RESULTING FROM ADOPTION OF LONG TRAIN OPERATION

LINE NO.		TOTAL PERCENTAGE CHANGE FOR TWO PERIODS 1924-25 TO 1928-29 AND 1930-31 TO 1938-39			TOTAL PERCENTAGE CHANGE REDISPATCH COMPARED WITH ACTUAL OPERATIONS TUCSON DIVISION (YUMA - LORDSBURG)			
		TUCSON DIVISION	PACIFIC LINES	SALT LAKE DIVISION	REDISPATCH OF JUNE AND AUGUST 1938	REDISPATCH OF APRIL 4-30, 1940 USING PRESENT POWER AND SHORT SIDINGS	REDISPATCH OF APRIL 4-30, 1940 USING AC POWER AND LONG SIDINGS	PERCENT INCREASE OF APRIL REDISPATCH USING AC POWER AND LONG SIDINGS OVER APRIL REDISPATCH USING PRESENT POWER AND SHORT SIDINGS
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
1	Percentage increase in cars per train	D 0.43	14.73	30.61	31.6	D 3.8	21.7	26.6
2	Percentage increase in gross ton miles per train mile	3.95	18.70	35.42	31.3	D 3.9	21.2	26.2
3	Percentage increase in gross ton miles per locomotive mile	3.96	20.87	36.57	34.5	D 4.6	24.9	31.0
4	Percent decrease in pounds of fuel per thousand gross ton miles	D 12.62	D 22.38	D 26.06	D 10%	I 1.5%	D 8.5%	D 10%

		JUNE & AUG.1938	APRIL 4-30, 1940	APRIL 4-30, 1940	APRIL 4-30, 1940
		(h)	(i)	(j)	(k)
5	Barrels of fuel oil consumed, Tucson Division	178,892	97,258	97,258	97,258
6	Average price of fuel oil per barrel	$0.97	$0.85	$0.85	$0.85
7	Cost of fuel oil consumed	$173,525	$82,669	$82,669	$82,669
8	Percentage decrease	10.0	1.5	8.5	10.0
9	Decrease in fuel consumption (saving)	D $17,352	I $1,240	D $7,027	D $8,267

5740

D = DECREASE
I = INCREASE

Defendant's Exhibit No. 251 (Witness Sines)
Feb. 4, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

LORDSBURG, NEW MEXICO TO EL PASO, TEXAS
FUEL CONSUMPTION COMPARISONS AND ESTIMATED ECONOMIES
RESULTING FROM ADOPTION OF LONG TRAIN OPERATION

LINE NO.		TOTAL PERCENTAGE CHANGE FOR TWO PERIODS 1924-25 TO 1928-29 AND 1930-31 TO 1938-39			TOTAL PERCENTAGE CHANGE REDISPATCH COMPARED WITH ACTUAL OPERATIONS LORDSBURG - EL PASO			
		TUCSON DIVISION	PACIFIC LINES	SALT LAKE DIVISION	REDISPATCH OF JUNE AND AUGUST 1938	REDISPATCH OF APRIL 4-30, 1940 USING PRESENT POWER AND SHORT SIDINGS	REDISPATCH OF APRIL 4-30, 1940 USING AC POWER AND LONG SIDINGS	PERCENT INCREASE OF APRIL REDISPATCH USING AC POWER AND LONG SIDINGS OVER APRIL REDISPATCH USING PRESENT POWER AND SHORT SIDINGS
		(a)	(b)	(c)	(d)	(e)	(f)	(g)
1	Percentage increase in cars per train	D 0.43	14.73	30.61	27.5	0.0	20.7	20.7
2	Percentage increase in gross ton miles per train mile	3.95	18.70	35.42	27.8	0.0	20.9	20.9
3	Percentage increase in gross ton miles per locomotive mile	3.96	20.87	36.57	25.5	0.0	19.1	19.1
4	Percentage decrease in pounds of fuel per thousand gross ton miles	D 12.62	D 22.38	D 26.06	D 7%	-	D 5%	D 5%

		JUNE & AUG.1938	APRIL 4-30,1940	APRIL 4-30, 1940	APRIL 4-30, 1940
		(h)	(i)	(j)	(k)
5	Barrels of fuel oil consumed, Lordsburg-El Paso	31,773	-	18,070	18,070
6	Average price of fuel oil per barrel	$0.97	-	$0.85	$0.85
7	Cost of fuel oil consumed	$30,820	-	$15,360	$15,360
8	Tons of coal consumed, Lordsburg-El Paso	2,100	-	1,553	1,553
9	Average price of coal per ton	$3.42	-	$3.75	$3.75
10	Cost of coal consumed	$7,182	-	$5,824	$5,824
11	Total cost of fuel consumed (oil and coal)	$38,002	-	$21,184	$21,184
12	Percentage decrease	7.0	-	5.0	5.0
13	Decrease in fuel consumption (saving)	D $2,660	-	D $1,059	D $1,059

D = DECREASE

5741

Defendant's Exhibit No. 252 (Witness Sines)
Feb. 4, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

SUMMARY OF ANNUAL SAVINGS AND
ANNUAL INCREASED COSTS IN FREIGHT AND
PASSENGER SERVICE BETWEEN
LOS ANGELES, CALIFORNIA AND EL PASO, TEXAS,
FOLLOWING REMOVAL OF RESTRICTIONS OF
ARIZONA TRAIN LIMIT LAW - YEAR 1938

	PERIOD JUNE & AUGUST 1938 (a)	ANNUAL YEAR 1938 (b)
1. FREIGHT SERVICE:		
Yuma, Arizona to El Paso, Texas.		
Saving for period June and August, 1938.		
Wages, Exhibit No. 224	$51,103.42	
Fuel, Yuma-Lordsburg Exhibit No. 250	17,352.00	
Fuel, Lordsburg-El Paso Exhibit No. 251	2,660.00	
TOTAL SAVING FOR PERIOD	$71,115.42	
Saving for year (saving for period increased in ratio of 17.89% to 100%)		$397,515
2. PASSENGER SERVICE: Exhibit No. 231		
Los Angeles, California to El Paso, Texas, Year 1938		10,884
3. TOTAL ANNUAL SAVINGS		408,399
4. Investment Charges: Exhibit No. 225.		
125,703 track feet of siding extensions, roundhouse and shop facilities, locomotive and caboose investment		79,005
5. NET ANNUAL SAVING		$329,394

Defendant's Exhibit No. 253 (Witness Sines)
Feb. 4, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY - JUNE AND AUGUST, 1938
EXTRA-TERRITORIAL EFFECT
OF ARIZONA TRAIN LIMIT LAW
BETWEEN ARIZONA-NEW MEXICO STATE LINE AND EL PASO, TEXAS

LINE NO.	DISTRICT	ACTUAL TRAIN MILES (a)	REDISPATCHED TRAIN MILES (b)	TRAIN MILE SAVING (a) minus (b) (c)	PER CENT SAVING (c) divided by (a) (d)
1	Arizona-New Mexico State Line to Lordsburg, New Mexico, 23 miles 749 actual trains 519 redispatched trains For period June and August, 1938	17,227	11,937	5,290	30.7%
2	Lordsburg, New Mexico to El Paso, Texas, 149 miles For period June and August, 1938	100,152	78,287	21,865	21.8%
3	Total for period (Lines 1 and 2)	117,379	90,224	27,155	23.1%
4	Train mile saving for year (saving for period increase in ratio of 17.89% to 100.00%)			151,789	
5	Monetary saving for year, (Line 4 x $ 0.5158*)			$ 78,293	

* - Exhibit No. 252 shows annual saving $329,394 Yuma, Arizona to El Paso, Texas, and 638,569 train miles eliminated equals $0.5158 per train mile saved.

Defendant's Exhibit No. 254 (Witness Sines)
Feb. 4, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

LOCOMOTIVE REPAIR COST DATA
FOR USE IN REDISPATCH STUDIES

LINE NO.	LOCOMOTIVES (a)	NET WEIGHT TONS (b)	MILEAGE OPERATED YEARS 1930 TO 1939 INCL. (c)	SHOP REPAIRS YEARS 1930 TO 1939 INCL. (d)	SHOP REPAIR COST PER MILE (d)÷(c) (e)
1	Mogul 6 - 9	110	2,068,990	$ 207,004.98	10.01¢
2	Consolidation 9 - 10	134	2,367,112	306,737.81	12.96
3	Mikado 2 - 4	158	2,559,058	367,321.94	14.35
4	Mikado 5 - 6	168	4,495,617	617,084.73	13.73
5	F - 1	191	6,566,488	877,539.69	13.36
6	F - 5	223	4,772,391	795,414.52	16.67
7	SP - 1	256	6,622,409	1,274,315.41	19.24

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Defendant's Exhibit No. 255 (Witness Sines)
Feb. 4, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY - LOCOMOTIVE REPAIRS
YUMA, ARIZONA TO EL PASO, TEXAS
FOR PERIOD APRIL 4TH TO APRIL 30TH, 1940
ACTUAL OPERATION COMPARED WITH REDISPATCHED OPERATION,
OBSERVING 70 CAR RESTRICTION AND
USING PRESENT POWER AND SHORT SIDINGS

LINE NO.	TYPE OF LOCOMOTIVE	ACTUAL LOCOMOTIVE MILES (a)	REPAIR COST PER MILE (CENTS) (b)	TOTAL FOR PERIOD (c)	REDISPATCHED LOCOMOTIVE MILES (d)	REPAIR COST PER MILE (CENTS) (e)	TOTAL FOR PERIOD (f)
1	Consolidation 9, 10	280	12.96	$ 36.29	280	12.96	36.29
2	Mikado 2, 4	149	14.35	21.38	149	14.35	21.38
3	Mikado 5 - 9	17,762	13.73	2,438.72	17,526	13.73	2,406.32
4	Pacific 10, 12	96	13.36	12.83	96	13.36	12.83
5	Mountain 1 - 5	1,649	13.36	220.31	1,583	13.36	211.49
6	F 1	21,443	13.36	2,864.78	20,976	13.36	2,802.39
7	F 3 - 5	110,488	16.67	18,418.35	119,554	16.67	19,929.65
8	SP 1 - 3	132,419	19.24	25,477.42	136,843	19.24	26,328.59
9	TOTAL	284,286	-	$49,490.08	297,007	-	$51,748.94
10	INCREASE FOR PERIOD, ...			$2,258.86			

Defendant's Exhibit No. ~~24x~~ 256 (Witness Sines)
Feb. 4, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY SUMMARY OF INCREASED COSTS,
YUMA, ARIZONA TO EL PASO, TEXAS,
FOR PERIOD APRIL 4TH TO APRIL 30TH, 1940
ACTUAL OPERATION COMPARED WITH REDISPATCHED OPERATION
OBSERVING 70 CAR RESTRICTION AND USING
PRESENT POWER AND SHORT SIDINGS.

	INCREASED COSTS
FREIGHT SERVICE: Exhibit No. 236	
Yuma, Arizona to El Paso, Texas,	
increase of 8,733 train miles	
and 12,721 locomotive miles.	
Wages Exh. No. 239	$ 5,832
Fuel, Yuma-Lordsburg Exh. No. 250	1,240
Locomotive repairs Exh. No. 255	2,259
TOTAL INCREASED COST	$ 9,331

5746

Defendant's Exhibit No. 257 (Witness Sines)
Feb. 4, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

RELATION BETWEEN LOCOMOTIVE SHOP REPAIR COSTS, RUNNING REPAIR COSTS, AND TOTAL COSTS

YEAR	SHOP REPAIRS (a)	RUNNING REPAIRS (b)	TOTAL REPAIRS (c)	PER CENT SHOP TO TOTAL (d)
1930	$5,454,951	$4,754,831	$10,209,782	53.4
1931	3,949,469	4,008,010	7,957,479	49.6
1932	2,973,145	3,285,098	6,258,243	47.5
1933	2,939,863	2,909,167	5,849,030	50.3
1934	3,854,615	2,775,867	6,630,482	58.1
1935	4,252,885	3,119,260	7,372,145	57.7
1936	5,403,178	4,242,818	9,645,996	56.0
1937	6,846,538	5,314,871	12,161,409	56.3
1938	6,297,278	4,447,985	10,745,263	58.6
1939	7,241,933	4,581,745	11,823,678	61.2
TOTAL 1930-1939	$49,213,855	$39,439,652	$88,653,507	AVERAGE 55.5

5747

Defendant's Exhibit No. 258 (Witness Sines)
Feb. 4, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY SUMMARY OF SAVINGS
YUMA, ARIZONA TO EL PASO, TEXAS
FOR PERIOD APRIL 4TH TO APRIL 30TH, 1940
ACTUAL OPERATION COMPARED WITH REDISPATCHED OPERATION,
WITH NO RESTRICTION AND USING AC POWER AND LONG SIDINGS

	SAVING
FREIGHT SERVICE: Exhibit No. 242	
Yuma, Arizona to El Paso Texas,	
excluding Phoenix line, eliminate	
47,449 train miles, and	
61,608 locomotive miles	
Wages Exh. No. 245	$20,192
Fuel, Yuma-Lordsburg Exh. No. 250	7,027
Fuel, Lordsburg-El Paso Exh. No. 251	1,059
TOTAL SAVING	$28,278

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Superior Court, Pima Co., Arizona

Defendant's Exhibit No. 259 (Witness Sines)
Feb. 4, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY - APRIL 4 - 30, 1940
ACTUAL OPERATION COMPARED WITH REDISPATCHED
OPERATION WITH NO RESTRICTION AND USING
AC POWER AND LONG SIDINGS
EXTRA-TERRITORIAL EFFECT OF ARIZONA TRAIN LIMIT LAW
BETWEEN ARIZONA-NEW MEXICO STATE LINE AND EL PASO, TEXAS

LINE NO.	DISTRICT	ACTUAL TRAIN MILES (a)	REDISPATCHED TRAIN MILES (b)	TRAIN MILE SAVING (a) minus (b) (c)	PER CENT SAVING (c) divided by (a) (d)
(1)	Arizona-New Mexico State Line to Lordsburg, New Mexico, 23 miles 409 actual trains 307 redispatched trains For period April 4th to 30th, 1940	9,407	7,061	2,346	24.9%
(2)	Lordsburg-New Mexico to El Paso, Texas, 149 miles For period April 4th to 30th, 1940	56,134	46,457	9,677	17.2%
(3)	Total for period (Lines 1 and 2)	65,541	53,518	12,023	18.3%
(4)	Monetary saving for month (Line 3 x $0.596*)			$7,166	

* - Exhibit No 258 shows saving of $28,278 Yuma, Arizona to El Paso, Texas and 47,449 train miles eliminated; equals $0.596 per train mile saved.

Superior Court, Pima Co., Arizona

Defendant's Exhibit No. 260 (Witness J.J. Sullivan)
Feb. 5, 1941

INTERSTATE COMMERCE COMMISSION RULES GOVERNING MONTHLY REPORTS OF RAILWAY ACCIDENTS
EFFECTIVE ON JANUARY 1ST, 1922

INTERSTATE COMMERCE COMMISSION
BUREAU OF STATISTICS

RULES
GOVERNING
MONTHLY REPORTS
OF
RAILWAY ACCIDENTS

1922 REVISION

(With modifying orders dated September 21, 1932, December 17, 1932, and January 14, 1936)

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1939

ORDER.

At a General Session of the INTERSTATE COMMERCE COMMISSION, held at its office in Washington, D. C., on the 31st day of December, A. D. 1921.

Ordered, That the annexed draft of rules entitled "Rules governing monthly reports of railway accidents" be, and they hereby are, approved to become effective as of January 1, 1922, and that all common carriers within the scope of the Accident Reports Act, approved May 6, 1910, be governed by the said rules in the preparation and submission of their monthly reports of accidents occurring on or after January 1, 1922.

It is further ordered, That the order of this Commission issued under date of October 11, 1918, in the matter of monthly reports of railway accidents be, and it is hereby, annulled except in its application to reports of accidents occurring before January 1, 1922.

By the Commission:

[SEAL.] GEORGE B. MCGINTY,
Secretary.

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RULES GOVERNING MONTHLY REPORTS OF RAILWAY ACCIDENTS.

GENERAL INSTRUCTIONS.

1. **Operation of a Railway.**—The term *operation of a railway* is used herein to include—

The operation of trains, locomotives, and cars and the facilities incidental to their operation, such as tracks, railway stations, depots, freight houses, warehouses, shops, coaling stations, wharves, and ferries used as an adjunct of train-service, etc., when such operation is performed under the supervision of the carrier by its employees.

The maintenance of equipment, roadway, track, buildings, and other parts of railway plant, when such maintenance is performed under the supervision of the carrier by its employees.

The construction of additions, betterments, and new lines when performed under the supervision of the carrier by its regular forces of employees ordinarily engaged in the construction, operation, or maintenance of existing lines.

2. **Accidents to be Reported.**—A *reportable accident* is an accident arising from the operation of a railway that results in one or more of the following circumstances:

(*a*) Damage to railway property amounting to more than $150, including the expense of clearing wreck, but not damage to or loss of freight or baggage, animals, or property of noncarriers on or adjacent to right of way.

(*b*) Death of a person.

(*c*) Injury to an employee sufficient to incapacitate him from performing his ordinary duties for more than three days in the aggregate during the 10 days immediately following the accident. This rule applies to employees on duty, and to those classed as not on duty, but does not apply to employees classed as passengers or trespassers.

(*d*) Injury to a person other than an employee if the injury is sufficient, in the opinion of the reporting officer, to incapacitate the injured person from following his customary vocation or mode of life for a period of more than one day. This rule applies also to employees classed as passengers or trespassers.

3. **Accidents Not to be Reported.**—No accident is to be reported unless it arises from the operation of a railway and causes either a reportable casualty or damage exceeding $150 to railway property (including the cost of clearing wreck); nor are reports of accidents of such nature as the following required: Casualties caused by frightened animals and injuries to persons jumping from vehicles not on railway property; casualties to persons other than employees on duty resulting from assaults by passengers and other persons not railway employees; casualties to employees received in personal encounters with other employees; cases of suicide in which death evidently was not caused by moving trains, locomotives, or cars; and cases of disability or death resulting from natural causes. Unless due to defective or moving railway equipment or negligence, mistake, or misconduct of railway employees, the following kinds of accident are likewise not reportable: Casualties to draymen and other persons, not railway employees, while loading or unloading freight at station and freight-house platforms or at or in cars; and casualties to contractors or their employees engaged in railway contract work.

4. **Doubtful Cases.**—Whenever any person declares that he has been injured in a railway accident and the carrier involved denies the allegation, the injury alleged, if of a reportable class, should be reported, but should be designated "claimed but not admitted by carrier," or otherwise, as may be appropriate. Any person found dead on or adjacent to the premises or right of way of a carrier should, unless excluded by the provisions of section 3, be reported by the carrier if the evidence or a coroner's verdict is in effect that such person's death resulted from the operation of its railway.

5. **Joint operations.**—For the purpose of accident classification, the term "joint operations" is intended to cover operations on terminal or other tracks used jointly or in common by two or more reporting carriers, or where the equipment of one carrier moves as its own train over the track of another carrier.

Locomotives, with or without crews, if loaned or leased by one carrier to another, are not thereby made subject to the rules relative to "joint operations."

Trains or locomotives of a nonreporting carrier which may become involved in reportable accidents on the line of a reporting carrier do not fall under the rules pertaining to "joint operations"; such accidents, however, should be included in the report of the reporting carrier.

If a reportable accident occurs on a private siding or track of like character, it should be reported by the carrier having possession of the locomotive concerned or employing the persons involved, but not as a joint-operation accident.

The question of responsibility among carriers for accidents classifiable under the rules applicable to joint operations is not to be considered in relation to the making of reports concerning them, but all carriers involved should make reports as respectively required.

For rules relative to reporting railway "crossing collisions," see section 8 (*e*) and (*f*).

5a. **Joint operations—Train accidents.**—Train accidents resulting in *total* damage in excess of $150 (including cost of clearing wreck), occurring on tracks used by two or more reporting carriers should be severally reported by the carrier or carriers whose *equipment* or *employees* are involved and the carrier whose superintendent is in immediate charge of the track on which the accident occurs. Each carrier concerned in such an accident should report the damage to its equipment and other items of expense as provided in the report blank and state (estimating, if unknown) the amount of damage sustained by the other carriers involved; the names of which should be respectively indicated before the items of damage.

If a reportable train accident, though occurring on jointly used track, involves only the equipment and employees of the carrier whose superintendent is in immediate charge of such track, the accident need be reported only by the carrier concerned.

Where two or more trains are involved, each carrier should report casualties to its passengers and employees and also to other persons on its train. Casualties to classes of persons not here mentioned should be appropriately reported by the carrier concerned.

5b. **Joint operations—Train-service accidents.**—Train-service accidents occurring on terminal or other tracks used jointly or in common by two or more reporting carriers involving employees on duty should be reported by the several carriers concerned. Casualties to other persons should be reported by the carrier whose equipment is involved.

5c. **Casualties to Railway Employees on Adjacent Track of Another Road.**—When a railway employee on duty is killed or injured on the adjacent track of another carrier, the accident should be reported by both carriers, whether or not a joint operation is involved.

CLASSIFICATION OF RAILWAY ACCIDENTS.

6. **Primary Groups and Their Definitions.**—Reportable railway accidents are divided into three primary groups:

Group I.—Train accidents.
Group II.—Train-service accidents.
Group III.—Nontrain accidents.

Group I.—Train Accidents.—This group covers accidents, with or without casualties, arising in connection with the operation or movement of trains, locomotives, or cars that result in damage to equipment or other railway property in excess of $150 (including cost of clearing wreck, in which should be included the local expense of transferring lading made necessary as the result of an accident, but not damage, if any, to the lading). (See Group I below.)

Group II.—Train-service Accidents.—This group covers accidents arising in connection with the operation or movement of trains, locomotives, or cars that result in casualties to persons, but not in damage to equipment or other railway property in excess of $150 (including cost of clearing wreck as indicated in the preceding paragraph). (See Group II, page 20.)

Group III.—Nontrain Accidents.—This group covers accidents that do not result directly from the operation or movement of trains, locomotives, or cars.

Accidents in connection with the operation of vessels are also considered nontrain accidents, and resulting casualties are reportable when the vessels are operated as an adjunct to train service. (See Group III, page 22.)

GROUP I.—TRAIN ACCIDENTS.

7. **Classification of Train Accidents.**—Train accidents should be classified under the following heads:

Collisions (Class C).
Derailments (Class D).
Locomotive-boiler accidents (Class B).
Other locomotive accidents or failures (not resulting in a collision, derailment, or boiler accident) (Class L).
Miscellaneous train accidents (Class M).

If a single accident is classifiable under two or more of the foregoing heads, it should be classified in accordance with its primary class.

8. **Collisions (Class C).**—A collision is a violent impact of a train, locomotive, or car with some other train, locomotive, or car while both are on rails. Accidents, however, in which cars, not in suitable condition to withstand common train usage, that, when coupled in trains, may be damaged through ordinary train movements, should be classified as miscellaneous train accidents, and not as collisions. (Accidents caused by trains, etc., striking hand cars, section motor cars, and like roadway machines, or bumping posts, are not classifiable as collisions, but otherwise according to circumstances.)

Reports of collisions, in addition to furnishing the information required by sections of these rules having general application, should describe briefly the method of operation in use for the track involved,

stating whether the block system was in use; and, if in use, whether manual, controlled manual, automatic, etc.

For collisions involving any question of train orders, the information should show whether they were on Form "19" or Form "31" (A. R. A. Standard Code of Train Rules).

In the case of a collision, the number of main tracks in use in the locality of the accident should be stated.

Collisions should be classified as follows:

(*a*) *Rear-end collisions.*—A rear-end collision is a collision in which the trains or locomotives involved are bound in the same direction on the same track.[1]

(*b*) *Head-on collisions.*—A head-on collision is a collision in which the trains or locomotives involved are bound in opposite directions on the same track.[1]

(*c*) *Broken-train collisions.*—A broken-train collision is a collision in which a moving *train* breaks into parts and a violent impact of two or more of the uncoupled parts of the same train occurs, or one or more of the parts collide with another train, locomotive, or car. Collisions in which the equipment involved is employed in a switching movement are not to be included in this class.

(*d*) *Side or raking collisions.*—This class does not include collisions of trains with cars classifiable under (*g*) or collisions of equipment employed in switching movements classifiable under (*h*). An accident caused by parts of equipment on one track coming in contact with equipment on a parallel track should not be classified as a collision, but as a miscellaneous train accident, unless a derailment occurs.

(*e*) *Crossing collisions at private railway crossings.*—The term "crossing collisions at private railway crossings" is used herein to mean collisions occurring at crossings or junctions on the carriers' right of way, involving trains, locomotives, or cars operated on the intersecting tracks not on public streets, highways, or other public property.[2]

(*f*) *Crossing collisions at public highway crossings.*—The term "crossing collisions at public highway crossings" is used herein to mean collisions occurring at railway grade crossings on public streets, highways, or other public property, involving trains, locomotives, or cars operated on the intersecting tracks. This class does not include accidents due to striking trolley cars, automobiles, or other vehicles, classifiable under sections 9 (*f*), 12 (*a*), or 13 (*h*).[2]

[1] The time-table or schedule direction should govern the classification of collisions in clauses (*a*) and (*b*) if at the time of the accident either of the trains or locomotives is at rest or if its incidental movement temporarily differs from its schedule direction.

[2] Crossing collisions covered by clauses (*e*) and (*f*) should be reported by each carrier affected. Items of damage and casualties to persons should be reported in the same manner as described in connection with "joint operations" (sections, sec. 6a and 6b, p. 35).

(*g*) *Collisions of trains with cars not in trains.*—This class does not include collisions of trains with cars, subject by train rules to the protection afforded to trains, which should be classified as (*a*), (*b*), (*c*), (*d*), (*e*), or (*f*), in accordance with the circumstances of the particular case.

(*h*) *Switching collisions.*—The term "switching collisions" is used herein to mean collisions occurring to equipment being switched, as in making or breaking up trains, shifting or setting out cars, etc., including accidents to locomotives involved in such service. A collision should not receive this classification when two or more locomotives, trains, or cuts of cars are involved unless both or all such units of equipment are employed in switching movements at the time of accident, but it should be classified as (*a*), (*b*), (*c*), (*d*), (*e*), (*f*), (*g*), or (*i*), in accordance with the circumstances of the particular case.

(*i*) *Collisions not elsewhere classifiable.*—This class includes collisions between light locomotives moving to or from roundhouse; also collisions between a locomotive and cars of a train or cut of cars occurring in recoupling the locomotive after it has been cut off to take water, for repairs, etc., but does not include collisions between locomotives and cars while engaged in switching movements as described in paragraph (*h*).

9. Derailments (Class D).—In reporting derailments the information required by provisions of these rules having general application should be furnished, and there should be indicated in particular, by initials and number, or name, both the equipment causing the derailment and the equipment derailed. If a derailment is due to the breaking of a rail, a Form R in addition to a Form T should be supplied. (See sec. 18, p. 23.)

Derailments should be classified as follows:

(*a*) *Derailments due to defects in or failures of power brake apparatus, hose, etc.*—This class covers derailments resulting from defects in or failures of power brakes or any apparatus or appurtenances connected therewith, including air hose and hose couplings, with the exceptions indicated in (*c*). (See sec. 5, p. 42, of code.)

(*b*) *Derailments due to defects in or failures of couplers.*—This class covers derailments resulting from defects in or failures of couplers and such of their mechanical parts as may be directly involved in the interlocking of two couplers, including, for example, the knuckle, knuckle pin, lock block, shank, etc., but not such apparatus as the coupler yoke, coupler or drawbar key, draft springs, friction plates, etc., or other parts back of the shank. (See sec. 7, p. 42, of code.)

(*c*) *Derailments due to other defects in or failures of locomotives or cars.*—This class covers derailments due to failures of locomo-

tives or cars, except those specifically provided for in classes (*a*) and (*b*), such as those resulting from broken or otherwise defective wheels (including cases in which wheels are broken as a result of defects in brake apparatus or other causes), tires, axles, journals, trucks, brake beams, brake rigging, draft gear (including coupler yoke, coupler or drawbar key, and other parts of draft rigging back of shank), side bearings, arch bars, car bodies, etc. (See secs. 1, 2, 3, 4, 6, 8, and 9, pp. 41, 42, and 43, of code.)

(*d*) *Derailments due to defects in track, bridges, switches, and signals, or other defects in roadway.*—This class covers derailments such as those resulting from broken rails, spread rails, soft track, defective ties, rough or irregular track, etc., that occur in the course of ordinary wear and weather conditions but does not include derailments due to such conditions as are outlined for class (*c*). (See secs. 1 to 6, pp. 43 and 44, of code.)

(*e*) *Derailments due to accidental obstructions or defects in track.*—This class covers derailments such as those due to weakening or destruction of bridges or other structures by fire; to animals, vehicles, etc., on track at places other than at public highway grade crossings; to landslides; to snow or ice on or in track; to floods; to washouts at culverts or other places; to coal, ballast, or parts of equipment or lading of another train falling on track or wedging in switch; and to other unforeseen happenings or obstructions of similar character. Parts of the equipment or lading of a train which, by falling on the track, cause a derailment of the same train, are not to be regarded as obstructions with relation to this class, but a derailment so caused should be properly assigned to class (*a*), (*b*), (*c*), or (*i*). (See items 4401 to 4411, sec. 4, p. 45, of code.)

(*f*) *Derailments due to obstructions at public highway crossings.*—This class covers accidents at public highway grade crossings due to trains, locomotives, or cars striking or being struck by trolley cars, automobiles, or other vehicles, or objects other than hand cars or other railway tools or material, which result in reportable derailments. State all material facts, including whether injured persons were pedestrians, occupants of trolley cars, automobiles, or other vehicles, etc.; the nature of protection, if any, afforded at the crossing at the time of an accident; that is, whether crossing gates, watchman, audible or visual signals (not stationary signs), etc.; the kind of vehicle or object struck and whether the view of the crossing was obscured by buildings, trees, cars, or other objects. (See also secs. 12 (*a*) and 13 (*h*).) (See items 4412 to 4422, sec. 4, p. 45, of code.)

(*g*) *Derailments due to negligence, mistake, or misconduct of trainmen or other employees.*—Derailments should not be reported in this class unless the direct or immediate cause was negligence, mistake, or

misconduct of railway employees, such as error in throwing switches, misunderstanding of or error in giving signals, failure of section men to protect when replacing rails, excessive speed in violation of instructions, etc. Derailments due to contributory negligence, such as those caused by the failure of inspectors or track walkers to discover defects in equipment or track, should not be included in this class, but should be reported in their proper classes. (See secs. 1 to 8, pp. 38, 39, and 40, of code.)

(*h*) *Derailments due to mistake or misconduct of persons other than employees.*—This class covers derailments such as those resulting from obstruction of track, misplacement of switches, tampering with brakes, etc., by persons other than employees. (See secs. 2 and 3, p. 45, of code.)

(*i*) *Derailments due to ascertained causes not classifiable under any preceding head.*—This class also includes derailments due to two or more immediate causes. The causes of derailments includable in this class should be clearly and fully described. (See sec. 1 and items 4423 to 4488, sec. 4, p. 45, of code.)

(*j*) *Derailments due to unknown causes.*—If any derailment is reported under this head, the reason for so classifying it should be given. The report should show what search or investigation has been made to find the cause of the derailment, and if the cause can not be assigned with certainty, that fact should be stated and the probable cause indicated, if practicable. (See sec. 5, p. 46, of code.)

10. **Locomotive-Boiler Accidents (Class B).**—In reporting locomotive-boiler accidents, complete information should be given, and in cases of explosions resulting from low water in the boiler it should be stated whether the condition was due to negligence of the locomotive crew or to an improper or defective condition of appurtenances used to supply water to the boiler or to indicate the water level therein. (For locomotive-boiler defects, see sec. 1, p. 41, of code.)

Locomotive-boiler accidents should be classified as follows:

(*a*) *Locomotive-boiler shell explosions.*

(*b*) *Crown sheet explosions due to low water where no contributory causes (negligence, or defects in or failures of equipment) are found.*

(*c*) *Crown sheet explosions due to low water where contributory causes (negligence, or defects in or failures of equipment) are found.*

(*d*) *Other explosions.*—This class covers explosions due to stay bolts or crown stays giving way, water foaming, and all other explosions not includable in classes (*a*), (*b*), and (*c*).

(*e*) *Accidents due to defects in or failures of tubing or pipes subject to steam pressure.*—This class covers accidents due to defects in or failures of flues, arch tubes, water bars, superheater tubes, etc.

(*f*) *Other locomotive-boiler accidents.*

11. **Other Locomotive Accidents (Class L).**—This class covers train accidents resulting from defects in or failures of locomotives or tenders, not classifiable as collisions, derailments, or locomotive-boiler accidents. In reporting an accident under this head, describe and give location of the part involved, state the nature of the defect or failure, and explain, so far as may be ascertainable, the cause of, or the conditions or circumstances responsible for or contributing to, the failure.

Other locomotive accidents should be classified as follows:

(*a*) *Accidents due to defects in or failures of locomotive cylinders.*—This class covers accidents due to defects in or failures of locomotive cylinders or cylinder heads, but does not include pistons or other parts.

(*b*) *Accidents due to defects in or failures of driving gear and machinery of locomotives.*—This class covers accidents due to defects in or failures of driving gear and machinery of locomotives, but not of locomotive tenders.

(*c*) *Accidents due to defects in or failures of wheels and axles of locomotives.*—This class does not include accidents resulting in derailments, which should be specifically classified as such.

(*d*) *Accidents due to defects in or failures of parts of locomotive tenders.*—This class covers accidents due to defects in or failures of locomotive tenders or parts or appurtenances of tenders when no derailment results.

(*e*) *Miscellaneous locomotive accidents.*

12. **Miscellaneous Train Accidents (Class M).**—This class covers all train accidents other than collisions, derailments, locomotive-boiler accidents, or other locomotive accidents, classified as follows:

(*a*) *Accidents at public highway crossings.*—This class covers accidents at public highway grade crossings due to trains, locomotives, or cars striking or being struck by trolley cars, automobiles, or other vehicles, or objects other than hand cars or other railway tools or material, which result in damage to railway property but not in derailments. State all material facts, including whether injured persons were pedestrians, occupants of trolley cars, automobiles, or other vehicles, etc.; the nature of protection, if any, afforded at the crossing at the time of an accident; that is, whether crossing gates, watchman, audible or visual signals (not stationary signs), etc.; the kind of vehicle or object struck, and whether the view of the crossing was obscured by buildings, trees, cars, or other objects. (See also secs. 9 (*f*) and 13 (*h*).)

(*b*) *Other miscellaneous train accidents.*—This class covers all train accidents not elsewhere provided for, such as accidents in which cars, not in suitable condition to withstand common train usage, that,

when coupled in trains, may be damaged, but not derailed, through ordinary train movements; accidents caused by trains, etc., striking hand cars, section motor cars and like roadway machines, or bumping posts, that result in no derailment, etc.

GROUP II.—TRAIN-SERVICE ACCIDENTS.

13. **Classification of Train-Service Accidents (Class S).**—In reporting train-service accidents, there should be furnished all pertinent information required by sections of these rules having general application and particularly:

Whether engineman or other employee contributed to the cause of the accident and, if so, in what manner and to what extent.

Whether person injured caught a foot in frog, switch, or guard rail, and, if injured in such a manner, whether safety blocks were in use and what kind.

Whether the presence of fog, snow, or ice contributed to the accident.

Whether failure of brakes or other parts of equipment contributed to the accident.

Train-service accidents should be classified as follows:

(*a*) *Accidents to employees while engaged in coupling or uncoupling locomotives or cars* (see sec. 6–A, p. 47, of code).—State in particular:

Name and style of couplers or uncoupling devices and, if defective, describe in detail the nature and extent of defect.

If employee was killed or injured while between locomotives or cars, explain why he was thus in jeopardy.

(*b*) *Accidents to employees while engaged in coupling or uncoupling air hose (or turning angle cocks in connection therewith), steam hose, and safety chains* (see sec. 6–B, p. 47, of code).—State in particular whether hose or couplings were defective, and, if defective, describe the nature and extent of the defect.

(*c*) *Accidents to employees while operating locomotives* (see sec. 6–C, p. 47, of code).—If locomotive parts or appurtenances were defective, describe in detail the nature and extent of defect. This class also includes employees other than enginemen and firemen who may be assisting in the operation of locomotives.

(*d*) *Accidents to employees while operating hand brakes* (see sec. 6–D, p. 48, of code).—If hand brake was defective, state type and describe in detail the nature and extent of defect.

(*e*) *Accidents to employees while operating switches* (see sec. 6–E, p. 49, of code).—If switch was defective, describe in detail the nature and extent of defect.

(*f*) *Accidents to persons on moving cars or locomotives resulting from coming in contact with any structure or fixture above or at side*

of track (see sec. 6–F, p. 49, of code).—This class covers accidents to all classes of persons resulting from coming in contact with fixed structures, such as bridges, tunnel walls or roofs, platforms, stock chutes, signals, signs, mail cranes, water tanks or penstocks or spouts, coaling stations including chutes or aprons, standpipes, permanently located wires or pipes, etc. State all material facts, including, in particular, when applicable:

Extent of injured person's acquaintance with the road at and in the vicinity of the place of accident; and
Distance between top of locomotive or car and obstruction; or
Distance between side of locomotive or car and obstruction.

(*g*) *Accidents to persons while getting on or off cars or locomotives* (see sec. 6–G, p. 49, of code).—This class covers not only accidents to persons while getting on or off cars or locomotives in the usual manner, but also, in general, accidents to employees in jumping from trains, locomotives, or cars, and to other persons in jumping from moving trains, or in jumping through car windows to escape from custody, or while mentally deranged, or with suicidal intent, etc.

NOTE.—In cases of reportable train accidents in which employees or other persons jumped from cars or locomotives in anticipation of the accidents and thereby received a reportable injury without coming into contact with wreckage, the injury so incurred should be reported separately and included in class (*g*), and cross references made in the Monthly Report between the report of it and the report covering the train accident.

(*h*) *Accidents at highway grade crossings* (see sec. 6–H, p. 50, of code).—This class covers accidents at public highway grade crossings due to trains, locomotives, or cars striking pedestrians or colliding with trolley cars, automobiles, or other vehicles, or objects other than hand cars or other railway tools or material, when such accidents result in reportable casualties but not in damage to railway property in excess of $150, including cost of clearing wreck. State all material facts, including whether injured persons were pedestrians, occupants of trolley cars, automobiles, or other vehicles, riding bicycles or motor cycles, etc.; the nature of protection, if any, afforded at the crossing at the time of an accident; that is, whether crossing gates, watchman, audible or visual signals (not stationary signs), etc.; the kind of vehicle or object struck, and whether the view of crossing was obscured by buildings, trees, cars, or other objects. (See also secs. 9 (*f*) and 12 (a).)

(*i*) *Struck or run over by cars or locomotives not classifiable above* (see sec. 6–I, p. 51, of code).

(*j*) *Miscellaneous train-service accidents not elsewhere classifiable* (see sec. 7–J, p. 51, of code).

GROUP III.—NONTRAIN ACCIDENTS.

14. **Classification of Nontrain Accidents.**—This group covers:

Accidents to employees that do not occur directly in connection with the operation or movement of trains, locomotives, or cars; as, for example, accidents occurring in connection with the construction, repair, or painting of buildings, tracks, or other structures or equipment (except running repairs made by trainmen on the road); with the movement, by shop, enginehouse, or other industrial employees, of locomotives or cars in shops, enginehouses, on repair tracks, etc., when in connection with industrial work; or the loading or unloading of cars at station or freight-house platforms, on yard tracks, or elsewhere; and also

Accidents to all classes of persons while on right of way or other railway premises, that do not occur directly in connection with the operation or movement of trains, locomotives, or cars, except such cases as are excluded by the provisions of sec. 3 of General Instructions, p. 12.

NOTE.—Accidents in which injuries are received by trackmen, bridge and building men, and other classes of employees or other persons and which are caused by trains, locomotives, or cars striking hand cars, tools, or other objects, should be appropriately reported as train accidents or train-service accidents.

The classification of persons to whom reportable casualties occur in nontrain accidents and the classification of such accidents should be in accordance with the "Instructions" given in "Form V."

FORM AND ARRANGEMENT OF REPORTS.

15. **Forms Used and Duplicate Reports.**—Monthly reports of railway accidents (including rail failures causing train accidents) should be made on forms provided by the Interstate Commerce Commission, or on forms identical therewith in arrangement, size, and in color and weight of paper, and every reporting carrier is required to retain in its files a duplicate of each report rendered to the commission. The forms provided, which are of four kinds, are designated as Forms V, T, R, and F.

Each sheet of each report should show in the appropriate place the name of the company for which it is filed, the month and year to which the report relates, together with all other particulars called for by the form. Each sheet of each report following Form V should bear the autograph signature of a responsible officer or employee.

16. **Form V (Verification).**—A report should be made on this form each month, even though no reportable (train, train-service, or nontrain) accident occurred during the month covered. Such report should include an oath or verification, made by the proper officer of the reporting carrier, as provided for attestation on Form V, which should show the number of train and train-service accidents that

occurred during the month for which the report is made, and the number of sheets, inclusive of Form V. If no reportable accident occurred during the month, that fact should be stated on this form. Form V should also show the total number of locomotive-miles run during the month, computed in accordance with the Interstate Commerce Commission's Classification of Train-miles, Locomotive-miles, and Car-miles. If any reportable nontrain accidents occurred during the month, they should be reported in the tables provided on Form V, but if none occurred, that fact should be stated as required.

17. **Form T (Train and Train-Service Accidents).**—A separate Form T sheet should be used for each reportable train accident or train-service accident and should show the required particulars concerning the accident.

18. **Form R (Rail Failures).**—In case of reportable train accidents resulting from rail failures, particulars of the failures should be reported on Form R, and all the information called for on that form should be furnished additionally to that required on Form T.

19. **Form F (Subsequent Fatalities).**—If, as the result of an injury, a person dies more than 24 hours after the occurrence of the accident, the casualty should be reported on a Form T as an injury, with full details as required by the provisions of the form, and in addition, a memorandum of the death should be given on Form F in accordance with the requirements of that form. This additional report is to be made in connection with the report for the month in which the accident occurred, if practicable, otherwise it should separately accompany the first monthly report filed after the death has come to the knowledge of the carrier. A single Form F may contain reports of more than one such fatality, provided all persons included therein were injured during the same month. A Form F is not required in relation to a nontrain accident.

20. **Classification Symbols.**—Symbols indicating the class of train accidents or of train-service accidents and the class of persons involved should be entered in the appropriate spaces on Form T as follows:

Class of accident.—Sheets carrying reports of collisions are to be marked C; those relating to derailments, D; those relating to locomotive-boiler accidents, B; those relating to other locomotive accidents (not resulting in collisions or derailments), L; those relating to miscellaneous train accidents, M; and those relating to train-service accidents, S. To each of these primary class symbols should be added the proper small letter to indicate the subclass covering the accident. (See secs. 8 to 13.)

Class of person.—The designation of the class of person should include the applicable capital letter preceding the name of the class,

to which should be added the number of the "Reporting Division," or the small letter applicable to the subclass, with such other descriptive detail as may be appropriate. (See sec. 31.)

21. **Arrangement and Numbering of Sheets.**—All the forms in a monthly report should be arranged in the order V, T, R, and F. All Forms T should be further grouped in accordance with the character of the accidents and arranged in the order C, D, B, L, M, and S, and subgrouped in order by subclasses; as, for example, first all of C–a, followed by all of C–b, followed in turn by all of C–c, etc., throughout the series. All sheets are to be numbered consecutively, beginning with No. 1 for Form V each month. When properly arranged and numbered, all sheets, including Form V, should be securely fastened.

In no case should the report for any month include a Form T sheet completed for an accident that did not occur during the month covered by the report. Should it be discovered by a carrier that the report of a particular accident on a Form T has, through mistake or otherwise, been improperly omitted from its regular monthly accident report, the sheet covering such accident should be separately transmitted to the Bureau of Statistics, with a suitable letter of explanation.

PARTICULARS TO BE REPORTED.

22. **General.**—Such of the following provisions as apply in any case should be carefully observed in the preparation of reports of both train and train-service accidents, and wherever a pertinent requirement is not complied with the report should explain the omission.

Reporting officers should endeavor to supply sufficient information in each report to enable the Interstate Commerce Commission to classify all data pertaining to each accident in accordance with the codes in the Appendix beginning on page 37.

In cases of train accidents it is necessary to show whether the accidents were attributable to—

Negligence of employees.
Defects in or failures of equipment.
Defects in or improper maintenance of way and structures.
Miscellaneous causes.

The report of an accident should give, so far as pertinent, particulars of the accident, such as time, place, weather, light, persons involved, equipment and other property damaged or involved, causes of accident, so far as ascertained (and if not ascertained, the report should indicate what effort has been made to ascertain causes and what seems to have been the most probable cause), description and extent of the damage caused, and suggested improvements in procedure, plant, and equipment for the prevention of similar accidents, cause and effects of fire, if any; experience and (whenever significant) condition of employee who caused or is believed or supposed to have

caused the accident. The report should indicate whether or not such employee had been continuously on duty for more than 16 hours at the time of the accident or had had less than 8 hours' rest before going on duty.

Unless manifestly without importance in the matter, quote the operating rule or rules bearing on the case, or give an essential abstract of the pertinent regulations, and indicate wherein the employee at fault, if any, violated the requirements.

23. **Visibility.**—The report should give sufficient particulars to show whether vision was obstructed or obscured and, if either, from what cause and to what extent.

24. **Place.**—In reporting place, the name of the State in which the accident occurred and the nearest station should be reported; also the direction and estimated distance from such station, unless the accident occurred directly at a station or in a yard, in which latter case the yard should be named or described.

25. **Definition of Yard.**—By the word "yard," as herein used, is meant a system of auxiliary tracks within defined limits provided for the making up of trains, storing of cars, and other purposes, over which movements not authorized by train order or time-table may be made, subject to prescribed signals and regulations. Sidings used exclusively as passing track are not included, nor is the main line within yard limits, and if an accident occurs on or results in fouling a main line so located that fact should be stated.

26. **Trains—Description and Particulars.**—For the purpose of reporting railway accidents a train may be defined as a locomotive, or more than one locomotive coupled, with or without cars, displaying markers. Hand cars, section motor cars, and like roadway machines, are not to be regarded as "cars," within the meaning of this definition.

DESCRIPTION.

In reporting accidents involving trains, locomotives, or cars, sufficient particulars should be given to show definitely to which of the six classes of service described below the equipment was assigned. Definite information is required in this respect and descriptive terms of local application, such as "milk," "transfer," "mine," etc., should not be used to designate classes of trains. In connection with this matter, a light engine involved in an accident should be classified as belonging to that class of service to which its assignment at the time of accident was related.

Transportation service—Freight.—This class includes trains run between terminals or stations for the purpose of transporting revenue freight; also those transporting only company freight when statistics of ton-miles are kept for the freight thus transported; also trains consisting of empty freight cars and trains consisting of a locomotive and a caboose running light in connection with such service. When milk, baggage, or other cars (not passenger cars or combination passenger and other cars) are hauled in a freight train, they do not change its class. Freight trains that regularly haul no passenger service equipment but transport passengers in a caboose should be classified as freight trains, as should also freight trains temporarily using a passenger car in place of a caboose, or that only occasionally contain a car devoted to passenger traffic.

Transportation service—Passenger.—This class includes trains run for the purpose of transporting passengers, baggage, mail, milk, express, or any combination of these; also trains consisting of dead-head passenger equipment. When one or more cars, other than regular passenger-train cars, are hauled incidentally in a passenger train, they do not change its class.

Transportation service—Mixed.—This class includes trains containing both freight-train cars moved in connection with freight traffic and passenger-train cars moved in connection with passenger traffic. The incidental omission of either freight-train or passenger-train cars from a regularly scheduled mixed train does not change its class.

Transportation service—Special.—This class includes revenue-earning trains not provided for in the three foregoing classes, such as chartered trains paid for either on the basis of a rate per mile run or a lump sum for the train, circus and theatrical trains run under contracts calling for payment of specified amounts for transportation between designated stations, chartered trains for the Federal or State Governments carrying troops, munitions of war, camp outfits, etc.

Work service.—This class includes nonrevenue trains run in the administration and upkeep service of the carrier, such as official trains, inspection trains, pay trains, special trains running with company fire apparatus to save the carrier's property from destruction, and trains run for the purpose of transporting the carrier's employees to and from work when no transportation charge is made; wrecking trains; construction and upkeep trains run in connection with maintenance and construction work, the cost of operating such trains being chargeable to the appropriate construction or maintenance accounts for rail-line operations; material and supply trains run for the purpose of distributing ties, rails, other track material, ballast, bridge material, and other materials and supplies at stations, towers, section houses, and other points; trains run for picking up and concentrating such material; and trains run for distributing material and supplies for use in connection with operation.

NOTE.—Work-service trains do not include solid fuel trains and other freight trains laden with company material and running from station to station under the same operating conditions as ordinary revenue freight trains.

Yard service.—This class of service includes the handling of equipment being switched or used in switching other equipment, as, for example, in making or breaking up trains, serving industrial tracks, storing, weighing, or classifying cars, and other like operations, that may be made without time-table or train order authority, subject to prescribed signals. Operations incidental to a road run when performed by a road train crew are not included.

PARTICULARS.

There should be given for each train involved—

Class of service as indicated above.
Number of train and locomotive.
Time-table direction in which bound at the time of accident (east, west, north, or south).
Estimated speed in miles per hour (but if train was at rest, it should be so stated).

When pertinent, state whether the train was being operated in accordance with the act of Congress of March 2, 1893, requiring the use of air brakes, how many cars were and how many were not equipped with air brakes, and on how many the air brakes were operative. State whether the air brakes on the locomotive were operative. State the number of loaded cars and the number of empty cars in the train; gross weight of train; number of locomotives pushing or pulling train; number of brakemen on train; where and when locomotives, cars, and brakes were last inspected; and the number of hand brakes used (if any), together with the reason for their use. Whenever material, state also under what orders the train was moving and what were its rights of track at the particular time and place of the accident.

27. **Defective Equipment.**—In the description of equipment defects that cause or contribute to either a train or a train-service accident, the report should show, whenever significant—

Number and initial of car.
Manufacturer and type of equipment or part.
Weight, number, and other identifying marks.
Year of manufacture and year of placing in service.
When, where, and by what class of employee the equipment was last inspected, whether any defects were noted, and, if any, what remedies were applied.

In reporting accidents involving appliances subject to the Federal safety appliance acts, the Commission's Classification of Safety Appliance Defects should be followed.

Describe the defective equipment involved with sufficient particularity to permit its classification in the code of "Defects in or Failures of Equipment," in the Appendix on page 41, and furnish information as follows:

Locomotive and parts:

Description—

Type, as simple, compound, articulated, etc.
Wheel arrangement.
Weight on drivers and total weight ready for service.

Parts—

Firebox and attachments.
Boiler and attachments.
Cylinders and steam chests.
Reciprocating parts.
Headlight.
Pilot.
Drivers.
Truck wheels.
Other parts of running gear as enumerated under cars.
Miscellaneous parts, naming them.

In case of electric locomotives, give similarly detailed information so far as practicable.

Cars and parts:

Wheels.
Axles and journals.
Boxes.
Truck frames and parts, naming them.
Couplers.
Draft gear and parts, naming them.
Brakes—
(1) Power.
(2) Hand.
Underframing.
Car sides.
Car ends.
Car roofs.
Miscellaneous parts, naming them.

Floating equipment: Give particulars.

28. **Defective Way and Structures.**—In statements covering defects or failures of rails, rail fastenings, switches, signal or other apparatus that caused or contributed to an accident, the report should show, whenever significant:

Manufacture and type of apparatus or part.
Weight, number, and other identifying marks.
Year of manufacture and year of placing in service.
When and by what class of employee inspected, whether any defects were noted, and, if any, what remedies were applied.

Describe the defective structure or parts with sufficient particularity to permit a classification in the code of "Defects in or Improper Maintenance of Way and Structures," in the Appendix on

page 43, and give sufficient information to permit identification under the following heads:

Roadbed, including embankments, cuts, ditches, drainage, etc.
Bridges, trestles, and culverts.
Ties, stating whether wood, steel, concrete, or other material, and, if wood, state kind and whether treated or untreated.
Rails, giving information required by Form R. If a rail failure occurs at a joint or within the space covered by angle or splice bars or at holes drilled for bonding or other purposes care should be taken to determine whether the joint or bolt or bonding holes or insulation caused or contributed to such failure, and, if determined, full particulars should be given.
Rail fastenings.
Switches.
Signal apparatus.
Clearances—
Overhead.
Side.
Buildings (describing each and indicating its ordinary use).

29. **Damage.**—A brief description of the damage (if any) resulting to the equipment, way, structures, and other property of the reporting carrier should be furnished, as well as the expense occasioned thereby in the case of train accidents. A statement of the amount of damage is not required for train-service or nontrain accidents. Damage to the property of railway companies other than the reporting carrier should also be described, so far as practicable, and if such property is railway equipment it should be described with the same particularity as would be appropriate were it the property of the company making the report.

In determining the amount of damage to railway property (including damage to foreign cars) the cost of clearing wreck should be included, but not any amount because of damage to freight or baggage, stock on right of way, or to other property of noncarriers, or because of personal injuries. The amount reported should be subdivided so as to show damage to equipment, to other railway property, and cost of clearing wreck (including the local expense of transferring lading made necessary as a result of the accident). If the amount of damage is not known at the time the report is filed with the commission, it should be estimated as accurately as practicable, and the fact that it is estimated should be stated.

30. **Casualties—Classification and Particulars.**—

Classification.—In reporting casualties to persons the following distinctions should be observed:

Killed.—Any person killed in an accident at the time of its occurrence, or so seriously injured as to die within 24 hours thereafter, should be reported as "killed."

NOTE.—See section 19 for instructions relative to injuries that subsequently result in death.

Injured.—Employees so seriously injured as to be incapacitated from performing their ordinary duties for more than 3 days, in the aggregate, during the 10 days immediately following the accident, should be reported as injured. This rule applies both to employees on duty and to those classed as not on duty, but does not apply to employees classed as passengers or trespassers.

Other persons should be reported as injured if the injury is sufficient, in the opinion of the reporting officer, to incapacitate the injured person from following his customary vocation or mode of life for a period of more than one day. This rule applies also to employees classed as passengers or trespassers.

Particulars.—Personal injuries should be sufficiently described to indicate—

The part of body injured and the specific nature and extent of the injury received (which should be reported in sufficient detail to enable the Interstate Commerce Commission to classify the injury in accordance with the code on page 54. Indefinite terms such as "mashed," "crushed," "injured," "hurt," etc., should not be used). In case of loss of any part, the extent should be indicated, as, for example, tip of index finger of right hand, two middle fingers to second joint of left hand, left arm to elbow, loss of right eye, etc.
The actual number of days of disability if ascertained at the time the report is made but, if the disability has not terminated by that time or is not ascertainable, an estimate of the number should be shown in the appropriate column on Form T, or the absence of an estimate fully explained.
The degree to which the person is maimed, if at all.

NOTE.—When the injury is of a permanent nature that fact may be stated in lieu of the number of days' disability.

CLASSIFICATION OF PERSONS.

31. **Classification.**—For the purpose of monthly reports, persons involved in railway accidents other than nontrain accidents should be named and sufficient particulars of each person should be given to permit an appropriate classification among the following classes:

(A) Employees on duty.—An employee should be considered on duty when he is, at the request or direction of the carrier, rendering

service or holding himself in readiness at his post of duty. He is not to be considered on duty while relieved from service and from responsibility for the performance of service, or while willfully and improperly absent from his post of duty. The classification of employees on duty is to be determined by the character of the work on which they are engaged, or to which they may be detailed, at the time of the accident. If this is different from that of their usual and customary duties, particulars should be given.

If any person killed or injured in an accident is known or believed to be an employee of another carrier that fact should be stated and appropriate class symbols indicating the customary occupation of the employee, with the name of the carrier by which he is employed, should be entered.

(B) Employees not on duty.—This class is restricted to employees lawfully on the premises of the carrier. Whenever an employee not on duty is injured, the report should explain the occasion of the employee's presence at the place of the accident. Employees trespassing should be included in Class (F) as trespassers. Employees (including trainmen deadheading between terminals, etc.,) when traveling as passengers should be included in Class (C) as passengers.

The following list of 148 Reporting Divisions into which all the distinctive classes of railway positions are grouped is derived from the "Rules Governing the Classification of Steam Railway Employees and Reports of Their Service and Compensation" prescribed by the Interstate Commerce Commission to be effective on July 1, 1921. The returns on all accident report forms should, with respect to the classification of employees, be made in conformity with these Reporting Divisions. For each employee reported on Form T as killed or injured there should be given the correct number of the Reporting Division to which the employee is properly assignable, and also the pay-roll or distinctive class title of his occupational position. The letter (A) or (B) should be used to indicate respectively whether he was on or off duty at the time of accident. Abbreviations or contractions may be used in the indication of position titles, if their meaning is sufficiently clear. For example, to indicate a casualty sustained by a road freight brakeman (through freight) on duty, the proper designation of class of person on Form T would be A-137, Road Freight Brakeman (through freight), while that of a casualty incurred in a train or a train-service accident by a buffet car porter on duty would be A-122, Buffet Car Porter.

List of reporting divisions for employees.

Division No.	Reporting division.
	I.—*Executives, officials, and staff assistants.*
1	Executives, general officers, and assistants.
2	Division officers, assistants, and staff assistants.
	II.—*Professional, clerical, and general.*
3	Architectural, chemical, and engineering assistants (A).
4	Architectural, chemical, and engineering assistants (B).
5	Subprofessional engineering and laboratory assistants.
6	Professional and subprofessional legal assistants.
7	Supervisory or chief clerks (major departments).
8	Chief clerks (minor departments) and assistant chief clerks and supervising cashiers.
9	Clerks and clerical specialists (A).
10	Clerks (B).
11	Clerks (C).
12	Mechanical device operators (office).
13	Stenographers and secretaries (A).
14	Stenographers and typists (B).
15	Storekeepers, sales agents, and buyers.
16	Ticket agents and assistant ticket agents.
17	Traveling auditors or accountants.
18	Telephone switchboard operators and office assistants.
19	Messengers and office boys.
20	Elevator operators and other office attendants.
21	Lieutenants and sergeants of police.
22	Patrolmen.
23	Watchmen (without police authority).
24	Supervising traffic agents.
25	Traffic agents, advertising and development agents.
26	Fire prevention, smoke, and time-service inspectors, and office building superintendents.
27	Claim agents and claim investigators.
28	Real estate and tax agents and investigators.
29	Examiners, instructors, and special investigators.
30	Miscellaneous trades workers (other than plumbers).
31	Motor vehicle and motor car operators.
32	Teamsters and stablemen.
33	Janitors and cleaners.
	III.—*Maintenance of way and structures.*
34	Roadmasters and general foremen (M. of W. and S.).
35	Assistant general foremen (M. of W. and S.).
36	Supervising maintenance of way inspectors and scale inspectors.
37	Maintenance of way inspectors.
38	Bridge and building gang foremen (skilled labor, M. of W. and S.).
39	Bridge and building carpenters.
40	Bridge and building ironworkers.
41	Bridge and building painters.
42	Masons, bricklayers, plasterers, and plumbers.
43	Skilled trades helpers (M. of W. and S.).
44	Regular apprentices (M. of W. and S.).
45	Portable steam equipment operators (M. of W. and S.).
46	Portable steam equipment operator helpers (M. of W. and S.).
47	Pumping equipment operators (M. of W. and S.).
48	Gang foremen (extra gang and work-train laborers).
49	Gang foremen (bridge and building, signal and telegraph laborers).
50	Gang or section foremen.

List of reporting divisions for employees—Continued.

Division No.	Reporting division.
	III.—*Maintenance of way and structures*—Continued.
81	Laborers (extra gang and work-train).
82	Track and roadway section laborers.
83	Maintenance of way laborers (other than track and roadway) and gardeners and farmers.
84	General foremen and supervising inspectors (signal, telegraph, and electrical transmission).
85	Assistant general foremen (signal, telegraph, and electrical transmission) and signal and telegraph inspectors.
86	Gang foremen (signal) and telegraph skilled trades labor).
87	Signalmen and signal maintainers.
88	Linemen and groundmen.
89	Assistant signalmen and assistant signal maintainers.
90	Signalmen and signal maintainer helpers.
	IV.—*Maintenance of equipment and stores.*
91	General foremen (M. E.).
92	Assistant general foremen and department foremen (M. E.).
93	General foremen (stores).
94	Assistant general foremen (stores).
95	Equipment, shop, and electrical inspectors (M. E.).
96	Material and supplies inspectors.
97	Gang foremen and gang leaders (skilled labor).
98	Machinists.
99	Boilermakers.
70	Carmen (A).
71	Carmen (B).
72	Carmen (C).
73	Carmen (D).
74	Electrical workers (A).
75	Electrical workers (B).
76	Electrical workers (C).
77	Machinists.
78	Molders.
79	Sheet-metal workers.
80	Skilled trades helpers (M. E. and Stores).
81	Helper apprentices (M. E. and Stores).
82	Regular apprentices (M. E. and Stores).
83	Gang foremen laborers (shops, enginehouses, power plants, and stores).
84	Coach cleaners.
85	Laborers (shops, enginehouses, and power plants).
86	Common laborers (shops, enginehouses, power plants, and stores).
87	Stationary engineers (steam).
88	Stationary firemen and oilers (steam and electrical plants).
89	Coal passers and water tenders (steam station boiler rooms).
	V.—*Transportation (other than train, engine, and yard).*
90	Chief train dispatchers, train dispatchers, and train directors.
91	Station agents (supervisory, major stations, nontelegraphers).
92	Station agents (supervisory, smaller stations, nontelegraphers).
93	Station agents (nonsupervisory, smaller stations, nontelegraphers).
94	Station agents (telegraphers and telephoners).
95	Chief telegraphers and telephoners or wire chiefs.
96	Clerk-telegraphers and clerk-telephoners.
97	Telegraphers, telephoners, and towermen.
98	Station masters and assistants.
99	Supervising baggage agents.

List of reporting divisions for employees—Continued.

Division No.	Reporting division.
	V.—*Transportation (other than train, engine, and yard)*—Continued.
100	Baggage agents and assistants.
101	Baggage, parcel room, and station attendants.
102	General foremen (freight stations, warehouses, grain elevators, and docks).
103	Assistant general foremen (freight stations, warehouses, grain elevators, and docks).
104	Gang foremen (freight station, warehouse, grain elevator, and dock labor).
105	Callers, loaders, scalers, sealers, and perishable freight inspectors.
106	Truckers (stations, warehouses, and platforms).
107	Laborers (coal and ore docks and grain elevators).
108	Common laborers (stations, warehouses, platforms, and grain elevators).
109	Stewards, restaurant and lodging-house managers, and dining-car supervisors.
110	Chefs and first cooks (dining cars and restaurants).
111	Second and third cooks (dining cars and restaurants).
112	Waiters and lodging-house attendants.
113	Camp and crew cooks and kitchen helpers.
114	Barge, lighter, and gasoline launch officers and workers.
115	Deck officers (ferryboats and towing vessels).
116	Engine-room officers (ferryboats and towing vessels).
117	Deck and engine-room workers (ferryboats and towing vessels).
118	Deck and engine-room officers and workers (steamers).
119	Floating equipment shore workers and attendants.
120	Transportation and dining service inspectors.
121	Parlor and sleeping car conductors.
122	Train attendants.
123	Bridge operators and helpers.
124	Crossing and bridge flagmen and gatemen.
125	Foremen (laundry) and laundry workers.
	VI (a).—*Transportation (yardmasters, switch tenders, and hostlers).*
126	Yardmasters and assistants.
127	Switch tenders.
128	Outside hostlers.
129	Inside hostlers.
130	Outside hostler helpers.
	VI (b).—*Transportation (train and engine).*
131	Road passenger conductors.
132	Assistant road passenger conductors and ticket collectors.
133	Road freight conductors (through freight).
134	Road freight conductors (local and way freight).
135	Road passenger baggagemen.
136	Road passenger brakemen and flagmen.
137	Road freight brakemen and flagmen (through freight).
138	Road freight brakemen and flagmen (local and way freight).
139	Yard conductors and yard foremen.
140	Yard brakemen and yard helpers.
141	Road passenger engineers and motormen.
142	Road freight engineers and motormen (through freight).
143	Road freight engineers and motormen (local and way freight).
144	Yard engineers and motormen.
145	Road passenger firemen and helpers.
146	Road freight firemen and helpers (through freight).
147	Road freight firemen and helpers (local and way freight).
148	Yard firemen and helpers.

(C) Passengers.

(a) On or getting on or off passenger trains.
(b) On or getting on or off other trains.
(c) Not on trains.

The class "Passengers" is to cover passengers on trains and all persons lawfully on the premises of the carrier incidentally to traveling on its trains, including passengers temporarily off trains, as at railway restaurants, etc., and at junctions in transferring from one train to another.

(D) Persons carried under contract.

(a) On or getting on or off passenger trains.
(b) On or getting on or off other trains.
(c) Not on trains.

The term "Persons carried under contract" is used herein to mean such persons as postal clerks, express messengers, Pullman conductors and porters, city baggage transfer and omnibus agents, newsboys, peddlers, live-stock tenders and others (not employees of the carrier) in charge of freight, and other like classes of persons authorized by the carrier to be on its trains *primarily for the conduct of their business* and not for the purpose of travel. Such persons when riding as passengers should be classed as passengers.

(E) Other nontrespassers.

(a) On or getting on or off passenger trains.
(b) On or getting on or off other trains.
(c) Not on trains.

The class "Other nontrespassers" covers persons on public highway crossings, unless classable as trespassers, and persons on the carrier's premises by license, permission, or invitation, who are not classable as employees, passengers, or persons carried under contract, such as persons present to meet trains or to transact business with the carrier, and persons adjacent to railway premises when injured as the result of the operation of the railway. (Students learning the road, etc., in anticipation of employment when sufficiently prepared should, if receiving no compensation, be included in this class.)

(F) Trespassers, employees.

(a) Walking along track.
(b) Crossing tracks at public highway crossings.
(c) Crossing tracks at other places.
(d) On or getting on or off trains.
(e) Not otherwise classed.

TRESPASSERS, OTHER THAN EMPLOYEES:

(G) Trespassers; under 14 years of age.

(a) Walking along track.
(b) Crossing tracks at public highway crossings.
(c) Crossing tracks at other places.
(d) On or getting on or off trains.
(e) Not otherwise classed.

(H) Trespassers; 14 to 21 years of age.

(a) Walking along track.
(b) Crossing tracks at public highway crossings.
(c) Crossing tracks at other places.
(d) On or getting on or off trains.
(e) Not otherwise classed.

(I) Trespassers; adult hoboes or tramps.

(a) Walking along track.
(b) Crossing tracks at public highway crossings.
(c) Crossing tracks at other places.
(d) On or getting on or off trains.
(e) Not otherwise classed.

(J) Trespassers; adults, other persons. (Includes residents of vicinity, visitors, and all other persons trespassing except itinerant unemployed.)

(a) Walking along track.
(b) Crossing tracks at public highway crossings.
(c) Crossing tracks at other places.
(d) On or getting on or off trains.
(e) Not otherwise classed.

Whenever persons are classed as "trespassers" the report should state the circumstances that warrant such a classification and, if possible, the regular occupation of such persons killed or injured.

A person should not be classed as a trespasser on a highway grade crossing unless the crossing is protected by gates, or other similar barriers, which were closed when the person went on the crossing, or unless the person attempted to pass over or under trains or cars at the crossing.

ORDER.

At a session of the INTERSTATE COMMERCE COMMISSION, Division 4, held at its office in Washington, D.C., on the 21st day of September, 1932.

The matter of accident statistics being under consideration,

It is ordered, That subdivision (C) of section 31 of the Rules Governing Monthly Reports of Railway Accidents, effective January 1, 1922, reading as follows:

(C) Passengers.

(a) On or getting on or off passenger trains.
(b) On or getting on or off other trains.
(c) Not on trains.

The class "Passengers" is to cover passengers on trains and all persons lawfully on the premises of the carrier incidentally to traveling on its trains, including passengers temporarily off trains, as at railway restaurants, etc., and at junctions in transferring from one train to another.

be, and it is hereby, modified to read as follows:

(C-1) Passengers on trains.

(a) On or getting on or off passenger trains.
(b) On or getting on or off other trains.

The class "Passengers on trains" is to cover persons holding transportation or paying cash fares who are actually on or getting on or off passenger-carrying trains under conditions not constituting trespass.

(C-2) Travelers not on trains.

The class "Travelers not on trains" is to cover persons who are lawfully on railway premises in connection with their journeys as passengers by railway and not covered by Class (C-1).

The reference to Class (C) in subdivision (B), Employees not on duty, of said section 31 shall be understood as applying to classes (C-1) or (C-2) as may be appropriate according to the nature of the accident.

It is further ordered, That the foregoing modification of subdivision (C) of said section 31 shall become effective as of January 1, 1933.

By the Commission, Division 4:

[SEAL] GEORGE B. McGINTY, *Secretary*.

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ORDER.

At a session of the INTERSTATE COMMERCE COMMISSION, Division 4, held at its office in Washington, D. C., on the 17th day of December, A. D. 1932.

The matter of accident statistics being under consideration,

It is ordered, That the list of reporting divisions and the introductory paragraph thereto in section 31 of the Rules Governing Monthly Reports of Railway Accidents, effective January 1, 1922, be, and are hereby, eliminated, and the following substituted therefor:

The following list of 128 Reporting Divisions into which all the distinctive classes of railway positions are grouped is derived from the "Rules Governing the Classification of Steam Railway Employees and Reports of Their Service and Compensation" prescribed by the Interstate Commerce Commission to be effective on July 1, 1921, as amended by order of October 20, 1932. The returns on all accident report forms should, with respect to the classification of employees, be made in conformity with these Reporting Divisions. For each employee reported on Form T as killed or injured there should be given the correct number of the Reporting Division to which the employee is properly assignable, and also the pay-roll or distinctive class title of his occupational position. The letter (A) or (B) should be used to indicate respectively whether he was on or off duty at the time of accident. Abbreviations or contractions may be used in the indication of position titles, if their meaning is sufficiently clear. For example, to indicate a casualty sustained by a road freight brakeman (through freight) on duty, the proper designation of class of person on Form T would be A-117, Road Freight Brakeman and Flagman (through freight), while that of a casualty incurred in a train or a train-service accident by a buffet car porter on duty would be A-101, Train Attendants.

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INTERSTATE COMMERCE COMMISSION.

List of reporting divisions for employees.

Division No.		Reporting division
Old	New	
		I.—Executives, officials, and staff assistants.
1	1	Executives, general officers, and assistants.
2	2	Division officers, assistants, and staff assistants.
		II.—Professional, clerical, and general.
3, 4, 5, 6	3	Professional and subprofessional assistants.
7	4	Supervisory or chief clerks (major departments).
8	5	Chief clerks (minor departments) and assistant chief clerks and supervising cashiers.
9	6	Clerks and clerical specialists (A).
10, 11	7	Clerks (B and C).
12	8	Mechanical device operators (office).
13	9	Stenographers and secretaries (A).
14	10	Stenographers and typists (B).
15	11	Storekeepers, sales agents, and buyers.
16	12	Ticket agents and assistant ticket agents.
17	13	Traveling auditors or accountants.
18	14	Telephone switchboard operators and office assistants.
19	15	Messengers and office boys.
20	16	Elevator operators and other office attendants.
21	17	Lieutenants and sergeants of police.
22, 23	18	Patrolmen and watchmen.
24, 25		
26, 28	19	Traffic and various other agents, inspectors and investigators.
29		
27	20	Claim agents or investigators.
27	21	Freight claim agents or investigators.
27	22	Chief claim agents or investigators.
30	23	Miscellaneous trades workers (other than plumbers).
31	24	Motor vehicle and motor car operators.
32	25	Teamsters and stablemen.
33	26	Janitors and cleaners.
		III.—Maintenance of way and structures.
34, 35	27	Roadmasters, general foremen and assistants.
36, 37	28	Maintenance of way and scale inspectors.
38	29	Bridge and building gang foremen (skilled labor).
39	30	Bridge and building carpenters.
40	31	Bridge and building ironworkers.
41	32	Bridge and building painters.
42	33	Masons, bricklayers, plasterers, and plumbers.
43, 44	34	Maintenance of way and structures helpers and apprentices.
45	35	Portable steam equipment operators.
46	36	Portable steam equipment operator helpers.
47	37	Pumping equipment operators.
48	38	Gang foremen (extra gang and work train laborers).
49	39	Gang foremen (bridge and building, signal and telegraph laborers).
50	40	Gang or section foremen.
51	41	Extra gang men.
52	42	Section men.
53	43	Maintenance of way laborers (other than track and roadway) and gardeners and farmers.
54, 55	44	General and assistant general foremen and inspectors (signal, telegraph, and electrical transmission).
56	45	Gang foremen (signal and telegraph skilled trades labor).

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MONTHLY REPORTS OF RAILWAY ACCIDENTS.

List of reporting divisions for employees—Continued.

Division No.		Reporting division
Old	New	
57	46	Signalmen and signal maintainers.
58	47	Linemen and groundmen.
59	48	Assistant signalmen and assistant signal maintainers.
60	49	Signalman and signal maintainer helpers.
		IV.—Maintenance of equipment and stores.
61, 62	50	General, assistant general, and department foremen.
63, 64	51	General and assistant general foremen (Stores).
65, 66	52	Equipment, shop, electrical, material, and supplies inspectors.
67	53	Gang foremen and gang leaders (skilled labor).
68	54	Blacksmiths.
69	55	Boilermakers.
70, 71	56	Carmen (A and B).
72, 73	57	Carmen (C and D).
74	58	Electrical workers (A).
75	59	Electrical workers (B).
76	60	Electrical workers (C).
77	61	Machinists.
78	62	Molders.
79	63	Sheet-metal workers.
80	64	Skilled trades helpers (M. of E. and Stores).
81	65	Helper apprentices (M. of E. and Stores).
82	66	Regular apprentices (M. of E. and Stores).
84	67	Coach cleaners.
82	68	Gang foremen (shops, engine houses, and power plants).
83	69	Gang foremen (stores and ice, reclamation, and timber-treating plants).
85	70	Classified laborers (shops, engine houses, and power plants).
86	71	General laborers (shops, engine houses, and power plants).
86	72	General laborers (stores and ice, reclamation, and timber-treating plants).
87	73	Stationary engineers (steam).
88, 89	74	Stationary firemen, oilers, coal passers, and water tenders.
		V.—Transportation (other than train, engine, and yard).
90	75	Chief train dispatchers.
90	76	Train dispatchers.
90	77	Train directors.
91	78	Station agents (supervisory, major stations, nontelegraphers).
92, 93	79	Station agents (smaller stations, nontelegraphers).
94	80	Station agents (telegraphers and telephoners).
95	81	Chief telegraphers and telephoners or wire chiefs.
96	82	Clerk-telegraphers and clerk-telephoners.
97	83	Telegraphers, telephoners, and towermen.
98	84	Station-masters and assistants.
99	85	Supervising baggage agents.
100	86	Baggage agents and assistants.
101	87	Baggage, parcel room, and station attendants.
102	88	General foremen (freight stations, warehouses, grain elevators, and docks).
103	89	Assistant general foremen (freight stations, warehouses, grain elevators, and docks).
104	90	Gang foremen (freight station, warehouse, grain elevator, and dock labor).
105	91	Callers, loaders, sealers, seglers, and perishable-freight inspectors.
106	92	Truckers (stations, warehouses, and platforms).

List of reporting divisions for employees—Continued.

Division No. Old	Division No. New	Reporting division
107	93	Laborers (coal and ore docks and grain elevators).
108	94	Common laborers (stations, warehouses, platforms, and grain elevators).
109	95	Stewards, restaurant and lodging-house managers, and dining-car supervisors.
110, 111	96	Chefs and cooks (restaurants or dining cars).
112, 113	97	Waiters, camp cooks, kitchen helpers, etc.
114, 115, 116, 117, 118, 119	98	Officers, workers, and attendants on barges, launches, ferry boats, towing vessels, steamers, and shore workers.
120	99	Transportation and dining-service inspectors.
121	100	Parlor and sleeping car conductors.
122	101	Train attendants.
123	102	Bridge operators and helpers.
124	103	Crossing and bridge flagmen and gatemen.
125	104	Foremen (laundry) and laundry workers.
		VI (a).—Transportation (yardmasters, switch tenders, and hostlers)
126	105	Yardmasters.
126	106	Assistant yardmasters.
127	107	Switch tenders.
128	108	Outside hostlers.
129	109	Inside hostlers.
130	110	Outside hostler helpers.
		VI (b).—Transportation (train and engine)
131	111	Road passenger conductors.
132	112	Assistant road passenger conductors and ticket collectors.
133	113	Road freight conductors (through freight).
134	114	Road freight conductors (local and way freight).
135	115	Road passenger baggagemen.
136	116	Road passenger brakemen and flagmen.
137	117	Road freight brakemen and flagmen (through freight).
138	118	Road freight brakemen and flagmen (local and way freight).
139	119	Yard conductors and yard foremen.
140	120	Yard brakemen and yard helpers.
141	121	Road passenger engineers and motormen.
142	122	Road freight engineers and motormen (through freight).
143	123	Road freight engineers and motormen (local and way freight).
144	124	Yard engineers and motormen.
145	125	Road passenger firemen and helpers.
146	126	Road freight firemen and helpers (through freight).
147	127	Road freight firemen and helpers (local and way freight).
148	128	Yard firemen and helpers.

It is further ordered, That this order shall become effective on January 1, 1933.

By the Commission, Division 4:

[SEAL] GEORGE B. McGINTY,
Secretary.

ORDER.

At a Session of the INTERSTATE COMMERCE COMMISSION, Division 4, held at its office in Washington, D. C., on the 14th day of January, 1936.

The matter of accident statistics being under consideration,

It is ordered, That the second, third, and fourth paragraphs of section 26 of the Rules Governing Monthly Reports of Railway Accidents, effective January 1, 1922, be, and they are hereby, modified to read as follows:

DESCRIPTION.

In reporting accidents involving trains, locomotives, or cars, sufficient particulars should be given to show definitely to which of the four classes described below the equipment was assigned. Definite information is required in this respect and descriptive terms of local application, such as "milk," "transfer," "mine," etc., should not be used to designate classes of trains. In connection with this matter, a light engine involved in an accident should be classified as belonging to that class of service to which its assignment at the time of accident was related.

Transportation service—Freight.—This class includes trains run between terminals or stations containing loaded or empty freight-train cars and trains consisting of a locomotive and caboose running light in connection with such service. Trains which contain passenger-train cars shall be classed as freight trains whenever the number of freight-train cars is in excess of the number of passenger-train cars in them.

Transportation service—Passenger.—This class includes trains run between terminals or stations containing loaded or empty passenger-train cars and trains consisting of deadhead passenger-train cars. Trains which contain freight-train cars shall be classed as passenger trains whenever the number of passenger-train cars is in excess of the number of freight-train cars in them.

It is further ordered, That the fifth and sixth paragraphs of said section 26 relating to mixed and special transportation service be and hereby are canceled.

It is further ordered, That the foregoing modification of section 26 shall become effective as of January 1, 1936.

By the Commission, Division 4:

[SEAL] GEORGE B. McGINTY,
Secretary.

6s

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Defendant's Exhibit No. 261 (Witness J.J. Sullivan)
Feb. 5, 1941

INTERSTATE COMMERCE COMMISSION RULES GOVERNING MONTHLY REPORTS OF RAILWAY ACCIDENTS EFFECTIVE ON JANUARY 1, 1922

ABSTRACT OF PAGES 22 AND 23

FORM AND ARRANGEMENT OF REPORTS.

15. **Forms Used and Duplicate Reports.**—Monthly reports of railway accidents (including rail failures causing train accidents) should be made on forms provided by the Interstate Commerce Commission or on forms identical therewith in arrangement, size, and in color and weight of paper, and every reporting carrier is required to retain in its files a duplicate of each report rendered to the commission. The forms provided, which are of four kinds, are designated as Forms V, T, R, and F.

Each sheet of each report should show in the appropriate place the name of the company for which it is filed, the month and year to which the report relates, together with all other particulars called for by the form. Each sheet of each report following Form V should bear the autograph signature of a responsible officer or employee.

16. **Form V (Verification).**—A report should be made on this form each month, even though no reportable (train, train-service, or nontrain) accident occurred during the month covered. Such report should include an oath or verification, made by the proper officer of the reporting carrier, as provided for attestation on Form V, which should show the number of train and train-service accidents that occurred during the month for which the report is made, and the number of sheets, inclusive of Form V. If no reportable accident occurred during the month, that fact should be stated on this form. Form V should also show the total number of locomotive-miles run during the month, computed in accordance with the Interstate Commerce Commission's Classification of Train-miles, Locomotive-miles, and Car-miles. If any reportable nontrain accidents occurred during the month, they should be reported in the tables provided on Form V, but if none occurred, that fact should be stated as required.

17. **Form T (Train and Train-Service Accidents).**—A separate Form T sheet should be used for each reportable train accident or train-service accident and should show the required particulars concerning the accident.

18. **Form R (Rail Failures).**—In case of reportable train accidents resulting from rail failures, particulars of the failures should be reported on Form R; and all the information called for on that form should be furnished additionally to that required on Form T.

19. **Form F (Subsequent Fatalities).**—If, as the result of an injury, a person dies more than 24 hours after the occurrence of the accident, the casualty should be reported on a Form T as an injury, with full details as required by the provisions of the form, and in addition, a memorandum of the death should be given on Form F in accordance with the requirements of that form. This additional report is to be made in connection with the report for the month in which the accident occurred, if practicable, otherwise it should separately accompany the first monthly report filed after the death has come to the knowledge of the carrier. A single Form F may contain reports of more than one such fatality, provided all persons included therein were injured during the same month. A Form F is not required in relation to a nontrain accident.

(1940 Revision)

MONTHLY REPORT OF RAILWAY ACCIDENTS

TO THE INTERSTATE COMMERCE COMMISSION

BUREAU OF STATISTICS

Form V

Name of reporting carrier } ..... Report for the month of } ....., 194....

..... (Name of reporting officer) ..... (Official title) ..... (Address)

Total number of miles run during month:

Locomotive .....

Motor train .....

Total .....

This report consists of ..... sheets, numbered 1 to ....., inclusive

VERIFICATION

STATE OF .....
COUNTY OF ..... } ss:

I, ... (Name of affiant), being first duly sworn, do say upon my oath that I am ..... (Title of office held by affiant) of ..... (Name of reporting carrier); that as such officer of the said carrier it is my duty to have supervision over the record of reportable accidents arising from the operation of the railway of the said carrier, and that I have caused to be compiled from the said record and to be carefully examined the annexed report of such accidents occurring during the month named at the head of this sheet; that the total number of train and train-service accidents (as defined in the effective rules of the Interstate Commerce Commission) during the said month was .....; that the said annexed report includes ..... sheets in addition to the present sheet; that each of said additional sheets is marked with the name of the month and the year above shown and the name of the reporting carrier, and is validated with the autograph signature of a responsible officer or employee of the said carrier; and that the said report is true and complete to the best of my knowledge and belief.

Subscribed and sworn to before me, a notary public in and for the State and County aforesaid, this ..... day of ....., 194....

(Use an impression seal) [L. S.]

..... Notary Public. ..... (Signature of affiant)

INSTRUCTIONS

1. **A report should be filed on Form V each month regardless of whether a reportable accident of any kind occurred during the month.**
2. The tabular statements of *nontrain* accidents (Sections A and B) must include all reportable nontrain accidents as defined in the Commission's Rules Governing Monthly Reports Railway Accidents. If no reportable nontrain accident occurred during the month covered by a report, that fact should be indicated by entering the word "None" opposite "Total persons in nontrain accidents" in Section B.
3. It should be noted that no casualties resulting from *train* or *train-service* accidents should be included in Sections A and B, as these sections pertain exclusively to nontrain accidents.
4. Accidents to persons resulting in immediate death or in death within 24 hours from the time the accident occurred should be reported in columns headed "Killed"; all other reportable accidents to persons, including those resulting in death of the persons injured after an interval of more than 24 hours from the time the accident occurred, should be reported in the columns headed "Injured".
5. Casualties to employees should be included in the returns when the period of incapacity exceeds 3 days in the aggregate during the 10 days immediately following the accident, and casualties to other persons should be included when the period of disability exceeds 1 day.
6. In the current "Rules Governing the Classification of Steam Railway Employees", etc., prescribed by the Interstate Commerce Commission, the distinctive classes of railway positions are grouped into 128 so-called Reporting Divisions, named in this form, and returns of casualties to employees should be made in conformity with them.
7. SECTION A.—This section pertains exclusively to casualties to employees on duty caused by reportable nontrain accidents.
8. SECTION B.—This section should include casualties to all classes of persons in reportable nontrain accidents.
9. SECTION C.—This section is intended for the recapitulation of reportable casualties to persons of all classes incurred in railway accidents of all kinds, and so should cover all *nontrain* casualties includable in Section B of Form V, as well as all *train* and *train-service* casualties returnable in Form T. Item No. 7, "Trespassers", is to include all persons regardless of class when trespassing.
10. SECTION D.—This section requires a separate statement of all casualties in train and train-service accidents occurring at public highway grade crossings that are properly included in Section C also.
11. SECTION E.—This section requires a separate statement of all casualties due to failures of locomotives, tenders, and appurtenances that are properly included in Sections A and B also.
12. SECTION F.—This section should be confined to injuries to employees on duty that resulted in incapacity beyond day or shift of accident, but for not more than 3 days in the aggregate within the 10-day period immediately following the accident, and should not include injuries reportable under the 1922 book of rules.

SECTION A—NONTRAIN CASUALTIES TO EMPLOYEES ON DUTY

Division No.	Reporting Division	Killed	Injured	Division No.	Reporting Division	Killed	Injured
	I—Executives, officials, and staff assistants				**Total brought forward**		
1	Executives, general officers, and assistants				*II—Professional, clerical, and general*—Continued		
2	Division officers, assistants, and staff assistants			14	Telephone switchboard operators and office assistants		
	II—Professional, clerical, and general			15	Messengers and office boys		
3	Professional and subprofessional assistants			16	Elevator operators and other office attendants		
4	Supervisory or chief clerks (major departments)			17	Lieutenants and sergeants of police		

Motor train .....

Total .....

VERIFICATION

STATE OF .....
COUNTY OF ..... } ss:

I, ... (Name of affiant), being first duly sworn, do say upon my oath that I am ..... (Title of office held by affiant)

of ..... (Name of reporting carrier); that as such officer of the said carrier it is my duty to have supervision over the record of reportable accidents arising from the operation of the railway of the said carrier, and that I have caused to be compiled from the said record and to be carefully examined the annexed report of such accidents occurring during the month named at the head of this sheet; that the total number of train and train-service accidents (as defined in the effective rules of the Interstate Commerce Commission) during the said month was .....; that the said annexed report includes ..... sheets in addition to the present sheet; that each of said additional sheets is marked with the name of the month and the year above shown and the name of the reporting carrier, and is validated with the autograph signature of a responsible officer or employee of the said carrier; and that the said report is true and complete to the best of my knowledge and belief.

Subscribed and sworn to before me, a notary public in and for the State and County aforesaid, this ..... day of ....., 19..

(Use an impression seal) [L. S.]

..... Notary Public.

..... (Signature of affiant)

INSTRUCTIONS

1. **A report should be filed on Form V each month regardless of whether a reportable accident of any kind occurred during the month.**
2. The tabular statements of *nontrain* accidents (Secs. A and B) must include all reportable nontrain accidents as defined in the Commission's Rules Governing Monthly Reports of Railway Accidents. If no reportable nontrain accident occurred during the month covered by a report, that fact should be indicated by entering the word "None" opposite "Total persons in nontrain accidents" in Section B.
3. It should be noted that no casualties resulting from *train* or *train-service* accidents should be included in Sections A and B, as these sections pertain exclusively to nontrain accidents.
4. Accidents to persons resulting in immediate death or in death within 24 hours from the time the accident occurred should be reported in columns headed "Killed"; all other reportable accidents to persons, including those resulting in death of the persons injured after an interval of more than 24 hours from the time the accident occurred, should be reported in the columns headed "Injured".
5. Casualties to employees should be included in the returns when the period of incapacity exceeds 3 days in the aggregate during the 10 days immediately following the accident, and casualties to other persons should be included when the period of disability exceeds 1 day.
6. In the current "Rules Governing the Classification of Steam Railway Employees", etc., prescribed by the Interstate Commerce Commission, the distinctive classes of railway positions are grouped into 128 so-called Reporting Divisions, named in this form, and returns of casualties to employees should be made in conformity with them.
7. SECTION A.—This section pertains exclusively to casualties to employees on duty caused by reportable nontrain accidents.
8. SECTION B.—This section should include casualties to all classes of persons in reportable nontrain accidents.
9. SECTION C.—This section is intended for the recapitulation of reportable casualties to persons of all classes incurred in railway accidents of all kinds, and so should cover all *nontrain* casualties includable in Section B of Form V, as well as all *train* and *train-service* casualties returnable in Form T. Item No. 7, "Trespassers", is to include all persons regardless of class when trespassing.
10. SECTION D.—This section requires a separate statement of all casualties in train and train-service accidents occurring at public highway grade crossings that are properly included in Section C also.
11. SECTION E.—This section requires a separate statement of all casualties due to failures of locomotives, tenders, and appurtenances that are properly included in Sections A and B also.
12. SECTION F.—This section should be confined to injuries to employees on duty that resulted in incapacity beyond day or shift of accident, but for not more than 3 days in the aggregate within the 10-day period immediately following the accident, and should not include injuries reportable under the 1922 book of rules.

SECTION A—NONTRAIN CASUALTIES TO EMPLOYEES ON DUTY

Division No.	Reporting Division	Killed	Injured
	I—Executives, officials, and staff assistants		
1	Executives, general officers, and assistants		
2	Division officers, assistants, and staff assistants		
	II—Professional, clerical, and general		
3	Professional and subprofessional assistants		
4	Supervisory or chief clerks (major departments)		
5	Chief clerks (minor departments) and assistant chief clerks and supervising cashiers		
6	Clerks and clerical specialists (A)		
7	Clerks (B and C)		
8	Mechanical device operators (office)		
9	Stenographers and secretaries (A)		
10	Stenographers and typists (B)		
11	Storekeepers, sales agents, and buyers		
12	Ticket agents and assistant ticket agents		
13	Traveling auditors or accountants		
	Total carried forward		

Division No.	Reporting Division	Killed	Injured
	Total brought forward		
	II—Professional, clerical, and general—Continued		
14	Telephone switchboard operators and office assistants		
15	Messengers and office boys		
16	Elevator operators and other office attendants		
17	Lieutenants and sergeants of police		
18	Patrolmen and watchmen		
19	Traffic and various other agents, inspectors, and investigators		
20	Claim agents or investigators		
21	Freight claim agents or investigators		
22	Chief claim agents or investigators		
23	Miscellaneous trades workers (other than plumbers)		
24	Motor vehicle and motor car operators		
25	Teamsters and stablemen		
26	Janitors and cleaners		
	Total carried forward		

(OVER)

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SECTION A—NONTRAIN CASUALTIES TO EMPLOYEES ON DUTY—Continued

Division No.	Reporting Division	Killed	Injured
	Total brought forward		
	III—*Maintenance of way and structures*		
27	Roadmasters, general foremen, and assistants		
28	Maintenance of way and scale inspectors		
29	Bridge and building gang foremen (skilled labor)		
30	Bridge and building carpenters		
31	Bridge and building ironworkers		
32	Bridge and building painters		
33	Masons, bricklayers, plasterers, and plumbers		
34	Maintenance of way and structures helpers and apprentices		
35	Portable steam equipment operators		
36	Portable steam equipment operator helpers		
37	Pumping equipment operators		
38	Gang foremen (extra gang and work-train laborers)		
39	Gang foremen (bridge and building, signal and telegraph laborers)		
40	Gang or section foremen		
41	Extra gang men		
42	Section men		
43	Maintenance of way laborers (other than track and roadway) and gardeners and farmers		
44	General and assistant general foremen and inspectors (signal, telegraph, and electrical transmission)		
45	Gang foremen (signal and telegraph skilled trades labor)		
46	Signalmen and signal maintainers		
47	Linemen and groundmen		
48	Assistant signalmen and assistant signal maintainers		
49	Signalman and signal maintainer helpers		
	IV—*Maintenance of equipment and stores*		
50	General, assistant general, and department foremen		
51	General and assistant general foremen (stores)		
52	Equipment, shop, electrical, material, and supplies inspectors		
53	Gang foremen and gang leaders (skilled labor)		
54	Blacksmiths		
55	Boilermakers		
56	Carmen (A and B)		
57	Carmen (C and D)		
58	Electrical workers (A)		
59	Electrical workers (B)		
60	Electrical workers (C)		
61	Machinists		
62	Molders		
63	Sheet-metal workers		
64	Skilled trades helpers (M. of E. and stores)		
	Total carried forward		

Division No.	Reporting Division	Killed	Injured
	Total brought forward		
	IV—*Maintenance of equipment and stores*—Continued		
65	Helper apprentices (M. of E. and stores)		
66	Regular apprentices (M. of E. and stores)		
67	Coach cleaners		
68	Gang foremen (shops, engine houses, and power plants)		
69	Gang foremen (stores and ice, reclamation, and timber-treating plants)		
70	Classified laborers (shops, engine houses, and power plants)		
71	General laborers (shops, engine houses, and power plants)		
72	General laborers (stores and ice, reclamation, and timber-treating plants)		
73	Stationary engineers (steam)		
74	Stationary firemen, oilers, coal passers, and water tenders		
	V—*Transportation (other than train, engine, and yard)*		
75	Chief train dispatchers		
76	Train dispatchers		
77	Train directors		
78	Station agents (supervisory, major stations, nontelegraphers)		
79	Station agents (smaller stations, nontelegraphers)		
80	Station agents (telegraphers and telephoners)		
81	Chief telegraphers and telephoners or wire chiefs		
82	Clerk-telegraphers and clerk-telephoners		
83	Telegraphers, telephoners, and towermen		
84	Station masters and assistants		
85	Supervising baggage agents		
86	Baggage agents and assistants		
87	Baggage, parcel room, and station attendants		
88	General foremen (freight stations, warehouses, grain elevators, and docks)		
89	Assistant general foremen (freight stations, warehouses, grain elevators, and docks)		
90	Gang foremen (freight station, warehouse, grain elevator, and dock labor)		
91	Callers, loaders, scalers, sealers, and perishable-freight inspectors		
92	Truckers (stations, warehouses, and platforms)		
93	Laborers (coal and ore docks and grain elevators)		
94	Common laborers (stations, warehouses, platforms, and grain elevators)		
95	Stewards, restaurant and lodging-house managers, and dining-car supervisors		
96	Chefs and cooks (restaurants or dining cars)		
97	Waiters, camp cooks, kitchen helpers, etc		
98	Officers, workers, and attendants on barges, launches, ferry boats, towing vessels, steamers, and shore workers		
99	Transportation and dining-service inspectors		
100	Parlor and sleeping car conductors		
	Total carried forward		

SECTION A—Nontrain Casualties to Employees on Duty—Continued

Division No.	Reporting Division	Killed	Injured
	Total brought forward		
	V—*Transportation (other than train, engine, and yard)*—Contd.		
101	Train attendants		
102	Bridge operators and helpers		
103	Crossing and bridge flagmen and gatemen		
104	Foremen (laundry) and laundry workers		
	VI (a)—*Transportation (yardmasters, switchtenders, and hostlers)*		
105	Yardmasters		
106	Assistant yardmasters		
107	Switch tenders		
108	Outside hostlers		
109	Inside hostlers		
110	Outside hostler helpers		
	VI (b)—*Transportation (train and engine)*		
111	Road passenger conductors		
112	Assistant road passenger conductors and ticket collectors		
113	Road freight conductors (through freight)		
	Total carried forward		

Division No.	Reporting Division	Killed	Injured
	Total brought forward		
	VI (b)—*Transportation (train and engine)*—Continued		
114	Road freight conductors (local and way freight)		
115	Road passenger baggagemen		
116	Road passenger brakemen and flagmen		
117	Road freight brakemen and flagmen (through freight)		
118	Road freight brakemen and flagmen (local and way freight)		
119	Yard conductors and yard foremen		
120	Yard brakemen and yard helpers		
121	Road passenger engineers and motormen		
122	Road freight engineers and motormen (through freight)		
123	Road freight engineers and motormen (local and way freight)		
124	Yard engineers and motormen		
125	Road passenger firemen and helpers		
126	Road freight firemen and helpers (through freight)		
127	Road freight firemen and helpers (local and way freight)		
128	Yard firemen and helpers		
	Total Employees on Duty in Nontrain Accidents		

SECTION B—Distribution of Nontrain Casualties According to Classes of Accident

Class of accident	Employees on duty	
	Killed	Injured
(a) Shop machinery, stationary engines and motors, cranes, etc. (1)		
(b) Locomotive cranes, steam shovels, dredges, pile drivers, etc. (2)		
(c) Transmission apparatus (belts, gears, shafting, ropes, etc.) (3)		
(d) Use of hand tools, apparatus, etc. (4)		
(e) Flying particles (5)		
(f) Explosives and inflammable, hot, or corrosive substances (6)		
(g) Electric currents (7)		
(h) Collapse, fall, etc., of objects (8)		
(i) Handling rails, ties, bridge timbers, etc. (9)		
Total carried forward		

Class of accident	Employees on duty	
	Killed	Injured
Total brought forward		
(j) M. W. and S. hand cars (nontrain accidents only) (10)		
(k) M. W. and S. motor cars (nontrain accidents only) (11)		
(l) Handling freight or supplies (12)		
(m) Falls of employees not includable in classes (a) to (l) (13)		
(n) Miscellaneous nontrain accidents (14)		
Total Employees on Duty in Nontrain Accidents		
(o) Other persons in nontrain accidents (15)		
Total Persons in Nontrain Accidents		

SECTION C—Recapitulation of All Casualties to Persons Resulting from Reportable Train, Train-Service, and Nontrain Accidents

No.	Class of person	Train accidents		Train-service accidents		Nontrain accidents		Total accidents (train, train-service, and nontrain)	
		Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
1	Employees on duty								
2	Employees not on duty								
3	Passengers on trains								
4	Travelers not on trains								
5	Persons carried under contract								
6	Other nontrespassers								
7	Trespassers (all classes)								
8	Grand Total								

(OVER)

SECTION D—Highway Grade-Crossing Accidents*

No.	Class of person	Train accidents		Train-service accidents		Total	
		Killed	Injured	Killed	Injured	Killed	Injured
1	Employees on duty						
2	Employees not on duty						
3	Passengers on trains						
4	Travelers not on trains						
5	Persons carried under contract						
6	Other nontrespassers						
7	Trespassers (all classes)						
8	Total						

*See item No. 10 of Instructions on face of this form.

SECTION E—Failures of Locomotives, Tenders, and Appurtenances in Nontrain Accidents*

Number of accidents

No.	Class of person	Killed	Injured
1	Employees on duty		
2	Employees not on duty		
3	Other persons		
4	Total		

*See item No. 11 of Instructions on face of this form.

SECTION F—Incapacity Beyond Day or Shift, Not in Excess of 3 Days*

No.	Kind of accident	Number of injuries to employees on duty
1	Train	
2	Train service	
3	Nontrain	
4	Total	

*See item No. 12 of Instructions on face of this form.

U. S. GOVERNMENT PRINTING OFFICE 12—1151

(936 REVISION)

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MONTHLY REPORT OF RAILWAY ACCIDENTS

TO THE BUREAU OF STATISTICS
INTERSTATE COMMERCE COMMISSION

SHEET No. .....

Name of reporting carrier (1) ..... For the month of ....., 19...

If "joint operation," or crossing collision, name roads involved (2) .....

If "joint operation," name road whose superintendent is in charge of track (3) .....

Carrier's number (4) ..... Carrier's division (5) ..... Date of accident (6) ..... Time of day (7) ..... I. C. C. class (8) .....

Place of accident: Name of State (9) ..... Nearest station (10) ..... Nearest milepost (11) ..... Estimated distance and direction from station named (12) .....

Kind of accident (13) ..... Clear, cloudy, or foggy? (14) ..... Raining or snowing? (15) ..... Daylight or dark? (16) .....

Cause (briefly) (17) .....

Kind of train (18) ..... Train No. (18a) ..... Number of cars in train (18b) ..... Engine Nos. (19) ..... Direction (20) ..... Speed (21) ..... m. p. h.

(22) Method of operation ..... (23) Number of main tracks .....

(Answers to questions 22 and 23 required only in connection with collisions)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
																												I. C. C. use only																

(24) DETAILS OF CASUALTIES TO PERSONS

Name and address of person (a)	Class of person (b)	I. C. C. use only 29	30	31	32	33	Killed or nature and extent of injuries (c)	I. C. C. use only 34	35	36	Days disability A = Actual P = Probable (d)

	NAME OF ROAD	(a) Equipment	(b) Way and Structures	(c) Clearing Wreck	(d) Total
(25) COST		$	$	$	$

Carrier's number (4) ..... Carrier's division (5) ..... Date of accident (6) ..... Time of day (7) ..... I. C. C. class (8) .....

Place of accident: Name of State (9) ..... Nearest station (10) ..... Nearest milepost (11) ..... Estimated distance and direction from station named (12) .....

Kind of accident (13) ..... Clear, cloudy, or foggy? (14) ..... Raining or snowing? (15) ..... Daylight or dark? (16) .....

Cause (briefly) (17) .....

Kind of train (18) ..... Train No. (18a) ..... Number of cars in train (18b) ..... Engine Nos. (19) ..... Direction (20) ..... Speed (21) ..... m. p. h.

(22) Method of operation ..... (23) Number of main tracks .....

(Answers to questions 22 and 23 required only in connection with collisions)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
																												I. C. C. use only																

(24) DETAILS OF CASUALTIES TO PERSONS

Name and address of person (a)	Class of person (b)	I. C. C. use only 29	30	31	32	33	Killed or nature and extent of injuries (c)	I. C. C. use only 34	35	36	Days disability A = Actual P = Probable (d)

(25) COST	NAME OF ROAD	(a) Equipment	(b) Way and Structures	(c) Clearing Wreck	(d) Total
		$	$	$	$
	TOTAL				

(26) Detail of cause, nature, and circumstances of accident; responsibility and experience of employees responsible.

(Signature) ..... (Title) .....

Form T (SEE INSTRUCTIONS ON REVERSE OF SHEET) 5772 12—1923

3991

INSTRUCTIONS REGARDING ENTRIES ON FACE OF THIS SHEET

(References are to sections of the Commission's Rules governing Monthly Reports of Railway Accidents, 1922 Revision)

1. The significant words in the name of the reporting carrier should be given in full, so far as practicable.

2 and 3. Concerning train accidents occurring on terminal or other track operated jointly or in common, or classifiable as crossing collisions, see, respectively, sections 5, 5*a*, and 5*b*, and 8 (*e*) and (*f*) of Rules.

4. Enter the number of the accident as recorded in the carrier's operating records.

5. Enter the name of the operating division on which the accident occurred.

6. State the day of the month.

7. State the time o'clock in hours and minutes, a.m. or p.m.

8. Enter a capital letter to indicate the class (see section 20 of the Rules) and a small letter to indicate the subclass (see sections 8 to 13).

9. The customary abbreviation for the name of a State may be used.

10. Give the name of the station nearest to the place where the accident occurred (or was first discovered) and indicate whether it occurred on main track, or on yard track or sidings. This information should be given both for train accidents and train-service accidents. Main tracks within yards are not to be regarded as yard tracks. Sidings not used exclusively as passing tracks are to be regarded as yards. See section 25 of Rules.

11. The giving of the number of the milepost nearest to the place of the accident is optional; and instead of giving it in the case of either a train or a train-service accident, if the accident occurred at a station, that fact should be stated, or, if it occurred within a yard, the name or description of the yard should be given.

12. Distance, estimated in miles or rods, should be given when appropriate.

18. Show the kind of train, as freight, passenger, work, switching, etc. If light engine, state to what class of service assigned. See section 26 of Rules.

20. Give the time-table direction.

21. Give the estimated speed in miles per hour.

22. In case of a collision, show whether trains were operated under a block system at point of accident, stating specifically what method of blocking, if any, was employed.

23. Give number of main tracks in use in locality of accident.

24. (*b*) See section 31 of Rules.

24. (*c*) See section 30 of Rules.

25. State the amount of damage to equipment (including damage to foreign cars), to other railway property, and cost of clearing wreck, with the total amount as provided. In case of a "joint-operation" accident, figures for the several items should be given for *each road involved*, the name of which should be clearly indicated. If no other road is involved, respondent may make the requisite entries on "Total" line only. See section 29 of Rules.

26. For information in general pertinent to the matter of returns, see sections 1 to 13, 17, 20, and 22 to 31 of Rules. If the space afforded on Form T is insufficient for *all* the requisite entries concerning a particular accident, blank sheets of like size, suitably identified and completed, may be attached to a single Form T containing the introductory details applicable to the accident as a whole.

1939
Revision

INTERSTATE COMMERCE COMMISSION
Bureau of Statistics

Supplement to
T sheet No.____.
_____, 19
(Month)

MONTHLY REPORT OF ACCIDENTS AT PUBLIC HIGHWAY GRADE CROSSINGS

Name of carrier _____

Date of accident _____. Nearest station _____

A report on this form must accompany each Form T sheet carrying the symbols D-f, M-a, or S-h, in item (8). (Refer to section 9 (f), page 17; section 12 (a), page 19; section 13 (h), page 21; and section 20, page 23 of Rules Governing Monthly Reports of Railway accidents - 1922 Revision.)

1. Type of accident:

(a) Person, vehicle, or object involved _____
(b) Type of vehicle _____
(b1) Struck by train _____; (b2) Ran into side of train _____

2. Part of train struck (if ran into side of train) _____

3. Crossing protection at time of accident:

(a) Type of protection _____
(b) Operation - Automatic _____; Manual _____; Other _____.
(c) Located on - Both sides of crossing _____; Side from which vehicle approached _____; Side opposite _____.
(d) State any factor impairing effective operation _____
_____

4. State whether view of crossing was obscured by buildings, trees, cars, or other objects _____

5. Night accidents (one-half hour after sunset to one-half hour before sunrise.)

Crossing illuminated - (Yes or No) _____

6. Estimated speed of vehicle's approach _____ State also if

(a) Stalled on crossing _____; (b) Stopped on crossing _____

7. If vehicle subject to Motor Carrier Act, 1935, state name and address of the operating company (or ICC plate number if obtained) _____
_____
_____

MONTHLY REPORT OF RAILWAY ACCIDENTS.

Sheet No..... **R**

Name of reporting carrier.....

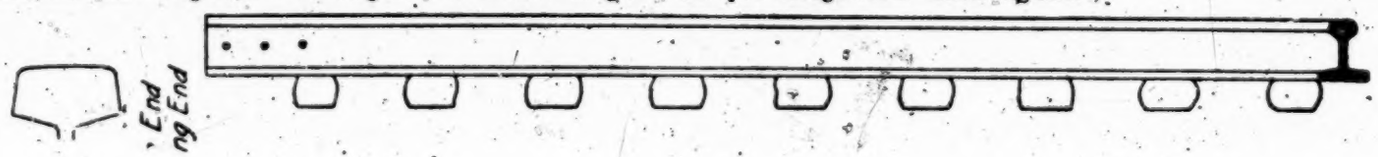
Report to the Interstate Commerce Commission for the month of ....., 193

Date of accident ....., as reported on Form T, Sheet No. .....

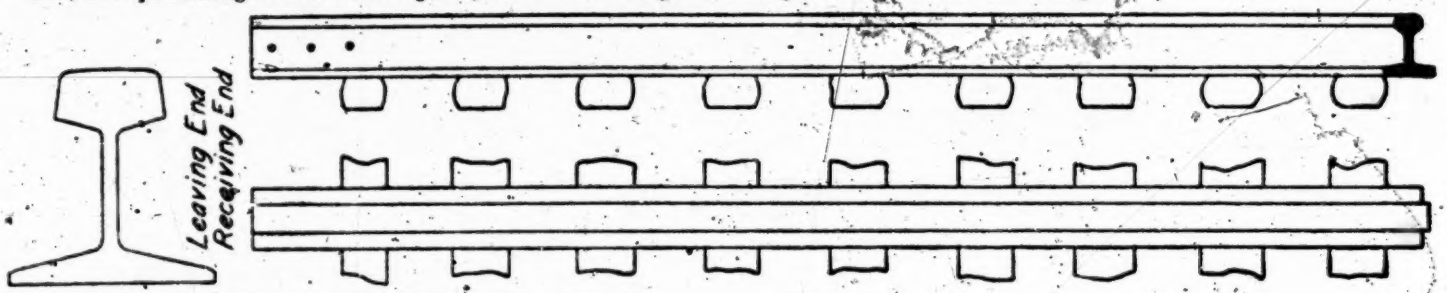
Report of rail failure on the ..... Division. Section No..... Nearest Station .....

1. Weight per yard—new.....pounds; rerolled.....pounds.
2. Rail section.....
3. Brand on rail.....
4. Heat No. on rail.....
5. Rail No. or letter.....
6. Original length of rail.....
7. Month and year rail was laid.....
8. Location.....feet .....of mile-post .....
9. Which track?..... Which rail?.....
10. On curve or straight line?.....
11. Degree of curve.....
12. High or low rail, if on curve .....
13. Superelevation of curve at break.....
14a. Was rail broken?.....
14b. Was rail damaged?.....
14c. Was rail defective?.....
15. Was rail much or little worn?.....
16. By whom discovered?.....
17. Date and time found.....
18. Was rail removed?.....
19. If removed, give date.....
20. Exact gage of track at break .....
21. Was break over or between ties?.....
22. Was break square or angular?.....
23. Distance between edges of ties at break.....
24. Condition of ties each side of break.....
25. Kind of ties .....
26. Were tie plates used?..... Kind?.....
27. Condition of line and surface.....
28. Kind of ballast.....
29. Was track properly ballasted?.....
30. Kind of material in roadbed under ballast.....
31. Was track well drained?.....
32. Was roadbed frozen?.....
33. Condition of weather (wet, dry, warm or cold, freezing or thawing).....
34a. If break was at joint, state kind, number of holes, and whether it was full-bolted or insulated.....
.....
34b. Were any bolts at joint loose?..... If so, how many?.....
35. If broken, state cause of break and describe any flaws found at point of break.....
.....
36. If previously damaged, describe nature and cause of damage, if known.....
.....
37. If defective, describe location of flaws or defects, and, if possible, what caused them.....
.....
.....
.....
.....
.....
.....

38. Draw on diagram lines of break, or partial fracture, such as long pieces from side of head and half-moon pieces from base, showing dimensions. Hollows in head should be shown on end section. Defects may also be indicated on diagram. Mark distance from end to break. (*If break is nearest receiving end, draw pen through words "Leaving end;" if nearest leaving end, draw pen through words "Receiving end.")



1. Weight per yard—new.....pounds; rerolled.....pounds.
2. Rail section.....
3. Brand on rail.....
4. Heat No. on rail.....
5. Rail No. or letter.....
6. Original length of rail.....
7. Month and year rail was laid.....
8. Location.....feet.....of mile-post.....
9. Which track?..... Which rail?.....
10. On curve or straight line?.....
11. Degree of curve.....
12. High or low rail, if on curve.....
13. Superelevation of curve at break.....
14a. Was rail broken?.....
14b. Was rail damaged?.....
14c. Was rail defective?.....
15. Was rail much or little worn?.....
16. By whom discovered?.....
17. Date and time found.....
18. Was rail removed?.....
19. If removed, give date.....
20. Exact gage of track at break.....
21. Was break over or between ties?.....
22. Was break square or angular?.....
23. Distance between edges of ties at break.....
24. Condition of ties each side of break.....
25. Kind of ties.....
26. Were tie plates used?..... Kind?.....
27. Condition of line and surface.....
28. Kind of ballast.....
29. Was track properly ballasted?.....
30. Kind of material in roadbed under ballast.....
31. Was track well drained?.....
32. Was roadbed frozen?.....
33. Condition of weather (wet, dry, warm or cold, freezing or thawing).....
34a. If break was at joint, state kind, number of holes, and whether it was full-bolted or insulated.....
34b. Were any bolts at joint loose?..... If so, how many?.....
35. If broken, state cause of break and describe any flaws found at point of break.....
36. If previously damaged, describe nature and cause of damage, if known.....
37. If defective, describe location of flaws or defects, and, if possible, what caused them.....
38. Draw on diagram lines of break, or partial fracture, such as long pieces from side of head and half-moon pieces from base, showing dimensions. Hollows in head should be shown on end section. Defects may also be indicated on diagram. Mark distance from end to break. (*If break is nearest receiving end, draw pen through words "Leaving end;" if nearest leaving end, draw pen through words "Receiving end.")



39. State any other important circumstances pertaining to failure.....

(Signature)..... (Title).....

*Applies only to track upon which the current of traffic is in one direction.

(over.)

INSTRUCTIONS.

In the description on Form R of failures of rails resulting in accidents, reported on Form T in accordance with the Commission's rules governing Monthly Reports of Railway Accidents (see sections 17, 18, and 28), the following terms should be used:

1. *Broken rail.*—This term is to be confined to a rail which is either broken through, separating it into two or more parts, or contains a crack which might result in a complete break. Mention transverse fissures specifically, when they occur.

2. *Flow of metal.*—This term means a "rolling out" of the metal on top of the head toward its sides without there being any indication of a breaking down of the head structure; that is, the underside of the head is not distorted.

3. *Crushed head.*—This term is used to indicate a "flattening" of the head, and is usually accompanied by a crushing down of the head.

4. *Split head.*—This term includes rails split through or near the center line of the head or rails with pieces split off the side of the head. When this term is used it should be further defined by stating whether it is or is not accompanied by a seam or hollow head. State also the length of the split or seam.

5. *Split web.*—This term is a longitudinal split along the axis of the web generally starting from the end of the rail through the bolt holes. State whether fracture passed across a bolt hole or in other parts of the web.

6. *Broken base.*—This term covers all breaks in base of rail and should be described and illustrated on the sketches provided for. Mention seams lengthwise the rail when they occur.

7. *Miscellaneous causes.*—This term is intended to cover all failures of rails reportable on Form R not includable in the preceding classes.

12—1908

5776

MONTHLY REPORT OF RAILWAY ACCIDENTS—SUBSEQUENT FATALITIES. Sheet No. F

Name of reporting carrier. _____ Report to the Interstate Commerce Commission for the month of _____, 19____

MEMORANDUM OF FATALITIES DEVELOPED FROM PREVIOUSLY REPORTED INJURIES.

If as the result of an injury, reported on Form T, a person dies more than twenty-four hours after the occurrence of the accident in which it was received, a memorandum containing significant particulars of the death should be given on Form F, which should be rendered in connection with the report for the month in which the accident occurred, if practicable; otherwise it should separately accompany the first monthly report filed after the death has come to the knowledge of the carrier. A single Form F may contain reports of more than one such fatality, provided all persons included therein were injured during the same month. No statements are expected in similar cases due to nontrain accidents. (See Section 19 of the Commission's Rules governing Monthly Reports of Railway Accidents, 1918 Revision.)

Line No.	Name and address of person (a).	Place of death (b).	Date of death (c).	Particulars of accident from which death resulted.		
				Class (d).	Date (e).	Place (f).
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

5777

Signature of officer or employee authenticating report ..... Title, ...

[1] Denote collision by C, derailment by D, locomotive boiler accident by B, other locomotive accident by L, miscellaneous train accident by M, and train-service accident by S; also give number of sheet of original report of accident.

12—1080

6:23:39

Defendant's Exhibit No. 262 (Witness J.J. Sullivan)
Feb. 5, 1941

CASUALTIES TO ALL CLASSES OF EMPLOYES ON DUTY
SUSTAINED IN TRAIN AND TRAIN-SERVICE ACCIDENTS
CLASS I RAILROADS OF THE UNITED STATES
REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION

YEARS 1923 TO 1939, INCLUSIVE

	Year	Total Car Miles (Thousands)	Total Train Miles (Thousands)	Total Locomotive Miles (Thousands)	Man-Hours Worked by All Employes (Thousands)	Casualties to All Classes of Employes on Duty in Train and Train-Service Accidents			Casualty Rate Per			
						Killed	Injured	Total	100 Million Car Miles	Million Train Miles	Million Locomotive Miles	Million Man-Hours
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
(1)	1923	29 432 900	1 245 099	1 756 170	4 856 983	1 907	38 520	40 027	136.00	32.15	22.79	8.24
(2)	1924	28 889.085	1 204 302	1 672 584	4 472 049	1 131	31 302	32 433	112.27	26.93	19.39	7.25
(3)	1925	30 785 543	1 220 846	1 697 798	4 458 702	1 180	31 275	32 455	105.42	26.58	19.12	7.28
(4)	1926	32 686 043	1 248 897	1 778 071	4 567 482	1 249	32 907	34 156	104.56	27.35	19.21	7.48
(5)	1927	32 462 178	1 220 987	1 728 040	4 416 147	1 121	27 085	28 206	86.89	23.10	16.32	6.39
(6)	1928	32 994 940	1 202 678	1 698 744	4 200 547	916	22 854	23 770	72.04	19.76	13.99	5.66
(7)	TOTAL 1923-28	187 230 289	7 342 809	10 331 407	26 971 909	7 104	183 943	191 047	AVERAGE 102.04	AVERAGE 26.02	AVERAGE 18.49	AVERAGE 7.08
(8)	1929	33 828 943	1 214 360	1 731 883	4 234 806	1 037	21 228	22 265	65.82	18.33	12.86	5.26
(9)	1930	30 177 596	1 106 386	1 550 246	3 648 890	690	13 033	13 723	45.47	12.40	8.85	3.76
(10)	1931	25 608 792	965 181	1 327 467	2 937 370	472	9 077	9 549	37.29	9.89	7.19	3.25
(11)	1932	20 350 867	821 158	1 104 953	2 291 540	414	6 943	7 357	36.15	8.96	6.66	3.21
(12)	1933	20 597 254	786 720	1 080 016	2 117 011	371	5 970	6 341	30.79	8.06	5.87	3.00
(13)	1934	22 179 787	818 473	1 124 043	2 267 515	372	6 252	6 624	29.87	8.09	5.89	2.92
(14)	TOTAL 1929-34	152 743 239	5 712 278	7 918 608	17 497 132	3 356	62 503	65 859	AVERAGE 43.12	AVERAGE 11.53	AVERAGE 8.32	AVERAGE 3.76
(15)	1935	22 312 343	829 198	1 149 494	2 265 664	413	6 195	6 608	29.35	7.97	5.75	2.92
(16)	1936	25 588 229	905 749	1 285 048	2 531 764	519	8 246	8 765	34.25	9.68	6.82	3.46
(17)	1937	26 848 096	933 219	1 310 645	2 646 909	582	8 433	9 015	33.58	9.66	6.88	3.41
(18)	1938	23 141 532	825 682	1 132 482	2 192 822	339	5 906	6 245	26.99	7.56	5.51	2.85
(19)	1939	25 258 741	853 179	1 190 362	2 342 153	353	6 360	6 713	26.58	7.87	5.64	2.87
(20)	TOTAL 1935-39	123 348 941	4 347 027	6 068 032	11 979 312	2 206	35 140	37 346	AVERAGE 30.28	AVERAGE 8.76	AVERAGE 6.15	AVERAGE 3.12
(21)	GRAND TOTAL 1923-39	463 322 469	17 402 114	24 318 047	56 448 353	12 666	281 586	294 252	AVERAGE 63.51	AVERAGE 16.91	AVERAGE 12.10	AVERAGE 5.21
	COMPARISONS OF AVERAGE CASUALTY RATES											
(22)	PERIOD 1929 - 34 COMPARED WITH PERIOD 1923 - 28 - DECREASE								57.74%	55.69%	55.00%	46.99%
(23)	PERIOD 1935 - 39 COMPARED WITH PERIOD 1929 - 34 - DECREASE								29.78%	25.50%	26.09%	17.02%
(24)	PERIOD 1935 - 39 COMPARED WITH PERIOD 1923 - 28 - DECREASE								70.33%	66.99%	66.74%	55.93%

SOURCE: Column (b) - I.C.C. Statistics of Railways in the United States, Statement 31 in issue of 1928 for years 1923 to 1928 inclusive; table No. 55 issue of 1938 for years 1929 to 1938, inclusive. Preliminary Abstract of Railway Statistics for Year 1939.

Column (c) - I.C.C. Statistics of Railways in the United States, Statement No. 30 issue of 1928 for years 1923 to 1928 inclusive; table No. 53 issue of 1938 for years 1929 to 1938 inclusive. Preliminary Abstract of Railway Statistics for Year 1939

Column (d) - I.C.C. Annual Accident Bulletins, Table No. 101 for years 1923 and 1924; Table No. 97 for subsequent years.

Column (e) - (f) - (g) - I.C.C. Annual Accident Bulletins, Table No. 55.

5778

Defendant's Exhibit No. 263 (Witness J.J. Sullivan)
Feb. 5, 1941

CASUALTIES TO ROAD TRAINMEN AND ENGINEMEN ON DUTY
ALL CLASSES OF SERVICE
SUSTAINED IN TRAIN AND TRAIN-SERVICE ACCIDENTS
CLASS I RAILROADS OF THE UNITED STATES
REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

	Year	Total Car Miles (Thousands)	Total Train Miles (Thousands)	Man-Hours Worked by Road Trainmen (Thousands)	Casualties to Road Trainmen on Duty in Train and Train-Service Accidents			Casualty Rate per		
					Killed	Injured	Total	100 Million Car Miles	Million Train Miles	Million Man-Hours
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
(1)	1923	29 432 500	1 245 099	499 275	545	21 093	21 638	73.52	17.38	43.34
(2)	1924	28 889 085	1 204 302	534 229	376	16 781	17 157	59.39	14.25	32.12
(3)	1925	30 785 543	1 220 846	529 615	388	16 262	16 650	54.08	13.64	31.44
(4)	1926	32 666 043	1 248 897	540 739	403	16 918	17 321	53.02	13.87	32.03
(5)	1927	32 462 178	1 220 987	510 068	[illegible]	14 062	14 434	44.46	11.82	28.30
(6)	1928	32 994 940	1 202 678	481 525	275	11 959	12 234	37.08	10.17	25.41
(7)	Total 1923-28	187 230 289	7 342 809	3 095 451	2 399	97 075	99 434	Average 53.11	Average 13.54	Average 32.12
(8)	1929	33 828 943	1 214 360	482 244	325	10 838	11 163	33.00	9.19	23.15
(9)	1930	30 177 596	1 106 386	409 413	251	7 037	7 288	24.15	6.59	17.80
(10)	1931	25 608 792	965 181	332 460	187	5 113	5 300	20.70	5.49	15.94
(11)	1932	20 350 867	821 158	266 228	163	3 990	4 153	20.41	5.06	15.60
(12)	1933	20 597 254	796 720	256 904	155	3 435	3 590	17.43	4.56	13.97
(13)	1934	22 179 787	818 473	268 510	185	3 696	3 881	17.50	4.74	14.45
(14)	Total 1929-34	152 743 239	5 712 278	2 015 799	1 266	34 109	35 375	Average 23.16	Average 6.19	Average 17.55
(15)	1935	22 512 347	829 198	269 939	166	3 552	3 718	16.52	4.48	13.77
(16)	1936	25 588 229	905 749	306 789	212	4 637	4 849	18.95	5.35	15.81
(17)	1937	26 848 096	933 219	312 500	231	4 482	4 713	17.55	5.05	15.08
(18)	1938	23 141 532	825 682	261 282	164	3 207	3 371	14.57	4.08	12.90
(19)	1939	25 258 741	853 179	273 602	153	3 368	3 521	13.94	4.13	12.87
(20)	Total 1935-39	123 348 941	4 347 027	1 424 112	926	19 246	20 172	Average 16.35	Average 4.64	Average 14.16
(21)	Grand Total 1923-39	463 322 469	17 402 114	6 535 322	4 551	150 430	154 981	Average 33.45	Average 8.91	Average 23.71
	COMPARISONS OF AVERAGE CASUALTY RATES									
(22)	PERIOD 1929 - 1934 COMPARED WITH PERIOD 1923 - 1928, DECREASE							56.39%	54.28%	45.36%
(23)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1929 - 1934, DECREASE							29.40%	25.04%	19.32%
(24)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1923 - 1928, DECREASE							69.21%	65.73%	55.92%

NOTE: Road Trainmen and Enginemen, includes conductors, brakemen, flagmen, baggagemen, engineers and firemen.

SOURCE: Columns (b), I.C.C. Statistics of Railways in the United States, Statement No. 31 issue of 1928 for years 1923 to 1928, inclusive; table No. 55 issue of 1938 for years 1929 to 1938, inclusive. Preliminary Abstract of

	YEAR	TOTAL CAR MILES (Thousands)	TOTAL TRAIN MILES (Thousands)	BY ROAD TRAINMEN (Thousands)	MEN ON DUTY IN TRAIN AND TRAIN SERVICE ACCIDENTS			MILLION CAR MILES	MILLION TRAIN MILES	MILLION MAN-HOURS
					KILLED	INJURED	TOTAL			
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
(1)	1923	29 432 500	1 245 099	499 275	545	21 093	21 638	73.52	17.38	43.34
(2)	1924	28 889 085	1 204 302	534 229	376	16 781	17 157	59.39	14.25	32.12
(3)	1925	30 785 543	1 220 846	529 615	388	16 262	16 650	54.08	13.64	31.44
(4)	1926	32 666 043	1 248 897	540 739	403	16 918	17 321	53.07	13.87	32.03
(5)	1927	32 462 178	1 220 987	510 068	372	14 062	14 434	44.46	11.82	28.30
(6)	1928	32 994 940	1 202 678	481 525	275	11 959	12 234	37.08	10.17	25.41
(7)	Total 1923-28	187 230 289	7 342 809	3 095 451	2 359	97 075	99 434	Average 53.11	Average 13.54	Average 32.12
(8)	1929	33 828 943	1 214 360	482 244	325	10 838	11 163	33.00	9.19	23.15
(9)	1930	30 177 596	1 106 386	409 413	251	7 037	7 288	24.15	6.59	17.80
(10)	1931	25 608 792	965 181	332 460	187	5 113	5 300	20.70	5.49	15.94
(11)	1932	20 350 869	821 158	266 228	163	3 990	4 153	20.41	5.06	15.60
(12)	1933	20 597 254	786 720	256 904	155	3 435	3 590	17.43	4.56	13.97
(13)	1934	22 179 787	818 473	268 510	185	3 696	3 881	17.50	4.74	14.45
(14)	Total 1929-34	152 743 239	5 712 278	2 015 759	1 266	34 109	35 375	Average 23.16	Average 6.19	Average 17.55
(15)	1935	22 512 343	829 198	269 939	166	3 552	3 718	16.52	4.48	13.77
(16)	1936	25 588 229	905 749	306 789	212	4 637	4 849	18.95	5.35	15.81
(17)	1937	26 848 096	933 219	312 500	231	4 482	4 713	17.55	5.05	15.08
(18)	1938	23 141 532	825 682	261 282	164	3 207	3 371	14.57	4.08	12.90
(19)	1939	25 258 741	853 179	273 602	153	3 368	3 521	13.94	4.13	12.87
(20)	Total 1935-39	123 348 941	4 347 027	1 424 112	926	19 246	20 172	Average 16.35	Average 4.64	Average 14.16
(21)	Grand Total 1923-39	463 322 469	17 402 114	6 535 322	4 551	150 430	154 981	Average 33.45	Average 8.91	Average 23.71
	COMPARISONS OF AVERAGE CASUALTY RATES									
(22)	PERIOD 1929 - 1934 COMPARED WITH PERIOD 1923 - 1928, DECREASE							56.39%	54.28%	45.36%
(23)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1929 - 1934, DECREASE							29.40%	25.04%	19.32%
(24)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1923 - 1928, DECREASE							69.21%	65.73%	55.92%

NOTE: Road Trainmen and Enginemen, includes conductors, brakemen, flagmen, baggagemen, engineers and firemen.

SOURCE: Columns (b), I.C.C. Statistics of Railways in the United States, Statement No. 31 issue of 1928 for years 1923 to 1928, inclusive; table No. 55 issue of 1938 for years 1929 to 1938, inclusive. Preliminary Abstract of Railway Statistics for year 1939.

Column (c), I.C.C. Statistics of Railways in the United States, statement No. 30 issue of 1928 for years 1923 to 1928; table No. 53 issue of 1938 for years 1929 to 1938, inclusive. Preliminary Abstract of Railway Statistics for year 1939.

Columns (d), (e) and (f), I.C.C. Annual Accident Bulletins, Table No. 55.

Defendant's Exhibit No. 264 (Witness J.J. Sullivan)
Feb. 5, 1941

CASUALTIES TO ROAD FREIGHT TRAINMEN AND ENGINEMEN ON DUTY

SUSTAINED IN TRAIN AND TRAIN-SERVICE ACCIDENTS
CLASS I RAILROADS OF THE UNITED STATES
REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

	YEAR	TOTAL FREIGHT TRAIN AND WORK TRAIN CAR MILES (Thousands)	TOTAL FREIGHT TRAIN AND WORK TRAIN TRAIN MILES (Thousands)	MAN-HOURS WORKED BY ROAD FREIGHT TRAINMEN AND ENGINEMEN (Thousands)	CASUALTIES TO ROAD FREIGHT TRAINMEN AND ENGINEMEN ON DUTY IN TRAIN AND TRAIN-SERVICE ACCIDENTS			CASUALTY RATE PER		
					KILLED	INJURED	TOTAL	100 MILLION CAR MILES	MILLION TRAIN MILES	MILLION MAN-HOURS
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
(1)	1923	25 797 580	678 898	460 561	436	17 778	18 214	70.60	26.83	39.55
(2)	1924	25 193 036	633 288	401 340	295	13 955	14 250	56.56	22.50	35.51
(3)	1925	26 990 496	646 304	399 608	292	13 710	14 002	51.88	21.66	35.04
(4)	1926	28 780 342	670 458	412 781	311	14 270	14 581	50.66	21.75	35.32
(5)	1927	28 581 119	647 534	385 660	298	11 851	12 149	42.51	18.76	31.50
(6)	1928	29 145 755	636 469	362 306	197	9 970	10 167	34.88	15.97	28.06
(7)	Total 1923-28	164 488 328	3 912 951	2 422 256	1 829	81 534	83 363	Average 50.68	Average 21.30	Average 34.42
(8)	1929	29 922 710	648 909	364 808	247	9 118	9 365	31.30	14.43	25.67
(9)	1930	26 450 708	563 262	299 734	195	5 906	6 101	23.07	10.83	20.35
(10)	1931	22 290 854	479 632	237 583	136	4 213	4 349	19.51	9.07	18.31
(11)	1932	17 550 925	400 512	187 178	117	3 286	3 403	19.39	8.50	18.18
(12)	1933	18 030 948	403 619	186 302	104	2 883	2 987	16.57	7.40	16.03
(13)	1934	19 531 651	434 073	198 272	135	3 109	3 244	16.61	7.47	16.36
(14)	Total 1929-34	133 777 796	2 930 007	1 473 877	934	28 515	29 449	Average 22.01	Average 10.05	Average 19.98
(15)	1935	19 801 769	440 865	199 897	141	2 998	3 139	15.85	7.12	15.70
(16)	1936	22 756 196	501 073	233 074	170	3 929	4 099	18.01	8.18	17.59
(17)	1937	23 853 441	516 834	237 171	193	3 772	3 965	16.62	7.67	16.72
(18)	1938	20 309 599	431 891	191 014	122	2 631	2 753	13.56	6.37	14.41
(19)	1939	22 378 131	462 296	204 884	123	2 885	3 008	13.44	6.51	14.68
(20)	Total 1935-39	109 099 136	2 352 959	1 066 040	749	16 215	16 964	Average 15.55	Average 7.21	Average 15.91
(21)	Grand Total 1923-39	407 365 280	9 195 917	4 962 173	3 512	126 264	129 776	Average 31.86	Average 14.11	Average 26.15
	COMPARISONS OF AVERAGE CASUALTY RATES									
(22)	PERIOD 1929 - 1934 COMPARED WITH PERIOD 1923 - 1928, DECREASE							56.55%	52.82%	41.95%
(23)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1929 - 1934, DECREASE							29.35%	28.26%	20.37%
(24)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1923 - 1928, DECREASE							69.32%	66.15%	53.78%

SOURCE: Column (b), I.C.C. Statistics of Railways in the United States, statement No. 31 in issue of 1935 for years 1923 to 1935 inclusive; table No. 55 for years 1936 and 1937; table No. 158 for year 1938. Preliminary [illegible] Statistics for Year 1939

CLASS I RAILROADS OF THE UNITED STATES
REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

	YEAR	TOTAL FREIGHT TRAIN AND WORK TRAIN CAR MILES (Thousands)	TOTAL FREIGHT TRAIN AND WORK TRAIN TRAIN MILES (Thousands)	MAN-HOURS WORKED BY ROAD FREIGHT TRAINMEN AND ENGINEMEN (Thousands)	CASUALTIES TO ROAD FREIGHT TRAINMEN AND ENGINEMEN ON DUTY, IN TRAIN AND TRAIN-SERVICE ACCIDENTS			CASUALTY RATE PER		
					KILLED	INJURED	TOTAL	100 MILLION CAR MILES	MILLION TRAIN MILES	MILLION MAN-HOURS
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
(1)	1923	25 797 580	678 898	460 561	436	17 778	18 214	70.60	26.83	39.55
(2)	1924	25 193 036	633 288	401 340	295	13 955	14 250	56.56	22.50	35.51
(3)	1925	26 990 496	646 304	399 608	292	13 710	14 002	[illegible]	21.66	35.04
(4)	1926	28 780 342	670 458	412 781	311	14 270	14 581	[illegible]	21.75	35.32
(5)	1927	28 581 119	647 534	385 660	298	11 851	12 149	42.51	18.76	31.50
(6)	1928	29 145 755	636 429	362 306	197	9 970	10 167	34.88	15.97	28.06
(7)	Total 1923-28	164 488 328	3 912 951	2 422 256	1 829	81 534	83 363	Average 50.68	Average 21.30	Average 34.42
(8)	1929	29 922 710	648 909	364 808	247	9 118	9 365	31.30	14.43	25.67
(9)	1930	26 450 708	563 262	299 734	195	5 906	6 101	23.07	10.83	20.35
(10)	1931	22 290 854	479 632	237 583	136	4 213	4 349	19.51	9.07	18.31
(11)	1932	17 550 925	400 512	187 178	117	3 286	3 403	19.39	8.50	18.18
(12)	1933	18 030 948	403 619	186 302	104	2 883	2 987	16.57	7.40	16.03
(13)	1934	19 531 651	434 073	198 272	135	3 109	3 244	16.61	7.47	16.36
(14)	Total 1929-34	133 777 796	2 930 007	1 473 877	934	28 515	29 449	Average 22.01	Average 10.05	Average 19.98
(15)	1935	19 801 769	440 865	199 897	141	2 998	3 139	15.85	7.12	15.70
(16)	1936	22 756 196	501 073	233 074	170	3 929	4 099	18.01	8.18	17.59
(17)	1937	23 853 441	516 834	237 171	193	3 772	3 965	16.62	7.67	16.72
(18)	1938	20 309 599	431 891	191 014	122	2 631	2 753	13.56	6.37	14.41
(19)	1939	22 378 131	462 296	204 884	123	2 885	3 008	13.44	6.51	14.68
(20)	Total 1935-39	109 099 136	2 352 959	1 066 040	749	16 215	16 964	Average 15.55	Average 7.21	Average 15.91
(21)	Grand Total 1923-39	407 365 260	9 195 917	4 962 173	3 512	126 264	129 776	Average 31.86	Average 14.11	Average 26.15
	COMPARISONS OF AVERAGE CASUALTY RATES									
(22)	PERIOD 1929 - 1934 COMPARED WITH PERIOD 1923 - 1928, DECREASE							56.55%	52.82%	41.95%
(23)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1929 - 1934, DECREASE							29.35%	28.26%	20.37%
(24)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1923 - 1928, DECREASE							69.32%	66.15%	53.78%

SOURCE: Column (b), I.C.C. Statistics of Railways in the United States, statement No. 31 in issue of 1935 for years 1923 to 1935 inclusive; table No. 55 for years 1936 and 1937; table No. 158 for year 1938. Preliminary Abstract of Railway Statistics for Year 1939.

Column (c), I.C.C. Statistics of Railways in the United States, statement No. 30 in issue of 1928 for years 1923 to 1928 inclusive; table No. 53 in issue of 1938 for years 1929 to 1938 inclusive. Preliminary Abstract of Railway Statistics for Year 1939.

Columns (d), (e) and (f), I.C.C. Annual Accident Bulletins, table No. 55

Defendant's Exhibit No. 265 (Witness J.J. Sullivan)
Feb. 5, 1941

CASUALTIES TO ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN ON DUTY SUSTAINED IN TRAIN AND TRAIN-SERVICE ACCIDENTS CLASS I RAILROADS OF THE UNITED STATES REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION YEARS 1923 TO 1939, INCLUSIVE

	YEAR	TOTAL FREIGHT TRAIN AND WORK TRAIN CAR MILES (Thousands)	TOTAL FREIGHT TRAIN AND WORK TRAIN TRAIN MILES (Thousands)	MAN-HOURS WORKED BY ROAD FREIGHT CONDUCTORS, BRAKEMEN, AND FLAGMEN (Thousands)	CASUALTIES TO ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN ON DUTY IN TRAIN & TRAIN-SERVICE ACCIDENTS			CASUALTY RATE PER		
					KILLED	INJURED	TOTAL	100 MILLION CAR MILES	MILLION TRAIN MILES	MILLION MAN-HOURS
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
(1)	1923	25 797 580	678 898	268 548	322	11 910	12 232	47.42	18.02	45.33
(2)	1924	25 193 036	633 288	234 752	215	9 838	10 053	39.90	15.87	42.82
(3)	1925	26 990 496	646 304	232 998	228	9 855	10 083	37.36	15.60	43.28
(4)	1926	28 780 342	670 458	239 990	256	10 282	10 538	36.62	15.72	43.91
(5)	1927	28 581 119	647 534	224 081	215	8 876	9 091	31.81	14.04	40.57
(6)	1928	29 145 755	636 469	210 124	163	7 662	7 825	26.85	12.29	37.24
(7)	Total 1923-28	164 488 328	3 912 951	1 410 493	1 399	58 423	59 822	Average 36.37	Average 15.29	Average 42.41
(8)	1929	29 922 710	648 909	211 276	176	6 910	7 086	23.68	10.92	33.54
(9)	1930	26 450 708	563 262	173 888	152	4 587	4 739	17.92	8.41	27.25
(10)	1931	22 290 854	479 632	137 510	109	3 275	3 384	15.18	7.06	24.61
(11)	1932	17 550 925	400 512	107 909	97	2 586	2 683	15.29	6.70	24.86
(12)	1933	18 030 948	403 619	106 829	82	2 283	2 365	13.12	5.86	22.14
(13)	1934	19 531 651	434 073	113 645	106	2 460	2 566	13.14	5.91	22.58
(14)	Total 1929-34	133 777 796	2 930 007	851 057	722	22 101	22 823	Average 17.06	Average 7.79	Average 26.82
(15)	1935	19 801 769	440 865	114 415	105	2 403	2 508	12.67	5.69	21.92
(16)	1936	22 756 196	501 073	133 026	125	3 119	3 244	14.26	6.47	24.39
(17)	1937	25 853 441	516 834	135 565	138	2 973	3 111	13.04	6.02	22.95
(18)	1938	20 309 599	431 891	109 601	92	2 069	2 161	10.64	5.00	19.72
(19)	1939	22 378 131	462 296	117 045	86	2 294	2 380	10.64	5.15	20.33
(20)	Total 1935-39	109 099 136	2 352 959	609 652	546	12 858	13 404	Average 12.29	Average 5.70	Average 21.99
(21)	Grand Total 1923-39	407 365 260	9 195 917	2 871 202	2 667	93 382	96 049	Average 23.58	Average 10.44	Average 33.45
	COMPARISONS OF AVERAGE CASUALTY RATES									
(22)	PERIOD 1929 - 1934 COMPARED WITH PERIOD 1923 - 1928,				DECREASE			53.09%	49.05%	36.76%
(23)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1929 - 1934,				DECREASE			27.96%	26.83%	18.01%
(24)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1923 - 1928,				DECREASE			66.21%	62.72%	48.15%

	Year	Total miles Train and Work Train Car Miles (Thousands)	Train miles Train and Work Train Train Miles (Thousands)	Number employees Conductors, Brakemen, and Flagmen (Thousands)	Conductors, Brakemen and Flagmen on Duty in Train & Train-Service Accidents			100 Million Car Miles	Million Train Miles	Million Man-Hours
					Killed	Injured	Total			
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
(1)	1923	25 797 580	678 898	268 548	322	11 910	12 232	47.42	18.08	45.33
(2)	1924	25 193 036	633 288	234 752	215	9 838	10 053	39.90	15.87	42.82
(3)	1925	26 990 496	646 304	232 998	228	9 855	10 083	37.36	15.60	43.28
(4)	1926	28 780 342	670 458	239 990	256	10 282	10 538	36.62	15.72	43.91
(5)	1927	28 581 119	647 534	224 081	215	8 876	9 091	31.81	14.04	40.57
(6)	1928	29 145 755	636 469	210 124	163	7 662	7 825	26.85	12.29	37.24
(7)	Total 1923-28	164 488 328	3 912 951	1 410 493	1 399	58 423	59 822	Average 36.37	Average 15.29	Average 42.41
(8)	1929	29 922 710	648 909	211 276	176	6 910	7 086	23.68	10.92	33.54
(9)	1930	26 450 708	563 262	173 888	152	4 587	4 739	17.92	8.41	27.25
(10)	1931	22 290 854	479 632	137 510	109	3 275	3 384	15.18	7.06	24.61
(11)	1932	17 550 925	400 512	107 909	97	2 586	2 683	15.29	6.70	24.86
(12)	1933	18 030 948	403 619	106 829	82	2 283	2 365	13.12	5.86	22.14
(13)	1934	19 531 651	434 073	113 645	106	2 460	2 566	13.14	5.91	22.58
(14)	Total 1929-34	133 777 796	2 930 007	851 057	722	22 101	22 823	Average 17.06	Average 7.79	Average 26.82
(15)	1935	19 801 769	440 865	114 415	105	2 403	2 508	12.67	5.69	21.92
(16)	1936	22 756 196	501 073	133 026	125	3 119	3 244	14.26	6.47	24.39
(17)	1937	23 853 441	516 834	135 565	138	2 973	3 111	13.04	6.02	22.95
(18)	1938	20 309 599	431 891	109 601	92	2 069	2 161	10.64	5.00	19.72
(19)	1939	22 378 131	462 296	117 045	86	2 294	2 380	10.64	5.15	20.33
(20)	Total 1935-39	109 099 136	2 352 959	609 652	546	12 858	13 404	Average 12.29	Average 5.70	Average 21.99
(21)	Grand Total 1923-39	407 365 260	9 195 917	2 871 202	2 667	93 382	96 049	Average 23.58	Average 10.44	Average 33.45
	COMPARISONS OF AVERAGE CASUALTY RATES									
(22)	PERIOD 1929 - 1934 COMPARED WITH PERIOD 1923 - 1928, DECREASE							53.09%	49.05%	36.76%
(23)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1929 - 1934, DECREASE							27.96%	26.83%	18.01%
(24)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1923 - 1928, DECREASE							66.21%	62.72%	48.15%

SOURCE: Column (b), I.C.C. Statistics of Railways in the United States, statement No. 31 in issue of 1935 for years 1923 to 1935 inclusive; table No. 55 for years 1936 and 1937; table No. 158 for year 1938. Preliminary Abstract of Railway Statistics for year 1939.

Column (c), I.C.C. Statistics of Railways in the United States, statement No. 30 in issue of 1928 for years 1923 to 1928; table No. 53 in issue of 1938 for years 1929 to 1938, inclusive. Preliminary Abstract of Railway Statistics for year 1939.

Columns (d), (e) and (f), I.C.C. Annual Accident Bulletins, table No. 5.

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Defendant's Exhibit No. 266 (Witness J.J. Sullivan)
xRebuttalx Feb. 5, 1941

CASUALTIES TO ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN
TRAIN-SERVICE ACCIDENTS CAUSED BY
SUDDEN STOP, START, LURCH OR JERK OF LOCOMOTIVE, CAR OR TRAIN
ALL RAILROADS OF THE UNITED STATES
REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

	YEAR	TOTAL FREIGHT AND WORK TRAIN CAR MILES (Thousands)	TOTAL FREIGHT AND WORK TRAIN TRAIN MILES (Thousands)	CASUALTIES TO ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN, CAUSED BY SUDDEN STOP, START, LURCH OR JERK OF TRAIN			CASUALTY RATE PER	
				KILLED	INJURED	TOTAL	100 MILLION CAR MILES	MILLION TRAIN MILES
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
(1)	1923	25,797,580	678,898	11	1,946	1,957	7.59	2.88
(2)	1924	25,193,036	633,288	8	1,667	1,675	6.65	2.64
(3)	1925	26,990,496	646,304	10	1,818	1,828	6.77	2.83
(4)	1926	28,780,342	670,458	8	1,922	1,930	6.71	2.88
(5)	1927	28,581,119	647,534	10	1,777	1,787	6.25	2.76
(6)	1928	29,145,755	636,469	6	1,571	1,577	5.41	2.48
(7)	TOTAL 1923-28	164,488,328	3,912,951	53	10,701	10,754	AVERAGE 6.54	2.75
(8)	1929	29,922,710	648,909	4	1,451	1,455	4.86	2.24
(9)	1930	26,450,708	563,282	5	971	976	3.69	1.73
(10)	1931	22,290,854	479,632	5	709	714	3.20	1.49
(11)	1932	17,550,985	400,512	4	499	503	2.87	1.26
(12)	1933	18,030,948	403,619	3	417	420	2.33	1.04
(13)	1934	19,531,651	434,073	3	493	496	2.54	1.14
(14)	TOTAL 1929-34	133,777,796	2,930,007	24	4,540	4,564	AVERAGE 3.41	1.56
(15)	1935	19,801,769	440,865	3	509	512	2.59	1.16
(16)	1936	22,756,196	501,073	3	671	674	2.96	1.35
(17)	1937	23,853,441	516,834	5	565	570	2.39	1.10
(18)	1938	20,309,599	431,891	2	316	318	1.57	.74
(19)	1939	22,378,131	462,296	3	396	399	1.78	.86
(20)	TOTAL 1935-39	109,099,136	2,352,959	16	2,457	2,473	AVERAGE 2.27	1.05
(21)	GRAND TOTAL 1923-39	407,365,260	9,195,917	93	17,698	17,791	AVERAGE 4.37	1.93
	COMPARISONS OF AVERAGE CASUALTY RATES							
(22)	PERIOD 1929 - 34 COMPARED WITH PERIOD 1923 - 28, DECREASE						47.86%	43.27%

(1)	1923	25,797,580	678,898	11	1,946	1,957	7.59	2.88
(2)	1924	25,193,036	633,288	8	1,667	1,675	6.65	2.64
(3)	1925	26,990,496	646,304	10	1,818	1,828	6.77	2.83
(4)	1926	28,710,342	670,458	8	1,922	1,930	6.71	2.88
(5)	1927	28,581,119	647,534	10	1,777	1,787	6.25	2.76
(6)	1928	29,145,755	636,469	6	1,571	1,577	5.41	2.48
(7)	TOTAL 1923-28	164,488,328	3,912,951	53	10,701	10,754	AVERAGE 6.54	2.75
(8)	1929	29,922,710	648,909	4	1,451	1,455	4.86	2.24
(9)	1930	26,450,708	563,262	5	971	976	3.69	1.73
(10)	1931	22,290,854	479,632	5	709	714	3.20	1.49
(11)	1932	17,550,925	400,512	4	499	503	2.87	1.26
(12)	1933	18,030,948	403,619	3	417	420	2.33	1.04
(13)	1934	19,531,651	434,073	3	493	496	2.54	1.14
(14)	TOTAL 1929-34	133,777,796	2,930,007	24	4,540	4,564	AVERAGE 3.41	1.56
(15)	1935	19,801,769	440,865	3	509	512	2.59	1.16
(16)	1936	22,756,196	501,073	3	671	674	2.96	1.35
(17)	1937	23,853,441	516,834	5	565	570	2.39	1.10
(18)	1938	20,309,599	431,891	2	316	318	1.57	.74
(19)	1939	22,378,131	462,296	3	396	399	1.78	.86
(20)	TOTAL 1935-39	109,099,136	2,352,959	16	2,457	2,473	AVERAGE 2.27	1.05
(21)	GRAND TOTAL 1923-39	407,365,260	9,195,917	93	17,698	17,791	AVERAGE 4.37	1.93
	COMPARISONS OF AVERAGE CASUALTY RATES							
(22)	PERIOD 1929 - 34 COMPARED WITH PERIOD 1923 - 28,			DECREASE			47.86%	43.27%
(23)	PERIOD 1935 - 39 COMPARED WITH PERIOD 1929 - 34,			DECREASE			33.43%	32.69%
(24)	PERIOD 1935 - 39 COMPARED WITH PERIOD 1923 - 28,			DECREASE			65.29%	61.82%

SOURCE: Column (b)- I.C.C. Statistics of Railways in the United States, Statement No. 31 in issue of 1935 for years 1923 to 1935, inclusive; Table No. 55 for years 1936 and 1937; Table No. 158 for year 1938, Preliminary Abstract of Railway Statistics for year 1939.

Column (c)- I.C.C. Statistics of Railways in the United States, Statement No. 30 in issue of 1928 for years 1923 to 1928, inclusive; Table No. 53 in issue of 1938 for years 1929 to 1938, inclusive, Preliminary Abstract of Railway Statistics for year 1939.

Columns (d) and (e)- I.C.C. Annual Accident Bulletins, Table No. 80, Code Causes 7007, 7008, 7009 and 7010 combined.

8801

Defendant's Exhibit No. 267 (Witness J.J. Sullivan)
Feb. 5, 1941

CASUALTIES TO PASSENGERS ON TRAINS
IN TRAIN AND TRAIN-SERVICE ACCIDENTS
CLASS I RAILROADS OF THE UNITED STATES
REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION
FOR THE YEARS 1923 TO 1939, INCLUSIVE.

	YEAR	NUMBER OF REVENUE PASSENGERS CARRIED (Thousands)	NUMBER OF REVENUE PASSENGERS CARRIED ONE MILE (Thousands)	NUMBER OF CASUALTIES TO PASSENGERS ON TRAINS — TRAIN ACCIDENTS: KILLED	INJURED	TOTAL	TRAIN-SERVICE ACCIDENTS: KILLED	INJURED	TOTAL	TOTAL, TRAIN AND TRAIN-SERVICE ACCIDENTS: KILLED	INJURED	TOTAL	CASUALTY RATE PER: 100 MILLION PASSENGERS CARRIED	100 MILLION PASSENGERS MILES
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
(1)	1923	986,913	38,885,922	41	2,581	2,622	41	2,997	3,038	102	5,578	5,660	5.71	14.54
(2)	1924	932,678	36,125,685	40	2,108	2,148	81	3,021	3,102	121	5,129	5,250	5.63	14.53
(3)	1925	886,690	35,963,889	83	2,012	2,095	56	2,740	2,796	139	4,752	4,891	5.52	13.60
(4)	1926	868,622	35,090,225	79	1,796	1,875	51	2,479	2,530	130	4,275	4,405	5.11	12.42
(5)	1927	809,666	33,660,126	10	1,463	1,473	46	2,195	2,241	56	3,658	3,714	4.48	11.03
(6)	1928	779,354	31,542,720	16	1,375	1,391	43	1,887	1,930	59	3,262	3,321	4.26	10.53
(7)	TOTAL, 1923-28	5,276,683	210,788,565	269	11,335	11,604	338	15,279	15,617	607	26,614	27,221	Average 5.16	Average 12.91
(8)	1929	779,558	31,078,623	30	1,635	1,665	42	1,990	2,032	72	3,625	3,697	4.74	11.90
(9)	1930	704,698	26,823,992	7	777	784	31	1,745	1,776	38	2,522	2,560	3.63	9.54
(10)	1931	596,665	21,898,583	4	487	491	26	1,519	1,545	30	2,006	2,036	3.41	9.30
(11)	1932	479,833	16,974,582	1	410	411	16	1,408	1,424	17	1,818	1,835	3.83	10.81
(12)	1933	433,252	16,344,107	22	652	674	15	1,308	1,323	37	1,960	1,997	4.61	12.22
(13)	1934	450,135	18,038,853	12	390	402	15	1,470	1,485	27	1,860	1,887	4.19	10.46
(14)	TOTAL, 1929-34	3,443,141	131,157,860	76	4,351	4,427	145	9,440	9,585	221	13,791	14,012	Average 4.07	Average 10.68
(15)	1935	446,176	18,079,794	1	364	365	17	1,498	1,515	18	1,862	1,880	4.21	10.17
(16)	1936	489,685	22,417,065	6	732	738	10	1,691	1,701	16	2,423	2,439	4.98	10.88
(17)	1937	497,549	24,659,483	3	536	539	15	1,958	1,973	18	2,494	2,512	5.05	10.19
(18)	1938	452,999	21,433,138	52	472	524	17	1,794	1,811	69	2,266	2,335	5.15	10.79
(19)	1939	451,586	22,657,464	13	775	788	14	1,714	1,728	27	2,489	2,516	5.57	11.10
(20)	TOTAL, 1935-39	2,337,929	109,847,074	75	2,879	2,954	73	8,655	8,728	148	11,534	11,682	Average 5.00	Average 10.63
	COMPARISONS OF AVERAGE CASUALTY RATES													
(21)	PERIOD 1929 - 34 COMPARED WITH PERIOD 1923 - 28,												DECREASE 21.12%	DECREASE 17.27%
(22)	PERIOD 1935 - 39 COMPARED WITH PERIOD 1929 - 34,												INCREASE 22.85%	DECREASE .47%
(23)	PERIOD 1935 - 39 COMPARED WITH PERIOD 1923 - 28												DECREASE 3.14%	DECREASE 17.66%

NOTE: An injury to a passenger is reportable if the injury is sufficient to incapacitate the injured person from following his customary vocation or mode of living for a period of more than one day. (I.C.C. Rules Governing the Reporting of Accidents.)

SOURCE: Column (b), I.C.C. Statistics of Railways in the United States, Statement No. 25 for years 1923 and 1924; I.C.C. Annual Accident Bulletins, Table No. 97 for subsequent years.

Column (c), I.C.C. Annual Accident Bulletins, Table No. 109.

Columns (d), (e), (g) and (h), I.C.C. Annual Accident Bulletins, Table No. 55.

Defendant's Exhibit No. 268 (Witness J.J. Sullivan)
Feb. 5, 1941

CASUALTIES IN HIGHWAY GRADE CROSSING ACCIDENTS
IN WHICH AUTOMOBILES WERE INVOLVED, ALL STEAM RAILWAYS,
REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION

YEARS 1923 - 1939, INCLUSIVE

	YEAR	TOTAL TRAIN MILES (thousands)	NUMBER OF AUTOMOBILES REGISTERED	CASUALTIES TO ALL CLASSES OF PERSONS			CASUALTY RATE PER	
				KILLED	INJURED	TOTAL CASUALTIES	MILLION TRAIN MILES	10,000 AUTOMOBILES REGISTERED
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
(1)	1923	1,245,099	15,092,177	1,759	5,416	7,175	5.76	4.75
(2)	1924	1,204,302	17,591,981	1,688	5,650	7,338	6.09	4.17
(3)	1925	1,220,846	19,954,347	1,784	5,916	7,700	6.31	3.86
(4)	1926	1,248,897	22,001,393	2,062	6,358	8,420	6.74	3.83
(5)	1927	1,220,987	23,127,315	1,974	6,068	8,042	6.59	3.48
(6)	1928	1,202,678	24,493,124	2,165	6,218	8,383	6.97	3.42
(7)	Total 1923-28	7,342,809	122,260,337	11,432	35,626	47,058	6.41 (Average)	3.85
(8)	1929	1,214,360	26,501,443	2,085	6,347	8,432	6.94	3.18
(9)	1930	1,106,386	26,523,779	1,695	5,206	6,901	6.24	2.60
(10)	1931	965,181	25,814,103	1,580	4,336	5,916	6.13	2.29
(11)	1932	821,158	24,136,879	1,310	3,778	5,088	6.20	2.11
(12)	1933	786,720	23,827,290	1,305	3,496	4,801	6.10	2.01
(13)	1934	818,473	24,933,403	1,320	4,099	5,419	6.62	2.17
(14)	Total 1929-34	5,712,278	151,736,897	9,295	27,262	36,557	6.40 (Average)	2.41
(15)	1935	829,198	26,221,052	1,442	4,434	5,876	7.09	2.24
(16)	1936	905,749	28,221,291	1,519	4,662	6,181	6.82	2.19
(17)	1937	933,219	29,705,220	1,607	4,904	6,511	6.98	2.19
(18)	1938	825,682	29,485,680	1,307	3,783	5,090	6.16	1.73
(19)	1939	853,179	30,615,087	1,190	3,744	4,934	5.78	1.61
(20)	Total 1935-39	4,347,027	144,248,330	7,065	21,527	28,592	6.58 (Average)	1.98
(21)	Grand Total 1923-39	17,402,114	418,245,564	27,792	84,415	112,207	6.45 (Average)	2.68

COMPARISONS OF AVERAGE CASUALTY RATES		Train Mile Basis	Registered Automobile Basis
PERIOD 1929 - 1934 COMPARED WITH PERIOD 1923 - 1928	DECREASE	0.16%	37.40%
PERIOD 1935 - 1939 COMPARED WITH PERIOD 1929 - 1934	DECREASE	2.81%	17.84%
	AVERAGE	2.65%	48.57%

	YEAR	TOTAL TRAIN MILES (thousands)	NUMBER OF AUTOMOBILES REGISTERED	CASUALTIES TO ALL CLASSES OF PERSONS			CASUALTY RATE PER	
				KILLED	INJURED	TOTAL CASUALTIES	MILLION TRAIN MILES	10,000 AUTOMOBILES REGISTERED
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
(1)	1923	1,245,099	15,092,177	1,759	5,416	7,175	5.76	4.75
(2)	1924	1,204,302	17,591,981	1,688	5,650	7,338	6.09	4.17
(3)	1925	1,220,846	19,954,347	1,784	5,916	7,700	6.31	3.86
(4)	1926	1,248,897	22,001,393	2,062	6,358	8,420	6.74	3.83
(5)	1927	1,220,987	23,127,315	1,974	6,068	8,042	6.59	3.48
(6)	1928	1,202,678	24,493,124	2,165	6,218	8,383	6.97	3.42
(7)	Total 1923-28	7,342,809	122,260,337	11,432	35,626	47,058	6.41 (Average)	3.85
(8)	1929	1,214,360	26,501,443	2,085	6,347	8,432	6.94	3.18
(9)	1930	1,106,386	26,523,779	1,695	5,206	6,901	6.24	2.60
(10)	1931	965,181	25,814,103	1,580	4,336	5,916	6.13	2.29
(11)	1932	821,158	24,136,879	1,310	3,778	5,088	6.20	2.11
(12)	1933	786,720	23,827,290	1,305	3,496	4,801	6.10	2.01
(13)	1934	818,473	24,933,403	1,320	4,099	5,419	6.62	2.17
(14)	Total 1929-34	5,712,278	151,736,897	9,295	27,262	36,557	6.40 (Average)	2.41
(15)	1935	829,198	26,221,052	1,442	4,434	5,876	7.09	2.24
(16)	1936	905,749	28,221,291	1,519	4,662	6,181	6.82	2.19
(17)	1937	933,219	29,705,220	1,607	4,904	6,511	6.98	2.19
(18)	1938	825,682	29,485,680	1,307	3,783	5,090	6.16	1.73
(19)	1939	853,179	30,615,087	1,190	3,744	4,934	5.78	1.61
(20)	Total 1935-39	4,347,027	144,248,330	7,065	21,527	28,592	6.58 (Average)	1.98
(21)	Grand Total 1923-39	17,402,114	418,245,564	27,792	84,415	112,207	6.45 (Average)	2.68

COMPARISONS OF AVERAGE CASUALTY RATES		Train Mile Basis	Registered Automobile Basis
PERIOD 1929 - 1934 COMPARED WITH PERIOD 1923 - 1928	DECREASE	0.16%	37.40%
PERIOD 1935 - 1939 COMPARED WITH PERIOD 1929 - 1934	DECREASE	∅ 2.81%	17.84%
PERIOD 1935 - 1939 COMPARED WITH PERIOD 1923 - 1928	DECREASE	∅ 2.65%	48.57%

SOURCE: Column (b), Interstate Commerce Commission, Statistics of Railways, Table No. 53.
Columns (c), (d) and (e), Interstate Commerce Commission, Accident Bulletins, Summary No. 24.

∅ = Increase

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Defendant's Exhibit No. 269 (Witness J.J. Sullivan)
Feb. 5, 1941

TRAIN ACCIDENTS
AND RESULTANT CASUALTIES
ALL RAILROADS OF THE UNITED STATES
REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

	YEAR	TOTAL CAR MILES (Thousands)	TOTAL TRAIN MILES (Thousands)	TOTAL LOCO. MILES (Thousands)	NUMBER OF TRAIN ACCIDENTS AS TO CLASSES						NUMBER OF TRAIN ACCIDENTS RESULTING IN CASUALTIES	NUMBER OF CASUALTIES TO TRAIN AND ENGINE-MEN ON DUTY IN ALL TRAIN ACCIDENTS		
					COLLISIONS	DERAILMENTS	LOCOMOTIVE BOILER	OTHER LOCOMOTIVE	MISCL.	TOTAL		KILLED	INJURED	TOTAL
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
(1)	1923	29,432,500	1,865,099	1,851,185	7,115	16,708	67	971	2,634	27,497	1,592	249	1,626	1,875
(2)	1924	28,889,085	1,804,302	1,744,794	5,164	14,259	46	756	2,141	22,368	1,244	185	1,243	1,428
(3)	1925	30,785,543	1,820,846	1,773,946	5,164	12,759	29	748	2,085	20,785	1,196	186	1,207	1,393
(4)	1926	32,664,043	1,849,897	1,823,273	5,572	12,605	30	732	2,137	21,077	1,316	161	1,319	1,480
(5)	1927	32,462,178	1,820,987	1,776,842	4,808	11,370	22	664	2,117	18,978	1,087	160	958	1,118
(6)	1928	32,994,940	1,802,678	1,745,908	4,302	9,938	25	552	2,122	16,949	951	125	940	1,065
(7)	TOTAL 1923-28	187,230,289	9,942,809	29,705,728	32,124	77,640	219	4,425	13,246	127,652	7,385	1,064	7,297	8,361
(8)	1929	33,629,943	1,814,360	1,777,824	4,435	9,971	18	712	2,151	17,186	945	141	828	969
(9)	1930	30,177,586	1,108,386	1,890,844	2,979	6,967	29	742	1,594	12,313	708	118	550	668
(10)	1931	25,608,798	965,281	1,360,894	1,915	4,854	15	635	987	8,052	508	85	351	436
(11)	1932	20,350,887	821,158	1,151,386	1,265	3,321	9	565	650	5,770	396	58	285	343
(12)	1933	20,897,254	788,720	1,109,086	1,219	3,291	15	463	655	5,623	417	59	304	363
(13)	1934	22,179,787	818,473	1,156,220	1,317	3,489	24	535	658	6,023	455	94	309	403
(14)	TOTAL 1929-34	152,743,239	5,715,318	8,135,404	13,136	31,493	108	3,610	6,687	54,996	3,430	550	2,607	3,157
(15)	1935	22,812,343	839,198	1,183,048	1,251	4,031	8	536	725	6,551	458	60	297	357
(16)	1936	25,568,229	903,749	1,320,813	1,767	4,926	15	674	904	8,286	590	108	431	539
(17)	1937	26,848,096	933,219	1,368,817	1,910	4,941	18	683	930	8,412	609	105	408	513
(18)	1938	23,141,532	825,682	1,177,587	1,801	3,272	16	500	693	5,682	427	78	285	363
(19)	1939	25,256,741	853,179	1,240,862	1,587	3,134	9	516	798	6,074	436	77	314	391
(20)	TOTAL 1935-39	123,348,941	4,347,027	6,290,945	7,656	20,394	66	2,849	4,040	35,005	2,519	428	1,725	2,153

SOURCE: Columns (b) and (c) - I.C.C. Statistics of Railways in the United States, Statements Nos. 30 and 31, issue of 1938, for years 1923 to 1938, inclusive, tables Nos. 55 and 56 issue of 1938 for years 1929 to 1936, inclusive; Preliminary Abstract of Railway Statistics for year 1939.

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		REAR-END AND HEAD-ON COLLISIONS						TRAIN ACCIDENTS DUE TO DEFECTS IN OR FAILURES OF EQUIPMENT											
					CASUALTIES TO TRAINMEN AND ENGINEMEN ON DUTY IN REAR-END AND HEAD-ON COLLISIONS											CASUALTIES TO TRAINMEN AND ENGINEMEN ON DUTY IN THESE ACCIDENTS		
	YEAR	NUMBER OF REAR-END	NUMBER OF HEAD-ON	TOTAL REAR-END AND HEAD-ON	KILLED	INJURED	TOTAL	LOCOS. AND TENDERS	TRUCKS	WHEELS AND AXLES	POWER BRAKES	HAND BRAKES	COUPLERS	DRAFT RIGGING	CAR BODIES ETC.	TOTAL	KILLED	INJURED	TOTAL
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)
(1)	1923	648	295	958	65	393	456	973	2,341	3,427	629	1,162	741	910	1,639	11,822	9	224	233
(2)	1924	407	206	613	45	292	337	668	1,903	2,839	504	892	561	904	1,804	9,295	7	161	168
(3)	1925	387	201	588	38	278	316	688	1,636	2,518	417	730	449	585	1,161	8,186	9	157	166
(4)	1926	454	200	654	54	340	394	655	1,589	2,426	428	738	408	576	1,136	7,934	4	152	156
(5)	1927	325	156	478	29	188	217	547	1,512	2,130	457	633	466	650	1,041	7,418	5	139	144
(6)	1928	290	138	428	27	177	204	470	1,280	1,956	373	602	382	546	1,078	6,687	5	124	129
(7)	TOTAL 1923-28	2,486	1,195	3,679	256	1,668	1,924	4,001	10,283	15,296	2,808	4,757	3,007	3,951	7,259	51,342	39	957	996
(8)	1929	371	154	525	47	177	224	594	1,342	1,867	347	542	421	565	965	6,643	6	147	153
(9)	1930	211	105	316	33	99	132	606	949	1,439	269	422	316	486	807	5,094	5	103	108
(10)	1931	132	56	188	9	43	52	515	578	1,010	120	347	158	269	277	3,174	4	69	73
(11)	1932	79	35	114	17	55	72	380	490	776	97	185	95	151	158	2,332	3	60	63
(12)	1933	89	49	138	11	49	60	360	548	726	110	172	77	142	189	2,324	-	43	43
(13)	1934	80	45	125	16	46	62	418	547	880	76	219	102	165	168	2,517	5	54	59
(14)	TOTAL 1929-34	862	444	1,306	133	469	602	2,873	4,454	6,888	1,021	1,787	1,169	1,718	2,364	22,014	23	476	499
(15)	1935	84	29	113	9	49	58	412	687	869	73	207	153	146	132	2,679	2	62	64
(16)	1936	151	90	241	39	108	147	533	868	1,135	73	257	171	187	213	3,411	5	63	68
(17)	1937	129	61	190	31	89	120	486	777	1,032	59	221	152	208	191	3,120	1	55	56
(18)	1938	78	52	130	15	58	73	405	315	839	42	128	83	136	127	2,073	1	35	36
(19)	1939	92	40	132	6	46	52	390	275	791	46	140	94	120	185	2,039	5	41	46
(20)	TOTAL 1935-39	534	272	806	100	350	450	2,224	2,922	4,666	293	953	653	771	846	13,322	14	256	270

5786

SOURCE: I.C.C. Annual Accident Bulletins; columns (b), (c), (e) and (f) Table No. 61; columns (h) to (r) Table No. 65.

Defendant's Exhibit No. 269
Sheet 3 of 3 sheets

	Year	All classes of train accidents: Number of accidents per 100 million car miles	All classes of train accidents: Number of accidents per million train miles	All classes of train accidents: Number of accidents per million locomotive miles	All classes of train accidents: Casualty rate, trainmen and enginemen per 100 million car miles	All classes of train accidents: Casualty rate, trainmen and enginemen per million train miles	All classes of train accidents: Casualty rate, trainmen and enginemen per million locomotive miles	Head-end and head-on collisions: Number per million train miles	Head-end and head-on collisions: Number per million locomotive miles	Head-end and head-on collisions: Casualty rate, trainmen and enginemen per million train miles	Head-end and head-on collisions: Casualty rate, trainmen and enginemen per million locomotive miles	Train accidents due to defects in or failures of equipment: Number per 100 million car miles	Train accidents due to defects in or failures of equipment: Number per million train miles	Train accidents due to defects in or failures of equipment: Casualty rate, trainmen and enginemen per 100 million car miles	Train accidents due to defects in or failures of equipment: Casualty rate, trainmen and enginemen per million train miles
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)
(1)	1925	95.42	22.09	15.82	6.87	1.61	1.08	.75	.51	.27	.25	40.17	9.42	.79	.19
(2)	1926	77.43	18.87	12.82	4.94	1.18	.82	.51	.35	.28	.19	32.17	7.72	.56	.14
(3)	1927	69.82	17.03	11.72	4.58	1.14	.79	.48	.33	.26	.18	28.89	6.71	.54	.14
(4)	1928	66.56	16.89	11.80	4.53	1.19	.82	.51	.35	.23	.21	24.29	6.26	.48	.13
(5)	1929	58.46	15.84	10.68	3.45	.91	.63	.39	.27	.15	.12	22.85	6.09	.44	.12
(6)	1930	51.37	14.09	9.71	3.32	.89	.61	.36	.25	.17	.12	20.27	5.54	.39	.11
(7)	TOTAL 1925-30	68.10	17.36	11.98	4.46	1.14	.78	.50	.34	.26	.18	27.42	6.99	.53	.14
(8)	1931	50.80	14.15	9.67	2.86	.80	.56	.35	.24	.15	.15	19.64	5.47	.45	.13
(9)	1932	40.80	11.13	7.74	2.13	.58	.40	.29	.20	.12	.08	16.65	4.54	.36	.10
(10)	1933	31.44	8.34	5.92	1.70	.45	.32	.19	.14	.08	.04	12.39	3.29	.29	.08
(11)	1934	33.35	7.05	5.10	1.60	.42	.30	.14	.10	.09	.06	11.44	2.84	.31	.08
(12)	1935	29.50	7.15	5.09	1.76	.46	.35	.15	.12	.09	.06	11.28	2.95	.31	.08
(13)	1936	27.16	7.26	5.21	1.82	.49	.36	.15	.11	.08	.06	11.26	3.05	.29	.07
(14)	TOTAL 1929-36	36.99	9.82	6.77	2.07	.55	.39	.23	.16	.11	.08	14.41	3.85	.33	.09
(15)	1938	29.10	7.90	5.64	1.89	.63	.39	.14	.10	.07	.06	11.90	3.23	.28	.08
(16)	1939	32.73	9.15	6.37	2.07	.62	.40	.27	.18	.14	.11	13.53	3.77	.37	.08
(17)	1937	31.88	9.01	6.15	1.91	.55	.37	.22	.14	.13	.09	11.68	3.24	.31	.08
(18)	1938	24.58	6.88	4.65	1.57	.44	.31	.13	.11	.09	.06	8.96	2.51	.16	.05
(19)	1939	24.05	7.12	4.90	1.55	.46	.32	.13	.11	.06	.04	8.07	2.39	.13	.05
(20)	TOTAL 1930-39	28.38	8.05	5.54	1.75	.50	.34	.19	.13	.10	.07	10.80	3.05	.22	.06
(21)	(See) (Index) (below)	47.81%	44.66%	45.80%	53.89%	51.98%	50.00%	84.00%	58.94%	57.69%	61.11%	47.48%	43.48%	57.94%	58.71%
(22)		31.14%	18.38%	17.09%	15.46%	9.09%	12.82%	17.39%	18.78%	9.09%	12.50%	35.08%	30.58%	33.33%	33.33%
(23)		58.37%	53.62%	53.30%	50.78%	56.14%	56.41%	68.00%	61.78%	61.54%	61.11%	60.61%	54.88%	58.49%	57.14%

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Vol. VIII

TRANSCRIPT OF RECORD

(Pages 3310 to 3408)

Supreme Court of the United States

OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY, APPELLANT,

vs.

STATE OF ARIZONA, EX REL. JOE CONWAY, ATTORNEY GENERAL OF THE STATE OF ARIZONA

APPEAL FROM THE SUPERIOR COURT OF THE STATE OF ARIZONA, COUNTY OF PIMA

FILED APRIL 12, 1944.

SUPREME COURT OF THE UNITED STATES

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VOL. VIII

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287—S. P. Co., Pacific Lines, derailments caused by defects in or failures of freight car equipment, road freight trains, including mixed reportable to I.C.C. 1923–1939, incl. State of Nevada 5863 3384

288—S. P. Co., Pacific Lines, comparison of total derailments caused by defects in or failure of freight car equipment shown in Exh. No. 287 for State of Nev. and Exh. No. 286 for State of Arizona, years 1923 to 1939, inclusive 5864 3385

289—S. P. Co., Pacific Lines, detail of train accidents, road freight train operation reported to ICC, years 1923–1939, incl., State of Arizona 5865 3386

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Defendant's Exhibit No. 270 (Witness J.J. Sullivan)
Feb. 5, 1941

TABULATION OF DATA
SHOWN IN SUMMARIES OF ACCIDENT INVESTIGATION REPORTS,
INTERSTATE COMMERCE COMMISSION - BUREAU OF SAFETY,
IN SO FAR AS IT RELATES TO ACCIDENTS INVOLVING ROAD FREIGHT TRAINS, INCLUDING MIXED TRAINS HANDLING FREIGHT CARS
YEARS 1928 TO 1939

C. SAFETY ACCIDENT ON REPORTS D COVERED	TOTAL NUMBER OF ACCIDENTS ALL KINDS OF TRAINS INVESTIGATED	NUMBER OF ACCIDENTS INVESTIGATED INVOLVING FREIGHT TRAINS: TOTAL NUMBER INVOLVING FREIGHT TRAINS	COLLISIONS	DERAILMENTS	LOCOMOTIVE BOILER AND OTHER LOCOMOTIVE ACCIDENTS	MISCELLANEOUS	PERSONS KILLED	PERSONS INJURED	TOTAL NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS: 40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	PRIMARY CAUSE OF ACCIDENT INVESTIGATED: DEFECTS IN OR FAILURES OF FRT. CARS	DEFECTS IN OR FAILURES OF LOCO-MOTIVES	DEFECTS IN OR FAILURES OF M of W & STRUCTURES	ALL OTHER CAUSES EXCEPT NEGLIGENCE	NEGLIGENCE OF EMPLOYES: CONDUCTORS & BRAKEMEN	ENGINEERS & FIREMEN	JOINT TRAINMEN & ENGINEMEN	TRAIN DISPATCHERS & OPERATORS	ALL OTHER EMPLOY
(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
Mar. 1928	21	9	6	2	-	1	14	38	6	-	2	5	2	1	-	-	1	-	1	1	1	2	3	-	-
June 1928	14	6	4	2	-	-	9	53	3	1	2	1	-	2	-	1	2	-	-	-	-	2	2	-	-
Sept 1928	16	9	5	4	-	-	17	104	4	1	2	1	-	2	-	-	2	-	1	1	1	2	2	-	-
Dec. 1928	22	8	8	-	-	-	17	137	8	-	1	-	1	1	-	-	-	-	-	-	-	2	6	-	-
YEAR 1928	73	32	23	8	-	1	57	332	21	2	7	7	3	6	-	1	5	-	2	2	2	8	13	-	-
Mar. 1929	48	25	22	3	-	-	34	160	22	2	3	3	4	-	2	1	2	-	1	-	7	4	9	-	1
June 1929	15	9	6	2	-	1	10	109	6	-	-	2	-	1	1	-	-	-	1	1	-	4	-	-	2
Sept 1929	35	19	14	5	-	-	28	124	14	3	3	1	2	1	-	1	1	-	2	2	3	5	5	1	-
Dec. 1929	35	17	15	2	-	-	13	147	11	3	2	4	1	2	-	2	1	-	-	-	5	5	4	-	2
YEAR 1929	133	70	57	12	-	1	85	540	53	8	8	10	7	4	3	4	4	-	4	3	15	18	18	2	5
Mar. 1930	25	14	10	3	-	1	26	166	8	2	4	-	1	1	1	-	1	-	-	1	3	7	2	-	-
June 1930	18	9	7	2	-	-	7	58	6	2	1	2	-	-	1	-	1	-	-	-	1	4	2	-	1
Sept 1930	19	12	7	5	-	-	26	52	4	5	2	-	2	-	1	1	1	1	1	2	1	3	2	1	-
Dec. 1930	15	8	6	2	-	-	9	56	10	-	-	-	-	1	-	-	1	-	-	-	2	3	2	-	-
YEAR 1930	77	43	30	12	-	1	68	332	28	9	7	2	3	2	3	1	4	1	1	3	7	17	8	1	1
Mar. 1931	17	5	4	1	-	-	4	38	3	1	-	-	-	-	-	1	-	-	-	-	-	3	1	-	1
June 1931	15	7	4	3	-	-	9	56	1	2	-	2	1	1	1	1	1	-	-	1	-	3	1	-	-
Sept 1931	14	3	-	3	-	-	6	8	2	1	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-
Dec. 1931	18	13	7	6	-	-	18	122	7	2	3	1	-	3	-	1	2	-	2	1	2	4	2	-	-
YEAR 1931	64	28	15	13	-	-	37	224	13	6	3	3	1	4	1	3	3	-	2	4	2	11	4	-	1
Mar. 1932	15	6	5	1	-	-	8	35	5	1	1	-	1	-	-	1	-	1	-	-	1	1	2	-	-
June 1932	11	6	3	3	-	-	15	64	2	-	-	-	2	-	2	1	3	-	-	-	-	2	-	-	1
Sept 1932	17	14	10	4	-	-	17	67	11	2	1	2	1	-	2	1	-	-	1	1	2	4	3	1	-
Dec. 1932	14	10	5	5	-	-	9	38	4	2	1	2	1	-	1	2	3	-	-	1	-	5	-	1	-
YEAR 1932	57	36	23	13	-	-	49	204	22	5	3	4	5	-	5	5	6	1	1	2	3	12	5	2	1
Mar. 1933	11	4	1	3	-	-	3	3	1	-	1	2	1	1	-	-	2	-	-	1	-	-	1	-	-
June 1933	17	7	1	6	-	-	8	16	2	2	-	1	2	-	-	1	3	-	-	2	-	1	-	-	1
Sept 1933	28	16	7	9	-	-	20	69	8	2	1	1	3	3	1	2	3	-	4	-	1	4	1	1	-
Dec. 1933	22	12	6	6	-	-	20	43	7	2	1	2	-	-	2	-	-	-	1	5	2	1	3	-	-
YEAR 1933	78	39	15	24	-	-	51	131	18	6	3	6	6	4	3	3	8	-	5	8	3	6	5	1	1

llivan)

AINS HANDLING FREIGHT CARS

R ES PT ENCE	PRIMARY CAUSE OF ACCIDENT INVESTIGATED							
	NEGLIGENCE OF EMPLOYES						NOT DEFINITELY DETERMINED OR QUESTIONABLE	TOTAL ALL CAUSES
	CONDUCTORS & BRAKEMEN	ENGINEERS & FIREMEN	JOINT TRAINMEN & ENGINEMEN	TRAIN DISPATCHERS & OPERATORS	ALL OTHER EMPLOYES	JOINT TWO OR MORE OTHER EMPLOYES		
)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
	1	2	3	-	-	-	-	9
	-	2	2	-	-	-	-	6
	1	2	2	-	-	-	-	9
	-	2	6	-	-	-	-	8
	2	8	13	-	-	-	-	32
	7	4	9	1	1	-	-	25
	-	4	-	-	2	-	1	9
	3	5	5	1	-	-	-	19
	5	5	4	-	2	-	-	17
	15	18	18	2	5	-	1	70
	3	7	2	-	-	-	-	14
	1	4	2	-	1	-	-	9
	1	3	2	1	-	-	-	12
	2	3	2	-	-	-	-	8
	7	17	8	1	1	-	-	43
	-	3	1	-	1	-	-	5
	-	3	1	-	-	-	1	7
	-	1	-	-	-	-	-	3
	2	4	2	-	-	-	-	13
	2	11	4	-	1	-	1	28
	1	1	2	-	-	1	1	6
	-	2	-	-	1	-	-	6
	2	4	3	1	-	1	1	14
	-	5	-	1	-	-	-	10
	3	12	5	2	1	1	2	36
	-	-	1	-	-	-	-	4
	-	1	-	-	1	-	-	7
	1	4	1	1	-	-	2	16
	2	1	3	-	-	-	-	12
	3	6	5	1	1	-	2	39
	-	1	4	-	-	-	-	10
							1	7

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
35	Jan. to Mar. 1928	21	9	6	2	-	1	14	38	6	-	2	5	2	1	-	-	1	-	1	1	1	2	3	-
36	Apr. to June 1928	14	6	4	2	-	-	9	53	3	1	2	1	-	2	-	1	2	-	-	-	-	2	2	-
37	July to Sept 1928	16	9	5	4	-	-	17	104	4	1	2	1	-	2	-	-	2	-	1	1	1	2	2	-
38	Oct. to Dec. 1928	22	8	8	-	-	-	17	137	8	-	1	-	1	1	-	-	-	-	-	-	-	2	6	-
	TOTAL YEAR 1928	73	32	23	8	-	1	57	332	21	2	7	7	3	6	-	1	5	-	2	2	2	8	13	-
39	Jan. to Mar. 1929	48	25	22	3	-	-	34	160	22	2	3	3	4	-	2	1	2	-	1	-	7	4	9	1
40	Apr. to June 1929	15	9	6	2	-	1	10	109	6	-	-	2	-	1	1	-	-	-	1	1	-	4	-	-
41	July to Sept 1929	35	19	14	5	-	-	28	124	14	3	3	1	2	1	-	1	1	-	2	2	3	5	5	1
42	Oct. to Dec. 1929	35	17	15	2	-	-	13	147	11	3	2	4	1	2	-	2	1	-	-	-	5	5	4	-
	TOTAL YEAR 1929	133	70	57	12	-	1	85	540	53	8	8	10	7	4	3	4	4	-	4	3	15	18	18	2
43	Jan. to Mar. 1930	25	14	10	3	-	1	26	166	8	2	4	-	1	1	1	-	1	-	-	1	3	7	2	-
44	Apr. to June 1930	18	9	7	2	-	-	7	58	6	2	1	2	-	-	1	-	1	-	-	-	1	4	2	-
45	July to Sept 1930	19	12	7	5	-	-	26	52	4	5	2	-	2	-	1	1	1	1	1	2	1	3	2	1
46	Oct. to Dec. 1930	15	8	6	2	-	-	9	56	10	-	-	-	-	1	-	-	1	-	-	-	2	3	2	-
	TOTAL YEAR 1930	77	43	30	12	-	1	68	332	28	9	7	2	3	2	3	1	4	1	1	3	7	17	8	1
47	Jan. to Mar. 1931	17	5	4	1	-	-	4	38	3	1	-	-	-	-	-	1	-	-	-	-	-	3	1	-
48	Apr. to June 1931	15	7	4	3	-	-	9	56	1	2	-	2	1	1	1	1	1	-	-	1	-	3	1	-
49	July to Sept 1931	14	3	-	3	-	-	6	8	2	1	-	-	-	-	-	-	-	-	-	2	-	1	-	-
50	Oct. to Dec. 1931	18	13	7	6	-	-	18	122	7	2	3	1	-	3	-	1	2	-	2	1	2	4	2	-
	TOTAL YEAR 1931	64	28	15	13	-	-	37	224	13	6	3	3	1	4	1	3	3	-	2	4	2	11	4	-
51	Jan. to Mar.1932	15	6	5	1	-	-	8	35	5	1	1	-	1	-	-	1	-	1	-	-	1	1	2	-
52	Apr. to June 1932	11	6	3	3	-	-	15	64	2	-	-	-	2	-	2	1	3	-	-	-	-	2	-	-
53	July to Sept 1932	17	14	10	4	-	-	17	67	11	2	1	2	1	-	2	1	-	-	1	1	2	4	3	1
54	Oct. to Dec. 1932	14	10	5	5	-	-	9	38	4	2	1	2	1	-	1	2	3	-	-	1	-	5	-	1
	TOTAL YEAR 1932	57	36	23	13	-	-	49	204	22	5	3	5	5	-	5	5	6	1	1	2	3	12	5	2
55	Jan. to Mar. 1933	11	4	1	3	-	-	3	3	1	-	1	2	1	1	-	-	2	-	-	1	-	-	1	-
56	Apr. to June 1933	17	7	1	6	-	-	8	16	2	2	-	1	2	-	-	1	3	-	-	2	-	1	-	-
57	July to Sept 1933	28	16	7	9	-	-	20	69	8	2	1	1	3	3	1	2	3	-	4	-	1	4	1	1
58	Oct. to Dec. 1933	22	12	6	6	-	-	20	43	7	2	1	2	-	-	2	-	-	-	1	5	2	1	3	-
	TOTAL YEAR 1933	78	39	15	24	-	-	51	131	18	6	3	6	6	4	3	3	8	-	5	8	3	6	5	1
59	Jan. to Mar. 1934	24	10	5	4	-	1	5	17	8	-	1	1	2	-	-	1	3	-	-	2	-	1	4	-
60	Apr. to June 1934	13	7	3	4	-	-	10	11	3	1	1	3	1	-	-	-	-	-	-	2	1	1	1	1
61	July to Sept 1934	17	7	2	5	-	-	10	21	3	2	1	2	-	-	-	1	1	-	-	3	1	-	1	-
62	Oct. to Dec. 1934	23	13	10	3	-	-	16	31	9	4	1	-	1	1	-	2	1	-	2	-	1	3	5	1
	TOTAL YEAR 1934	77	37	20	16	-	1	41	80	23	7	4	6	4	1	-	4	5	-	2	7	3	5	11	2
63	Jan. to Mar. 1935	16	10	5	5	-	-	10	114	7	1	-	3	-	1	-	-	2	-	-	3	1	1	1	1
64	Apr. to June 1935	17	15	5	10	-	-	17	60	8	3	2	4	1	-	-	-	3	-	3	4	-	3	1	1
65	July to Sept 1935	22	17	5	11	-	1	32	70	9	3	1	2	1	1	-	4	3	-	2	5	-	2	3	-
66	Oct. to Dec. 1935	16	8	3	4	-	1	10	15	5	1	-	3	-	2	-	-	3	-	-	1	1	2	-	-
	TOTAL YEAR 1935	71	50	18	30	-	2	69	259	29	8	3	12	2	4	-	4	11	-	5	13	2	8	5	2

	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
	1	2	3	-	-	-	-	9
	-	2	2	-	-	-	-	6
	1	2	2	-	-	-	-	9
	-	2	6	-	-	-	-	8
	2	8	13	-	-	-	-	32
	7	4	9	1	1	-	-	25
	-	4	-	-	2	-	1	9
	3	5	5	1	-	-	-	19
	5	5	4	-	2	-	-	17
	15	18	18	2	5	-	1	70
	3	7	2	-	-	-	-	14
	1	4	2	-	1	-	-	9
	1	3	2	1	-	-	-	12
	2	3	2	-	-	-	-	8
	7	17	8	1	1	-	-	43
	-	3	1	-	1	-	-	5
	-	3	1	-	-	-	1	7
	-	1	-	-	-	-	-	3
	2	4	2	-	-	-	-	13
	2	11	4	-	1	-	1	28
	1	1	2	-	-	-	1	6
	-	2	-	-	1	-	-	6
	2	4	3	1	-	1	1	14
	-	5	-	1	-	-	-	10
	3	12	5	2	1	1	2	36
	-	-	1	-	-	-	-	4
	-	1	-	-	1	-	-	7
	1	4	1	1	-	-	2	16
	2	1	3	-	-	-	-	12
	3	6	5	1	1	-	2	39
	-	1	4	-	-	-	-	10
	1	1	1	1	-	-	1	7
	1	-	1	-	-	-	1	7
	1	3	5	1	-	-	-	13
	3	5	11	2	-	-	2	37
	1	1	1	1	-	1	-	10
	-	3	1	1	-	-	-	15
	-	2	3	-	1	1	-	17
	1	2	-	-	1	-	-	8
	2	8	5	2	2	2	-	50

I. C. C. BUREAU OF SAFETY SUMMARY OF ACCIDENT INVESTIGATION REPORTS No.	PERIOD COVERED	TOTAL NUMBER OF ACCIDENTS ALL KINDS OF TRAINS INVESTIGATED	NUMBER OF ACCIDENTS INVESTIGATED INVOLVING FREIGHT TRAINS: TOTAL NUMBER INVOLVING FREIGHT TRAINS	COLLISIONS	DERAILMENTS	LOCOMOTIVE BOILER AND OTHER LOCOMOTIVE ACCIDENTS	MISCELLANEOUS	PERSONS KILLED	PERSONS INJURED	TOTAL NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS: 40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	PRIMARY CAUSE OF ACCIDENT INVESTIGATED: DEFECTS IN OR FAILURES OF FRT. CARS	DEFECTS IN OR FAILURES OF LOCOMOTIVES	DEFECTS IN OR FAILURES OF M of W & STRUCTURES	ALL OTHER CAUSES EXCEPT NEGLIGENCE	NEGLIGENCE OF EMPLOYES: CONDUCTORS & BRAKEMEN	ENGINEERS & FIREMEN	JOINT TRAINMEN & ENGINEERS	TRAIN DISPATCHERS & OPERATORS	ALL OTHER EMPLOYES
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
7	Jan. to Mar. 1936	28	16	8	8	-	-	21	64	12	1	4	2	-	-	-	2	5	-	-	3	2	1	4	-	1
8	Apr. to June 1936	18	13	6	7	-	-	14	219	9	2	2	1	-	-	-	1	1	1	-	4	-	3	1	-	-
9	July to Sept 1936	28	15	6	9	-	-	24	44	8	3	3	2	-	1	-	-	2	1	2	3	2	2	1	-	-
0	Oct. to Dec. 1936	27	18	13	5	-	-	24	68	14	1	2	6	2	2	1	1	-	-	1	2	3	1	6	1	2
	TOTAL YEAR 1936	101	62	33	29	-	-	83	395	43	7	11	11	2	3	1	4	11	2	3	12	7	7	12	1	3
1	Jan. to Mar. 1937	36	26	19	7	-	-	29	117	18	5	3	4	1	2	1	2	1	-	2	1	4	8	7	-	-
2	Apr. to June 1937	18	8	2	6	-	-	7	15	3	4	1	-	-	-	1	-	2	-	2	-	2	2	-	-	-
3	July to Sept 1937	17	12	5	7	-	-	20	32	11	1	2	-	-	-	-	-	1	-	-	3	1	2	3	-	1
4	Oct. to Dec. 1937	39	21	11	10	-	-	31	62	13	2	4	-	4	2	-	1	4	-	-	6	1	2	5	-	1
	TOTAL YEAR 1937	110	67	37	30	-	-	87	226	45	12	10	4	5	4	2	3	8	-	4	10	6	14	15	-	2
	Jan. to Mar. 1938	22	13	10	3	-	-	21	78	7	2	-	1	2	1	1	1	-	-	-	2	3	3	2	1	-
	Apr. to June 1938	17	9	3	6	-	-	7	47	3	3	1	-	2	-	-	-	1	2	-	3	-	-	2	-	1
	July to Sept 1938	17	9	5	3	-	1	9	42	5	2	1	-	1	-	1	-	1	-	1	1	1	1	2	-	1
	Oct. to Dec. 1938	24	15	9	6	-	-	30	100	10	3	2	1	1	1	-	1	1	-	1	5	-	3	4	1	-
	TOTAL YEAR 1938	80	46	27	18	-	1	67	267	25	10	4	2	6	2	2	2	3	2	2	11	4	7	10	2	2
	Jan. to Mar. 1939	20	15	-	-	-	-	17	83	7	1	3	1	-	1	1	1	3	-	-	4	1	5	2	-	-
	Apr. to June 1939	26	17	-	-	-	-	24	79	7	4	1	2	4	2	1	1	-	1	2	5	-	3	5	1	-
	July to Sept 1939	17	9	-	-	-	-	9	57	3	-	2	3	2	-	-	1	-	1	-	1	1	4	2	-	-
	Oct. to Dec. 1939	18	10	-	-	-	-	7	118	7	1	-	2	-	1	1	2	-	-	-	1	-	3	6	-	-
	TOTAL YEAR 1939	81	51	-	-	-	-	57	337	24	6	6	8	6	4	3	9	3	2	2	11	2	15	15	1	-
	GRAND TOTAL 12 YEARS	1002	561	298	206	-	7	751	3,327	344	86	69	75	50	38	23	43	71	8	33	86	56	128	121	14	18

CAUSES OF ACCIDENTS, CASUALTIES, AND NUMBER OF FREIGHT TRAINS BY VARIOUS LENGTHS

	CAUSE	PER CENT OF TOTAL ACCIDENTS	NUMBER OF ACCIDENTS	PERSONS KILLED	PERSONS INJURED	NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE: 40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	N
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
I.	NEGLIGENCE OF EMPLOYES	62.2	349	390	2,428	258	53	45	53	31	22	15	22	499	40
I.	DEFECTS IN OR FAILURES OF EQUIPMENT	14.1	79	108	318	24	11	10	6	9	9	6	15	90	5
I.	DEFECTS IN OR IMPROPER MAINTENANCE OF WAY AND STRUCTURES	5.9	33	57	202	17	7	4	2	3	1	1	1	36	3
7.	MISCELLANEOUS CAUSES	17.8	100	196	379	45	15	10	14	7	6	1	5	103	8
	GRAND TOTAL	100.0	561	751	3,327	344	86	69	75	50	38	23	43	728	57

PRIMARY CAUSE OF ACCIDENT INVESTIGATED — NEGLIGENCE OF EMPLOYES								
...L OTHER ...SES EXCEPT ...GENCE	CONDUCTORS & BRAKEMEN	ENGINEERS & FIREMEN	JOINT TRAINMEN & ENGINEMEN	TRAIN DISPATCHERS & OPERATORS	ALL OTHER EMPLOYES	JOINT TWO OR MORE OTHER EMPLOYES	NOT DEFINITELY DETERMINED OR QUESTIONABLE	TOTAL ALL CAUSES
(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
3	2	1	4	-	1	-	-	16
4	-	3	1	-	-	2	1	13
3	2	2	1	-	-	-	1	14
2	3	1	6	1	2	-	-	19
12	7	7	12	1	3	2	2	62
1	4	8	7	-	-	2	1	26
-	-	2	-	-	-	-	2	8
3	1	2	3	-	1	-	1	12
6	1	2	5	-	1	2	-	21
10	6	14	15	-	2	4	4	67
2	3	3	2	1	-	2	-	13
3	-	-	2	-	1	-	-	9
1	1	1	2	-	1	1	-	9
5	-	3	4	1	-	-	-	15
11	4	7	10	2	2	3	-	46
4	1	5	2	-	-	-	-	15
5	-	3	5	1	-	-	-	17
1	1	4	2	-	-	-	-	9
1	-	3	6	-	-	-	-	10
11	2	15	15	1	-	-	-	51
16	56	128	121	14	18	12	14	561

NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE									TOTAL			
									70 CARS AND LESS		OVER 70 CARS	
40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT.
(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
258	53	45	53	31	22	15	22	499	409	82.0	90	18.0
24	11	10	6	9	9	6	15	90	51	56.7	39	43.3
17	7	4	2	3	1	1	1	36	30	83.3	6	16.7
45	15	10	14	7	6	1	5	103	84	81.6	19	18.4
344	86	69	75	50	38	23	43	728	574	78.8	154	21.2

ACCIDENT REPORTS ACT.

AN ACT REQUIRING COMMON CARRIERS ENGAGED IN INTERSTATE AND FOREIGN COMMERCE TO MAKE FULL REPORTS OF ALL ACCIDENTS TO THE INTERSTATE COMMERCE COMMISSION, AND AUTHORIZING INVESTIGATIONS THEREOF BY SAID COMMISSION.

BE IT ENACTED BY THE SENATE AND HOUSE OF REPRESENTATIVES OF THE UNITED STATES OF AMERICA IN CONGRESS ASSEMBLED, That it shall be the duty of the general manager, superintendent, or other proper officer of every common carrier engaged in interstate or foreign commerce by railroad to make to the Interstate Commerce Commission, at its office in Washington, District of Columbia, a monthly report under oath, of all collisions, derailments, or other accidents resulting in injury to persons, equipment, or roadbed arising from the operation of such railroad under such rules and regulations as may be prescribed by the said commission, which report shall state the nature and causes thereof and the circumstances connected therewith: PROVIDED, That hereafter all said carriers shall be relieved from the duty of reporting accidents in their annual financial and operating reports made to the commission.

SEC. 2. That any common carrier failing to make such report within thirty days after the end of any month shall be deemed guilty of a misdemeanor, and upon conviction thereof by a court of competent jurisdiction shall be punished by a fine of not more than one hundred dollars for each and every offense and for every day during which it shall fail to make such report after the time herein specified for making the same.

SEC. 3. That the Interstate Commerce Commission shall have authority to investigate all collisions, derailments, or other accidents resulting in serious injury to person or to the property of a railroad occurring on the line of any common carrier engaged in interstate or foreign commerce by railroad. The commission, or any impartial investigator thereunto authorized by said commission, shall have authority to investigate such collisions, derailments, or other accidents aforesaid, and all the attending facts, conditions, and circumstances, and for that purpose may subpoena witnesses, administer oaths, take testimony, and require the production of books, papers, orders, memoranda, exhibits, and other evidence, and shall be provided by said carriers with all reasonable facilities: PROVIDED, That when such accident is investigated by a commission of the State in which it occurred, the Interstate Commerce Commission shall, if convenient, make any investigation it may have previously determined upon, at the same time as, and in connection with, the State commission investigation. Said commission shall, when it deems it to the public interest, make reports of such investigations, stating the cause of accident, together with such recommendations as it deems proper. Such reports shall be made public in such manner as the commission deems proper.

SEC. 4. That neither said report not any report of said investigation nor any part thereof shall be admitted as evidence or used for any purpose in any suit or action for damages growing out of any matter mentioned in said report or investigation.

SEC. 5. That the Interstate Commerce Commission is authorized to prescribe for such common carriers a method and form for making the reports hereinbefore provided.

SEC. 6. That the Act entitled "An Act requiring common carriers engaged in interstate commerce to make full reports of all accidents to the Interstate Commerce Commission," approved March third, nineteen hundred and one, is hereby repealed.

SEC. 7. That the term "interstate commerce," as used in this Act, shall include transportation from any State or Territory or the District of Columbia to any other State or Territory or the District of Columbia, and the term "foreign commerce," as used in this Act, shall include transportation from any State or Territory or the District of Columbia to any foreign country and from any foreign country to any State or Territory or the District of Columbia.

SEC. 8. That this Act shall take effect sixty days after its passage.

Public, No. 165, approved May 6, 1910.

ORDER

At a Session of the INTERSTATE COMMERCE
its office in Washington, D.C., on the

IN THE MATTER OF REQUIRING CO
ENGAGED IN INTERSTATE OR FORE
SPECIAL REPORTS BY TELEGRAM O
OR INJURY TO ONE OR MORE PERS

The commission having under f
matter of informing itself as to t
cases, of investigating "collision
accidents resulting in serious inj
on the line of any common carrier
foreign commerce by railroad, as a
the Act of May 6, 1910, and pursua
Section 20 of the interstate comme

It is ordered, That the requir
commission of June 21, 1911, be mo

It is ordered, That on and aft
every common carrier engaged i
commerce by railroad shall by
superintendent, or other prope
after the occurrence thereof,
the Interstate Commerce Commis
Washington, D.C., any collisio
the railroad operated by such
in the death or serious injury
including any collision with a
crossing resulting in the dest
any passenger, employee, or oth
train involved in any such col

It is further ordered, That th
used in the preceding paragraph of
injury to any person sufficient, in
officer, to incapacitate the injure
customary vocation or mode of life
three days in the aggregate during t
following the accident."

By the commission, division 6.

C

(SEAL)

nor any part thereof

ion for damages grow-

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e Commission,"

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her State or Terri-

ed in this Act, shall

olumbia to any foreign

strict of Columbia.

ORDER

At a Session of the INTERSTATE COMMERCE COMMISSION, Division 6, held at its office in Washington, D.C., on the 8th day of December, A.D., 1928

IN THE MATTER OF REQUIRING COMMON CARRIERS BY RAILROAD ENGAGED IN INTERSTATE OR FOREIGN COMMERCE, TO MAKE SPECIAL REPORTS BY TELEGRAM OF ACCIDENTS CAUSING DEATH OR INJURY TO ONE OR MORE PERSONS.

"The commission having under further consideration the matter of informing itself as to the advisability, in particular cases, of investigating "collisions, derailments, or other accidents resulting in serious injury to persons" occurring on the line of any common carrier engaged in interstate or foreign commerce by railroad, as authorized by Section 3 of the Act of May 6, 1910, and pursuant to the provisions of Section 20 of the interstate commerce act:

It is ordered, That the requirements of the order of the commission of June 21, 1911, be modified to read as follows:

It is ordered, That on and after January 1, 1929, every common carrier engaged in interstate or foreign commerce by railroad shall by its general manager, superintendent, or other proper officer immediately after the occurrence thereof, report by telegram to the Interstate Commerce Commission, at its office in Washington, D.C., any collision or derailment upon the railroad operated by such common carrier resulting in the death or serious injury of one or more persons, including any collision with a motor vehicle at a grade crossing resulting in the death or serious injury of any passenger, employee, or other person riding on the train involved in any such collision.

It is further ordered, That the words "serious injury" as used in the preceding paragraph of this order shall mean "an injury to any person sufficient, in the opinion of the reporting officer, to incapacitate the injured person from following his customary vocation or mode of life for a period of more than three days in the aggregate during the ten days immediately following the accident."

By the commission, division 6.

GEORGE B McGINTY,

Secretary.

(SEAL)

DETAIL OF CAUSE
AS ASSIGNED BY INTERSTATE COMMERCE COMMISSION, BUREAU OF SAFETY,
FOR ACCIDENT, NUMBER OF CASUALTIES AND NUMBER OF TRAINS INVOLVED,
BY VARIOUS LENGTHS

	I.C.C. INVESTIGATION NUMBER	NUMBER OF ACCIDENTS	PERSONS KILLED	PERSONS INJURED	NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOS: 40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
I. NEGLIGENCE OF EMPLOYES:												
(A) Train Orders:												
1. Failure of the engineman of the passenger train to obey a meet order	1414	1	1	21	1							
2. Failure to obey a wait order, for which the engineman, fireman and conductor of one of the trains were responsible	1426	1		4			1			1		
3. Failure to obey a meet order, for which the engineman and the conductor of the freight train were primarily responsible	1448	1	1	10			1					
4. Failure to obey a wait order, for which the motorman and conductor of a passenger train were responsible	1465	1	2	63	1							
5. Failure of an operator to deliver a wait order and by his failure to secure the block before permitting one of the trains to enter the block	1469	1	4	3	2							
6. Failure to remember a meet order, for which the entire crew of the freight train was responsible, with the exception of the middle trakeman; the latter was at fault for his failure to make himself acquainted with the contents of the orders held by his train	1478	1		4	1							
7. Failure to obey a wait order, for which the entire crew of a passenger train was responsible	1486	1	6		1							
8. Failure to obey a meet order, for which the entire crew of a passenger train was responsible	1501	1	3	38	1							
9. Failure to obey a wait order, for which the engineman, fireman and head brakeman of one of the trains were responsible	1507	1		4	2							
10. Failure of the motorman and conductor of one of the trains to stop at a siding specified by train order, and obtain further orders before proceeding beyond that point	1557	1	1	5	2							
11. Failure to obey a wait order, for which the entire crew of one of the trains was responsible	1566	1	2	6	2							
12. Failure of the road foreman of engines who was acting as engineman of the following train, to read all of the train orders affecting the movement of his train	1581	1		3	1		1					
13. Failure of the signalman on duty to deliver a train order	1593	1	2	4	1	1						
14. Failure of the engineman of the passenger train to obey a train order establishing a meeting point	1645	1		8	1							
15. Failure to obey a meet order, for which the motorman of the passenger train was responsible	1677	1	1	4	1							
16. Caused by the engineman and the fireman of the light engine misreading a wait order	1701	1	1	2				1				
17. Failure of a conductor to deliver a meet order to his engineman	1760	1		4	1	1						
18. Failure to obey a meet order, for which the conductor-motorman of a passenger train was responsible	1770	1	9	5	1							
19. Lap order	1778	1	2	3	2							
20. Failure of an operator to copy that portion of a train order which directed a train superior by direction to take siding at a meeting point with an opposing train	1793	1	4	2	1							1
21. Failure of the engineman of a passenger train properly to obey a meet order	1799	1		16		1						
22. Failure of an agent-operator to deliver a meet order	1846	1		2	2							
23. Failure to obey a wait order	1883	1		4	2							
24. Failure to obey a wait order	1889	1		2	2							
25. Failure to obey a meet order	1900	1	2	4	1							
26. Failure to obey a meet order	1914	1	2	1	1			1				
27. Failure to obey a meet order	1944	1		3	1							
28. Failure of an operator to delivery a copy of a meet order	1970	1		9	2							
29. Action of the dispatcher in annulling a train order to an inferior train without first annulling it to the superior train; the operator failed to hold the superior train in accordance with verbal instructions received from the dispatcher	1980	1		3		1		1				
[illegible] the failure of the fireman and the head brakeman properly to check												

PERSONS		NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE									TOTAL			
											70 CARS AND LESS		OVER 70 CARS	
KILLED	INJURED	40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT.
(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1	21	1												
	4			1			1							
1	10			1										
2	63	1												
4	3	2												
	4	1												
6		1												
3	38	1												
	4	2												
1	5	2												
2	6	2												
	3	1		1										
2	4	1	1											
	8	1												
1	4	1												
1	2				1									
	4	1	1											
9	5	1												
2	3	2												
4	2	1							1					
	16		1											
	2	2												
	4	2												
	2	2												
2	4	1												
2	1	1			1									
	3	1												
	9	2												
	3		1		1									
	3								2					

I. NEGLIGENCE OF EMPLOYES:							
(A) Train Orders:							
1. Failure of the engineman of the passenger train to obey a meet order	1414	1	1	21	1		
2. Failure to obey a wait order, for which the engineman, fireman and conductor of one of the trains were responsible	1426	1		4			1
3. Failure to obey a meet order, for which the engineman and the conductor of the freight train were primarily responsible	1448	1	1	10			1
4. Failure to obey a wait order, for which the motorman and conductor of a passenger train were responsible	1465	1	2	63	1		
5. Failure of an operator to deliver a wait order and by his failure to secure the block before permitting one of the trains to enter the block	1469	1	4	3	2		
6. Failure to remember a meet order, for which the entire crew of the freight train was responsible, with the exception of the middle brakeman; the latter was at fault for his failure to make himself acquainted with the contents of the orders held by his train	1478	1		4	1		
7. Failure to obey a wait order, for which the entire crew of a passenger train was responsible	1486	1	6		1		
8. Failure to obey a meet order, for which the entire crew of a passenger train was responsible	1501	1	3	38	1		
9. Failure to obey a wait order, for which the engineman, fireman and head brakeman of one of the trains were responsible	1507	1		4	2		
10. Failure of the motorman and conductor of one of the trains to stop at a siding specified by train order, and obtain further orders before proceeding beyond that point	1557	1	1	5	2		
11. Failure to obey a wait order, for which the entire crew of one of the trains was responsible	1566	1	2	6	2		
12. Failure of the road foreman of engines who was acting as engineman of the following train, to read all of the train orders affecting the movement of his train	1581	1		3	1		1
13. Failure of the signalman on duty to deliver a train order	1593	1	2	4	1	1	
14. Failure of the engineman of the passenger train to obey a train order establishing a meeting point	1645	1		8	1		
15. Failure to obey a meet order, for which the motorman of the passenger train was responsible	1677	1	1	4	1		
16. Caused by the engineman and the fireman of the light engine misreading a wait order	1701	1	1	2			
17. Failure of a conductor to deliver a meet order to his engineman	1760	1		4	1	1	
18. Failure to obey a meet order, for which the conductor-motorman of a passenger train was responsible	1770	1	9	5	1		
19. Lap order	1778	1	2	3	2		
20. Failure of an operator to copy that portion of a train order which directed a train superior by direction to take siding at a meeting point with an opposing train	1793	1	4	2	2		
21. Failure of the engineman of a passenger train properly to obey a meet order	1799	1		16		1	
22. Failure of an agent-operator to deliver a meet order	1846	1		2	2		
23. Failure to obey a wait order	1880	1		4	2		
24. Failure to obey a wait order	1889	1		2	2		
25. Failure to obey a meet order	1900	1	2	4	1		
26. Failure to obey a meet order	1914	1	2	1	1		
27. Failure to obey a meet order	1944	1		3	1		
28. Failure of an operator to delivery a copy of a meet order	1970	1		9	2		
29. Action of the dispatcher in annulling a train order to an inferior train without first annulling it to the superior train; the operator failed to hold the superior train in accordance with verbal instructions received from the dispatcher	1980	1		3		1	
30. Failure to obey a meet order, due to the engineman falling asleep and the failure of the fireman and the head brakeman properly to check the movement of their train when approaching the meeting point	2009	1		3			
31. Failure to obey a meet order	2032	1	3	3	2		
32. Failure to obey a meet order	2107	1		18	1		
33. Primarily by failure to obey a wait order	2111	1	4	6	2		
34. Failure to comply with a meet order, due to failure to identify an opposing train at the meeting point	2126	1	5	6	1		
35. Failure of an operator properly to copy a train order; a contributing cause was the failure of Extra 4582 properly to clear the train-order waiting time of the superior train	2235	1	2	2	1	1	

1	21	1												
	4			1		1								
1	10			1										
2	63	1												
4	3	2												
	4	1												
6		1												
3	30	1												
	4	2												
1	5	2												
2	6	2												
	3	1		1										
2	4	1	1											
	8	1												
1	4	1												
1	2				1									
	4	1	1											
9	5	1												
2	3	2												
4	2	1							1					
	16		1											
	2	2												
	4	2												
	2	2												
2	4	1												
2	1	1			1									
	3	1												
	9	2												
	3		1		1									
	3								2					
3	3	2												
	18	1												
4	6	2												
5	6	1												
4	2	1	1											

	I.C.C. INVESTI-GATION NUMBER	NUMBER OF ACCIDENTS	PERSONS KILLED	PERSONS INJURED	NUMBER OF FREIGHT TRAINS INVOLVED A VARIOUS LENGTHS IN CARS, EXCLUSIVE OF 40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
I - NEGLIGENCE OF EMPLOYES:											
(A) Train Orders: (Continued)											
36. Issuance of a lap order	2252	1	4	19	1						
37. Lap of the authority of two opposing trains, due to the lack of a common understanding of the method of operation, and by irregular practice in a train-dispatching office	2284	1	1	1	1						
38. Failure to obey a meet order	2390	1		3	1						
TOTAL - NEGLIGENCE - TRAIN ORDERS		38	64	298	43	5	3	3	-	1	-
(B) Fixed Signals:											
1. Failure of the engineman of one of the freight trains to operate his train under proper control after entering a block under a permissive signal indication	1409	1	1	21	1			1	1		
2. Failure properly to observe and obey signal indications, for which the engineman, fireman and head brakeman of the following train were responsible	1411	1	3	4				1		1	
3. Failure of the engineman in charge of the lead engine of one of the trains involved in the collision to approach a block signal under proper control	1421	1	2	3	1		1				
4. Failure of an engineman properly to observe signal indications	1477	1	5	38							1
5. Failure of an engineman properly to observe and obey signal indications	1568	1	3					1			
6. Failure of an engineman properly to obey signal indications in controlling speed of his train when passing through a cross-over	1629	1	2			1					
7. Failure of the engineman of the following train properly to observe and obey signal indications	1686	1		23							
8. Failure of the hostler of the light engine properly to observe and obey signal indications	1771	1	1	2							
9. Failure of the engineman of the freight train properly to observe and obey signal indications	1788	1		6	1	1					
10. Failure of an engineman properly to observe and obey the stop indication of a dwarf signal	1789	1		4				1			
11. Failure of an engineman properly to control the speed of his train after receiving a caution signal indication	1946	1	1	1					1		
12. Failure to obey signal indications	1728	1	1		1						
13. Failure of an engineman properly to obey signal indications	1509	1		7					1		
14. Failure of an engineman properly to obey signal indications	1697	1	2	3	1						
15. Failure of an engineman properly to obey signal indications	1737	1		51	1						
16. Failure of an engineman properly to obey signal indications	1801	1		1					1		
17. Failure of an engineman properly to obey signal indications	1828	1		3				1	1		
18. Failure of the engineman of the passenger train properly to obey signal indications	1784	1		2				1			
19. Failure of the engineman of the passenger train properly to observe and obey signal indications	1757	1	1	10	1						
20. Failure to observe and obey signal indications for which an engineman, fireman and head brakeman were responsible	1758	1		3			1				
21. Failure of an engineman properly to observe and obey automatic block signals and other restrictive indications	1563	1		4		1					
22. Failure of the engineman of the light engine to maintain a proper lookout when running a caution block signal indication	1611	1	2				1				
23. Failure of an engineman properly to control the speed of his train so as to stop before passing a home interlocking signal which was displaying a stop indication	1680	1		3	1						
24. Failure of an engineman properly to control the speed of his train while moving through an occupied block under a permissive block signal indication	1739	1	3			1	1				
25. Failure of an engineman properly to control the speed of his train so as to stop before passing a block signal which was in stop position	1769	1		3	1				1		

PERSONS		NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE									TOTAL			
											70 CARS AND LESS		OVER 70 CARS	
KILLED	INJURED	40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT.
(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
4	19	1												
1	1	1												
	3	1							1					
64	298	43	5	3	3	-	1	-	4	59	54	91.5	5	8.5
1	21	1			1	1								
	4				1		1							
2	3	1		1					1					
5	38							1						
3					1									
2			1											
	23								1					
1	2								1					
	6	1	1											
	4				1									
1	1					1			2					
1		1												
	7					1								
2	3	1												
	31	1												
	1					1			1					
	3				1	1								
	2				1									
1	10	1												
	3			1					1					
	4		1											
2				1										
	3	1												
3			1	1										
	3	1				1								

I. NEGLIGENCE OF EMPLOYES:										
(A) Train Orders: (Continued)										
36. Issuance of a lap order	2252	1	4	19	1					
37. Lap of the authority of two opposing trains, due to the lack of a common understanding of the method of operation, and by irregular practice in a train-dispatching office	2284	1	1	1	1					
38. Failure to obey a meet order	2390	1		3	1					
TOTAL - NEGLIGENCE - TRAIN ORDERS		38	64	298	43	5	3	3	-	1
(B) Fixed Signals:										
1. Failure of the engineman of one of the freight trains to operate his train under proper control after entering a block under a permissive signal indication	1409	1	1	21	1			1	1	
2. Failure properly to observe and obey signal indications, for which the engineman, fireman and head brakeman of the following train were responsible	1411	1	3	4				1		1
3. Failure of the engineman in charge of the lead engine of one of the trains involved in the collision to approach a block signal under proper control	1421	1	2	3	1		1			
4. Failure of an engineman properly to observe signal indications	1477	1	5	38						
5. Failure of an engineman properly to observe and obey signal indications	1568	1	3					1		
6. Failure of an engineman properly to obey signal indications in controlling speed of his train when passing through a cross-over	1629	1	2			1				
7. Failure of the engineman of the following train properly to observe and obey signal indications	1686	1		23						
8. Failure of the hostler of the light engine properly to observe and obey signal indications	1771	1	1	2						
9. Failure of the engineman of the freight train properly to observe and obey signal indications	1788	1		6	1	1				
10. Failure of an engineman properly to observe and obey the stop indication of a dwarf signal	1789	1		4				1		
11. Failure of an engineman properly to control the speed of his train after receiving a caution signal indication	1946	1	1	1					1	
12. Failure to obey signal indications	1728	1	1		1					
13. Failure of an engineman properly to obey signal indications	1509	1		7					1	
14. Failure of an engineman properly to obey signal indications	1697	1	2	3	1					
15. Failure of an engineman properly to obey signal indications	1737	1		51	1					
16. Failure of an engineman properly to obey signal indications	1801	1		1					1	
17. Failure of an engineman properly to obey signal indications	1828	1		3				1	1	
18. Failure of the engineman of the passenger train properly to obey signal indications	1784	1		2				1		
19. Failure of the engineman of the passenger train properly to observe and obey signal indications	1757	1	1	10	1					
20. Failure to observe and obey signal indications for which an engineman, fireman and head brakeman were responsible	1758	1		3			1			
21. Failure of an engineman properly to observe and obey automatic block signals and other restrictive indications	1563	1		4		1				
22. Failure of the engineman of the light engine to maintain a proper lookout when running a caution block signal indication	1611	1	2				1			
23. Failure of an engineman properly to control the speed of his train so as to stop before passing a home interlocking signal which was displaying a stop indication	1680	1		3	1					
24. Failure of an engineman properly to control the speed of his train while moving through an occupied block under a permissive block signal indication	1739	1	3			1	1			
25. Failure of an engineman properly to control the speed of his train so as to stop before passing a block signal which was in stop position	1769	1		3	1				1	
26. Failure properly to observe and obey signal indications governing the movement of the freight train	1981	1	2	4					1	
27. Failure of engineman to properly observe and obey signal indication governing movement of his train over a railroad crossing	1989	1	1	12		1				
28. Failure of the engineman of the freight train properly to observe and obey stop indication of a dwarf signal	2037	1		9				1		
29. Failure of an engineman properly to observe and obey a stop signal indication	2073	1		200		1				
30. Failure to observe and obey automatic block signal indications and to obey the stop signals of a flagman	2138	1		6				1		

4	19	1												
1	1	1												
	3	1							1					
64	298	43	5	3	3	-	1	-	4	59	54	91.5	5	8.5
1	21	1			1	1								
3	4				1		1							
2	3	1		1					1					
5	38							1						
3					1									
2			1											
	23								1					
1	2								1					
	6	1	1											
	4				1									
1	1					1			2					
1		1												
	7					1								
2	3	1												
	51	1												
	1					1			1					
	3				1	1								
	2				1									
1	10	1												
	3			1					1					
	1		1											
2				1										
	3	1												
3			1	1										
	3	1				1								
2	4					1								
1	12		1											
	9				1									
1	200		1											
	6				1									

	I.C.C. INVESTI-GATION NUMBER	NUMBER OF ACCIDENTS	PERSONS		NUMBER OF FREIGHT TRAINS IN VARIOUS LENGTHS IN CARS, INCLUS					
			KILLED	INJURED	40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
I. NEGLIGENCE OF EMPLOYEES:										
(B) Fixed Signals: (Continued)										
31. Failure of Extra 9023 properly to observe and obey interlocking signal indications	2144	1		6		1				
32. Failure to operate the freight train in accordance with interlocking signal indications	2189	1		5			1			
33. Failure of the ____ train properly to observe and obey interlocking signal indications governing movement of the train over a railroad crossing	2336	1	2	4						1
34. Failure properly to obey interlocking signal indications	2337	1	1					1		
35. Failure to observe and to obey signal indications governing the movement of second 9	2360	1		11						
36. Failure to operate PT-56 in accordance with interlocking signal indications	2387	1		5	1					
TOTAL - NEGLIGENCE - FIXED SIGNALS		36	33	454	10	7	5	9	7	2
(C) Hand Signals:										
1. Action of the motorman handling the two locomotives in mistaking a hand signal given for the other locomotive as a signal from one of his own brakemen	2066	1	1		2					
TOTAL - NEGLIGENCE - HAND SIGNALS		1	1		2					
(D) Train Flagging:										
1. Work train making a movement against an opposing scheduled train without flag protection for which engineman and a brakeman were responsible	1463	1	4	6	1					
2. Failure of a flagman properly to protect the rear of his train	1476	1		1	1			1		
3. Train making a back-up movement through a cross-over without proper flag protection, for which head brakeman, engineman and conductor were responsible	1479	1		1	2					
4. Failure to provide proper flag protection for which the conductor and the flagman of the mixed train were responsible	1494	1		2	1					
5. Failure of a flagman to afford proper flag protection	1506	1	1						1	
6. Failure of the crew of the work extra to provide proper protection for its movement against an opposing train	1543	1	2	4	1					
7. Failure of a brakeman of the freight train to afford proper protection to his train while it was fouling the main track	1580	1	1	13				1		
8. One of the freight trains heading out on main track without adequate flag protection	1591	1		2						2
9. Failure to provide proper flag protection for a movement against the current of traffic, for which the conductor and the flagman of the light engine were responsible	1596	1		2	1					
10. Failure of the flagman of the first train to provide proper flag protection, and the failure of the conductor of that train to take proper precautions for the safety of his train	1599	1		5	1	1				
11. Failure to provide proper flag protection when making a back-up movement on the main track for which the conductor and the flagman of the work train were responsible	1612	1		2		1				
12. Failure to provide proper flag protection when standing on the main track on the time of a following superior train	1619	1	1							1
13. Failure to provide proper flag protection for which the conductor and the flagman of the freight train were responsible	1642	1		20	1					
14. Failure to provide proper flag protection for which the conductor and the flagman of the freight train were responsible	1649	1	1	1					1	
15. Failure of the flagman of the freight train properly to protect his train by flag	1672	1		42	1					
16. Failure of the flagman of the first train properly to afford protection	1676	1	1	2	1					1
17. Freight train occupying the main track beyond the meeting point without flag protection for which the engineman was primarily responsible	1710	1		2		1				1
18. Failure of a flagman to provide adequate flag protection	1745	1	1	5		1		1		
19. Failure of a conductor to provide flag protection	1773	1	1	3	1			1		

PERSONS		NUMBER OF FREIGHT TRAINS INVOLVED AS TO PASSING LOADING IN CARS, EXCLUSIVE OF CABOOSE									TOTAL			
											70 CARS AND LESS		OVER 70 CARS	
KILLED	INJURED	40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT.
(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	6		1											
	5			1										
2	4						1							
1					1									
	11							1						
	5	1												
33	454	10	7	5	9	7	2	2	7	49	31	63.3	18	36.7
1		2												
1		2								2	2	100.0	-	-
4	6	1												
	1	1			1									
	1	2												
	2	1												
1						1								
2	4	1												
1	13				1									
	2						2							
	2	1												
	5	1	1											
	2		1											
1							1							
	20	1												
1	1					1								
	42	1												
1	2	1					1							
	2		1				1							
1	5		1		1									
1	3	1												

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
I. NEGLIGENCE OF EMPLOYEES:									
(B) Fixed Signals: (Continued)									
31. Failure of Extra 9023 properly to observe and obey interlocking signal indications	2144	1		6		1			
32. Failure to operate the freight train in accordance with interlocking signal indications	2189	1		5			1		
33. Failure of the ____ train properly to observe and obey interlocking signal indications governing movement of the train over a railroad crossing	2336	1	2	4					
34. Failure properly to obey interlocking signal indications	2337	1	1					1	
35. Failure to observe and to obey signal indications governing the movement of second 9	2360	1		11					
36. Failure to operate PT-56 in accordance with interlocking signal indications	2387	1		5	1				
TOTAL - NEGLIGENCE - FIXED SIGNALS[D]		36	33	454	10	7	5	9	7
(C) Hand Signals:									
1. Action of the motorman handling the two locomotives in mistaking a hand signal given for the other locomotive as a signal from one of his own brakemen	2066	1	1		2				
TOTAL - NEGLIGENCE - HAND SIGNALS		1	1		2				
(D) Train Flagging:									
1. Work train making a movement against an opposing scheduled train without flag protection for which engineman and a brakeman were responsible	1463	1	4	6	1				
2. Failure of a flagman properly to protect the rear of his train	1476	1		1	1			1	
3. Train making a back-up movement through a cross-over without proper flag protection, for which head brakeman, engineman and conductor were responsible	1479	1		1	2				
4. Failure to provide proper flag protection for which the conductor and the flagman of the mixed train were responsible	1494	1		2	1				
5. Failure of a flagman to afford proper flag protection	1506	1	1						1
6. Failure of the crew of the work extra to provide proper protection for its movement against an opposing train	1541	1	2	4	1				
7. Failure of a brakeman of the freight train to afford proper protection to his train while it was fouling the main track	1580	1	1	13				1	
8. One of the freight trains heading out on main track without adequate flag protection	1991	1		2					
9. Failure to provide proper flag protection for a movement against the current of traffic, for which the conductor and the flagman of the light engine were responsible	1996	1		2	1				
10. Failure of the flagman of the first train to provide proper flag protection, and the failure of the conductor of that train to take proper precautions for the safety of his train	1999	1		5	1	1			
11. Failure to provide proper flag protection when making a back-up movement on the main track for which the conductor and the flagman of the work train were responsible	1612	1		2		1			
12. Failure to provide proper flag protection when standing on the main track at the time of a following superior train	1619	1	1						
13. Failure to provide proper flag protection for which the conductor and the flagman of the freight train were responsible	1642	1		20	1				
14. Failure to provide proper flag protection for which the conductor and the flagman of the freight train were responsible	1649	1	1	1					1
15. Failure of the flagman of the freight train properly to protect his train by flag	1672	1		42	1				
16. Failure of the flagman of the first train properly to afford protection	1676	1	1	3	1				
17. Freight train occupying the main track beyond the meeting point without flag protection for which the engineman was primarily responsible	1710	1		2		1			
18. Failure of a flagman to provide adequate flag protection	1745	1	1	5		1		1	
19. Failure of a conductor to provide flag protection	1773	1	1	3	1			1	
20. Failure of a flagman to provide proper flag protection	1775	1	1	2					
21. Failure of the rear brakeman and the conductor of the freight train to provide proper flag protection when standing on the main track at the time of a following superior train	1863	1		3	1				
22. Failure of the conductor and the flagman of the relief train properly to protect their train	1899	1	1	6		1			
23. Failure of a conductor and a flagman to provide proper protection	1861	1	1		2				
24. Failure of the conductor and the flagman of the extra train to provide proper flag protection	2015	1	4	3	2				

	6		1											
	5			1										
2	4						1							
1					1									
	11							1						
	5	1												
33	454	10	7	5	9	7	2	2	7	49	31	63.3	18	36.7
1		2												
1		2								2	2	100.0	-	-
4	6	1												
	1	1			1									
	1	2												
	2	1												
1						1								
2	4	1												
1	13				1									
	2						2							
	2	1												
	5	1	1											
	2		1											
1							1							
	20	1												
1	1					1								
	42	1												
1	2	1					1							
	2		1				1							
1	5		1		1									
1	3	1			1									
1	2							1	1					
	3	1												
1	6		1											
1		2												
4	3	2												

Sheet

	I. C. C. INVESTIGATION NUMBER	NUMBER OF ACCIDENTS	PERSONS KILLED	PERSONS INJURED	NUMBER OF FREIGHT TRAINS INVOLVED AS TO TRAILING TONNAGE IN CARS, EXCLUSIVE OF CABOOSE: 45 AND LESS	46 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
I. NEGLIGENCE OF EMPLOYES:												
(D) Train Flagging: (Continued)												
25. Failure to provide flag protection	2122	1	2	2	2							
26. Failure of the crew of the helper engine to provide adequate flag protection	2080	1	2	1	1	1						
27. Failure properly to protect a movement from a siding to the main track	2131	1	2	1	1		1					
28. Extra 3095 occupying the main track on the time of a first-class train without proper flag protection	2142	1	2	34						1		
29. Failure to protect the snow plow train by flag	2151	1	1	2	1							
30. Failure properly to protect a movement from a siding to the main track	2161	1	2	1	2							
31. Failure of the crew of Extra 1554 properly to protect their train while making a cross-over movement on time of a first-class train	2203	1	1	5						1		
32. Failure of a second-class train to provide flag protection when occupying the main track on the time of a first-class train	2259	1	2	10							1	
33. Work extra making a movement within working limits without proper flag protection	2282	1		1	1							
34. Unauthorized main-track movement of No. 99 without flag protection	2300	1		2	2							
35. Failure of the crew of the preceding train to provide adequate flag protection	2304	1		4	2							
36. Failure to provide adequate flag protection after having failed to clear the time of a first-class train	2365	1		28	1							
TOTAL - NEGLIGENCE - TRAIN FLAGGING		36	34	218	30	6	1	4	2	7	2	1
(E) Hand Brakes:												
1. Failure to set the brakes on cars left standing on a grade, for which the rear brakeman was primarily at fault	1536	1	1		1							
2. Failure to apply a sufficient number of hand brakes to hold the cars left standing on a descending grade while the engine was uncoupled from the train to take water	1951	1		2		1						
3. Failure to set brakes on the detached portion of a train left standing on a grade	2130	1	1	1				1				
4. Failure to apply hand brakes on cars left standing on a grade	2149	1	1	1	1							
5. Failure to apply a sufficient number of hand brakes to hold 2 cut of cars left standing on a descending grade	2228	1	1		1							
6. Failure to apply a sufficient number of hand brakes to secure cars left on a yard track on a descending grade	2377	1		9	1							
TOTAL - NEGLIGENCE - HAND BRAKES		6	4	13	4	1		1				
(F) Switches:												
1. Open switch, for which a head brakeman was responsible	1512	1		3	1			1				
2. Open switch	1540	1		3	2							
3. Open switch for which the head brakeman of the freight train was primarily responsible	1743	1	2	7			1					
4. Open switch	1551	1	3	22						1		
5. Open switch	1608	1	1		1							
6. Open switch	1683	1	1	2	1							
7. Open switch	1969	1		8	1							
TOTAL - NEGLIGENCE - SWITCHES		7	7	45	6		1	1		1		
(G) Other Forms of Negligence of Employes:												
1. Freight train being operated at excessive speed within yard limits for which the enginemen and conductor were responsible	1402	1	1	1	1			1				

PERSONS		NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, INCLUDING OF CABOOSE									TOTAL			
											70 CARS AND LESS		OVER 70 CARS	
KILLED	INJURED	40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT.
(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
2	2	2												
2	1	1	1											
2	1	1		1										
2	34						1							
1	2	1												
2	1	2												
1	5						1							
2	10							1						
	1	1												
	2	2												
	4	2												
	28	1												
34	218	30	6	1	4	2	7	2	1	53	41	77.4	12	22.6
1		1												
	2		1											
1	1				1									
1	1	1												
1		1												
	9	1												
4	13	4	1		1					6	6	100.0	-	-
	3	1			1									
	3	2												
2	7			1										
3	22						1							
1		1												
1	2	1												
	8	1												
7	45	6		1	1		1			9	8	88.9	1	11.1

I. NEGLIGENCE OF EMPLOYEES:								
(D) Train Flagging: (Continued)								
25. Failure to provide flag protection	2132	1	2	2	2			
26. Failure of the crew of the helper engine to provide adequate flag protection	2080	1	2	1	1	1		
27. Failure properly to protect a movement from a siding to the main track	2131	1	2	1	1		1	
28. Extra 2035 occupying the main track at the time of a first-class train without proper flag protection	2142	1	2	34				
29. Failure to protect the snow plow train by flag	2151	1	1	2	1			
30. Failure properly to protect a movement from a siding to the main track	2161	1	2	1	2			
31. Failure of the crew of Extra 1554 properly to protect their train while making a cross-over movement on time of a first-class train	2203	1	1	5				
32. Failure of a second-class train to provide flag protection when occupying the main track on the time of a first-class train	2239	1	2	10				
33. Work extra making a movement within working limits without proper flag protection	2282	1		1	1			
34. Unauthorized main-track movement of No. 99 without flag protection	2300	1		2	2			
35. Failure of the crew of the preceding train to provide adequate flag protection	2304	1		4	2			
36. Failure to provide adequate flag protection after having failed to clear the time of a first-class train	2565	1		28	1			
TOTAL - NEGLIGENCE - TRAIN FLAGGING		36	34	218	30	6	1	4
(E) Hand Brakes:								
1. Failure to set the brakes on cars left standing on a grade, for which the rear brakeman was primarily at fault	1536	1	1		1			
2. Failure to apply a sufficient number of hand brakes to hold the cars left standing on a descending grade while the engine was uncoupled from the train to take water	1951	1		2		1		
3. Failure to set brakes on the detached portion of a train left standing on a grade	2130	1	1	1				1
4. Failure to apply hand brakes on cars left standing on a grade	2149	1	1	1	1			
5. Failure to apply a sufficient number of hand brakes to hold a cut of cars left standing on a descending grade	2228	1	1		1			
6. Failure to apply a sufficient number of hand brakes to secure cars left on a yard track on a descending grade	2377	1		9	1			
TOTAL - NEGLIGENCE - HAND BRAKES		6	4	13	4	1		1
(F) Switches:								
1. Open switch, for which a head brakeman was responsible	1512	1		3	1			1
2. Open switch	1540	1		3	2			
3. Open switch for which the head brakeman of the freight train was primarily responsible	1743	1	2	7			1	
4. Open switch	1551	1	3	22				
5. Open switch	1608	1	1		1			
6. Open switch	1683	1	1	2	1			
7. Open switch	1969	1		8	1			
TOTAL - NEGLIGENCE - SWITCHES		7	7	45	6		1	1
(G) Other Forms of Negligence of Employes:								
1. Freight train being operated at excessive speed within yard limits for which the enginemen and conductor were responsible	1602	1	1	1	1			1
2. Failure of the engineman of the following train properly to control the speed of his train within yard limits	1454	1	1	2	1			
3. Failure of the engineman of one of the trains properly to control the speed of his train within yard limits	1498	1	1	1	1	1		
4. Failure of the engineman of one of the trains to operate it under proper control within yard limits	1515	1	2	1	1			
5. Failure of the engineman of one of the trains to operate it under proper control within yard limits	1704	1	2		1	1		
6. Failure of the engineman of the freight train properly to control the speed of his train within yard limits	1518	1	1	1	1			
7. Failure of the engineman of the freight train properly to control the speed of his train within yard limits	1664	1	2	3		1		
8. Failure of the lead engineman of the freight train to operate his train under proper control within yard limits	1534	1		2	1			

2	2	2												
2	1	1	1											
2	1	1		1										
2	34						1							
1	2	1												
2	1	2												
1	5						1							
2	10							1						
	1	1												
	2	2												
	4	2												
	28	1												
34	218	30	6	1	4	2	7	2	1	53	41	77.4	12	22.6
1		1												
	2		1											
1	1				1								1	
1	1	1												
1		1												
	9	1												
4	13	4	1		1					6	6	100.0	-	-
	3	1			1									
	3	2												
2	7			1										
3	22						1							
1		1												
1	2	1												
	8	1												
7	45	6		1	1		1			9	8	88.9	1	11.1
1	1	1			1									
1	2	1					1							
1	1	1	1											
2	1	1					1							
2		1	1											
1	1	1												
2	3		1											
	2	1												

	I. C. C. INVESTIGATION NUMBER	NUMBER OF ACCIDENTS	PERSONS KILLED	PERSONS INJURED	NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CAB. 40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
I. NEGLIGENCE OF EMPLOYEES:												
(G) Other Forms of Negligence of Employes: (Continued)												
9. Failure of an engineman to operate under proper control within yard limits	1562	1		1			1		1			
10. Failure of an engineman to operate under proper control within yard limits	1614	1	1				1		1			
11. Failure of the engineman of the freight train to have his train under proper control when approaching yard limits	1600	1	1	1	1							
12. Failure of the engineman of the light engine to operate under proper control within yard limits and by failure of the fireman to give the engineman correct information regarding the track ahead	1610	1	3		1							
13. Failure of an engineman properly to control his train within yard limits	1643	1		3	1		1					
14. Failure of the engineman of the following train to have his train under proper control when approaching yard limits	1654	1	2	4	1		1					
15. Failure to operate under proper control within yard limits, for which a brakeman, and the engineman of one of the trains were responsible	1733	1	1		2							
16. Failure of an engineman to operate his train under control within yard limits	1783	1	1	1	2							
17. Failure of an engineman to operate his train under control within yard limits	1786	1		2	2							
18. Primarily by the failure of the freight train to operate under proper control within yard limits	1952	1	3			1						
19. Failure to operate under proper control in an occupied block for which the engineman of the express train was responsible	1624	1		4			1					
20. Primarily by the following train being operated at a speed which was excessive in view of existing weather conditions	1555	1	2	2	1			1				
21. Failure of the engineman properly to control the speed of his train	1990	1		9			1					
22. Believed to have been due to a rate of speed which was materially in excess of the speed restrictions on the curve involved for the type of engine in use	1992	1	1	1		1						
23. Failure of the engineman properly to control the speed of his train on a heavy descending grade	1606	1	2	1	1							
24. Failure of the engineman of the following train properly to control the speed of his train on a descending grade	1639	1		3		1		1				
25. Excessive speed on a sharp curve	1723	1	2	5	1							
26. Excessive speed on a sharp curve	1911	1	1	4	1							
27. Believed to have been caused primarily by excessive speed	1780	1	1	12	1							
28. Failure of the conductor of the passenger train properly to control the speed of his train during a back-up movement	1916	1	1					1				
29. Crew of the freight train overlooking the passenger train	1400	1	2	5	1							
30. Freight train being operated on short time against an opposing superior train	1438	1	1	21	1							
31. Failure of an extra train to clear the time of a first class train, for which the entire crew was responsible	1462	1	3	45	1							
32. An extra train being operated against an opposing superior train on short time for which the conductor and engineman were responsible	1513	1	3	2	2							
33. Engineman and the fireman of the light engine in overlooking an opposing superior train	1531	1		2		1						
34. One of the trains being operated against a superior train on short time, for which the conductor and the engineman were responsible	1576	1		2				2				
35. Crew of the work train overlooking a superior train, and their failure to get into clear for a superior train as required by the rules	1578	1	1	1								
36. Freight train being operated against an opposing passenger train on short time for which the conductor and engineman were responsible	1616	1	1	19	1							
37. Overlooking a schedule of an opposing superior train, for which the entire crew of the inferior train was responsible	1621	1		5	2							
38. Believed to have been caused by the operation of the train with the engine running backwards, at an excessive rate of speed for which the engineman and the conductor were responsible	1634	1	3	3	1							
39. Operation of the freight train on short time against an opposing superior train	1635	1	1	17	1			1				
[illegible] of the engineman of the passenger train properly to control the speed of his train approaching a meeting point	1692	1		20	1							

PERSONS		NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE								TOTAL			
										70 CARS AND LESS		OVER 70 CARS	
KILLED	INJURED	40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT.
(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	1			1		1								
1				1		1								
1	1	1												
3		1												
	3	1		1										
2	4	1		1										
1		2												
1	1	2												
	2	2												
3			1											
	4			1										
2	1	1			1									
	9			1										
1	1		1											
2	1	1												
	3		1		1									
2	5	1												
1	4	1												
1	12	1												
1					1									
2	5	1												
1	21	1												
3	45	1												
3	2	2												
	2		1											
	2				2									
1	1								1					
1	19	1												

	Cal. Number (1)	Of Accidents (2)	Persons Killed (3)	Persons Injured (4)	And Less (5)
I. NEGLIGENCE OF EMPLOYES:					
(C) Other Forms of Negligence of Employes: (Continued)					
9. Failure of an engineman to operate under proper control within yard limits	1562	1		1	
10. Failure of an engineman to operate under proper control within yard limits	1614	1	1		
11. Failure of the engineman of the freight train to have his train under proper control when approaching yard limits	1600	1	1	1	1
12. Failure of the engineman of the light engine to operate under proper control within yard limits and by failure of the fireman to give the engineman correct information regarding the track ahead	1610	1	3		1
13. Failure of an engineman properly to control his train within yard limits	1643	1		3	1
14. Failure of the engineman of the following train to have his train under proper control when approaching yard limits	1654	1	2	4	1
15. Failure to operate under proper control within yard limits, for which a brakeman, and the engineman of one of the trains were responsible	1733	1	1		2
16. Failure of an engineman to operate his train under control within yard limits	1783	1	1	1	2
17. Failure of an engineman to operate his train under control within yard limits	1786	1		2	2
18. Primarily by the failure of the freight train to operate under proper control within yard limits	1952	1	3		
19. Failure to operate under proper control in an occupied block for which the engineman of the express train was responsible	1624	1		4	
20. Primarily by the following train being operated at a speed which was excessive in view of existing weather conditions	1555	1	2	1	1
21. Failure of the engineman properly to control the speed of his train	1590	1		9	
22. Believed to have been due to a rate of speed which was materially in excess of the speed restrictions on the curve involved for the type of engine in use	1592	1	1	1	
23. Failure of the engineman properly to control the speed of his train on a heavy descending grade	1606	1	2	1	1
24. Failure of the engineman of the following train properly to control the speed of his train on a descending grade	1639	1		3	
25. Excessive speed on a sharp curve	1723	1	2	5	1
26. Excessive speed on a sharp curve	1910	1	1	4	1
27. Believed to have been caused primarily by excessive speed	1780	1	1	12	1
28. Failure of the conductor of the passenger train properly to control the speed of his train during a back-up movement	1916	1	1		
29. Crew of the freight train overlooking the passenger train	1400	1	2	5	1
30. Freight train being operated on short time against an opposing superior train	1438	1	1	21	1
31. Failure of an extra train to clear the time of a first class train, for which the entire crew was responsible	1462	1	3	45	1
32. An extra train being operated against an opposing superior train on short time for which the conductor and engineman were responsible	1513	1	3	2	2
33. Engineman and the fireman of the light engine in overlooking an opposing superior train	1531	1		2	
34. One of the trains being operated against a superior train on short time, for which the conductor and the engineman were responsible	1576	1		2	
35. Crew of the work train overlooking a superior train, and their failure to get into clear for a superior train as required by the rules	1578	1	1	1	
36. Freight train being operated against an opposing passenger train on short time for which the conductor and engineman were responsible	1616	1	1	19	1
37. Overlooking a schedule of an opposing superior train, for which the entire crew of the inferior train was responsible	1621	1		5	2
38. Believed to have been caused by the operation of the train with the engine running backwards, at an excessive rate of speed for which the engineman and the conductor were responsible	1634	1	3	3	1
39. Operation of the freight train on short time against an opposing superior train	1635	1	1	17	1
40. Failure of the engineman of the passenger train properly to control the speed of his train approaching a meeting point	1692	1		10	1
41. Failure of the engineman of the passenger train properly to control the speed of his train approaching a meeting point	1854	1	1	11	1
42. Failure of the engineman of the light engine to know the correct time with the result that his train failed to clear for an opposing superior train in accordance with a train order	1835	1	1	3	1
43. Failure of the crew of one train properly to identify a train on a siding, with the result that they failed to obey a meet order governing another train	1666	1	2	4	1
44. Failure of the crew of one train properly to identify a train on a siding, resulting in failure to obey a meet order governing another train	1941	1	1	6	2
45. Operation of a train on short time against an opposing train which was superior by direction	1890	1		2	1

	1			1		1										
1				1		1										
1	1	1														
3		1														
	3	1		1												
2	4	1		1												
1		2														
1	1	2														
	2	2														
3			1													
	4			1												
2	1	1			1											
	9			1												
1	1		1													
2	1	1														
	3		1		1											
2	5	1														
1	4	1														
1	12	1														
1					1											
2	5	1														
1	21	1														
3	45	1														
3	2	2														
	2		1													
	2				2											
1	1								1							
1	19	1														
	5	2														
3	3	1														
1	17	1			1											
	10	1														
1	11	1														
1	3	1														
2	4	1	1													
1	6	2														
	2	1			1											

	I. C. C. Investigation Number	Number of Accidents	Persons Killed	Persons Injured	Number of Persons Varying Lengths of Time: 40 and less	41 to 90	91 to 60	61 to 70
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I. NEGLIGENCE OF EMPLOYEES:								
(g) Other Forms of Negligence of Employes: (Continued)								
46. A crew of an inferior train overlooking the schedule of an opposing superior train	1925	1	1	15	1			
47. Freight train occupying the main track on the time of a first class train without authority for which the engineer was primarily responsible; the fireman and head brakeman were partly responsible for having also overlooked the superior train	1712	1	1	11				
48. Failure of the motorman of the passenger train properly to control the speed of his train approaching a passing point	1539	1		61	1			
49. Failure of the engineman of the freight train to bring his train to a stop on a siding before it fouled the main track	1441	1	1	16				
50. Freight train fouling the main track directly in front of the passenger train, an overdue superior train, for which the conductor and the engineman of the freight train were responsible	1482	1	2	12	1			
51. Light engine fouling main track directly in front of an approaching train, for which the fireman and head brakeman were responsible	1689	1	1			1		
52. Action of the engineman of the passenger train in pulling out of a depot track without receiving the proper signal from a switch tender and fouling the westbound main track which was then occupied by the freight train	1796	1		1	1			
53. Light engine fouling the main track directly in front of an approaching freight train	1942	1	4	1				
54. Light engines being operated against the current of traffic without authority and without protection, for which both engine crews were responsible	1560	1	2	6				
55. An extra being operated against the first section of an opposing superior train without authority, for which the engineman and conductor were responsible	1656	1	7	1		2		
56. Failure of the engineman of the following train to operate his train under proper control and by the failure of the conductor and the flagman of the preceding train properly to protect the rear of their train	1416	1	1			1		1
57. Failure of the flagman of the freight train properly to protect the rear of his train and by the failure of an operator to issue a caution card to the passenger train before allowing it to enter an occupied block	1436	1	1	1			1	
58. Failure of the engineman of the following train properly to observe and obey the stop indication of an automatic signal, and by the failure of the conductor of the preceding train properly to protect the rear of his train	1468	1	1				1	
59. Failure of the conductor and a flagman to provide proper flag protection; a contributing cause was the failure of an engineman properly to control the speed of his train when operating under a permissive block signal indication	1558	1	2	1	1		1	
60. Failure of the flagman of the freight train to provide proper flag protection; a contributing cause was the failure of the engineman of the passenger train properly to control the speed of his train when holding an order authorizing a second class train to run ahead of his	1577	1		68				
61. Failure of the conductor of the first train to provide proper flag protection and by the failure of the engineman of the following train to reduce speed in accordance with indications displayed by interlocking approach and home signals	1736	1	1	2	1			
62. Failure of the flagman of the freight train to provide proper flag protection, and by the failure of the motorman of the passenger train to operate his train under proper control in an occupied block	1777	1	1	6				
63. Caused primarily by the failure of all concerned to provide adequate flag protection against the passenger train; by the failure of the engineman of the freight train properly to observe and obey the stop indication of an absolute signal, and by the failure of the engineman of the passenger train properly to observe and obey the caution indication of an intermediate signal	1787	1	5	19		1		
64. Failure of an engineman to operate his train at restricted speed while running in an occupied block, and by the failure of a conductor and flagman to provide proper flag protection	1868	1		1	1			1
65. Primarily by the failure of the engineman of the freight train properly to control the speed of his train when running in an occupied block under a permissive signal indication; a contributing cause was the failure of the engineman and flagman of the work train to provide proper flag protection for their train	1949	1	2	12	1			
66. Failure of an engineman properly to control the speed of his train when running under a permissive signal in an occupied block under weather conditions which materially restricted his range of vision	1849	1		1				
67. Failure of an engineman properly to obey signal indications, and by the failure of a flagman to provide full flag protection	1955	1		1	1		1	
68. Failure of the conductor and the flagman of first train properly to protect by flag; a contributing cause was the failure of the engineman of the following train to approach yard limits under proper control in view of existing weather conditions	1406	1	2				2	
69. Failure of the engineman of the following train to operate his train under proper control within yard limits and also by his failure properly to obey stop indication								

PERSONS		NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE									TOTAL			
											70 CARS AND LESS		OVER 70 CARS	
KILLED	INJURED	40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT.
(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1	15	1												
1	11							1						
	61	1												
1	16						1							
2	12	1												
1			1											
	1	1												
4	1						1							
2	6					1								
7	1		2											
1			1		1									
1	1			1										
1				1		1								
2	1	1		1										
	68					1								
1	2	1												
1	6							1						
5	19		1											
	1	1			1									
2	12	1												
	1								2					
	1	1		1										
2				2										

46. A crew of an inferior train overlooking the schedule of an opposing superior train	1925	1	1	15	1				
47. Freight train occupying the main track at the time of a first class train without authority for which the engineer was primarily responsible; the firemen and head brakemen were partly responsible for having also overlooked the superior train	1712	1	1	11					
48. Failure of the motorman of the passenger train properly to control the speed of his train approaching a passing point	1529	1		61	1				
49. Failure of the engineman of the freight train to bring his train to a stop on a siding before it fouled the main track	1441	1	1	16					
50. Freight train fouling the main track directly in front of the passenger train, an overdue superior train, for which the conductor and the engineman of the freight train were responsible	1482	1	2	12	1				
51. Light engine fouling main track directly in front of an approaching train, for which the firemen and head brakemen were responsible	1689	1	1			1			
52. Action of the engineman of the passenger train in pulling out of a depot track without receiving the proper signal from a switch tender and fouling the westbound main track which was then occupied by the freight train	1796	1		1	1				
53. Light engine fouling the main track directly in front of an approaching freight train	1942	1	4	1					
54. Light engines being operated against the current of traffic without authority and without projection, for which both engine crews were responsible	1560	1	2	6					1
55. An extra being operated against the first section of an opposing superior train without authority, for which the engineman and conductor were responsible	1656	1	7	1		2			
56. Failure of the engineman of the following train to operate his train under proper control and by the failure of the conductor and the flagman of the preceding train properly to protect the rear of their train	1416	1	1			1		1	
57. Failure of the flagman of the freight train properly to protect the rear of his train and by the failure of an operator to issue a caution card to the passenger train before allowing it to enter an occupied block	1436	1	1	1			1		
58. Failure of the engineman of the following train properly to observe and obey the stop indication of an automatic signal, and by the failure of the conductor of the preceding train properly to protect the rear of his train	1468	1	1				1		1
59. Failure of the conductor and a flagman to provide proper flag protection; a contributing cause was the failure of an engineman properly to control the speed of his train when operating under a permissive block signal indication	1558	1	2	1	1		1		
60. Failure of the flagman of the freight train to provide proper flag protection; a contributing cause was the failure of the engineman of the passenger train properly to control the speed of his train when holding an order authorizing a second class train to run ahead of him	1577	1		68					1
61. Failure of the conductor of the first train to provide proper flag protection and by the failure of the engineman of the following train to reduce speed in accordance with indications displayed by interlocking approach and home signals	1736	1	1	2	1				
62. Failure of the flagman of the freight train to provide proper flag protection, and by the failure of the motorman of the passenger train to operate his train under proper control in an occupied block	1777	1	1	6					
63. Caused primarily by the failure of all concerned to provide adequate flag protection against the passenger train; by the failure of the engineman of the freight train properly to observe and obey the stop indication of an absolute signal, and by the failure of the engineman of the passenger train properly to observe and obey the caution indication of an intermediate signal	1787	1	5	19		1			
64. Failure of an engineman to operate his train at restricted speed while running in an occupied block, and by the failure of a conductor and flagman to provide proper flag protection	1868	1		1	1			1	
65. Primarily by the failure of the engineman of the freight train properly to control the speed of his train when running in an occupied block under a permissive signal indication; a contributing cause was the failure of the engineman and flagman of the work train to provide proper flag protection for their train	1949	1	2	12	1				
66. Failure of an engineman properly to control the speed of his train when running under a permissive signal in an occupied block under weather conditions which materially restricted his range of vision	1849	1		1					
67. Failure of an engineman properly to obey signal indications, and by the failure of a flagman to provide full flag protection	1955	1		1	1		1		
68. Failure of the conductor and the flagman of first train properly to protect by flag; a contributing cause was the failure of the engineman of the following train to approach yard limits under proper control in view of existing weather conditions	1406	1	2				2		
69. Failure of the engineman of the following train to operate his train under proper control within yard limits and also by his failure properly to obey stop indication displayed by a block signal	1442	1	1	5			1	1	
70. Failure of the engineman of the following train properly to obey signal indications and by his failure to operate his train under proper control within yard limits	1449	1	1	1	1				1
71. Failure of the crew of the yard engine to provide flag protection and by the failure of the freight train to be operated under proper control within yard limits	1862	1	1	2	1				
72. Failure of the conductor of the log train properly to supervise the back-up movement being made	1473	1	2		1			1	
73. Failure properly to control a back-up movement around the wye	1855	1	1		2				
74. Failure of an engineman to have his engine under proper control when making a switching movement	1650	1	1						

1	15	1												
1	11							1						
	61	1												
1	16						1							
2	12	1												
1			1											
	1	1												
4	1						1							
2	6					1								
7	1		2											
1			1		1									
1	1			1										
1				1		1								
2	1	1		1										
	68					1								
1	2	1												
1	6							1						
5	19		1											
	1	1			1									
2	12	1												
	1								2					
	1	1		1										
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1	5			1	1									
1	1	1				1								
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1		2												
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	I. C. C. INVESTIGATION NUMBER	NUMBER OF ACCIDENTS	PERSONS		VAR	
			KILLED	INJURED	40 AND LESS	4 T 5
	(1)	(2)	(3)	(4)	(5)	(6
I. NEGLIGENCE OF EMPLOYEES:						
(G) Other Forms of Negligence of Employes: (Continued)						
75. Failure to note that there was not sufficient clearance to permit the engine and cars to back past the cars which had been left on the main track	1926	1	1			
76. Yard engine being fired up with the throttle and reverse lever apparently in position that permitted the engine to start when sufficient steam pressure was generated, for which an engine watchman was responsible	1480	1		1		
77. Failure of the fireman of the following train to maintain a proper lookout and to notify the engineman that the track was occupied	1410	1	1	1	2	
78. Failure of the fireman of the light engine to maintain a proper lookout while making a back-up movement on a passing track	1564	1	1			
79. Failure of the engineman and conductor of the transfer train to maintain a proper lookout ahead and by the failure of the engineman to operate under proper control within yard limits	1674	1	1	2	2	
80. Failure of a fireman to maintain proper lookout on a curve to the left and to notify the engineman of a caboose ahead	1681	1	1	2	2	
81. Primarily by the failure of the fireman and head brakeman of extra to maintain a proper lookout when proceeding through yard limits and under a restricted speed signal indication	1813	1		1		
82. Open switch, and by the failure of anyone on the engine to observe the switch lamp indication or to maintain a proper lookout	1826	1		2	1	
83. Failure to obey a wait order for which the engineman and conductor of the passenger train were responsible. A contributing cause was the failure of the crew of the freight train properly to protect their train when running on short time against the passenger train	1439	1	3	36		
84. Failure of the engineman of the following train and the flagman of the leading train to take proper precautions for the safety of their respective trains when operating under close headway	1447	1	2	2	2	
85. Freight train occupying the main track on the time of a superior train without protection, and by the passenger train departing from a station ahead of schedule time, for which the conductors and enginemen of both trains were responsible	1457	1	3	8	1	
86. Failure to apply the power brakes and also a sufficient number of hand brakes to hold the rear portion of a train on a descending grade after the engine had been detached, the responsibility being shared by the engineer, conductor and head brakeman	1492	1	1	1	1	
87. Failure of the conductor of one of the trains properly to check a train register	1493	1		2	1	
88. Caused either by the failure of the conductor of the freight train properly to check a train register, or to errors in making an entry in the train register	1510	1	1	15		
89. Failure of the section motor car to be removed from the main track in foggy weather, or to be protected by flag, for which the section foreman was responsible	1516	1	2	2	1	
90. Cut of cars being shoved ahead on a yard track by a transfer engine without due regard for safety	1517	1	1			
91. Failure of the enginemen and firemen of the freight train properly to observe and obey the stop indications of an absolute signal, and by the further failure of the enginemen to operate his train under full control in accordance with flagging instructions	1520	1		9	1	
92. Failure of a conductor and a flagman to afford proper protection for the rear end of their train, and by the failure of a motorman to maintain a proper watch of the track ahead	1527	1	1	26		
93. Failure of a conductor to check a train register	1571	1	3	6	2	
94. A run-away freight train, due to a closed angle cock in the brake pipe at the head end of the first car behind the locomotive, and to failure to make proper air-brake tests, which would have disclosed this condition, either after the locomotives were changed or before starting down the grade on which the accident occurred	1582	1		2	2	
95. Failure of a conductor to see to it that proper protection was afforded to that portion of his train left standing on main track, and by the failure of an engineman properly to control the speed of his train approaching the depot	1597	1		3	2	
96. Failure of an engineman of the train to maintain proper lookout and to have his train under proper control within yard limits, and by th failure of the conductor to exercise proper care before attempting to back his train on to another district	1605	1	1	3	1	

NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE									TOTAL			
									70 CARS AND LESS		OVER 70 CARS	
40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT.
(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	1											
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	GATION NUMBER	OF ACCIDENTS	PERSONS KILLED	PERSONS INJURED	ARD LESS	TO 50	TO 60	TO 70
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I. NEGLIGENCE OF EMPLOYEES:								
(G) Other Forms of Negligence of Employes: (Continued)								
75. Failure to note that there was not sufficient clearance to permit the engine and cars to back past the cars which had been left on the main track	1926	1	1			1		
76. Yard engine being fired up with the throttle and reverse lever apparently in position that permitted the engine to start when sufficient steam pressure was generated, for which an engine watchman was responsible	1480	1		1			1	
77. Failure of the fireman of the following train to maintain a proper lookout and to notify the engineman that the track was occupied	1410	1	1	1	2			
78. Failure of the fireman of the light engine to maintain a proper lookout while making a back-up movement on a passing track	1564	1	1				1	
79. Failure of the engineman and conductor of the transfer train to maintain a proper lookout ahead and by the failure of the engineman to operate under proper control within yard limits	1674	1	1	2	2			
80. Failure of a fireman to maintain proper lookout on a curve to the left and to notify the engineman of a caboose ahead	1681	1	1	2	2			
81. Primarily by the failure of the fireman and head brakeman of extra to maintain a proper lookout when proceeding through yard limits and under a restricted speed signal indication	1813	1		1			1	1
82. Open switch, and by the failure of anyone on the engine to observe the switch lamp indication or to maintain a proper lookout	1826	1		2	1			
83. Failure to obey a wait order for which the engineman and conductor of the passenger train were responsible. A contributing cause was the failure of the crew of the freight train properly to protect their train when running on short time against the passenger train.	1439	1	3	36		1		
84. Failure of the engineman of the following train and the flagman of the leading train to take proper precautions for the safety of their respective trains when operating under close headway	1447	1	2	2	2			
85. Freight train occupying the main track on the time of a superior train without protection, and by the passenger train departing from a station ahead of schedule time, for which the conductors and enginemen of both trains were responsible	1457	1	3	8	1			
86. Failure to apply the power brakes and also a sufficient number of hand brakes to hold the rear portion of a train on a descending grade after the engine had been detached, the responsibility being shared by the engineer, conductor and head brakeman	1492	1	1	1	1			
87. Failure of the conductor of one of the trains properly to check a train register	1493	1		2	1	1		
88. Caused either by the failure of the conductor of the freight train properly to check a train register, or to errors in making an entry in the train register	1510	1	1	15				
89. Failure of the section motor car to be removed from the main track in foggy weather, or to be protected by flag, for which the section foreman was responsible	1516	1	2	2	1			
90. Cut of cars being shoved ahead on a yard track by a transfer engine without due regard for safety	1517	1	1					
91. Failure of the enginemen and firemen of the freight train properly to observe and obey the stop indications of an absolute signal, and by the further failure of the enginemen to operate his train under full control in accordance with flagging instructions	1520	1		9	1			
92. Failure of a conductor and a flagman to afford proper protection for the rear end of their train, and by the failure of a motorman to maintain a proper watch of the track ahead	1527	1	1	26				1
93. Failure of a conductor to check a train register	1571	1	3	6	2			
94. A run-away freight train, due to a closed angle cock in the brake pipe at the head end of the first car behind the locomotive, and to failure to make proper air-brake tests, which would have disclosed this condition, either after the locomotives were changed or before starting down the grade on which the accident occurred	1582	1		2	2			
95. Failure of a conductor to see to it that proper protection was afforded to that portion of his train left standing on main track, and by the failure of an engineman properly to control the speed of his train approaching the depot	1597	1		3	2			
96. Failure of an engineman of the train to maintain proper lookout and to have his train under proper control within yard limits, and by the failure of the conductor to exercise proper care before attempting to kick his train on to another district	1605	1	1	3	1		1	
97. Foreman of the switch engine releasing a block which had been obtained for a movement against current of traffic before the movement had been completed	1632	1	1	1	1			
98. Failure of the engineman of the milk train properly to control the speed of his train in view of existing weather conditions and by his failure to obey signal indications	1636	1		3				
99. Failure of an operator to deliver a meet order. Contributing causes were the failure of the dispatcher to comply with the rules when issuing the order in question, together with a misunderstanding by the operator in the operation of a manual block	1659	1		30				
100. The crew of an extra disregarded the schedule of a superior train and followed that train too closely, in violation of a 10 minute spacing rule	1679	1	4		2			
101. Train running away as a result of starting down the grade at excessive speed, a closed angle cock near the head end of the train preventing the engineman from making an effective application of the brakes, and the members of the crew at the rear end of the train failing to take necessary action in time to bring the train under control	1741	1	1	3				
102. Failure to obey a meet order, and by operating in a train cars having defective brake equipment which rendered inoperative the air brake devices at the rear of the train	1755	1	3	3	2			

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2												

	I. C. C. INVESTIGATION NUMBER	NUMBER OF ACCIDENTS	PERSONS KILLED	PERSONS INJURED	40 AND LESS
	(1)	(2)	(3)	(4)	(5)
I. NEGLIGENCE OF EMPLOYEES:					
(G) Other Forms of Negligence of Employes: (Continued)					
103. Violation of the operating rules by a train dispatcher in completing a meet order to an inferior train before he had obtained the signature of the conductor of the superior train and to disregard of a train order signal in stop position by a conductor and an engineman	1772	1	3	3	1
104. Primarily by the failure of an engineman to have the headlight of his engine displayed, and by his failure to provide such other flag protection as was necessary in view of the fact that he did not know whether the rear of his train was in the clear	1797	1		3	
105. Primarily by the failure of the fireman of the train to maintain a proper lookout while approaching a railroad crossing at grade; contributing causes were the failure of the enginemen of both trains to approach the crossing with their trains under full control	1841	1		2	1
106. Operation of the light engine against an opposing superior train without authority, and by the failure of the crew of the light engine properly to observe and obey the stop indication of a manual block signal	1865	1	1	5	
107. Operation of an extra ahead of a first-class train without sufficient time to clear as required by the rules, and by the failure of an engineman properly to control the speed of his train after being flagged	1867	1		1	
108. Failure of an engineman properly to observe and obey signal indications and also the stop signals of a flagman	1901	1		2	
109. Failure of an operator to display the train-order signal and to deliver a hold order to the crew of the extra and by his further error in lining up the route and displaying signal indications admitting this train to a block which he had pledged to and which was occupied by an opposing train	1909	1	1	3	1
110. Failure of an operator to restore a cross-over switch to normal position, resulting in a freight train being operated against the current of traffic without protection	1940	1	1	1	1
111. Failure of the freight train to be operated under proper control within yard limits; the failure of the fireman and head brakeman of that train to maintain a proper lookout, and the defective condition of the brake valve which prevented the engineman from making an emergency application of the brakes	1954	1		2	2
112. Primarily by the failure of an engineman properly to obey signal indications, while the passenger train flagman did not go back as far as he could have gone in the time available	1964	1		50	1
113. Failure of an engineman properly to control the speed of his train when approaching a meeting point	1973	1		39	1
114. Misunderstanding a yardmaster's instructions concerning one yard movement, and failure to provide adequate safeguards for another yard movement	1974	1	1	1	
115. Failure of a freight train to be properly protected by flag and by the failure of a passenger train to be operated under proper control in view of the fact that the crew held an order directing the freight train to run ahead of them until overtaken	1982	1		17	1
116. Failure of the engineman of the passenger train properly to control the speed of his train when approaching interlocking limits and to obey the stop indication of the home signal	1990	1		6	
117. Failure of the freight train to clear the time of an opposing superior train	1995	1	2	13	1
118. Making of an unauthorized movement on the main line without being properly protected by flag, by the issuance of an improper order by the dispatcher, and by the acceptance of such improper order by the crew of Train No. 32	1999	1		5	2
119. Excessive speed on a sharp curve, the engineman having lost control of the train on a steep descending grade	2001	1	4	8	1
120. Failure of the engineman of the M&E train properly to control speed of his train and approach crossing at grade of the PRR prepared to stop	2005	1		1	2
121. Failure of a rail motor car to keep clear of an opposing scheduled freight train	2008	1		4	
122. Failure of an engineman properly to observe and obey signal indications, and by failure of a flagman and conductor to provide proper flag protection	2013	1	1	3	
123. Train running away on a heavy mountain grade, due to the fact that the portion of the train left standing on the grade was not properly secured before engine cut off	2017	1		1	1
124. Operation of a motor car and trailer on the time of an opposing overdue train without protection	2021	1	1	1	
125. Failure of an engineman to operate his train under proper control within yard limits	2027	1	2	1	2
126. Failure to operate under proper control when approaching and entering yard limits, coupled with failure properly to observe and obey signal indications					
127. Operation of an extra train					

JURED	NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE									TOTAL			
										70 CARS AND LESS		OVER 70 CARS	
	40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT.
(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
3	1												
3		1		1									
2	1												
5							1						
1		1											
2					1								
3	1		1										
1	1	1											
2	2												
50	1												
39		1											
1						1							
17	1												
6				1									
13	1												
5	2												
8	1												
1	2												
4								1					
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1		1											
1				1									
1	2												
	1			1									

I. NEGLIGENCE OF EMPLOYEES:				
(G) Other Forms of Negligence of Employees: (Continued)				
103. Violation of the operating rules by a train dispatcher in completing a meet order to an inferior train before he had obtained the signature of the conductor of the superior train and to disregard of a train order signal in stop position by a conductor and an engineman	1772	1	3	3
104. Primarily by the failure of an engineman to have the headlight of his engine displayed, and by his failure to provide such other flag protection as was necessary in view of the fact that he did not know whether the rear of his train was in the clear	1797	1		3
105. Primarily by the failure of the fireman of the train to maintain a proper lookout while approaching a railroad crossing at grade; contributing causes were the failure of the enginemen of both trains to approach the crossing with their trains under full control	1841	1		2
106. Operation of the light engine against an opposing superior train without authority, and by the failure of the crew of the light engine properly to observe and obey the stop indication of a manual block signal	1865	1	1	5
107. Operation of an extra ahead of a first-class train without sufficient time to clear as required by the rules, and by the failure of an engineman properly to control the speed of his train after being flagged	1867	1		1
108. Failure of an engineman properly to observe and obey signal indications and also the stop signals of a flagman	1901	1		2
109. Failure of an operator to display the train-order signal and to deliver a hold order to the crew of the extra and by his further error in lining up the route and displaying signal indications admitting this train to a block which he had pledged to and which was occupied by an opposing train	1909	1	1	3
110. Failure of an operator to restore a cross-over switch to normal position, resulting in a freight train being operated against the current of traffic without protection	1940	1	1	1
111. Failure of the freight train to be operated under proper control within yard limits; the failure of the fireman and head brakeman of that train to maintain a proper lookout, and the defective condition of the brake valve which prevented the engineman from making an emergency application of the brakes	1954	1		2
112. Primarily by the failure of an engineman properly to obey signal indications, while the passenger train flagman did not go back as far as he could have gone in the time available	1964	1		2
113. Failure of an engineman properly to control the speed of his train when approaching a meeting point	1973	1		39
114. Misunderstanding a yardmaster's instructions concerning one yard movement, and failure to provide adequate safeguards for another yard movement	1974	1	1	1
115. Failure of a freight train to be properly protected by flag and by the failure of a passenger train to be operated under proper control in view of the fact that the crew held an order directing the freight train to run ahead of them until overtaken	1982	1		17
116. Failure of the engineman of the passenger train properly to control the speed of his train when approaching interlocking limits and to obey the stop indication of the home signal	1990	1		6
117. Failure of the freight train to clear the time of an opposing superior train	1995	1	2	13
118. Making of an unauthorized movement on the main line without being properly protected by flag, by the issuance of an improper order by the dispatcher, and by the acceptance of such improper order by the crew of Train No. 32	1999	1		5
119. Excessive speed on a sharp curve, the engineman having lost control of the train on a steep descending grade	2001	1	4	8
120. Failure of the engineman of the N&LE train properly to control speed of his train and approach crossing at grade of the PRR prepared to stop	2005	1		1
121. Failure of a rail motor car to keep clear of an opposing scheduled freight train	2008	1		4
122. Failure of an engineman properly to observe and obey signal indications, and by failure of a flagman and conductor to provide proper flag protection	2013	1	1	3
123. Train running away on a heavy mountain grade, due to the fact that the portion of the train left standing on the grade was not properly secured before engine cut off	2017	1		1
124. Operation of a motor car and trailer on the time of an opposing overdue train without protection	2021	1	1	1
125. Failure of an engineman to operate his train under proper control within yard limits	2027	1	2	1
126. Failure to operate under proper control when approaching and entering yard limits, coupled with failure properly to observe and obey signal indications	2028	1	3	
127. Operation of an extra train on the time of a following superior train without authority and without adequate flag protection	2030	1	1	6
128. Operation of an extra train on close time ahead of a following superior train, and by failure properly to protect a back-up movement	2035	1		13
129. Failure of a hostler properly to control the speed of the light engines while moving over the main track within yard limits, by his failure to maintain a proper lookout, and by the fact that the double-heading cock was open on the engine being towed	2039	1		2
130. Primarily by the failure of the engineman of the freight to operate under control approaching a station in a dense fog; a contributing cause was failure of the flagman of the mixed train to provide proper flag protection in view of [illegible] conditions	2043			

(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
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3		1		1									
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13		1											
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	I. C. C. INVESTIGATION NUMBER	NUMBER OF ACCIDENTS	PERSONS		NUMBER OF VARIOUS LENGTH		
			KILLED	INJURED	40 AND LESS	41 TO 50	51 TO 60
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I. NEGLIGENCE OF EMPLOYES:							
(G) Other Forms of Negligence of Employes: (Continued)							
131. Failure of the flagman of the B&M train to maintain a proper lookout and to control the speed of his train properly while making a back-up movement and by failure of the conductor and flagman of the CV train properly to protect their train while moving from a passing track to the main track	2051	1	1		1		1
132. Failure of the freight train to be operated under proper control within yard limits	2062	1	1	3	1		
133. Failure of an engineman properly to control the speed of his train approaching a meeting point	2065	1	1	4	1	1	
134. Train being operated against the current of traffic without authority or protection	2067	1		1	1		
135. Failure of the switching crew to afford flag protection against a second-class train while occupying the main track, and by the freight train not being operated under proper control within yard limits	2071	1	2	1			
136. A conductor, when he entered a branch line, leaving a register slip at the junction to cover the return movement from the branch before the movement was executed	2081	1	2	10	2		
137. Failure of a brakeman to ascertain that a coupling had been made between a car which was picked up and train against which it was placed	2090	1	1		1		
138. Failure of the _____ train to be operated under proper control on a yard track	2098	1	1	2			
139. Failure of the crew of the passenger train to obey a meet order and to comply with block-signal rules	2103	1		13			1
140. Failure of an operator to display a train-order signal and to deliver a "hold" order, and by his further failure to restore a block signal to stop position after the passage of a preceding train	2104	1		5			
141. Failure of a crew to comply with the rule which required trains in the same direction to keep at least 10 minutes apart, where no form of block signal was in use; a contributing cause was the failure of a conductor to provide adequate protection for the rear of his train	2116	1	1	3	2		
142. Failure to operate under proper control within yard limits	2117	1		4			
143. Failure to provide adequate flag protection, and by the failure of the enginemen of the following train to operate under such control, in view of existing weather conditions, as would enable him to comply with signal indications	2119	1		3			
144. Train entering a block without authority and by failure of the crew of that train to provide adequate flag protection before making a cross-over movement	2124	1		2	1		
145. Route being changed directly in front of an approaching train as a result of failure properly to identify such train	2125	1	1	4			1
146. Failure of a crew properly to protect a cross-over movement and by the failure of an engineman properly to observe and obey such signal indications	2129	1	3		1		
147. Failure of Extra 1207 to be operated under proper control within yard limits	2132	1	2	15	2		
148. Failure of a flagman to provide protection for a work extra occuping the main track on the time of an overdue superior train; a contributing cause was the operation of a freight train at an excessive rate of speed after having received a caution block-signal indication	2134	1	1	3			1
149. Failure of the train to be properly protected by flag and of the following train to be operated in accordance with automatic block-signal indications	2135	1	1	1	1		
150. Failure of train No. 167 to be operated in compliance with signal indications and by the failure of Extra 1424 to be properly protected by flag	2139	1	1	2		1	
151. Failure properly to protect a back-up movement	2140	1	1		2		
152. Failure to provide flag protection and by failure properly to observe and obey block-signal indications	2147	1	3	4			
153. Failure to properly observe and obey signal indications and failure properly to protect the rear of a standing train	2152	1		2	2		
154. Failure properly to control the speed of a train when approaching a cross-over, due in part to a partly closed angle cock which prevented the engineman from obtaining normal braking throughout the train	2153	1		1	1		
155. Failure properly to control the speed of _____ train No. 84 when approaching a railroad crossing at grade	2154	1	1	1	1	1	
156. Failure to operate train Second No. 47 under control within yard limits	2155	1	2	1			

	NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE									TOTAL			
										70 CARS AND LESS		OVER 70 CARS	
JURED	40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT.
(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	1		1										
3	1												
4	1	1											
1	1												
1				1									
10	2												
	1												
2				1									
13			1										
5					1								
3	2												
4				2									
3		1		1									
2	1			1									
4			1				1						
	1				1								
15	2												
3			1										
1	1			1									
2		1		1									
	2												
4						1	1						
2	2												
1	1												
1	1	1											

I. NEGLIGENCE OF EMPLOYES:						
(C) Other Forms of Negligence of Employes: (Continued)						
131. Failure of the flagman of the BBB train to maintain a proper lookout and to control the speed of his train properly while making a back-up movement and by failure of the conductor and flagman of the CV train properly to protect their train while moving from a passing track to the main track	2051	1	1		1	
132. Failure of the freight train to be operated under proper control within yard limits	2062	1	1	3	1	
133. Failure of an engineman properly to control the speed of his train approaching a meeting point	2065	1	1	4	1	1
134. Train being operated against the current of traffic without authority or protection	2067	1		1	1	
135. Failure of the switching crew to afford flag protection against a second-class train while occupying the main track, and by the freight train not being operated under proper control within yard limits	2071	1	2	1		
136. A conductor, when he entered a branch line, leaving a register slip at the junction to cover the return movement from the branch before the movement was executed	2081	1	2	10	2	
137. Failure of a brakeman to ascertain that a coupling had been made between a car which was picked up and train against which it was placed	2090	1	1		1	
138. Failure of the _____ train to be operated under proper control on a yard track	2098	1	1	2		
139. Failure of the crew of the passenger train to obey a meet order and to comply with block-signal rules	2103	1		13		
140. Failure of an operator to display a train-order signal and to deliver a "hold" order, and by his further failure to restore a block signal to stop position after the passage of a preceding train	2104	1		5		
141. Failure of a crew to comply with the rule which required trains in the same direction to keep at least 10 minutes apart, where no form of block signal was in use; a contributing cause was the failure of a conductor to provide adequate protection for the rear of his train	2116	1	1	3	2	
142. Failure to operate under proper control within yard limits	2117	1		4		
143. Failure to provide adequate flag protection, and by the failure of the enginemen of the following train to operate under such control, in view of existing weather conditions, as would enable him to comply with signal indications	2119	1		3		1
144. Train entering a block without authority and by failure of the crew of that train to provide adequate flag protection before making a cross-over movement	2124	1		2	1	
145. Route being changed directly in front of an approaching train as a result of failure properly to identify such train	2125	1	1	4		
146. Failure of a crew properly to protect a cross-over movement and by the failure of an engineman properly to observe and obey such signal indications	2129	1	3		1	
147. Failure of Extra 1207 to be operated under proper control within yard limits	2132	1	2	15	2	
148. Failure of a flagman to provide protection for a work extra occuping the main track on the time of an overdue superior train; a contributing cause was the operation of a freight train at an excessive rate of speed after having received a caution block-signal indication	2134	1	1	3		
149. Failure of the train to be properly protected by flag and of the following train to be operated in accordance with automatic block-signal indications	2135	1	1	1	1	
150. Failure of train No. 167 to be operated in compliance with signal indications and by the failure of Extra 1424 to be properly protected by flag	2139	1	1	2		1
151. Failure properly to protect a back-up movement	2140	1	1		2	
152. Failure to provide flag protection and by failure properly to observe and obey block-signal indications	2147	1	3	4		
153. Failure to properly observe and obey signal indications and failure properly to protect the rear of a standing train	2152	1		2	2	
154. Failure properly to control the speed of a train when approaching a cross-over, due in part to a partly closed angle cock which prevented the enginemen from obtaining normal braking throughout the train	2153	1		1	1	
155. Failure properly to control the speed of _____ train No. 84 when approaching a railroad crossing at grade	2154	1	1	1	1	1
156. Failure to operate train Second No. 47 under control within yard limits	2155	1	2	1		
157. Open switch and failure of those on the engine of train Second No. 52 to maintain a proper lookout of the track ahead	2158	1	2	1		
158. Failure of Extra 2002 to be operated under proper control within yard limits	2162	1	2	3	2	
159. Engine 2505 fouling the clearance point of a switch, while another train was passing	2163	1	1	2		
160. Failure to obey a wait order; a contributing cause was the failure of an extra train to clear the time of an opposing regular train as required by rule	2166	1	1	22	1	
161. Freight train fouling the clearance point of a main-track switch directly in front of an approaching superior train	2177	1		3		
162. Failure to operate Extra 101 under control within yard limits	2184	1	2	1	1	

Jurisdiction (4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	1		1										
3	1												
4	1	1											
1	1												
1				1									
10	2												
	1												
2				1									
13			1										
5					1								
3	2												
4				2									
3		1		1									
2	1			1									
4			1				1						
	1				1								
15	2												
3			1										
1	1			1									
2		1		1									
	2												
4						1	1						
2	2												
1	1												
1	1	1											
1				1									
1			1										
3	2												
2								1					
22	1												
3							1						
1	1		1										

	I. C. C. INVESTIGATION NUMBER	NUMBER OF ACCIDENTS	PERSONS		NUMBER OF FREI VARIOUS LENGTHS I			
			KILLED	INJURED	40 AND LESS	41 TO 50	51 TO 60	61 TO 70
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I. NEGLIGENCE OF EMPLOYES:								
(G) Other Forms of Negligence of Employes: (Continued)								
163. Failure to obey a meet order, due to the order having been misread by the engineman; also by failure to operate under proper control within yard limits	2187	1		2	1	1		
164. Failure to operate under proper control within yard limits	2188	1	1	2	2			
165. Failure of the engine crew of a work extra to maintain a proper lookout when making a movement within working limits	2191	1	3		1			
166. Failure of a train crew to discover that a coupling between two cuts of cars had not been properly made, and failure to have a member of the train crew stationed on the leading car of the cut of cars being pushed into the storage track	2195	1	2		1			
167. Failure to provide adequate flag protection while a rail was being replaced in the track	2196	1	2	6	1			
168. Failure of the crew of the work train to clear a superior train before the wait requirements set up for that train by train order had expired	2199	1	3	5	1			
169. Failure of second 92 to be operated under proper control when approaching and entering yard limits; a contributing cause was the failure of first 92 to provide adequate flag protection within yard limits when carrying passengers	2202	1		5			1	
170. Operation of a section motorcar on the main track too close to the time of a following train and failure of the crew of the motor car to provide adequate flag protection	2204	1	1	2			1	
171. Failure of the crew of the yard engine to operate under control on a siding	2214	1	1	3			1	
172. Failure of the passenger train to be operated in accordance with the requirements of a caution card in manual-block territory, and the failure of the crew of the freight train to provide adequate flag protection	2215	1	3	10				
173. Failure of the passenger train to be operated under control in yard limits, and failure of the crew of the freight train fully to carry out the requirements of the flagging rule	2220	1	1	3	1			
174. Failure of Extra 2007 to be operated under proper control within yard limits	2232	1	1	1	1			
175. Failure properly control the speed of an extra train entering yard limits, possibly due to some mental disorder of the engineman operating the locomotive of that train	2233	1	2		1	1		
176. Failure of the mixed train to be operated under control within yard limits, and the failure of the freight train to provide adequate rear-end protection in foggy weather	2240	1	1		1			
177. Failure to require a trainman to occupy a conspicuous position on the leading car of a cut of cars being shoved on a yard track	2244	1	1		1	1		
178. Failure of the freight train crew to provide adequate rear-end protection, and by the action of the dispatcher in authorizing the passenger train to enter an occupied block under a clear manual block signal	2246	1		2				1
179. Failure to properly control the speed of a freight train within yard limits, particularly in view of existing weather conditions	2247	1	2	2	1			
180. Cars being backed into a short stub-end house track by mistake, instead of into the siding as instructed	2248	1	1		1			
181. Failure of the superior train to stop clear of the switch used by the train being met in entering the siding at a train-order meeting point	2253	1	1	4				
182. Failure of Extra 312 to provide flag protection within yard limits while carrying passengers, and the failure of Extra 5604 to be operated under control within yard limits	2257	1	5	33				
183. Failure of the crew of Extra 1384 properly to observe and obey signal indications, and to comply with the requirements of Rule 93	2260	1	2		2			
184. Failure properly to control the speed of a light engine, due to the engineman falling asleep	2262	1	1	2				
185. Failure of the yard engine to be operated under proper control within yard limits	2263	1		3		1		
186. Failure of an inferior train to clear the time of a superior train and to furnish flag protection as required by the rules, and the failure of the superior train to be stopped short of a block signal displaying a stop indication	2264	1		18			1	
187. Leverman failing definitely to ascertain that the route was properly line before clearing a signal for a passenger train to proceed through the interlocking, resulting in the diversion of that train to an occupied nonsignaled yard track	2273	1		6	1			
188. Failure properly to protect the rear end of the leading train, and by failure of the light engine to be operated in accordance with signal rules	2280	1		4	1			
	[illegible]	1	1	2	1			

	NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE									TOTAL			
										70 CARS AND LESS		OVER 70 CARS	
ED	40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT.
)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
2	1	1											
2	2												
	1												
	1												
6	1												
5	1												
5			1		1								
2			1										
3			1										
0					1								
3	1												
1	1				1								
	1	1											
	1				1								
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2				1									
2	1												
	1												
4						1							
13					1								
	2												
2					1								
3		1											
18			1										
6	1												
4	1												
2	1												

	NUMBER (1)	ACCIDENTS (2)	KILLED (3)	INJURED (4)	(5)	(6)	(7)	(8)
I. NEGLIGENCE OF EMPLOYES:								
(G) Other Forms of Negligence of Employes: (Continued)								
163. Failure to obey a meet order, due to the order having been misread by the engineman; also by failure to operate under proper control within yard limits	2187	1		2	1	1		
164. Failure to operate under proper control within yard limits	2188	1	1	2	2			
165. Failure of the engine crew of a work extra to maintain a proper lookout when making a movement within working limits	2191	1	3		1			
166. Failure of a train crew to discover that a coupling between two cuts of cars had not been properly made, and failure to have a member of the train crew stationed on the leading car of the cut of cars being pushed into the storage track	2195	1	2		1			
167. Failure to provide adequate flag protection while a rail was being replaced in the track	2196	1	2	6	1			
168. Failure of the crew of the work train to clear a superior train before the wait requirements set up for that train by train order had expired	2199	1	3	5	1			
169. Failure of second 92 to be operated under proper control when approaching and entering yard limits; a contributing cause was the failure of first 92 to provide adequate flag protection within yard limits when carrying passengers	2202	1		5			1	
170. Operation of a section motorcar on the main track too close to the time of a following train and failure of the crew of the motor car to provide adequate flag protection	2204	1	1	2			1	
171. Failure of the crew of the yard engine to operate under control on a siding	2214	1	1	3			1	
172. Failure of the passenger train to be operated in accordance with the requirements of a caution card in manual-block territory, and the failure of the crew of the freight train to provide adequate flag protection	2215	1	3	10				
173. Failure of the passenger train to be operated under control in yard limits, and failure of the crew of the freight train fully to carry out the requirements of the flagging rule	2220	1	1	3	1			
174. Failure of Extra 2007 to be operated under proper control within yard limits	2232	1	1	1	1			
175. Failure properly control the speed of an extra train entering yard limits, possibly due to some mental disorder of the engineman operating the locomotive of that train	2233	1	2		1	1		
176. Failure of the mixed train to be operated under control within yard limits, and the failure of the freight train to provide adequate rear-end protection in foggy weather	2240	1	1		1			
177. Failure to require a trainman to occupy a conspicuous position on the leading car of a cut of cars being shoved on a yard track	2244	1	1		1	1		
178. Failure of the freight train crew to provide adequate rear-end protection, and by the action of the dispatcher in authorizing the passenger train to enter an occupied block under a clear manual block signal	2246	1		2				1
179. Failure to properly control the speed of a freight train within yard limits, particularly in view of existing weather conditions	2247	1	2	2	1			
180. Cars being backed into a short stub-end house track by mistake, instead of into the siding as instructed	2248	1	1		1			
181. Failure of the superior train to stop clear of the switch used by the train being met in entering the siding at a train-order meeting point	2253	1	1	4				
182. Failure of Extra 312 to provide flag protection within yard limits while carrying passengers, and the failure of Extra 5604 to be operated under control within yard limits	2257	1	5	33				
183. Failure of the crew of Extra 1384 properly to observe and obey signal indications, and to comply with the requirements of Rule 93	2260	1	2		2			
184. Failure properly to control the speed of a light engine, due to the engineman falling asleep	2262	1	1	2				
185. Failure of the yard engine to be operated under proper control within yard limits	2263	1		3		1		
186. Failure of an inferior train to clear the time of a superior train and to furnish flag protection as required by the rules, and the failure of the superior train to be stopped short of a block signal displaying a stop indication	2264	1		18			1	
187. Leverman failing definitely to ascertain that the route was properly line before clearing a signal for a passenger train to proceed through the interlocking, resulting in the diversion of that train to an occupied nonsignaled yard track	2273	1		6	1			
188. Failure properly to protect the rear end of the leading train, and by failure of the light engine to be operated in accordance with signal rules	2280	1		4	1			
189. Failure to operate the freight train under proper control within yard limits	2281	1	1	2	1			
190. Failure of Extra 928 to provide proper flag protection and by the failure of Extra 1064 to be operated in accordance with the interlocking home signal indication	2283	1		3	1		1	
191. Failure of a motor-car to clear the main track for a freight train or to provide flag protection, on account of over-estimating the running time of the freight train	2293	1		5	1			
192. Failure of an inferior train to clear the schedule time of an opposing superior train as required by rule	2297	1	1	26		1		
193. Failure to operate a train under proper control prepared to stop before reaching the crossing gates at a railroad intersection	2298	1	1	2		1	1	
194. Inferior train occuping the main track without authority on the time of a following first-class train, and not providing proper protection	2301	1		11	1			

)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
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2	2												
	1												
	1												
6	1												
5	1												
5			1		1								
2			1										
3			1										
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13					1								
	2												
2					1								
3		1											
18			1										
6	1												
4	1												
2	1												
3	1		1										
5	1												
36		1			0								
2		1	1										
11	1												

	I. C. C. INVESTIGATION NUMBER	NUMBER OF ACCIDENTS	PERSONS		NUMBER OF FREIGHT VARIOUS LENGTHS IN			
			KILLED	INJURED	40 AND LESS	41 TO 50	51 TO 60	61 TO 70
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I. NEGLIGENCE OF EMPLOYES:								
(G) Other Forms of Negligence of Employes: (Continued)								
195. Failure to maintain a proper lookout from both trains and to proceed under proper control prepared to stop when approaching a railroad crossing at grade	2306	1		10	1			
196. Failure to route a west-bound train on the westward track as intended, failure to correctly record its movement on the eastward track over a route which had been set up for a preceding train and subsequent authorization for an east-bound train to pass a home interlocking signal, displaying stop, when the eastward track was occupied by the opposing train	2307	1	1	20				
197. Failure to operate the freight train under proper control within yard limits	2311	1	1	4	1			
198. Failure to operate Extra 1843 in accordance with signal indications and by failure of Extra 1539 to furnish adequate flag protection	2320	1		5	2			
199. Failure properly to obey signal indications and failure to move under proper control within yard limits prepared to stop unless the track was seen or known to be clear	2322	1		5			1	
200. Failure of the _____ train to stop at a railroad crossing at grade which was occupied by a train on a conflicting route	2324	1		6	1			
201. Failure of the crews of both trains to maintain a proper lookout and to proceed under proper control prepared to stop when approaching a railroad crossing at grade	2329	1		4	2			
202. Failure of No. 238 to clear the time of an opposing superior train and to obey the stop indication of an automatic block signal, and probably also by failure of No. 107 properly to observe and obey an approach signal indication	2332	1	3	38		1		
203. Failure to secure a car on a grade, which resulted in the car sidesweeping the cab of the engine, damaging air, steam, and hot water connections, which compelled the engine crew to leave the engine without closing the throttle and in turn allowed the engine to move out of control	2333	1	2	17			1	
204. Failure to provide proper flag protection for the preceding train and by failure to operate the following train in accordance with interlocking signal indications	2339	1		2				
205. No. 197 occupying the main track without authority because of a misunderstanding of instructions, and failure to operate No. 940 in accordance with the yard limit rule	2342	1	1	1	2			
206. Switch being improperly lined immediately in front of an approaching train	2345	1		11	2			
207. Failure to observe that a movement was being made on the wrong track	2347	1	5	3	1			
208. Failure of Extra 843 to provide proper flag protection and by the failure to operate No. 325 in accordance with block-signal indications	2348	1		8				1
209. Failure to protect the rear end of the first train and by failure to control properly the speed of the second train in compliance with a permissive manual-block indication. The collision of the third train with the wreckage was caused by failure to provide proper flag protection.	2351	1	4	4			1	
210. Excessive speed on a sharp curve	2353	1	2					1
211. Failure to control properly the speed of a freight train approaching a meeting point	2366	1	1	4				
212. Failure to control properly the speed of a freight train when approaching a meeting point	2372	1		5				
213. Failure to control the speed of a train properly when approaching a meeting point	2380	1		32	1			
214. No. 71 being operated in accordance with the indication of a block signal which falsely displayed a proceed indication, instead of being operated under control within yard limits as required by the yard limit rule	2381	1		3				
215. Excessive speed on a sharp curve, because of failure to control the speed properly on a descending grade	2382	1	2		1			
216. Failure of a train to clear the time of an opposing superior train and failure to furnish proper flag protection after having failed to clear the time of the opposing superior train	2383	1		1			1	1
217. Failure to provide adequate flag protection for the preceding train and by failure to control the speed of the following train in compliance with a permissive-block indication	2384	1	1	2				2
218. A junction switch being opened without authority or instructions, which resulted in diverting an approaching train to an occupied track, and failure to control the speed of the passenger train properly when approaching a junction and when operating against the current of traffic within yard limits	2386	1	2	38	1			

	NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE									TOTAL			
										70 CARS AND LESS		OVER 70 CARS	
KILLED INJURED	40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT
(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
10	1												
20					1								
4	1												
5	2												
5			1										
6	1												
4	2							[redacted]					
38		1											
17			1										
2							1	1					
1	2												
11	2												
3	1												
8				1									
4			1			2							
				1									
4					2								
5								1					
32	1												
3					2								
	1												
1			1	1									
2				2									
38	1												

195. Failure to maintain a proper lookout from both trains and to proceed under proper control prepared to stop when approaching a railroad crossing at grade	2306	1		10	1		
196. Failure to route a west-bound train on the westward track as intended, failure to correctly record its movement on the eastward track over a route which had been set up for a preceding train and subsequent authorization for an east-bound train to pass a home interlocking signal, displaying stop, when the eastward track was occupied by the opposing train	2307	1	1	20			
197. Failure to operate the freight train under proper control within yard limits	2311	1	1	4	1		
198. Failure to operate Extra 1843 in accordance with signal indications and by failure of Extra 1539 to furnish adequate flag protection	2320	1		5	2		
199. Failure properly to obey signal indications and failure to move under proper control within yard limits prepared to stop unless the track was seen or known to be clear	2322	1		5			1
200. Failure of the ____ train to stop at a railroad crossing at grade which was occupied by a train on a conflicting route	2324	1		6	1		
201. Failure of the crews of both trains to maintain a proper lookout and to proceed under proper control prepared to stop when approaching a railroad crossing at grade	2329	1		4	2		
202. Failure of No. 238 to clear the time of an opposing superior train and to obey the stop indication of an automatic block signal, and probably also by failure of No. 107 properly to observe and obey an approach signal indication	2332	1	3	38		1	
203. Failure to secure a car on a grade, which resulted in the car sideswiping the cab of the engine, damaging air, steam, and hot water connections, which compelled the engine crew to leave the engine without closing the throttle and in turn allowed the engine to move out of control	2333	1	2	17			1
204. Failure to provide proper flag protection for the preceding train and by failure to operate the following train in accordance with interlocking signal indications	2339	1		2			
205. No. 197 occupying the main track without authority because of a misunderstanding of instructions, and failure to operate No. 94C in accordance with the yard limit rule	2342	1	1	1	2		
206. Switch being improperly lined immediately in front of an approaching train	2345	1		11	2		
207. Failure to observe that a movement was being made on the wrong track	2347	1	5	3	1		
208. Failure of Extra 843 to provide proper flag protection and by the failure to operate No. 325 in accordance with block-signal indications	2348	1		8			
209. Failure to protect the rear end of the first train and by failure to control properly the speed of the second train in compliance with a permissive manual-block indication. The collision of the third train with the wreckage was caused by failure to provide proper flag protection.	2351	1	4	4			1
210. Excessive speed on a sharp curve	2353	1	2				
211. Failure to control properly the speed of a freight train approaching a meeting point	2366	1	1	4			
212. Failure to control properly the speed of a freight train when approaching a meeting point	2372	1		5			
213. Failure to control the speed of a train properly when approaching a meeting point	2380	1		32	1		
214. No. 71 being operated in accordance with the indication of a block signal which falsely displayed a proceed indication, instead of being operated under control within yard limits as required by the yard limit rule	2381	1		3			
215. Excessive speed on a sharp curve, because of failure to control the speed properly on a descending grade	2382	1	2		1		
216. Failure of a train to clear the time of an opposing superior train and failure to furnish proper flag protection after having failed to clear the time of the opposing superior train	2383	1		1			1
217. Failure to provide adequate flag protection for the preceding train and by failure to control the speed of the following train in compliance with a permissive-block indication	2384	1	1	2			
218. A junction switch being opened without authority or instructions, which resulted in diverting an approaching train to an occupied track, and failure to control the speed of the passenger train properly when approaching a junction and when operating against the current of traffic within yard limits	2386	1	2	38	1		
219. Failure of an extra train to clear the time of an opposing first-class train	2388	1		49	1		
220. Failure to control the speed of a following train because of an open double-heading cock on the second engine	2391	1		6		1	
221. Failure to provide proper flag protection for the preceding train and by operation of the following train in automatic train-stop territory with the automatic train-stop and cab signal devices cut out, contrary to current instructions, resulting in an imperfectly displayed cab signal	2393	1		8			
222. Failure to provide proper flag protection for a work extra and by failure to operate a freight extra in accordance with signal indications	2396	1		5			
223. Engine occupying the main track without authority and without flag protection	2397	1	2	1	1		
224. Failure to control the speed of the second train in compliance with the rules applicable to train movements on an assigned track	2402	1	1	2	2		
TOTAL - NEGLIGENCE - OTHER FORMS OF NEGLIGENCE OF EMPLOYEES		226	247	1 400	169	34	35
GRAND TOTAL - NEGLIGENCE OF EMPLOYEES		348	390	2 428	258	53	45

10	1												
20					1								
4	1												
5	2												
5			1										
6	1												
4	2												
38		1											
17			1										
2							1	1					
1	2												
11	2												
3	1												
8				1									
4			1		2								
				1									
4					2								
5								1					
32	1												
3					2								
	1												
1			1	1									
2				2									
38	1												
49	1												
6		1					1						
8								1					
5						1							
1	1			1									
2	2												
1 400	163	34	35	35	22	11	11	10	321	267	83.2	54	16.8
2 428	258	53	45	53	31	22	15	22	499	409	82.0	90	18.0

	I. C. C. INVESTIGATION NUMBER	NUMBER OF ACCIDENTS	PERSONS		NUMBER OF FREIGHT VARIOUS LENGTHS IN C				
			KILLED	INJURED	40 AND LESS	41 TO 50	51 TO 60	61 TO 70	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
II. DEFECTS IN OR FAILURES OF EQUIPMENT:									
(A) Other Parts and Appurtenances of Locomotives and Tenders:									
1. Broken engine truck radius bar	1652	1	1	2		1			
2. Broken main rod	1749	1	1	1					
3. Rigid engine truck, due to a steel block having become wedged between the pedestal jaw and the swinging bolster, preventing the normal curving of the truck	2060	1		1					
4. Believed to have been caused by a stuck wedge	2100	1	2	1		1			
5. Loose pilot brace becoming lodged under the left wheel of the engine truck and forcing it off the rail	2266	1	1	5					
6. Rigid engine truck, due to the engine-truck swing center-plate casting being fouled by a displaced swing-hanger pin	2276	1	1			1			
7. Wear on the bearings on the cradle castings of the engine truck, combined with the wear on the spring casing of the centering device of the trailer truck	2343	1	1			1			
8. Failure to lubricate properly the main boiler-bearing sliding plate of an articulated locomotive (wreckage of which struck a freight train moving in the opposite direction on an adjacent track)	2369	1	3	5					
TOTAL - DEFECTS IN OR FAILURES OF LOCOMOTIVES AND TENDERS		8	10	15		4			
(B) Trucks:									
1. Broken arch bar	1396	1	4	1	1				
2. Broken arch bar	1404	1	2	1					
3. Broken arch bar	1798	1	2	5	1				
4. Broken arch bar	1819	1				1			
5. Broken arch bar	1947	1	1	1	1				
6. Failure of an arch bar truck under the thirteenth car in the train	1633	1	2			1			
7. Failure of an arch bar truck	1663	1	4						
8. Failure of an arch bar truck	1678	1	1	1	1				
9. Failure of an arch bar truck	1814	1	1		1				
10. Failure of an arch bar truck	1822	1	5	3					
11. Failure of an arch bar truck	1935	1	2	1			1	1	
12. Failure of an arch bar truck under the eighth car in the train	1791	1	1	2			1		
13. Believed to have been caused by the defective condition of a truck center plate of a car in a freight train	1419	1	1	24					
14. Failure of the rear truck of the nineteenth car in the freight train	1544	1	1	1	1				
15. Defective condition of a truck under one of the cars in the first train to be derailed	1808	1	1	1					
16. Defective condition in the side bearings of a tank car	1832	1	2	3					
17. Failure of an arch bar truck	1971	1	1	1	1				
18. Collapse of the side frame of an arch bar truck	1975	1	3	1	1		1		
19. Broken arch bar	1976	1		1	2				
20. Broken arch bar	1988	1						1	
21. Broken arch bar	1996	1	2	4		1			
22. Broken arch bar	2016	1							

PERSONS KILLED (3)	PERSONS INJURED (4)	NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE: 40 AND LESS (5)	41 TO 50 (6)	51 TO 60 (7)	61 TO 70 (8)	71 TO 80 (9)	81 TO 90 (10)	91 TO 100 (11)	OVER 100 (12)	TOTAL (13)	TOTAL: 70 CARS AND LESS NO. (14)	70 CARS AND LESS PER CENT. (15)	OVER 70 CARS NO. (16)	OVER 70 CARS PER CENT. (17)
1	2		1											
1	1					1								
	1								1					
2	1		1											
1	5					1								
1			1											
1			1											
3	5								2					
10	15		4			2			3	9	4	44.4	5	55.6
4	1	1												
2	1						1							
2	5	1												
			1											
1	1	1												
2			1											
4						1								
1	1	1												
1		1												
5	3								1					
2	1			1	1				1					
1	2			1										
1	24						1							
1	1	1												
1	1					1	1							
2	3					1								
1	1	1												
3	1	1		1										
	1	2												
					1									
2	4		1											
							1							

(A) Other Parts and Appurtenances of Locomotives and Tenders:									
1. Broken engine truck radius bar	1652	1	1	2		1			
2. Broken main rod	1749	1	1	1					
3. Rigid engine truck, due to wheel block having become wedged between the pedestal jaw and the swinging bolster, preventing the normal curving of the truck	2060	1		1					
4. Believed to have been caused by a stuck wedge	2100	1	2	1		1			
5. Loose pilot truss becoming lodged under the left wheel of the engine truck and forcing it off the rail	2266	1	1	5					
6. Rigid engine truck, due to the engine-truck swing center-plate casting being fouled by a displaced swing-hanger pin	2276	1	1			1			
7. Wear on the bearings on the cradle castings of the engine truck, combined with the wear on the spring casing of the centering device of the trailer truck	2343	1	1			1			
8. Failure to lubricate properly the main boiler-bearing sliding plate of an articulated locomotive (wreckage of which struck a freight train moving in the opposite direction on an adjacent track)	2369	1	3	5					
TOTAL - DEFECTS IN OR FAILURES OF LOCOMOTIVES AND TENDERS		8	10	15		4			2
(B) Trucks:									
1. Broken arch bar	1396	1	4	1	1				
2. Broken arch bar	1404	1	2	1					
3. Broken arch bar	1798	1	2	5	1				
4. Broken arch bar	1819	1				1			
5. Broken arch bar	1947	1	1	1	1				
6. Failure of an arch bar truck under the thirteenth car in the train	1633	1	2			1			
7. Failure of an arch bar truck	1663	1	4						1
8. Failure of an arch bar truck	1678	1	1	1	1				
9. Failure of an arch bar truck	1814	1	1		1				
10. Failure of an arch bar truck	1822	1	5	3					
11. Failure of an arch bar truck	1935	1	2	1			1	1	
12. Failure of an arch bar truck under the eighth car in the train	1791	1	1	2			1		
13. Believed to have been caused by the defective condition of a truck center plate of a car in a freight train	1419	1	1	24					
14. Failure of the rear truck of the nineteenth car in the freight train	1544	1	1	1	1				
15. Defective condition of a truck under one of the cars in the first train to be derailed	1808	1	1	2					1
16. Defective condition in the side bearings of a tank car	1832	1	2	3					1
17. Failure of an arch bar truck	1971	1	1	1	1				
18. Collapse of the side frame of an arch bar truck	1975	1	3	1	1		1		
19. Broken arch bar	1976	1		1	2				
20. Broken arch bar	1988	1						1	
21. Broken arch bar	1996	1	2	4		1			
22. Broken arch bar	2016	1							
23. Failure of an arch bar truck	2047	1		2			1		
24. Failure of an arch bar truck	2072	1			1				
25. Broken arch bar	2092	1		2	1				
26. Failure of a truck side-frame	2110	1	1	3			1		
27. Failure of an arch bar truck	2167	1		1	1				

	I. C. C. INVESTIGATION NUMBER	NUMBER OF ACCIDENTS	PERSONS		NUMBER OF VARIOUS LENG		
			KILLED	INJURED	40 AND LESS	41 TO 50	51 TO 60
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
II. DEFECTS IN OR FAILURES OF EQUIPMENT:							
(B) Trucks: (Continued)							
28. Broken arch bar	2168	1		1		1	
29. Probably resulted from the breaking of an arch bar	2227	1	6	6	1		
30. Failure of an arch bar truck	2230	1		11			
31. Failure of a truck side frame	2308	1	1	4		1	
32. Lack of side bearing clearance at the leading end of the car being shoved, combined with a wrong truck side in the leading truck	2229	1	1		1		
TOTAL - DEFECTS IN OR FAILURES OF TRUCKS		32	45	81	13	5	5
(C) Wheels and Axles:							
1. Broken wheel	1459	1	2	21			
2. Broken wheel	1794	1	1	1			
3. Failure of a fusion welded axle on the front truck of the forty-seventh car in the freight train	1700	1	2	37			
4. Broken wheel, apparently due to the sticking of the air brakes	1735	1	1	9			
5. Broken wheel, apparently due to overheating	1764	1	1				
6. Broken journal, due to overheating	1845	1	1	6			
7. Burned off journal	1852	1	4	5		1	
8. Broken wheel, apparently due to overheating	1825	1	1	1			
9. Broken journal, due to overheating; the cause of overheating was not ascertained	1992	1	4	7			1
10. Broken journal	2010	1	4	7		1	
11. Broken wheel	2031	1	1	1	1		
12. Broken journal, due to its having been overheated	2044	1	1		1		
13. Broken wheel	2048	1	4	3	1		
14. Loose wheel	2099	1	1		1		
15. Broken journal, due to overheating	2123	1	1				
16. Broken journal, due to having been overheated	2269	1	2	3			
17. Broken wheel	2291	1	1	3			
18. Broken wheel, apparently caused by overheating	2338	1	1	1			1
TOTAL - DEFECTS IN OR FAILURES OF WHEELS AND AXLES		18	33	105	4	2	2
(D) Hand Brakes, Brake Rigging, and Appurtenances:							
1. Damaged switch resulting from a dragging brake rigging on a previous train contacting and bending the switch tie rods and pulling the switch point away from the stock rail	2378	1	3		1		
TOTAL - DEFECTS IN OR FAILURES OF HAND BRAKES, BRAKE RIGGING, AND APPURTENANCES		1	3		1		
(E) Power Brakes and Appurtenances, Except Air Reservoirs and Pumps on Locomotives:							
1. Failure of the engineman of one of the trains properly to control the speed of his train approaching a meeting point, due either to his failure to begin braking soon enough or to the improper functioning of the brakes	1488	1		1	1		1
TOTAL - DEFECTS IN OR FAILURES OF POWER BRAKES AND APPURTENANCES, EXCEPT AIR RESERVOIRS AND PUMPS ON LOCOMOTIVES		1		1	1		1
(F) Couplers:							

PERSONS		NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE									TOTAL			
											70 CARS AND LESS		OVER 70 CARS	
KILLED	INJURED	40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT
(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	1		1											
6	6	1												
	11								1					
1	4		1											
1		1												
45	81	15	5	5	2	3	4		3	37	27	73.0	10	27.0
2	21							1						
1	1							1						
2	37								1					
1	9								1					
1								1						
1	6						1							
4	5		1											
1	1					1								
	7			1										
	7		1											
1	1	1												
1		1												
4	3	1												
1		1												
1					1		1							
2	3					1								
1	3							1						
1	4			1										
33	105	4	2	2	1	2	2	4	2	19	9	47.4	10	52.6
3		1												
3		1								1	1	100.0	-	-
	1	1		1										
	1	1		1						2	2	100.0	-	-

28. Broken arch bar	1466	1		1		1		
29. Probably resulted from the breaking of an arch bar	2227	1	6	6	1			
30. Failure of an arch bar truck	2230	1		11				
31. Failure of a truck side frame	2308	1	1	4		1		
32. Lack of side bearing clearance at the leading end of the car being shoved, combined with a wrong truck side in the leading truck	2229	1	1		1			
TOTAL - DEFECTS IN OR FAILURES OF TRUCKS		32	45	81	15	5	5	
(C) Wheels and Axles:								
1. Broken wheel	1459	1	2	21				
2. Broken wheel	1794	1	1	1				
3. Failure of a fusion welded axle on the front truck of the forty-seventh car in the freight train	1700	1	2	37				
4. Broken wheel, apparently due to the sticking of the air brakes	1735	1	1	9				
5. Broken wheel, apparently due to overheating	1764	1	1					
6. Broken journal, due to overheating	1845	1	1	6				
7. Burned off journal	1852	1	4	5		1		
8. Broken wheel, apparently due to overheating	1825	1	1	1				
9. Broken journal, due to overheating; the cause of overheating was not ascertained	1992	1	4	7			1	
10. Broken journal	2010	1	4	7		1		
11. Broken wheel	2031	1	1	1	1			
12. Broken journal, due to its having been overheated	2044	1	1		1			
13. Broken wheel	2048	1	4	3	1			
14. Loose wheel	2099	1	1		1			
15. Broken journal, due to overheating	2123	1	1					
16. Broken journal, due to having been overheated	2269	1	2	3				
17. Broken wheel	2291	1	1	3				
18. Broken wheel, apparently caused by overheating	2338	1	1	1			1	
TOTAL - DEFECTS IN OR FAILURES OF WHEELS AND AXLES		18	33	105	4	2	2	1
(D) Hand Brakes, Brake Rigging, and Appurtenances:								
1. Damaged switch resulting from a dragging brake rigging on a previous train contacting and bending the switch tie rods and pulling the switch point away from the stock rail	2378	1	3		1			
TOTAL - DEFECTS IN OR FAILURES OF HAND BRAKES, BRAKE RIGGING, AND APPURTENANCES		1	3		1			
(E) Power Brakes and Appurtenances, Except Air Reservoirs and Pumps on Locomotives:								
1. Failure of the engineman of one of the trains properly to control the speed of his train approaching a meeting point, due either to his failure to begin braking soon enough or to the improper functioning of the brakes	1488	1		1	1		1	
TOTAL - DEFECTS IN OR FAILURES OF POWER BRAKES AND APPURTENANCES, EXCEPT AIR RESERVOIRS AND PUMPS ON LOCOMOTIVES		1		1	1		1	
(F) Couplers:								
1. Freight train broke in two, due to a low coupler	1399	1	1	2			1	
2. Train breaking in two, due to a defective coupler	1504	1		2				
3. Freight train parting between the third and fourth cars, due to a low coupler	1899	1						
4. Train breaking in two between the second and third cars due to the breaking of the coupler knuckle at the rear end of the second car	1905	1					1	
5. Broke in two, due to a defective knuckle, when uncoupling a helper engine from a train in motion	1965	1	2					

	1		1											
6	9	1												
	11									1				
1	4		1											
1		1												
43	81	15	5	5	2	3	4	6	3	37	27	73.0	10	27.0
2	21						1	1						
1	1							1						
2	37								1					
1	9								1					
1								1						
1	6						1							
4	5		1											
1	1					1								
1	7			1										
4	7		1											
1	1	1												
1		1												
4	3	1												
1		1												
1					1		1							
2	3					3								
1	3							1						
1	1			1										
33	105	4	2	2	1	2	2	4	2	19	9	47.4	10	52.6
3		1												
3		1								1	1	100,0	-	-
	2	1		1										
	1	1		1						2	2	100,0	-	-
1	2				1									
	2								1					
									1					
				1										
2					2									

5003

	1		1											
6	6	1												
	11								1					
1	4		1											
1		1												
45	81	15	5	5	2	3	4		3	37	27	73.0	10	27.0
2	21							1						
1	1							1						
2	37								1					
1	9								1					
1								1						
1	6						1							
4	5		1											
1	1					1								
1	7			1										
4	7		1											
1	1	1												
1		1												
4	3	1												
1		1												
1				1			1							
2	3					1								
1	3							1						
1	1			1										
33	105	4	2	2	1	2	2	4	2	19	9	47.4	10	52.6
3		1												
3		1								1	1	100.0	-	-
	1	1		1										
	1	1		1						2	2	100.0	-	-
1	2				1									
	2								1					
									1					
				1										
2					2			0						

	I. C. C. INVESTIGATION NUMBER	NUMBER OF ACCIDENTS	PERSONS		NUMBER VARIOUS LE		
			KILLED	INJURED	40 AND LESS	41 TO 50	51 TO 60
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
II. DEFECTS IN OR FAILURES OF EQUIPMENT:							
(F) Couplers: (Continued)							
6. Freight train breaking in two between the second and third cars on account of a low coupler, this condition being due to truck springs being compressed almost solid, while a contributing cause was the amount of free slack in the couplers.	2026	1		5			
7. Low coupler; a contributing cause was excessive free slack in the draft gears of both of the cars involved	2053	1		1			
8. Break in two of the train due to the failure of a coupler shank	2224	1		2			
9. Freight train parting between the ninth and tenth cars because of a low coupler	2330	1		1			
TOTAL - DEFECTS IN OR FAILURES OF COUPLERS		9	3	14			1
(G) Draft Rigging:							
1. Pulling out coupler as result of the coupler key working out	1433	1	4	8	1		
2. Freight train breaking in two between the twenty-fifth and twenty-sixth cars due to a defective coupler yoke	1625	1	1	1			
3. Pulled out coupler	1761	1	4				
4. Pulled out coupler	1768	1		54			
5. Breaking in two between the eighteenth and nineteenth cars due to a defective coupler yoke	1898	1	1				
6. Five cars and a caboose running away after a break in two, which resulted from a defective coupler yoke, and by the further fact that the air brakes were inoperative in this portion of the train because of a defective train pipe at the head end of a locomotive crane, the fifth car from the rear	2023	1	2	5	2		
7. Drawbar being pulled out of the front end of the eighteenth car, due to a broken coupler yoke	2200	1		4			1
TOTAL - DEFECTS IN OR FAILURES OF DRAFT RIGGING		7	12	72	3		1
(H) Car Bodies and Other Parts of Equipment:							
1. Buckling of a car in the freight train, causing the car ahead of it to foul the adjacent track, where it was struck by the passenger train	1575	1	1	25			
2. Break in two on account of a low coupler and excessive free slack in the draft gears and attachments	2106	1	1	4			
3. Train parting between the ninth and tenth cars in the train on account of a bent carrier iron, low coupler, and excessive free slack in the draft gear of a refrigerator car	2143	1		1			
TOTAL - DEFECTS IN OR FAILURES OF CAR BODIES		3	2	30			
GRAND TOTAL - DEFECTS IN OR FAILURES OF EQUIPMENT		79	108	318	24	11	10
III. DEFECTS IN OR IMPROPER MAINTENANCE OF WAY AND STRUCTURES:							
(A) Bridges, Trestles, Culverts and Tunnels:							
1. Collapse of a bridge due to its having been weakened by the derailment of a car in a preceding freight train	1412	1	2	2	1		
2. Collapse of a timber trestle under the train, probably resulting from removal of essential braces while the structure was undergoing extensive repairs	2002	1	5	3	1		
TOTAL - DEFECTS IN BRIDGES, TRESTLES, CULVERTS AND TUNNELS		2	7	5	2		
(B) Rails and Joints:							
1. Broken rail	1539	1	6	65			
2. Broken rail	1738	1	4	38			1
[illegible]	1742	1	2	2	1		

	NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE									TOTAL			
										70 CARS AND LESS		OVER 70 CARS	
S. INJURED	40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT.
(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
5						1							
1								1					
2						1							
1								1					
14			1	3		2		4	10	4	40.0	6	60.0
8	1												
1							1						
					1								
54							1						
					1								
5	2												
4			1										
72	3		1		2		2		8	4	50.0	4	50.0
25													
4						1		1					
1								1					
30						1		3	4	-	-	4	100.0
318	24	11	10	6	9	9	6	15	90	51	56.7	39	43.3
2	1			1									
3	1												
5	2			1					3	3	100.0	-	-
65								1					
38			1										

7. Low coupler; a contributing cause was excessive free slack in the draft gears of both of the cars involved	2053	1		1			
8. Break in two of the train due to the failure of a coupler shank	2224	1		2			
9. Freight train parting between the ninth and tenth cars because of a low coupler	2330	1		1			
TOTAL - DEFECTS IN OR FAILURES OF COUPLERS		9	3	14			1
(G) Draft Rigging:							
1. Pulling out coupler as result of the coupler key working out	1433	1	4	8	1		
2. Freight train breaking in two between the twenty-fifth and twenty-sixth cars due to a defective coupler yoke	1625	1	1	1			
3. Pulled out coupler	1761	1	4				
4. Pulled out coupler	1768	1		54			
5. Breaking in two between the eighteenth and nineteenth cars due to a defective coupler yoke	1898	1	1				
6. Five cars and a caboose running away after a break in two, which resulted from a defective coupler yoke, and by the further fact that the air brakes were inoperative in this portion of the train because of a defective train pipe at the head end of a locomotive crane, the fifth car from the rear	2023	1	2	5	2		
7. Drawbar being pulled out of the front end of the eighteenth car, due to a broken coupler yoke	2200	1		4			1
TOTAL - DEFECTS IN OR FAILURES OF DRAFT RIGGING		7	12	72	3		1
(H) Car Bodies and Other Parts of Equipment:							
1. Buckling of a car in the freight train, causing the car ahead of it to foul the adjacent track, where it was struck by the passenger train	1575	1	1	25			
2. Break in two on account of a low coupler and excessive free slack in the draft gears and attachments	2106	1	1	4			
3. Train parting between the ninth and tenth cars in the train on account of a bent carrier iron, low coupler, and excessive free slack in the draft gear of a refrigerator car	2143	1		1			
TOTAL - DEFECTS IN OR FAILURES OF CAR BODIES		3	2	30			
GRAND TOTAL - DEFECTS IN OR FAILURES OF EQUIPMENT		79	108	318	24	11	10
III. DEFECTS IN OR IMPROPER MAINTENANCE OF WAY AND STRUCTURES:							
(A) Bridges, Trestles, Culverts and Tunnels:							
1. Collapse of a bridge due to its having been weakened by the derailment of a car in a preceding freight train	1412	1	2	2	1		
2. Collapse of a timber trestle under the train, probably resulting from removal of essential braces while the structure was undergoing extensive repairs	2002	1	5	3	1		
TOTAL - DEFECTS IN BRIDGES, TRESTLES, CULVERTS AND TUNNELS		2	7	5	2		
(B) Rails and Joints:							
1. Broken rail	1539	1	6	65			
2. Broken rail	1738	1	4	38			1
3. Broken rail	1742	1	2	2	1		
4. Broken rail	1870	1	3	7			1
5. Broken rail	1945	1	1	1		1	
6. Broken rail	1956	1	2		1		
7. Broken rail	1985	1	1	3		1	
8. Broken rail	2082	1	2		1		
9. Broken rail	2176	1	3	7		1	
10. Broken rail	2302	1	1	5	1		
TOTAL - DEFECTS IN RAILS AND JOINTS		10	25	128	4	3	2

5						1							
1								1					
2						1							
1								1					
14			1	3		2		4	10	4	40.0	6	60.0
8	1												
1							1						
					1								
54							1						
					1								
5	2												
4			1										
72	3		1		2		2		8	4	50.0	4	50.0
25								1					
4						1		1					
1								1					
30						1		3	4	-	-	4	100.0
318	24	11	10	6	9	9	6	15	90	51	56.7	39	43.3
2	1			1									
3	1												
5	2			1					3	3	100.0	-	-
65								1					
38			1										
2	1												
7			1										
1		1											
	1												
3		1											
	1												
7		1											
5	1												
128	4	3	2					1	10	9	90.0	1	10.0

	I. C. C. INVESTI-GATION NUMBER	NUMBER OF ACCIDENTS	PERSONS KILLED	PERSONS INJURED	40 AND LESS	NUMBER OF FI VARIOUS LENGTH 41 TO 50	51 TO 60	6 T
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8
III. DEFECTS IN OR IMPROPER MAINTENANCE OF WAY AND STRUCTURES:								
(C) Frogs and Switches:								
1. Defective switch	1530	1	1	6	1			
2. A train was allowed to pass over a facing-switch point which was in process of being built up by welding	1857	1		4				
3. Split switch, due to the points opening under the train as the result of a broken connecting rod	1979	1	1	3	1			
4. Cocked or partly-opened switch	2088	1	5	4		1		
TOTAL - DEFECTS IN FROGS AND SWITCHES		4	7	17	2	1		
(D) Interlocking and Block Signal System:								
1. False clear indication of an interlocking signal, and by the failure of the block operator and the lever man to take the required measures to protect movement through the interlocking plant after warning devices had indicated that some part of the plant was not functioning properly	1838	1		6				
2. Proceed signal indication being improperly displayed, due to changes in the signal-control circuits which had been made by a signal maintainer	2118	1	1	3	2			
TOTAL - DEFECTS IN INTERLOCKING AND BLOCK SIGNAL		2	1	9	2			
(E) Miscellaneous:								
1. A track buckling under the train, due to excessive heat and the poor condition of the track	1430	1		16	1			
2. Poor track conditions	1475	1	2	1	1			
3. Poor track conditions	1545	1	1		1			
4. Buckling of the track under the train, due to the hot weather prevailing at the time	1657	1	3	2				
5. Kink in track	1776	1		2				
6. A sun kinked rail	1833	1	1	1			1	
7. Buckling of the track under the train due to the extreme heat prevailing at the time	1844	1	2	10				1
8. Believed to have been caused by track conditions which did not provide an adequate margin of safety, and operation of the train probably somewhat in excess of the maximum rate of speed permitted	1983	1	2		1			
9. Defective track which had not been maintained in condition to provide for the safe movement of trains at authorized speed	2011	1	1	2	1			
10. Kinked track and failure to make proper inspection and repairs after the track had been reported as being in damaged condition	2157	1		5		1		
11. Spread track and the high rail of the curve turning over, due to bad track conditions	2160	1	1		1			
12. Irregular track conditions	2169	1	1	1	1			
13. Kinked track	2286	1	2			1		
14. Track kinking under the train, resulting from the movement of the train over tight track which had been disturbed during track repair work	2358	1		3				
15. Kinked track	2361	1	1			1		
TOTAL - MISCELLANEOUS DEFECTS MAINTENANCE OF WAY		15	17	43	7	3	2	1
GRAND TOTAL - DEFECTS IN OR IMPROPER MAINTENANCE OF WAY AND STRUCTURES		33	57	202	17	7	4	2

NS INJURED	40 AND LESS	NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE								TOTAL			
		41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	70 CARS AND LESS		OVER 70 CARS	
										NO.	PER CENT.	NO.	PER CENT.
(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
6	1												
4					1		1						
3	1												
4		1											
17	2	1			1		1		5	3	60.0	2	40.0
6						1							
3	2												
9	2					1			3	2	66.7	1	33.3
16	1												
1	1												
	1												
2													
2					1								
1			1										
10				1									
	1												
2	1												
5		1											
	1												
1	1												
		1											
3					1								
		1											
43	7	3	2	1	2				15	13	86.7	2	13.3
202	17	7	4	2	3	1	1	1	36	30	83.3	6	16.7

	I. C. C. INVESTIGATION NUMBER	NUMBER OF ACCIDENTS	PERSONS		NUMBER VARIOUS	
			KILLED	INJURED	40 AND LESS	41 TO 50
	(1)	(2)	(3)	(4)	(5)	(6)
IV. MISCELLANEOUS CAUSES:						
(A) Ascertained Causes:						
1. Wing fence of a cattle guard that was lying on track	1395	1	1	2		
2. Automobile being driven upon crossing at grade directly in front of a passenger train which was approaching at high speed	1622	1	11	131	1	
3. Cocked or partly open switch, apparently due to tampering	1665	1	2	1	1	
4. Cocked switch, which had been tampered with by two young boys	1726	1	2	1	1	
5. Cocked or partly opened switch, due to malicious tampering	1732	1		3	1	
6. Cocked or partly opened switch, due to tampering	1795	1	1	3	1	
7. Cocked or partly opened switch	1904	1	1		1	
8. Cocked or partly opened switch	1917	1	1	2		
9. Open switch. (Responsibility not determined)	1724	1	2	2		1
10. Automobile being driven into the side of the train, for which the driver of the automobile was responsible	1785	1	1	4	1	
11. Large rock having fallen from the side of a cliff, fouling the track	1806	1	1	1		
12. Track spike having been placed on the track by an eight year old boy	1823	1	1	6		1
13. Rock slide	1872	1	4	2		
14. Land slide	1873	1	2	14		
15. Engine wheels striking one or more pieces of wood on the high rail of a curve	1878	1	1	7		1
16. Striking cattle on track	1879	1	5		1	
17. Large rock having fallen on track	1881	1	2	1	1	
18. Deep hard packed snow on the west rail of the track	1895	1	1	2	1	
19. Flangeways at a highway crossing being filled with dirt and stones	1653	1	1	4	1	
20. Washout	1523	1	2	3		
21. Washout	1533	1	2	1		1
22. Washout	1549	1	2		1	
23. Washout	1711	1	2	1		
24. Washout	1824	1	1	1	1	
25. Washout	1906	1	3			1
26. Washout	1927	1	2	1	1	
27. Washout	1931	1	1	2		1
28. Washout	1932	1	1	1	1	
29. Earth and rock which had fallen on the track from the side of a rocky cut	1959	1	2		1	
30. Train striking a bull which was on the track	1967	1	3	4	1	
31. Land and rock slide	1972	1	1	2		

NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE									TOTAL			
									70 CARS AND LESS		OVER 70 CARS	
40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT.
(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
				1								
1												
1												
1												
1												
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1												
			1									
	1											
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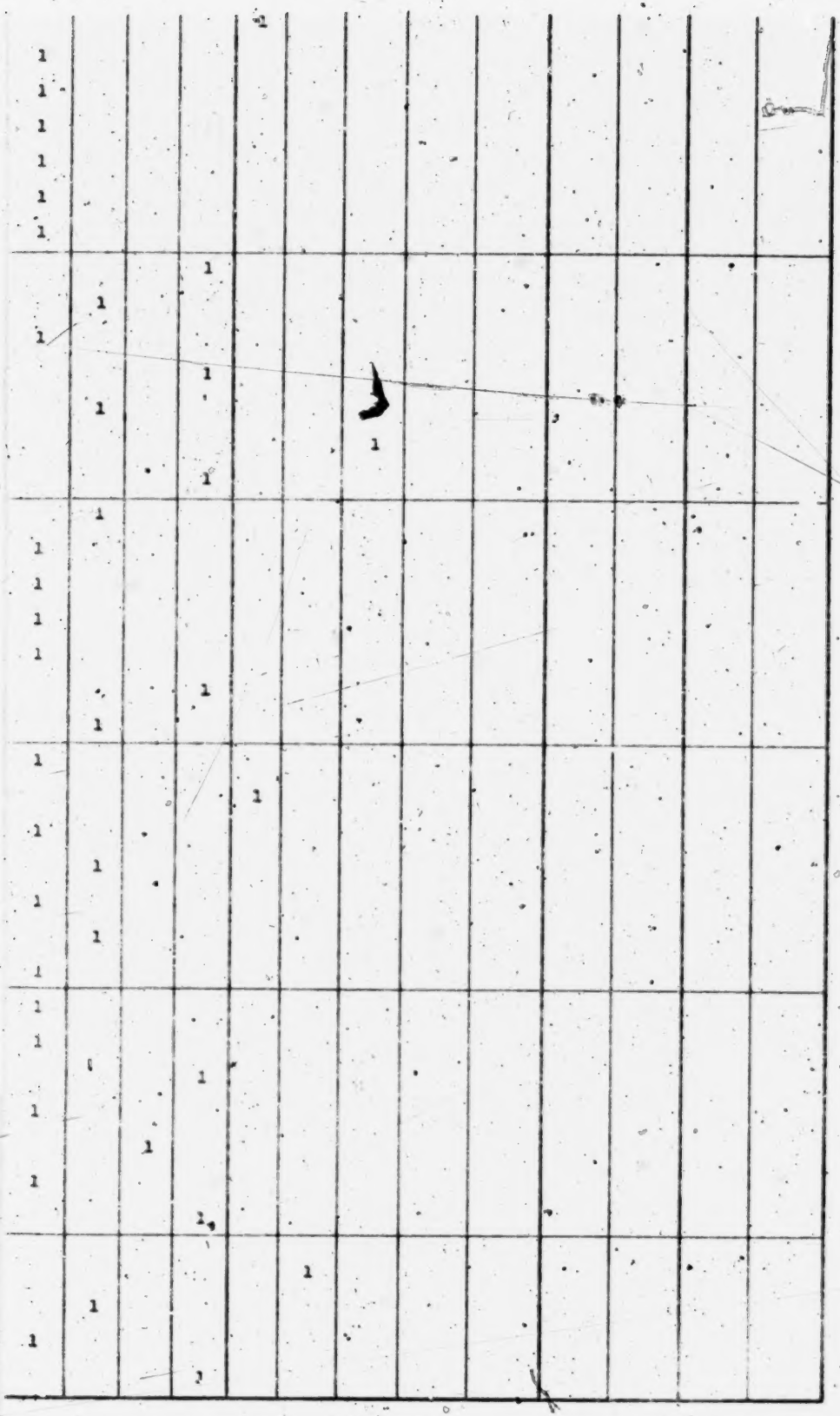
1. Wing fence of a cattle guard that was lying on track	1395	1	1	2					
2. Automobile being driven upon crossing at grade directly in front of a passenger train which was approaching at high speed	1622	1	11	11	1				
3. Cocked or partly open switch, apparently due to tampering	1665	1	2	1	1				
4. Cocked switch, which had been tampered with by two young boys	1726	1	2	1	1				
5. Cocked or partly opened switch, due to malicious tampering	1732	1		3	1				
6. Cocked or partly opened switch, due to tampering	1795	1	1	3	1				
7. Cocked or partly opened switch	1904	1	1		1				
8. Cocked or partly opened switch	1917	1	1	2				1	
9. Open switch. (Responsibility not determined)	1724	1	2	2		1			
10. Automobile being driven into the side of the train, for which the driver of the automobile was responsible	1785	1	1	4	1				
11. Large rock having fallen from the side of a cliff, fouling the track	1806	1	1	1				1	
12. Track spike having been placed on the track by an eight year old boy	1823	1	1	6		1			
13. Rock slide	1872	1	4	2					
14. Land slide	1873	1	2	14				1	
15. Engine wheels striking one or more pieces of wood on the high rail of a curve	1878	1	1	7		1			
16. Striking cattle on track	1879	1	5		1				
17. Large rock having fallen on track	1881	1	2	1	1				
18. Deep hard packed snow on the west rail of the track	1895	1	1	2	1				
19. Flangeways at a highway crossing being filled with dirt and stones	1653	1	1	4	1				
20. Washout	1523	1	2	3				1	
21. Washout	1533	1	2	1		1			
22. Washout	1549	1	2		1				
23. Washout	1711	1	2	1					1
24. Washout	1824	1	1	1	1				
25. Washout	1906	1	3			1			
26. Washout	1927	1	2	1	1				
27. Washout	1931	1	1	2		1			
28. Washout	1932	1	1	1	1				
29. Earth and rock which had fallen on the track from the side of a rocky cut	1959	1	2		1				
30. Train striking a bull which was on the track	1967	1	3	4	1				
31. Land and rock slide	1972	1	1	2				1	
32. Malicious tampering with the track	1984	1	2	1	1				
33. Large rock falling against the roadbed and knocking the track out of alignment	1986	1		4			1		
34. Open switch (Responsibility not determined)	1987	1	2	1	1				
35. Track spikes being placed on the track, one on each rail of a curve	1991	1	3	4				1	
36. Run-in of slack of sufficient force, when coupled with the rocking motion of a loaded tank car, to result in that car mounting the outside rail of a curve	1997	1	3	7					
37. Rock slide	2000	1	1	1		1			
38. Irregular track and improper side-bearing clearance of a tank car	2004	1	1		1				
39. Rock slide	2006	1	1	1				1	



	I. C. C. INVESTIGATION NUMBER	NUMBER OF ACCIDENTS	PERSONS		NUMBER OF FR... VARIOUS LENGTH...			
			KILLED	INJURED	40 AND LESS	41 TO 50	51 TO 60	6... TO 7...
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IV. MISCELLANEOUS CAUSES:								
(A) Ascertained Causes: (Continued)								
40. Washout	2007	1	3	1				
41. Automobile being driven upon a railroad crossing at grade directly in front of an approaching train	2020	1	2	2				
42. Bridge having been weakened due to high water, to such an extent that it collapsed under the weight of the train	1432	1	4		1			
43. A fill becoming saturated with moisture to such an extent as to result in its giving way under the weight of the engine	2041	1	2	1	1			
44. Condition of the fourteenth car in the train, which permitted the greater weight to be carried on the right side, and allowed an excessive rocking motion of the car when aggravated by irregular track conditions	2050	1		4	1		1	
45. Body of refrigerator car buckling out of the middle of the freight train due to severe slack action and fouling the adjacent truck directly in front of an approaching passenger train	2055	1	3	11				
46. Pilot of engine striking a car stake, which apparently resulted in taking enough weight off the engine-truck wheels to allow the left wheel to mount the high rail of a curve	2064	1	1	1			1	
47. Run-in of slack	2069	1	1				1	
48. Motor truck being driven upon a highway grade crossing directly in front of an approaching train	2074	1	3	2	1			
49. Washout	2075	1	1	2	1			
50. Open switch, due to a reinforcing bolt having become lodged between the normally closed switch point and the stock rail in such manner as to make it impossible to close and lock the switch, but permitting the improper display of proceed signal indications	2076	1	1	5			1	
51. Heavy rectangular, metal plate falling off a flat car and rolling under the truck of the following car	2083	1	1	1	1			
52. Piece of iron having been placed on the track by a 12-year old boy	2085	1	1	2				
53. Tank car rocking off the track on a curve, due principally to irregular track conditions	2094	1		3			1	
54. Train running off a derail which had been restored to its normal position by some unknown person	2105	1	1	1	1			
55. Land and rock slide	2109	1	2	3	1			
56. Ice in the flangeways of a highway crossing	2136	1	1	1		1		
57. Block of wood on the high rail of a curve	2194	1	2	1	1			
58. Collapse of a trestle which had been weakened by fire	2193	1	3		1			
59. Rock slide	2197	1	1	2	1			
60. Motor truck being driven upon a highway crossing at grade directly in front of an approaching train	2206	1	1	3	1			
61. Motor truck being driven upon a highway grade crossing directly in front of an approaching train	2207	1	1	4	1			
62. Probably due to a combination of a top-heavy load and a partially bound truck-center casting in the seventeenth car in the train, in conjunction with slight irregularities in the track	2216	1	2		1			
63. Cut of cars running away from a yard on a descending grade, due to the car rider falling from the car before a hand brake had been set	2221	1	1	1	1			
64. Excessive rocking motion of the tender, due to the rate of speed and the fact that water in the tank was low, resulting in reduced weight on the rear or leading tender truck	2234	1	1	1	1			
65. Landslide	2239	1	2	3			1	
66. Wheels of a tank car climbing the outside rail of a curve because of excessive side bearing clearance and irregularities in track surface, the car trucks being held rigid due to the brakes being applied when this car approached and entered upon this curve	2242	1	1	1	1			
67. Rock which had fallen upon the track	2258	1	1	2				
68. Excessive speed on a sharp curve, together with insecure track due to lack of ballast	2270	1	1	5		1		
69. Switch being inadvertently left open	2274	1		5		1		
70. Collapse of a bridge due to its being struck and weakened by the derailing equipment of a highway bridge located about 7 miles upstream								

NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE									TOTAL			
									70 CARS AND LESS		OVER 70 CARS	
40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT.
(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
			1									
			1									
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43. A fill becoming saturated with moisture to such an extent as to result in its giving way under the weight of the engine	2041	1	2	1
44. Condition of the fourteenth car in the train, which permitted the greater weight to be carried on the right side, and allowed an excessive rocking motion of the car when aggravated by irregular track conditions	2050	1		4
45. Body of refrigerator car buckling out of the middle of the freight train due to severe slack action and fouling the adjacent truck directly in front of an approaching passenger train	2055	1	3	11
46. Pilot of engine striking a car stake, which apparently resulted in taking enough weight off the engine-truck wheels to allow the left wheel to mount the high rail of a curve	2064	1	1	1
47. Run-in of slack	2069	1	1	
48. Motor truck being driven upon a highway grade crossing directly in front of an approaching train	2074	1	3	2
49. Washout	2075	1	1	2
50. Open switch, due to a reinforcing bolt having become lodged between the normally closed switch point and the stock rail in such manner as to make it impossible to close and lock the switch, but permitting the improper display of proceed-signal indications	2076	1	1	5
51. Heavy rectangular, metal plate falling off a flat car and rolling under the truck of the following car	2083	1	1	1
52. Piece of iron having been placed on the track by a 12-year old boy	2085	1	1	2
53. Tank car rocking off the track on a curve, due principally to irregular track conditions	2094	1		3
54. Train running off a derail which had been restored to its normal position by some unknown person	2105	1	1	1
55. Land and rock slide	2109	1	2	3
56. Ice in the flangeways of a highway crossing	2136	1	1	1
57. Block of wood on the high rail of a curve	2194	1	2	1
58. Collapse of a trestle which had been weakened by fire	2193	1	3	
59. Rock slide	2197	1	1	2
60. Motor truck being driven upon a highway crossing at grade directly in front of an approaching train	2206	1	1	3
61. Motor truck being driven upon a highway grade crossing directly in front of an approaching train	2207	1	1	4
62. Probably due to a combination of a top-heavy load and a partially bound truck-center casting in the seventeenth car in the train, in conjunction with slight irregularities in the track	2216	1	2	
63. Cut of cars running away from a yard on a descending grade, due to the car rider falling from the car before a hand brake had been set	2221	1	1	1
64. Excessive rocking motion of the tender, due to the rate of speed and the fact that water in the tank was low, resulting in reduced weight on the rear or leading tender truck	2234	1	1	1
65. Landslide	2239	1	2	3
66. Wheels of a tank car climbing the outside rail of a curve because of excessive side bearing clearance and irregularities in track surface, the car trucks being held rigid due to the brakes being applied when this car approached and entered upon this curve	2242	1	1	1
67. Rock which had fallen upon the track	2258	1	1	2
68. Excessive speed on a sharp curve, together with insecure track due to lack of ballast	2270	1	1	5
69. Switch being inadvertantly left open	2274	1		5
70. Collapse of a bridge due to its having been broken and weakened by the drifting wreckage of a highway bridge located about 7 miles upstream, which had been washed out by flood water	2275	1	2	1
71. Deposit of dirt upon the tracks at a road crossing, due to heavy rainfall	2295	1	3	1
72. Heavy run-in of slack due to a sudden stop following a heavy service brake-pipe reduction	2310	1		5
73. Failures of the couplers between the forty-sixth and forty-seventh cars to couple properly when the train was assembled	2314	1		1
74. School bus being driven upon a highway grade crossing directly in front of an approaching train	2315	1	24	15

	I. C. C. INVESTIGATION NUMBER	NUMBER OF ACCIDENTS	PERSONS KILLED	PERSONS INJURED	NUMBER OF FREIGHT TRAINS INVOLVED VARIOUS LENGTHS IN CARS, EXCLUSIVE O: 40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
IV. MISCELLANEOUS CAUSES:											
(A) Ascertained Causes: (Continued)											
75. Extra 3342 parting between the thirty-ninth and fortieth cars, owing primarily to a low coupler and a contributing factor of free slack in the draft gear, and the collision of the two portions of the train which resulted in the train buckling and fouling an adjacent track where it was struck by a passenger train	2316	1		6							
76. Train striking a rock which had fallen upon the track	2319	1	1	6				1			
77. Train striking rocks which had fallen upon the track	2325	1	3	1							
78. Striking a rock on the track, simultaneously with which the engine and tender were struck by a land slide	2327	1	1	1	1						
79. Collapse of a wooden bridge, which had been weakened by two bents being broken off and forced from under it, because of pressure exerted by debris and highwater	2331	1		2	1						
80. Engine-truck wheels being raised sufficiently for the flanges to pass over the rail, because of ice in the flangeways and along the rails adjacent to a planked road crossing	2334	1	1	1	1						
81. Rock and shale slide	2344	1	1	1		1					
82. Gasoline tank truck being driven upon a railroad crossing at grade immediately in front of an approaching train	2349	1	4						1		
83. Gasoline tank truck being driven upon a railroad crossing at grade directly in front of an approaching train	2350	1	1	3	1						
84. Washout	2354	1	2			1					
85. Washout	2367	1	1	2							
86. Train striking large rocks	2368	1	3				1				
87. Engine truck wheel striking a spike which had been placed on top of the high rail of a curve	2385	1	2	1				1			
TOTAL - MISCELLANEOUS CAUSES - ASCERTAINED CAUSES		87	168	336	42	13	9	11	4	3	1
(B) Unascertained Causes:											
1. Not definitely ascertained (derailment of pony-truck wheels of engine)	1703	1	1	3				1			
2. Not definitely ascertained (side collision)	1734	1	1	2						2	
3. Not definitely ascertained (derailment of engine)	1779	1	1	2			1				
4. Not definitely ascertained (derailment of cars)	1836	1	4						1		
5. Not definitely ascertained (derailment of cars)	1837	1	2	9						1	
6. Not definitely determined (side collision)	1750	1	3	14	1						
7. Not definitely determined (derailment of engine)	1913	1	1	1					1		
8. Not definitely determined (derailment of engine and cars)	1920	1	2	1				1			
9. Not definitely determined (derailment of engine and cars)	2070	1	3	4	1						
10. Not definitely determined (derailment of cars)	2095	1	5					1			
11. Not definitely determined; it was believed, however, to have been due to a broken rail (derailment of 2 engines and 25 cars)	2156	1	1	1					1		
12. Not definitely determined, but it was thought that some part of the brake rigging on the twenty-ninth car broke and fell across the north main track rail and acted as a derail (derailment of cars)	2180	1		1		1					
13. Not definitely ascertained (derailment of cars)	2181	1	1			1					

CARS INJURED	NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE									TOTAL			
										70 CARS AND LESS		OVER 70 CARS	
	40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT.
(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
6								1					
6				1									
1								1					
1	1												
2	1												
1	1												
1		1											
					1								
3	1												
		1											
2								1					
			1										
1				1									
336	42	13	9	11	4	3	1	5	88	75	85.2	13	14.8
3				1									
2						2							
2			1										
					1								
9						1							
14	1												
1					1								
1				1									
4	1												
				1									
1					1								
1		1											
		1											
5	1												
43	3	2	1	3	3	3			15	9	60.0	6	40.0

OBS. INJURED	NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE									TOTAL			
										70 CARS AND LESS		OVER 70 CARS	
	40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TOTAL	NO.	PER CENT.	NO.	PER CENT.
(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
6								1					
6				1									
1								1					
1	1												
2	1												
1	1												
1		1											
3	1				1								
2		1						1					
1			1	1									
336	42	13	9	11	4	3	1	5	88	75	85.2	13	14.8
3				1									
2						2							
2			1										
					1								
9						1							
14	1												
1					1								
1				1									
4	1												
				1									
1					1								
1		1								6			
		1											
5	1												
43	3	2	1	3	3	3			15	9	60.0	6	40.0
379	45	15	10	14	7	6	1	5	103	84	81.5	19	18.5

IV. MISCELLANEOUS CAUSES:									
(A) Ascertained Causes: (Continued)									
75. Extra 3342 parting between the thirty-ninth and fortieth cars, owing primarily to a low coupler and a contributing factor of free slack in the draft gear, and the collision of the two portions of the train which resulted in the train buckling and fouling an adjacent track where it was struck by a passenger train	2316	1		6					
76. Train striking a rock which had fallen upon the track	2319	1	1	6				1	
77. Train striking rocks which had fallen upon the track	2325	1	3	1					
78. Striking a rock on the track, simultaneously with which the engine and tender were struck by a land slide	2327	1	1	1	1				
79. Collapse of a wooden bridge, which had been weakened by two bents being broken off and forced from under it, because of pressure exerted by debris and highwater	2331	1		2	1				
80. Engine-truck wheels being raised sufficiently for the flanges to pass over the rail, because of ice in the flangeways and along the rails adjacent to a plowed road crossing	2334	1	1	1	1				
81. Rock and shale slide	2344	1	1	1		1			
82. Gasoline tank truck being driven upon a railroad crossing at grade immediately in front of an approaching train	2349	1	4						1
83. Gasoline tank truck being driven upon a railroad crossing at grade directly in front of an approaching train	2350	1	1	3	1				
84. Washout	2354	1	2			1			
85. Washout	2367	1	1	2					
86. Train striking large rocks	2368	1	3				1		
87. Engine truck wheel striking a spike which had been placed on top of the high rail of a curve	2385	1	2	1				1	
TOTAL - MISCELLANEOUS CAUSES - ASCERTAINED CAUSES		87	168	336	42	13	9	11	4
(B) Unascertained Causes:									
1. Not definitely ascertained (derailment of pony-truck wheels of engine)	1703	1	1	3				1	
2. Not definitely ascertained (side collision)	1734	1	1	2					
3. Not definitely ascertained (derailment of engine)	1779	1	1	2			1		
4. Not definitely ascertained (derailment of cars)	1836	1	4						1
5. Not definitely ascertained (derailment of cars)	1837	1	2	9					
6. Not definitely determined (side collision)	1750	1	3	14	1				
7. Not definitely determined (derailment of engine)	1913	1	1	1					1
8. Not definitely determined (derailment of engine and cars)	1920	1	2	1				1	
9. Not definitely determined (derailment of engine and cars)	2070	1	3	4	1				
10. Not definitely determined (derailment of cars)	2095	1	5					1	
11. Not definitely determined; it was believed, however, to have been due to a broken rail (derailment of 2 engines and 25 cars)	2156	1	1	1					1
12. Not definitely determined, but it was thought that some part of the brake rigging on the twenty-ninth car broke and fell across the north main track rail and acted as a derail (derailment of cars)	2180	1		1		1			
13. Not definitely ascertained (derailment of cars)	2181	1	1			1			
14. Not definitely determined (derailment of cars)	2186	1	3	5	1				
TOTAL - MISCELLANEOUS CAUSES - UNASCERTAINED CAUSES		14	28	43	3	2	1	3	3
GRAND TOTAL - MISCELLANEOUS CAUSES		101	196	379	45	15	10	14	7
GRAND TOTAL - ALL ACCIDENTS INVESTIGATED, ROAD FREIGHT TRAINS - ALL CAUSES		561	751	3 327	344	86	69	75	50

6								1					
6				1									
1								1					
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1		1											
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3	1												
		1											
2								1					
			1										
1				1									
336	42	13	9	11	4	3	1	5	88	75	85.2	13	14.8
3				1									
2						2							
2			1										
					1								
9						1							
14	1												
1					1								
1				1									
4	1												
				1									
1					1								
1		1											
		1											
5	1												
43	3	2	1	3	3	3			15	9	60.0	6	40.0
379	45	15	10	14	7	6	1	5	103	84	81.5	19	18.5
3 327	344	86	69	75	50	38	20	43	728	574	78.8	154	21.2

INDEX OF
INTERSTATE COMMERCE COMMISSION, BUREAU OF SAFETY,
ACCIDENT INVESTIGATION REPORTS,
YEARS 1928 TO 1939, INCLUSIVE

QUARTERLY SUMMARY NUMBER (1)	INVESTIGATION NUMBER (2)	NAME OF CARRIER (3)	LOCATION (4)	DATE (5)
35	1395	Missouri Pacific Railroad,	Lake View, Ark.,	January 27, 1928
35	1399	Southern Railway,	Flippen, Ga.,	February 15, 1928
35	1400	Cleveland Southwestern Railway & Light Co.	Brooks, Ohio,	February 19, 1928
35	1402	Erie Railroad,	Black Rock, N.Y.,	February 25, 1928
35	1406	New York, Chicago & St. Louis Railroad,	Tipton, Ind.,	March 12, 1928
35	1409	Pennsylvania Railroad,	Marsh Run, Pa.,	March 16, 1928
35	1410	Chicago, Burlington & Quincy Railroad,	St. Paul, Minn.,	March 23, 1928
35	1411	Union Pacific Railroad,	Loring, Kans.,	March 28, 1928
35	1412	St.Louis-San Francisco Railway,	Nash, Mo.,	March 29, 1928
36	1396	Boston & Maine Railroad,	Ballcah, N.H.,	February 13, 1928
36	1414	Reading Company,	Sunbury, Pa.,	April 9, 1928
36	1416	Baltimore & Ohio Railroad,	Bard, W. Va.,	May 6, 1928
36	1419	Pennsylvania Railroad,	Johnstown, Pa.,	May 20, 1928
36	1421	Pennsylvania Railroad,	Barberton, Ohio,	May 28, 1928
36	1426	New York, Chicago & St. Louis Railroad,	Somerville, Pa.,	June 13, 1928
37	1404	New York Central Railroad,	Watkins Glenn, N.Y.,	March 11, 1928
37	1430	Grand Trunk Western Railway,	Flushing, Mich.,	July 8, 1928
37	1432	Wabash Railway,	Missola, Iowa,	July 20, 1928
37	1433	Boston & Maine Railroad,	Farmington, N.H.,	July 22, 1928
37	1436	Wabash Railway,	Valley City, Ill.,	August 3, 1928
37	1438	Piedmont & Northern Railway,	Buncombe, S.C.,	August 11, 1928
37	1439	Missouri Pacific Railroad,	Waring, Kans.,	August 20, 1928
37	1441	Hocking Valley Railway,	Cummings, Ohio,	August 26, 1928
37	1442	Texas & Pacific Railway,	Shongaville, La.,	September 1, 1928
38	1447	Chicago & North Western Railway,	Crookston, Nebr.,	October 22, 1928
38	1448	Missouri Pacific Railroad,	Magnolia, Ark.,	October 23, 1928
38	1449	Union Pacific Railroad,	Green River, Wyo.,	October 24, 1928
38	1454	Gulf, Colorado & Santa Fe Railway,	Texas City Junction, Tex.	November 7, 1928
38	1457	Norfolk & Western Railway,	Fries Junction, Va.,	November 16, 1928
38	1462	Fort Worth & Denver City Railway,	Twist, Tex.,	December 9, 1928
38	1463	Missouri Pacific Railroad,	LaBussell, Mo.,	December 13, 1928
38	1465	Yazoo & Mississippi Valley Railroad,	Howard, Miss.,	December 22, 1928
39	1459	Baltimore & Ohio Railroad,	Eagle, W. Va.,	November 25, 1928
39	1468	Elgin, Joliet & Eastern Railway,	Matteson, Ill.,	January 1, 1929
39	1469	Baltimore & Ohio Railroad,	East St.Louis, Ill.,	January 6, 1929
39	1473	Oregon-Washington Railroad & Navigation Co., Union Pacific System,	Preacher's Slough, Wash.,	January 11, 1929
39	1475	Pere Marquette Railway,	Fennick, Mich.,	January 16, 1929
39	1476	Detroit, Toledo & Ironton Railroad,	Denver, Ohio,	January 17, 1929
39	1477	Pennsylvania Railroad,	Short Lane, Md.,	January 17, 1929
39	1478	Clinchfield Railroad,	Cheston, Tenn.,	January 21, 1929
39	1479	Southern Railway System,	Landis, N.C.,	January 21, 1929
39	1480	Seaboard Air Line Railway,	Helena, Ga.,	January 22, 1929
39	1482	Illinois Central Railroad,	Mounds, Ill.,	January 22, 1929
39	1486	Louisville, Henderson & St. Louis Railway,	Semper, Ky.,	February 1, 1929
39	1488	Baltimore & Ohio Railroad,	Willow Valley, Ind.,	February 8, 1929
39	1492	New York, New Haven & Hartford Railroad,	Fall River, Mass.,	February 14, 1929
39	1493	Illinois Central Railroad,	Benton, Ill.,	February 16, 1929
39	1494	Toledo, Peoria & Western Railroad,	Greeds, Ill.,	February 18, 1929
39	1498	Mobile & Ohio Railroad,	Humboldt, Tenn.,	February 20, 1929
39	1501	Northwestern Pacific Railroad,	Largo, Calif.,	February 28, 1929
39	1504	Atchison, Topeka & Santa Fe Railway,	Sibley, Mo.,	March 2, 1929
39	1506	Pennsylvania Railroad,	South Fork, Pa.,	March 5, 1929
39	1507	Chicago, Rock Island & Pacific Railway,	Pressburg, Mo.,	March 7, 1929
39	1509	Chicago, Burlington & Quincy Railroad,	Rome, Iowa,	March 16, 1929
39	1510	Missouri Pacific Railroad,	Barton Crossing, Ark.,	March 18, 1929
39	1512	Clinchfield Railroad,	Thermal, N.C.,	March 24, 1929
39	1513	New York, Chicago & St. Louis Railroad,	Edwardsville, Ill.,	March 2b, 1929

QUARTERLY SUMMARY NUMBER (1)	INVESTIGATION NUMBER (2)	NAME OF CARRIER (3)
41	1534	Delaware & Hudson Co.,
41	1536	Chicago, Burlington & Quincy Railroad,
41	1539	Erie Railroad
41	1540	Chesapeake & Ohio Railway,
41	1541	Central Railroad of New Jersey,
41	1544	Pennsylvania Railroad,
41	1545	Lehigh Valley Railroad,
41	1549	Tompah & Tidewater Railroad,
41	1551	Chicago, Milwaukee, St. Paul & Pacific Railroad,
41	1555	Grand Trunk Western Railway,
41	1557	Fort Wayne-Lima Railroad;
41	1558	Pennsylvania Railroad,
41	1560	Boston & Maine Railroad,
41	1562	Northern Pacific Railway,
41	1563	Delaware, Lackawanna & Western Railroad,
41	1564	Oregon Short Line Railroad, Union Pacific System,
41	1566	Pere Marquette Railway,
42	1568	Pennsylvania Railroad,
42	1571	Boston & Maine Railroad,
42	1575	Pennsylvania Railroad,
42	1576	New York, Chicago & St. Louis Railroad,
42	1577	Missouri Pacific Railroad,
42	1578	Chicago Great Western Railroad,
42	1580	Fort Worth & Denver City Railway,
42	1581	Missouri-Kansas-Texas Railroad,
42	1582	Norfolk & Western Railway,
42	1590	Baltimore & Ohio Railroad and Chicago, Indianapolis & Louisville Railwa
42	1591	Central Railroad of New Jersey,
42	1592	Colorado & Southern Railway,
42	1593	Chicago, St. Paul, Minneapolis & Omaha Railway,
42	1596	Lehigh Valley Railroad,
42	1597	Chicago & North Western Railway,
42	1599	St. Louis Southwestern Railway Company of Texas,
42	1600	Toledo, Peoria & Western Railroad,
43	1605	Chicago & Eastern Illinois Railway,
43	1606	Northern Pacific Railway,
43	1608	Baltimore & Ohio Railroad,
43	1610	New York Central Railroad,
43	1611	Erie Railroad,
43	1612	Cincinnati, New Orleans & Texas Pacific Railway, Southern Railway Syste
43	1614	Erie Railroad,
43	1616	Illinois Central Railroad,
43	1619	St. Louis-Southwestern Railway,
43	1621	New York, Chicago & St. Louis Railroad,
43	1622	Chicago, North Shore and Milwaukee Railroad,
43	1624	Baltimore & Ohio Railroad,
43	1625	Erie Railroad,
43	1639	Pennsylvania Railroad,
44	1632	Chicago & North Western Railway,
44	1633	Nashville, Chattanooga & St. Louis Railway,
44	1634	The Reading Company,
44	1635	Florida East Coast Railway,
44	1636	Boston & Maine Railroad,
44	1639	Lehigh Valley Railroad,
44	1642	St. Louis Southwestern Railway of Texas,
44	1643	Chicago, Rock Island & Pacific Railway,
44	1645	Chicago, St. Paul, Minneapolis & Omaha Railroad,

NAME OF CARRIER (3)	LOCATION (4)	DATE (5)
iney Railroad,	Hudson Falls, N.Y.,	July 4, 1929
	Millington, Ill.,	July 6, 1929
y,	Corning, N.Y.,	July 11, 1929
	Harvey, W. Va.,	July 11, 1929
Jersey,	Lemoka Harbor, N.J.,	July 13, 1929
	Hillside, Pa.,	July 15, 1929
road,	Lattimer Junction, Pa.	July 16, 1929
	Soda, Calif.,	August 5, 1929
Pond & Pacific Railroad,	Wadsworth, Ill.	August 9, 1929
way,	Morrice, Mich.,	August 18, 1929
,	Middlepoint, Ohio,	August 21, 1929
	Royalton, Pa.,	August 26, 1929
,	Shawsheen, Mass.,	September 14, 1929
estern Railroad,	Sartell, Minn.,	September 15, 1929
ad, Union Pacific System,	Greendell, N.J.,	September 17, 1929
	Nugget, Wyo.,	September 22, 1929
	Petoskey, Mich.,	September 27, 1929
	Portage, Pa.,	October 9, 1929
	Nahor, N.H.,	October 16, 1929
	Iron Hill, Md.,	October 25, 1929
Louis Railroad,	Dean, Pa.,	October 25, 1929
d,	Collinston, La.,	October 27, 1929
ilroad,	West Platte, Mo.,	October 28, 1929
Railway,	Memphis, Tex.,	October 30, 1929
ilroad,	Savonburg, Kans.,	October 31, 1929
y,	Lick Branch, W. Va.,	November 1, 1929
d and Chicago, Indianapolis & Louisville Railway,	Rosedale, Ind.,	November 15, 1929
Jersey,	Treichler, Pa.	November 23, 1929
way,	Garcia, N. Mex.,	November 24, 1929
apolis & Omaha Railway,	Sibley, Iowa,	November 30, 1929
	Manch Chunk, Pa.,	December 2, 1929
Railway,	Pecatonica, Ill.,	December 2, 1929
ailway Company of Texas,	Pittsburg, Tex.,	December 13, 1929
Railroad,	Forrest, Ill.,	December 21, 1929
is Railway,	Sidell Junction, Ill.,	January 7, 1930
,	Lookout, Mont.,	January 16, 1930
d,	Brunswick, Md.,	January 18, 1930
d,	Syracuse Junction, N.Y.,	January 19, 1930
	Lantone, N.Y.,	January 20, 1930
& Texas Pacific Railway, Southern Railway System,	High Bridge, Ky.,	January 20, 1930
d,	Wheatland, Pa.,	January 22, 1930
ailway,	Woosung, Ill.,	January 23, 1930
Louis Railroad,	Idalia, Mo.,	January 30, 1930
	Edwardsville, Ill.,	February 14, 1930
Milwaukee Railroad,	Kenosha, Wis.,	February 23, 1930
d/	Altamont, Md.,	March 2, 1930
	Freedom, Ohio,	March 4, 1930
	Frankford, Pa.,	March 28, 1930
Railway,	Janesville, Wis.,	April 25, 1930
St. Louis Railw	Ball Buckle, Tenn.,	April 26, 1930
	Merkle, Pa.,	April 29, 1930
ay,	Bunnell, Fla.,	May 3, 1930
	North Chelmsford, Mass.,	May 9, 1930
ailway of Texas,	Bear Creek Junction, Pa.,	May 18, 1930
acific Railway,	Naples, Tex.,	May 20, 1930
	Beckett, Okla.,	May 27, 1930

35	1406	New York, Chicago & St. Louis Railroad,
35	1409	Pennsylvania Railroad,
35	1410	Chicago, Burlington & Quincy Railroad,
35	1411	Union Pacific Railroad,
35	1412	St.Louis-San Francisco Railway,
36	1396	Boston & Maine Railroad,
36	1414	Reading Company,
36	1416	Baltimore & Ohio Railroad,
36	1419	Pennsylvania Railroad,
36	1421	Pennsylvania Railroad,
36	1426	New York, Chicago & St. Louis Railroad,
37	1404	New York Central Railroad,
37	1430	Grand Trunk Western Railway,
37	1432	Wabash Railway,
37	1433	Boston & Maine Railroad,
37	1436	Wabash Railway,
37	1438	Piedmont & Northern Railway,
37	1439	Missouri Pacific Railroad,
37	1441	Hocking Valley Railway,
37	1442	Texas & Pacific Railway,
38	1447	Chicago & North Western Railway,
38	1448	Missouri Pacific Railroad,
38	1449	Union Pacific Railroad,
38	1454	Gulf, Colorado & Santa Fe Railway,
38	1457	Norfolk & Western Railway,
38	1462	Fort Worth & Denver City Railway,
38	1463	Missouri Pacific Railroad,
38	1465	Yazoo & Mississippi Valley Railroad,
39	1459	Baltimore & Ohio Railroad,
39	1468	Elgin, Joliet & Eastern Railway,
39	1469	Baltimore & Ohio Railroad,
39	1473	Oregon-Washington Railroad & Navigation Co., Union Pacific System,
39	1475	Pere Marquette Railway,
39	1476	Detroit, Toledo & Ironton Railroad,
39	1477	Pennsylvania Railroad,
39	1478	Clinchfield Railroad,
39	1479	Southern Railway System,
39	1480	Seaboard Air Line Railway,
39	1482	Illinois Central Railroad,
39	1486	Louisville, Henderson & St. Louis Railway,
39	1488	Baltimore & Ohio Railroad,
39	1492	New York, New Haven & Hartford Railroad,
39	1493	Illinois Central Railroad,
39	1494	Toledo, Peoria & Western Railroad,
39	1498	Mobile & Ohio Railroad,
39	1501	Northwestern Pacific Railroad,
39	1504	Atchison, Topeka & Santa Fe Railway,
39	1506	Pennsylvania Railroad,
39	1507	Chicago, Rock Island & Pacific Railway,
39	1509	Chicago, Burlington & Quincy Railroad,
39	1510	Missouri Pacific Railroad,
39	1512	Clinchfield Railroad,
39	1513	New York, Chicago & St. Louis Railroad,
40	1515	Texas and Pacific Railway,
40	1516	Chicago, Rock Island & Pacific Railway,
40	1517	New York Central Railroad,
40	1518	Missouri Pacific Railroad,
40	1520	Buffalo, Rochester and Pittsburgh Railway,
40	1523	Lehigh Valley Railroad,
40	1527	Northern Pacific Railway,
40	1529	East Michigan Railway,
40	1530	New Orleans Great Northern Railroad,
41	1531	Western Pacific Railroad,
41	1533	Ann Arbor Railroad,

Tipton, Ind.,	March 12, 1928	41	1541	Central Railroad of New Jersey,
Marsh Run, Pa.,	March 16, 1928	41	1544	Pennsylvania Railroad,
St. Paul, Minn.,	March 23, 1928	41	1545	Lehigh Valley Railroad,
Loring, Kans.,	March 28, 1928	41	1549	Tonopah & Tidewater Railroad,
Nash, Mo.,	March 29, 1928	41	1551	Chicago, Milwaukee, St. Paul & Pacifi
Balleah, N.H.,	February 13, 1928	41	1555	Grand Trunk Western Railway,
Sunbury, Pa.,	April 9, 1928	41	1557	Fort Wayne-Lima Railroad,
Bard, W. Va.,	May 6, 1928	41	1558	Pennsylvania Railroad,
Johnstown, Pa.,	May 20, 1928	41	1560	Boston & Maine Railroad,
Barberton, Ohio,	May 28, 1928	41	1562	Northern Pacific Railway,
Summerville, Pa.,	June 13, 1928	41	1563	Delaware, Lackawanna & Western Railro
Watkins Glenn, N.Y.,	March 11, 1928	41	1564	Oregon Short Line Railroad, Union Pac
Flushing, Mich.,	July 8, 1928	41	1566	Pere Marquette Railway,
Missola, Iowa,	July 20, 1928	42	1568	Pennsylvania Railroad,
Farmington, N.H.,	July 22, 1928	42	1571	Boston & Maine Railroad,
Valley City, Ill.,	August 3, 1928	42	1575	Pennsylvania Railroad,
Buncombe, S.C.,	August 11, 1928	42	1576	New York, Chicago & St. Louis Railroa
Waring, Kans.,	August 20, 1928	42	1577	Missouri Pacific Railroad,
Cummings, Ohio,	August 26, 1928	42	1578	Chicago Great Western Railroad,
Channyville, La.,	September 1, 1928	42	1580	Fort Worth & Denver City Railway,
Crookston, Nebr.,	October 22, 1928	42	1581	Missouri-Kansas-Texas Railroad,
Knoxville, Ark.,	October 23, 1928	42	1582	Norfolk & Western Railway,
Green River, Wyo.,	October 24, 1928	42	1590	Baltimore & Ohio Railroad and Chicago,
Texas City Junction, Tex.	November 7, 1928	42	1591	Central Railroad of New Jersey,
Fries Junction, Va.,	November 16, 1928	42	1592	Colorado & Southern Railway,
Twist, Tex.,	December 9, 1928	42	1593	Chicago, St. Paul, Minneapolis & Omaha
LaRussell, Mo.,	December 13, 1928	42	1596	Lehigh Valley Railroad,
Howard, Miss.,	December 22, 1928	42	1597	Chicago & North Western Railway,
Eagle, W. Va.,	November 25, 1928	42	1599	St. Louis Southwestern Railway Company
Matteson, Ill.,	January 1, 1929	42	1600	Toledo, Peoria & Western Railroad,
East St.Louis, Ill.,	January 6, 1929	43	1605	Chicago & Eastern Illinois Railway,
Preacher's Slough, Wash.,	January 11, 1929	43	1606	Northern Pacific Railway,
Fenwick, Mich.,	January 16, 1929	43	1608	Baltimore & Ohio Railroad,
Denver, Ohio,	January 17, 1929	43	1610	New York Central Railroad,
Short Lane, Md.,	January 17, 1929	43	1611	Erie Railroad,
Chester, Tenn.,	January 21, 1929	43	1612	Cincinnati, New Orleans & Texas Pacifi
Landis, N.C.,	January 21, 1929	43	1614	Erie Railroad,
Helena, Ga.,	January 22, 1929	43	1616	Illinois Central Railroad,
Mounds, Ill.,	January 22, 1929	43	1619	St. Louis-Southwestern Railway,
Cooper, Ky.,	February 1, 1929	43	1621	New York, Chicago & St. Louis Railroad,
Willow Valley, Ind.,	February 8, 1929	43	1622	Chicago, North Shore and Milwaukee Rail
Fall River, Mass.,	February 14, 1929	43	1624	Baltimore & Ohio Railroad,
Newton, Ill.,	February 16, 1929	43	1625	Erie Railroad,
Dreeds, Ill.,	February 18, 1929	43	1639	Pennsylvania Railroad,
Humboldt, Tenn.,	February 20, 1929	44	1632	Chicago & North Western Railway,
Largo, Calif.,	February 28, 1929	44	1633	Nashville, Chattanooga & St. Louis Rail
Sibley, Mo.,	March 2, 1929	44	1634	The Reading Company,
South Fork, Pa.,	March 5, 1929	44	1635	Florida East Coast Railway,
Freeburg, Mo.,	March 7, 1929	44	1636	Boston & Maine Railroad,
Rome, Iowa,	March 16, 1929	44	1639	Lehigh Valley Railroad,
Barton Crossing, Ark.,	March 18, 1929	44	1642	St. Louis Southwestern Railway of Texas
Thereal, N.C.,	March 24, 1929	44	1643	Chicago, Rock Island & Pacific Railway,
Edwardsville, Ill.,	March 26, 1929	44	1645	Chicago, St. Paul, Minneapolis & Omaha
Denton, Tex.,	April 3, 1929	45	1649	Erie Railroad,
Argon, Iowa,	April 4, 1929	45	1650	Chicago & Erie Railroad,
Stanley, Ohio,	April 6, 1929	45	1652	Texas and New Orleans Railroad, Southern
Kenova, Ark.,	April 10, 1929	45	1653	Yadkin Railroad,
West Falls, N.Y.,	April 22, 1929	45	1654	Union Pacific Railroad,
Owego, N.Y.,	May 3, 1929	45	1656	St. Louis Southwestern Railway,
Spokane, Wash.,	May 17, 1929	45	1657	Chicago, Rock Island & Pacific Railway,
Ortonville, Mich.,	June 2, 1929	45	1659	Pennsylvania Railroad,
Bogalusa, La.,	June 15, 1929	45	1663	Chicago, Rock Island & Pacific Railway,
Milegarden, Calif.,	July 1, 1929	45	1664	Chicago, Rock Island & Gulf Railway,
Pomona, Mich.,	July 4, 1929	45	1665	Michigan Central Railroad,

Jersey,	Lanoka Harbor, N.J.,	July 13, 1929
	Hillside, Pa.,	July 15, 1929
	Lattimer Junction, Pa.	July 16, 1929
road,	Soda, Calif.,	August 5, 1929
Paul & Pacific Railroad,	Wadsworth, Ill.	August 9, 1929
way,	Morrice, Mich.,	August 18, 1929
	Middlepoint, Ohio,	August 21, 1929
	Royalton, Pa.,	August 26, 1929
	Shawsheen, Mass.,	September 14, 1929
	Sartell, Minn.,	September 15, 1929
estern Railroad,	Greendell, N.J.,	September 17, 1929
ad, Union Pacific System,	Nugget, Wyo.,	September 22, 1929
	Petoskey, Mich.,	September 27, 1929
	Portage, Pa.,	October 9, 1929
	Rabor, N.H.,	October 16, 1929
	Iron Hill, Md.,	October 25, 1929
Louis Railroad,	Dean, Pa.,	October 25, 1929
d,	Collinston, La.,	October 27, 1929
ilroad,	West Platte, Mo.,	October 28, 1929
Railway,	Memphis, Tex.,	October 30, 1929
ilroad,	Sevenburg, Kans.,	October 31, 1929
y,	Lick Branch, W. Va.,	November 1, 1929
d and Chicago, Indianapolis & Louisville Railway,	Rosehdale, Ind.,	November 15, 1929
Jersey,	Treichler, Pa.	November 23, 1929
way,	Garcia, N. Mex.,	November 24, 1929
apolis & Omaha Railway,	Sibley, Iowa,	November 30, 1929
	Manch Chunk, Pa.,	December 2, 1929
Railway,	Pecatonica, Ill.,	December 2, 1929
ailway Company of Texas,	Pittsburg, Tex.,	December 13, 1929
Railroad,	Forrest, Ill.,	December 21, 1929
is Railway,	Sidell Junction, Ill.,	January 7, 1930
	Lookout, Mont.,	January 16, 1930
d,	Brunswick, Md.,	January 18, 1930
d,	Syracuse Junction, N.Y.,	January 19, 1930
	Lawtons, N.Y.,	January 20, 1930
& Texas Pacific Railway, Southern Railway System,	High Bridge, Ky.,	January 20, 1930
d,	Wheatland, Pa.,	January 22, 1930
ailway,	Woosung, Ill.,	January 23, 1930
Louis Railroad,	Idalia, Mo.,	January 30, 1930
	Edwardsville, Ill.,	February 14, 1930
Milwaukee Railroad,	Kenosha, Wis.,	February 23, 1930
d,	Altamont, Md.,	March 2, 1930
	Freedom, Ohio,	March 4, 1930
	Frankford, Pa.,	March 28, 1930
Railway,	Janesville, Wis.,	April 25, 1930
St. Louis Railway,	Ball Buckle, Tenn.,	April 26, 1930
	Merkle, Pa.,	April 29, 1930
ay,	Bunnell, Fla.,	May 3, 1930
	North Chelmsford, Mass.,	May 9, 1930
ailway of Texas,	Bear Creek Junction, Pa.,	May 18, 1930
acific Railway,	Naples, Tex.,	May 20, 1930
	Beckett, Okla.,	May 27, 1930
apolis & Omaha Railroad,	Sioux City, Iowa,	June 2, 1930
	Youngstown, Ohio,	July 9, 1930
ilroad, Southern Pacific Lines,	Huntington, Ind.,	July 11, 1930
	Urbana, Texas,	July 20, 1930
	Gold Hill, N.C.,	July 23, 1930
ailway,	Wenonah, Texas,	July 24, 1930
acific Railway,	McNeil, Ark.,	August 2, 1930
	Agenda, Kans.,	August 3, 1930
acific Railway,	Hawksville, Ind.,	August 14, 1930
ulf Railway,	Kremlin, Okla.	September 12, 1930
d,	North Fort Worth, Tex.,	September 12, 1930
	Detroit, Mich.,	September 28, 1930

QUARTERLY SUMMARY NUMBER (1)	INVESTIGATION NUMBER (2)	NAME OF CARRIER (3)	LOCATION (4)	DATE (5)
45	1665	Michigan Central Railroad,	Detroit, Mich.,	September 28, 1930
45	1666	Chicago, Rock Island & Pacific Railway,	Jennings, Kans.,	September 28, 1930
46	1672	Denver & Rio Grande Western Railroad,	Chandler Junction, Colo.	October 14, 1930
46	1674	Erie Railroad,	Cleveland, Ohio,	October 22, 1930
46	1676	Yazoo & Mississippi Valley Railroad,	Money, Miss.,	November 14, 1930
46	1677	Lake Shore Electric Railway,	Hayes, Ohio,	November 15, 1930
46	1678	Chicago, Rock Island & Pacific Railway,	Havana, Ark.,	November 22, 1930
46	1679	Western Pacific Railroad,	Sunol, Calif.,	November 28, 1930
46	1680	Pere Marquette Railway,	Ann Pere, Mich.,	December 2, 1930
46	1681	New York Central Railroad,	West 124th Street, Riverside Park, New York, NY.	December 10, 1930
47	1683	Missouri Pacific Railroad,	Carlton, Kans.,	January 17, 1931
47	1686	Norfolk & Western Railway,	Alnwick, W. Va.,	February 2, 1931
47	1689	Illinois Central Railroad,	Freeport, Ill.,	February 7, 1931
47	1692	Chicago & Alton Railroad,	Covel, Ill.,	February 19, 1931
47	1697	Chicago, Indianapolis & Louisville Railway,	Guernsey, Ind.,	March 19, 1931
48	1700	Pennsylvania Railroad,	Spruce Creek, Pa.,	April 17, 1931
48	1701	Western Pacific Railroad,	David, Calif.,	April 19, 1931
48	1703	Chicago Great Western Railroad,	Inver Grove, Minn.,	May 3, 1931
48	1704	Wabash Railway,	Chicago Ridge, Ill.,	May 6, 1931
48	1710	Kansas, Oklahoma & Gulf Railway	Konefick, Okla.,	May 20, 1931
48	1711	Pennsylvania Railroad,	Star Rock, Pa.,	June 16, 1931
48	1712	Denver & Rio Grande Western Railroad,	Roper, Utah,	June 22, 1931
49	1723	Pere Marquette Railway,	Edmore, Mich.,	September 25, 1931
49	1724	Atlantic Coast Line Railroad,	Haines City, Fla.,	September 25, 1931
49	1726	New York Central Railroad,	Napes, Pa.	September 29, 1931
50	1728	Atlantic Coast Line Railroad,	Buffalo Bluff, Fla.,	October 11, 1931
50	1732	New York, New Haven & Hartford Railroad	East Taunton, Mass.,	November 11, 1931
50	1733	Western Pacific Railroad,	Winnemucca, Nev.,	November 14, 1931
50	1734	The Belt Railway of Chicago and Baltimore & Ohio Chicago Terminal Railroad,	Chicago, Ill.,	November 17, 1931
50	1735	Pennsylvania Railroad,	Black Run, Ohio,	November 18, 1931
50	1736	Chicago & North Western Railway,	Barrington, Ill.,	November 21, 1931
50	1737	Pennsylvania Railroad,	Monon, Pa.,	November 21, 1931
50	1738	Missouri Pacific Railroad,	Myrick, Mo.,	November 22, 1931
50	1739	Pennsylvania Railroad,	Avonmore, Pa.,	November 28, 1931
50	1741	Pennsylvania Railroad,	Gallitzin, Pa.,	December 9, 1931
50	1742	Missouri Pacific Railroad,	Lawrence, Nebr.,	December 10, 1931
50	1743	Seaboard Air Line Railway,	Scott, Fla.,	December 11, 1931
50	1745	Illinois Central Railroad,	Saline, Ill.,	December 20, 1931
51	1749	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Tomah, Wis.,	January 30, 1932
51	1750	Great Northern Railway; Chicago, Milwaukee, St. Paul & Pacific Railroad,	Wahpeton, N. Dak.,	January 30, 1932
51	1753	Southern Railway,	Peak, Tenn.,	March 1, 1932
51	1757	Baltimore & Ohio Railroad,	Warsaw, N.Y.,	March 7, 1932
51	1758	Chesapeake & Ohio Railway,	Upper Sandusky, Ohio	March 11, 1932
51	1760	Erie Railroad	North Tonawanda, N.Y.,	March 26, 1932
52	1761	Missouri Pacific Railroad,	Malvern, Ark.,	April 9, 1932
52	1764	Pennsylvania Railroad,	Protection, N.Y.,	May 26, 1932
52	1768	Pennsylvania Railroad,	Deans, N.J.,	June 7, 1932
52	1769	New York Central Railroad,	Clay Bank, Ohio,	June 18, 1932
52	1770	Cincinnati & Lake Erie Railroad,	Elk Creek, Ohio,	June 30, 1932
52	1771	Chesapeake & Ohio Railway,	Richmond, Va.,	June 30, 1932
53	1772	Central Vermont Railway,	Pitchville Jct., Conn.,	July 6, 1932
53	1773	Great Northern Railway,	Warba, Minn.,	July 13, 1932
53	1775	Pennsylvania Railroad,	Juniata Bridge, Pa.,	July 22, 1932
53	1776	Cleveland, Cincinnati, Chicago & St. Louis Railway,	De Graff, Ohio,	July 25, 1932
53	1777	Chicago, Burlington & Quincy Railroad,	Pottstown, Ill.	August 3, 1932
53	1778	Boston & Maine Railroad,	Rutland, Mass.,	August 3, 1932
53	1779	Norfolk & Western Railway,	Wharncliffe, W. Va.,	August 10, 1932
53	1780	Central of Georgia Railway,	Maricopa, Ala.,	August 18, 1932
53	1783	Louisville & Nashville Railroad,	Doyle, Ky.,	August 27, 1932
53	1784	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Atkins, Iowa,	August 30, 1932
53	1785	Seaboard Air Line Railway,	Hopewell, Fla.	September 21, 1932

QUARTERLY SUMMARY NUMBER (1)	INVESTIGATION NUMBER (2)	NAME OF CARRIER (3)
54	1795	Interstate Railroad,
54	1796	Cleveland, Cincinnati, Chicago & St. Louis Railway,
54	1797	New York Central Railroad,
54	1798	Southern Railway System,
54	1799	Minneapolis, St. Paul & Sault Ste. Marie Railway,
54	1801	Pennsylvania Railroad,
55	1806	Pennsylvania Railroad,
55	1808	Erie Railroad,
55	1813	Portland Terminal Company,
55	1814	Lehigh Valley Railroad,
56	1819	Missouri Pacific Railroad,
56	1822	Baltimore & Ohio Railroad,
56	1823	Southern Railway,
56	1824	New York, Chicago & St. Louis Railroad,
56	1825	Chicago, Milwaukee, St. Paul & Pacific Railroad,
56	1826	St. Louis-San Francisco Railway,
56	1828	Pennsylvania Railroad,
57	1832	St. Louis Southwestern Railway Co. of Texas,
57	1833	Chicago, Rock Island & Pacific Railway,
57	1835	Maine Central Railroad,
57	1836	Chicago, Milwaukee, St. Paul & Pacific Railroad,
57	1837	Delaware & Hudson Railroad,
57	1838	Pennsylvania Railroad,
57	1841	Chicago & Eastern Illinois Railway, Illinois Central Railroad,
57	1844	Spokane, Portland & Seattle Railway,
57	1845	Oregon-Washington Railroad & Navigation Co.,
57	1846	New York Central Railroad,
57	1849	New York Central Railroad,
57	1852	Baltimore & Ohio Railroad,
57	1854	Virginian Railway,
57	1855	Boston & Maine Railroad,
57	1857	Union Pacific Railroad,
57	1859	Atchison, Topeka & Santa Fe Railway,
58	1861	Indiana Harbor Belt Railroad,
58	1862	Chesapeake and Ohio Railway,
58	1863	Southern Pacific Co.,
58	1865	New York Central Railroad,
58	1867	Western Maryland Railway,
58	1868	Chesapeake and Ohio Railway,
58	1870	Louisville & Nashville Railroad,
58	1872	Great Northern Railway,
58	1873	Richmond, Fredericksburg & Potomac Railroad,
58	1878	Louisville & Nashville Railroad,
58	1879	International-Great Northern Railroad,
58	1881	Virginian Railway,
59	1883	St. Louis-San Francisco Railway,
59	1889	Norfolk Southern Railroad,
59	1890	Spokane, Portland & Seattle Railway,
59	1895	Bangor and Aroostook Railroad,
59	1898	Baltimore & Ohio Railroad,
59	1899	Baltimore & Ohio Railroad,
59	1900	Chicago, Milwaukee, St. Paul & Pacific Railroad,
59	1901	Pennsylvania Railroad,
59	1904	Chestnut Ridge Railway,
59	1905	Atchison, Topeka & Santa Fe Railway,
60	1906	Chicago, St. Paul, Minneapolis & Omaha Railway,
60	1909	Baltimore & Ohio and Pennsylvania Railroads,
60	1910	Lehigh Valley Railroad,
60	1913	Norfolk & Western Railway,
60	1914	Virginian Railway,
60	1916	Chicago, Rock Island & Pacific Railway

NAME OF CARRIER (3)	LOCATION (4)	DATE (5)
terstate Railroad,	Josephine, Va.,	December 1, 1932
aveland, Cincinnati, Chicago & St. Louis Railway,	Springfield, Ohio,	December 8, 1932
w York Central Railroad,	Pleasantville, Ohio,	December 10, 1932
uthern Railway System,	Kinsler, S.C.,	December 19, 1932
nneapolis, St. Paul & Sault Ste. Marie Railway,	Wheatland, Wis.,	December 21, 1932
nnsylvania Railroad,	Tyrone, Pa.,	December 24, 1932
nnsylvania Railroad,	Blairsville, Pa.,	January 18, 1933
ie Railroad,	Garfield, N.J.,	February 10, 1933
rtland Terminal Company,	Portland, Maine,	March 16, 1933
high Valley Railroad,	Avoca, Pa.,	March 26, 1933
ssouri Pacific Railroad,	Monroe, La.,	April 14, 1933
ltimore & Ohio Railroad,	Sir John's Run, W. Va.,	April 29, 1933
uthern Railway,	Stacey, N.C.,	May 3, 1933
w York, Chicago & St. Louis Railroad,	East Lynn, Ill.,	May 11, 1933
icago, Milwaukee, St. Paul & Pacific Railroad,	Kingston, Ill.,	May 14, 1933
. Louis-San Francisco Railway,	Neodesha, Kans.,	May 16, 1933
nnsylvania Railroad,	Penn, Pa.,	May 25, 1933
. Louis Southwestern Railway Co. of Texas,	Trinidad, Tex.,	July 7, 1933
icago, Rock Island & Pacific Railway,	Billings, Okla.,	July 10, 1933
ine Central Railroad,	Cornish, Maine,	July 21, 1933
icago, Milwaukee, St. Paul & Pacific Railroad,	Gladwin, Iowa,	July 21, 1933
laware & Hudson Railroad,	Avoca, Pa.,	July 23, 1933
nnsylvania Railroad,	Baltimore, Md.,	July 28, 1933
icago & Eastern Illinois Railway, Illinois Central Railroad,	Marion, Ill.,	August 3, 1933
okane, Portland & Seattle Railway,	Spearfish, Wash.,	August 13, 1933
egon-Washington Railroad & Navigation Co.,	Attalia, Wash.,	August 14, 1933
w York Central Railroad,	Angola, Ind.,	August 21, 1933
w York Central Railroad,	Cedar Run, Pa.,	August 26, 1933
ltimore & Ohio Railroad,	Pleasant Valley, Ohio,	September 1, 1933
rginian Railway,	Amigo, W. Va.,	September 8, 1933
ston & Maine Railroad,	West Concord, Mass.,	September 11, 1933
ion Pacific Railroad,	Gibbon, Nebr.,	September 18, 1933
tchison, Topeka & Santa Fe Railway,	Enterprise, Kans.,	September 29, 1933
diana Harbor Belt Railroad,	Chicago Ridge, Ill.,	October 14, 1933
esapeake and Ohio Railway,	South Richmond, Ind.,	October 25, 1933
uthern Pacific Co.,	Monterey, Calif.,	October 26, 1933
w York Central Railroad,	New Lexington, Ohio,	November 2, 1933
stern Maryland Railway,	Henry, W. Va.,	November 18, 1933
esapeake and Ohio Railway,	Wayne, Ind.,	November 23, 1933
uisville & Nashville Railroad,	Woodrow, Tenn.,	November 29, 1933
eat Northern Railway,	Milan, Wash.,	December 3, 1933
chmond, Fredericksburg & Potomac Railroad,	Cherry Hill, Va.,	December 6, 1933
uisville & Nashville Railroad,	Wadsworth, Ala.,	December 26, 1933
ternational-Great Northern Railroad,	Black Bridge, Tex.,	December 27, 1933
rginian Railway,	Hardy, Va.,	December 31, 1933
t.Louis-San Francisco Railway,	Swift, Mo.,	January 3, 1934
rfolk Southern Railroad,	Grimesland, N.C.,	February 12, 1934
okane, Portland & Seattle Railway,	Carson, Wash.,	February 13, 1934
ngor and Aroostook Railroad,	State Road, Maine,	February 25, 1934
ltimore & Ohio Railroad,	Sand Patch, Pa.,	February 28, 1934
ltimore & Ohio Railroad,	Mount Airy, Md.,	March 4, 1934
icago, Milwaukee, St. Paul & Pacific Railroad,	Specht's Ferry, Iowa,	March 6, 1934
nnsylvania Railroad,	Columbia City, Ind.,	March 8, 1934
estnut Ridge Railway,	Delaware Avenue, Pa.,	March 26, 1934
tchison, Topeka & Santa Fe Railway,	Lynn, N. Mex.,	March 27, 1934
icago, St. Paul, Minneapolis & Omaha Railway,	Northline, Wis.,	April 3, 1934
ltimore & Ohio and Pennsylvania Railroads,	Kylesburg, Ohio,	April 19, 1934
high Valley Railroad,	Bowmanstown, Pa.,	April 24, 1934
rfolk & Western Railway,	Nace, Va.,	May 20, 1934
rginian Railway,	Cirtsville, W. Va.,	May 22, 1934

46	1680	Pere Marquette Railway,	Ann Pere, Mich.,	December 2, 1930	55	1808	Erie Railroad,
46	1681	New York Central Railroad,	West 124th Street, Riverside Park, New York, NY.	December 10, 1930	55	1813	Portland Terminal Company,
47	1683	Missouri Pacific Railroad,	Carlton, Kans.,	January 17, 1931	55	1814	Lehigh Valley Railroad,
47	1686	Norfolk & Western Railway,	Alnwick, W. Va.,	February 2, 1931	56	1819	Missouri Pacific Railroad,
47	1689	Illinois Central Railroad,	Freeport, Ill.,	February 7, 1931	56	1822	Baltimore & Ohio Railroad,
47	1692	Chicago & Alton Railroad,	Covel, Ill.,	February 19, 1931	56	1823	Southern Railway,
47	1697	Chicago, Indianapolis & Louisville Railway,	Guernsey, Ind.,	March 19, 1931	56	1824	New York, Chicago & St. Louis Railroad,
48	1700	Pennsylvania Railroad,	Spruce Creek, Pa.,	April 17, 1931	56	1825	Chicago, Milwaukee, St. Paul & Pacific Railroad,
48	1701	Western Pacific Railroad,	David, Calif.,	April 19, 1931	56	1826	St. Louis-San Francisco Railway,
48	1703	Chicago Great Western Railroad,	Inver Grove, Minn.,	May 3, 1931	56	1828	Pennsylvania Railroad,
48	1704	Wabash Railway,	Chicago Ridge, Ill.,	May 6, 1931	57	1832	St. Louis Southwestern Railway Co. of Texas,
48	1710	Kansas, Oklahoma & Gulf Railway	Kenefick, Okla.,	May 20, 1931	57	1833	Chicago, Rock Island & Pacific Railway,
48	1711	Pennsylvania Railroad,	Star Rock, Pa.,	June 16, 1931	57	1835	Maine Central Railroad,
48	1712	Denver & Rio Grande Western Railroad,	Roper, Utah,	June 22, 1931	57	1836	Chicago, Milwaukee, St. Paul & Pacific Railroad,
49	1723	Pere Marquette Railway,	Edmore, Mich.,	September 25, 1931	57	1837	Delaware & Hudson Railroad,
49	1724	Atlantic Coast Line Railroad,	Haines City, Fla.,	September 25, 1931	57	1838	Pennsylvania Railroad,
49	1726	New York Central Railroad,	Napes, Pa.,	September 29, 1931	57	1841	Chicago & Eastern Illinois Railway, Illinois Central Railroad,
50	1728	Atlantic Coast Line Railroad,	Buffalo Bluff, Fla.,	October 11, 1931	57	1844	Spokane, Portland & Seattle Railway,
50	1732	New York, New Haven & Hartford Railroad	East Taunton, Mass.,	November 11, 1931	57	1845	Oregon-Washington Railroad & Navigation Co.,
50	1733	Western Pacific Railroad,	Winnemucca, Nev.,	November 14, 1931	57	1846	New York Central Railroad,
50	1734	The Belt Railway of Chicago and Baltimore & Ohio Chicago Terminal Railroad,	Chicago, Ill.,	November 17, 1931	57	1849	New York Central Railroad,
50	1735	Pennsylvania Railroad,	Black Run, Ohio,	November 18, 1931	57	1852	Baltimore & Ohio Railroad,
50	1736	Chicago & North Western Railway,	Barrington, Ill.,	November 21, 1931	57	1854	Virginian Railway,
50	1737	Pennsylvania Railroad,	Monon, Pa.,	November 21, 1931	57	1855	Boston & Maine Railroad,
50	1738	Missouri Pacific Railroad,	Myrick, Mo.,	November 22, 1931	57	1857	Union Pacific Railroad,
50	1739	Pennsylvania Railroad,	Avonmore, Pa.,	November 28, 1931	57	1859	Atchison, Topeka & Santa Fe Railway,
50	1741	Pennsylvania Railroad,	Gallitzin, Pa.,	December 9, 1931	58	1861	Indiana Harbor Belt Railroad,
50	1742	Missouri Pacific Railroad,	Lawrence, Nebr.,	December 10, 1931	58	1862	Chesapeake and Ohio Railway,
50	1743	Seaboard Air Line Railway,	Scott, Fla.,	December 11, 1931	58	1863	Southern Pacific Co.,
50	1745	Illinois Central Railroad,	Saline, Ill.,	December 20, 1931	58	1865	New York Central Railroad,
51	1749	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Tomah, Wis.,	January 30, 1932	58	1867	Western Maryland Railway,
51	1750	Great Northern Railway; Chicago, Milwaukee, St. Paul & Pacific Railroad,	Wahpeton, N. Dak.,	January 30, 1932	58	1868	Chesapeake and Ohio Railway,
51	1753	Southern Railway,	Peak, Tenn.,	March 1, 1932	58	1870	Louisville & Nashville Railroad,
51	1757	Baltimore & Ohio Railroad,	Warsaw, N.Y.,	March 7, 1932	58	1872	Great Northern Railway,
51	1758	Chesapeake & Ohio Railway,	Upper Sandusky, Ohio	March 11, 1932	58	1873	Richmond, Fredericksburg & Potomac Railroad,
51	1760	Erie Railroad,	North Tonawanda, N.Y.,	March 26, 1932	58	1878	Louisville & Nashville Railroad,
52	1761	Missouri Pacific Railroad,	Malvern, Ark.,	April 9, 1932	58	1879	International-Great Northern Railroad,
52	1764	Pennsylvania Railroad,	Protection, N.Y.,	May 26, 1932	59	1881	Virginian Railway,
52	1768	Pennsylvania Railroad,	Deans, N.J.,	June 7, 1932	59	1883	St.Louis-San Francisco Railway,
52	1769	New York Central Railroad,	Clay Bank, Ohio,	June 18, 1932	59	1889	Norfolk Southern Railroad,
52	1770	Cincinnati & Lake Erie Railroad,	Elk Creek, Ohio,	June 30, 1932	59	1890	Spokane, Portland & Seattle Railway,
52	1771	Chesapeake & Ohio Railway,	Richmond, Va.,	June 30, 1932	59	1895	Bangor and Aroostook Railroad,
53	1772	Central Vermont Railway,	Fitchville Jct., Conn.,	July 6, 1932	59	1898	Baltimore & Ohio Railroad,
53	1773	Great Northern Railway,	Warba, Minn.,	July 13, 1932	59	1899	Baltimore & Ohio Railroad,
53	1775	Pennsylvania Railroad,	Juniata Bridge, Pa.,	July 22, 1932	59	1900	Chicago, Milwaukee, St. Paul & Pacific Railroad,
53	1776	Cleveland, Cincinnati, Chicago & St. Louis Railway,	De Graff, Ohio,	July 25, 1932	59	1901	Pennsylvania Railroad,
53	1777	Chicago, Burlington & Quincy Railroad,	Pottstown, Ill.	August 3, 1932	59	1904	Chestnut Ridge Railway,
53	1778	Boston & Maine Railroad,	Rutland, Mass.,	August 3, 1932	59	1905	Atchison, Topeka & Santa Fe Railway,
53	1779	Norfolk & Western Railway,	Wharncliffe, W. Va.,	August 10, 1932	60	1906	Chicago, St. Paul, Minneapolis & Omaha Railway,
53	1780	Central of Georgia Railway,	Marioope, Ala.,	August 18, 1932	60	1909	Baltimore & Ohio and Pennsylvania Railroads,
53	1783	Louisville & Nashville Railroad,	Doyle, Ky.,	August 27, 1932	60	1910	Lehigh Valley Railroad,
53	1784	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Atkins, Iowa,	August 30, 1932	60	1913	Norfolk & Western Railway,
53	1785	Seaboard Air Line Railway,	Hopewell, Fla.,	September 21, 1932	60	1914	Virginian Railway,
53	1786	Chicago, St. Paul, Minneapolis & Omaha Railway,	Marshfield, Wis.,	September 21, 1932	60	1916	Chicago, Rock Island & Pacific Railway,
53	1787	Louisville & Nashville Railroad,	Wald, Ala.,	September 29, 1932	61	1917	Elgin, Joliet & Eastern Railway,
53	1788	Pere Marquette Railway,	Plymouth, Mich.,	September 30, 1932	61	1920	Reading Company,
54	1789	Texas & Pacific Railway,	Dallas, Tex.,	October 11, 1932	61	1925	Virginian Railway,
54	1791	Pennsylvania Railroad,	Perryman, Md.,	October 18, 1932	61	1926	Missouri Pacific Railroad,
54	1793	Chesapeake & Ohio Railway,	Elk Hill, Va.,	November 24, 1932	61	1927	Southern Railway,
54	1794	Wabash Railway,	Norborne, Mo.,	November 29, 1932	61	1931	Norfolk Southern Railroad,
					61	1932	Virginia Central Railway,

ie Railroad,	Garfield, N.J.,	February 10, 1933
rtland Terminal Company,	Portland, Maine,	March 16, 1933
high Valley Railroad,	Avoca, Pa.,	March 26, 1933
souri Pacific Railroad,	Monroe, La.,	April 14, 1933
ltimore & Ohio Railroad,	Sir John's Run, W. Va.,	April 29, 1933
uthern Railway,	Stacey, N.C.,	May 3, 1933
w York, Chicago & St. Louis Railroad,	East Lynn, Ill.,	May 11, 1933
icago, Milwaukee, St. Paul & Pacific Railroad,	Kingston, Ill.,	May 14, 1933
. Louis-San Francisco Railway,	Neodesha, Kans.,	May 16, 1933
nnsylvania Railroad,	Penn, Pa.,	May 25, 1933
. Louis Southwestern Railway Co. of Texas,	Trinidad, Tex.,	July 7, 1933
icago, Rock Island & Pacific Railway,	Billings, Okla.,	July 10, 1933
ine Central Railroad,	Cornish, Maine,	July 21, 1933
icago, Milwaukee, St. Paul & Pacific Railroad,	Gladwin, Iowa,	July 21, 1933
laware & Hudson Railroad,	Avoca, Pa.,	July 23, 1933
nnsylvania Railroad,	Baltimore, Md.,	July 25, 1933
icago & Eastern Illinois Railway, Illinois Central Railroad,	Marion, Ill.,	August 3, 1933
okane, Portland & Seattle Railway,	Spearfish, Wash.,	August 13, 1933
gon-Washington Railroad & Navigation Co.,	Attalia, Wash.,	August 14, 1933
w York Central Railroad,	Angola, Ind.,	August 21, 1933
w York Central Railroad,	Cedar Run, Pa.,	August 26, 1933
ltimore & Ohio Railroad,	Pleasant Valley, Ohio,	September 1, 1933
rginian Railway,	Amigo, W. Va.,	September 8, 1933
ston & Maine Railroad,	West Concord, Mass.,	September 11, 1933
ion Pacific Railroad,	Gibbon, Nebr.,	September 18, 1933
chison, Topeka & Santa Fe Railway,	Enterprise, Kans.,	September 29, 1933
diana Harbor Belt Railroad,	Chicago Ridge, Ill.,	October 14, 1933
sapeake and Ohio Railway,	South Richmond, Ind.,	October 25, 1933
uthern Pacific Co.,	Monterey, Calif.,	October 26, 1933
w York Central Railroad,	New Lexington, Ohio,	November 2, 1933
stern Maryland Railway,	Henry, W. Va.,	November 18, 1933
sapeake and Ohio Railway,	Wayne, Ind.,	November 23, 1933
uisville & Nashville Railroad,	Woodrow, Tenn.,	November 29, 1933
reat Northern Railway,	Milan, Wash.,	December 3, 1933
hmond, Fredericksburg & Potomac Railroad,	Cherry Hill, Va.,	December 6, 1933
uisville & Nashville Railroad,	Wadsworth, Ala.,	December 26, 1933
ternational-Great Northern Railroad,	Black Bridge, Tex.,	December 27, 1933
rginian Railway,	Hardy, Va.,	December 31, 1933
t.Louis-San Francisco Railway,	Swift, Mo.,	January 3, 1934
rfolk Southern Railroad,	Grimesland, N.C.,	February 12, 1934
okane, Portland & Seattle Railway,	Carson, Wash.,	February 13, 1934
ngor and Aroostook Railroad,	State Road, Maine,	February 25, 1934
ltimore & Ohio Railroad,	Sand Patch, Pa.,	February 28, 1934
ltimore & Ohio Railroad,	Mount Airy, Md.,	March 4, 1934
hicago, Milwaukee, St. Paul & Pacific Railroad,	Spechts Ferry, Iowa,	March 6, 1934
nnsylvania Railroad,	Columbia City, Ind.,	March 8, 1934
stnut Ridge Railway.	Delaware Avenue, Pa.,	March 26, 1934
chison, Topeka & Santa Fe Railway,	Lynn, N. Mex.,	March 27, 1934
hicago, St. Paul, Minneapolis & Omaha Railway,	Northline, Wis.,	April 3, 1934
ltimore & Ohio and Pennsylvania Railroads,	Kylesburg, Ohio,	April 19, 1934
high Valley Railroad,	Bowmanstown, Pa.,	April 24, 1934
rfolk & Western Railway,	Nace, Va.,	May 20, 1934
rginian Railway,	Cirtsville, W. Va.,	May 22, 1934
hicago, Rock Island & Pacific Railway,	Pacific Junction, Okla.,	June 11, 1934
lgin, Joliet & Eastern Railway,	Indiana Harbor, Ind.,	June 26, 1934
ading Company,	Martin's Siding, Pa.,	July 15, 1934
rginian Railway,	Dothan, W. Va.,	August 12, 1934
issouri Pacific Railroad,	Alix, Ark.,	August 23, 1934
uthern Railway,	Piedmont, S.C.,	August 28, 1934
rfolk Southern Railroad,	Knightdale, N.C.,	September 13, 1934
rginia Central Railway,	Fredericksburg, Va.,	September 14, 1934

INDEX (Continued)

QUARTERLY SUMMARY NUMBER (1)	INVESTIGATION NUMBER (2)	NAME OF CARRIER (3)	LOCATION (4)	DATE (5)
61	1935	Pennsylvania Railroad,	Ely, Pa.	September 29, 1934
62	1940	Indianapolis Union Railway,	Indianapolis, Ind.,	October 31, 1934
62	1941	Chicago, Indianapolis & Louisville Railway,	Jordan, Ind.,	November 1, 1934
62	1942	Boston and Maine Railroad,	Clinton, Mass.,	November 5, 1934
62	1944	Nicholas, Fayette and Greenbrier Railroad,	Saw Mill, W. Va.,	November 15, 1934
62	1945	Pennsylvania Railroad,	Seanor, Pa.,	November 19, 1934
62	1946	Union Pacific Railroad,	Wamsutter, Wyo.,	November 26, 1934
62	1947	Missouri Pacific Railroad,	Adrian, Mo.,	December 2, 1934
62	1949	Long Island Railroad,	Vandeveer Park, Long Island, N.Y.,	December 4, 1934
62	1951	Chicago & North Western Railway,	Owatonna, Minn.,	December 8, 1934
62	1952	Chicago, Burlington & Quincy Railroad	Freeman, Ill.,	December 8, 1934
62	1954	Union Terminal Company,	Dallas, Tex.,	December 17, 1934
62	1955	Baltimore & Ohio Railroad,	Big Gunpowder, Md.,	December 18, 1934
62	1956	Mobile and Ohio Railroad,	Trio, Ala.,	December 20, 1934
63	1959	Southern Railway,	Edwardsville, Ala.,	January 5, 1935
63	1964	Pennsylvania Railroad,	Edgewood, Md.,	February 5, 1935
63	1965	New York Central Railroad,	Kile, Ohio,	February 7, 1935
63	1967	Seaboard Air Line Railway,	Cecil, Ala.,	February 17, 1935
63	1969	Nashville, Chattanooga & St. Louis Railway,	Lexington, Tenn.,	February 23, 1935
63	1970	Virginian Railway,	Wriston, W.Va.,	February 25, 1935
63	1971	Missouri Pacific Railroad,	Cunningham Spur, Ark.,	February 25, 1935
63	1972	Clinchfield Railroad,	Toecane, N. C.,	March 20, 1935
63	1973	Missouri Pacific Railroad,	Shields, Kans.,	March 26, 1935
63	1974	New York Central Railroad,	Corning, N.Y.,	March 27, 1935
64	1975	Chicago, Rock Island & Pacific Railway,	Ottawa, Ill.,	April 4, 1935
64	1976	Chicago, Rock Island & Pacific Railway,	Tiffin, Iowa,	April 4, 1935
64	1979	Louisville & Nashville Railroad,	Jemison, Ala.,	April 14, 1935
64	1980	Erie Railroad,	MQ Crossing, N.Y.,	April 25, 1935
64	1981	Missouri-Kansas-Texas Railroad,	Cross (Parsons), Kans.,	April 26, 1935
64	1982	Denver & Salt Lake Railway,	Tolland, Colo.,	May 2, 1935
64	1983	Illinois Central Railroad,	Rust, Ill.,	May 9, 1935
64	1984	Central of Georgia Railway,	Batesville, Ala.,	May 12, 1935
64	1985	Yazoo & Mississippi Valley Railroad, and Illinois Central System,	Steven, La.,	May 18, 1935
64	1986	Chesapeake & Ohio Railway,	South Fayette, W. Va.,	May 21, 1935
64	1987	Chesapeake & Ohio Railway,	Gulfco, Ky.,	May 29, 1935
64	1988	Western Pacific Railroad,	Red Rock, Calif.,	June 9, 1935
64	1989	Chicago, Rock Island & Pacific Railway, and Minneapolis & St. Louis Railroad,	Morning Sun, Iowa,	June 13, 1935
64	1990	Texas and Pacific Railway,	T.& P.Jct. (Dallas) Tex.,	June 14, 1935
64	1991	Missouri Pacific Railroad,	Little Rock, Ark.,	June 23, 1935
65	1992	Denver & Rio Grande Western Railroad,	Geneva, Utah,	July 3, 1935
65	1995	Northern Pacific Railway,	Walland, Wash.,	July 17, 1935
65	1996	Missouri Pacific Railroad,	Sheldon, Mo.,	July 20, 1935
65	1997	Missouri-Kansas-Texas Railroad of Texas,	Brucesville, Tex.,	July 31, 1935
65	1999	Pere Marquette Railway,	Riverdale, Mich.,	August 3, 1935
65	2000	Denver & Rio Grande Western Railroad,	Ruby, Colo.,	August 4, 1935
65	2001	Denver & Rio Grande Western Railroad,	Moore Junction, Colo.,	August 6, 1935
65	2002	Southern Pacific Company,	Cochran, Ore.,	August 6, 1935
65	2004	Chicago, Rock Island & Pacific Railway,	Bland, Mo.,	August 12, 1935
65	2005	Pennsylvania Railroad, and Wheeling & Lake Erie Railway,	Valley Junction, Ohio,	August 20, 1935
65	2006	Denver & Rio Grande Western Railroad,	Cameo, Colo.,	August 31, 1935
65	2007	Pennsylvania Railroad,	Felton, Del.,	September 6, 1935
65	2008	Chesapeake & Ohio Railway,	Pemberton, Va.,	September 9, 1935
65	2009	Chesapeake & Ohio Railway,	Warren, Va.,	September 10, 1935
65	2010	Yazoo & Mississippi Valley Railroad, and Illinois Central System,	West Monroe, La.,	September 14, 1935
65	2011	Chicago & North Western Railway,	Roxby, Mont.,	September 18, 1935

QUARTERLY SUMMARY NUMBER (1)	INVESTIGATION NUMBER (2)	NAME OF (3)
67	2035	Southern Railway,
67	2037	Chicago & North Western Railway,
67	2039	Indiana Harbor Belt Railway,
67	2041	Southern Railway,
67	2043	Litchfield and Madison Railway,
67	2044	Chicago, Rock Island & Pacific Rail
67	2045	Chicago, St. Paul, Minneapolis & Om
67	2047	Southern Pacific Company
67	2048	Baltimore and Ohio Railroad,
67	2050	Chicago, Rock Island & Pacific Rail
67	2051	Boston & Maine Railroad,
67	2053	Virginian Railway,
67	2055	Pennsylvania Railroad,
68	2060	Chesapeake & Ohio Railway,
68	2062	St. Louis, Brownsville & Mexico Ry.
68	2064	Central Vermont Railway,
68	2065	Wheeling & Lake Erie Railway,
68	2066	Fort Dodge, Des Moines and Southern
68	2067	Lehigh Valley Railroad,
68	2069	Southern Railway,
68	2070	Chicago, Indianapolis & Louisville
68	2071	New York, Chicago & St. Louis Railr
68	2072	Pennsylvania Railroad,
68	2073	Missouri Pacific Railroad,
68	2074	Chicago, Burlington & Quincy Railro
68	2075	International-Great Northern Railro
69	2076	Michigan Central Railroad,
69	2080	Southern Railway,
69	2081	Chicago, Rock Island & Pacific Rail
69	2082	Missouri Pacific Railroad,
69	2083	Missouri Pacific Railroad,
69	2085	Pennsylvania Railroad,
69	2088	Baltimore & Ohio Railroad,
69	2090	Nashville, Chattanooga & St. Louis
69	2092	Pennsylvania Railroad,
69	2094	Chicago Great Western Railroad,
69	2095	Missouri-Kansas-Texas Railroad,
69	2098	Boston and Maine Railroad,
69	2099	Baltimore & Ohio Railroad,
69	2100	Illinois Central Railroad,
69	2103	Ann Arbor Railroad,
70	2104	Erie Railroad,
70	2105	Reading Company,
70	2106	Pennsylvania Railroad,
70	2107	Chicago, Burlington & Quincy Railro
70	2109	Louisville & Nashville Railroad,
70	2110	Western Pacific Railroad,
70	2111	Louisiana & Arkansas Railway,
70	2116	St. Louis Southwestern Railway of
70	2117	Atchison, Topeka & Santa Fe Railwa
70	2118	Pittsburgh & West Virginia Railway
70	2119	Union Pacific Railroad,
70	2122	St. Louis Southwestern Railway,
70	2123	Pennsylvania Railroad,
70	2124	Pennsylvania Railroad,
70	2125	Illinois Central Railroad,
70	2126	Chicago Great Western Railroad

NAME OF CARRIER (3)	LOCATION (4)	DATE (5)
thern Railway,	Lake, Ill.,	January 22, 1936
ago & North Western Railway,	Boone, Iowa,	January 30, 1936
ana Harbor Belt Railway,	Gibson, Ind.,	January 31, 1936
thern Railway,	Straven, Ala.,	February 4, 1936
hfield and Madison Railway,	Stallings, Ill.,	February 13, 1936
ago, Rock Island & Pacific Railway,	Floris, Iowa,	February 16, 1936
ago, St. Paul, Minneapolis & Omaha Railway,	Merrian, Minn.,	February 17, 1936
thern Pacific Company	Lerdo, Calif.,	February 25, 1936
timore and Ohio Railroad,	Wheatland, Ind.,	February 26, 1936
ago, Rock Island & Pacific Railway,	LaSalle, Ill.,	March 6, 1936
ton & Maine Railroad,	Claremont Junction, N.H.,	March 12, 1936
ginian Railway,	Ingleside, W. Va.,	March 20, 1936
sylvania Railroad,	Manor, Pa.,	March 27, 1936
apeake & Ohio Railway,	Richmond, Va.,	April 26, 1936
Louis, Brownsville & Mexico Ry., Missouri Pacific Lines,	Brownsville, Tex.,	April 28, 1936
tral Vermont Railway,	Northfield, Vt.,	May 3, 1936
eling & Lake Erie Railway,	Pryor, Ohio,	May 14, 1936
t Dodge, Des Moines and Southern Railroad,	Boone, Iowa,	May 20, 1936
igh Valley Railroad,	Tannery, Pa.,	May 28, 1936
thern Railway,	Efland, N.C.,	June 11, 1936
ago, Indianapolis & Louisville Railway,	Putnamville, Ind.,	June 12, 1936
York, Chicago & St. Louis Railroad,	Madison, Ill.,	June 15, 1936
sylvania Railroad,	New Brunswick, N.J.,	June 17, 1936
souri Pacific Railroad,	Valley Park, Mo.,	June 23, 1936
ago, Burlington & Quincy Railroad,	Blue Springs, Nebr.,	June 29, 1936
rnational-Great Northern Railroad, Missouri Pacific Lines,	Kyle, Tex.,	June 30, 1936
higan Central Railroad,	Wayne Junction, Mich.,	July 5, 1936
thern Railway,	Peak, Tenn.,	July 11, 1936
ago, Rock Island & Pacific Railway,	Butterfield, Ark.,	July 13, 1936
souri Pacific Railroad,	Myrtle, Ark.,	July 14, 1936
souri Pacific Railroad,	Ozark Junction, Ark.,	July 15, 1936
sylvania Railroad,	Vandergrift, Pa.,	July 21, 1936
timore & Ohio Railroad,	Clay City, Ill.,	July 28, 1936
hville, Chattanooga & St. Louis Railway,	anta, Ga.,	August 9, 1936
sylvania Railroad,	Vanport, Pa.,	September 1, 1936
ago Great Western Railroad,	Mingo, Iowa,	September 8, 1936
souri-Kansas-Texas Railroad,	Klondike, Mo.,	September 10, 1936
ton and Maine Railroad,	Mechanicville, N.Y.,	September 14, 1936
timore & Ohio Railroad,	Staunton, Va.,	September 14, 1936
inois Central Railroad,	Toone, Tenn.,	September 15, 1936
Arbor Railroad,	Urania, Mich.,	September 30, 1936
e Railroad,	Glen Echo, Ohio,	October 13, 1936
ding Company,	Preston Junction, Pa.,	October 21, 1936
sylvania Railroad,	Menlo Park, N.J.,	October 26, 1936
ago, Burlington & Quincy Railroad,	Omar, Colo.,	October 27, 1936
isville & Nashville Railroad,	Altro, Ky.,	November 7, 1936
tern Pacific Railroad,	Franklin, Calif.,	November 8, 1936
isiana & Arkansas Railway,	Grant, La.,	November 9, 1936
Louis Southwestern Railway of Texas,	Granby, Tex.,	November 18, 1936
hison, Topeka & Santa Fe Railway,	Kingman, Aris.,	November 19, 1936
sburgh & West Virginia Railway,	West Belt Junction, Pa.,	November 19, 1936
on Pacific Railroad,	Decker, Colo.,	November 24, 1936
Louis Southwestern Railway,	Buckner, Ark.,	November 25, 1936
sylvania Railroad,	North Judson, Ind.,	November 29, 1936
sylvania Railroad,	Springdale, Pa.,	December 2, 1936
inois Central Railroad,	Champaign, Ill.,	December 3, 1936
ago Great Western Railroad,	Boyd, Iowa,	December 13, 1936
	Little York, N.Y.,	December 20, 1936

62	1947	Missouri Pacific Railroad,	Adrian, Mo.,	December 2, 1934	67	2047	Southern Pacific Company
62	1949	Long Island Railroad,	Vanderveer Park, Long Island, N.Y.,	December 4, 1934	67	2048	Baltimore and Ohio Railroad,
62	1951	Chicago & North Western Railway,	Owatonna, Minn.,	December 8, 1934	67	2050	Chicago, Rock Island & Pacific Railway
62	1952	Chicago, Burlington & Quincy Railroad	Freeman, Ill.,	December 8, 1934	67	2051	Boston & Maine Railroad,
62	1954	Union Terminal Company,	Dallas, Tex.,	December 17, 1934	67	2053	Virginian Railway,
62	1955	Baltimore & Ohio Railroad,	Big Gunpowder, Md.,	December 18, 1934	67	2055	Pennsylvania Railroad,
62	1956	Mobile and Ohio Railroad,	Trio, Ala.,	December 20, 1934	68	2060	Chesapeake & Ohio Railway,
63	1959	Southern Railway,	Edwardsville, Ala.,	January 5, 1935	68	2062	St. Louis, Brownsville & Mexico Ry., N
63	1964	Pennsylvania Railroad,	Edgewood, Md.,	February 5, 1935	68	2064	Central Vermont Railway,
63	1965	New York Central Railroad,	Kile, Ohio,	February 7, 1935	68	2065	Wheeling & Lake Erie Railway,
63	1967	Seaboard Air Line Railway,	Cecil, Ala.,	February 17, 1935	68	2066	Fort Dodge, Des Moines and Southern Ra
63	1969	Nashville, Chattanooga & St. Louis Railway,	Lexington, Tenn.,	February 23, 1935	68	2067	Lehigh Valley Railroad,
63	1970	Virginian Railway,	Wriston, W.Va.,	February 25, 1935	68	2069	Southern Railway,
63	1971	Missouri Pacific Railroad,	Cunningham Spur, Ark.,	February 25, 1935	68	2070	Chicago, Indianapolis & Louisville Rai
63	1972	Clinchfield Railroad,	Tuscano, N. C.,	March 20, 1935	68	2071	New York, Chicago & St. Louis Railroad
63	1973	Missouri Pacific Railroad,	Shields, Kans.,	March 26, 1935	68	2072	Pennsylvania Railroad,
63	1974	New York Central Railroad,	Corning, N.Y.,	March 27, 1935	68	2073	Missouri Pacific Railroad,
64	1975	Chicago, Rock Island & Pacific Railway,	Ottawa, Ill.,	April 4, 1935	68	2074	Chicago, Burlington & Quincy Railroad,
64	1976	Chicago, Rock Island & Pacific Railway,	Tiffin, Iowa,	April 4, 1935	68	2075	International-Great Northern Railroad,
64	1979	Louisville & Nashville Railroad,	Jemison, Ala.,	April 24, 1935	69	2076	Michigan Central Railroad,
64	1980	Erie Railroad,	MQ Crossing, N.Y.,	April 25, 1935	69	2080	Southern Railway,
64	1981	Missouri-Kansas-Texas Railroad,	Cross (Parsons), Kans.,	April 26, 1935	69	2081	Chicago, Rock Island & Pacific Railway
64	1982	Denver & Salt Lake Railway,	Tolland, Colo.,	May 2, 1935	69	2082	Missouri Pacific Railroad,
64	1983	Illinois Central Railroad,	Rust, Ill.,	May 9, 1935	69	2083	Missouri Pacific Railroad,
64	1984	Central of Georgia Railway,	Batesville, Ala.,	May 12, 1935	69	2085	Pennsylvania Railroad,
64	1985	Yazoo & Mississippi Valley Railroad, and Illinois Central System,	Steven, La.,	May 18, 1935	69	2088	Baltimore & Ohio Railroad,
64	1986	Chesapeake & Ohio Railway,	South Fayette, W. Va.,	May 21, 1935	69	2090	Nashville, Chattanooga & St. Louis Rai
64	1987	Chesapeake & Ohio Railway,	Oulfco, Ky.,	May 29, 1935	69	2092	Pennsylvania Railroad,
64	1988	Western Pacific Railroad,	Red Rock, Calif.,	June 9, 1935	69	2094	Chicago Great Western Railroad,
64	1989	Chicago, Rock Island & Pacific Railway, and Minneapolis & St. Louis Railroad,	Morning Sun, Iowa,	June 13, 1935	69	2095	Missouri-Kansas-Texas Railroad,
64	1990	Texas and Pacific Railway,	T.& P.Jct. (Dallas) Tex.,	June 14, 1935	69	2098	Boston and Maine Railroad,
64	1991	Missouri Pacific Railroad,	Little Rock, Ark.,	June 23, 1935	69	2099	Baltimore & Ohio Railroad,
65	1992	Denver & Rio Grande Western Railroad,	Geneva, Utah,	July 3, 1935	69	2100	Illinois Central Railroad,
65	1995	Northern Pacific Railway,	Welland, Wash.,	July 17, 1935	69	2103	Ann Arbor Railroad,
65	1996	Missouri Pacific Railroad,	Sheldon, Mo.,	July 20, 1935	70	2104	Erie Railroad,
65	1997	Missouri-Kansas-Texas Railroad of Texas,	Bruceville, Tex.,	July 31, 1935	70	2105	Reading Company,
65	1999	Pere Marquette Railway,	Riverdale, Mich.,	August 3, 1935	70	2106	Pennsylvania Railroad,
65	2000	Denver & Rio Grande Western Railroad,	Ruby, Colo.,	August 4, 1935	70	2107	Chicago, Burlington & Quincy Railroad,
65	2001	Denver & Rio Grande Western Railroad,	Moore Junction, Colo.,	August 6, 1935	70	2109	Louisville & Nashville Railroad,
65	2002	Southern Pacific Company,	Cochran, Ore.,	August 6, 1935	70	2110	Western Pacific Railroad,
65	2004	Chicago, Rock Island & Pacific Railway,	Bland, Mo.,	August 12, 1935	70	2111	Louisiana & Arkansas Railway,
65	2005	Pennsylvania Railroad, and Wheeling & Lake Erie Railway,	Valley Junction, Ohio,	August 20, 1935	70	2116	St. Louis Southwestern Railway of Texa
65	2006	Denver & Rio Grande Western Railroad,	Cameo, Colo.,	August 31, 1935	70	2117	Atchison, Topeka & Santa Fe Railway,
65	2007	Pennsylvania Railroad,	Felton, Del.,	September 6, 1935	70	2118	Pittsburgh & West Virginia Railway,
65	2008	Chesapeake & Ohio Railway,	Pemberton, Va.,	September 9, 1935	70	2119	Union Pacific Railroad,
65	2009	Chesapeake & Ohio Railway,	Warren, Va.,	September 10, 1935	70	2122	St. Louis Southwestern Railway,
65	2010	Yazoo & Mississippi Valley Railroad, and Illinois Central System,	West Monroe, La.,	September 14, 1935	70	2123	Pennsylvania Railroad,
65	2011	Chicago & North Western Railway,	Roxby, Nebr.,	September 18, 1935	70	2124	Pennsylvania Railroad,
65	2013	New York, New Haven & Hartford Railroad,	Westport, Conn.,	September 27, 1935	70	2125	Illinois Central Railroad,
66	2016	Baltimore & Ohio Railroad,	Frederick Junction, Md.,	November 4, 1935	70	2126	Chicago Great Western Railroad,
66	2017	Denver & Salt Lake Railway,	Hallinsville, Colo.,	November 5, 1935	70	2129	Delaware, Lackawanna & Western Railroa
66	2020	Pennsylvania Railroad,	Jewett, Ohio,	November 14, 1935	70	2130	New York, Chicago & St. Louis Railroad,
66	2021	Southern Railway,	Jackson, Ga.,	November 20, 1935	71	2131	Chicago, Burlington & Quincy Railroad,
66	2023	Oregon-Washington Railroad & Navigation Co., Union Pacific System,	So. Junction, Ore.,	December 4, 1935	71	2132	Atchison, Topeka & Santa Fe Railway,
66	2026	Virginian Railway,	Girtsville, W. Va.,	December 14, 1935	71	2134	Pittsburgh & Lake Erie Railroad,
66	2027	Spokane, Portland & Seattle Railway,	Lyle, Wash.,	December 17, 1935	71	2135	Lehigh Valley Railroad,
66	2028	Northern Pacific Railway,	Auburn, Wash.,	December 19, 1935	71	2136	Wabash Railway,
67	2030	Missouri Pacific Railroad,	Lone Tree, Mo.,	January 4, 1936	71	2138	Southern Pacific Railroad,
67	2031	New York Central Railroad,	Carter, N.Y.,	January 5, 1936	71	2139	Missouri Pacific Railroad,
67	2032	Canadian Pacific Railway,	Lowelltown, Me.,	January 7, 1936	71	2140	Southern Railway,
					71	2142	Chicago, Rock Island & Pacific Railway,

timore and Ohio Railroad,	Wheatland, Ind.,	February 26, 1936
cago, Rock Island & Pacific Railway,	LaSalle, Ill.,	March 6, 1936
ton & Maine Railroad,	Claremont Junction, N.H.,	March 12, 1936
ginian Railway,	Ingleside, W. Va.,	March 20, 1936
nsylvania Railroad,	Manor, Pa.,	March 27, 1936
apeake & Ohio Railway,	Richmond, Va.,	April 26, 1936
Louis, Brownsville & Mexico Ry., Missouri Pacific Lines,	Brownsville, Tex.,	April 28, 1936
tral Vermont Railway,	Northfield, Vt.,	May 3, 1936
eling & Lake Erie Railway,	Pryor, Ohio,	May 14, 1936
t Dodge, Des Moines and Southern Railroad,	Boone, Iowa,	May 20, 1936
igh Valley Railroad,	Tannery, Pa.,	May 28, 1936
thern Railway,	Efland, N.C.,	June 11, 1936
cago, Indianapolis & Louisville Railway,	Putnamville, Ind.,	June 12, 1936
York, Chicago & St. Louis Railroad,	Madison, Ill.,	June 15, 1936
nsylvania Railroad,	New Brunswick, N.J.,	June 17, 1936
souri Pacific Railroad,	Valley Park, Mo.,	June 23, 1936
cago, Burlington & Quincy Railroad,	Blue Springs, Nebr.,	June 29, 1936
rnational-Great Northern Railroad, Missouri Pacific Lines,	Kyle, Tex.,	June 30, 1936
higan Central Railroad,	Wayne Junction, Mich.,	July 5, 1936
thern Railway,	Peak, Tenn.,	July 11, 1936
cago, Rock Island & Pacific Railway,	Butterfield, Ark.,	July 13, 1936
souri Pacific Railroad,	Myrtle, Ark.,	July 14, 1936
souri Pacific Railroad,	Ozark Junction, Ark.,	July 15, 1936
nsylvania Railroad,	Vandergrift, Pa.,	July 21, 1936
timore & Ohio Railroad,	Clay City, Ill.,	July 28, 1936
hville, Chattanooga & St. Louis Railway,	Junta, Ga.,	August 9, 1936
nsylvania Railroad,	Vanport, Pa.,	September 1, 1936
cago Great Western Railroad,	Mingo, Iowa,	September 8, 1936
souri-Kansas-Texas Railroad,	Klondike, Mo.,	September 10, 1936
ton and Maine Railroad,	Mechanicville, N.Y.,	September 14, 1936
timore & Ohio Railroad,	Staunton, Va.,	September 14, 1936
inois Central Railroad,	Toone, Tenn.,	September 15, 1936
Arbor Railroad,	Urania, Mich.,	September 30, 1936
e Railroad,	Glen Echo, Ohio,	October 13, 1936
ding Company,	Preston Junction, Pa.,	October 21, 1936
nsylvania Railroad,	Menlo Park, N.J.,	October 26, 1936
cago, Burlington & Quincy Railroad,	Omar, Colo.,	October 27, 1936
isville & Nashville Railroad,	Altro, Ky.,	November 7, 1936
tern Pacific Railroad,	Franklin, Calif.,	November 8, 1936
isiana & Arkansas Railway,	Grant, La.,	November 9, 1936
Louis Southwestern Railway of Texas,	Granby, Tex.,	November 18, 1936
hison, Topeka & Santa Fe Railway,	Kingman, Ariz.,	November 19, 1936
tsburgh & West Virginia Railway,	West Belt Junction, Pa.,	November 19, 1936
on Pacific Railroad,	Decker, Colo.,	November 7, 1936
Louis Southwestern Railway,	Buckner, Ark.,	November 25, 1936
nsylvania Railroad,	North Judson, Ind.,	November 29, 1936
nsylvania Railroad,	Springdale, Pa.,	December 2, 1936
inois Central Railroad,	Champaign, Ill.,	December 3, 1936
cago Great Western Railroad,	Boyd, Iowa,	December 13, 1936
aware, Lackawanna & Western Railroad,	Little York, N.Y.,	December 20, 1936
York, Chicago & St. Louis Railroad,	Bloomington, Ill.,	December 31, 1936
cago, Burlington & Quincy Railroad,	Keenesburg, Colo.,	January 1, 1937
hison, Topeka & Santa Fe Railway,	Hilinwood, Kans.,	January 2, 1937
tsburgh & Lake Erie Railroad,	Wick Haven, Pa.,	January 6, 1937
igh Valley Railroad,	Phillipsburg, N.J.,	January 9, 1937
ash Railway,	Glenwood Jct., Mo.,	January 9, 1937
thern Pacific Railroad,	Blue Canon, Calif.,	January 28, 1937
souri Pacific Railroad,	Bucyrus, Kans.,	January 30, 1937
thern Railway,	Jefferson, Ala.,	February 3, 1937
cago, Rock Island & Pacific Railway,	Logan, N. Mex.,	February 9, 1937

QUARTERLY SUMMARY NUMBER (1)	INVESTIGATION NUMBER (2)	NAME OF CARRIER (3)	LOCATION (4)	DATE (5)
71	2143	Western Maryland Railway,	Oldtown, Md.,	February 9, 1937
71	2144	Pittsburgh & Lake Erie Railroad,	Pittsburgh, Pa.,	February 11, 1937
71	2147	Erie Railroad,	Decatur, Ind.,	February 14, 1937
71	2149	Baltimore & Ohio Railroad,	Hutchinson, W. Va.,	February 16, 1937
71	2151	Northern Pacific Railway;	Pingree, N. Dak.,	February 22, 1937
71	2152	Cleveland, Cincinnati, Chicago & St. Louis Railway,	McCoy, Ind.,	February 22, 1937
71	2153	New York, Chicago & St. Louis Railroad,	Stony Island, Ill.,	March 3, 1937
71	2154	Atlanta, Birmingham & Coast Railroad, Louisville & Nashville Railroad,	Helena, Ala.,	March 6, 1937
71	2155	New York, Chicago & St. Louis Railroad,	St. Marys, Ohio,	March 6, 1937
71	2156	Pennsylvania Railroad,	Blairsville, Pa.,	March 6, 1937
71	2157	Pere Marquette Railway,	Michigan City, Ind.,	March 7, 1937
71	2158	Mobile & Ohio Railroad,	Okolona, Miss.,	March 14, 1937
71	2160	Minneapolis, St. Paul & Sault Ste. Marie Railway,	Fullerton, N. Dak.,	March 17, 1937
71	2161	Southern Pacific Railroad,	Eliot, Calif.,	March 18, 1937
71	2162	Union Pacific Railroad,	Minidoka, Idaho,	March 19, 1937
71	2163	Norfolk & Western Railway,	Flat Top, Va.,	March 21, 1937
71	2166	Colorado & Southern Railway,	Royce, N. Mex.,	March 26, 1937
72	2167	Atlantic Coast Line Railroad,	Childs, Fla.,	April 2, 1937
72	2168	Missouri-Kansas-Texas Railroad,	Stark, Kans.,	April 8, 1937
72	2169	Pennsylvania Railroad,	Rushville, Ind.,	April 16, 1937
72	2176	Illinois Central Railroad,	Hillside, Tenn.,	May 29, 1937
72	2177	Seaboard Air Line Railway,	Youngville, N.C.,	June 2, 1937
72	2180	Grand Trunk Western Railroad,	Lansing, Mich.,	June 9, 1937
72	2181	Missouri-Kansas-Texas Railroad,	Noxie, Okla.,	June 12, 1937
72	2184	Missouri Pacific Railroad,	Jamestown, Kans.,	June 30, 1937
73	2186	International-Great Northern Railroad,	Manchaca, Tex.,	July 12, 1937
73	2187	Wheeling & Lake Erie Railway,	Jewett, Ohio,	July 16, 1937
73	2188	St. Louis-San Francisco Railway,	Winfield, Kans.,	July 20, 1937
73	2189	Pennsylvania Railroad,	Philadelphia, Pa.,	July 30, 1937
73	2191	Cincinnati, New Orleans & Texas Pacific Railway; Southern Railway System,	Sale Creek, Tenn.,	August 2, 1937
73	2193	Northwestern Pacific Railroad,	Camp Nine, Calif.,	August 6, 1937
73	2194	Lehigh Valley Railroad,	Verdi Junction, Pa.,	August 9, 1937
73	2195	Pennsylvania Railroad,	New Galilee, Pa.,	August 18, 1937
73	2196	Baltimore & Ohio Railroad,	Cannelburg, Ind.,	August 24, 1937
73	2197	Chesapeake & Ohio Railway,	O.K. Cabin, Ky.,	August 25, 1937
73	2199	Denver & Rio Grande Western Railroad,	Grand Valley, Colo.,	September 8, 1937
73	2200	Chicago, Burlington & Quincy Railroad,	Wendel, Ill.,	September 24, 1937
74	2202	Chicago, Rock Island & Pacific Railway,	Liberal, Kans.,	October 2, 1937
74	2203	Missouri Pacific Railroad,	Gale, Ill.,	October 3, 1937
74	2204	Cleveland, Cincinnati, Chicago & St. Louis Railway,	Cobb, Ind.,	October 6, 1937
74	2206	Louisville & Nashville Railroad,	Crestwood, Ky.,	October 15, 1937
74	2207	Western Maryland Railway,	Brush Run, Pa.,	October 15, 1937
74	2214	Wabash Railway,	La Fayette, Ind.,	October 25, 1937
74	2215	Wabash Railway,	Catlin, Ill.,	October 26, 1937
74	2216	Missouri-Kansas-Texas Railroad of Texas,	Troy, Tex.,	October 26, 1937
74	2220	St. Louis Southwestern Railway of Texas,	Rusk, Tex.,	November 6, 1937
74	2221	St. Louis San Francisco Railway,	Pierce City, Mo.,	November 9, 1937
74	2224	Union Pacific Railroad,	Brigham, Utah,	November 18, 1937
74	2227	Southern Pacific Company,	Kerman, Calif.,	November 23, 1937
74	2228	Wheeling & Lake Erie Railway,	Clyde, Ohio,	November 28, 1937
74	2229	Burlington-Rock Island Railroad,	Normangee, Tex.,	November 30, 1937
74	2230	Baltimore & Ohio Railroad,	Great Cacapon, W. Va.,	December 1, 1937
74	2232	Yazoo & Mississippi Valley Railroad, Illinois Central System,	Lake Cormorant, Miss.,	December 6, 1937
74	2233	Seaboard Air Line Railway,	Arcadia, Fla.,	December 7, 1937
74	2234	Chicago, St. Paul, Minneapolis & Omaha Railway,	Cornell, Wis.,	December 11, 1937
74	2235	Southern Railway System,	Salvisa, Ky.,	December 12, 1937
74	2239	Spokane, Portland & Seattle Railway,		

QUARTERLY SUMMARY NUMBER (1)	INVESTIGATION NUMBER (2)	NAME OF (3)
75	2260	Illinois Central System,
75	2262	Southern Pacific Company,
75	2263	Minneapolis, St. Paul & Sault Ste.
76	2264	Chicago Great Western Railroad,
76	2266	Missouri-Kansas-Texas Railroad,
76	2269	Chicago, Rock Island & Pacific Rail
76	2270	Louisville & Nashville Railroad,
76	2273	Boston & Maine Railroad,
76	2274	Pennsylvania Railroad,
76	2276	Yazoo & Mississippi Valley Railroad
76	2277	Fort Worth & Denver City Railway,
76	2280	Pennsylvania Railroad,
77	2281	Pennsylvania Railroad,
77	2282	Pennsylvania Railroad,
77	2283	Delaware & Hudson Railroad,
77	2284	Chesapeake & Western Railway,
77	2286	Chicago, Rock Island & Pacific Rail
77	2291	Southern Pacific Railroad,
77	2293	Wheeling & Lake Erie Railway,
77	2295	Boston and Maine Railroad,
77	2297	Denver & Salt Lake Railway,
78	2298	Seaboard Air Line Railway and the A
78	2300	Chicago, Rock Island & Pacific Rail
78	2301	Chicago & North Western Railway,
78	2302	Central of Georgia Railway,
78	2304	St. Louis-San Francisco Railway,
78	2306	Chicago, Rock Island & Pacific Rail
78	2307	Boston & Maine Railroad,
78	2308	Illinois Central Railroad,
78	2310	Southern Pacific Company,
78	2311	Atlantic Coast Line Railroad,
78	2314	Southern Pacific Company,
78	2315	Denver & Rio Grande Western Railroa
78	2316	Erie Railroad,
78	2319	Baltimore & Ohio Railroad,
78	2320	Illinois Central Railroad,
79	2322	Chicago & North Western Railway,
79	2324	Terminal Railroad Association of St.
79	2325	Illinois Central Railroad,
79	2327	Southern Railway,
79	2328	Central of Georgia Railway,
79	2329	Illinois Central Railroad and Chicag
79	2330	Lehigh Valley Railroad,
79	2331	Union Pacific Railroad,
79	2332	St. Louis-San Francisco Railway,
79	2333	Chicago Great Western Railroad,
79	2334	Chicago, Rock Island & Pacific Rail
79	2336	Union Pacific Railroad and Northern
79	2337	Chicago, Burlington & Quincy Railroa
79	2338	Southern Pacific Company,
79	2339	Baltimore & Ohio Railroad,
80	2342	Alton Railroad,
80	2343	Minneapolis, St. Paul & Sault Ste.
80	2344	Pittsburgh & West Virginia Railway,
80	2345	Spokane, Portland & Seattle Railway,
80	2347	Pennsylvania Railroad,

NAME OF CARRIER (3)	LOCATION (4)	DATE (5)
,	Carbondale, Ill.,	March 14, 1938
Sault Ste. Marie Railway,	Loomis, Calif.,	March 26, 1938
ailroad,	Fond du Lac, Wis.,	March 28, 1938
	Clare, Ill.,	April 3, 1938
ailroad,	Atoka, Okla.,	April 10, 1938
acific Railway,	Oak Forest, Ill.,	April 20, 1938
ailroad,	Elliston, Ky.,	April 24, 1938
	East Somerville, Mass.,	May 31, 1938
ley Railroad, Illinois Central System,	Kimbolton, Ohio,	June 7, 1938
Railway,	Clarksburg, Miss.,	June 13, 1938
	Sanmorwood, Tex.,	June 10, 1938
	Cleveland, Ohio,	June 25, 1938
	Elwood, Ind.,	July 11, 1938
ad,	Lawsonham, Pa.,	July 21, 1938
y,	Hudson, Pa.,	July 21, 1938
	Laymans, Va.,	July 30, 1938
acific Railway,	Altoona, Iowa,	August 3, 1938
d,	Jasper, Oregon,	September 12, 1938
lway.	Unionvale, Ohio,	September 16, 1938
d,	East Deerfield, Mass.,	September 20, 1938
ay,	Lowell, Colo.,	September 27, 1938
y and the Atlantic Coast Line Railroad,	Archer, Fla.,	October 6, 1938
acific Railway,	Washburn, Iowa,	October 15, 1938
Railway,	Maribel, Wis.,	October 18, 1938
ay,	Holt, Ga.,	October 21, 1938
Railway,	Rotan, Ark.,	October 27, 1938
acific Railway, and Chicago, Burlington & Quincy RR.	Council Bluffs, Iowa,	November 6, 1938
	Charlemont, Mass.,	November 7, 1938
d,	Belmont, Miss.,	November 9, 1938
,	Reno, Nevada,	November 19, 1938
road,	Florence, S.C.,	November 25, 1938
	Erickson, Calif.,	November 15, 1938
erh Railroad,	Riverton, Utah,	December 1, 1938
	Howells Junction, N.Y.	December 5, 1938
d,	Hope, Ohio,	December 26, 1938
d,	Marissa, Ill.,	December 29, 1938
Railway,	Evansville, Wis.,	January 2, 1939
ation of St. Louis,	Madison, Ill.,	January 27, 1939
d,	Robbs Spur, Ill.,	January 29, 1939
	Paint Rock, N.C.,	February 3, 1939
ay,	Sargent, Ga.,	February 7, 1939
d and Chicago, Milwaukee, St.Paul & Pacific RR,	Charles City, Iowa,	February 9, 1939
	Jutland, N.J.,	February 10, 1939
	Chard, Wash.,	February 15, 1939
Railway,	Quincy, Miss.,	February 16, 1939
ilroad,	Tennant, Iowa,	February 18, 1939
acific Railway,	Brandt, S. Dak.,	February 20, 1939
nd Northern Pacific Railway,	Attalia, Wash.,	February 27, 1939
ncy Railroad,	Beverly, Mo.,	February 28, 1939
,	Caliente, Calif.,	March 10, 1939
	Point of Rocks, Md.,	March 20, 1939
	Summit, Ill.,	April 1, 1939
ault Ste. Marie Railway,	Superior, Wis.,	April 8, 1939
a Railway,	Hockdale, W. Va.,	April 9, 1939
ie Railway,		

71	2153	New York, Chicago & St. Louis Railroad,	Stony Island, Ill.,	March 3, 1937	76	2270	Louisville & Nashville Rai
71	2154	Atlanta, Birmingham & Coast Railroad, Louisville & Nashville Railroad,	Helena, Ala.,	March 6, 1937	76	2273	Boston & Maine Railroad.
71	2155	New York, Chicago & St. Louis Railroad,	St. Marys, Ohio,	March 6, 1937	76	2274	Pennsylvania Railroad,
71	2156	Pennsylvania Railroad,	Blairsville, Pa.,	March 6, 1937	76	2276	Yazoo & Mississippi Valley
71	2157	Pere Marquette Railway,	Michigan City, Ind.,	March 7, 1937	76	2277	Fort Worth & Denver City R
71	2158	Mobile & Ohio Railroad,	Okolona, Miss.,	March 14, 1937	76	2280	Pennsylvania Railroad,
71	2160	Minneapolis, St. Paul & Sault Ste. Marie Railway,	Fullerton, N. Dak.,	March 17, 1937	77	2281	Pennsylvania Railroad,
71	2161	Southern Pacific Railroad,	Eliot, Calif.,	March 18, 1937	77	2282	Pennsylvania Railroad,
71	2162	Union Pacific Railroad,	Minidoka, Idaho,	March 19, 1937	77	2283	Delaware & Hudson Railroad
71	2163	Norfolk & Western Railway,	Flat Top, Va.,	March 21, 1937	77	2284	Chesapeake & Western Railway,
71	2166	Colorado & Southern Railway,	Royce, N. Mex.,	March 26, 1937	77	2286	Chicago, Rock Island & Pac
72	2167	Atlantic Coast Line Railroad,	Childs, Fla.,	April 2, 1937	77	2291	Southern Pacific Railroad,
72	2168	Missouri-Kansas-Texas Railroad,	Stark, Kans.,	April 8, 1937	77	2293	Wheeling & Lake Erie Railw
72	2169	Pennsylvania Railroad,	Rushville, Ind.,	April 16, 1937	77	2295	Boston and Maine Railroad,
72	2176	Illinois Central Railroad,	Hillside, Tenn.,	May 29, 1937	77	2297	Denver & Salt Lake Railway,
72	2177	Seaboard Air Line Railway,	Youngville, N.C.,	June 2, 1937	78	2298	Seaboard Air Line Railway,
72	2180	Grand Trunk Western Railroad,	Lansing, Mich.,	June 9, 1937	78	2300	Chicago, Rock Island & Pac
72	2181	Missouri-Kansas-Texas Railroad,	Noxie, Okla.,	June 12, 1937	78	2301	Chicago & North Western Ra
72	2184	Missouri Pacific Railroad,	Jamestown, Kans.,	June 30, 1937	78	2302	Central of Georgia Railway,
73	2186	International-Great Northern Railroad,	Manchaca, Tex.,	July 12, 1937	78	2304	St. Louis-San Francisco Ra
73	2187	Wheeling & Lake Erie Railway,	Jewett, Ohio,	July 16, 1937	78	2306	Chicago, Rock Island & Pac
73	2188	St. Louis-San Francisco Railway,	Winfield, Kans.,	July 20, 1937	78	2307	Boston & Maine Railroad,
73	2189	Pennsylvania Railroad,	Philadelphia, Pa.,	July 30, 1937	78	2308	Illinois Central Railroad,
73	2191	Cincinnati, New Orleans & Texas Pacific Railway; Southern Railway System,	Sale Creek, Tenn.,	August 2, 1937	78	2310	Southern Pacific Company,
73	2193	Northwestern Pacific Railroad,	Camp Nine, Calif.,	August 6, 1937	78	2311	Atlantic Coast Line Railroa
73	2194	Lehigh Valley Railroad,	Vexit Junction, Pa.,	August 9, 1937	78	2314	Southern Pacific Company,
73	2195	Pennsylvania Railroad,	New Galilee, Pa.,	August 18, 1937	78	2315	Denver & Rio Grande Western
73	2196	Baltimore & Ohio Railroad,	Cannelburg, Ind.,	August 24, 1937	78	2316	Erie Railroad,
73	2197	Chesapeake & Ohio Railway,	O.K. Cabin, Ky.,	August 25, 1937	78	2319	Baltimore & Ohio Railroad,
73	2199	Denver & Rio Grande Western Railroad,	Grand Valley, Colo.,	September 8, 1937	78	2320	Illinois Central Railroad,
73	2200	Chicago, Burlington & Quincy Railroad,	Mendel, Ill.,	September 24, 1937	79	2322	Chicago & North Western Ra
74	2202	Chicago, Rock Island & Pacific Railway,	Liberal, Kans.,	October 2, 1937	79	2324	Terminal Railroad Associati
74	2203	Missouri Pacific Railroad,	Gale, Ill.,	October 3, 1937	79	2325	Illinois Central Railroad,
74	2204	Cleveland, Cincinnati, Chicago & St. Louis Railway,	Cobb, Ind.,	October 6, 1937	79	2327	Southern Railway,
74	2206	Louisville & Nashville Railroad,	Crestwood, Ky.,	October 15, 1937	79	2328	Central of Georgia Railway,
74	2207	Western Maryland Railway,	Brush Run, Pa.,	October 15, 1937	79	2329	Illinois Central Railroad
74	2214	Wabash Railway,	La Fayette, Ind.,	October 25, 1937	79	2330	Lehigh Valley Railroad,
74	2215	Wabash Railway,	Catlin, Ill.,	October 26, 1937	79	2331	Union Pacific Railroad,
74	2216	Missouri-Kansas-Texas Railroad of Texas,	Troy, Tex.,	October 26, 1937	79	2332	St. Louis-San Francisco Rai
74	2220	St. Louis Southwestern Railway of Texas,	Rusk, Tex.,	November 6, 1937	79	2333	Chicago Great Western Railw
74	2221	St. Louis San Francisco Railway,	Pierce City, Mo.,	November 9, 1937	79	2334	Chicago, Rock Island & Paci
74	2224	Union Pacific Railroad,	Brigham, Utah,	November 18, 1937	79	2336	Union Pacific Railroad and
74	2227	Southern Pacific Company,	Kermah, Calif.,	November 23, 1937	79	2337	Chicago, Burlington & Quincy
74	2228	Wheeling & Lake Erie Railway,	Clyde, Ohio,	November 28, 1937	79	2338	Southern Pacific Company,
74	2229	Burlington-Rock Island Railroad,	Normangee, Tex.,	November 30, 1937	79	2339	Baltimore & Ohio Railroad,
74	2230	Baltimore & Ohio Railroad,	Great Cacapon, W. Va.,	December 1, 1937	80	2342	Alton Railroad,
74	2232	Yazoo & Mississippi Valley Railroad, Illinois Central System,	Lake Cormorant, Miss.,	December 6, 1937	80	2343	Minneapolis, St. Paul & Sau
74	2233	Seaboard Air Line Railway,	Arcadia, Fla.,	December 7, 1937	80	2344	Pittsburgh & West Virginia
74	2234	Chicago, St. Paul, Minneapolis & Omaha Railway,	Cornell, Wis.,	December 11, 1937	80	2345	Spokane, Portland & Seattle
74	2235	Southern Railway System,	Salvisa, Ky.,	December 12, 1937	80	2347	Pennsylvania Railroad,
74	2239	Spokane, Portland & Seattle Railway,	Mt. Pleasant, Wash.,	December 26, 1937	80	2348	Texas & Pacific Railway,
74	2240	Missouri Pacific Railroad,	Poplar Bluff, Mo.,	December 27, 1937	80	2349	Atlantic Coast Line Railroa
75	2242	Missouri-Kansas-Texas Railroad,	Tryon, Okla.,	January 4, 1938	80	2350	Ann Arbor Railroad,
75	2244	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Lanark, Ill.,	January 12, 1938	80	2351	Pennsylvania Railroad,
75	2246	Minneapolis, St. Paul & Sault Ste. Marie Railway,	Voltaire, N. Dak.,	January 20, 1938	80	2353	Norfolk and Western Railway
75	2247	Chicago, Rock Island & Pacific Railway,	Waterloo, Iowa,	January 25, 1938	80	2354	Missouri Pacific Railroad,
75	2248	Chicago & North Western Railway,	Lake Bluff, Ill.,	February 3, 1938	80	2358	Missouri Pacific Railroad,
75	2252	Colorado & Southern Railway,	Folsom, N. Mex.,	February 14, 1938	80	2360	Delaware, Lackawanna & West
75	2253	St. Louis Southwestern Railway,	Roe, Ark.,	February 17, 1938	80	2361	Illinois Central Railroad,
75	2257	Chicago, Burlington & Quincy Railroad,	West Burlington, Iowa,	February 26, 1938	80	2365	Atlantic Coast Line Railro
75	2258	Norfolk & Western Railway,	Hull, W. Va.,	March 3, 1938	80	2366	Chicago, Milwaukee, St. P
75	2259	Louisville & Nashville Railroad,	Patio, N.Y.,	March 10, 1938	80	2367	Baltimore & Ohio Railroad,

...ay Railroad, Illinois Central System,	Kimbolton, Ohio,	June 7, 1938
... Railway,	Clarksburg, Miss.,	June 13, 1938
	Sammorwood, Tex.,	June 10, 1938
	Cleveland, Ohio,	June 25, 1938
	Elwood, Ind.,	July 11, 1938
	Lawsenham, Pa.,	July 21, 1938
...ad,	Hudson, Pa.,	July 21, 1938
...y,	Laymans, Va.,	July 30, 1938
...acific Railway,	Altoona, Iowa,	August 3, 1938
...d,	Jasper, Oregon,	September 12, 1938
...lway.	Unionvale, Ohio,	September 16, 1938
...d,	East Deerfield, Mass.,	September 20, 1938
...ay,	Lowell, Colo.,	September 27, 1938
...y and the Atlantic Coast Line Railroad,	Archer, Fla.,	October 6, 1938
...acific Railway,	Washburn, Iowa,	October 15, 1938
...Railway,	Maribel, Wis.,	October 18, 1938
...ay,	Holt, Ga.,	October 21, 1938
... Railway,	Rotan, Ark.,	October 27, 1938
...acific Railway, and Chicago, Burlington & Quincy RR.	Council Bluffs, Iowa,	November 6, 1938
	Charlemont, Mass.,	November 7, 1938
...d,	Belmont, Miss.,	November 9, 1938
...,	Reno, Nevada,	November 19, 1938
...road,	Florence, S.C.,	November 25, 1938
...	Erickson, Calif.,	November 15, 1938
...ern Railroad,	Riverton, Utah,	December 1, 1938
...d,	Howells Junction, N.Y.	December 5, 1938
...d,	Hope, Ohio,	December 26, 1938
	Marissa, Ill.,	December 29, 1938
...Railway,	Evansville, Wis.,	January 2, 1939
...ation of St. Louis,	Madison, Ill.,	January 27, 1939
...d,	Robbs Spur, Ill.,	January 29, 1939
	Paint Rock, N.C.,	February 3, 1939
...ay,	Sargent, Ga.,	February 7, 1939
...d and Chicago, Milwaukee, St.Paul & Pacific RR,	Charles City, Iowa,	February 9, 1939
	Jutland, N.J.,	February 10, 1939
	Chard, Wash.,	February 15, 1939
...Railway,	Quincy, Miss.,	February 16, 1939
...Lroad,	Tennant, Iowa,	February 18, 1939
...acific Railway,	Brandt, S. Dak.,	February 20, 1939
...d Northern Pacific Railway,	Attalia, Wash.,	February 27, 1939
...incy Railroad,	Beverly, Mo.,	February 28, 1939
...,	Caliente, Calif.,	March 20, 1939
	Point of Rocks, Md.,	March 20, 1939
	Summit, Ill.,	April 1, 1939
...quit Gulf Northern Railway,	Superior, Wis.,	April 8, 1939
...e Railway,	Rockdale, W. Va.,	April 9, 1939
...ie Railway,	Ainsworth Junction, Wash.	April 17, 1939
	Kenny, Pa.,	April 30, 1939
...ad,	Denton, Tex.,	May 8, 1939
	Fayetteville, N.C.,	May 1, 1939
	McBain, Mich.,	May 16, 1939
	Bradford, Ohio,	May 21, 1939
...ay,	Pembroke, Va.,	May 20, 1939
...,	Scott, Mo.,	May 30, 1939
...tern Railroad,	Shepherd, Ark.,	June 2, 1939
	Port Norris Jct., N.J.,	June 3, 1939
...,	Unionville, Ind.,	June 4, 1939
...oad,	Haines City, Fla.,	June 18, 1939
...ul & Pacific Railroad,	Gretna, S. Dak.,	June 26, 1939
...	Allandale, Ohio,	June 28, 1939

INDEX (Continued)

QUARTERLY SUMMARY NUMBER (1)	INVESTIGATION NUMBER (2)	NAME OF CARRIER (3)	LOCATION (4)	DATE (5)	QUARTERLY SUMMARY NUMBER (1)	INVESTIGATION NUMBER (2)	NAME OF CARRIER (3)	LOCATION (4)	DATE (5)
81	2368	Louisville & Nashville Railroad,	Sinks, Ky.,	July 3, 1939					
81	2369	Norfolk and Western Railway,	Dry Branch, Va.,	July 5, 1939					
81	2372	Missouri Pacific Railroad,	Nelson, Mo.,	August 7, 1939					
81	2377	Chicago, Milwaukee, St. Paul and Pacific Railroad,	Marion Yard, Iowa,	September 8, 1939					
81	2380	Southern Pacific Railroad,	Hasson, Calif.,	September 15, 1939					
81	2381	Chicago, Burlington & Quincy Railroad,	Old Monroe, Mo.,	September 16, 1939					
81	2382	Chesapeake and Ohio Railway,	Trace, Ky.,	September 22, 1939					
81	2383	Alton Railroad,	Vera, Mo.,	September 24, 1939					
82	2384	Pennsylvania Railroad,	Parkesburg, Pa.,	September 27, 1939					
82	2385	Atchison, Topeka & Santa Fe Railway,	Plaines, Ill.,	October 1, 1939					
82	2386	Chicago, Burlington & Quincy Railroad,	Napier, Mo.,	October 2, 1939					
82	2387	Pennsylvania Railroad,	Philadelphia, Pa.,	October 13, 1939					
82	2388	Atlantic Coast Line Railroad,	Wilmington, N.C.,	October 21, 1939					
82	2390	Indiana Harbor Belt Railroad,	Alco, Ind.,	October 30, 1939					
82	2391	Colorado and Southern Railway,	Des Moines, N.Mex.,	November 2, 1939					
82	2393	Illinois Central Railroad,	Mattoon, Ill.,	November 19, 1939					
82	2396	Pennsylvania Railroad,	Pequea, Pa.,	December 4, 1939					
82	2397	Southern Pacific Railroad,	Morley, Calif.,	December 15, 1939					
83	2402	Pennsylvania Railroad,	Meadows Yard, N.J.,	December 31, 1939					

Defendant's Exhibit No. 271 (Witness J.J. Sullivan)
Feb. 5, 1941

TABULATION OF DATA
PUBLISHED IN QUARTERLY SUMMARIES OF ACCIDENT INVESTIGATION REPORTS
INTERSTATE COMMERCE COMMISSION - BUREAU OF SAFETY
IN SO FAR AS IT RELATES TO ACCIDENTS INVOLVING PASSENGER TRAINS
IN THE UNITED STATES

YEARS 1934 TO 1939

BUREAU OF SAFETY QUARTERLY SUMMARY OF ACCIDENT INVESTIGATION REPORTS — NO.	PERIOD COVERED	TOTAL NO. OF ACCIDENTS, ALL KINDS OF TRAINS INVESTIGATED	NUMBER OF ACCIDENTS INVESTIGATED INVOLVING PASSENGER TRAINS: TOTAL NUMBER INVOLVING PASSENGER TRAINS	COLLISIONS	DERAILMENTS	MISCL.	PERSONS KILLED: PASSENGERS	EMPLOYES	ALL OTHERS	PERSONS INJURED: PASSENGERS	EMPLOYES	ALL OTHERS	TOTAL NUMBER OF PASSENGER TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS: 5 AND LESS	6 TO 8	9 TO 11	12 TO 14	OVER 14	TOTAL	PRIMARY CAUSE OF ACCIDENT INVESTIGATED: DEFECTS IN OR FAILURES OF EQUIPMENT	DEFECTS IN OR IMPROPER MAINTENANCE OF WAY AND STRUCTURES	COLLISIONS WITH VEHICLES AT GRADE CROSSINGS	ALL OTHER CAUSES EXCEPT NEGLIGENCE	NEGLIGENCE OF EMPLOYES: CONDUCTORS AND BRAKEMEN	ENGINEERS AND FIREMEN	JOINT TRAINMEN AND ENGINEMEN	DISPATCHERS AND OPERATORS	OTHER EMPLOYES	JOINT TWO OR MORE OTHER EMPLOYES	TOTAL NEGLIGENCE	NOT DEFINITELY DETERMINED
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(bb)	(cc)	(dd)	(ee)
59	Jan to Mar 1934	24	12	3	9	-	9	14	4	62	35	10	7	6	1	1	-	15	1	-	5	1	-	3	2	-	-	-	5	-
60	Apr to June "	13	5	2	3	-	1	5	-	6	10	1	5	1	-	-	-	6	-	-	-	2	1	1	1	-	-	-	3	-
61	July to Sept "	17	11	1	8	-	1	12	8	367	19	18	5	1	4	2	-	12	-	-	4	3	1	2	1	-	-	-	4	-
62	Oct to Dec "	23	10	3	7	-	2	16	1	35	20	14	5	3	5	-	-	13	-	1	-	2	-	2	1	-	-	-	3	1
	TOTAL YEAR 1934	77	38	11	27	-	13	47	13	510	84	43	22	11	10	3	-	46	1	1	9	11	2	8	5	-	-	-	15	1
63	Jan to Mar 1935	16	9	4	4	1	-	5	2	238	49	24	3	4	1	1	1	10	1	-	1	1	1	3	2	-	-	-	6	-
64	Apr to June "	17	5	4	-	1	-	3	14	25	11	18	3	-	2	-	-	5	-	-	1	-	-	3	1	-	1	-	4	-
65	July to Sept "	22	6	2	3	1	6	7	3	76	38	13	3	1	1	-	1	6	-	-	2	1	-	1	1	-	-	-	3	-
66	Oct to Dec "	16	8	3	4	1	-	7	1	36	17	9	1	2	1	-	1	9	-	4	2	1	-	-	1	-	-	-	1	-
	TOTAL YEAR 1935	71	28	11	13	4	6	22	20	375	115	64	12	7	7	1	3	30	1	4	6	3	1	7	5	-	1	-	14	-
67	Jan to Mar 1936	26	12	6	5	1	2	12	11	135	43	23	6	4	1	3	-	14	-	1	2	1	-	4	2	-	-	-	6	-
68	Apr to June "	18	5	2	2	1	3	1	3	222	18	-	4	1	-	1	-	6	-	1	1	1	-	1	1	-	-	-	2	-
69	July to Sept "	28	8	4	3	1	-	10	4	97	31	9	5	2	1	1	-	9	-	-	2	3	-	1	2	-	-	-	3	-
70	Oct to Dec "	27	10	5	5	-	11	11	3	152	24	15	6	4	1	2	-	13	1	1	2	1	-	1	2	-	-	-	5	-
	TOTAL YEAR 1936	101	35	17	15	3	16	34	21	606	116	47	21	11	3	7	-	42	1	3	7	6	-	7	7	-	-	-	16	-
71	Jan to Mar 1937	36	11	2	7	2	-	9	3	110	28	11	5	1	4	1	-	11	1	-	4	3	1	1	1	-	-	-	3	-
72	Apr to June "	18	8	3	5	-	-	5	-	130	22	14	5	1	1	2	-	9	1	1	-	1	1	3	1	-	1	-	5	-
73	July to Sept "	17	6	4	2	-	-	3	-	242	29	1	1	1	3	2	-	7	-	1	-	-	1	3	1	-	-	-	5	-
74	Oct to Dec "	32	12	7	10	1	1	19	16	182	36	51	10	5	6	2	1	22	-	1	4	6	-	1	1	-	-	-	6	-
	TOTAL YEAR 1937	110	44	16	25	3	1	36	19	664	115	77	21	8	12	7	1	49	2	3	8	10	3	10	6	-	-	-	19	-
75	Jan to Mar 1938	22	12	7	5	-	3	14	3	110	29	12	7	4	2	2	-	15	-	-	3	-	1	4	2	1	-	1	7	-
76	Apr to June "	17	9	4	4	1	42	10	2	143	36	13	2	2	3	3	1	11	-	1	1	1	-	1	2	-	1	-	6	-
77	July to Sept "	17	9	5	4	-	9	9	2	209	52	14	1	5	1	3	-	12	1	-	1	3	1	2	-	1	-	-	4	-
78	Oct to Dec "	24	13	5	6	2	-	5	1	213	23	3	3	2	1	1	-	14	-	1	2	4	-	2	1	1	-	-	4	-
	TOTAL YEAR 1938	80	43	21	19	3	54	38	10	735	140	42	16	13	11	11	1	52	1	4	7	10	2	7	7	2	2	1	21	-
79	Jan to Mar 1939	20	10	5	4	1	-	9	2	120	20	17	5	2	3	1	-	10	-	1	-	3	1	3	1	-	-	1	6	-
80	Apr to June "	26	12	4	6	2	-	6	1	167	31	10	5	3	2	2	-	12	1	1	4	-	-	3	3	-	-	-	6	-
81	July to Sept "	17	11	5	6	-	10	19	-	492	47	21	5	-	4	4	1	14	-	1	-	3	1	2	3	-	1	-	7	-
82	Oct to Dec "	18	11	6	5	-	-	6	-	120	28	28	3	3	5	1	-	12	-	1	1	1	-	1	1	1	2	1	8	-
	TOTAL YEAR 1939	81	44	20	21	3	13	40	3	899	126	76	18	7	14	8	1	48	1	4	5	7	2	9	10	1	3	2	27	-
	GRAND TOTAL 111 YEARS	520	232	96	120	16	105	217	86	3 789	729	350	110	57	57	37	6	267	7	21	42	49	10	50	40	3	6	3	112	1

SUMMARY OF CAUSES OF ACCIDENTS INVESTIGATED, CASUALTIES, AND NUMBER OF PASSENGER TRAINS OF VARIOUS LENGTHS INVOLVED

	PER CENT. OF TOTAL ACCIDENTS	NUMBER OF ACCIDENTS	PERSONS KILLED: PASSENGERS	EMPLOYES	ALL OTHERS	PERSONS INJURED: PASSENGERS	EMPLOYES	ALL OTHERS	TOTAL NO. OF PASSR. TRAINS OF VARIOUS LENGTHS IN CARS: 5 AND LESS	6 TO 8	9 TO 11	12 TO 14	OVER 14	TOTAL	TOTAL NUMBER OF TRAINS: 14 CARS AND LESS NUMBER	14 CARS AND LESS PER CENT	OVER 14 CARS NUMBER	OVER 14 CARS PER CENT
	(ff)	(gg)	(hh)	(ii)	(jj)	(kk)	(ll)	(mm)	(nn)	(oo)	(pp)	(qq)	(rr)	(ss)	(tt)	(uu)	(vv)	(ww)
I. Negligence of employes	48.3	112	44	95	7	2 504	449	142	62	30	31	16	3	142	139	97.7	3	2.3
II. Defects in or failure of equipment	3.0	7	1	-	2	108	10	9	2	2	1	2	-	7	7	100.0	-	-
III. Defects in or improper maintenance of way	9.1	21	3	10	3	384	69	37	9	3	7	4	-	23	23	100.0	-	-
IV. Collisions with vehicles at grade crossings	18.1	42	3	42	67	239	78	66	20	8	10	4	1	43	42	97.7	1	2.3
V. Miscellaneous	21.5	50	54	70	7	554	143	76	17	14	8	11	2	52	50	96.2	2	3.8

63 Jan to Mar 1935	16	9	5	4	1	-	5	2	238	49	20	3	4	1	1	1	10	1	-	-	1	-	-	2	-	-	-	13	1
64 Apr to June "	13	3	4	-	1	-	3	14	25	11	18	3	-	2	-	-	5	-	-	1	-	1	3	2	-	-	-	6	-
65 July to Sept "	22	6	2	3	1	6	7	3	76	38	13	3	1	1	-	1	6	-	-	2	-	-	3	1	-	-	-	4	-
66 Oct to Dec "	14	8	1	6	-	-	1	-	36	17	9	1	2	1	-	1	5	-	-	1	-	-	2	1	-	-	-	3	-
TOTAL YEAR 1935	71	26	11	13	4	6	22	20	375	113	60	12	7	5	1	3	30	1	-	4	1	-	-	1	-	-	-	1	-
67 Jan to Mar 1936	28	12	6	5	1	2	12	11	135	43	23	6	4	1	3	-	14	-	1	2	1	-	4	2	-	-	-	6	-
68 Apr to June "	18	5	2	2	1	3	1	3	222	18	-	4	1	-	1	-	6	-	1	1	1	-	1	1	-	-	-	2	-
69 July to Sept "	26	8	4	3	1	-	10	4	97	31	9	5	2	1	1	-	9	-	-	2	3	-	1	2	-	-	-	3	-
70 Oct to Dec "	27	10	5	5	-	11	11	3	132	24	15	6	4	1	2	-	13	1	1	2	2	-	3	2	-	-	-	5	-
TOTAL YEAR 1936	101	35	17	15	3	16	34	21	586	116	47	21	11	3	7	-	42	1	3	7	7	-	9	7	-	-	-	16	-
71 Jan to Mar 1937	36	11	2	7	2	-	9	3	110	28	11	5	1	4	1	-	11	1	-	4	3	1	1	1	-	-	-	3	-
72 Apr to June "	18	8	3	5	-	-	5	-	130	22	14	5	1	1	2	-	9	1	1	-	1	1	3	1	-	-	-	5	-
73 July to Sept "	17	6	4	2	-	-	3	-	242	29	1	1	1	1	2	-	7	-	1	-	-	1	3	1	-	-	-	5	-
74 Oct to Dec "	39	19	7	11	1	3	15	16	182	36	23	10	5	4	2	1	22	-	3	4	6	-	1	3	1	-	-	6	-
TOTAL YEAR 1937	110	44	16	25	3	3	32	19	664	117	49	21	8	10	7	1	49	2	5	8	10	1	8	6	-	-	-	19	-
75 Jan to Mar 1938	22	12	7	5	-	3	14	3	110	29	12	7	4	2	2	-	15	-	-	3	-	1	4	2	1	-	1	9	-
76 Apr to June "	17	9	4	4	1	42	10	2	141	36	13	2	2	3	3	1	11	-	1	1	3	-	1	2	-	1	-	4	-
77 July to Sept "	17	9	5	4	-	9	9	2	209	32	14	1	5	3	3	-	12	1	-	1	3	-	1	2	-	1	-	4	-
78 Oct to Dec "	24	13	5	6	2	-	5	1	213	25	3	4	2	1	1	-	14	-	1	3	6	-	2	4	1	-	-	6	-
TOTAL YEAR 1938	80	43	21	19	3	54	38	10	713	122	42	14	13	11	9	1	52	1	2	8	12	1	8	14	2	1	-	23	-
79 Jan to Mar 1939	20	10	5	4	1	-	9	2	120	20	17	5	1	3	2	-	10	-	1	-	3	1	3	1	-	-	1	6	-
80 Apr to June "	26	12	4	6	2	-	6	1	167	31	10	5	3	2	2	-	12	1	1	4	-	-	3	3	3	-	-	6	-
81 July to Sept "	17	11	5	6	-	10	19	-	472	67	21	5	-	4	4	1	14	-	1	-	3	1	2	3	-	1	-	7	-
82 Oct to Dec "	18	11	6	5	-	1	6	-	120	36	23	1	1	1	1	-	12	-	1	1	1	-	1	1	-	1	1	3	-
TOTAL YEAR 1939	81	44	20	21	3	11	40	3	899	154	71	16	7	14	9	1	48	1	4	5	7	2	9	10	3	1	2	22	-
GRAND TOTAL 11 YEARS	520	232	96	120	16	105	217	86	3 789	729	350	110	57	57	37	6	267	7	21	42	49	10	50	40	3	6	3	112	1

SUMMARY OF CAUSES OF ACCIDENTS INVESTIGATED, CASUALTIES, AND NUMBER OF PASSENGER TRAINS OF VARIOUS LENGTHS INVOLVED

	PER CENT. OF TOTAL ACCIDENTS	NUMBER OF ACCIDENTS	PERSONS KILLED			PERSONS INJURED			TOTAL NO. OF PASSR. TRAINS OF VARIOUS LENGTHS IN CARS						TOTAL NUMBER OF TRAINS			
															14 CARS AND LESS		OVER 14 CARS	
			PASSENGERS	EMPLOYES	ALL OTHERS	PASSENGERS	EMPLOYES	ALL OTHERS	5 AND LESS	6 TO 8	9 TO 11	12 TO 14	OVER 14	TOTAL	NUMBER	PER CENT	NUMBER	PER CENT
	(77)	(88)	(bb)	(11)	(jj)	(kk)	(ll)	(mm)	(nn)	(oo)	(pp)	(qq)	(rr)	(ss)	(tt)	(uu)	(vv)	(ww)
I. Negligence of employes	48.3	112	84	95	7	2 504	449	162	62	30	31	16	3	142	139	97.7	3	2.3
II. Defects in or failure of equipment	3.0	7	1	-	2	108	10	9	2	2	1	2	-	7	7	100.0	-	-
III. Defects in or improper maintenance of way	9.1	21	3	10	3	384	49	37	9	3	7	4	-	23	23	100.0	-	-
IV. Collisions with vehicles at grade crossings	18.1	42	3	42	67	239	78	66	20	8	10	4	1	43	42	97.7	1	2.3
V. Miscellaneous	21.5	50	54	70	7	554	145	76	17	14	8	11	2	52	50	96.2	2	3.8
GRAND TOTAL	100.0	232	105	217	86	3 789	729	350	110	57	57	37	6	267	261	97.8	6	2.2

BRIEF DESCRIPTION OF ACCIDENTS INVOLVING TRAINS WHICH CONSISTED OF MORE THAN 14 CARS

I. C. C. INVESTIGATION NUMBER

1973 A freight train consisting of 41 cars and a caboose collided with the third car from the engine of a 15 car passenger train which was entering a siding. No fatalities resulted, but injury to 35 passengers and 4 Pullman employes occurred. The accident was caused by the failure of the enginemen of the freight train to control the speed of his train approaching the meeting point.

1993 The engine, its tender, and the first 8 cars of a 14 car passenger train were derailed, caused by a washout due to an unusually heavy local rainstorm. There were no fatalities; 18 passengers, 15 dining car employes, 1 train porter and 3 railroad employes were injured.

2015 The engines and first 2 cars of a 14 car passenger train were derailed when it collided with a motor truck at a grade crossing caused by the motor truck being driven upon the railroad crossing directly in front of the approaching train. There were no fatalities; 9 passengers, 7 dining car employes, 3 Pullman employes, and the driver of the truck were injured.

2213 A 5 car passenger train collided with the 13th car from the engine of a 24 car milk and passenger train which was passing over a cross-over, caused by the failure properly to control the speed of the 5 car train when passing a grade signal and approaching a cross-over at the end of double-track. There were no fatalities; the flagman and the baggageman of the milk train and the conductor and fireman of the 5-car train were injured.

2365 The engine and 5 first cars, which had been detached from a 30 car milk train, derailed one of the milk cars while backing into a siding, caused by the separation of a switch point from the stock rail due to the throw-lever of the switch stand being unlatched. The head trainman was fatally injured.

2374 A 14 car passenger train collided with the side of a 10 car passenger train at a railroad crossing at grade, caused by failure of the enginemen to control the speed of a train in compliance with interlocking signals. One passenger and one employe were killed, and 16 passengers and 2 dining-car employes were injured.

CAUSE (a)	I.C.C. NO. (b)	KIND OF ACCIDENT (c)	PERSONS KILLED: PASSENGERS (d)	KILLED: EMPLOYES (e)	KILLED: OTHERS (f)	INJURED: PASSENGERS (g)	INJURED: EMPLOYES (h)	INJURED: OTHERS (i)	NUMBER OF PASSENGER TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS: 5 AND LESS (j)	6 TO 8 (k)	9 TO 11 (l)	12 TO 14 (m)	OVER 14 CARS (n)	TOTAL (o)
I. NEGLIGENCE OF EMPLOYES:														
(A) Train Orders:														
1. Failure to obey a meet order	1900	Collision		2			2	2		1				
2. Failure to obey a meet order	1944	Collision				2		1	1					
3. Failure of the motorman of a passenger train to obey a meet order	2003	Collision	6	1		20	2	1	1					
4. Failure to obey a meet order	2024	Collision		3		6	3	2			2			
5. Failure of a crew to obey a meet order	2086	Collision		4	1	54	10	4	2					
6. Failure to obey a meet order	2107	Collision				12	4	2			1			
7. Issuance of a lap order	2252	Collision		4		11	5	3	1					
8. Failure to obey a meet order	2279	Collision	1			64	13	5		1		1		
9. Failure to obey a meet order	2373	Collision				30	4	1	1		1			
10. Excessive speed when entering an open switch to a siding because the instruction to take siding was omitted from the train order delivered to the train involved	2398	Derailment				6	5	1	1					
TOTAL - NEGLIGENCE - TRAIN ORDERS 10 ACCIDENTS			7	14	1	205	48	22	7	2	4	1		14
(B) Fixed Signals:														
1. Failure of the engineman of the second train properly to obey signal indications	1928	Collision		1		295					1	1		
2. Failure of the engineman of one of the trains properly to obey signal indications, probably due to either misjudgement of speed or of braking distance	1943	Collision		1		9	3	3	1	1				
3. Failure of an engineman properly to observe and obey the stop indication of a train-order and manual block signal	1957	Collision		3		29	3				2			
4. Failure of an engineman to obey signal indications	1963	Collision				79	14		1	1				
5. Failure of the train to be operated in accordance with signal indications ...	1966	Derailment				47	17	9			1			
6. Failure properly to observe and obey signal indications governing the movement of the freight train	1981	Collision		2		3	1		1					
7. Failure of the engineman of the _____ train properly to observe and obey a signal indication governing the movement of his train over a railroad crossing	1989	Collision		1		8	4		1					
8. Failure of the engineman of the passenger train properly to control the speed of his train when approaching interlocking limits and to obey the stop indication of the home signal	1990	Collision				6					1			
9. Failure of the engineman of the freight train properly to observe and obey the stop indication of a dwarf signal	2037	Collision				2	6	1		1				
10. Failure of an engineman and a fireman properly to observe and obey signal indications	2040	Collision				39	5	10				2		
11. Failure of an engineman properly to observe and obey a stop signal indication	2073	Collision				187	13			1				
12. Failure properly to observe and obey automatic block signal indications	2185	Collision				196	17	1			1	1		
13. Failure to operate the freight train in accordance with interlocking signal indications	2189	Collision				2	3					1		
14. Failure of the following train properly to observe and obey signal indications	2245	Collision			1		1		2					
15. Failure to obey a restricted-speed signal indication	2254	Collision				21	4	2		1	1			
16. Failure of second 99 to be operated in accordance with signal indications	2268	Collision				6	2	3			1	1		
17. Failure of the _____ train properly to observe and obey interlocking signal indications governing movement of the train over a railroad crossing	2336	Collision		2										

	2086	Collision		4	1	34	10	4	2						
6. Failure to obey a meet order	2107	Collision				12	4	2			1				
7. Issuance of a lap order	2252	Collision		4		11	5	3	1						
8. Failure to obey a meet order	2279	Collision	1			64	13	5		1		1			
9. Failure to obey a meet order	2373	Collision				30	4	1	1		1				
10. Excessive speed when entering an open switch to a siding because the instruction to take siding was omitted from the train order delivered to the train involved	2398	Derailment				6	5	1	1						
TOTAL - NEGLIGENCE - TRAIN ORDERS 10 ACCIDENTS			7	14	1	205	48	22	7	2	4	1			14
(B) Fixed Signals:															
1. Failure of the engineman of the second train properly to obey signal indications	1928	Collision		1		295					1	1			
2. Failure of the engineman of one of the trains properly to obey signal indications, probably due to either misjudgement of speed or of braking distance	1943	Collision		1		9	3	3	1	1					
3. Failure of an engineman properly to observe and obey the stop indication of a train-order and manual block signal	1957	Collision		3		29	3				2				
4. Failure of an engineman to obey signal indications	1963	Collision				79	14		1	1					
5. Failure of the train to be operated in accordance with signal indications ...	1966	Derailment				47	17	9			1				
6. Failure properly to observe and obey signal indications governing the movement of the freight train	1981	Collision		2		3	1		1						
7. Failure of the engineman of the _____ train properly to observe and obey a signal indication governing the movement of his train over a railroad crossing	1989	Collision		1		8	4		1						
8. Failure of the engineman of the passenger train properly to control the speed of his train when approaching interlocking limits and to obey the stop indication of the home signal	1990	Collision				6					1				
9. Failure of the engineman of the freight train properly to observe and obey the stop indication of a dwarf signal	2037	Collision				2	6	1		1					
10. Failure of an engineman and a fireman properly to observe and obey signal indications	2040	Collision				39	5	10				2			
11. Failure of an engineman properly to observe and obey a stop signal indication	2073	Collision				187	13			1					
12. Failure properly to observe and obey automatic block signal indications	2185	Collision				196	17	1			1	1			
13. Failure to operate the freight train in accordance with interlocking signal indications	2189	Collision				2	3					1			
14. Failure of the following train properly to observe and obey signal indications	2245	Collision			1		1		2						
15. Failure to obey a restricted-speed signal indication	2254	Collision				21	4	2		1	1				
16. Failure of second 59 to be operated in accordance with signal indications	2268	Collision				6	2	3			1	1			
17. Failure of the _____ train properly to observe and obey interlocking signal indications governing movement of the train over a railroad crossing	2336	Collision		2			3	1			1				
18. Failure to observe and to obey signal indications governing the movement of second 9	2360	Collision				9	2			1					
19. Train running off an open derail because of failure to observe and obey interlocking signal indications	2362	Derailment				8	10	1				1			
20. Failure to control the speed of the _____ train in compliance with interlocking signal indications	2374	Collision	1	1		16	2				1		1		
21. Failure to operate FT-56 in accordance with interlocking signal indications	2387	Collision					5				1				
TOTAL - NEGLIGENCE - FIXED SIGNALS 21 ACCIDENTS			1	11	1	962	115	31	6	6	11	7	1		1

CAUSE (a)	I.C.C. No. (b)	KIND OF ACCIDENT (c)	PERSONS KILLED: PASSENGERS (d)	KILLED: EMPLOYEES (e)	KILLED: OTHERS (f)	INJURED: PASSENGERS (g)	INJURED: EMPLOYEES (h)	INJURED: OTHERS (i)	NUMBER OF PASSENGER TRAINS AS TO VARIOUS LENGTHS: 5 AND LESS (j)	6 TO 8 (k)	9 TO 11 (l)	12 TO 14 (m)
I. NEGLIGENCE OF EMPLOYEES:												
(C) Train Flagging:												
1. Extra 5055 occupying the main track on the time of a first class train without proper flag protection	2142	Collision		2		31	3				1	
2. Failure to provide adequate flag protection for train No. 504	2170	Collision		1		6	1	1	1	1		
3. Failure of the crew of Extra 1554 properly to protect their train while making a cross-over movement on the time of a first-class train	2203	Collision		1		3	1	1	1			
4. Failure of a second-class train to provide flag protection when occupying the main track on the time of a first-class train	2259	Collision		2		6	1	3	1			
5. Inferior train occupying the main track without authority on the time of a following first-class train and not providing proper protection	2301	Collision				9	1	1	1			
6. Failure to provide adequate flag protection after having failed to clear the time of a first-class train	2365	Collision				23	3	2			1	
TOTAL - NEGLIGENCE - TRAIN FLAGGING 6 ACCIDENTS				6		78	10	8	4	1	2	
(D) Hand Brakes:												
1. Failure to apply a sufficient number of hand brakes to secure cars left on a yard track on a descending grade	2377	Derailment				2	4	3			1	
TOTAL - NEGLIGENCE - HAND BRAKES 1 ACCIDENT						2	4	3			1	
(E) Switches:												
1. Switch being opened directly in front of an approaching train, for which the head brakeman of another train was responsible	1922	Derailment		2	1	11		2		1		
2. Open switch	1969	Collision				5	3		1			
3. Open switch	2250	Derailment		1			2		1			
4. Switch being opened directly in front of an approaching train	2294	Collision	8	3		132	1	6			1	1
5. Open switch	2323	Derailment					2		1			
TOTAL - NEGLIGENCE - SWITCHES 5 ACCIDENTS			8	6	1	148	8	8	3	1	1	1
(F) Other Forms of Negligence:												
(1) Excessive Speed:												
1. Train entering a 10° curve at a rate of speed for which the elevation of the outer rail did not provide and adequate margin of safety	1887	Derailment		2		10	4	2	1	1		
2. Excessive speed on a sharp curve	1897	Derailment	9	2		28	16	2	1			
3. Excessive speed on a sharp curve	1915	Derailment	1	2					1			
4. Failure of the conductor of the passenger train properly to control the speed of his train during a back-up movement	1916	Collision		1					1			
5. Excessive speed on a sharp curve	2038	Derailment	1	2		26	2	2		1		
6. Excessive speed on a sharp curve	2042	Derailment		2		2			1			
7. Excessive speed on a sharp curve	2139	Derailment		1		1		3			1	
8. Excessive speed on a sharp curve	2171	Derailment		1		83	12	5				1
9. Failure to control the speed of a train as required by signal indications, resulting in the train entering a short turnout at excessive speed, the route not having been properly lined for a main track movement due to obstruction of a spring switch	2183	Derailment					1		1			

3. Failure of the crew of Extra 1554 properly to protect their train while making a cross-over movement on the time of a first-class train	2203	Collision		1		3	1	1	1			
4. Failure of a second-class train to provide flag protection when occupying the main track on the time of a first-class train	2259	Collision		2		6	1	3	1			
5. Inferior train occupying the main track without authority on the time of a following first-class train and not providing proper protection	2301	Collision				9	1	1	1			
6. Failure to provide adequate flag protection after having failed to clear the time of a first-class train	2365	Collision				23	3	2			1	
TOTAL - NEGLIGENCE - TRAIN FLAGGING 6 ACCIDENTS				6		78	10	8	4	1	2	
(D) Hand Brakes:												
1. Failure to apply a sufficient number of hand brakes to secure cars left on a yard track on a descending grade	2377	Derailment				2	4	3			1	
TOTAL - NEGLIGENCE - HAND BRAKES 1 ACCIDENT						2	4	3			1	
(E) Switches:												
1. Switch being opened directly in front of an approaching train, for which the head brakeman of another train was responsible	1922	Derailment		2	1	11		2		1		
2. Open switch	1969	Collision				5	3		1			
3. Open switch	2250	Derailment		1			2		1			
4. Switch being opened directly in front of an approaching train	2294	Collision	8	3		132	1	6			1	1
5. Open switch	2323	Derailment					2		1			
TOTAL - NEGLIGENCE - SWITCHES 5 ACCIDENTS			8	6	1	148	8	8	3	1	1	1
(F) Other Forms of Negligence:												
(1) Excessive Speed:												
1. Train entering a 10° curve at a rate of speed for which the elevation of the outer rail did not provide and adequate margin of safety	1887	Derailment		2		10	4	2	1	1		
2. Excessive speed on a sharp curve	1897	Derailment	9	2		28	16	2	1			
3. Excessive speed on a sharp curve	1915	Derailment	1	2					1			
4. Failure of the conductor of the passenger train properly to control the speed of his train during a back-up movement	1916	Collision		1					1			
5. Excessive speed on a sharp curve	2038	Derailment	1	2		26	2	2		1		
6. Excessive speed on a sharp curve	2042	Derailment		2		2			1			
7. Excessive speed on a sharp curve	2133	Derailment		1		2		3			1	
8. Excessive speed on a sharp curve	2174	Derailment		1		83	12	5				1
9. Failure to control the speed of a train as required by signal indications, resulting in the train entering a short turnout at excessive speed, the route not having been properly lined for a main track movement due to obstruction of a spring switch	2183	Derailment					1		1			
10. Excessive speed on a sharp curve	2198	Derailment		1		1	2			1		
11. Failure properly to control the speed of No. 388 when passing a grade signal and approaching a cross-over at the end of double track	2212	Collision					4		1			
12. Failure properly to control the speed of a train after entering an occupied block under the "Stop; then Proceed" indication of an automatic-block signal	2226	Collision	1			31	3			2		
13. Failure to comply with the speed restriction governing entry to a siding	2256	Derailment		2		9	2		1			
14. Excessive speed on a sharp curve	2399	Derailment		2		9		3	1			
TOTAL - NEGLIGENCE - EXCESSIVE SPEED 14 ACCIDENTS			12	18		201	46	17	9	5	1	1

CAUSE (a)	I.C.C. NO. (b)	KIND OF ACCIDENT (c)	PERSONS KILLED: PASSENGERS (d)	KILLED: EMPLOYES (e)	KILLED: OTHERS (f)	INJURED: PASSENGERS (g)	INJURED: EMPLOYES (h)	INJURED: OTHERS (i)	NUMBER OF PASSENGER TRAINS AS TO VARIOUS LENGTHS: 5 AND LESS (j)	6 TO 8 (k)	9 TO 11 (l)	12 TO 14 (m)	OVER 14 (n)
NEGLIGENCE OF EMPLOYES:													
(F) Other Forms of Negligence: (Continued)													
(2) Joint Failure to Protect and Failure to Run With Caution in Yard Limits:													
1. Failure to properly protect ____ switch engine 500 by flag, and by failure to operate ____ train No. 26 under proper control within yard limits	2182	Collision				7	1	2	1				
2. Failure of the passenger train to be operated under control in yard limits, and failure of the crew of the freight train fully to carry out the requirements of the flagging rule	2220	Collision		1		1		2	1				
3. Failure to provide proper protection for the preceding train, and by failure to control the speed of the following train properly	2400	Collision				3			1	1			
TOTAL-NEGLIGENCE - JOINT FAILURE TO PROTECT AND FAILURE TO RUN WITH CAUTION IN YARD LIMITS 3 ACCIDENTS				1		11	1	4	3	1			
(3) Joint Failure to Protect and Disregard of Caution or Other Signal:													
1. Primarily by the failure of an engineman properly to obey signal indications, while the passenger train flagman did not go back as far as he could have gone in the time available	1964	Collision				32	12	6				1	
2. Failure of the passenger train to be operated in accordance with the requirements of a caution card in manual-block territory and the failure of the crew of the freight train to provide adequate flag protection	2215	Collisio		2	1	1	2	7			1		
3. Failure to obey signal indications and the failure to furnish proper rear-end protection	2251	Collision				10	3	1			1	1	
4. Failure to operate the following train in accordance with signal indications, and by failure to provide adequate flag protection for the preceding train	2285	Collision	1			23	32				1	1	
5. Failure of Extra 843 to provide proper flag protection and by the failure to operate No. 325 in accordance with block-signal indications	2348	Collision				4	2	2		1			
6. Failure of the passenger train to be adequately protected by flag, and by the failure of the light engine to be operated in accordance with the signal indication	2357	Collision				15			1				
7. Failure to provide proper flag protection for the preceding train and by operation of the following train in automatic train-stop territory with the automatic train-stop and cab signal devices cut out, contrary to current instructions, resulting in an imperfectly displayed cab signal	2393	Collision				2	6				1		
TOTAL-NEGLIGENCE - JOINT FAILURE TO PROTECT AND DISREGARD OF CAUTION OR OTHER SIGNAL 7 ACCIDENTS			1	2	1	87	57	16	1	1	4	3	
(4) Failure to Identify Opposing Trains or to Clear Superior Trains:													
1. Operation of the work train on short time against an opposing superior train	1902	Collision				8	4		1				
2. Crew of an inferior train over-looking the schedule of an opposing superior train	1925	Collision	1			7	5	3	1				
3. Failure of the freight train to clear the time of an opposing superior train	1995	Collision		1	1	6	3	4	1				
4. Failure to comply with a meet order, due to failure to identify an opposing train at the meeting point	2126	Collision		5		1	4	1	1				
5. Failure of a light engine to clear the scheduled time of an opposing superior train	2205	Collision		5		5		2	1				
6. Failure of an inferior train to clear the schedule time of an opposing superior train as required by rule	2297	Collision			1	16	9	1		1			
7. Failure of an extra train to clear the time of an opposing first-class train	2388	Collision				41	6	2		1			
TOTAL-NEGLIGENCE - FAILURE TO IDENTIFY OPPOSING TRAINS OR TO CLEAR SUPERIOR TRAINS 7 ACCIDENTS			1	11	2	84	31	13	5	2			
(5) Overrunning Scheduled Meeting Point, or Failure to Clear Switch at Meeting or Passing Points:													
1. Failure of an engineman to stop at a meeting point and ascertain that the track was clear	1891	Collision				10	4			2			
2. Failure of an engineman properly to control the speed of his train when approaching a meeting point	1973	Collision				35		4					

ailure to properly protect ____ switch engine 500 by flag, and by failure to operate ____ train No. 26 under proper control within yard limits	2182	Collision				7	1	2	1					
ailure of the passenger train to be operated under control in yard limits, and failure of the crew of the freight train fully to carry out the requirements of the flagging rule	2220	Collision		1		1		2	1					
ailure to provide proper protection for the preceding train, and by failure to control the speed of the following train properly	2400	Collision				3			1	1				
TOTAL-NEGLIGENCE - JOINT FAILURE TO PROTECT AND FAILURE TO RUN WITH CAUTION IN YARD LIMITS 3 ACCIDENTS				1		11	1	4	3	1				4
Joint Failure to Protect and Disregard of Caution or Other Signal:														
rimarily by the failure of an engineman properly to obey signal indications, while the passenger train flagman did not go back as far as he could have gone in the time available	1964	Collision				32	12	6			1			
ailure of the passenger train to be operated in accordance with the requirements of a caution card in manual-block territory and the failure of the crew of the freight train to provide adequate flag protection	2215	Collisio		2	1	1	2	7			1			
ailure to obey signal indications and the failure to furnish proper rear-end protection	2251	Collision				10	3	1			1	1		
ailure to operate the following train in accordance with signal indications, and by failure to provide adequate flag protection for the preceding train	2285	Collision	1			23	32				1	1		
ailure of Extra 843 to provide proper flag protection and by the failure to operate No. 325 in accordance with block-signal indications	2348	Collision				4	2	2		1				
ailure of the passenger train to be adequately protected by flag, and by the failure of the light engine to be operated in accordance with the signal indication	2357	Collision				15			1					
ailure to provide proper flag protection for the preceding train and by operation of the following train in automatic train-stop territory with the automatic train-stop and cab signal devices cut out, contrary to current instructions, resulting in an imperfectly displayed cab signal	2393	Collision				2	6				1			
TOTAL-NEGLIGENCE - JOINT FAILURE TO PROTECT AND DISREGARD OF CAUTION OR OTHER SIGNAL 7 ACCIDENTS			1	2	1	87	57	16	1	1	4	3		9
Failure to Identify Opposing Trains or to Clear Superior Trains:														
eration of the work train on short time against an opposing superior train	1902	Collision				8	4		1					
ue of an inferior train over-looking the schedule of an opposing superior train	1925	Collision	1			7	5	3	1					
ailure of the freight train to clear the time of an opposing superior train	1995	Collision		1	1	6	3	4	1					
ailure to comply with a meet order, due to failure to identify an opposing train at the meeting point	2126	Collision		5		1	4	1	1					
ailure of a light engine to clear the scheduled time of an opposing superior train	2205	Collision		5		5		2	1					
ailure of an inferior train to clear the schedule time of an opposing superior train as required by rule	2297	Collision			1	16	9	1		1				
ailure of an extra train to clear the time of an opposing first-class train	2388	Collision				41	6	2		1				
TOTAL-NEGLIGENCE - FAILURE TO IDENTIFY OPPOSING TRAINS OR TO CLEAR SUPERIOR TRAINS 7 ACCIDENTS			1	11	2	84	31	13	5	2				7
Overrunning Scheduled Meeting Point, or Failure to Clear Switch at Meeting or Passing Points:														
ailure of an engineman to stop at a meeting point and ascertain that the track was clear	1891	Collision				10	4			2				
ailure of an engineman properly to control the speed of his train when approaching a meeting point	1973	Collision				35		4					1	
ain running past its timetable meeting point with an opposing train without authority	2063	Collision	1	1		11	3		2					
eight train fouling the clearance point of a main-track switch directly in front of an approaching superior train	2177	Collision					2	1			1			
ailure of the superior train to stop clear of the switch used by the train being met in entering the siding at a train-order meeting point	2253	Collision		1		1	3			1				
ailure to control properly the speed of a freight train when approaching a meeting point	2372	Collision				2	1	2	1					
ailure to control the speed of a train properly when approaching a meeting point	2380	Collision				27	3	2			1			
TOTAL - NEGLIGENCE - OVERRUNNING SCHEDULED MEETING POINT, OR FAILURE TO CLEAR SWITCH AT MEETING OR PASSING POINTS 7 ACCIDENTS			1	2		86	16	9	3	3	2		1	9

CAUSE (a)	I.C.C. NO. (b)	KIND OF ACCIDENT (c)	PERSONS KILLED: PASSENGERS (d)	EMPLOYEES (e)	OTHERS (f)	PERSONS INJURED: PASSENGERS (g)	EMPLOYEES (h)	OTHERS (i)	NUMBER OF PASSENGER TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS: 5 AND LESS (j)	6 TO 8 (k)	9 TO 11 (l)	12 TO 14 (m)	OVER 14 CARS (n)	T
I. NEGLIGENCE OF EMPLOYES:														
(F) Other Forms of Negligence: (Continued)														
(6) All Other Negligence:														
1. The gas-electric car departing from the station on the main track instead of another track designated in a clearance card and in verbal instructions received from the operator; also by the failure of the enginemen of both trains involved to move under proper control within yard limits	1918	Collision				6	7		2					
2. Failure of the engineman and fireman of the light engine to know the correct time, with the result that their engine failed to clear the main track for an opposing superior train	1930	Collision		3		1	2	1	1					
3. Running through a derail switch, due to the failure of the flagman of the helper engine to close the passing track switch after his engine had entered the main track and by the failure of both enginemen to note that their train had entered the open switch and was moving on the passing track	1961	Derailment		1						1				
4. Failure of a freight train to be properly protected by flag and by the failure of a passenger train to be operated under proper control in view of the fact that the crew held an order directing the freight train to run ahead of them until overtaken	1982	Collision				8	6	3	1					
5. Operation of a motor car on the time of an opposing overdue first-class train without authority or protection	1998	Misc.Train		1			1		1					
6. Operation of an extra train on the time of a following superior train without authority and without adequate flag protection	2030	Collision		1		5	1		1					
7. Operation of an extra train on close time ahead of a following superior train, and by failure properly to protect a back-up movement	2035	Collision				10	3		1					
8. Failure of the light engine to clear the time of an opposing overdue superior train, the engineman having become confused as to the schedule time of that train; a contributing cause was the failure of the passenger train to be brought to a stop when the engineman observed the headlight of the opposing light engine	2101	Collision		1		13	7	1	1					
9. Failure of the crew of the passenger train to obey a meet order and to comply with block-signal rules	2103	Collision				2	8	3	1					
10. Failure of a motorman-conductor to approach a meeting point under proper control in view of existing conditions	2114	Collision		1		8	1		2					
11. Failure of the ____ train to be brought under control until it was too late to avoid colliding with the train ahead, and by the lack of any system to provide for the proper spacing of trains	2121	Collision	10			58	1		1	1				
12. Failure properly to observe and obey signal indications and to approach a meeting point under control	2128	Collision		3		2	5			2				
13. Failure to obey a wait order; a contributing cause was the failure of an extra train to clear the time of an opposing regular train as required by rule	2166	Collision		1		16	5	1	1					
14. Switch engine occupying the main track within yard limits on the time of a first-class train without authority or protection	2192	Collision				3			1					
15. Failure of a train crew to discover that a coupling between two cuts of cars had not been properly made, and failure to have a member of the train crew stationed on the leading car of the cut of cars being pushed into the storage track	2195	Collision		2							1			
16. Failure of the freight train crew to provide adequate rear-end protection, and by the action of the dispatcher in authorizing the passenger train to enter an occupied block under a clear manual block signal	2246	Collision				1	1			1				
17. Failure of an inferior train to clear the time of a superior train and to furnish flag protection as required by the rules, and the failure of the superior train to be stopped short of a block signal displaying a stop indication	2264	Collision				12	2	4	1					
18. Leverman failing definitely to ascertain that the route was properly lined before clearing a signal for a passenger train to proceed through the interlocking, resulting in the diversion of that train														

(F) Other Forms of Negligence: (Continued)

(6) All Other Negligence:

1. The gas-electric car departing from the station on the main track instead of another track designated in a clearance card and in verbal instructions received from the operator; also by the failure of the enginemen of both trains involved to move under proper control within yard limits	1918	Collision				6	7		2				
2. Failure of the engineman and fireman of the light engine to know the correct time, with the result that their engine failed to clear the main track for an opposing superior train	1930	Collision		3		1	2	1	1				
3. Running through a derail switch, due to the failure of the flagman of the helper engine to close the passing track switch after his engine had entered the main track and by the failure of both enginemen to note that their train had entered the open switch and was moving on the passing track	1961	Derailment		1						1			
4. Failure of a freight train to be properly protected by flag and by the failure of a passenger train to be operated under proper control in view of the fact that the crew held an order directing the freight train to run ahead of them until overtaken	1982	Collision				8	6	3	1				
5. Operation of a motor car on the time of an opposing overdue first-class train without authority or protection	1998	Misc Train		1			1		1				
6. Operation of an extra train on the time of a following superior train without authority and without adequate flag protection	2030	Collision		1		5	1		1				
7. Operation of an extra train on close time ahead of a following superior train, and by failure properly to protect a back-up movement	2035	Collision				10	3		1				
8. Failure of the light engine to clear the time of an opposing overdue superior train, the engineman having become confused as to the schedule time of that train; a contributing cause was the failure of the passenger train to be brought to a stop when the engineman observed the headlight of the opposing light engine	2101	Collision		1		13	7	1	1				
9. Failure of the crew of the passenger train to obey a meet order and to comply with block-signal rules	2103	Collision				2	8	3	1				
10. Failure of a motorman-conductor to approach a meeting point under proper control in view of existing conditions	2114	Collision		1		8	1		2				
11. Failure of the _____ train to be brought under control until it was too late to avoid colliding with the train ahead, and by the lack of any system to provide for the proper spacing of trains	2121	Collision	10			58	1		1	1			
12. Failure properly to observe and obey signal indications and to approach a meeting point under control	2128	Collision		3		2	5			2			
13. Failure to obey a wait order; a contributing cause was the failure of an extra train to clear the time of an opposing regular train as required by rule	2166	Collision		1		16	5	1	1				
14. Switch engine occupying the main track within yard limits on the time of a first-class train without authority or protection	2192	Collision				3			1				
15. Failure of a train crew to discover that a coupling between two cuts of cars had not been properly made, and failure to have a member of the train crew stationed on the leading car of the cut of cars being pushed into the storage track	2195	Collision		2							1		
16. Failure of the freight train crew to provide adequate rear-end protection, and by the action of the dispatcher in authorizing the passenger train to enter an occupied block under a clear manual block signal	2246	Collision				1	1			1			
17. Failure of an inferior train to clear the time of a superior train and to furnish flag protection as required by the rules, and the failure of the superior train to be stopped short of a block signal displaying a stop indication	2264	Collision				12	2	4	1				
18. Leverman failing definitely to ascertain that the route was properly lined before clearing a signal for a passenger train to proceed through the interlocking, resulting in the diversion of that train to an occupied nonsignaled yard track	2273	Collision				5	1			1			
19. Lap of authority of two opposing trains due to the lack of some understanding of the method of operation, and by irregular practice in a train dispatching office	2284	Collision		1			1		1				
20. Failure to maintain a proper lookout from both trains and to proceed under proper control prepared to stop when approaching a railroad crossing at grade	2306	Collision				1	8	1	1				
21. Failure to route a westbound train on the westward track as intended, failure to correctly record its movement on the eastward track over a route which had been set up for a preceding train, and subsequent authorization for an east-bound train to pass a home interlocking signal displaying stop, when the eastward track was occupied by the opposing train	2307	Collision		1		10	7	3	1				
22. Failure of the _____ train to be operated under control prepared to stop at a railroad crossing at grade	2309	Collision				185					1	1	

CAUSE (a)	I.C.C. NO. (b)	KIND OF ACCIDENT (c)	PERSONS KILLED: PASSENGERS (d)	KILLED: EMPLOYEES (e)	KILLED: OTHERS (f)	INJURED: PASSENGERS (g)	INJURED: EMPLOYEES (h)	INJURED: OTHERS (i)	NUMBER OF PASSENGER TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS: 5 AND LESS (j)	6 TO 8 (k)	9 TO 11 (l)	12 TO 14 (m)	OVER 14 CARS (n)	TOTAL (o)
NEGLIGENCE OF EMPLOYEES:														
Other Forms of Negligence: (Continued)														
All Other Negligence: (Continued)														
Failure properly to obey signal indications and failure to move under proper control within yard limits prepared to stop unless the track was seen or known to be clear	2322	Collision					5			1				
Failure of the ____ train to stop at a railroad crossing at grade, which was occupied by a train on a conflicting route	2324	Collision				5	1		1					
Failure of No. 236 to clear the time of an opposing superior train and to obey the stop indication of an automatic block signal, and probably also by failure of No. 107 properly to observe and obey an approach signal indication	2331	Collision		2	1	30	4	4			1			
Failure to secure a car on a grade, which resulted in the car sideswiping the cab of the engine, damaging air, steam, and hot water connections, which compelled the engine crew to leave the engine without closing the throttle and in turn allowed the engine to move out of control	2333	Collision		2		11	2	4	1					
Improper manipulation by an inexperienced assistant during the temporary absence of the regular operator of the controlling lever of the ditcher of the time of a switching movement of the work train, permitting the boom to foul the adjacent track and strike the passenger train, and by failure to set the hand brake properly to prevent the lateral movement of the ditcher	2352	Misc.Train		1		45	5	1			1			
Failure to furnish proper flag protection for the first train, and by failure properly to control the speed of the second train within subdivision terminal limits because of depending upon a signal which displayed a false proceed indication	2379	Collision				164	16					2		
Junction switch being opened without authority or instructions, which resulted in diverting an approaching train to an occupied track, and failure to control the speed of the passenger train properly when approaching a junction and when operating against the current of traffic within yard limits	2386	Collision		2		25	8	5	1					
Yard engine backing into a main track turn-out without authority and striking the side of a moving passenger train	2389	Collision	3			8	3				1			
Track motor car fouling the main track on the time of a first-class train	2394	Derailment		1		6	2			1				
TOTAL - ALL OTHER NEGLIGENCE 31 ACCIDENTS			13	24	1	640	113	31	21	8	5	3		37
GRAND TOTAL - NEGLIGENCE OF EMPLOYEES 112 ACCIDENTS			44	95	7	2 504	449	162	62	30	31	16	3	142
DEFECTS IN OR FAILURES OF EQUIPMENT:														
Trucks:														
Failure of an arch bar truck	1960	Derailment			2	6	1	1		1				
Failure of a truck bolster, because of improper welding	2363	Derailment				1		1	1					
TOTAL - TRUCKS 2 ACCIDENTS					2	7	1	2	1	1				2
Wheels and Axles:														
Broken wheel	1894	Derailment				2	2	2	1					
Broken wheel	2108	Derailment	1			41		5				1		
Failure of a roller bearing, which resulted in the burning off of a journal	2141	Derailment				10	1				1			
Broken journal, due to overheating; the cause of overheating could not be determined	2175	Derailment				27	3					1		
Broken journal, due to overheating	2288	Derailment				21	3			1				
TOTAL - WHEELS AND AXLES 5 ACCIDENTS			1			101	9	7	1	1	1	2		5
GRAND TOTAL - DEFECTS IN OR FAILURES OF EQUIPMENT 7 ACCIDENTS			1		2	108	10	9	2	2	1	2		7

CAUSE (a)	I.C.C. NO. (b)	KIND OF ACCIDENT (c)	PERSONS KILLED: PASSENGERS (d)	KILLED: EMPLOYEES (e)	KILLED: OTHERS (f)	INJURED: PASSENGERS (g)	INJURED: EMPLOYEES (h)	INJURED: OTHERS (i)	NUMBER OF PASSENGERS AS TO VARIOUS LEGS: 5 AND LESS (j)	6 TO 8 (k)	9 TO 11 (l)	12 TO 14 (m)
III. DEFECTS IN OR IMPROPER MAINTENANCE OF WAY AND STRUCTURES:												
(A) Bridges, Trestles, Culverts, and Tunnels:												
1. Failure of a bridge	2225	Derailment	2			70	2		1			
2. Collapse of a truss span of bridge 97.23 as a result of the pile bents supporting the east end of the span having been pulled out of position by the drifting of a caisson, resulting in the fouling of bridge bents by anchor cables attached to the caisson	2378	Derailment		2					1			
TOTAL - BRIDGES, TRESTLES, CULVERTS AND TUNNELS 2 ACCIDENTS			2	2		70	2		2			
(B) Rails and Joints:												
1. Broken rail	1937	Derailment	1	1		6	2				2	
2. Broken rail	2022	Derailment		1			2		1			
3. Broken rail	2029	Derailment				5				1		
4. Broken rail	2068	Derailment			2	18						1
5. Broken rail	2112	Derailment		1	1	18	5	6				1
6. Broken rail	2190	Derailment				40	7				1	
7. Broken rail, due to transverse fissures	2218	Derailment				5	3		1			
8. Broken rail, because of the presence of a transverse fissure	2335	Derailment				69	2	5				1
9. Broken rail, resulting from the presence of transverse fissures	2401	Derailment				28	2	12			1	
TOTAL - RAILS AND JOINTS 9 ACCIDENTS			1	3	3	189	23	23	2	1	4	3
(C) Frogs and Switches:												
1. Split switch, due to the point opening under a moving train as the result of a broken head-rod	2317	Derailment					2	2			1	
2. Switch opening under a train as a result of a broken switch lug	2321	Derailment				33	2	1				1
TOTAL - FROGS AND SWITCHES 2 ACCIDENTS						35	4	3	9		1	1
(D) Interlocking and Block Signal System:												
1. False proceed signal indications	2046	Collision		1		41	9	7	1	1		
TOTAL - INTERLOCKING AND BLOCK SIGNAL SYSTEM 1 ACCIDENT				1		41	9	7	1	1		
(E) Miscellaneous:												
1. Spread rails, due to track not being adequately maintained	2018	Derailment				1					1	
2. Loose guard rail, but it could not be determined how the guard rail became loosened	2025	Derailment		1			2	1	1			
3. Kinked track	2172	Derailment		1		2	2	3	1			
4. Spreading of the track; apparently due to failure of rail fastenings used on track of special construction	2236	Derailment				30	4		1			
5. Spread rails, due to the track not being properly maintained	2271	Derailment		2					1			
6. Primarily by irregularities in the track	2318	Derailment				16	1				1	
7. Spread rails, on account of inadequate track maintenance	2356	Derailment					2			1		
TOTAL - MISCELLANEOUS 7 ACCIDENTS				4		49	11	4	4	1	2	
GRAND TOTAL - DEFECTS IN OR IMPROPER MAINTENANCE OF WAY AND STRUCTURES-21 ACCIDENTS			3	10	3	384	49	37	9	3	7	4

CAUSE (a)	I.C.C. NO. (b)	KIND OF ACCIDENT (c)	PERSONS KILLED: PASSENGERS (d)	EMPLOYEES (e)	OTHERS (f)	INJURED: PASSENGERS (g)	EMPLOYEES (h)	OTHERS (i)	NUMBER OF PASSENGER T AS TO VARIOUS LENG: 5 AND LESS (j)	6 TO 8 (k)	9 TO 11 (l)	12 TO 14 (m)
V. COLLISIONS WITH VEHICLES AT GRADE CROSSINGS:												
1. Motor truck being driven upon a grade crossing directly in front of an approaching train	1882	Derailment		1	2		1		1			
2. Motor truck being driven upon a grade crossing directly in front of an approaching passenger train resulting in derailment of train on adjacent track	1884	Derailment		1	1					1		1
3. Train striking an automobile which had run off the highway at a grade crossing and had become stalled across the track	1886	Derailment		2						1		
4. Motor truck and trailer being driven on a railroad crossing at grade directly in front of an approaching train	1888	Derailment		1			1		1			
5. Motor truck being driven upon a railroad crossing at grade directly in front of an approaching passenger train	1896	Derailment		2	1	4	1	1			1	
6. Train striking an automobile which had turned off the highway at a grade crossing and had become stalled on the track	1923	Derailment		1		1	1				1	
7. Train striking an automobile which had been shoved upon the track by a following automobile while it was standing at a highway grade crossing waiting for the train to pass	1924	Derailment			5	5	2	1	1			
8. Motor truck being driven upon a railroad crossing at grade directly in front of an approaching passenger train	1933	Derailment		1	1	1		1			1	
9. Train striking an automobile which had become stalled on the track adjacent to a highway grade crossing	1934	Derailment		2		7	1	4			1	
10. Failure of a crossing watchman to lower the gates at the crossing when a train was approaching	1968	Misc.Train		3		6	1	2	1			
11. School bus being driven upon a railroad crossing at grade directly in front of an approaching train, due primarily to the failure of the driver to take adequate precautions before starting over the crossing, and to inadequate protection of the crossing which resulted from failure of responsible authorities to enforce, and of the railroad company to obey, the law requiring maintenance of a watchman until 12 o-clock midnight	1978	Misc.Train	9		14			15			1	
12. Motor vehicle being driven upon a highway crossing at grade directly in front of an approaching train	1994	Derailment		1		27	9	1			1	
13. Automobile being driven upon a railroad crossing at grade directly in front of an approaching passenger train	2012	Derailment		3	2	5	4	7		1		
14. Motor truck being driven upon a railroad crossing at grade directly in front of an approaching train	2014	Misc.Train			1		2		1			
15. Motor truck being driven upon a railroad crossing at grade directly in front of an approaching train	201	Derailment				9	7	4				
16. Failure of the official in charge of the movement of the motor truck and trailer to remain at the crossing and provide adequate protection	2054	Misc.Train				1	8				1	
17. The failure of the bus driver to stop as required by law and also by the rules of the bus company and to know that no train was approaching before attempting to proceed over a railway crossing at grade. Contributing causes were the failure of local authorities to enforce an ordinance making it unlawful for trains to operate within the corporate limits at speeds in excess of 20 miles per hour, and the failure of the railway company to require its employes to observe the provisions of the ordinance	2056	Derailment			11			2	1			
18. Motor truck being driven upon a highway grade crossing just as the train was approaching	2099	Misc.Train			1		2		1			
19. Road scraper being driven on a highway grade crossing directly in front of an approaching train	2078	Misc.Train			1		1		1			
20. Train striking an automobile which had turned off the highway and had become stalled on the track	2093	Derailment			1	17	2				1	
21. Automobile being driven upon a highway crossing directly in front of an approaching train	2113	Derailment			1				1			
22. Motor truck being driven upon a private crossing directly in front of an approaching train	2115	Derailment			1	12	4		1			
23. Action of the driver of a motor vehicle in starting over a railroad crossing at grade at the time that an approaching train started to pass over the crossing	2137	Misc.Train			1			2	1			
24. Motor truck being driven upon a highway crossing at grade directly in front of an approaching train	2148	Derailment		1	1	5	1		1			
25. Automobile being driven on a [illegible]												

IV. COLLISIONS WITH VEHICLES AT GRADE CROSSINGS:

1. Motor truck being driven upon a grade crossing directly in front of an approaching train	1882	Derailment		1	2		1		1			
2. Motor truck being driven upon a grade crossing directly in front of an approaching passenger train resulting in derailment of train on adjacent track	1884	Derailment		1	1					1		1
3. Train striking an automobile which had run off the highway at a grade crossing and had become stalled across the track	1886	Derailment		2						1		
4. Motor truck and trailer being driven on a railroad crossing at grade directly in front of an approaching train	1888	Derailment		1			1		1			
5. Motor truck being driven upon a railroad crossing at grade directly in front of an approaching passenger train	1896	Derailment		2	1	4	1	1			1	
6. Train striking an automobile which had turned off the highway at a grade crossing and had become stalled on the track	1923	Derailment		1		1	1				1	
7. Train striking an automobile which had been shoved upon the track by a following automobile while it was standing at a highway grade crossing waiting for the train to pass	1924	Derailment			5	5	2	1	1			
8. Motor truck being driven upon a railroad crossing at grade directly in front of an approaching passenger train	1933	Derailment		1	1	1		1			1	
9. Train striking an automobile which had become stalled on the track adjacent to a highway grade crossing	1934	Derailment		2		7	1	4			1	
10. Failure of a crossing watchman to lower the gates at the crossing when a train was approaching	1968	Misc.Train		3		6	1	2	1			
11. School bus being driven upon a railroad crossing at grade directly in front of an approaching train, due primarily to the failure of the driver to take adequate precautions before starting over the crossing, and to inadequate protection of the crossing which resulted from failure of responsible authorities to enforce, and of the railroad company to obey, the law requiring maintenance of a watchman until 12 o-clock midnight	1978	Misc.Train			14			15			1	
12. Motor vehicle being driven upon a highway crossing at grade directly in front of an approaching train	1994	Derailment		1		27	9	1			1	
13. Automobile being driven upon a railroad crossing at grade directly in front of an approaching passenger train	2012	Derailment		3	2	5	4	7		1		
14. Motor truck being driven upon a railroad crossing at grade directly in front of an approaching train	2014	Misc.Train			1		2		1			
15. Motor truck being driven upon a railroad crossing at grade directly in front of an approaching train	201	Derailment				9	7	2				
16. Failure of the official in charge of the movement of the motor truck and trailer to remain at the crossing and provide adequate protection	2054	Misc.Train				1	8				1	
17. The failure of the bus driver to stop as required by law and also by the rules of the bus company and to know that no train was approaching before attempting to proceed over a railway crossing at grade. Contributing causes were the failure of local authorities to enforce an ordinance making it unlawful for trains to operate within the corporate limits at speeds in excess of 20 miles per hour, and the failure of the railway company to require its employes to observe the provisions of the ordinance	2056	Derailment			11			2	1			
18. Motor truck being driven upon a highway grade crossing just as the train was approaching	2059	Misc.Train			1		2		1			
19. Road scraper being driven on a highway grade crossing directly in front of an approaching train	2078	Misc.Train			1		1		1			
20. Train striking an automobile which had turned off the highway and had become stalled on the track	2093	Derailment			1	17	2				1	
21. Automobile being driven upon a highway crossing directly in front of an approaching train	2113	Derailment			1				1			
22. Motor truck being driven upon a private crossing directly in front of an approaching train	2115	Derailment			1	12	4		1			
23. Action of the driver of a motor vehicle in starting over a railroad crossing at grade at the time that an approaching train started to pass over the crossing	2137	Misc.Train			1			2	1			
24. Motor truck being driven upon a highway crossing at grade directly in front of an approaching train	2148	Derailment		1	1	5	1		1			
25. Automobile being driven on a railroad crossing at grade directly in front of an approaching train, in disregard of signals indicating approach of a train	2159	Derailment		2		29	9	2		1		
26. Motor truck being driven upon a private crossing directly in front of an approaching train	2164	Misc.Train			1		2		1			

CAUSE (a)	I.C.C. NO. (b)	KIND OF ACCIDENTS (c)	PERSONS KILLED: PASSENGERS (d)	KILLED: EMPLOYEES (e)	KILLED: OTHERS (f)	INJURED: PASSENGERS (g)	INJURED: EMPLOYEES (h)	INJURED: OTHERS (i)	NUMBER OF PASSENGER TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS: 5 AND LESS (j)	6 TO 8 (k)	9 TO 11 (l)	12 TO 14 (m)	OVER 14 CARS (n)
COLLISIONS WITH VEHICLES AT GRADE CROSSINGS:													
27. School bus being driven upon a private road crossing directly in front of an approaching train	2210	Misc.Train			10			19	1				
28. Truck being driven upon a railroad crossing at grade directly in front of an approaching train	2211	Derailment		1	2		1			1			
29. Motor truck being driven upon a highway grade crossing directly in front of an approaching train	2219	Derailment		1	2	3	2				1		
30. Automobile stalled on the track near a highway crossing due to loss of control of the car following damage to a tire	2223	Derailment		1		1	1		1				
31. An automobile being stalled on the track near a highway, probably due to careless driving	2249	Derailment	3	2	1	2						1	
32. Motor truck being driven upon a highway grade crossing in front of an approaching train, in disregard of signals indicating the approach of a train	2255	Derailment			1	42	3	1		1			
33. Gasoline tank-truck being driven upon a railroad crossing at grade in disregard of flashing light signals, a contributing cause was the failure of the crossing gateman to lower the gates or to protect the crossing with hand signals	2261	Derailment		2		6		2	1				
34. Motor truck being driven upon a railroad crossing at grade directly in front of an approaching passenger train	2272	Misc.Train		2							1		
35. Automobile proceeding upon a railroad crossing at grade directly in front of an approaching passenger train	2287	Derailment		2		1	1			1			
36. Automobile tank-truck being driven upon a railroad crossing at grade directly in front of an approaching train	2299	Misc.Train		2	2				1				
37. Gasoline tank-truck being driven upon a railroad crossing at grade directly in front of an approaching passenger train	2305	Misc.Train		2	1					1			
38. Log truck being driven upon a highway grade crossing immediately in front of an approaching train in disregard of signals indicating the approach of a train	2346	Derailment		2	1	25						1	
39. Power road grader being driven upon a highway grade crossing immediately in front of an approaching train, in disregard of signals indicating the approach of a train	2355	Derailment				26	2		1				
40. Gasoline tank-truck being driven upon a railroad crossing at grade immediately in front of an approaching train	2364	Misc.Train		1		2			1				
41. Motor truck striking the side of a railroad passenger motor car at a highway grade crossing in disregard of signals indicating the approach of a train	2370	Derailment		1			1	1	1				
42. Automobile becoming stalled on a highway grade crossing in front of an approaching train	2399	Derailment		2		1		1				1	
TOTAL - COLLISIONS WITH VEHICLES AT GRADE CROSSINGS — 42 ACCIDENTS			3	42	67	239	78	66	20	8	10	4	1
MISCELLANEOUS CAUSES:													
Ascertained Causes:													
1. Floods, Washouts, Landslides, Snow Slides, etc:													
1. Washout	1885	Derailment		1				1	1				
2. Train striking sand and gravel which had been washed upon the track	1921	Derailment			1	34	4	3				1	
3. Rock slide	1963	Derailment		2					1				
4. Washout due to an unusually heavy local rainstorm	1993	Derailment				18	19						1
5. Snowslide	2049	Derailment	1	2		2			1				
6. Washout	2150	Derailment				12	5	1	1				
7. Burned-out bridge	2171	Derailment		2		5		2	1				

28. Truck being driven upon a railroad crossing at grade directly in front of an approaching train	2211	Derailment		1	2		1			1				
29. Motor truck being driven upon a highway grade crossing directly in front of an approaching train	2219	Derailment		1	3	3	1				1			
30. Automobile stalled on the track near a highway crossing due to loss of control of the car following damage to a tire	2223	Derailment		1		1	1		1					
31. An automobile being stalled on the track near a highway, probably due to careless driving	2249	Derailment	3	2	1	2						1		
32. Motor truck being driven upon a highway grade crossing in front of an approaching train, in disregard of signals indicating the approach of a train	2255	Derailment			1	42	3	1		1				
33. Gasoline tank-truck being driven upon a railroad crossing at grade in disregard of flashing-light signals, a contributing cause was the failure of the crossing gateman to lower the gates or to protect the crossing with hand signals	2261	Derailment		2		6		2	1					
34. Motor truck being driven upon a railroad crossing at grade directly in front of an approaching passenger train	2272	Misc.Train		2							1			
35. Automobile proceeding upon a railroad crossing at grade directly in front of an approaching passenger train	2287	Derailment		2		1	1			1				
36. Automobile truck being driven upon a railroad crossing at grade directly in front of an approaching train	2299	Misc.Train		2	2				1					
37. Gasoline tank-truck being driven upon a railroad crossing at grade directly in front of an approaching passenger train	2306	Misc.Train		2	1									
38. Log truck being driven upon a highway grade crossing immediately in front of an approaching train in disregard of signals indicating the approach of a train	2346	Derailment		2	3	24						1		
39. Power road grader being driven upon a highway grade crossing immediately in front of an approaching train, in disregard of signals indicating the approach of a train	2355	Derailment				26	7		1					
40. Gasoline tank-truck being driven upon a railroad crossing at grade immediately in front of an approaching train	2364	Misc.Train		1		2			1					
41. Motor truck striking the side of a railroad passenger motor car at a highway grade crossing in disregard of signals indicating the approach of a train	2370	Derailment		1			1	1	1					
42. Automobile becoming stalled on a highway grade crossing in front of an approaching train	2399	Derailment		2		1		1	2			1		
TOTAL - COLLISIONS WITH VEHICLES AT GRADE CROSSINGS - 42 ACCIDENTS			3	42	67	239	78	66	20	8	10	4	1	
V. MISCELLANEOUS CAUSES:														
A. Ascertained Causes:														
(1) Fires, Washouts, Landslides, Snow Slides, etc:														
1. Washout	1885	Derailment		1				1	1					
2. Train striking sand and gravel which had been washed upon the track	1921	Derailment			1	34	4	3				1		
3. Rock slide	1953	Derailment		2					1					
4. Washout due to an unusually heavy local rainstorm	1993	Derailment				18	19					3	1	
5. Snowslide	2049	Derailment	1	2		2			1					
6. Washout	2150	Derailment				12	5	1	1					
7. Burned-out bridge	2171	Derailment		2		5		2	1					
8. Presence of a large boulder on the track at a point where the range of vision of the enginemen were restricted	2222	Derailment		2							1			
9. Rock which had fallen upon the track	2238	Derailment		2			5			1				
10. Landslide	2241	Derailment		1	6		2	8			1			
11. Washout	2275	Derailment		1								1		
12. Undermining of the piers of a bridge, due to a cloudburst	2278	Derailment	41	4	2	56	18	1			1			
13. Washout	2289	Derailment		1	1	16	1	5			1			

CAUSE (a)	I.C.C. NO. (b)	KIND OF ACCIDENT (c)	PERSONS KILLED: PASSENGERS (d)	KILLED: EMPLOYEES (e)	KILLED: OTHERS (f)	INJURED: PASSENGERS (g)	INJURED: EMPLOYEES (h)	INJURED: OTHERS (i)	NUMBER OF PASSENGER TRAINS IN ACCIDENTS AS TO VARIOUS LENGTHS IN CARS: 5 AND LESS (j)	6 TO 8 (k)	9 TO 11 (l)	12 TO 14 (m)	OVER 14 CARS (n)
V. MISCELLANEOUS CAUSES:													
(A) Ascertained Causes: (Continued)													
(1) Fires, Washouts, Landslides, Snow Slides, etc: (Continued)													
14. Fire in an express car, due to improper operation of its oil-lamp equipment	2326	Misc.Train			1			1			1		
15. Landslide	2340	Derailment		1		5	1	2	1				
16. Landslide	2341	Derailment		2					1				
17. Track being washed out as a result of unusually heavy rainfall	2376	Derailment				32	6		1				
18. Rock slide	2392	Derailment		1			1				1		
TOTAL - FIRES, WASHOUTS, LANDSLIDES, SNOW SLIDES, ETC. 18 ACCIDENTS			42	22	5	180	62	24	8	1	6	2	1
(2) All Other:													
1. Bolt having been placed on the high rail of a curve	1907	Derailment		1			2			1			
2. Combination of several factors, including irregular track surface, speed, and distribution of the tender load which caused tender to rock sufficiently to derail the rear truck	1908	Derailment		1			1	1	1				
3. Crossing material on the rails at a highway grade crossing	1919	Derailment		1			1		1				
4. Combination of several factors, including irregularity in alignment and surface of track and a speed which was too high in view of the existing track conditions and the superelevation which was provided	1929	Derailment		1		5	3	3	1				
5. Malicious tampering with the track	1938	Derailment		1		4	1			1			
6. Locked or partly opened switch, apparently due to malicious tampering	1948	Derailment		2	1	4		5			1		
7. Brake shoe lying on a rail	1950	Derailment					2			1			
8. Open switch, apparently due to malicious tampering	1958	Derailment		3		8	2	2	1				
9. Snow being packed on the track at a highway crossing	1962	Derailment		1		28	1	2		1			
10. Train striking cattle on the track in the vicinity of a highway crossing	2019	Derailment		2		15	1	2		1			
11. Pigs of refuse coal lying against or on top of the high rail of a curve	2036	Derailment		1		2	4			1			
12. Body of a refrigerator car buckling out of the middle of the freight train, due to severe slack action, and fouling the adjacent track directly in front of an approaching passenger train	2055	Collision		3		5	5	1				1	
13. Metal highway grade crossing plate becoming dislodged and being struck by a train	2057	Derailment	2			6			1				
14. Open switch, due to a reinforcing bar bolt having become lodged between the normally closed switch point and the stock rail in such manner as to make it impossible to close and lock the switch, but permitting the improper display of proceed-signal indications	2076	Collision		1		3	1	1				1	
15. Train striking an automobile which was being driven on the track in the same direction as that in which the train was moving	2079	Derailment		2	1	8				1			
16. Switch being locked or partly opened with malicious intent	2102	Derailment		2			2			1			
17. Brake shoe having been placed by some children upon the rail at a highway crossing	2127	Derailment		1				1		1			
18. Train striking an automobile which had been driven along the track by an intoxicated driver until it became wedged between the rails at a switch	2145	Derailment		2		1		2					
19. Metallic steam-heat connector on the forward end of the leading car dropping from the car and becoming wedged in the heel block of a trailing point switch	2165	Derailment				4	2				1		
20. Track spike lying on top of the high rail of a curve	2208	Derailment				4	2	1	1				
21. Train striking and running over cattle on the track	2217	Derailment						1					

(A) Accidents Caused: (Continued)													
(1) Fires, Washouts, Landslides, Snow Slides, etc: (Continued)													
14. Fire in an express car, due to improper operation of its oil-lamp equipment	2326	Misc.Train			1			1			1		
15. Landslide	2340	Derailment		1		5	1	2	1				
16. Landslide	2341	Derailment		7					1				
17. Track being washed out as a result of unusually heavy rainfall	2376	Derailment				32	6		1				
18. Rock slide	2392	Derailment		1			1				1		
TOTAL - FIRES, WASHOUTS, LANDSLIDES, SNOW SLIDES, ETC. 18 ACCIDENTS			42	22	5	180	62	24	8	1	6	2	
(2) All Other:													
1. Bolt having been placed on the high rail of a curve	1907	Derailment		1			2			1			
2. Combination of several factors, including irregular track surface, speed, and distribution of the tender load which caused tender to rock sufficiently to derail the rear truck	1908	Derailment		1			1	1	1				
3. Crossing material on the rails at a highway grade crossing	1919	Derailment		1			1		1				
4. Combination of several factors, including irregularity in alignment and surface of track and a speed which was too high in view of the existing track conditions and the superelevation which was provided	1929	Derailment		1		5	3	3	1				
5. Malicious tampering with the track	1938	Derailment		1		4	1			1			
6. Cocked or partly opened switch, apparently due to malicious tampering	1948	Derailment		2	1	4		5			1		
7. Brake shoe lying on a rail	1950	Derailment					2			1			
8. Open switch, apparently due to malicious tampering	1958	Derailment		3		8	2	2	1				
9. Snow being packed on the track at a highway crossing	1962	Derailment		1		28	1	2		1			
10. Train striking cattle on the track in the vicinity of a highway crossing	2019	Derailment		2		15	1	2		1			
11. Piece of refuse coal lying against or on top of the high rail of a curve	2036	Derailment		1		2	4			1			
12. Body of a refrigerator car buckling out of the middle of the freight train, due to severe slack action, and fouling the adjacent track directly in front of an approaching passenger train	2055	Collision		3		5	5	1				1	
13. Metal highway grade crossing plate becoming dislodged and being struck by a train	2057	Derailment	2			6			1				
14. Open switch, due to a reinforcing bar bolt having become lodged between the normally closed switch point and the stock rail in such manner as to make it impossible to close and lock the switch, but permitting the improper display of proceed-signal indications	2076	Collision		1		3	1	1				1	
15. Train striking an automobile which was being driven on the track in the same direction as that in which the train was moving	2079	Derailment		2	1	8				1			
16. Switch being cocked or partly opened with malicious intent	2102	Derailment		2			2			1			
17. Brake shoe having been placed by some children upon the rail at a highway crossing	2127	Derailment		1				1		1			
18. Train striking an automobile which had been driven along the track by an intoxicated driver until it became wedged between the rails at a switch	2145	Derailment		2		1		2					
19. Metallic stone-bolt connector on the forward end of the leading car dropping from the car and becoming wedged in the heel block of a trailing point switch	2165	Derailment				4	2				1		
20. Track spike lying on top of the high rail of a curve	2208	Derailment				4	2	1	1				
21. Train striking and running over cattle on the track	2217	Derailment		2		2	1	1					
22. Failure properly to control speed, due to closed angle cock at the rear end of the second car of a 12 car train	2237	Collision				26	6	12				1	
23. Separation of a switch point from the stock rail due to the throw lever of the switch stand being unlatched (Switching move with 5 cars)	2265	Derailment		1									

CAUSE (a)	I.C.C. NO. (b)	KIND OF ACCIDENT (c)	PERSONS KILLED: PASSENGERS (d)	KILLED: EMPLOYEES (e)	KILLED: OTHERS (f)	INJURED: PASSENGERS (g)	INJURED: EMPLOYEES (h)	INJURED: OTHERS (i)	NUMBER OF PASSENGER TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS: 5 AND LESS (j)	6 TO 8 (k)	9 TO 11 (l)	12 TO 14 (m)	OVER 14 CARS (n)	TOTAL (o)
ROUS CAUSES:														
ined Causes: (Continued)														
then Continued)														
clear signal indication given by the automatic signal governing the use of the block within which accident occurred, and failure to provide proper flag protection for the first train	2290	Collision					2	1		1		1		
h having been tampered with and left open by two boys	2296	Derailment		2			1	1		1				
switch, apparently due to malicious tampering	2303	Derailment				6			1					
ng guide truck wheel of an electric engine mounting the point of a double-slip frog that did not vide sufficient protection through the space between the knuckle and the point of frog for a motive of this design with the rear unit conforming to the angles set up by a sharp curve when front unit was passing through a frog on tangent track	2312	Derailment				6						1		
ive speed on a sharp curve; possibly a broken engine driving spring was a contributing cause	2313	Derailment					3	1		1				
3342 parting between the thirty-sixth and fortieth cars, owing primarily to a low coupler and a tributing factor of free slack in the draft gear, and the collision of the two portions of the in which resulted in the train buckling and fouling an adjacent track where it was struck by a senger train	2316	Collision				5	1		1					
nation of wide gage, curve worn rail; loose spikes, worn flanges, and driving wheel brakes re-ining applied on a curve, which resulted in a wheel on the low side dropping inside the low rail the high rail becoming overturned	2371	Derailment				120	17	9				1		
ious tampering with the track	2375	Derailment	9	15		99	13	3				1		
TOTAL - ASCERTAINED CAUSES - ALL OTHER 31 ACCIDENTS			11	45	2	361	74	49	8	13	2	9	1	33
ertained Causes:														
efinitely ascertained	1936	Derailment	1	3		13	7	3	1					1
TOTAL - UNASCERTAINED CAUSES 1 ACCIDENT			1	3		13	7	3	1					1
GRAND TOTAL - MISCELLANEOUS 50 ACCIDENTS			54	70	7	554	143	76	17	14	8	11	2	52
GRAND TOTAL - ALL ACCIDENTS INVESTIGATED - ALL CAUSES 232 ACCIDENTS			105	217	86	3 799	729	350	110	57	57	37	6	267

QUARTERLY SUMMARY NUMBER (1)	INVESTIGATION NUMBER (2)	NAME OF CARRIER (3)	LOCATION (4)	DATE (5)	QUARTERLY SUMMARY NUMBER (1)	INVESTIGATION NUMBER (2)	NAME OF CARRIER (3)
59	1882	Chicago, St. Paul, Minneapolis & Omaha RR,	Omaha, Nebr.,	January 1, 1934	67	2036	New York Central,
59	1884	Pennsylvania Railroad,	Deans, N. J.,	January 3, 1934	67	2037	Chicago & North Western Railway,
59	1885	Northern Pacific Railway,	Arrow, Idaho,	January 23, 1934	67	2038	Reading Railroad,
59	1886	Reading Company,	Elandon, Pa.,	January 25, 1934	67	2040	Cincinnati Union Terminal Company,
59	1887	Chicago & North Western Railway,	Monico, Wis.,	February 8, 1934	67	2042	Southern Railway,
59	1888	Oregon Short Line Railroad, Union Pacific System,	Woods Cross, Utah,	February 9, 1934	67	2046	Cincinnati Union Terminal Company,
59	1891	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Wegdahl, Minn.,	February 19, 1934	67	2049	Northern Pacific Railway,
59	1894	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Iron Mountain, Mich.,	February 22, 1934	67	2054	Atchison, Topeka & Santa Fe Railway,
59	1896	Pennsylvania Railroad,	Delphos, Ohio,	February 26, 1934	67	2055	Pennsylvania Railroad,
59	1897	Pennsylvania Railroad,	Pittsburgh, Pa.,	February 26, 1934	67	2056	Central of Georgia Railway,
59	1900	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Specht's Ferry, Iowa,	March 6, 1934	68	2057	Union Pacific Railroad,
59	1902	Washington and Old Dominion Railway,	Jackson, Va.,	March 10, 1934	68	2059	Chicago, Burlington & Quincy Railroad,
60	1907	St. Louis-San Francisco Railway,	Dora, Ala.,	April 5, 1934	68	2063	Cincinnati & Lake Erie Railroad,
60	1908	Northern Pacific Railway,	Big Lake, Wash.,	April 6, 1934	68	2068	Atchison, Topeka & Santa Fe Railway,
60	1915	Pennsylvania Railroad,	Graystone, Md.,	June 6, 1934	68	2073	Missouri Pacific Railroad,
60	1916	Chicago, Rock Island & Pacific Railway,	Pacific Junction, Okla.,	June 11, 1934	69	2076	Michigan Central Railroad,
60	1918	New York, New Haven & Hartford Railroad,	Fall River, Mass.,	June 30, 1934	69	2078	New York Central Railroad,
61	1919	Chesapeake & Ohio Railway,	Paintsville, Ky.,	July 7, 1934	69	2079	Illinois Central Railroad,
61	1921	Denver & Rio Grande Western Railroad,	Echo, Colo.,	July 26, 1934	69	2086	Central of Georgia Railway,
61	1922	Southern Pacific Company,	Manteca, Calif.,	August 3, 1934	69	2093	Missouri Pacific Railroad,
61	1923	Great Northern Railway,	Wolf Point, Mont.,	August 10, 1934	69	2101	Chicago, Burlington & Quincy Railroad,
61	1924	Michigan Central Railroad,	Vermontville, Mich.,	August 10, 1934	69	2102	Louisiana & Arkansas Railway,
61	1925	Virginian Railway,	Dothan, W. Va.,	August 12, 1934	69	2103	Ann Arbor Railroad,
61	1928	New York Central Railroad,	Crugers, N.Y.,	August 31, 1934	70	2107	Chicago, Burlington & Quincy Railroad,
61	1929	Yazoo & Mississippi Valley Railroad, Illinois Central System,	Centreville, Miss.,	September 3, 1934	70	2108	Pennsylvania Railroad,
61	1930	Atchison, Topeka & Santa Fe Railway,	Cambridge, Kans.,	September 7, 1934	70	2112	Cleveland, Cincinnati, Chicago & St. Louis R
61	1933	Cleveland, Cincinnati, Chicago & St. Louis Railway,	Lawrenceville, Ill.,	September 18, 1934	70	2113	Baltimore & Ohio Railroad,
61	1934	Pennsylvania Railroad,	Convoy, Ohio,	September 29, 1934	70	2114	Indiana Railroad,
62	1936	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Guttenberg, Iowa,	October 11, 1934	70	2115	New York, New Haven and Hartford Railroad,
62	1937	Chicago, Rock Island & Pacific Railway,	Downey, Iowa,	October 12, 1934	70	2121	Chicago Rapid Transit Company,
62	1938	Pennsylvania Railroad,	Laurel Hill, Pa.,	October 21, 1934	70	2126	Chicago Great Western Railroad,
62	1943	Boston and Maine Railroad,	Ayer, Mass.,	November 9, 1934	70	2127	St. Louis Southeastern Railway,
62	1944	Nicholas, Fayette and Greenbrier Railroad,	Saw Mill, W. Va.,	November 15, 1934	70	2128	Louisville & Nashville Railroad,
62	1948	Atlantic Coast Line Railroad,	Forrester, Fla.,	December 3, 1934	71	2133	International-Great Northern Railroad,
62	1950	Chicago, Great Western Railroad,	West St. Paul, Minn.,	December 4, 1934	71	2137	Chicago, Springfield & St. Louis Railway,
62	1953	Denver and Rio Grande Western Railroad,	Niger, Colo.	December 12, 1934	71	2141	Union Pacific Railroad,
62	1957	Cleveland, Cincinnati, Chicago & St. Louis Railway,	Paget, Ohio,	December 23, 1934	71	2142	Chicago, Rock Island & Pacific Railway,
62	1958	Pennsylvania Railroad,	Linden, Ohio,	December 27, 1934	71	2145	Southern Pacific Railroad,
63	1960	Southern Railway,	Charlotte, N.C.,	January 13, 1935	71	2148	Baltimore & Ohio Railroad,
63	1961	Delaware, Lackawanna & Western Railroad,	Newton, N.J.,	January 19, 1935	71	2150	Chicago, Milwaukee, St. Paul & Pacific Railr
63	1962	Central Railroad of New Jersey,	West Carteret, N.J.,	January 23, 1935	72	2170	Chicago & North Western Railway,
63	1963	Delaware, Lackawanna & Western Railroad,	Harrison, N.J.,	January 29, 1935	72	2171	Denver & Rio Grande Western Railroad,
63	1964	Pennsylvania Railroad,	Edgewood, Md.,	February 5, 1935	72	2172	Grand Trunk Western Railroad,
63	1966	Florida East Coast Railway,	Jupiter, Fla.,	February 12, 1935	72	2174	Louisville & Nashville Railroad,
63	1968	Pennsylvania Railroad,	Woodbridge, N.J.,	February 21, 1935	72	2175	Pennsylvania Railroad,
63	1969	Nashville, Chattanooga & St. Louis Railway,	Lexington, Tenn.,	February 23, 1935	72	2177	Seaboard Air Line Railway,
63	1973	Missouri Pacific Railroad,	Shields, Kans.,	March 26, 1935	72	2182	Texas & New Orleans Railroad,
64	1978	Baltimore & Ohio Railroad,	Rockville, Md.,	April 11, 1935	72	2183	Atchison, Topeka & Santa Fe Railway,
64	1981	Missouri-Kansas-Texas Railroad,	Cross (Parsons), Kans.,	April 26, 1935	73	2185	Chicago & North Western Railway,
64	1982	Denver & Salt Lake Railway,	Tolland, Colo.	May 2, 1935	73	2189	Pennsylvania Railroad,
64	1989	Chicago, Rock Island & Pacific Railway, Minneapolis & St. Louis RR	Morning Sun, Iowa,	June 13, 1935	73	2190	Southern Pacific Company,
64	1990	Texas & Pacific Railway,	T.& P.Jct.,(Dallas), Tex.	June 14, 1935	73	2192	Houston Belt & Terminal Railway,
65	1993	Great Northern Railway,	Lanark, Mont.,	July 5, 1935	73	2195	Pennsylvania Railroad,
65	1992	Pennsylvania Railroad,	Upper Sandusky, Ohio,	July 17, 1935	73	2198	Wabash Railway,
65	1995	Northern Pacific Railway,	Welland, Wash.,	July 17, 1935	74	2203	Missouri Pacific Railroad,
65	1998	Canas Prairie Railroad,	Lewiston, Idaho,	August 1, 1935	74	2205	Chicago, Burlington & Quincy Railroad,
65	2003	Cincinnati & Lake Erie Railroad,	Springfield, Ohio,	August 10, 1935	74	2208	Pennsylvania Railroad,
65	2012	Cleveland, Cincinnati, Chicago & St. Louis Railway,	Hollsboro, Ill.,	September 20, 1935	74	2210	Chicago Great Western Railroad
66	2014	Long Island Railroad,					

NAME OF CARRIER (3)	LOCATION (4)	DATE (5)
rk Central,	Tonking Cove, N.f.,	January 27, 1936
go & North Western Railway,	Boone, Iowa,	January 30, 1936
g Railroad,	Clement, near Sunbury, Pa.	January 30, 1936
nati Union Terminal Company,	Cincinnati, Ohio,	January 31, 1936
rn Railway,	Allendale, S.C.,	February 8, 1936
nati Union Terminal Company,	Cincinnati, Ohio,	February 22, 1936
rn Pacific Railway,	Borax, Mont.,	February 26, 1936
son, Topeka & Santa Fe Railway,	Claremont, Calif.,	March 23, 1936
lvania Railroad,	Manor, Pa.,	March 27, 1936
d of Georgia Railway,	Byron, Ga.,	March 28, 1936
Pacific Railroad,	Manokan, Kans.,	April 20, 1936
go, Burlington & Quincy Railroad,	Hoag, Nebr.,	April 24, 1936
nati & Lake Erie Railroad,	Urbana, Ohio,	April 28, 1936
son, Topeka & Santa Fe Railway,	Lawrie, Okla.,	May 30, 1936
ri Pacific Railroad,	Valley Park, Mo.,	June 23, 1936
rn Central Railroad,	Wayne Jct., Mich.,	July 5, 1936
rk Central Railroad,	Riga, Mich.,	July 9, 1936
ic Central Railroad,	Covington, Tenn.,	July 10, 1936
d of Georgia Railway,	Ogeechee, Ga.,	July 23, 1936
ri Pacific Railroad,	Mabelvale, Ark.,	September 8, 1936
go, Burlington & Quincy Railroad,	Spear, Mont.,	September 22, 1936
iana & Arkansas Railway,	Moore, La.,	September 28, 1936
ctor Railroad,	Urania, Mich.,	September 30, 1936
go, Burlington & Quincy Railroad,	Omar, Colo.,	October 27, 1936
lvania Railroad,	Princeton Jct., N.J.,	October 29, 1936
land, Cincinnati, Chicago & St. Louis Railway,	London, Ind.,	November 11, 1936
ore & Ohio Railroad,	Branchville, Md.,	November 11, 1936
a Railroad,	East Germantown, Ind.,	November 12, 1936
rk, New Haven and Hartford Railroad,	Barrington, R.I.,	November 13, 1936
go Rapid Transit Company,	Chicago, Ill.,	November 24, 1936
go Great Western Railroad,	Boyd, Iowa,	December 13, 1936
uis Southwestern Railway,	Corley, Tex.,	December 15, 1936
ville & Nashville Railroad,	Castleberry, Ala.,	December 17, 1936
national-Great Northern Railroad,	Austin, Tex.,	January 5, 1937
go, Springfield & St. Louis Railway,	Springfield, Ill.,	January 11, 1937
Pacific Railroad,	Orchard, Colo.,	February 8, 1937
c, Rock Island & Pacific Railway,	Logan, N. Mex.,	February 9, 1937
ern Pacific Railroad,	Selma, Calif.,	February 12, 1937
ore & Ohio Railroad,	Dorsey, Md.,	February 15, 1937
go, Milwaukee, St. Paul & Pacific Railroad,	Rockton, Ill.,	February 21, 1937
go & North Western Railway,	DeSmet, S. Dak.,	April 25, 1937
& Rio Grande Western Railroad,	Domingues, Colo.,	April 26, 1937
Trunk Western Railroad,	Ionia, Mich.,	May 3, 1937
ville & Nashville Railroad,	East Bernstadt, Ky.,	May 23, 1937
ylvania Railroad,	Bay View, Md.,	May 28, 1937
ard Air Line Railway,	Youngville, N.C.,	June 2, 1937
& New Orleans Railroad,	Shreveport, La.,	June 26, 1937
son, Topeka & Santa Fe Railway,	Bargetto, Calif.,	June 29, 1937
go & North Western Railway,	Evanston, Ill.,	July 2, 1937
ylvania Railroad,	Philadelphia, Pa.,	July 30, 1937
ern Pacific Company,	Yeaney, Oregon,	August 2, 1937
on Belt & Terminal Railway,	Houston, Tex.,	August 3, 1937
ylvania Railroad,	New Galilee, Pa.,	August 18, 1937
h Railway,	New Haven, Ind.,	Sept. 7, 1937
ri Pacific Railroad,	Gale, Ind.,	October 3, 1937

59	1884	Pennsylvania Railroad,	Deans, N. J.,	January 3, 1934	67	2037	Chicago & North Western Railway,
59	1885	Northern Pacific Railway,	Arrow, Idaho,	January 23, 1934	67	2038	Reading Railroad,
59	1886	Reading Company,	Blandon, Pa.,	January 25, 1934	67	2040	Cincinnati Union Terminal Company,
59	1887	Chicago & North Western Railway,	Monico, Wis.,	February 8, 1934	67	2042	Southern Railway,
59	1888	Oregon Short Line Railroad, Union Pacific System,	Woods Cross, Utah,	February 9, 1934	67	2046	Cincinnati Union Terminal Company,
59	1891	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Wegdahl, Minn.,	February 19, 1934	67	2049	Northern Pacific Railway,
59	1894	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Iron Mountain, Mich.,	February 22, 1934	67	2054	Atchison, Topeka & Santa Fe Railway,
59	1896	Pennsylvania Railroad,	Delphos, Ohio,	February 26, 1934	67	2055	Pennsylvania Railroad,
59	1897	Pennsylvania Railroad,	Pittsburgh, Pa.,	February 26, 1934	67	2056	Central of Georgia Railway,
59	1900	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Spechts Ferry, Iowa,	March 6, 1934	68	2057	Union Pacific Railroad,
59	1902	Washington and Old Dominion Railway,	Jackson, Va.,	March 10, 1934	68	2059	Chicago, Burlington & Quincy Railroad,
60	1907	St. Louis-San Francisco Railway,	Dora, Ala.,	April 5, 1934	68	2063	Cincinnati & Lake Erie Railroad,
60	1908	Northern Pacific Railway,	Big Lake, Wash.,	April 6, 1934	68	2068	Atchison, Topeka & Santa Fe Railway,
60	1915	Pennsylvania Railroad,	Graystone, Md.,	June 6, 1934	68	2073	Missouri Pacific Railroad,
60	1916	Chicago, Rock Island & Pacific Railway,	Pacific Junction, Okla.,	June 11, 1934	69	2076	Michigan Central Railroad,
60	1918	New York, New Haven & Hartford Railroad,	Fall River, Mass.,	June 30, 1934	69	2078	New York Central Railroad,
61	1919	Chesapeake & Ohio Railway,	Paintsville, Ky.,	July 7, 1934	69	2079	Illinois Central Railroad,
61	1921	Denver & Rio Grande Western Railroad,	Echo, Colo.,	July 26, 1934	69	2086	Central of Georgia Railway,
61	1922	Southern Pacific Company,	Manteca, Calif.,	August 3, 1934	69	2093	Missouri Pacific Railroad,
61	1923	Great Northern Railway,	Wolf Point, Mont.,	August 10, 1934	69	2101	Chicago, Burlington & Quincy Railroad,
61	1924	Michigan Central Railroad,	Vaimontville, Mich.,	August 10, 1934	69	2102	Louisiana & Arkansas Railway,
61	1925	Virginian Railway,	Dothan, W. Va.,	August 12, 1934	69	2103	Ann Arbor Railroad,
61	1928	New York Central Railroad,	Orugers, N.Y.,	August 31, 1934	70	2107	Chicago, Burlington & Quincy Railroad,
61	1929	Yazoo & Mississippi Valley Railroad, Illinois Central System,	Centreville, Miss.,	September 3, 1934	70	2108	Pennsylvania Railroad,
61	1930	Atchison, Topeka & Santa Fe Railway,	Cambridge, Kans.,	September 7, 1934	70	2112	Cleveland, Cincinnati, Chicago & St. Louis Railway,
61	1933	Cleveland, Cincinnati, Chicago & St. Louis Railway,	Lawrenceville, Ill.,	September 18, 1934	70	2113	Baltimore & Ohio Railroad,
61	1934	Pennsylvania Railroad,	Convoy, Ohio,	September 29, 1934	70	2114	Indiana Railroad,
62	1936	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Guttenberg, Iowa,	October 11, 1934	70	2115	New York, New Haven and Hartford Railroad,
62	1937	Chicago, Rock Island & Pacific Railway,	Downey, Iowa,	October 12, 1934	70	2121	Chicago Rapid Transit Company,
62	1938	Pennsylvania Railroad,	Laurel Hill, Pa.,	October 21, 1934	70	2126	Chicago Great Western Railroad,
62	1943	Boston and Maine Railroad,	Ayer, Mass.,	November 9, 1934	70	2127	St. Louis Southwestern Railway,
62	1944	Nicholas, Fayette and Greenbrier Railroad,	Saw Mill, W. Va.,	November 15, 1934	70	2128	Louisville & Nashville Railroad,
62	1948	Atlantic Coast Line Railroad,	Forrester, Fla.,	December 3, 1934	71	2133	International-Great Northern Railroad,
62	1950	Chicago, Great Western Railroad,	West St. Paul, Minn.,	December 4, 1934	71	2137	Chicago, Springfield & St. Louis Railway,
62	1953	Denver and Rio Grande Western Railroad,	Niger, Colo.	December 12, 1934	71	2141	Union Pacific Railroad,
62	1957	Cleveland, Cincinnati, Chicago & St. Louis Railway,	Paget, Ohio,	December 23, 1934	71	2142	Chicago, Rock Island & Pacific Railway,
62	1958	Pennsylvania Railroad,	Linden, Ohio,	December 27, 1934	71	2145	Southern Pacific Railroad,
63	1960	Southern Railway,	Charlotte, N.C.,	January 13, 1935	71	2148	Baltimore & Ohio Railroad,
63	1961	Delaware, Lackawanna & Western Railroad,	Newton, N.J.,	January 19, 1935	71	2150	Chicago, Milwaukee, St. Paul & Pacific Railroad,
63	1962	Central Railroad of New Jersey,	West Carteret, N.J.,	January 23, 1935	72	2170	Chicago & North Western Railway,
63	1963	Delaware, Lackawanna & Western Railroad,	Harrison, N.J.,	January 29, 1935	72	2171	Denver & Rio Grande Western Railroad,
63	1964	Pennsylvania Railroad,	Edgewood, Md.,	February 5, 1935	72	2172	Grand Trunk Western Railroad,
63	1966	Florida East Coast Railway,	Jupiter, Fla.,	February 12, 1935	72	2174	Louisville & Nashville Railroad,
63	1968	Pennsylvania Railroad,	Woodbridge, N.J.,	February 21, 1935	72	2175	Pennsylvania Railroad,
63	1969	Nashville, Chattanooga & St. Louis Railway,	Lexington, Tenn.,	February 23, 1935	72	2177	Seaboard Air Line Railway,
63	1973	Missouri Pacific Railroad,	Shields, Kans.,	March 26, 1935	72	2182	Texas & New Orleans Railroad,
64	1978	Baltimore & Ohio Railroad,	Rockville, Md.,	April 11, 1935	72	2183	Atchison, Topeka & Santa Fe Railway,
64	1981	Missouri-Kansas-Texas Railroad,	Cross (Parsons), Kans.,	April 26, 1935	73	2185	Chicago & North Western Railway,
64	1982	Denver & Salt Lake Railway,	Tolland, Colo.	May 2, 1935	73	2189	Pennsylvania Railroad,
64	1989	Chicago, Rock Island & Pacific Railway, Minneapolis & St. Louis RR.	Morning Sun, Iowa,	June 13, 1935	73	2190	Southern Pacific Company,
64	1990	Texas & Pacific Railway,	T.& P.Jct.,(Dallas), Tex.	June 14, 1935	73	2192	Houston Belt & Terminal Railway,
65	1993	Great Northern Railway,	Lanark, Mont.,	July 5, 1935	73	2195	Pennsylvania Railroad,
65	1994	Pennsylvania Railroad,	Upper Sandusky, Ohio,	July 17, 1935	73	2198	Wabash Railway,
65	1995	Northern Pacific Railway,	Welland, Wash.,	July 17, 1935	74	2203	Missouri Pacific Railroad,
65	1998	Camas Prairie Railroad,	Lewiston, Idaho,	August 1, 1935	74	2205	Chicago, Burlington & Quincy Railroad,
65	2003	Cincinnati & Lake Erie Railroad,	Springfield, Ohio,	August 10, 1935	74	2208	Pennsylvania Railroad,
66	2013	Cleveland, Cincinnati, Chicago & St. Louis Railway,	Hollsboro, Ill.,	September 20, 1935	74	2210	Chicago Great Western Railroad,
66	2014	Long Island Railroad,	Hicksville, N.Y.,	October 16, 1935	74	2211	Southern Pacific Company,
66	2015	Southern Pacific Company,	West Glendale, Calif.,	October 19, 1935	74	2212	Delaware, Lackawanna & Western Railroad,
66	2018	Denver & Salt Lake Railway,	Sulphur, Colo.	November 8, 1935	74	2215	Wabash Railway,
66	2019	Missouri Pacific Railroad,	Windsor, La.,	November 10, 1935	74	2217	Illinois Central System,
66	2022	Pennsylvania Railroad,	Blairsville, Pa.,	November 29, 1935	74	2218	Central of Georgia Railway,
66	2024	Georgia Railroad,	Dearing, Ga.,	December 12, 1935	74	2219	Central of Georgia Railway,
66	2025	Virginian Railway,	Lester Siding, W. Va.,	December 13, 1935	74	2220	St. Louis Southwestern Railway of Texas,
66	2029	Chicago, Rock Island & Pacific Railway,	Jefferson, Okla.,	December 30, 1935	74	2222	Western Pacific Railroad,
67	2030	Missouri Pacific Railroad,	Lone Tree, Mo.,	January 4, 1936	74	2223	Chicago, Milwaukee, St. Paul & Pacific Railroad,
67	2035	Southern Railway,	Lake, Ill.,	January 22, 1936	74	2225	Norfolk & Western Railway,

ng ....,	Cincinnati, Ohio,	January 31, 1936
nnati Union Terminal Company,		
	Allendale, S.C.,	February 8, 1936
rn Railway,	Cincinnati, Ohio,	February 23, 1936
nnati Union Terminal Company,	Borax, Mont.,	February 26, 1936
rn Pacific Railway,	Claremont, Calif.,	March 23, 1936
son, Topeka & Santa Fe Railway,		
	Manor, Pa.,	March 27, 1936
lvania Railroad,	Byron, Ga.,	March 28, 1936
al of Georgia Railway,	Hanchan, Kans.,	April 20, 1936
Pacific Railroad,	Poag, Nebr.,	April 24, 1936
go, Burlington & Quincy Railroad,		
	Urbana, Ohio,	April 28, 1936
nnati & Lake Erie Railroad,	Laurie, Okla.,	May 30, 1936
son, Topeka & Santa Fe Railway,	Valley Park, Mo.,	June 23, 1936
ri Pacific Railroad,	Wayne Jct., Mich.,	July 5, 1936
an Central Railroad,		
	Riga, Mich.,	July 9, 1936
rk Central Railroad,	Covington, Tenn.,	July 10, 1936
is Central Railroad,	Ogeechee, Ga.,	July 23, 1936
al of Georgia Railway,	Mabelvale, Ark.,	September 8, 1936
ri Pacific Railroad,		
	Spear, Mont.,	September 22, 1936
go, Burlington & Quincy Railroad,	Moore, La.,	September 28, 1936
iana & Arkansas Railway,	Urania, Mich.,	September 30, 1936
rbor Railroad,	Omar, Colo.,	October 27, 1936
go, Burlington & Quincy Railroad,		
	Princeton Jct., N.J.,	October 29, 1936
lvania Railroad,	London, Ind.,	November 11, 1936
land, Cincinnati, Chicago & St. Louis Railway,	Branchville, Md.,	November 11, 1936
more & Ohio Railroad,	East Germantown, Ind.,	November 12, 1936
ma Railroad,		
	Barrington, R.I.,	November 13, 1936
ork, New Haven and Hartford Railroad,	Chicago, Ill.,	November 24, 1936
go Rapid Transit Company,	Boyd, Iowa,	December 13, 1936
go Great Western Railroad,	Corley, Tex.,	December 15, 1936
ouis Southwestern Railway,		
	Castleberry, Ala.,	December 17, 1936
ville & Nashville Railroad,	Austin, Tex.,	January 5, 1937
national-Great Northern Railroad,	Springfield, Ill.,	January 11, 1937
go, Springfield & St. Louis Railway,	Orchard, Colo.,	February 8, 1937
Pacific Railroad,		
	Logan, N. Mex.,	February 9, 1937
go, Rock Island & Pacific Railway,	Selma, Calif.,	February 12, 1937
ern Pacific Railroad,	Dorsey, Md.,	February 15, 1937
more & Ohio Railroad,	Rockton, Ill.,	February 21, 1937
go, Milwaukee, St. Paul & Pacific Railroad,		
	DeSmet, S. Dak.,	April 25, 1937
go & North Western Railway,	Domingues, Colo.,	April 26, 1937
r & Rio Grande Western Railroad,	Ionia, Mich.,	May 3, 1937
Trunk Western Railroad,	East Bernstadt, Ky.,	May 23, 1937
ville & Nashville Railroad,		
	Bay View, Md.,	May 28, 1937
lvania Railroad,	Youngville, N.C.,	June 2, 1937
ard Air Line Railway,	Shreveport, La.,	June 26, 1937
& New Orleans Railroad,	Barstow, Calif.,	June 29, 1937
son, Topeka & Santa Fe Railway,		
	Evanston, Ill.,	July 29, 1937
go & North Western Railway,	Philadelphia, Pa.,	July 30, 1937
lvania Railroad,	Yamsay, Oregon,	August 2, 1937
ern Pacific Company,	Houston, Tex.,	August 3, 1937
on Belt & Terminal Railway,		
	New Galilee, Pa.,	August 18, 1937
lvania Railroad,	New Haven, Ind.,	Sept. 7, 1937
h Railway,	Gale, Ind.,	October 3, 1937
ri Pacific Railroad,	Kamp, Nebr.,	October 7, 1937
go, Burlington & Quincy Railroad,		
	Riegelsville, N.J.,	October 16, 1937
lvania Railroad,	Mason City, Iowa,	October 22, 1937
go Great Western Railroad,	Turlock, Calif.,	October 23, 1937
ern Pacific Company,	Portland, Pa.,	October 24, 1937
are, Lackawanna & Western Railroad,		
	Catlin, Ill.,	October 26, 1937
h Railway,	Tallahatchie, Miss.,	November 4, 1937
ois Central System,	Arles, Ga.,	November 4, 1937
al of Georgia Railway,	Lovejoy, Ga.,	November 6, 1937
al of Georgia Railway,		
	Rusk, Tex.,	November 6, 1937
ouis Southwestern Railway of Texas,	Pulga, Calif.,	November 11, 1937
rn Pacific Railroad.	Morton Grove, Ill.,	November 14, 1937
go, Milwaukee, St. Paul & Pacific Railroad,	Bluefield, Va.,	November 30, 1937
lk & Western Railway,		

RLY R	INVESTI-GATION NUMBER (2)	NAME OF CARRIER (3)	LOCATION (4)	DATE (5)	QUARTERLY SUMMARY NUMBER (1)	INVESTI-GATION NUMBER (2)	NAME OF CARRIER (3)	LOCATION (4)	DATE (5)
	2226	Illinois Central System,	Chicago, Ill.,	November 22, 1937	81	2376	Central Railroad of New Jersey,	Chatsworth, N. J.,	August 19, 1939
	2236	Pere Marquette Railway,	Beech, Mich.,	December 17, 1937	81	2378	Boston and Maine Railroad,	Portsmouth, N. H.,	September 10, 1939
	2237	Louisville & Nashville Railroad,	Hopkinsville, Ky.,	December 24, 1937	81	2379	Chicago, Milwaukee, St. Paul and Pacific Railroad,	Avery, Idaho,	September 15, 1939
	2238	Pennsylvania Railroad,	Pittsburgh, Pa.,	December 25, 1937	82	2389	Pennsylvania Railroad,	Fort Wayne, Ind.,	October 24, 1939
	2241	Great Northern Railway,	Monroe, Wash.,	December 28, 1937	82	2392	Great Northern Railway,	Kamka, Idaho,	November 8, 1939
	2245	New York Central Railroad,	Syracuse, N.Y.,	January 19, 1938	82	2394	Chicago & North Western Railway,	Great Lakes, Ill.,	November 22, 1939
	2246	Minneapolis, St. Paul & Sault Ste. Marie Railway,	Voltaire, N. Dak.,	January 20, 1938	82	2398	Chicago, Milwaukee, St. Paul and Pacific Railroad,	Elkhart Lake, Wis.,	December 16, 1939
	2249	Missouri Pacific Railroad,	Cunningham Spur, Ark.,	February 6, 1938	82	2399	Union Pacific Railroad,	Richland, Nebr.,	December 20, 1939
	2250	Mobile & Ohio Railroad,	Murphysboro, Ill.,	February 12, 1938	82	2400	Terminal Railroad Association of St. Louis,	East St. Louis, Ill.,	December 25, 1939
	2251	Michigan Central Railroad,	Monroe, Mich.,	February 13, 1938	82	2401	Texas and New Orleans Railroad of the Southern Pacific Lines,	Orange, Texas,	December 30, 1939
	2252	Colorado & Southern Railway,	Folsom, N. Mex.,	February 16, 1938					
	2253	St. Louis Southwestern Railway,	Roe, Ark.,	February 17, 1938					
	2254	Missouri Pacific Railroad,	Benton, Ark.,	February 19, 1938					
	2255	Wabash Railway,	Worth, Ill.,	February 22, 1938					
	2256	Kansas City Southern Railway,	Spencer, Tex.,	February 23, 1938					
	2259	Louisville & Nashville Railroad,	Patio, Ky.,	March 10, 1938					
	2261	Central Railroad of New Jersey,	Secaucus, N.J.,	March 21, 1938					
	2264	Chicago Great Western Railroad,	Clare, Ill.,	April 8, 1938					
	2265	New York Central Railroad,	Yonkers, N.Y.,	April 9, 1938					
	2268	New York Central Railroad,	North Germantown, N.Y.,	April 17, 1938					
	2271	Chicago Great Western Railroad,	Bolton, Ill.,	May 25, 1938					
	2272	Pennsylvania Railroad,	Van Wert, Ohio,	May 26, 1938					
	2273	Boston & Maine Railroad,	East Somerville, Mass.,	May 31, 1938					
	2275	Missouri Pacific Railroad,	Hematite, Mo.,	June 11, 1938					
	2278	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Saugus, Mont.,	June 19, 1938					
	2279	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Ingomar, Mont.,	June 26, 1938					
	2284	Chesapeake Western Railway,	Laymans, Va.,	July 30, 1938					
	2285	New York Central Railroad,	Rocky Ridge, Ohio,	July 31, 1938					
	2287	Wabash Railway,	Huntington, Ind.,	August 13, 1938					
	2288	Wabash Railway,	Chicago Ridge, Ill.,	September 3, 1938					
	2289	Chicago, St. Paul, Minneapolis & Omaha Railway,	Northline, Wis.,	September 9, 1938					
	2290	Chicago, St. Paul, Minneapolis & Omaha Railway,	Valley Junction, Wis.,	September 11, 1938					
	2294	Southern Pacific Railroad,	Tortuga, Calif.,	September 20, 1938					
	2296	New York Central Railroad,	Adams, N.Y.,	September 23, 1938					
	2297	Denver & Salt Lake Railway,	Lowell, Colo.,	September 27, 1938					
	2299	St. Louis-San Francisco Railway,	Columbus, Kans.,	October 10, 1938					
	2301	Chicago & North Western Railway,	Maribel, Wis.,	October 18, 1938					
	2303	Chicago & North Western Railway,	McHenry, Ill.,	October 23, 1938					
	2305	Baltimore & Ohio Railroad,	Trenton, Ohio,	October 31, 1938					
	2306	Chicago, Rock Island & Pacific Railway, and C.B.& Q. RR.,	Council Bluffs, Iowa,	November 6, 1938					
	2307	Boston & Maine Railroad,	Charlemont, Mass.,	November 7, 1938					
	2309	New York Central Railroad and Grand Trunk Western Railroad,	South Bend, Ind.,	November 12, 1938					
	4312	Grand Central Terminal Railroad,	New York, N.Y.,	November 29, 1938					
	2313	Western Pacific Railroad,	Oroville, Calif.,	November 30, 1938					
	2315	Erie Railroad,	Rowells Junction, N.Y.,	December 5, 1938					
	2317	International-Great Northern Railroad, Missouri Pacific Lines,	McNeil, Tex.,	December 8, 1938					
	2318	Baltimore & Ohio Railroad,	Standley, Ohio,	December 10, 1938					
	2321	Chesapeake & Ohio Railway,	Marmet, W. Va.,	December 30, 1938					
	2323	Wabash Railway,	Defiance, Ohio,	January 14, 1939					
	2326	Baltimore & Ohio Railroad,	Broad Ford, Pa.,	December 16, 1938					
	2335	Union Pacific Railroad,	Bosler, Wyo.,	February 24, 1939					
	2340	Minneapolis, St. Paul & Sault Ste. Marie Railway,	Osceola, Wis.,	March 22, 1939					
	2341	Duluth, South Shore & Atlantic Railway,	Michigamme, Mich.,	March 30, 193[illegible]					

74	2238	Pennsylvania Railroad,	Pittsburgh, Pa.,	December 20, 1937			
74	2241	Great Northern Railway,	Monroe, Wash.,	December 28, 1937	82	2392	Great Northern Railway,
75	2245	New York Central Railroad,	Syracuse, N.Y.,	January 19, 1938	82	2397	Chicago & North Western Railway,
75	2248	Minneapolis, St. Paul & Sault Ste. Marie Railway,	Voltaire, N. Dak.,	January 20, 1938	82	2398	Chicago, Milwaukee, St. Paul and Pacific Railroad;
75	2249	Missouri Pacific Railroad,	Cunningham Spur, Ark.,	February 6, 1938	82	2399	Union Pacific Railroad,
75	2250	Mobile & Ohio Railroad,	Murphysboro, Ill.,	February 12, 1938	82	2400	Terminal Railroad Association of St. Louis,
75	2251	Michigan Central Railroad,	Monroe, Mich.,	February 13, 1938	82	2401	Texas and New Orleans Railroad of the Southern Pacific
75	2252	Colorado & Southern Railway,	Folsom, N. Mex.,	February 16, 1938			
75	2253	St. Louis Southwestern Railway,	Roe, Ark.,	February 17, 1938			
75	2254	Missouri Pacific Railroad,	Benton, Ark.,	February 19, 1938			
75	2255	Wabash Railway,	Worth, Ill.,	February 22, 1938			
75	2256	Kansas City Southern Railway,	Spencer, Tex.,	February 23, 1938			
75	2259	Louisville & Nashville Railroad,	Patio, Ky.,	March 10, 1938			
75	2261	Central Railroad of New Jersey,	Sewaren, N.J.,	March 21, 1938			
76	2264	Chicago Great Western Railroad,	Clare, Ill.,	April 3, 1938			
76	2265	New York Central Railroad,	Yonkers, N.Y.,	April 9, 1938			
76	2268	New York Central Railroad,	North Germantown, N.Y.,	April 17, 1938			
76	2271	Chicago Great Western Railroad,	Bolton, Ill.,	May 25, 1938			
76	2272	Pennsylvania Railroad,	Van Wert, Ohio,	May 26, 1938			
76	2273	Boston & Maine Railroad,	East Somerville, Mass.,	May 31, 1938			
76	2275	Missouri Pacific Railroad,	Hematite, Mo.,	June 11, 1938			
76	2278	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Saugus, Mont.,	June 19, 1938			
76	2279	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Ingomar, Mont.,	June 25, 1938			
77	2284	Chesapeake Western Railway,	Laymans, Va.,	July 30, 1938			
77	2285	New York Central Railroad,	Rocky Ridge, Ohio,	July 31, 1938			
77	2287	Wabash Railway,	Huntington, Ind.,	August 13, 1938			
77	2288	Wabash Railway,	Chicago Ridge, Ill.,	September 3, 1938			
77	2289	Chicago, St. Paul, Minneapolis & Omaha Railway,	Northline, Wis.,	September 9, 1938			
77	2290	Chicago, St. Paul, Minneapolis & Omaha Railway,	Valley Junction, Wis.,	September 11, 1938			
77	2294	Southern Pacific Railroad,	Tortuga, Calif.,	September 20, 1938			
77	2296	New York Central Railroad,	Adams, N.Y.,	September 23, 1938			
77	2297	Denver & Salt Lake Railway,	Lowell, Colo.,	September 27, 1938			
78	2299	St. Louis-San Francisco Railway,	Columbus, Kans.,	October 10, 1938			
78	2301	Chicago & North Western Railway,	Maribel, Wis.,	October 18, 1938			
78	2303	Chicago & North Western Railway,	McHenry, Ill.,	October 23, 1938			
78	2305	Baltimore & Ohio Railroad,	Trenton, Ohio,	October 31, 1938			
78	2306	Chicago, Rock Island & Pacific Railway and C.B.& Q. RR.,	Council Bluffs, Iowa,	November 6, 1938			
78	2307	Boston & Maine Railroad,	Charlemont, Mass.,	November 7, 1938			
78	2309	New York Central Railroad and Grand Trunk Western Railroad,	South Bend, Ind.,	November 12, 1938			
78	2312	Grand Central Terminal Railroad,	New York, N.Y.,	November 29, 1938			
78	2313	Western Pacific Railroad,	Oroville, Calif.,	November 30, 1938			
78	2316	Erie Railroad,	Bowells Junction, N.Y.,	December 5, 1938			
78	2317	International-Great Northern Railroad, Missouri Pacific Lines,	McNeil, Tex.,	December 8, 1938			
78	2318	Baltimore & Ohio Railroad,	Standley, Ohio,	December 10, 1938			
78	2321	Chesapeake & Ohio Railway,	Marmet, W. Va.,	December 30, 1938			
79	2323	Wabash Railway,	Defiance, Ohio,	January 14, 1939			
79	2326	Baltimore & Ohio Railroad,	Broad Ford, Pa.,	December 16, 1938			
79	2335	Union Pacific Railroad,	Bosler, Wyo.,	February 24, 1939			
79	2340	Minneapolis, St. Paul & Sault Ste. Marie Railway,	Osceola, Wis.,	March 22, 1939			
79	2341	Duluth, South Shore & Atlantic Railway,	Michigamme, Mich.,	March 30, 1939			
80	2346	Northern Pacific Railway,	Bucoda, Wash.,	April 27, 1939			
80	2352	New York, New Haven & Hartford Railroad,	Newington, Conn.,	May 25, 1939			
80	2355	Chicago, Milwaukee, St. Paul & Pacific Railroad,	Astico, Wis.,	May 26, 1939			
80	2356	Missouri-Kansas-Texas Railroad,	Rhineland, Mo.,	May 27, 1939			
80	2357	Pennsylvania Railroad,	Harrison, N.J.,	June 2, 1939			
80	2359	Texas and Pacific Railway,	Ranger, Tex.,	June 3, 1939			
80	2362	Cleveland, Cincinnati, Chicago & St. Louis Railway,	Shelbyville, Ind.,	June 5, 1939			
80	2363	Great Northern Railway,	Walker, Minn.,	June 6, 1939			
80	2364	Union Pacific Railroad,	Rigby, Idaho,	June 17, 1939			
81	2370	Missouri Pacific Railroad,	Chester, Ill.,	July 13, 1939			
81	2371	Atchison, Topeka & Santa Fe Railway,	Coconino, Ariz.,	July 27, 1939			
81	2373	St. Louis-San Francisco Railway,	Pickensville, Ala.,	August 10, 1939			
81	2374	Denver and Rio Grande Western Railroad and the Atchison, Topeka & Santa Fe Railway-Colorado and Southern Railway,	South Denver, Colo.,	August 12, 1939			
81	2375	Southern Pacific Railroad,	Harney, Nev.,	August 12, 1939			

SOUTHERN PACIFIC COMPANY (Pacific Lines)

	YEAR	TOTAL LOCOMOTIVE MILES (THOUSANDS)	TRAIN & TRAIN SERVICE ACCIDENTS CASUALTIES TO EMPLOYES ON DUTY			TOTAL CASUALTIES PER MILLION LOCOMOTIVE MILES
			KILLED	INJURED	TOTAL	
	(a)	(b)	(c)	(d)	(e)	(f)
(1)	1923	51 136	36	770	806	15.76
(2)	1924	47 898	37	586	623	13.01
(3)	1925	53 856	25	631	656	12.18
(4)	1926	58 090	30	543	573	9.86
(5)	1927	54 197	24	490	514	9.48
(6)	1928	54 500	24	507	531	9.72
(7)	Total 1923-28	319 677	176	3 527	3 703	Average 11.58
(8)	1929	57 643	26	544	570	9.89
(9)	1930	51 367	15	360	375	7.30
(10)	1931	43 305	13	307	320	7.39
(11)	1932	36 699	11	228	239	6.51
(12)	1933	32 851	13	221	234	7.12
(13)	1934	36 646	10	243	253	6.90
(14)	Total 1929-34	258 511	88	1 903	1 991	Average 7.70
(15)	1935	39 206	23	294	317	8.09
(16)	1936	48 627	14	420	434	8.93
(17)	1937	53 438	23	494	517	9.67
(18)	1938	44 954	16	333	349	7.76
(19)	1939	45 299	29	315	344	7.59
(20)	Total 1935-39	231,524	105	1 856	1 961	Average 8.47
(21)	Period 1929-34 Compared with period 1923-28			-	Decrease	33.51%
(22)	Period 1935-39 Compared with period 1929-34			-	Increase	10.00%
(23)	Period 1935-39 Compared with period 1923-28			-	Decrease	26.86%

SOURCE: I.C.C. Annual Accident Bulletins; Column (b), Table 101 for years 1923 and 1924; Table 97 for subsequent years. Columns (c) and (d); Tables 99.

Pacific Lines, as of December 31, 1938, included 8,706 miles of road operated in States of Nevada, Utah, California, Oregon, Arizona, Texas and New Mexico.

3819

Defendant's Exhibit No. 273 (Witness J.J. Sullivan)
Feb. 5, 1941

CASUALTIES TO TRAINMEN ON DUTY,
ALL CLASSES OF SERVICE
SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS
REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 - 1939, INCLUSIVE

SOUTHERN PACIFIC COMPANY (Pacific Lines)

	YEAR	TOTAL LOCOMOTIVE MILES RUN (THOUSANDS)	TOTAL MAN-HOURS WORKED BY TRAINMEN (THOUSANDS)	TOTAL CAR MILES (THOUSANDS)	TRAIN & TRAIN SERVICE ACCIDENTS CASUALTIES TO TRAINMEN ON DUTY			TOTAL CASUALTIES		
					KILLED	INJURED	TOTAL	PER MILLION LOCOMOTIVE MILES	PER MILLION MAN-HOURS WORKED	PER 100 MILLION CAR MILES
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
(1)	1923	51 136	25 055	875 630	16	643	659	12.89	26.30	75.26
(2)	1924	47 898	22 999	863 041	19	494	513	10.71	22.31	59.44
(3)	1925	53 856	25 148	1 025 175	10	504	514	9.54	20.44	50.14
(4)	1926	58 090	25 036	1 065 357	17	443	460	7.92	18.37	43.18
(5)	1927	54 197	24 333	1 097 094	14	417	431	7.95	17.71	39.29
(6)	1928	54 500	24 333	1 149 310	10	441	451	8.27	18.53	39.24
(7)	Total 1923-28	319 677	146 904	6 075 607	86	2 942	3 028	Average 9.47	Average 20.61	Average 49.84
(8)	1929	57 643	24 725	1 178 259	14	458	472	8.19	19.09	40.06
(9)	1930	51 367	20 896	1 056 223	7	316	323	6.29	15.46	30.58
(10)	1931	43 365	16 820	875 928	9	259	268	6.19	15.93	30.60
(11)	1932	36 699	13 713	736 769	9	201	210	5.72	15.31	28.50
(12)	1933	32 851	12 422	686 507	10	195	205	6.24	16.50	29.86
(13)	1934	36 646	14 173	809 766	7	218	225	6.14	15.88	27.79
(14)	Total 1929-34	258 511	102 749	5 343 452	56	1 647	1 703	Average 6.59	Average 16.57	Average 31.87
(15)	1935	39 206	15 267	887 536	9	244	255	6.45	16.57	28.51
(16)	1936	48 627	19 214	1 071 541	10	357	367	7.55	19.10	34.25
(17)	1937	53 438	21 519	1 171 350	17	424	442	8.27	20.54	37.73
(18)	1938	45 014	17 999	1 021 947	10	291	301	6.70	16.86	29.45
(19)	1939	45 299	18 301	1 113 826	11	249	260	5.74	14.21	23.34
(20)	Total 1935-39	231 524	92 156	5 266 220	58	1 565	1 623	Average 7.01	Average 17.61	Average 30.82
(21)	Period 1929-34 compared with period 1923-28 - Decrease							30.41%	19.60%	36.06%
(22)	Period 1935-39 compared with period 1929-34 - Decrease							6.37%	6.28%	3.29%
(23)	Period 1935-39 compared with period 1923-28 - Decrease							25.98%	14.56%	38.16%

	YEAR	LOCOMOTIVE MILES RUN (THOUSANDS)	MAN-HOURS WORKED BY TRAINMEN (THOUSANDS)	TOTAL CAR MILES (THOUSANDS)	TRAIN & TRAIN SERVICE ACCIDENTS CASUALTIES TO TRAINMEN ON DUTY			TOTAL CASUALTIES		
					KILLED	INJURED	TOTAL	PER MILLION LOCOMOTIVE MILES	PER MILLION MAN-HOURS WORKED	PER 100 MILLION CAR MILES
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
(1)	1923	51 136	25 055	875 630	16	643	659	12.89	26.30	75.26
(2)	1924	47 898	22 999	863 041	19	494	513	10.71	22.31	59.44
(3)	1925	53 856	25 148	1 025 175	10	504	514	9.54	20.44	50.14
(4)	1926	58 090	25 036	1 065 357	17	443	460	7.92	18.37	43.18
(5)	1927	54 197	24 333	1 097 094	14	417	431	7.95	17.71	39.29
(6)	1928	54 500	24 333	1 149 310	10	441	451	8.27	18.53	39.24
(7)	Total 1923-28	319 677	146 904	6 075 607	86	2 942	3 028	Average 9.47	Average 20.61	Average 49.84
(8)	1929	57 643	24 725	1 178 259	14	458	472	8.19	19.09	40.06
(9)	1930	51 367	20 896	1 056 223	7	316	323	6.29	15.46	30.58
(10)	1931	43 305	16 820	875 928	9	259	268	6.19	15.93	30.60
(11)	1932	36 699	13 713	736 769	9	201	210	5.72	15.31	28.50
(12)	1933	32 851	12 422	686 507	10	195	205	6.24	16.50	29.86
(13)	1934	36 646	14 173	809 766	7	218	225	6.14	15.88	27.79
(14)	Total 1929-34	258 511	102 749	5 343 452	56	1 647	1 703	Average 6.59	Average 16.57	Average 31.87
(15)	1935	39 206	15 267	887 536	9	244	253	6.45	16.57	28.51
(16)	1936	48 627	19 214	1 071 541	10	357	367	7.55	19.10	34.25
(17)	1937	53 438	21 519	1 171 350	18	424	442	8.27	20.54	37.73
(18)	1938	44 914	17 959	1 021 967	10	291	301	6.70	16.86	29.45
(19)	1939	45 299	18 301	1 113 826	11	249	260	5.74	14.21	23.34
(20)	Total 1935-39	231 524	92 156	5 266 220	58	1 565	1 623	Average 7:01	Average 17.61	Average 30.82
(21)	Period 1929-34 compared with period 1923-28 - Decrease							30.41%	19.60%	36.06%
(22)	Period 1935-39 compared with period 1929-34 - Decrease							ø 6.37%	ø 6.28%	3.29%
(23)	Period 1935-39 compared with period 1923-28 - Decrease							25.98%	14.56%	38.16%

NOTE: The term "trainmen," includes engineers and motormen, firemen and helpers, conductors, brakemen, and flagmen engaged in passenger, freight, yard, or work service; also train baggagemen, but not hostlers. (Page 122, I.C.C. Accident Bulletin No. 108 and prior).

SOURCE: I.C.C. Annual Accident Bulletins; column (b), table 101 for the years 1923 and 1924; table 97 for later years, columns (c), (e) and (f) table 99, except column (c) for year 1923 obtained from Interstate Commerce Commission's Form B. Column (d) I.C.C. Statistics of Railways in the United States.

Pacific Lines, as of December 31, 1938, included 8,706 miles of road operated in the States of Nevada, Utah, California, Oregon, Arizona Texas and New Mexico.

ø - Increase

33550

Defendant's Exhibit No. 274 (Witness J.J. Sullivan)

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

DETAIL OF CASUALTIES TO ALL CLASSES OF EMPLOYES ON DUTY, SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS,
ROAD FREIGHT TRAIN OPERATION
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939 INCLUSIVE

STATE OF ARIZONA

ITEM NO.	DATE (1)	LOCATION (2)	I.C.C. CLASS (3)	TRAIN NUMBER (4)	NO. CARS IN TRAIN (5)	SPEED M.P.H. (6)	PERSON INJURED NAME (7)	PERSON INJURED OCCUPATION (8)	ESTIMATED DISABILITY (Days) (9)	DESCRIPTION OF ACCIDENT (10)
	1923						YEAR 1923			
(1)	1-1	Yuma	S-g	2-266	46	15	W.W.Pettis	Conductor	30	Stepped on rock getting off engine.
(2)	1-2	Tully	S-g	L-3660-W	57	3	C.H.Sellars	Conductor	7	Fell when defective hand hold came loose
(3)	1-8	Gila	S-e	2-426	58	2	C.E.Jacobs	Brakeman	30	Shoved drawbar over with foot, coupling engine to caboose.
(4)	1-20	Stockham	D-4	L-3639-W	58	8	H.A.Miller	Fireman	25	Engine derailed at switch.
(5)	1-24	Yuma	S-j	L-2820-W	57	Standing	T.Heath	Conductor	20	Fell and struck head on some part of train equipment.
(6)	1-28	Tucson	FS-j	L-2797-W	69	4	T.A.Tinney H.R.Rutledge	Conductor Brakeman	8 13	Train parted due to some one stepping on cutting lever caus rough stop of train.
(7)	2-5	Wellton	S-g	1-426	58	22	M.J.Hennessy	Investigator	4	Attempting board caboose, struck derail stand.
(8)	3-4	San Simon	S-g	L-3654-W	67	Standing	B.F.Oliver	Brakeman	14	Fell from bridge when detraining from train.
(9)	3-10	Ethyl	S-g	3-412	66	Standing	F.S.Thomas	Brakeman	5	Fell passing over between cars in train.
(10)	3-13	Rankin	S-j	L-3669-W	66	25	J.Broome	Trk.walker	13	Struck by pipe in passing train.
(11)	3-24	Morales	FS-j	482	41	Standing	O.C.Boone	Brakeman	30	Lost balance and fell from top of caboose to ground.
(12)	3-26	Estrella	FS-j	L-2547-W	70	12	L.Bean	B&B Cook	14	Undesired emergency caused rough stop of train.
(13)	3-26	Bowie	S-e	L-3659-W	66	25	D.I.Robinson	Fireman	5	Sand in eye, standing out engine.
(14)	4-11	Ethyl	S-j	L-3660-W	53	Standing	P.H.Holden	Spec.Officer	14	Shot by negro trespasser.
(15)	4-12	Aztec	FS-j	L-2822-W	53	5	D.D.White	Brakeman	10	Slack run in as train was being brought to a stop, injuring brakeman in cab.
(16)	4-29	Aztec	FS-j	1-412	68	6	R.L.Hutton	Brakeman	6	Undesired emergency as train was being brought to a stop, injured brakeman in caboose.
(17)	5-1	Benton	S-j	L-2739-W	67	20	J.H.Hamilton	Brakeman	4	Flying particle of metal in eye.
(18)	5-6	Yuma	S-e	2-426	55	Standing	J.F.Hundy	Brakeman	7	Struck on chest when switch handle flew up.
(19)	5-23	Stockham	S-j	L-2752-W	68	Standing	R.T.Burr	Brakeman	4	Strained ligament in leg while running.
(20)	6-14	Tucson	S-e	1-422	67	Standing	L.J.Murphree	Engineer	16	Swinging through cab window to ground.
(21)	6-26	Maricopa	S-e	L-2595-W	65	35	A.M.Isaacs	Fireman	6	Burned by escaping steam from squirt hose.
(22)	6-28	Tully	FS-j	L-3649-W	58	25	J.Hunker	Brakeman	7	Undesired emergency caused sudden stop and injury to brakeman in caboose.
(23)	7-5	Lenchs	S-e	L-3252-W	49	30	J.Weigel	Engineer	7	Foreign particle in eye.
(24)	7-7	Xavier	S-d	L-2752-W	12	2	C.J.Broyles	Brakeman	7	Slipped and fell while setting hand brake.
(25)	7-7	Ben	S-j	2-92	41	5	A.E.Andrews	Brakeman	20	Struck by piece of lumber shifting on car.
(26)	7-10	Patio	C-b	L-2583-W	47	3	P.Morales	Car repr.	3	Train collided with cut of standing cars. Injured man riding on top of train and caught in wreckage.
(27)	7-13	Casa Grande	S-g	2-244	54	10	H.E.Tudor	Brakeman	20	Fell attempting to board train.
(28)	7-23	Bowie	FS-j	L-3635-W	63	6	E.Burns	Water serv. foreman	21	Rough stop threw injured man against stove in outfit car.

(4)	1-20	Stockham	B-4	L-3639-W	58	8	H.A.Miller	Fireman	25	Engine derailed at switch.
(5)	1-24	Tyee	S-j	L-3820-W	57	Standing	T.Smith	Conductor	20	Fell and struck head on some part of train equipment.
(6)	1-28	Tucson	FS-j	L-2794-W	69	"	T.A.Tinney H.R.Rutledge	Conductor Brakeman	8 13	Train parted due to some one stepping on setting lever caused rough stop of train.
(7)	2-5	Wellton	S-g	1-426	58	22	H.J.Hennessy	Investigator	4	Attempting board caboose, struck derail stand.
(8)	3-4	San Simon	S-g	L-3654-W	67	Standing	B.F.Oliver	Brakeman	14	Fell from bridge when detraining from train.
(9)	3-10	Sibyl	S-g	3-412	66	Standing	F.S.Thomas	Brakeman	5	Fell passing over between cars in train.
(10)	3-13	Ruthin	S-j	L-3665-W	66	25	J.Broome	Trimmer	13	Struck by pipe in passing train.
(11)	3-24	Markleo	FS-j	482	41	Standing	G.C.Boone	Brakeman	30	Lost balance and fell from top of caboose to ground.
(12)	3-26	Estrella	FS-j	L-2541-W	70	12	L.Dunn	R&B Cook	14	Undesired emergency caused rough stop of train.
(13)	3-26	Bowie	S-c	L-2639-W	66	25	D.I.Robinson	Fireman	5	Sand in eye, causing out engine.
(14)	4-11	Sybil	S-j	L-3660-W	53	Standing	P.H.Holden	Spec.Officer	14	Shot by negro trespasser.
(15)	4-12	Artec	FS-j	L-2822-W	53	5	D.D.White	Brakeman	10	Slack run in as train was being brought to a stop, injuring brakeman in cab.
(16)	4-29	Artec	FS-j	1-412	68	6	R.L.Estine	Brakeman	6	Undesired emergency as train was being brought to a stop, injured brakeman in caboose.
(17)	5-1	Hunton	S-j	L-2739-W	67	20	J.H.Hamilton	Brakeman	4	Flying particle of metal in eye.
(18)	5-6	Tacna	S-c	2-426	55	Standing	J.F.Hundy	Brakeman	7	Struck on chest when switch handle flew up.
(19)	5-23	Stockham	S-j	L-2752-W	68	Standing	R.T.Burr	Brakeman	4	Strained ligament in leg while running.
(20)	6-14	Tucson	S-c	1-422	67	Standing	L.J.Murphree	Engineer	16	Swinging through cab window to ground.
(21)	6-26	Marana	S-c	L-2595-W	65	35	A.H.Inanes	Fireman	6	Burned by escaping steam from squirt hose.
(22)	6-28	Tully	FS-j	L-3647-W	58	25	J.Hunter	Brakeman	7	Undesired emergency caused sudden stop and injury to brakeman in caboose.
(23)	7-5	Lanchu	S-c	L-3252-W	49	30	J.Weigel	Engineer	7	Foreign particle in eye.
(24)	7-7	Xavier	S-d	L-2752-W	12	2	C.J.Broyles	Brakeman	7	Slipped and fell while setting hand brake.
(25)	7-7	Box	S-j	2-92	41	5	A.E.Andrews	Brakeman	20	Struck by piece of lumber shifting on car.
(26)	7-10	Patio	C-b	L-2583-W	47	3	P.Rosales	Car repr.	3	Train collided with end of standing cars. Injured man riding on top of train and caught in wreckage.
(27)	7-13	Casa Grande	S-g	3-244	54	10	H.E.Tudor	Brakeman	20	Fell attempting to board train.
(28)	7-23	Bowie	FS-j	L-3615-W	63	6	E.Burns	Water serv. foreman	21	Rough stop threw injured man against stove in outfit car.
(29)	8-1	Piedra	S-g	L-2757-W	62	8	H.W.Lemon	Conductor	21	Ankle broken getting off caboose.
(30)	8-21	Tucson	S-d	244	69	Standing	L.L.Darnell	Brakeman	20	Fell from car while releasing hand brake.
(31)	9-17	Araby	S-j	L-2782-W	67	10	D.B.Ross	Brakeman	7	Sand in eye.
(32)	9-20	Bowie	S-j	92	57	25	C.J.Broyles	Brakeman	6	Sand in eye.
(33)	9-24	Lava	FS-j	92	48	20	A.J.Young	Brakeman	20	Slack action caused brakeman to fall while walking over train.
(34)	10-3	Marana	S-j	L-2774-W	67	Standing	W.B.Williams	Brakeman	21	Strained back while lifting a hot box cooler.
(35)	10-14	Dragoon	S-g	244	62	Standing	O.M.Barringer	Brakeman	14	Stepped off bridge when getting off car.
(36)	10-16	Stanwix	FS-j	L-2724-W	62	4	D.A.Quinn	Brakeman	4	Undesired emergency caused sudden stop, injured brakeman in caboose.
(37)	11-19	Irene	S-g	92	62	Standing	E.L.Hale	Brakeman	12	Lost hand hold and fell down embankment.
(38)	11-19	Stanwix	S-g	1-92	50	12	H.C.Richardson	Brakeman	7	Slipped and fell to ground attempting to get on train.
(39)	11-23	Vamar	S-j	L-3641-W	51	20	R.R.Troutman	Brakeman	20	Slipped and fell walking over top of train.
(40)	11-26	Dragoon	S-g	1-412	56	5 to 6	A.C.Knowles	Brakeman	10	Stepped off trestle getting off car in train.
(41)	12-2	Bowie	-g	L-3647-W	66	10	D.L.Agnew,	Brakeman	5	Struck knee getting on the train.
(42)	12-23	Benson	-j	244	61	Standing	C.J.Franklin	Brakeman	20	Slipped and fell, stepping from one car to another.

A = caused from sudden stopping, starting, lurch, or jerk of car or train.

ITEM NO.	DATE (1)	LOCATION (2)	I.C.C. CLASS (3)	TRAIN NUMBER (4)	NO. CARS IN TRAIN (5)	SPEED M.P.H. (6)	PERSON INJURED NAME (7)	PERSON INJURED OCCUPATION (8)	ESTIMATED DISABILITY (Days) (9)	DESCRIPTION OF ACCIDENT (10)
	1924						YEAR 1924			
(43)	1-3	Pantano	FS-j	X-3665-W	65	2 to 3	J.W.Wonner	Conductor	20	Undesired emergency caused sudden stop and injury to conductor in caboose.
(44)	1-20	Maricopa	S-j	X-2851-W	65	6 to 8	G.W.White	Brakeman	30	Fell from pilot of engine.
(45)	1-21	Patio	S-g	2-412	55	10	R.L.Shield	Brakeman	12	Foot slipped attempting to board train.
(46)	1-29	Wymola	S-j	244	50	15	C.W.McCorkle	Brakeman	20	Ties in car rolled and caught brakeman.
(47)	1-31	Casa Grande	S-j	1-412	66	10	H.Showers	Brakeman	4	Stepped in hole or low spot along track.
(48)	2-9	Continental	S-j	482	20	30	L.Y.Pironi	Brakeman	30	Hot sand in eye.
(49)	2-10	San Simon	S-g	X-3667-W	61	Standing	B.E.Hunt	Brakeman	7	Sprained ankle getting off car.
(50)	2-27	Alrich	S-g	X-3647-W	67	Standing	D.S.Bull	Brakeman	30	Slipped and fell from car while getting off.
(51)	3-1	Dome	FS-j	X-2686-W	64	8	G.C.Davis	Brakeman	9	Run-in of slack as train was stopping injured brakeman in caboose.
(52)	3-4	Patagoni	S-g	483	4	5	H.M.Wilkins	Brakeman	13	Foot slipped on ladder while getting off car.
(53)	4-3	Pembroke	S-j	3-412	50	2	O.H.Clayton	Conductor	6	Slipped and strained tendon in leg while walking.
(54)	4-4	Karro	S-i	X-3728-W	64	10	R.E.Simmons	Brakeman	Permanent	Fell under train while bleeding brake cylinder on car.
(55)	4-20	Willcox	S-j	X-3237-W	39	Standing	C.H.Sollars	Conductor	15	Stepped on protruding nail.
(56)	4-23	Theba	FS-d	X-2598-W	64	6	C.C.Easterling	Brakeman	10	Thrown against end of car and brake wheel while setting hand brake, when car he was riding struck another cut of cars.
(57)	5-15	Dragoon	S-c	2-412	64	Standing	J.G.Blaise	Fireman	30	Fell from trestle getting off engine.
(58)	5-25	Polvo	FS-j	X-3638-W	53	25	E.J.Durnil	Conductor	9	Undesired emergency caused sudden stop and injury to conductor in caboose.
(59)	5-28	Lusena	S-g	1-412	65	8 to 12	B.W.Edwards	Conductor	20	Foot slipped on ballast getting on moving train.
(60)	6-18	Maricopa	FS-j	X-2557-W	66	6	C.M.Pilcher	Brakeman	14	Run in of slack as train was stopping injured brakeman in caboose.
(61)	6-18	Estrella	FS-j	1-244	67	4	J.M.Wonner	Conductor	14	Thrown against end of caboose when caboose made rough coupling to train.
(62)	6-27	Mohawk	S-g	X-2826-W	66	1	R.L.Shields	Brakeman	Died	Fell from bridge to ground when getting off train.
(63)	7-18	Lava	S-j	2-426	47	7 to 8	M.M.McBoon	Brakeman	20	Caught foot between draw bar and deadwood.
(64)	7-20	Tucson	S-d	X-2725-W	67	Standing	V.B.Hendry	Brakeman	20	Fell from car while releasing hand brake.
(65)	7-23	Benson	S-j	244	59	10	G.M.Barringer	Brakeman	5	Flying particle of steel in eye.
(66)	9-10	Tubac	S-j	X-2942-W	60	4	J.H.Hamilton	Brakeman	8	Stepped in hole while bleeding brake cylinder on car.
(67)	9-26	Willcox	S-c	X-3657-W	48	Standing	R.C.Wiggins	Fireman	20	Lost balance and fell from engine tender while taking water.
(68)	9-29	Lusena	S-g	X-3658-W	49	Standing	C.A.Binkley	Brakeman	20	Fell from trestle while getting off train.
(69)	10-6	Benson	S-j	X-3753-W	64	8	J.H.Hamilton	Brakeman	11	Stepped on piece of ballast and turned ankle.
(70)	10-21	Pantano	S-c	412	63	Standing	R.V.Culley	Fireman	18	Slipped on top of engine tender.
(71)	11-30	Gila	S-j	X-2791-W	62	Standing	H.H.Hanemire	Brakeman	12	Struck by pole while unloading cattle from car.
(72)	12-7	Chemise	S-j	244	47	20 to 25	W.F.Groth	Brakeman	40	Fell from moving train due to hand hold pulling loose.
(73)	12-13	Safford	S-j	X-670-E	28	25	J.M.Dorsey	Brakeman	21	Slipped and fell on gondola car.
(74)	12-14	Dome	S-j	1-412	38	10	F.E.Coleman	Brakeman	15	Foot slipped off ladder on car.
(75)	12-16	Cortaro	S-c	2-412	60	20	R.J.Hudis	Fireman	22	Scalded by hot water escaping from squirt hose.
(76)	12-16	Tempe	S-g	54	65	Standing	F.B.Able	Brakeman	12	Stepped on stake driven into ground when getting off caboose.
	1925						YEAR 1925			

(54)	4-4	Marre	S-f	X-3728-W	64	10	R.E.Simmons	Brakeman	Permanent	Fell under train while bleeding brake cylinder on car.
(55)	4-20	Willcox	S-j	X-3233-W	39	Standing	C.H.Sellars	Conductor	15	Stepped on protruding nail.
(56)	4-23	Theba	S-d	X-2598-W	64	6	C.C.Easterling	Brakeman	10	Thrown against end of car and brake wheel while setting hand brake, when car he was riding struck another cut of cars.
(57)	5-15	Dragoon	S-c	2-412	64	Standing	J.G.Blaise	Fireman	30	Fell from trestle getting off engine.
(58)	5-25	Palve	S-j	X-3638-W	53	25	E.J.Durnil	Conductor	9	Undesired emergency caused a sudden stop and injury to conductor in caboose.
(59)	5-28	Laguna	S-g	1-412	65	8 to 12	B.W.Edwards	Conductor	20	Foot slipped on ballast getting on moving train.
(60)	6-18	Maricopa	S-j	X-2557-W	66	6	C.H.Pilcher	Brakeman	14	Run in of slack as train was stopping injured brakeman in caboose.
(61)	6-18	Estrella	S-j	1-244	67	4	J.M.Wonmer	Conductor	14	Thrown against end of caboose when caboose made rough coupling to train.
(62)	6-27	Mohawk	S-g	X-2326-W	66	1	R.L.Shields	Brakeman	Died	Fell from bridge to ground when getting off train.
(63)	7-18	Lava	S-j	2-426	47	7 to 8	H.H.McBeen	Brakeman	20	Caught foot between draw bar and deadwood.
(64)	7-20	Tucson	S-d	X-2725-W	67	Standing	V.B.Hendry	Brakeman	20	Fell from car while releasing hand brake.
(65)	7-23	Benson	S-j	244	59	10	G.M.Barringer	Brakeman	5	Flying particle of steel in eye.
(66)	9-10	Tuba	S-j	X-2942-W	60	4	J.H.Hamilton	Brakeman	8	Stepped in hole while bleeding brake cylinder on car.
(67)	9-26	Willcox	S-c	X-3657-W	48	Standing	R.C.Wiggins	Fireman	20	Lost balance and fell from engine tender while taking water.
(68)	9-29	Laguna	S-g	X-3658-W	49	Standing	C.A.Binkley	Brakeman	20	Fell from trestle while getting off train.
(69)	10-6	Benson	S-j	X-3753-W	64	8	J.H.Hamilton	Brakeman	11	Stepped on piece of ballast and turned ankle.
(70)	10-21	Pantano	S-c	412	63	Standing	R.V.Culley	Fireman	18	Slipped on top of engine tender.
(71)	11-30	Gila	S-j	X-2791-W	62	Standing	H.H.Hammire	Brakeman	12	Struck by pole while unloading cattle from car.
(72)	12-7	Chemise	S-j	244	47	20 to 25	W.F.Groth	Brakeman	40	Fell from moving train due to hand hold pulling loose.
(73)	12-13	Safford	S-j	X-670-E	28	25	J.M.Dorsey	Brakeman	21	Slipped and fell on gondola car.
(74)	12-14	Dome	S-j	1-412	38	10	F.E.Coleman	Brakeman	15	Foot slipped off ladder on car.
(75)	12-16	Cortaro	S-c	2-412	60	20	R.J.Hudis	Fireman	22	Scalded by hot water escaping from squirt hose.
(76)	12-16	Tempe	S-g	54	65	Standing	F.B.Able	Brakeman	12	Stepped on stake driven into ground when getting off caboose.
	1925					YEAR 1925				
(77)	1-1	Maricopa	S-j	X-2594-W	64	3	F.E.Martin	Brakeman	Permanent	Fell from moving car and run over when cars coupled to others.
(78)	1-2	Don Luis	S-d	X-288-W	70	2	W.A.Kidd	Brakeman	6	Struck by brake club when releasing hand brake.
(79)	1-3	Gila	S-j	X-2556-W	67	15	E.Perry	Brakeman	4	Thrown down on top of cars when hard coupling made.
(80)	1-20	Tucson	S-d	X-2559-W	70	Standing	P.H.Arnold	Brakeman	3	Fell from car while releasing hand brake.
(81)	1-30	Maricopa	S-c	X-2723-W	67	Standing	E.J.Roberts	Fireman	14	Slipped and fell from top of engine tender.
(82)	1-30	Sentinel	S-j	X-2812-W	61	3	R.B.Miller	Brakeman	4	Sprained ankle walking alongside train bleeding brake cylinder on car.
(83)	2-14	Dragoon	S-d	X-36 -W	3	4	H.M.Martin	Brakeman	4	Struck by brake handle releasing hand brake.
(84)	2-19	Bowie	S-j	X-2899-E	3	Standing	T.Crow	Brakeman	10	Fell between while stepping from one car to another.
(85)	2-27	Tucson	S-d	1-46	48	1	R.Bell	Brakeman	30	Sudden start of train while setting hand brake on car, threw brakeman down on car.
(86)	3-21	Bsell	S-g	X-3615-W	68	10	C.T.Palmer	Brakeman	30	Thrown to ground while trying to catch caboose.
(87)	3-21	Bowie	S-g	2-426	58	6 to 8	H.L.Hack H.Bsell	Brakeman Brakeman	5 10	Train entering siding, collided with standing cut of cars.
(88)	3-28	Asher	S-j	1-412	62	25	R.B.Miller	Brakeman	10	Slipped and fell from moving train.
(89)	4-2	Red Rock	S-c	2-92	57	Standing	R.Lyle	Engineer	30	Caught finger in air sander valve.
(90)	4-12	Alrich	S-j	1-412	64	30	R.R.Blanton	Brakeman	30	Undesired emergency caused sudden stop and threw brakeman against locker in caboose.
(91)	4-13	Coledon	S-j	X-2757-W	58	4	F.E.Pierce	Brakeman	4	Fell from culvert.

P = caused from sudden stopping, starting, lurch, or jerk of car or train.

ITEM NO.	DATE (1)	LOCATION (2)	I.C.C. CLASS (3)	TRAIN NUMBER (4)	NO. CARS IN TRAIN (5)	SPEED M.P.H. (6)	PERSON INJURED NAME (7)	PERSON INJURED OCCUPATION (8)	ESTIMATED DISABILITY (Days) (9)	DESCRIPTION OF ACCIDENT (10)
	1925						YEAR 1925 (CONTINUED)			
(92)	4-24	San Simon	S-j	2-412	66	Standing	O.O.Hutcheson	Brakeman	7	Stepped in shallow ditch and fell.
(93)	4-30	Gila	S-g	92	50	6	G.J.Gullander	Brakeman	4	Turned ankle on piece of ballast while getting off car.
(94)	5-2	Gilbert	S-j	127	20	2	F.N.Peterson	Car repr.	7	Blocks shifted on flat car and caught fingers.
(95)	5-19	Hayden Jct.	S-j	X-3277-W	8	Standing	O.R.Rich	Brakeman	8	Dumped into ore bin.
(96)	5-23	Pinal	S-g	X-669-W	13	1	G.C.Dial	Conductor	15	Stepped on rock and fell getting off caboose.
(97)	6-7	Pembroke	FS-j	X-2836-W	68	18	R.F.Allen	Brakeman	18	Undesired emergency caused sudden stop and brakeman falling between cars.
(98)	6-9	Gila	S-j	X-3639-W	66	Unknown	J.H.Hamilton	Brakeman	30	Foreign particle in eye.
(99)	6-10	Gila	S-j	X-2702-W	66	Standing	E.R.Findley	Brakeman	6	Failed to take proper hold and fell out of cupola.
(100)	6-12	Carador	S-g	X-3448-W	31	12 to 15	H.Tipton	Brakeman	Permanent	Fell under car while attempting to board train.
(101)	6-13	Buell	S-g	X-3492-W	64	20	H.G.Stephenson	Brakeman	10	Slipped on sand box of engine.
(102)	6-13	Benson	S-g	2-244	66	10	W.A.Garrison	Brakeman	5	Fell when getting off moving train, to close switch.
(103)	6-14	Bowie	FS-j	X-3645-W	57	11	J.W.Kane	Brakeman	11	Undesired emergency caused sudden stop throwing brakeman against end of caboose.
(104)	6-21	Bowie	S-j	1-426	64	30	H.V.Irion	Brakeman	7	Sand in eye.
(105)	7-2	Fenner	S-j	X-3683-W	64	15	C.C.Pennington	Brakeman	4	Slipped and fell on engine tender.
(106)	7-3	Piedra	S-j	X-2725-W	66	Standi	J.H.Giles	Brakeman	7	Ice plug dropped on foot.
(107)	7-19	Patio	S-j	4-412	62	Standing	B.E.Jenkins	Brakeman	30	Ice platform apron dropped on finger.
(108)	7-20	Curve	FS-j	426	70	12	G.C.Mann	Brakeman	12	Yoke rivets sheared off first car from engine causing break-in-two.
(109)	7-23	Piedra	D-e	626	54	32	W.J.Woodmansee	Engineer	10	Derailed car injured engineer of work train in siding.
(110)	8-1	Red Rock	S-j	X-2851-W	54	4	S.W.Shockley	Brakeman	8	Turned ankle on ballast, running to catch caboose.
(111)	8-4	Tartron	S-e	1-412	63	20	R.Lyle	Engineer	17	Scalded by hot water from squirt hose.
(112)	8-17	Hereford	FS-j	X-3306-W	70	8	C.C.Pennington	Brakeman	30	Broke bone in hand ejecting trespasser.
(113)	8-25	Cholla	S-j	X-3667-W	63	4	M.J.Bell	Brakeman	7	Sprained ankle running for switch.
(114)	8-26	Stockham	FS-j	X-2728-W	67	8 to 10	J.R.West	Brakeman	10	Rough stop caused by break-in-two due to trespasser stepping on cutting lever injured brakeman in caboose.
(115)	8-28	Mescal	S-j	X-3314-W	70	20	B.F.Rinkleib	Fireman	20	Caught finger between clinker hook and anchor bar.
(116)	9-16	Sibyl	S-j	418	40	Standing	J.McLaughlin	Brakeman	7	Strained back loading freight in car.
(117)	9-27	Certaro	S-j	3-412	57	25	T.Hart	Brakeman	15	Hot sand in eye.
(118)	10-13	Bowie	S-j	X-3661-W	68	30	W.L.Slack	Brakeman	5	Foreign particle in eye.
(119)	10-25	Carador	S-e	7	28	21	H.A.Huddleston	Engineer	21	Cut off finger trying to replace grease cup in stoker conveyor.
(120)	11-1	Mescal-Benson	S-j	X-3658-W	None	30	C.M.Warble	Brakeman	4	Foreign substance in eye.
(121)	11-2	Cutter	S-j	X-2760-E	40	15	H.B.Elledge	Engineer	5	Sand in eye.
(122)	11-6	Gila	S-g	X-3660-W	65	8	G.M.Barringer	Brakeman	14	Slipped getting on engine.
(123)	11-14	Douglas	FS-j	X-3255-W	61	4	A.A.Crenshaw	Brakeman	15	Undesired emergency threw brakeman to floor of caboose.

(101)	6-13	Buell	S-g	X-3492-W	64	20	H.G.Stephenson	Brakeman	10	Slipped on sand box of engine.
(102)	6-13	Benson	S-g	2-244	66	10	W.A.Garrison	Brakeman	5	Fell when getting off moving train, to close switch.
(103)	6-14	Bowie	#S-j	X-3665-W	57	11	J.B.Kane	Brakeman	11	Undesired e mergency caused sudden stop throwing brakeman against end of caboose.
(104)	6-21	Bowie	S-j	1-426	64	30	H.V.Irion	Brakeman	7	Sand in eye.
(105)	7-2	Fenner	S-j	X-3683-W	64	15	C.C.Pennington	Brakeman	4	Slipped and fell on engine tender.
(106)	7-3	Piedra	S-j	X-2725-W	66	Standi ;	J.H.Giles	Brakeman	7	Ice plug dropped on foot.
(107)	7-19	Patio	S-j	4-412	62	Standing	B.E.Jenkins	Brakeman	30	Ice platform apron dropped on finger.
(108)	7-20	Curvo	#S-j	426	70	12	G.C.Mann	Brakeman	12	Yoke rivets sheared off first car from engine causing break-in-two.
(109)	7-23	Piedra	S-e	426	54	32	W.J.Woodmansee	Engineer	10	Derailed car injured engineer of work train in siding.
(110)	8-1	Red Rock	S-j	X-2851-W	54	4	S.W.Shockley	Brakeman	8	Turned ankle on ballast, running to catch caboose.
(111)	8-4	Tartron	S-e	1-412	63	20	R.Lyle	Engineer	17	Scalded by hot water from squirt hose.
(112)	8-17	Hereford	S-j	X-3306-W	70	8	C.C.Pennington	Brakeman	30	Broke bone in hand ejecting trespasser.
(113)	8-25	Cholla	S-j	X-3667-W	63	4	M.J.Bell	Brakeman	7	Sprained ankle running for switch.
(114)	8-26	Stockham	#S-j	X-2728-W	67	8 to 10	J.R.West	Brakeman	10	Rough stop caused by break-in-two due to trespasser stepping on cutting lever injured brakeman in caboose.
(115)	8-26	Mescal	S-j	X-3314-W	70	20	B.F.Rinkleib	Fireman	20	Caught finger between clinker hook and anchor bar.
(116)	9-16	Sibyl	S-j	418	40	Standing	J.McLaughlin	Brakeman	7	Strained back loading freight in car.
(117)	9-27	Cortaro	S-j	3-412	57	25	T.Hart	Brakeman	15	Hot sand in eye.
(118)	10-15	Bowie	S-j	X-3681-W	68	30	W.L.Black	Brakeman	5	Foreign particle in eye.
(119)	10-25	Carador	S-e	7	28	21	H.A.Huddleston	Engineer	21	Cut off finger trying to replace grease cup in stoker conveyor.
(120)	11-1	Mescal-Benson	S-j	X-3658-W	Home	30	C.H.Warble	Brakeman	4	Foreign substance in eye.
(121)	11-2	Cutter	S-j	X-2760-E	40	15	H.B.Elledge	Engineer	5	Sand in eye.
(122)	11-6	Gila	S-g	X-3660-W	65	8	G.M.Barringer	Brakeman	14	Slipped getting on engine.
(123)	11-14	Douglas	#S-j	X-3255-W	61	4	A.A.Crenshaw	Brakeman	15	Undesired emergency threw brakeman to floor of caboose.
(124)	11-29	Empire	S-j	94	68	Unknown	F.N.Arnold	Brakeman	60	Foreign matter in eye.
(125)	12-1	Casa Grande	S-j	X-2716-W	51	1	L.Reece	Brakeman	8	Caught between running boards of cars.
(126)	12-12	Benson	S-j	X-3682-W	52	2	F.P.Schram	Brakeman	7	Cars moved while brakeman beneath same making repairs.
(127)	12-16	Gila	S-j	X-2725-W	64	Standing	A.J.Brown	Brakeman	4	Stumbled and fell over scrap iron while running to get on engine.
(128)	12-16	Maricopa	S-g	X-3658-W	61	Standing	W.W.Holden	Brakeman	10	Turned ankle stepping off car to ground.
(129)	12-19	Tucson	S-d	2-412	67	Standing	W.C.Hawkins	Brakeman	12	Thrown against brake wheel when brake chain loosened.
(130)	12-21	Mesa	S-g	126	44	1	S.R.Watson	Brakeman	11	Turned ankle getting off car.
(131)	12-22	Frankenburg	S-j	X-1713-W	18	Standing	B.V.Overbay	Conducter	6	Closed car door on finger.
	1926						YEAR 1926			
(132)	1-6	Drury	S-g	412	68	3	L.G.Moyer	Brakeman	7	Strained leg getting off engine.
(133)	1-16	Benson	S-j	412	61	25	C.W.Christian	Brakeman	14	Fell between cars stepping from one car to another.
(134)	1-22	Enid	S-j	2-412	52	Standing	G.H.Denny	Brakeman	30	Fell from top of car in standing train.
(135)	1-26	Lewis Springs	#S-j	X-3[illegible]3-W	70	18	E.T.Williams F.R.Webb W.F.Kelly	Conducter Brakeman Brakeman	4 4 4	Train parted due to broken knuckle third car from engine, injured men in caboose.
(136)	1-26	Ft. Huachuca	S-e	161	10	Standing	R.F.Hayes	Fireman	4	Caught hand between ash pan and pry bar.
(137)	2-6	Hayden	S-b	136	14	8	A.Hillouse	Brakeman	Killed	Caught between cars and run over while coupling air hose.

- caused from sudden stopping, starting, lurch, or jerk of car or train.

ITEM NO.	DATE (1)	LOCATION (2)	I.C.C. CLASS (3)	TRAIN NUMBER (4)	NO. CARS IN TRAIN (5)	SPEED M.P.H. (6)	PERSON INJURED NAME (7)	PERSON INJURED OCCUPATION (8)	ESTIMATED DISABILITY (Days) (9)	DESCRIPTION OF ACCIDENT (10)
	1926						YEAR 1926 (CONTINUED)			
(138)	2-8	Elm	FS-j	X-2706-E	61	35	J.H.Trotman	Brakeman	30	Train jerked due to slack action injuring brakeman hanging on side ladder of car.
(139)	2-19	Tempe	S-g	X-1697-E	67	8	V.R.Gere	Fireman	20	Jumped from engine in derailment at road crossing.
(140)	2-23	Ligurta	S-i	X-2785-E	1	25	J.Chavez	Trk.lbrer	10	Struck by train.
(141)	2-23	Wellton	S-d	2-92	40	Standing	G.A.Fields	Brakeman	30	Fell while setting hand brake.
(142)	3-2	Hillito	FS-j	X-2516-W	64	15	C.W.Neal	Brakeman	Killed	Fell between cars and run over when train parted due to broken knuckle on first car in train.
(143)	3-7	Kendall	FS-j	X-3072-W	29	1	P.DeMaro	Conductor	5	Attempted place lighted fusee in sill rear of caboose as slack ran in, causing fusee to strike foot, spike first.
(144)	3-11	Bosque	S-j	X-2586-W	66	6	E.D.Storms	Brakeman	21	Struck by hobo or projection from train.
(145)	3-12	Yuma	S-g	X-3636-W	56	8	L.C.Sheffield	Brakeman	20	Threw entire weight on one foot jumping from car.
(146)	3-15	Gorta	S-j	64	3	25	W.H.McKinney	Fireman	14	Cinder in eye.
(147)	3-27	Ligurta	FS-j	X-2799-W	67	12	A.J.Brown	Brakeman	14	Undesired emergency caused sudden stop and threw brakeman to floor of caboose.
(148)	4-8	Tempe	S-j	126	4	2	R.H.Earle	Brakeman	20	Rolled between platform and moving car.
(149)	4-16	Toltec	S-j	X-2799-W	64	Standing	H.A.Clow	Brakeman	9	Pointed end of fusee struck leg.
(150)	4-25	Ray Jct.	S-j	X-3240-W	32	4	E.R.Bormore	Conductor	25	Fell from top of caboose when it side swiped car on adjacent track.
(151)	5-1	Tempe	S-g	X-3108-W	28	10 to 15	F.C.DeMaro	Conductor	16	Jumped from engine in anticipation of collision.
(152)	5-11	Globe	S-j	X-2858-E	18	4	W.S.Gatchell	Brakeman	10	Stumbled over rail and fell while running.
(153)	5-16	Maricopa	S-j	5-430	61	12	L.L.Hess	Brakeman	8	Sprained ankle on end of running board.
(154)	5-23	Tucson	S-e	X-3702-W	66	10	C.C.Keith	Engineer	10	Cinder in eye.
(155)	5-23	Benson	S-e	X-2750-W	66	Standing	R.F.Hayes	Fireman	14	Lost balance and fell while putting up indicators.
(156)	5-29	Tucson	FS-j	X-3702-W	67	3	S.C.Cunningham	Brakeman	10	Emergency stop by engineer to avoid collision, injured brakemen in caboose.
(157)	5-29	Vamar	S-e	3-412	60	25	J.F.Gray	Fireman	4	Sand in eye.
(158)	6-10	Buchan	S-j	X-2801-W	66	12	J.H.Kelly	Brakeman	7	Hot sand in eye.
(159)	6-11	Stockham	FS-j	91	66	15	H.Inskeep	Brakeman	Died	Fell from top of train when train parted due to undesired emergency.
(160)	6-13	Buzina	S-e	3-412	66	4	J.E.O'Brien	Engineer	45	Frost plug of injector blew out causing him to fall to ground.
(161)	6-14	Yuma	S-i	430	36	2	R.A.Goldwater	Brakeman	Killed	Struck by light engine.
(162)	6-15	Benson	S-j	417	35	20	L.B.Corkum	Brakeman	6	Sand in eye.
(163)	6-26	Tully	S-e	1-412	68	15	J.H.Moore	Fireman	8	Struck elbow on shaker bar.
(164)	6-26	Fairbank	S-j	185	43	10	W.J.Armstrong	Brakeman	7	Cinder in eye.
(165)	6-29	Theba	S-i	X-2565-W	66	Standing	J.N.Crisp	Brakeman	Killed	Struck by passing passenger train.
(166)	7-22	Curve	S-j	3-412	61	Standing	R.T.Quint	Conductor	25	Fell when ballast rolled under feet.
(167)	7-31	Lewis Springs	S-j	186	24	4	B.Lee	Brakeman	7	Caught by shifting lumber on car when coupling made.
(168)	8-13	Benson	S-j	X-3700-W	70	6	H.Showers	Brakeman	30	Knocked off car by cable from hoist.
(169)	9-8	Willcox	S-j	X-3713-W	63	25	C.J.Franklin	Brakeman	Killed	Fell from top of train and run over.
(170)	9-9	Tucson	FS-j	X-3704-W	70	8	W.H.Preston	Conductor	11	Break-in-two due to draw bar key working out of eleventh car from engine.
(171)	9-21	[illegible]								

(147)	3-27	Ligurta	#S-j	X-2799-W	67	12	A.J.Brom	Brakeman	14	Undesired emergency caused sudden stop and threw brakeman to floor of caboose.
(148)	4-8	Tempe	S-j	126	4	2	R.H.Earle	Brakeman	20	Rolled between platform and moving car.
(149)	4-14	Toltec	S-j	X-2799-W	64	Standing	H.A.Clow	Brakeman	9	Pointed end of fusee struck leg.
(150)	4-25	Ray Jct.	S-j	X-3240-W	32	4	E.R.Bermore	Conductor	25	Fell from top of caboose when it side swiped car on adjacent track.
(151)	5-1	Tempe	S-g	X-3108-W	28	10 to 15	F.C.DeMare	Conductor	16	Jumped from engine in anticipation of collision.
(152)	5-11	Globe	S-j	X-2858-E	18	4	W.S.Gatchell	Brakeman	10	Stumbled over rail and fell while running.
(153)	5-16	Maricopa	S-j	5-430	61	12	L.L.Ross	Brakeman	8	Sprained ankle on end of running board.
(154)	5-23	Tucson	S-e	X-3702-W	66	10	C.C.Keith	Engineer	10	Cinder in eye.
(155)	5-23	Benson	S-e	X-2750-W	66	Standing	R.F.Hayes	Fireman	14	Lost balance and fell while putting up indicators.
(156)	5-29	Tucson	#S-j	X-3702-W	67	3	S.C.Cunningham	Brakeman	10	Emergency stop by engineer to avoid collision, injured brakeman in caboose.
(157)	5-29	Vamar	S-e	3-412	60	25	J.F.Gray	Fireman	4	Sand in eye.
(158)	6-10	Buchan	S-j	X-2801-W	66	12	J.H.Kelly	Brakeman	7	Hot sand in eye.
(159)	6-11	Stockham	#S-j	91	66	15	H.Inskeep	Brakeman	Died	Fell from top of train when train parted due to undesired emergency.
(160)	6-13	Wasima	S-e	3-412	66	4	J.E.O'Brien	Engineer	45	Frost plug of injector blew out causing him to fall to ground.
(161)	6-14	Yuma	S-i	430	36	2	R.A.Goldwater	Brakeman	Killed	Struck by light engine.
(162)	6-15	Benson	S-j	417	35	20	L.B.Corkum	Brakeman	6	Sand in eye.
(163)	6-26	Tully	S-e	1-412	68	15	J.H.Moore	Fireman	8	Struck elbow on shaker bar.
(164)	6-26	Fairbank	S-j	185	43	10	W.J.Armstrong	Brakeman	7	Cinder in eye.
(165)	6-29	Theba	S-i	X-2545-W	66	Standing	J.N.Crisp	Brakeman	Killed	Struck by passing passenger train.
(166)	7-22	Curve	S-j	3-412	61	Standing	R.T.Quint	Conductor	25	Fell when ballast rolled under feet.
(167)	7-31	Lewis Springs	S-j	186	24	4	B.Lee	Brakeman	7	Caught by shifting lumber on car when coupling made.
(168)	8-13	Benson	S-j	X-3700-W	70	6	H.Showers	Brakeman	30	Knocked off car by cable from hoist.
(169)	9-8	Willcox	S-j	X-3713-W	63	25	C.J.Franklin	Brakeman	Killed	Fell from top of train and run over.
(170)	9-9	Tucson	#S-j	X-3704-W	70	8	W.H.Preston	Conductor	11	Break-in-two due to draw bar key working out of eleventh car from engine.
(171)	9-23	Wellton	#S-j	243	61	8 to 10	W.J.Carey	Brakeman	26	Claims jerk of stopping train threw him against caboose ladder.
(172)	9-27	Casa Grande	S-g	X-1713-E	13	Standing	C.McClung	Brakeman	30	Stepped on rock getting off car.
(173)	10-29	Nunez	S-g	X-1835-E	63	6	H.H.Eberwein	Brakeman	14	Stumbled and fell getting off moving car.
(174)	11-2	Bernardino	S-j	125	34	Standing	G.Hernandez	Sect.Labrer	4	Dropped tie on foot in car of local freight.
(175)	11-7	Chandler	S-j	X-1835-E	12	Standing	A.C.Ellisdn	Brakeman	7	Mule kicked board in brakeman's face.
(176)	12-1	Globe	S-d	2-142	17	Standing	C.C.Dallas	Brakeman	90	Brake club slipped and caused brakeman to fall to ground.
(177)	12-4	Granite Spur	S-e	243	58	8	I.L.Bell	Conductor	30	Slipped and fell while throwing switch and struck by car.
(178)	12-17	Bisbee Jct.	S-g	188	66	5	C.Cavin	Brakeman	14	Ballast rolled under foot.
(179)	12-22	Tucson	S-e	X-659-E	68	Standing	H.C.Betts	Fireman	6	Shaker bar slipped, causing fireman to fall.
	1927						YEAR 1927			
(180)	1-26	Picacho	S-j	426	52	Standing	F.S.Thomas	Brakeman	8	Sprained back taking water due to spout tipping.
(181)	2-3	Harqua	S-g	X-2573-E	20	8 to 10	W.J.Carey	Brakeman	Permanent	Fell under train when he came in contact with hand rail on bridge while getting off train.
(182)	2-12	Benson	S-d	417	17	4	O.C.Boone	Brakeman	10	Struck by brake club releasing hand brake.
(183)	3-5	Olberg	S-j	X-2723-W	27	Standing	J.J.McMahan	Brakeman	20	Struck on leg by cattle guard being unloaded from car.
(184)	3-8	Bon	S-j	1-92	54	4	C.McClung	Brakeman	20	Stumbled on ballast while running ahead of train to line switch.

= caused from sudden stopping, starting, lurch, or jerk of car or train.

ITEM NO.	DATE	LOCATION	I.C.C. CLASS	TRAIN NUMBER	NO. CARS IN TRAIN	SPEED M.P.H.	PERSON INJURED NAME	PERSON INJURED OCCUPATION	ESTIMATED DISABILITY (Days	DESCRIPTION OF ACCIDENT.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	1927					YEAR 1927 (CONTINUED)				
(185)	3-11	Gila	S-g	243	67	3	C.L.Cain	Brakeman	20	Slipped on ballast getting off moving train.
(186)	3-20	Cortaro	C-a	X-2801-W	69	Standing	V.Henderson	Brakeman	210	Passenger train collided with rear of standing freight train. Flagman of freight train riding engine of passenger train injured. (Fireman and two brakeman and four passengers on passenger train also injured).
(187)	4-16	Ray Jct.	S-j	127	30	6	M.Sumerud	Brakeman	30	Struck in eye by fragments of exploding torpedo.
(188)	4-17	Tucson	S-d	X-3706-W	70	Standing	R.C.Scott	Brakeman	12	Fell from car while setting hand brake.
(189)	5-21	Bowie	S-d	141	49	4	R.E.Ellis	Brakeman	30	Fell to ground while setting hand brake.
(190)	5-22	Casa Grande	FD-i	X-2739-W	66	6 to 8	F.W.Winner	Tel.lineman	Killed	Undesired emergency due to engine separating from train caused outfit cars on rear to derail and fatally injuredman in one of the cars.
(191)	5-23	Stoval	FS-j	91	70	35	E.King	Brakeman	30	Air hose uncoupled when struck by piece of stirrup from car. Sudden stop cause brakeman to be thrown to floor of caboose.
(192)	5-24	Bowie	S-d	X-4313-W	67	Standing	J.B.Hughes	Brakeman	10	Fell from car while releasing hand brake.
(193)	5-29	Tully	S-j	X-3682-W	67	Standing	L.Reece	Brakeman	14	Disconnected main rod of engine fell on hand.
(194)	6-20	Rillito	S-j	421	38	Standing	M.C.Pierce	Conductor	14	Slipped on pipe in car.
(195)	6-21	Yuma	S-e	X-2724-W	66	4	G.O.Brents	Brakeman	6	Ball of switch lever dropped on foot when throwing switch.
(196)	6-28	San Juan	S-g	X-3719-W	70	6	C.A.Olds	Brakeman	10	Turned ankle getting off car.
(197)	7-14	Ray Jct.	S-d	X-2705-W	34	Standing	G.A.Torbett	Brakeman	4	Struck in mouth by brake wheel while releasing hand brake.
(198)	7-14	Aldona	FS-j	X-3719-W	70	10	J.E.Knudson S.W.Shockley	Brakeman Brakeman	13 21	Thrown to floor of caboose by rough stop due to undesired emergency.
(199)	7-15	Blaisdell	FS-j	2-412	57	20	E.R.Findley	Brakeman	20	Slack ran out when air applied and released throwing brakeman against hand rail of caboose.
(200)	7-19	Yuma	S-g	91	54	12	H.F.Thompson	Brakeman	9	Fell when attempting to board moving train.
(201)	8-11	Blaisdell	S-j	423	59	10	F.E.Peirce	Brakeman	4	Sand in eye.
(202)	8-28	Douglas	S-d	138	42	5	A.Kelly	Brakeman	4	Fell against end of car setting hand brake.
(203)	8-29	Franklin	S-i	175	8	Standing	N.Reardon	Conductor	Killed	Fell from car while releasing hand brake.
(204)	9-14	Marana	S-j	1-430	54	4	K.E.Reese	Brakeman	6	Stumbled and fell over protruding stake in ground while running ahead to throw switch.
(205)	9-29	Paxton	S-j	X-2701-E	36	6	W.E.Messer	Brakeman	7	Stumbled and fell over loose rocks while running for derail.
(206)	10-11	Naco	S-j	X-3710-W	67	4	R.L.Franks	Brakeman	4	Attacked and beaten by trespassers.
(207)	11-13	Tucson	S-j	2-412	2	5	H.Swan	Brakeman	20	Cars collided with caboose knocking brakeman down in caboose who was putting up indicators.
(208)	11-16	Lucena	S-g	2-412	53	Standing	T.W.Donnelly	Conductor	10	Fell from bridge to ground below when stepping off caboose.
(209)	11-24	Gila	S-i	92	7	5	T.C.Carroll	Brakeman	30	Struck by lead car of 7 cars being shoved to a coupling by helper engine.
(210)	12-2	Tucson	S-d	91	55	Standing	E.G.Gray	Brakeman	14	Strained knee releasing hand brake.
(211)	12-10	Naviska	S-j	92	46	8	L.E.Haydock	Brakeman	14	Stumbled over raised track while running to get on train.
(212)	12-31	Douglas	S-j	X-3695-W	59	7	J.C.Jones	Brakeman	7	Assaulted by some unknown person with club.
	1928					YEAR 1928				
(213)	1-13	Tucson	S-g	426	43	Standing	W.R.Murray	Brakeman	20	Slipped on ice and sprained ankle when getting off standing car.

(192)	5-24	Bowie	S-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
(193)	5-29	Tully	S-j	X-3682-W	67	Standing	L.Reece	Brakeman	14	Disconnected main rod of engine fell on hand.
(194)	6-20	Rillito	S-j	421	38	Standing	M.C.Pierce	Conductor	14	Slipped on pipe in car.
(195)	6-21	Yuma	S-e	X-2724-W	66	4	G.O.Brents	Brakeman	6	Ball of switch lever dropped on foot when throwing switch.
(196)	6-28	San Juan	S-g	X-3719-W	70	6	C.A.Olds	Brakeman	10	Turned ankle getting off car.
(197)	7-14	Ray Jct.	S-d	X-2705-W	34	Standing	G.A.Torbett	Brakeman	4	Struck in mouth by brake wheel while releasing hand brake.
(198)	7-14	Aldona	FS-j	X-3719-W	70	10	J.E.Knudsen S.W.Shockley	Brakeman Brakeman	13 21	Thrown to floor of caboose by rough stop due to undesired emergency.
(199)	7-15	Blaisdell	FS-j	2-412	51	20	E.R.Findley	Brakeman	20	Slack ran out when air applied and released throwing brakeman against hand rail of caboose.
(200)	7-19	Yuma	S-g	91	54	12	H.F.Thompson	Brakeman	9	Fell when attempting to board moving train.
(201)	8-11	Blaisdell	S-j	423	59	10	F.E.Peirce	Brakeman	4	Sand in eye.
(202)	8-28	Douglas	S-d	138	42	5	A.Kelly	Brakeman	4	Fell against end of car setting hand brake.
(203)	8-29	Franklin	S-d	175	8	Standing	M.Reardon	Conductor	Killed	Fell from car while releasing hand brake.
(204)	9-14	Marana	S-j	1-430	54	4	H.E.Reese	Brakeman	6	Stumbled and fell over protruding stake in ground while running ahead to throw switch.
(205)	9-29	Peston	S-j	X-2701-E	36	6	W.E.Messer	Brakeman	7	Stumbled and fell over loose rocks while running for derail.
(206)	10-11	Rasc	S-j	X-3710-W	67	4	R.L.Franks	Brakeman	4	Attacked and beaten by trespassers.
(207)	11-13	Tucson	S-j	2-412	2	5	H.Swan	Brakeman	20	Cars collided with caboose knocking brakeman down in caboose who was putting up indicators.
(208)	11-16	Lucena	S-g	2-412	53	Standing	T.W.Donnelly	Conductor	10	Fell from bridge to ground below when stepping off caboose.
(209)	11-24	Gila	S-i	92	7	5	T.C.Carroll	Brakeman	3	Struck by lead car of 7 cars being shoved to a coupling by helper engine.
(210)	12-2	Tucson	S-d	91	55	Standing	E.G.Gray	Brakeman	14	Strained knee releasing hand brake.
(211)	12-10	Naviska	S-j	92	46	8	L.E.Haydock	Brakeman	14	Stumbled over raised track while running to get on train.
(212)	12-31	Douglas	S-j	X-3695-W	59	7	J.C.Jones	Brakeman	7	Assaulted by some unknown person with club.
	1928					YEAR 1928				
(213)	1-13	Tucson	S-e	426	43	Standing	W.R.Murray	Brakeman	20	Slipped on ice and sprained ankle when getting off standing car.
(214)	1-17	Harqua	S-d	X-2823-E	46	Standing	G.M.Speer	Brakeman	10	Fell to ground while setting hand brake.
(215)	1-18	Sentinel	S-g	2-412	62	10	H.B.Burkitt	Conductor	25	Fell while attempting to board caboose due to hand hold breaking.
(216)	2-21	Bowie	S-i	X-3681-W	4	5	A.Gonzales	Laborer	Killed	Struck by train.
(217)	2-23	Buckeye	S-e	X-3073-E	32	Standing	J.L.Lewis	Fireman	9	Scalded when frost plug blew out of injector.
(218)	3-11	Red Rock	S-i	X-2520-W	63	5	T.Ryan	Pumper	4	Struck by train.
(219)	4-1	Bowie	S-j	X-3713-W	4	4	E.Bradley	Brakeman	30	Fell when stepping from one car to another.
(220)	4-7	Phoenix	S-i	126	15	6	A.Strope	Brakeman	10	Struck by engine on adjacent track.
(221)	4-19	Bowie	S-g	428	7	3	H.C.Carmichael	Brakeman	14	Fell while getting on car.
(222)	5-18	Jaynes	S-j	X-2834-W	68	8	C.McClung	Brakeman	14	Stumbled on ballast while running to catch caboose.
(223)	5-22	Curtiss	S-g	168	12	Standing	D.A.Quinn	Brakeman	10	Stepped in hole getting off car.
(224)	5-23	Picacho	S-e	1-412	58	Standing	C.H.Warner	Fireman	10	Fell on top of engine tender after taking water.
(225)	5-30	Sibyl	S-g	X-3694-W	66	5	T.J.Lemos	Brakeman	10	Fell getting off car.
(226)	5-30	Randolph	S-j	438	45	Standing	J.H.Hamilton	Brakeman	5	Dropped piece of pipe on foot
(227)	6-2	Mesa	FS-j	127	30	6	S.H.Stover	Conductor	4	Slack action on rear of train as train was stopping, threw conductor against end of caboose.

F - caused from sudden stopping, starting, lurch, or jerk of car or train.

ITEM NO.	DATE (1)	LOCATION (2)	I.C.C. CLASS (3)	TRAIN NUMBER (4)	NO. CARS IN TRAIN (5)	SPEED M.P.H. (6)	TRAIN HANDLED NAME (7)	TRAIN HANDLED OCCUPATION (8)	ESTIMATED DISABILITY (Days) (9)	DESCRIPTION OF ACCIDENT (10)
	1928						YEAR 1928 (CONTINUED)			
(228)	6-4	Florence	S-1	126	37	Standing	R.E.Earle	Brakeman	20	Sand in eye.
(229)	6-10	Tucson	S-6	3-428	52	Standing	H.E.Tudor	Brakeman	4	Wrenched back getting hand brake.
(230)	6-11	Catalina	FS-1	189	67	5	W.N Whyo	Conductor	30	Knocked from top of caboose when train parted due to broken knuckle.
(231)	6-22	Sentinel	FS-1	E-2701-B	67	15	C.V.Gibson	Brakeman	20	Thrown against end of caboose when undesired emergency occurred.
(232)	6-24	Bosque	S-1	2-242	52	18	H.N.Faath	Brakeman	12	Splinter in hand while adjusting ventilator.
(233)	6-27	Willcox	S-6	418	47	Standing	O.C.Bond	Brakeman	14	Fell from car while setting hand brake.
(234)	7-1	Bernardino	S-6	E-3627-B	66	35	F.A.Wheeler	Fireman	6	Sand in eye.
(235)	7-8	Portuna	FS-1	E-2857-B	70	6	D.A.Quinn T.H.Hutton	Conductor Brakeman	8 8	Thrown in caboose due to mishandling of air and slack by engineer.
(236)	7-27	Queen Creek	S-6	138	34	Standing	W.Luttrell	Fireman	14	Fell to ground when rope to water tank valve broke when taking water.
(237)	9-2	Marquo	S-1	E-2749-B	57	10	C.Cavin	Brakeman	14	Sand in eye.
(238)	9-8	Wabash	SFS	1-428	62	7	O.H.Speer	Brakeman	45	Stepped in hole and fell when alighting from train.
(239)	9-27	Casa Grande	S-1	243	56	Standing	A.A.Dunn	Brakeman	20	Caught finger between brake shoe and brake head.
(240)	10-11	Fairbank	S-6	185	42	Standing	C.C.Dial	Conductor	14	Sprained arm releasing hand brake.
(241)	10-24	Coolidge	S-1	438	40	Standing	J.W.Mytinger	Conductor	60	Fell to ground when gang-plank slipped while unloading freight.
(242)	10-30	Miami	S-6	E-2599-E	18	Standing	W.F.Dugan	Brakeman	5	Bruised back setting hand brake when train broke.
(243)	11-3	Wabash	S-1	243	30	4	A.Kelly	Brakman	14	Stepped in hole and sprained ankle while running to catch train.
(244)	11-12	Douglas	FS-1	2-310	70	8	J.W.Johnson	Conductor	7	Thrown from caboose platform to ground when slack ran in due to emergency application by engineer to avoid misplaced switch.
(245)	11-13	Lava	S-1	2-242	55	15	R.T.Barker	Brakeman	5	Slipped on grab iron climbing side of car.
(246)	11-22	Fairbank	S-1	E-3714-B	59	6	J.R.Robinson	Brakeman	Killed	Fell from top of train and run over.
(247)	12-6	Mesa	S-1	E-2105-B	8	2	D.R.Mills	Brakeman	90	Fell from top of car to ground.
(248)	12-7	Sibyl	FS-1	E-3697-B	64	4	G.F.Givens	Conductor	15	Train parted due to knuckle opening between fourth and fifth cars from caboose.
(249)	12-9	Aztec	S-1	244	43	15	R.Price	W.S.Helper	Killed	Struck by train.
(250)	12-31	Wellton	S-6	E-2801-E	49	10 to 15	J.J.Kane	Brakeman	10	Fell getting off moving train.
	1929						YEAR 1929			
(251)	1-3	Dragoon	S-1	417	48	Standing	J.L.Pullian	Brakeman	7	Door closed suddenly on finger.
(252)	1-3	Blackwater	S-6	E-2761-B	66	5	B.L.Douglas	Brakeman	10	Sprained ligament of back getting off engine.
(253)	1-6	Picacho	S-1	1-428	57	Standing	R.R.Elanton	Brakeman	5	Match plug dropped on foot.
(254)	1-17	Benson	S-6	2-410	69	10	B.J.Haines	Brakeman	10	Slipped and fell attempting to board train.
(255)	1-17	Marquo	FS-1	E-2774-B	65	4	G.C.Marks C.Cavin	Conductor Brakeman	10 14	Undesired emergency as train being brought to a stop, injured men in caboose.
(256)	1-26	Mesa	S-1	2-312	58	6	J.R.Webb	Conductor	157	Fell off bridge running to catch rear of train.
(257)	2-18	Chaves	S-1	E-3972-B	59	8	D.W.Lowther	Brakeman	20	Turned ankle on rock running alongside train bleeding brake cylinder on car.
(258)	3-18	Magma	S-6	E-2562-E	40	15	E.O.Fredericks	Brakeman	15	Stepped on rock and fell getting off car.
(259)	3-31	Dome	FS-1	E-2791-B	70	25	A.V.Beeman	Conductor	24	Thrown in caboose when engineer unnecessarily applied brakes in emergency.
(260)	4-15	Stockton	FS-1	E-2565-B	65	18	R.H.Kell	Brakeman	6	Rough stop caused by trespasser stepping on cutting lever 14 cars from head end, injured brakeman in caboose.
(261)	4-17	Casa Grande	S-6	E-2701-B	55	25	S.Lomax	Fireman	20	Stepped on edge of squirt hose and turned ankle.
(262)	5-2	Coatilla	S-1	E-2527-B	66	6	C.McClung	Brakeman	45	Stepped on ballast and turned ankle running to line switch.
(263)	5-3	Dila	S-6	1-242	55	Standing	J.W.Davis	Fireman	17	Stepped on loose nut on front step of engine.
(264)	6-6	Wellton	S-1	E-3749-E	64	8	O.H.Thornell	Brakeman	8	Wrenched knee on top of car.
(265)	6-9	Caledon	S-1	1-428	59	4	D.B.Hughes	Brakeman	30	Ran into hand rail on bridge and fell down edge of embankment
(266)	6-11	Picacho	S-1	3-92	52	Standing	T.D.Holland	Brakeman	5	Stepped on tank spout hook and sprained ankle.
(267)	6-20	Sabino	S-1	E-2795-B	64	40	J.Hall	Brakeman	20	Scalded by hot water from squirt hose.
(268)	6-22	Hydar	S-6	E-2549-E	67	Standing	J.F.Hill	Fireman	30	Lost balance and fell to ground while taking water.
(269)	7-1	San Pedro	FS-1	E-3745-B	70	35	J.E.Knudson	Brakeman	13	Airhose blew off second car from engine causing injury to brakeman in caboose.
(270)	7-1	Wabash	S-6	E-3951-B	68	3	R.F.Higgins	Conductor	16	Jumped from caboose in anticipation of derailment.
(271)	7-6	Benson	S-6	E-3751-B	67	Standing	A.F.Bayer	Engineer	30	Foot slipped off guide of engine while making minor repairs.
(272)	7-6	Dome	S-6	436	24	3 to 4	B. Fraley	Brakeman	15	Sole of shoe caught on protruding nail in car floor causing fall.
(273)	7-15	Congor	S-6	E-2549-B	66	25	C.F.Miller	Fireman	5	Scalded by hot water from squirt hose.

* - caused from sudden stopping, starting, lurch, or jerk of car or train.

ITEM NO.	DATE (1)	LOCATION (2)	I.C.C. CLASS (3)	TRAIN NUMBER (4)	NO. CARS IN TRAIN (5)	SPEED M.P.H. (6)	PERSON INJURED NAME (7)	PERSON INJURED OCCUPATION (8)	ESTIMATED DISABILITY (Days) (9)	DESCRIPTION OF ACCIDENT (10)
	1929						YEAR 1929 (CONTINUED)			
(274)	7-15	Bosque	S-j	X-2749-W	49	4	M.B.Fenton	Brakeman	30	Caught foot between deadwood and draw bar.
(275)	7-16	Picacho	S-j	1-428	53	5	W.P.Messer	Brakeman	5	Fell in man-hole of engine tender.
(276)	8-13	Marana	S-g	X-2549-E	55	10	O.E.Redmond	Brakeman	7	Slipped and fell on ballast, getting off engine.
(277)	8-18	Rillito	S-j	X-2423-W	55	15 to 20	W.J.Shannon	Fireman	30	Struck thumb on train order hoop.
(278)	8-26	Tombstone	S-g	164	2	Standing	D.A.Quinn	Brakeman	7	Foot slipped descending side ladder on car.
(279)	8-28	Picacho	S-g	X-2795-W	55	5	R.E.Justice	Brakeman	30	Bruised toe on ballast getting off caboose.
(280)	9-2	Hayden	S-b	X-3240-W	9	Just Moved	H.B.Irion	Brakeman	60	Fingers caught between coupler and striking plate when turning angle cock.
(281)	9-3	Maricopa	S-g	X-2530-W	52	6	H.L.Miller	Brakeman	11	Stepped on piece of ballast and fell, getting off engine.
(282)	9-10	Dome	S-j	X-2797-W	65	Standing	H.E.Burkhart	Brakeman	25	Struck by falling car door.
(283)	10-5	Montezuma	S-j	432	49	35	C.Cavin	Brakeman	30	Fell while descending from cupola of caboose due to step breaking.
(284)	10-17	Bell	S-j	436	36	Standing	R.L.Franks	Brakeman	10	Strained back lifting sack of potatoes in car.
(285)	12-11	Tucson	S-d	X-3305-W	39	Standing	L.Reece	Brakeman	45	Fell to ground while setting hand brake.
(286)	12-14	Tucson	S-d	2-412	69	Standing	J.T.Bell	Brakeman	11	Strained back when releasing hand brake.
(287)	12-18	Tucson	PS-j	X-3682-W	68	20	W.C.Willoughby	Brakeman	Permanent	Fell from car as slack jerked when engineer released brakes.
(288)	12-19	Alrich	S-j	412	69	30	J.G.Blaise	Fireman	22	Cinder in eye.
	1930						YEAR 1930			
(289)	1-7	Dusk	PS-j	X-2751-W	70	5	F.R.Hughes	Brakeman	8	Knocked down in caboose when train parted due to breaking emergency chain between engine and first car.
(290)	1-20	Box	S-i	X-2709-W	68	40	F.E.Whitaker	Sig.Mntnr.	Killed	Struck by train while attempting remove motor car from track.
(291)	2-13	Bowie	S-j	X-3713-W	57	Standing	J.E.Follett	Conductor	5	Iron platform truck slipped from his hands and injured toe.
(292)	2-19	Ocapoe	PS-j	421	67	25	H.E.Foley	Brakeman	62	Train parted, rough stop throwing brakeman off of third car from engine.
(293)	2-20	Sentinel	S-j	423	58	Standing	R.P.Higgins	Brakeman	14	Dropped piece of pipe on foot.
(294)	2-21	Hereford	PS-j	X-5023-W	70	35	S.W.Shockley	Brakeman	10	Undesired emergency caused sudden stop, injuring brakeman in caboose.
(295)	3-14	Stanwix	S-j	X-3652-W	66	8	G.L.Schofield	Brakeman	60	Stumbled on ballast and fell while bleeding brake cylinder on car.
(296)	3-19	Tucson	PS-j	X-2701-W	66	12 to 15	E.H.Strasser	Brakeman	10	Train parted due to trespasser stepping on cutting lever 5 cars from engine injuring brakeman in caboose.
(297)	3-22	Coleden	S-g	X-3613-W	65	Standing	D.J.Croughan	Brakeman	30	Stepped off bridge and fell to ground while getting off engine to line switch.
(298)	3-24	Rittenhouse	S-j	X-1624-W	2	Standing	J.C.Ward	Conductor	30	Stepped off end of running board of car and fell to ground.
(299)	4-6	Marah	S-j	X-3700-W	66	35	L.D.Oliver	Brakeman	Killed	Fell from top of train and run over.
(300)	4-14	Wade	PS-j	X-3686-W	67	12	B.E.Howard	Brakeman	8	Run-in of slack as train was being stopped in siding, injured brakeman in caboose.
(301)	4-19	Tucson	S-g	312	50	Standing	A.Hesselberg	Yard Clerk	6	Fell to ground getting off train.
(302)	5-3	Wellton	S-g	1-426	66	6	K.T.Buckles	Brakeman	5	Fell getting off train.
(303)	5-5	Waco	S-a	X-5013-W	70	2	C.A.Boyd	Brakeman	12	Caught fingers between knuckles of cars.
(304)	5-15	Tucson	PS-j	X-3072-W	67	10	J.Featherstone	Brakeman	4	Sudden stop caused by undesired emergency injured brakeman in caboose.
(305)	5-26	Phoenix	S-j	432	55	Standing	W.W.Pettis	Conductor	30	Hands slipped crossing over between cars fracturing fore-arm.
										Burned and received [illegible] from car

(282)	9-18	Dome	S-j	A-2197-W	60	Standing	H.E.Burkhart	Brakeman	25	Struck by falling car door.
(283)	10-5	Montezuma	S-j	432	49	35	C.Cavin	Brakeman	30	Fell while descending from cupola of caboose due to step breaking.
(284)	10-17	Bell	S-j	436	36	Standing	R.L.Franks	Brakeman	10	Strained back lifting sack of potatoes in car.
(285)	12-11	Tucson	S-d	X-3305-W	39	Standing	L.Reece	Brakeman	45	Fell to ground while setting hand brake.
(286)	12-14	Tucson	S-d	2-412	69	Standing	J.T.Bell	Brakeman	11	Strained back when releasing hand brake.
(287)	12-18	Tucson	ƒS-j	X-3682-W	68	20	W.C.Willoughby	Brakeman	Permanent	Fell from car as slack jerked when engineer released brakes.
(288)	12-19	Airich	S-j	412	69	30	J.G.Blaise	Fireman	22	Cinder in eye.
	1930					YEAR 1930				
(289)	1-7	Desk	ƒS-j	X-2751-W	70	5	F.R.Hughes	Brakeman	8	Knocked down in caboose when train parted due to breaking emergency chain between engine and first car.
(290)	1-20	Ben	S-i	X-2709-W	68	40	P.E.Whitaker	Sig.Mntnr.	Killed	Struck by train while attempting remove motor car from track.
(291)	2-13	Bowie	S-j	X-3713-W	57	Standing	J.E.Follett	Conductor	5	Iron platform truck slipped from his hands and injured toe.
(292)	2-19	Ocapee	ƒS-j	421	67	25	H.E.Foley	Brakeman	62	Train parted, rough stop throwing brakeman off of third car from engine.
(293)	2-20	Sentinel	S-j	423	58	Standing	R.P.Higgins	Brakeman	14	Dropped piece of pipe on foot.
(294)	2-21	Hereford	ƒS-j	X-5023-W	70	35	S.W.Shockley	Brakeman	10	Undesired emergency caused sudden stop, injuring brakeman in caboose.
(295)	3-14	Stanwix	S-j	X-3652-W	66	8	G.L.Schofield	Brakeman	60	Stumbled on ballast and fell while bleeding brake cylinder on car.
(296)	3-19	Tucson	ƒS-j	X-2701-W	66	12 to 15	E.H.Strasser	Brakeman	10	Train parted due to trespasser stepping on cutting lever 5 cars from engine injuring brakeman in caboose.
(297)	3-22	Coledon	S-g	X-3613-W	65	Standing	D.J.Croughan	Brakeman	30	Stepped off bridge and fell to ground while getting off engine to line switch.
(298)	3-24	Rittenhouse	S-j	X-1624-W	2	Standing	J.G.Ward	Conductor	30	Stepped off end of running board of car and fell to ground.
(299)	4-6	Marsh	S-j	X-3700-W	66	15	L.D.Oliver	Brakeman	Killed	Fell from top of train and run over.
(300)	4-14	Hado	ƒS-j	X-3686-W	67	12	B.E.Howard	Brakeman	8	Run-in of slack as train was being stopped in siding, injured brakeman in caboose.
(301)	4-19	Tucson	S-g	312	50	Standing	A.Hesselberg	Yard Clerk	6	Fell to ground getting off train.
(302)	5-3	Wellton	S-g	1-426	66	6	K.T.Buckles	Brakeman	5	Fell getting off train.
(303)	5-5	Rose	S-a	X-5013-W	70	2	C.A.Boyd	Brakeman	12	Caught fingers between knuckles of cars.
(304)	5-15	Tucson	ƒS-j	X-3072-W	67	10	J.Featherstone	Brakeman	4	Sudden stop caused by undesired emergency injured brakeman in caboose.
(305)	5-26	Phoenix	S-j	432	55	Standing	W.W.Pettis	Conductor	30	Hands slipped crossing over between cars fracturing fore-arm.
(306)	6-21	Calfred	S-g	423	64	Standing	C.McClung	Brakeman	30	Turned and sprained ankle alighting from car.
(307)	6-26	Bosque	ƒS-j	X-3246-W	67	15	R.H.Keil	Brakeman	4	Brakeman riding on top of sixth car from head end thrown to ground when conductor applied air from caboose.
(308)	6-30	Picacho	S-e	X-2834-W	61	4	O.O.Orrison	Fireman	14	Scalded by hot water from squirt hose.
(309)	8-1	Tucson	ƒS-j	X-3634-W	69	12	H.Badabaugh	Brakeman	12	Brakeman thrown to floor of caboose when train parted due to trespasser stepping on cutting lever.
(310)	8-6	Wescal	ƒS-j	312	68	15	S.W.Shockley	Brakeman	85	Brakeman in cupola knocked against window frame when engineer made emergency application of brakes to avoid over-running interlocking signal.
(311)	8-14	Saddle	S-g	X-3074-W	42	10	C.E.Baumgardner	Brakeman	10	Slipped on ballast and fell, getting on train.
(312)	9-13	Ray Jct.	S-j	X-3276-E	37	2	J.G.Ward	Brakeman	6	Dust in eye.
(313)	10-3	Ray Jct.	S-j	X-3276-E	37	5	J.G.Ward	Brakeman	11	Stepped on rock and sprained ankle running to catch caboose.
(314)	10-5	Hereford	S-j	1-312	69	Standing	J.C.Jones	Brakeman	45	Fractured hand attempting to eject trespasser.
(315)	10-15	Phoenix	ƒS-h	431	69	6	A.J.Young	Brakeman	30	Thrown from top of caboose to ground when train stopped suddenly, due to striking automobile on grade crossing.
(316)	10-23	Casa Grande	S-g	3-410	45	3	D.A.Quinn	Brakeman	4	Stepped on piece of ballast and sprained ankle getting off car.
(317)	10-28	Tucson	ƒS-j	X-3323-W	65	2	J.M.Alsobrook	Brakeman	13	Sudden jerk of slack due to engineer releasing brakes at too slow speed, injured brakeman in caboose.

ƒ - caused from sudden stopping, starting, lurch, or jerk of car or train.

ITEM NO.	DATE	LOCATION	I.C.C. CLASS	TRAIN NUMBER	NO. CARS IN TRAIN	SPEED M.P.H.	PERSON INJURED NAME	PERSON INJURED OCCUPATION	ESTIMATED DISABILITY (Days)	DESCRIPTION OF ACCIDENT
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	1930						YEAR 1930 (CONTINUED)			
(318)	10-30	Pantano	S-e	412	70	Standing	B.F.Baker	Engineer	20	Finger caught between water spout and man-hole.
(319)	10-30	Casa Grande	S-d	422	64	Standing	C.B.Palmer	Brakeman	30	Lost balance and fell to ground while operating hand brake.
(320)	11-19	Roll	S-j	431	50	12	C.R.Lester	Brakeman	4	Slipped off step of engine gangway and fell to ground.
(321)	12-8	Casador	S-j	1-312	70	Standing	F.W.Hutton	Conductor	60	Lost balance and fell from bridge to ground below.
(322)	12-19	Tucson	S-d	482	69	Standing	P.H.Primley	Brakeman	20	Struck on wrist by brake club when hand brake released suddenly.
(323)	12-30	Tucson	S-d	417	57	8	J.W.Vance	Brakeman	60	Lost balance and fell to ground setting hand brakes.
	1931						YEAR 1931			
(324)	1-10	Willcox	S-g	X-3683-W	62	Standing	H.F.Brown	Brakeman	15	Fell from car while detraining.
(325)	2-11	Serape	S-j	X-2700-W	66	Standing	M.E.Harmon	Brakeman	9	End of chute apron dropped and struck abdomen.
(326)	2-18	Tucson	S-g	1-416	57	Standing	G.J.Dorsey	Fireman	20	Slipped and fell to ground from running board of engine.
(327)	3-8	Tucson	S-j	2-414	70	Standing	H.E.Richardson	Brakeman	4	Wrenched back climbing through cars.
(328)	3-10	Tartron	S-g	423	55	5	N.B.Greenway	Brakeman	9	Sprained leg getting on engine.
(329)	3-24	Raso	S-j	3-410	70	18	B.M.Montgomery	Conductor	11	Right hand scalded with squirt hose.
(330)	4-9	Falfa	#S-d	1-434	67	4	R.W.Wills	Brakeman	6	Impact at coupling tore brakeman's grasp from brake wheel, causing him to fall across couplers between cars.
(331)	4-11	Wellton	S-j	431	69	6	B.I.Slater	Conductor	6	Stepped in hole and fell while running alongside car bleeding brake cylinders.
(332)	6-4	Hereford	#S-j	189	66	3	J.M.Johnson	Conductor	4	Knocked against end of caboose when slack ran in as engineer applied brakes.
(333)	6-4	Mescal	S-e	1-414	70	Standing	H.L.Fuller	Engineer	5	Burned by explosion when water thrown on hot journal engine trailer.
(334)	6-19	Curve	S-j	2-414	70	10	B.F.Rinkleib	Fireman	5	Hot sand in eye.
(335)	7-1	Bon-Muner	#S-j	X-3124-W	67	40	E.L.Haile	Brakeman	5	Thrown to floor of caboose by sudden stop, due to train parting caused by knuckle coming open.
(336)	7-6	Lava	S-j	414	46	30	C.C.Marks	Conductor	30	Sprained ankle account running board on top of car breaking under weight of conductor.
(337)	7-11	Charleston	#S-j	X-5005-W	70	35	G.V.Lake	Brakeman	11	Thrown against locker box in caboose when run-in of slack occurred as train was being stopped.
(338)	7-24	Mescal	S-c	3-412	70	25	T.H.Blythe	Fireman	30	Scalded when pressure pipe to water pump gauge burst.
(339)	7-29	Wellton	S-i	410	55	12	J.Salas	Sect.labrer	20	Struck by train.
(340)	8-5	Esmond	C-i	410	55	30	S.W.Mote J.F.Martin H.T.Stapp	Engineer Fireman Brakeman	6 Permanent 12	Engine backing with two cars ahead of engine, collided with standing portion of train when main reservoir pipe brdke off, injuring three men on engine.
(341)	8-12	Gila	S-c	X-3613-W	57	Standing	F.R.Lathrop	Fireman	14	Slipped on top of engine tender.
(342)	8-28	Wellton	S-c	416	65	Standing	H.L.Young	Fireman	30	Slipped and fell on tender on engine while taking water.
(343)	10-3	Marsh	S-j	X-3315-W	39	35	R.E.Harmon	Brakeman	20	Vibration of car on which he was riding bruised and fractured testicle.
(344)	10-11	Vail	#S-j	X-3752-W	60	12	H.F.Muse	Brakeman	90	Claims jerk of train caused him to fall between cars while stepping from one to another.
(345)	10-16	Phoenix	#S-j	432	69	4	B.I.Slater	Conductor	17	Thrown down in caboose by slack action caused by improper handling of air by engineer making stop.
(346)	11-23	Hyder	#S-j	432	51	6	B.I.Slater	Conductor	97	Thrown down in caboose by severe run-in of slack due to improper handling of air by engineer.
(347)	12-6	Tucson	#S-j	X-3629-W	69	8	A.A.Dean J.A.Langston	Conductor Brakeman	16	Sudden stop caused by trespasser stepping on cutting lever between ninth and tenth cars [illegible] trainmen in caboose

(324)	1-10	Willcox	S-g	X-3683-W	62	Standing	H.F.Brown	Brakeman	15	Fell from car while detraining.
(325)	2-11	Serape	S-j	X-2766-W	66	Standing	H.E.Harmon	Brakeman	9	End of chute apron dropped and struck abdomen.
(326)	2-18	Tucson	S-g	1-416	57	Standing	G.J.Dorsey	Fireman	20	Slipped and fell to ground from running board of engine.
(327)	3-8	Tucson	S-j	2-414	70	Standing	H.E.Richardson	Brakeman	4	Wrenched back climbing through cars.
(328)	3-10	Tartron	S-g	423	55	5	N.B.Greenway	Brakeman	9	Sprained leg getting on engine.
(329)	3-24	Raso	S-j	3-410	70	18	B.W.Montgomery	Conductor	11	Right hand scalded with squirt hose.
(330)	4-9	Falfa	#S-d	1-434	67	4	R.W.Willis	Brakeman	6	Impact at coupling tore brakeman's grasp from brake wheel, causing him to fall across couplers between cars.
(331)	4-11	Wellton	S-j	431	69	6	B.I.Slater	Conductor	6	Stepped in hole and fell while running alongside car bleeding brake cylinders.
(332)	6-4	Hereford	#S-j	189	66	3	J.M.Johnson	Conductor	4	Knocked against end of caboose when slack ran in as engineer applied brakes.
(333)	6-4	Mescal	S-c	1-414	70	Standing	H.L.Fuller	Engineer	5	Burned by explosion when water thrown on hot journal engine trailer.
(334)	6-19	Curvo	S-j	2-414	70	10	B.F.Rinkleib	Fireman	5	Hot sand in eye.
(335)	7-1	Bon-Nunez	#S-j	X-3124-W	67	40	E.L.Haile	Brakeman	5	Thrown to floor of caboose by sudden stop, due to train parting caused by knuckle coming open.
(336)	7-6	Lava	S-j	414	46	30	G.C.Marks	Conductor	30	Sprained ankle account running board on top of car breaking under weight of conductor.
(337)	7-11	Charleston	#S-j	X-5005-W	70	35	G.V.Lake	Brakeman	11	Thrown against locker box in caboose when run-in of slack occurred as train was being stopped.
(338)	7-24	Mescal	S-c	3-412	70	25	T.H.Blythe	Fireman	30	Scalded when pressure pipe to water pump gauge burst.
(339)	7-29	Wellton	S-i	410	55	12	J.Salas	Sect.Labrer	20	Struck by train.
(340)	8-5	Esmond	C-i	410	55	30	S.W.Mote J.F.Martin H.T.Stapp	Engineer Fireman Brakeman	6 Permanent 12	Engine backing with two cars ahead of engine, collided with standing portion of train when main reservoir pipe broke off, injuring three men on engine.
(341)	8-12	Gila	S-c	X-3613-W	57	Standing	F.R.Lathrop	Fireman	14	Slipped on top of engine tender.
(342)	8-28	Wellton	S-c	416	65	Standing	H.L.Young	Fireman	30	Slipped and fell on tender on engine while taking water.
(343)	10-3	Marsh	S-j	X-3315-W	39	35	R.E.Harmon	Brakeman	20	Vibration of car on which he was riding bruised and fractured testicle.
(344)	10-11	Vail	#S-j	X-3752-W	60	12	H.F.Muse	Brakeman	96	Claims jerk of train caused him to fall between cars while stepping from one to another.
(345)	10-16	Phoenix	#S-j	432	69	4	B.I.Slater	Conductor	17	Thrown down in caboose by slack action caused by improper handling of air by engineer making stop.
(346)	11-23	Hyder	#S-j	432	51	6	B.I.Slater	Conductor	97	Thrown down in caboose by severe run-in of slack due to improper handling of air by engineer.
(347)	12-6	Tucson	#S-j	X-3629-W	69	8	A.A.Dean J.A.Langston W.R.Rutledge	Conductor Brakeman Brakeman	16 5 8	Sudden stop caused by trespasser stepping on cutting lever between ninth and tenth cars injured trainmen in caboose.
	1932							YEAR 1932		
(348)	1-28	Bawtry	S-j	X-3752-W	61	30	J.M.Guinn	Sect. Foreman	Killed	Struck by train.
(349)	2-11	Fairbank	S-j	171	5	8	H.Schleuning	Brakeman	30	Impact of cars, knocked brakeman from cars.
(350)	2-18	Fairbank	S-d	189	63	Standing	O.E.Spaw	Brakeman	30	Struck in face by brake club while releasing brake.
(351)	2-23	Naco	S-j	189	70	Standing	D.M.Bloodworth	Brakeman	21	Strained back lifting freight.
(352)	3-24	Wymola	#S-j	X-3277-W	67	5	T.H.Parker J.S.Hardwicke A.J.Murray	Conductor Brakeman Brakeman	41 6 5	Engineer made emergency application of brakes to avoid running through switch improperly lined, injuring men in caboose.
(353)	4-12	Tucson	#S-j	433	67	12	J.H.Hamilton	Brakeman	21	Thrown against stove in caboose, when train parted due to trespasser stepping on cutting lever.
(354)	5-7	Contention	S-g	943	3	4	R.E.Kelley	Brakeman	24	Slipped on rock boarding train.
(355)	5-28	Raso	#W-b	X-5021-W	67	6	B.E.Hunt	Brakeman	18	Thrown against caboose locker end to floor when train parted due to defective knuckle.
(356)	6-18	Wellton	S-c	X-3310-W	63	Standing	E.R.Lathrop	Fireman	30	Lost balance and fell from engine tender to ground.

- caused from sudden stopping, starting, lurch, or jerk of car or train.

ITEM NO.	DATE (1)	LOCATION (2)	I.C.C. CLASS (3)	TRAIN NUMBER (4)	NO. CARS IN TRAIN (5)	SPEED M.P.H. (6)	PERSON INJURED NAME (7)	PERSON INJURED OCCUPATION (8)	ESTIMATED DISABILITY (Days) (9)	DESCRIPTION OF ACCIDENT (10)
	1932						YEAR 1932 (CONTINUED)			
(357)	6-19	Gila	S-c	1-852	67	Standing	J.V.Stockwell	Fireman	4	Slipped and fell from front end of engine to ground.
(358)	7-2	Magma	S-j	X-2583-W	70	5	M.M.McEwan	Brakeman	5	Burned by steam from boiler blow-off cock.
(359)	9-2	Mohawk	S-j	848	70	4	I.C.Allen	Brakeman	20	Stepped on stone while running to throw switch.
(360)	9-3	Bernardino	S-j	964	53	Standing	C.W.Berryhill	Brakeman	60	Stepped off top of standing car.
(361)	9-15	Wellton	S-c	1-848	57	2	J.A.Ingram	Fireman	90	Burned by escaping steam when valve to injector steam pipe blew out at turret.
(362)	10-13	Bowie	S-d	2-866	45	3	F.W.Killmer	Brakeman	11	Lost balance and fell against end of car while releasing hand brake.
(363)	10-19	Hyder	S-c	902	54	Standing	H.A.Harrington	Fireman	60	Lost balance and fell to ground while taking water.
(364)	12-8	Coolidge	S-j	1-903	62	8	H.Showers	Brakeman	9	Stepped on piece of ballast and turned ankle.
(365)	12-9	Normal Jct.	S-d	X-2235-E	5	Standing	W.F.McNeley	Brakeman	90	Lost balance and fell to ground releasing hand brakes.
(366)	12-20	Palo Verde	S-g	901	53	6	E.V.Shaw	Brakeman	7	Slipped on piece of ballast getting off car.
(367)	12-29	Willcox	FW-b	866	57	10	R.T.Quint	Brakeman	7	Thrown against stove when engineer applied brakes in emergency when main rod strap broke.
	1933						YEAR 1933			
(368)	1-11	Picacho	FS-j	903	62	25	G.B.Palmer	Conductor	28	Conductor claims heavy slack action on rear threw him against cupola steps.
(369)	1-18	Cazador	FS-j	X-5011-W	67	25	C.A.Sorrells	Conductor	16	Thrown from his chair to floor when engineer made emergency application of brakes when he incorrectly believed engine had passed over broken rail.
(370)	1-21	Gila	S-j	X-3625-W	54	7	D.Glover	Brakeman	20	Struck by swinging door of car in train.
(371)	2-6	Tucson-Picacho	S-j	903	63	Unknown	J.H.Hamilton	Brakeman	4	Hot sand in eye.
(372)	2-26	Casa Grande	S-j	X-3307-W	66	Standing	C.A.Boyd	Brakeman	20	Slipped on cupola step in caboose.
(373)	6-14	Bowie	S-c	X-3752-W	67	Standing	M.J.Brady	Fireman	20	Slipped and fell on engine tender.
(374)	6-28	Benson	S-g	X-5027-W	68	15	R.T.Quint	Conductor	14	Struck knee on caboose step boarding train.
(375)	7-22	Maricopa	FS-g	X-3317-W	66	9	W.E.Williams	Brakeman	9	Slack ran out as brakeman boarded caboose straining pelvis.
(376)	7-30	Red Rock	S-g	854	62	12	D.Glover	Brakeman	10	Strained foot stepping on piece of ballast when alighting from train.
(377)	9-18	Pima	S-g	X-2757-W	9	7	B.R.Tolson	Conductor	30	Lost hand hold and fell to ground attempting to board caboose.
(378)	9-25	Wasaysampa	S-j	902	70	Standing	R.A.Joiner	Brakeman	Killed	Stepped from caboose and fell from bridge to ground below.
(379)	10-16	Tombstone	S-j	944	5	Standing	C.A.Boyd	Brakeman	8	Gangplank slipped while unloading freight.
(380)	10-28	Hyder	FS-j	901	39	4	L.A.Webb	Brakeman	14	Thrown against side of car on which he was riding when train parted due to broken knuckle.
	1934						YEAR 1934			
(381)	1-2	Casa Grande	S-g	856	25	Standing	R.E.Johnson	Engineer	6	Stepped on small rock getting off engine.
(382)	1-8	Bowie	S-b	3-862	38	Standing	R.G.Stead	Brakeman	20	Coupling air hose, hose flew up and struck hand.
(383)	2-15	Bowie	S-g	X-5029-W	49	6	W.A.Clelland	Conductor	30	Turned ankle getting off train.
(384)	3-8	Bisbee Jct.	S-i	X-5033-E	45	6	R.A.Powers	Conductor	Killed	Fell under train attempting to get on.
(385)	4-29	Curve	S-j	1-862	70	14	C.H.Warner	Fireman	14	Sand in eye.

(360)	9-3	Bernardino	S-j	964	53	Standing	C.W.Berryhill	Brakeman	60	Stepped off top of standing car.
(361)	9-15	Wellton	S-c	1-848	57	2	J.A.Ingram	Fireman	90	Burned by escaping steam when valve to injector steam pipe blew out at turret.
(362)	10-13	Bowie	S-d	2-866	45	3	F.W.Killmer	Brakeman	11	Lost balance and fell against end of car while releasing hand brake.
(363)	10-19	Hyder	S-c	902	54	Standing	H.A.Harrington	Fireman	60	Lost balande and fell to ground while taking water.
(364)	12-8	Coolidge	S-j	1-903	62	8	H.Showers	Brakeman	9	Stepped on piece of ballast and turned ankle.
(365)	12-9	Normal Jct.	S-d	X-2295-E	5	Standing	W.F.McNeley	Brakeman	90	Lost balance and fell to ground releasing hand brakes.
(366)	12-20	Palo Verde	S-g	901	53	6	E.V.Shaw	Brakeman	7	Slipped on piece of ballast getting off car.
(367)	12-29	Willcox	#M-b	866	57	10	R.T.Quint	Brakeman	7	Thrown against stove when engineer applied brakes in emergency when main rod strap broke.
	1933						YEAR 1933			
(368)	1-11	Picacho	#S-j	903	62	25	G.B.Palmer	Conductor	28	Conductor claims heavy slack action on rear threw him against cupola steps.
(369)	1-18	Cazador	#S-j	X-5011-W	67	25	C.A.Sorrells	Conductor	16	Thrown from his chair to floor when engineer made emergency application of brakes when he incorrectly believed engine had passed over broken rail.
(370)	1-21	Gila	S-j	X-3625-W	54	7	D.Glover	Brakeman	20	Struck by swinging door of car in train.
(371)	2-6	Tucson-Picacho	S-j	903	63	Unknown	J.M.Hamilton	Brakeman	4	Hot sand in eye.
(372)	2-26	Casa Grande	S-j	X-3307-W	66	Standing	C.A.Boyd	Brakeman	20	Slipped on cupola step in caboose.
(373)	6-14	Bowie	S-c	X-3752-W	67	Standing	M.J.Brady	Fireman	20	Slipped and fell on engine tender.
(374)	6-28	Benson	S-g	X-5027-W	68	15	R.T.Quint	Conductor	14	Struck knee on caboose step boarding train.
(375)	7-22	Maricopa	#S-g	X-3317-W	66	9	W.E.Williams	Brakeman	9	Slack ran out as brakeman boarded caboose straining pelvis.
(376)	7-30	Red Rock	S-g	854	62	12	D.Glover	Brakeman	10	Strained foot stepping on piece of ballast when alighting from train.
(377)	9-18	Pima	S-g	X-2757-W	9	7	B.R.Tolson	Conductor	30	Lost hand hold and fell to ground attempting to board caboose.
(378)	9-25	Wasacyampa	S-j	902	70	Standing	R.A.Joiner	Brakeman	Killed	Stepped from caboose and fell from bridge to ground below.
(379)	10-16	Tombstone	S-j	944	5	Standing	C.A.Boyd	Brakeman	8	Gangplank slipped while unloading freight.
(380)	10-28	Hyder	#S-j	901	39	4	L.A.Webb	Brakeman	14	Thrown against side of car on which he was riding when train parted due to broken knuckle.
	1934						YEAR 1934			
(381)	1-2	Casa Grande	S-g	856	25	Standing	R.E.Johnson	Engineer	6	Stepped on small rock getting off engine.
(382)	1-8	Bowie	S-b	3-862	38	Standing	R.G.Stead	Brakeman	20	Coupling air hose, hose flew up and struck hand.
(383)	2-15	Bowie	S-g	X-5029-W	49	6	W.A.Clelland	Conductor	30	Turned ankle getting off train.
(384)	3-8	Bisbee Jct.	S-i	X-5033-E	45	6	R.A.Powers	Conductor	Killed	Fell under train attempting to get on.
(385)	4-29	Curve	S-j	1-862	70	14	C.H.Warner	Fireman	14	Sand in eye.
(386)	5-5	Tempe	S-j	X-1833-E	39	Standing	W.T.Means	Conductor	20	Fell from running board of car.
(387)	6-15	Benson	S-g	3-866	70	Standing	W.L.Slack	Brakeman	4	Turned ankle on rock when alighting from train.
(388)	6-15	Mohawk	S-g	X-3618-W	64	10	R.H.Reece	Brakeman	45	Lost hand hold on car and jumped or fell down an embankment.
(389)	6-21	Gila	S-c	854	70	Standing	J.B.Gandy	Engineer	7	Scalded by hot water from squirt hose.
(390)	7-10	Yuma	S-g	2-848	64	10	E.O.Fredericks	Brakeman	23	Missed hand hold and fell to ground attempting to board caboose of train.
(391)	7-22	Tucson	S-d	903	46	Standing	H.E.Richardson	Brakeman	90	Fell from top of car to ground while releasing hand brake.
(392)	8-17	Bowie	S-d	X-5002-W	51	2	H.F.Huse	Brakeman	60	Fell from car while releasing hand brake.
(393)	8-28	Vail	S-c	X-5003-W	45	Standing	A.L.Vogel	Engineer	15	Scalded by hot water from squirt hose.
(394)	9-8	Joan	S-g	901	33	Standing	E.R.Barnes	Brakeman	11	Fell to ground while descending from car.
(395)	10-3	Tucson	S-d	864	58	Standing	E.J.Durnil	Brakeman	18	Wrenched back releasing hand brake.
(396)	11-27	Dragoon	#S-j	X-5006-W	64	10	A.S.McNeece	Brakeman	30	Fell when climbing into cupola account slack action.

- caused from sudden stopping, starting, lurch, or jerk of car or train.

ITEM NO.	DATE (1)	LOCATION (2)	I.C.C. CLASS (3)	TRAIN NUMBER (4)	NO. CARS IN TRAIN (5)	SPEED M.P.H. (6)	PERSON INJURED NAME (7)	PERSON INJURED OCCUPATION (8)	ESTIMATED DISABILITY (Days) (9)	DESCRIPTION OF ACCIDENT (10)
	1935						YEAR 1935			
(397)	2-2	Tyson	S-g	902	57	4	R.N.Barker	Brakeman	22	Foot slipped off tie as about to board engine pilot.
(398)	3-10	Bowie	S-j	X-5012-W	66	2	T.A.McLaney	Brakeman	24	Slack action as train coming to a stop caused brakeman to lose his balance while going over top of caboose, falling to ground.
(399)	3-20	Tucson	S-g	1-862	70	8	O. Shaw	Conductor	286	Unknown - either getting off car, lost balance, or struck by some object and knocked off.
(400)	3-25	Yuma	S-j	2-842	62	6	J.E.Bourion	Engineer	7	Sand blew in eye.
(401)	3-31	Tovrea	S-j	903	44	Standing	B.R.Blanton	Brakeman	7	Tool box lid on engine dropped on fingers.
(402)	4-12	Dragoon	S-j	X-5046-W	66	30	J.H.Alspbrook	Conductor	4	Undesired emergency when automatic air applied due to defective triple, train parted 20th car from engine.
(403)	5-19	Maricopa	S-c	2-856	69	20	R. I. Hill	Fireman	9	Train parted and derailed account broken arch bar 2nd car from caboose, rough stop caused fireman to scald himself with boiler compound he was mixing on deck of engine.
(404)	6-12	Bowie	S-d	X-5030-W	66	Standing	C.T.Simmons	Brakeman	8	Claims hand brake released suddenly throwing man off car.
(405)	6-18	Gila	S-g	X-3615-W	68	8 to 10	R. E. Fuchs	Brakeman	10	Burst blood vessel in leg getting off engine.
(406)	6-26	Tucson	S-d	X-5016-W	70	Standing	W.C.Ritchie	Brakeman	12	Tightening up hand brake on car, brake suddenly released.
(407)	6-30	Vail	S-j	X-5023-W	53	30	R.E.Brannon	Brakeman	5	Flying particle of sand blew into brakeman's eye while on top of train.
(408)	7-11	Naco	S-j	X-5034-W	68	Standing	F.W.Holmes	Sta.Laborer	50	Assisting in closing box car door, caught finger between hook and lever.
(409)	7-19	Wellton	S-j	1-844	57	3	W.A.Moores	Brakeman	30	Air hose blew off tender of engine causing emergency stop throwing brakeman who was on caboose steps against corner of the caboose.
(410)	7-30	Nogal	S-d	X-5027-W	66	4	A.H.Weathers	Brakeman	4	Claims releasing hand brakes on car with club, brake released suddenly, club jerking from hand striking him on head.
(411)	7-31	Benson	S-c	1-866	65	Standing	C.W.Richardson	Engineer	34	Attempting replace cable on pulley at water column, hand caught under pulley and cable.
(412)	7-31	Aztec-Waggish	S-j	1-848	70	25	V. L. Cole	Brakeman	21	Getting down into cab rack, hobo lurched against brakeman, causing him to fall.
(413)	9-27	Casa Grande	S-g	854	70	Standing	T.A.McLaney	Brakeman	19	Turned ankle on slag ballast when getting off car in train
(414)	9-28	Bisbee Jct.	S-j	962	29	3	M.J.O'Brien	Brakeman	66	Attempting to control movement of two coupled detached cars by manipulating angle cock on one of the cars, when angle cock opened air hose flew up and struck left arm.
(415)	10-10	Yuma	S-g	824	70	Standing	J.R.Birmingham	Investigator	20	Foot slipped off ladder when getting down off car in train.
(416)	10-26	Yuma	S-j	901	58	Standing	W.H.McDowell	Brakeman	31	Foot slipped off pilot beam of engine while removing jack preparatory to returning it to caboose.
(417)	12-24	Kendall	S-g	X-2447-E	54	3	J. C. Jones	Brakeman	6	Fell from trestle when getting off train.
(418)	12-28	Coolidge	S-j	903	66	4	R.W.H.Chalmers	Brakeman	6	Claims foot slipped off step of car account step oily.
1933							YEAR 1936			
(419)	1-21	San Simon	S-j	X-5031-W	66	10	O.H.Hedmarie	Conductor	20	Stumbled and fell to knees when stepped in small depression on ground.
(420)	2-6	Somerton	S-j	X-1643-W	8	10	R.D.Phillipson	Brakeman	5	Shoved hand through cupola window glass attempting to open a window.
(421)	2-19	Vail	S-g	X-5017-W	54	8	W.L.Witthopp	Brakeman	45	Lost footing and fell detraining from locomotive.
(422)	2-29	San Simon	S-c	X-3323-W	44	20	R. C. Schultz	Fireman	14	Struck hand against tool box when lost balance lifting manhole cover on engine tank.
(423)	2-29	Douglas	S-c	964	45	Standing	R.E.L.Fogle	Fireman	15	Caught finger between pinch bar and cross-head of locomotive.
(424)	3-5	Litchfield	S-j	901	63	Standing	D.E.Lewis	Brakeman	4	Fell while walking alongside train account catching foot in bailing wire laying alongside track

(406)	6-26	Tucson	S-d	X-5016-W	70	Standing	W.C.Ritchie	Brakeman	12	Tightening up hand brake on car, brake suddenly released.
(407)	6-30	Vail	S-j	X-5023-W	53	30	R.E.Brennan	Brakeman	5	Flying particle of sand blew into brakeman's eye while on top of train.
(408)	7-11	Naco	S-j	X-5034-W	68	Standing	F.W.Holmes	Sta.Laborer	50	Assisting in closing box car door, caught finger between hook and lever.
(409)	7-19	Wellton	S-j	1-844	57	3	W.A.Mucmoe	Brakeman	30	Air hose blew off tender of engine causing emergency stop throwing brakeman who was on caboose steps against corner of the caboose.
(410)	7-30	Benson	S-d	X-5027-W	66	4	A.H.Weathers	Brakeman	4	Claims releasing hand brakes on car with club, brake released suddenly, club jerking from hand striking him on head.
(411)	7-31	Benson	S-c	1-866	65	Standing	C.W.Richardson	Engineer	34	Attempting replace cable on pulley at water column, hand caught under pulley and cable.
(412)	7-31	Aztec-Muggins	S-j	1-848	70	25	V. L. Cale	Brakeman	21	Getting down into coke rack, hobo lurched against brakeman, causing him to fall.
(413)	9-27	Casa Grande	S-g	854	70	Standing	T.A.Holaday	Brakeman	19	Turned ankle on slag ballast when getting off car in train
(414)	9-28	Bisbee Jct.	S-j	962	29	3	M.J.O'Brien	Brakeman	66	Attempting to control movement of two coupled detached cars by manipulating angle cock on one of the cars, when angle cock opened air hose flew up and struck left arm.
(415)	10-10	Yuma	S-g	824	70	Standing	J.R.Birmingham	Investigator	20	Foot slipped off ladder when getting down off car in train.
(416)	10-26	Yuma	S-j	901	58	Standing	W.H.McDowell	Brakeman	31	Foot slipped off pilot beam of engine while removing jack preparatory to returning it to caboose.
(417)	12-24	Kendall	S-g	X-2447-E	54	3	J. C. Jones	Brakeman	6	Fell from trestle when getting off train.
(418)	12-28	Coolidge	S-j	903	66	4	R.W.M.Chalmers	Brakeman	6	Claims foot slipped off step of car account step oily.
1933						YEAR 1936				
(419)	1-21	San Simon	S-j	X-5031-W	66	10	O.M.Medearis	Conductor	20	Stumbled and fell to knees when stepped in small depression on ground.
(420)	2-6	Somerton	S-j	X-1643-W	8	10	R.D.Phillipsen	Brakeman	5	Shoved hand through cupola window glass attempting to open a window.
(421)	2-19	Vail	S-g	X-5017-W	54	8	W.L.Witthopp	Brakeman	45	Lost footing and fell detraining from locomotive.
(422)	2-29	San Simon	S-c	X-3323-W	44	20	R. C. Schultz	Fireman	14	Struck hand against tool box when lost balance lifting manhole cover on engine tank.
(423)	2-29	Douglas	S-c	964	45	Standing	R.E.L.Fogle	Fireman	15	Caught finger between pinch bar and cross-head of locomotive.
(424)	3-5	Litchfield	S-j	901	63	Standing	D.E.Lewis	Brakeman	4	Fell while walking alongside train account catching foot in bailing wire laying alongside track.
(425)	4-11	Chandler	S-j	X-1835-W	33	Standing	R. Orquidez	L.G.Laborer	4	Caught hand between tie and car while distributing ties from car.
(426)	5-9	Phoenix	S-i	901		Standing	D.B.Ross	Conductor	Killed	Struck and run over while cleaning train by cut of 18 cars handled by yard engine moving 12 miles per hour.
(427)	6-27	Arizola	S-j	X-3310-W	65	38	G.B.McClellan	Engineer	9	Foreign particle blew in eye.
(428)	7-3	Amole	S-j	5/866	70	20	E. Smith	Fireman	4	Hot sand in eye.
(429)	7-6	Kim	S-j	X-2432-W	65	4	R.M.Barker	Brakeman	56	Thrown in caboose by slack action as train entering siding.
(430)	7-14	Bisbee Jct.	S-d	X-5035-W	60	4	D.M.Richards	Brakeman	20	Strained shoulder releasing hand brake.
(431)	7-15	Aztec	S-c	X-3647-W	54	Standing	E. Seale	Fireman	9	Fell from engine tender to ground when spout hook slipped off.
(432)	7-15	Yuma	S-i	X-2518-W	59	8	L.L.Williams	Brakeman	Killed	Struck and run over by his own engine moving on adjacent track.
(433)	8-27	Tucson	S-j	X-5034-W	64	15	A.S.McNeece	Conductor	12	Thrown against rear ladder of caboose when slack ran out as train was stopping
(434)	10-31	Buchan	S-j	858	57	3	W.T.Williams	Brakeman	20	Thrown against cupola steps by slack action.
(435)	11-7	Tovrea	S-g	903	25	8	C.A.Bower	Brakeman	12	Stepped on piece of slag and turned ankle detraining from engine.
(436)	11-7	Tucson	S-j	X-3384-W	35	Standing	G.B.Frey	Conductor	90	Caught hand between car and grab iron crossing over between cars.
(437)	12-4	Picacho	S-j	857	60	10	A.H.Weathers	Brakeman	15	Claims strained groin regulating vent on car.
(438)	12-6	Yuma	S-c	X-1643-W	None at time	Standing	H.C.Richardson	Fireman	14	Slipped on tool box of engine tank and fell to ground.
(439)	12-23	Clifton	S-g	952	1	Standing	C.A.Allen	Brakeman	10	Stepped on small rock and sprained ankle detraining from car.
(440)	12-23	Dock	S-j	3-904	30	35	J.C.Johnson	Brakeman	4	Foreign particle in eye.

= caused from sudden stopping, starting, lurch or jerk of car or train

ITEM NO.	DATE (1)	LOCATION (2)	I.C.C. CLASS (3)	TRAIN NUMBER (4)	NO. CARS IN TRAIN (5)	SPEED M.P.H. (6)	PERSON INJURED NAME (7)	OCCUPATION (8)	ESTIMATED DISABILITY (Days) (9)	DESCRIPTION OF ACCIDENT (10)
1937							YEAR 1937			
(441)	1-9	Bowie	MS-j	3-864	63	1	J.J.Ellis	Conductor	5	Thrown against cupola steps when train was stopping.
(442)	1-14	Tucson	S-j	1-845	51	Standing	J.D.Phillips	Brakeman	3	Slipped off edge of car roof to ground.
(443)	1-15	Tucson	S-d	X-3617-E	44	Standing	C.F.Hand	Brakeman	4	Slipped and fell on frosty car roof while releasing hand brake.
(444)	1-6	Yuma	MS-j	X-3313-W	66	5	C.D.Quinn	Brakeman	8	Thrown against rear door of caboose by undesired emergency application of brakes.
(445)	2-19	Estrella	S-j	X-3627-E	67	40	F.W.Scott	Brakeman	4	Particle of sand in eye.
(446)	3-1	Montezuma	S-j	901	57	Standing	E.V.Shaw	Conductor	23	Caught finger between piece of freight and door frame.
(447)	3-23	San Simon	S-j	1-866	55	25	W.C.Alexander	Brakeman	20	Fell on slippery load of piling.
(448)	4-11	Globe	S-d	X-2583-E	71	Standing	H.D.Ball	Brakeman	30	Back of hand struck by brake club while releasing hand brake.
(449)	4-12	Calumet	S-j	X-3305-W	61	4	C.W.Birks	Brakeman	4	Thrown against end ladder by sudden stop during switching move.
(450)	4-16	Tucson	S-d	X-3301-W	60	Standing	H.P.Likes, Jr.	Brakeman	3-1/2	Lost balance and fell to ground releasing hand brake.
(451)	5-10	Picacho	S-j	X-2432-E	41	15	Mrs.J.E.Godwin	Telegrph.	9	Foreign particle in eye while handing up orders to train
(452)	5-17	Blaisdell	S-j	4-841	50	Standing	A.J.Brown	Brakeman	7	Stepped on small rock and sprained ankle.
(453)	5-22	Bosque	S-j	1-843	62	25	E. Bradley	Brakeman	30	Fell from moving train.
(454)	6-17	Picacho	MS-j	4-856	68	10	F.H.Beerse	Brakeman	4	Fell from steps of caboose when slack ran out.
(455)	6-20	Picacho	SC	3-856	60	Standing	J.W.Mickey	Fireman	25	Burned foot by spilling hot compound.
(456)	6-26	Bowie	S-j	X-5042-W	59	10	W.A.Moores	Conductor	30	Fell from top of car in moving train.
(457)	7-5	Jaynes	MS-j	X-5022-W	65	35	V.R.Murray	Brakeman	4	Thrown against inside frame of cupola by undesired emergency.
(458)	7-6	Red Rock	S-j	903	50	40	M.S.Thompson	Brakeman	Killed	Fell from top of moving train.
(459)	7-21	Gila	S-g	856	53	8	C.A.Boyd, Jr.	Brakeman	14	Stepped on rock and sprained ankle detraining from caboose.
(460)	7-22	Aztec	S-g	X-2837-E	67	10	G.R.Tinsley	Brakeman	14	Slipped on small rock and fell spraining arm and shoulder when boarding caboose.
(461)	8-22	Dixie	S-j	901	67	12	C.L.Cain	Conductor	9	Fell from car to ground when brake wheel unexpectedly released due to defect.
(462)	9-3	Mohawk	S-j	X-3372-W	65	35	C.H.Sellars	Fireman	4	Hot sand in eye.
(463)	10-12	Litchfield	S-j	X-1833-W	5	1	H.W.Holley	Brakeman	30	Stepped off end of car and fell to ground.
(464)	10-12	Tacna	S-j	3-841	47	Standing	W.W.Pettie	Conductor	8	Finger caught between brake club and truck frame while wiring up brake beam.
(465)	10-16	Wellton	S-j	902	62	Standing	F.E.Gray	Brakeman	5	Foot struck by rebounding running board.
(466)	10-21	Yuma	MS-j	X-5025-E	12	12	O.C.Klaus W.H.Mausman	Conductor Brakeman	30 Permanent	Thrown in caboose on account of undesired emergency as train was being brought to a stop.
(467)	11-3	Fairbank	S-j	941	10	Standing	S.W.Shockley	Conductor	42	Lost balance and fell from top of a water car to ground.
(468)	11-8	Benson	S-g	1-866	69	15	F.W.Killmer	Conductor	30	Stumbled and fell on highway crossing detraining from caboose.
(469)	11-9	Globe	S-d	X-2757-E	10	Standing	C.L.Bishop	Brakeman	30	Struck by flying brake club while releasing hand brake.
(470)	11-10	Coolidge	S-j	X-1825-W	11	8	R.E.Kelly	Brakeman	30	Thrown to ground from caboose when it made hard coupling with standing cars.
(471)	11-30	Corta	S-j	X-3301-E	30	18	D.W.Richards	Brakeman	4	Foreign object in eye.
(472)	12-15	Benson	MS-j	X-5009-W	66	15	A.P.Leirce, T.E.Nolen	Brakeman Brakeman	14 19	Trainmen thrown in caboose by sudden stop caused by train parting due to defective draw bar.
(473)	12-24	Tucson	MS-j	X-5026-W	70	8	B.F.VanHorn	Conductor	40	Thrown from side of car when train backing up broke in two
1938							YEAR 1937			

(457)	7-5	Jaynes	S-j	X-5022-W	65	35	V.R.Murray	Brakeman	4	Thrown against inside frame of cupola by undesired emergency.
(458)	7-5	Red Rock	S-j	903	50	40	M.S.Thompson	Brakeman	Killed	Fell from top of moving train.
(459)	7-21	Gila	S-g	856	53	8	C.A.Boyd, Jr.	Brakeman	14	Stepped on rock and sprained ankle detraining from caboose.
(460)	7-21	Aztec	S-g	X-2837-W	67	10	G.R.Tinsley	Brakeman	14	Slipped on small rock and fell spraining arm and shoulder when boarding caboose.
(461)	8-22	Dixie	S-j	901	67	12	C.L.Cain	Conductor	9	Fell from car to ground when brake wheel unexpectedly released due to defect.
(462)	9-5	Mohawk	S-j	X-3322-W	65	35	C.H.Sellars	Fireman	4	Hot sand in eye.
(463)	10-12	Litchfield	S-j	X-1833-W	5	1	H.W.Holley	Brakeman	30	Stepped off end of car and fell to ground.
(464)	10-12	Tacna	S-j	3-841	47	Standing	T.W.Pettis	Conductor	6	Finger caught between brake club and truck frame while wiring up brake beam.
(465)	10-16	Wellton	S-j	902	62	Standing	F.D.Grey	Brakeman	5	Foot struck by rebounding running board.
(466)	10-21	Yuma	S-j	X-5025-E	12	12	O.C.Klaus W.H.Hauseman	Conductor Brakeman	30 Permanent	Thrown in caboose on account of undesired emergency as train was being brought to a stop.
(467)	11-3	Fairbank	S-j	941	10	Standing	S.W.Shockley	Conductor	42	Lost balance and fell from top of a water car to ground.
(468)	11-8	Benson	S-g	1-866	69	15	F.W.Killmer	Conductor	30	Stumbled and fell on highway crossing detraining from caboose.
(469)	11-9	Globe	S-d	X-2757-E	10	Standing	C.L.Bishop	Brakeman	30	Struck by flying brake club while releasing hand brake.
(470)	11-10	Coolidge	S-j	X-1825-W	11	8	R.E.Kelly	Brakeman	30	Thrown to ground from caboose when it made hard coupling with standing cars.
(471)	11-30	Corts	S-j	X-3301-E	30	18	D.M.Richards	Brakeman	4	Foreign object in eye.
(472)	12-15	Benson	S-j	X-5009-W	66	15	A.P.Peirce, T.E.Nolen	Brakeman Brakeman	14 19	Trainmen thrown in caboose by sudden stop caused by train parting due to defective draw bar.
(473)	12-24	Tucson	S-j	X-5026-W	70	8	B.F.VanHorn	Conductor	40	Thrown from side of car when train backing up broke-in-two
1938				YEAR 1938						
(474)	1-15	Nogales	S-d	871	45	Standing	A.H.Weathers	Brakeman	30	Wrenched arm when hand brake released unexpectedly.
(475)	1-28	Clifton	S-g	952	5	4	J.F.Hickman	Conductor	10	Thrown to ground account failure to get clear when detraining from car.
(476)	2-20	Piedra	S-j	X-3113-W	66	Standing	V.J.Krupp	Brakeman	30	Caught finger between chain hook and drain of arch bar truck.
(477)	2-23	Somerton	S-g	X-1624-W	11	8	W.J.Bernard	Brakeman	30	Slipped on gravel and fell detraining from caboose.
(478)	2-24	Picacho	S-j	X-3618-W	65	35	W.C.Ritchie	Brakeman	Killed	Fell from gangway of engine.
(479)	3-29	Yuma	S-i	X-1721-W	48	Standing	W.A.Franks	Conductor	Died	Struck and run over by car handled by yard engine.
(480)	4-3	Harqua	S-j	902	45	4	R.E.McCullar	Brakeman	14	Slipped on piece of slag rounding the shop switch.
(481)	6-13	Tucson	C-h	X-3613-W	65	3	C.A.Bruce	Conductor	7	Two cars uncontrolled in switching movement collided with rear of train as it was leaving yard.
(482)	6-17	Wescal	S-j	3-866	68	3	L.F.Brown	Brakeman	3	Thrown against end ladder of caboose by slack action during back-up movement of train.
(483)	6-22	Gila	S-j	X-3636-W	70	8	G.O.Brockmiller	Conductor	8	Flying particle entered eye.
(484)	7-2	Yuma	S-j	2-842	70	Standing	C.Bryan	Conductor	8	Stepped on some object on ground and turned an ankle.
(485)	7-3	Douglas	S-g	X-5000-W	50	10	P.J.Savage	Brakeman	45	Stumbled and fell detraining from car.
(486)	7-11	Forrest	S-j	962	67	Standing	A.A.Crenshaw	Brakeman	4	Fell from caboose platform to ground while adjusting marker.
(487)	7-30	Tucson	S-d	962	24	Standing	W.F.Kelley	Brakeman	Died	Fell from car to ground when struck by brake club as hand brake released unexpectedly.
(488)	8-5	Mohawk	D-e	X-3612-W	66	35	A.V.Beaman	Conductor	6	Thrown in caboose by sudden stop due to derail set of empty car next ahead of caboose.
(489)	8-19	Casa Grande	S-e	1-852	67	Standing	E. Nail	Brakeman	5	Sprained shoulder when switch rod struck in face.
(490)	10-3	Dragoon	S-e	Frt. Helper	None at time	Standing	G.J.Dorsey	Fireman	14	Strained elbow throwing switch.
(491)	10-9	Willcox	S-j	4-845	47	Standing	J.F.Hendrix	Conductor	30	Slipped and fell on slag ballast while walking alongside train.
(492)	10-27	Yuma	S-e	2-842	68	Standing	E.F.Taylor	Fireman	0	Fell from front end of locomotive while putting up injunctions
(493)	12-18	Bowie	S-d	X-5006-W	64	4	H.Showers	Brakeman	21	Trainman's foot struck when hand brake released unexpectedly.

= caused from sudden stopping, starting, lurch or jerk of car or train

ITEM NO.	DATE (1)	LOCATION (2)	I.C.C. CLASS (3)	TRAIN NUMBER (4)	NO. CARS IN TRAIN (5)	SPEED M.P.H. (6)	PERSON INJURED NAME (7)	PERSON INJURED OCCUPATION (8)	ESTIMATED DISABILITY (Days) (9)	DESCRIPTION OF ACCIDENT (10)
1939										
(494)	2-2	Tucson	S-c	Detached engine	None	Standing	H. M. Flais	Fireman	30	Twisted wrist when wrench slipped replacing plug in blow-off cock.
(495)	2-19	Maricopa	S-c	1-856	62	Standing	H. S. Hall	Fireman	30	Fell off engine tender to ground while taking water.
(496)	3-4	Castilla	S-j	X-3634-W	66	40	T. P. King	Brakeman	30	Fell from gangway of engine to ground.
(497)	3-17	Ochoa	S-j	1-864	61	20	W.H.McDowell	Brakeman	6	Slipped and fell stepping from low to high car while walking over train.
(498)	3-28	Ft. Huachuca	S-d	942	10	Standing	C. R. Evans	Brakeman	14	Lost balance while setting hand brake and fell against ties loaded on flat car.
(499)	3-30	Theba	S-a	X-3643-W	64	1	C.L.Mathews	Brakeman	21	Claims pin dropped and caught hand when adjusting knuckle on car.
(500)	4-4	Maco	S-d	X-3611-W	70	Standing	H. E. Birch	Brakeman	60	Fell from top of car to ground while preparing to set hand brake.
(501)	5-9	Tovrea	S-g	X-17524E	7	Standing	R. E. Kelly	Brakeman	7	Sprained ankle when stepped on loose rock alighting from caboose.
(502)	6-2	Montrose	S-g	X-3743-W	65	8	O.N.Smyth	Brakeman	21	Sprained right knee when stepped in hole attempting to board engine.
(503)	6-2	Mescal-Benson	β S-j	2-864	69	Unknown	F.B.Austin	Bus.Car Chef	20	Claimed that jerk of train threw him against range oven door.
(504)	6-28	Wellton	S-j	902	53	1	L.W.Milligan	Brakeman	Killed	Fell between moving cars and run over during switching move.
(505)	7-22	Sentinel	S-g	3-842	70	1	A. J. Brown	Brakeman	10	Turned ankle on slag ballast when boarding car in train.
(506)	7-23	Bowie	β S-j	X-5003-W	70	1	O. C. Boone	Brakeman	180	Claims that as train started slack action or jerk of train caused him to fall from car to ground.
(507)	7-30	Arlington	β S-j	902	59	Unknown	R. A. Green	Brakeman	30	Either thrown or fell down in caboose.
(508)	7-31	Don Luis	S-g	X-3406-E	20	10	Jack Gray	Brakeman	15	While attempting to board engine, slipped on wet ground and fell against engine.
(509)	8-11	Mohawk	β S-j	X-3617-W	70	4	I. C. Allen	Conductor	45	Thrown in caboose when engineer made quick stop to avoid running through switch.
(510)	10-16	Fortuna	S-j	X-3617-E	38	Standing	A. Palacio	Sec.laborer	14	Caught finger in dump car door.
(511)	10-17	Maco	β S-j	962	51	8	F. A. Lassen	Brakeman	10	Thrown against car when adjustment of slack occurred backing 20 cars to coupling with train standing on main track.
(512)	10-27	Gila	S-c	1-854	68	20	F. G. Welch	Fireman	14	Fell against front of engine tender while sanding flues.
(513)	11-7	Ft. Huachuca	S-d	943	4	Standing	I. L. Bell	Conductor	180	Fell from top of car to ground apparently while operating hand brake.

β = caused from sudden stopping, starting, lurch or jerk of car or train

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

DETAIL OF CASUALTIES TO ALL CLASSES OF EMPLOYES ON DUTY, SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS
ROAD FREIGHT TRAIN OPERATION
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION

STATE OF ARIZONA

ITEM NO.	DATE (1)	LOCATION (2)	I.C.C. CLASS (3)	TRAIN NUMBER (4)	NO. CARS IN TRAIN (5)	SPEED M.P.H. (6)	PERSON INJURED NAME (7)	PERSON INJURED OCCUPATION (8)	ESTIMATED DISABILITY (DAYS) (9)	DESCRIPTION OF ACCIDENT (10)
	1940						YEAR 1940			
(514)	2-23	Tucson	S-d	X-3643-#	60	Standing	W.R.Eaton	Brakeman	21	Fell from top of standing car apparently when setting hand brake.
(515)	3-16	Dragoon	S-j	2-862	70	3	W.C.Alexander	Brakeman	45	Brakeman on top of caboose injured when train made rough coupling to caboose.
(516)	4-4	Dixie	S-g	901	67	Standing	J.C.Slade	Brakeman	25	Stepped on slag and turned ankle getting off standing car.
(517)	4-11	Laneha	S-g	1-866	64	Standing	W.G.Old	Brakeman	5	Turned and sprained ankle on loose slag when alighting from caboose.
(518)	4-12	Gila	S-g	X-3714-#	91	8	G.M.Barringer	Brakeman	60	Fell across rail when stepped on slag ballast alighting from caboose which was detached from train and being handled along by engine.
(519)	5-3	Wymola	S-j	904	47	6	J.S.Hardwicke	Brakeman	20	Claims fell over piece of slag or rock while running to get on caboose striking knee on tie.
(520)	5-14	Bowie	S-g	2-866	69	2	J.K.Bragg	Brakeman	6	When alighting from engine stepped on piece of slag, turned ankle.
(521)	5-28	Fort Huachuca	S-d	943	7	Standing	C.C.Bratton	Brakeman	30	Struck by ratchet brake lever handle when hand brake suddenly released.
(522)	6-3	Red Rock	S-j	X-3663-#	56	8	W.H.Gladden	Conductor	6	Slack action in train injured conductor on rear platform of caboose.
(523)	6-6	Red Rock	S-j	904	35	Standing	C.R.McGowan	Fireman	10	When shoving water spout into manhole on tank, foot slipped in between boards.
(524)	6-15	Gila	S-j	X-3742-#	63	8	T.O.Lowe	Brakeman	90	Fell from top of car in switching movement.
(525)	6-22	Yuma	S-j	3-841	66	8	D.R.Mills	Brakeman	60	Leg caught between cab and tender.
(526)	7-17	Benson	S-g	3-866	55	Standing	J.Gray	Brakeman	14	Stepped on piece of broken glass bottle alighting from engine.
(527)	9-17	Tucson	S-j	2-864	70	Standing	H.N.Riesgo	Car Inspr	14	Struck by hatch plug which dropped off of top of car.
(528)	10-23	Cashion	S-g	901	68	4	J.W.Vance	Brakeman	4	Jumped from side of car as it went over derail.
(529)	11-8	Tanque	S-j	883	49	Standing	J.F.Stubblefield	Fireman	5	Missed step and fell against footboard of tender.
(530)	11-10	Buckeye	S-j	901	37	Standing	C.C.Pennington	Conductor	15	Heavy crate on truck became unbalanced and fell against man wheeling truck.
(531)	12-23	Fairbank	S-j	964	69	5	M.I.Schetter	Brakeman	5	Stepped in opening between running boards of engine tender.

= caused from sudden stopping, starting, lurch, or jerk of car or train

Defendant's Exhibit No. 275 (Witness J.J. Sullivan)
Feb. 6, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

DETAIL OF CASUALTIES TO ALL CLASSES OF EMPLOYES ON DUTY, SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS,
ROAD FREIGHT TRAIN OPERATION
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939 INCLUSIVE

STATE OF NEVADA

ITEM NO.	DATE (1)	LOCATION (2)	I.C.C. CLASS (3)	TRAIN NUMBER (4)	NO. CARS IN TRAIN (5)	SPEED M.P.H. (6)	PERSON INJURED NAME (7)	PERSON INJURED OCCUPATION (8)	ESTIMATED DISABILITY (Days) (9)	DESCRIPTION OF ACCIDENT (10)
	1923							YEAR 1923		
(1)	1-26	Oreana	S-j	L-2707-W	54	Standing	J. S. Regan	Brakeman	4	Bar slipped and struck eye while jacking down car.
(2)	2-2	Big Canyon	S-g	183	25	10	C. J. Baker	Brakeman	10	Slipped and strained arm getting on caboose.
(3)	3-6	Elbur:	FS-j	L-2793-W	50	1 to 2	H. R. Lloyd	Brakeman	5	Engineer applied brakes in emergency to avoid running over derail, run-in of slack threw brakeman against end of caboose.
(4)	3-13	Lovelock	FS-j	280	58	8	F. E. B. Gates	Conductor	15	Engine parted from train, sudden stop threw conductor to floor of caboose.
(5)	3-15	Carlin	S-b	L-2831-W	15	Just moved	G. E. Long	Car Inspr	60	Road engine and 2 cars coupled to train, ran over foot of car-inspector coupling air hose.
(6)	5-7	Montello	S-d	L-2546-W	2	4	H. King	Brakeman	21	Sudden stop while setting hand brakes when cars coupled to others, caused him to fall to ground.
(7)	6-17	Derby	S-j	L-2829-E	10	Standing	J. F. May	Brakeman	5	Fell from platform while trucking freight.
(8)	7-8	Granite Point	FS-b	L-2577-W	85	3	G. W. Roberts	Brakeman	15	Sudden stop due to undesired emergency threw brakeman against cupola window.
(9)	7-10	Wells	S-g	3-276	69	6	D. W. Tanner	Brakeman	6	Stepped in hole alighting from train.
(10)	7-12	Vista	S-j	L-1795-E	30	Standing	C. J. Baker	Brakeman	5	Struck by piece of wood to which train orders were attached.
(11)	7-12	Mesel	FS-j	L-2836-W	85	15	C. B. Hill	Brakeman	8	Sudden stop due to undesired emergency, threw brakeman against cupola of caboose.
(12)	7-23	Parran	S-j	L-2565-W	48	Standing	R. Dalgar	Brakeman	14	Stepped on rock or in hole and fell.
(13)	8-4	Oreana	S-j	L-2595-W	56	8	A. W. Parker	Brakeman	15	Fell from train when struck by rock thrown by trespasser.
(14)	8-10	Montel	S-j	1-280	1	4	D. J. Antista	Brakeman	30	Foot caught between engine step and pair of wheels.
(15)	8-19	Imlay	C-h	L-2793	1	7 to 10	A. C. Bailey W. A. Truesdale	Conductor Brakeman	30 20	Engine collided with caboose while switching.
(16)	8-21	Thisbe	S-c	1-276	55	30	W. E. Bissell	Engineer	9	Foot caught between reverse lever and foot rest.
(17)	8-21	Elko	S-d	L-1752-W	20	Standing	J. H. Rothlisa	Brakeman	8	Lost balance and fell to ground while releasing hand brake.
(18)	8-24	Hazen	S-g	L-2534-E	42	2	E. L. Kelly	Brakeman	10	Slipped and fell to ground getting off car.
(19)	9-1	Comus	S-i	L-2535-W	47	30	J. Gonzales	Sec. Lab.	20	Struck by train.
(20)	9-13	Moor	FS-j	L-3200-W	49	3	C. A. Johnson	Brakeman	15	Train parted due to knuckle breaking on first car; sudden stop threw brakeman against cupola steps.
(21)	9-25	Elko	FS-j	L-3222-W	50	3 to 4	F. C. Snooks O. O. Turner	Conductor Brakeman	30	Emergency application of brakes by engineer due to [illegible]

	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	engine parted from train, sudden stop threw conductor to floor of caboose.
(5)	3-15	Carlin	S-b	L-2831-W	15	Just moved	G. E. Long	Car Inspr	60	Road engine and 2 cars coupled to train, ran over foot of car-inspector coupling air hose.
(6)	5-7	Montello	S-d	L-2546-W	2	4	H. King	Brakeman	21	Sudden stop while setting hand brakes when cars coupled to others, caused him to fall to ground.
(7)	6-17	Derby	S-j	L-2829-E	10	Standing	J. F. May	Brakeman	5	Fell from platform while trucking freight.
(8)	7-8	Granite Point	ƒS-b	L-2577-W	85	3	G. W. Roberts	Brakeman	15	Sudden stop due to undesired emergency threw brakeman against cupola window.
(9)	7-10	Wells	S-g	3-276	69	6	D. W. Tanner	Brakeman	6	Stepped in hole alighting from train.
(10)	7-12	Vista	S-j	L-1795-E	30	Standing	C. J. Baker	Brakeman	5	Struck by piece of wood to which train orders were attached.
(11)	7-12	Mosal	ƒS-j	L-2836-W	85	15	C. B. Hill	Brakeman	8	Sudden stop due to undesired emergency, threw brakeman against cupola of caboose.
(12)	7-23	Farran	S-j	L-2565-W	48	Standing	R. Dalgar	Brakeman	14	Stepped on rock or in hole and fell.
(13)	8-4	Oreana	S-j	L-2595-W	56	8	A. W. Parker	Brakeman	15	Fell from train when struck by rock thrown by trespasser.
(14)	8-10	Montel	S-j	1-280	1	4	B. J. Antista	Brakeman	30	Foot caught between engine step and pair of wheels.
(15)	8-19	Imlay	C-h	L-2783	1	7 to 10	A. C. Bailey W. A. Truesdale	Conductor Brakeman	30 20	Engine collided with caboose while switching.
(16)	8-21	Thisbe	S-c	1-276	55	30	W. E. Bissell	Engineer	9	Foot caught between reverse lever and foot rest.
(17)	8-21	Elko	S-d	L-1752-W	20	Standing	J. H. Rothlisa	Brakeman	8	Lost balance and fell to ground while releasing hand brake.
(18)	8-24	Hazen	S-g	L-2534-E	42	2	E. L. Kelly	Brakeman	10	Slipped and fell to ground getting off car.
(19)	9-1	Comus	S-i	L-2535-W	47	30	J. Gonzales	Sec. Lab.	20	Struck by train.
(20)	9-13	Moor	ƒS-j	L-3200-W	49	3	C. A. Johnson	Brakeman	15	Train parted due to knuckle breaking on first car; sudden stop threw brakeman against cupola steps.
(21)	9-25	Elko	ƒS-j	L-3222-W	50	1 to 4	F. C. Snooks O. O. Turner	Conductor Brakeman	30 7	Emergency application of brakes by engineer due to switch not properly lined, threw conductor and brakeman to floor of caboose.
(22)	9-27	Ladoga	S-c	L-2518-W	49	Standing	H. L. Herstine	Fireman	6	Slipped and fell from running board of engine.
(23)	9-29	Montello	S-j	L-2520-W	48	Standing	R. E. Vanouse	Brakeman	30	Slipped and fell from standing car.
(24)	10-1	Montello	ƒS-j	262	72	6	J. F. Critchlow	Conductor	6	Train parted due to trespasser stepping on cutting lever, sixth car from engine, conductor thrown against caboose stove.
(25)	10-6	Carlin	ƒS-j	L-3203-W	69	6	L. A. Woods	Brakeman	6	Sudden stop due to undesired emergency threw brakeman against cupola window.
(26)	10-6	Hazen	ƒS-j	1-280	55	15	H. E. Miner	Brakeman	14	Fell from cupola to floor of caboose due to slack action of train, service application by engineer.
(27)	10-7	Sparks	ƒS-j	L-2468	54	6 to 8	C. Nolly B. A. Garrett	Conductor Brakeman	11 8	Conductor thrown against grab iron of caboose and brakeman thrown to floor when engineer made emergency application to avoid collision with standing cars.
(28)	10-15	Carlin	ƒS-j	2-280	50	2 to 3	S. W. McElhanney	Brakeman	5	Sudden stop due to undesired emergency, threw brakeman against cupola steps.
(29)	10-17	Montello	S-d	L-3209-W	45	Standing	R. J. Morron	Brakeman	5	Slipped and fell from car while setting hand brake.
(30)	10-28	Imlay	S-a	L-2565-W	5	4 to 5	M. Smith	Brakeman	10	Struck knee while uncoupling caboose.
(31)	10-29	Carlin	S-c	L-2540	None at time	Standing	R. E. Harmon	Engineer	10	Burned by hot water from squirt hose.
(32)	10-30	Mardi	S-g	L-3236-W	46	8	D. P. Ball	Brakeman	10	Fell getting off caboose to line switch.
(33)	11-1	Moor	ƒS-j	2-280	52	20	E. E. Neal	Brakeman	12	Sudden stop as train was being stopped to enter siding, threw brakeman against hand-hold of caboose.
(34)	11-10	Mafed	S-g	1-262	55	Standing	C. R. Harris	Brakeman	10	Slipped and fell getting off car.
(35)	11-15	Mallock	S-j	L-3231-W	61	Standing	E. E. Neal	Brakeman	10	Hand caught between wrecking frog and pin lifter on engine.
(36)	11-15	Coin	ƒS-j	1-280	50	4	E. L. Kelly	Brakeman	4	Brakeman struck by dislodged stationery cabinet when engineer applied brakes in emergency to avoid running through switch.

ƒ = caused from sudden stopping, starting, lurch, or jerk of car or train.

	DATE	LOCATION	I.C.C. CLASS	TRAIN NUMBER	NO. CARS IN TRAIN	SPEED M.P.H.	PERSON INJURED NAME	PERSON INJURED OCCUPATION	ESTIMATED DISABILITY (Days)	DESCRIPTION OF ACCIDENT
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	1923						YEAR 1923 (CONTINUED)			
(37)	11-16	Elko	S-j	316	12	Standing	D. L. Bishop	Brakeman	5	Empty oil drum fell on foot.
(38)	11-25	Cobre	S-g	1-280	52	6	L. D. Harvey	Brakeman	15	Stepped on rock and turned ankle alighting from train.
(39)	11-30	Vivian	#S-b	X-2520-W	85	10	A. E. Higham S. C. Behan J. S. Cosgrave	Conductor Brakeman Brakeman	10 4 8	Train parted due to coupler pulling out of engine tender. Sudden stop threw trainmen down in caboose.
(40)	12-4	Carlin	S-j	X-2516-W	75	Standing	W. A. Edwards	Brakeman	15	Ran into post enroute to storeroom.
(41)	12-10	Elko	S-b	1-262	55	Standing	C. E. Jacobs	Brakeman	20	Slipped and fell while attempting to turn angle cock.
(42)	12-19	Hazen	S-j	X-2524-W	11	2 to 5	J. F. May	Brakeman	Killed	Fell from top of car and run over during switching move.
(43)	12-21	Coin	S-j	X-3203-W	28	30	E. J. Gibson	Brakeman	30	Struck on arm by some object getting out of cupola.
(44)	12-29	Montello	S-d	X-3201-W	49	4	C. G. Frease	Brakeman	10	Slipped and fell while setting hand brake.
	1924						YEAR 1924			
(45)	1-23	Montello	S-g	X-2525-W	50	3	J. J. Vandermark	Brakeman	5	Turned ankle alighting from engine.
(46)	1-25	Sparks	S-g	X-2829-W	15	Standing	G. Smith	Brakeman	4	Turned ankle alighting from car.
(47)	2-16	Imlay	S-i	1-280	4	6	F. M. Dillow	Brakeman	4	Struck by engine of passenger train No. 1.
(48)	3-4	Ladoga	S-g	X-2527-W	62	Standing	W. W. Powers	Conductor	15	Slipped and fell alighting from caboose.
(49)	3-17	Montello	S-g	276	76	6	W. Todd	Brakeman	6	Slipped and fell alighting from train.
(50)	4-20	Moor	#S-j	278	75	5 to 6	A. A. Stead	Brakeman	10	Sudden stop caused by trespasser stepping on cutting lever, thirtieth car from engine, threw brakeman to floor of caboose.
(51)	5-5	Winnemucca	S-e	X-1795-W	None at time	Standing	H. E. Malone	Brakeman	10	Finger caught in hook of switch.
(52)	5-7	Elburz	#S-j	X-2755-W	76	4 to 5	A. A. Thomas	Conductor	10	Sudden stop due to undesired emergency, threw conductor against end of caboose.
(53)	6-11	Sparks	S-j	184	25	Standing	H. C. Sullivan	Brakeman	15	Slipped and fell while stepping from one car to another.
(54)	6-18	Sparks	S-e	X-4015-W	48	Standing	J. C. Koegel	Engineer	Died	Bonnet came out of main pump throttle valve scalding engineer.
(55)	7-5	Halleck	S-j	2-276	66	6	C. G. Frease	Brakeman	20	Slipped and fell while passing over train.
(56)	7-20	Tecoma	C-h	X-3202-W	94	8 to 12	B. Stockham	Brakeman	10	Engine shoving 44 cars collided with standing cut of cars on branch.
(57)	7-27	Rasid	S-j	X-3210-W	95	Standing	C. L. Bunnell	Fireman	10	Stepped in hole while walking to throw switch.
(58)	8-8	Wose	#S-j	X-2525-W	39	5	L. D. Harvey	Brakeman	5	Engineer applied brakes in emergency, throwing brakeman against side of caboose.
(59)	8-11	Carlin	S-g	2-258	74	10 to 15	O. O. Turner	Brakeman	4	Fell alighting from train.
(60)	8-29	Carlin	S-g	3-272	72	10	T. Kenny	Conductor	15	Fell while getting on caboose.
(61)	8-29	Vivian	#S-j	X-3236-W	100	25	A. A. Stead	Brakeman	10	Sudden stopped caused by undesired emergency, threw brakeman against indicator box in caboose cupola.
(62)	9-6	Fenelon	S-g	X-3233-W	100	Standing	I. E. Fowler	Fireman	6	Slipped and fell getting down from engine.
(63)	9-6	Fenelon	#S-j	X-3204-W	100	15 to 20	G. Marsten	Brakeman	11	Engineer made quick step to avoid overruning switch, throwing brakeman against cupola window.
(64)	9-19	[illegible]								

										[illegible] Engine.
(46)	1-25	Sparks	S-g	X-2829-W	15	Standing	G. Smith	Brakeman	4	Turned ankle alighting from car.
(47)	2-16	Imlay	S-i	1-280	4	6	F. M. Dillow	Brakeman	4	Struck by engine of passenger train No. 1.
(48)	3-4	Ladoga	S-g	X-2527-W	62	Standing	W. W. Powers	Conductor	15	Slipped and fell alighting from caboose.
(49)	3-17	Montello	S-g	276	76	6	W. Todd	Brakeman	6	Slipped and fell alighting from train.
(50)	4-20	Moor	S-j	278	75	5 to 6	A. A. Steed	Brakeman	10	Sudden stop caused by trespasser stepping on cutting lever, thirtieth car from engine, threw brakeman to floor of caboose.
(51)	5-5	Winnemucca	S-c	X-1795-W	None at time	Standing	H. E. Malone	Brakeman	10	Finger caught in hook of switch.
(52)	5-7	Elburz	S-j	X-2755-W	76	4 to 5	A. A. Thomas	Conductor	10	Sudden stop due to undesired emergency, threw conductor against end of caboose.
(53)	6-11	Sparks	S-j	184	25	Standing	H. C. Sullivan	Brakeman	15	Slipped and fell while stepping from one car to another.
(54)	6-18	Sparks	S-c	X-4015-W	48	Standing	J. C. Koegel	Engineer	Died	Bonnet came out of main pump throttle valve scalding engineer.
(55)	7-5	Halleck	S-j	2-276	66	6	C. G. Frease	Brakeman	20	Slipped and fell while passing over train.
(56)	7-20	Tecoma	C-h	X-3202-W	94	8 to 12	B. Stockham	Brakeman	10	Engine shoving 44 cars collided with standing cut of cars on branch.
(57)	7-27	Rasid	S-j	X-3210-W	95	Standing	C. L. Bunnell	Fireman	10	Stepped in hole while walking to throw switch.
(58)	8-8	Wose	S-j	X-2525-W	39	5	L. D. Harvey	Brakeman	5	Engineer applied brakes in emergency, throwing brakeman against side of caboose.
(59)	8-11	Carlin	S-g	2-258	74	10 to 15	O. O. Turner	Brakeman	4	Fell alighting from train.
(60)	8-29	Carlin	S-g	1-272	72	10	T. Kenny	Conductor	15	Fell while getting on caboose.
(61)	8-29	Vivian	S-j	X-3236-W	100	25	A. A. Steed	Brakeman	10	Sudden stopped caused by undesired emergency, threw brakeman against indicator box in caboose cupola.
(62)	9-6	Fenelon	S-g	X-3233-W	100	Standing	I. E. Fowler	Fireman	6	Slipped and fell getting down from engine.
(63)	9-6	Fenelon	S-j	X-3204-W	100	15 to 20	S. Marston	Brakeman	11	Engineer made quick stop to avoid overruning switch, throwing brakeman against cupola window.
(64)	9-17	Farren	S-g	X-2784-W	50	Standing	H. C. Collins	Brakeman	20	Slipped when alighting from engine to throw switch.
(65)	9-25	Carlin	S-j	1-276	60	7 to 8	J. S. Cosgrave	Brakeman	15	Sudden stop due to undesired emergency, threw brakeman against caboose door.
(66)	9-28	Carlin	S-g	1-280	54	4 to 7	I. Fredrickson	Car Rep.	30	Slipped and fell under wheels attempting to board train.
(67)	10-5	Mason	S-g	1-272	54	15	R. M. Smith	Brakeman	Killed	Attempted to get on 4th car from engine and fell under train.
(68)	10-11	Clark	S-g	4-280	54	10	O. M. Close	Conductor	15	Slipped and struck head against corner of caboose.
(69)	10-14	Kodak	S-c	X-2535-W	None at time	Standing	D. P. McCaully	Fireman	26	Slipped and sprained ankle climbing down into cab after taking water.
(70)	10-21	Elko	S-j	X-3205-W	48	8	G. C. Finley	Brakeman	Killed	Fell from top of train.
(71)	11-8	Huxley	S-j	1-272	60	25	E. B. Bates	Trs.rider	Killed	Fell from train and run over.
(72)	11-26	Carlin	S-j	X-2819-W	56	15 to 20	H. B. McMullen H. Joslyn	Brakeman Brakeman	30 20	Train parted between engine and first car. Sudden stop threw one brakeman to floor of caboose and the other against caboose door.
(73)	12-6	Wells	S-g	X-3207-W	53	Standing	B. J. Cunningham	Brakeman	9	Stepped on rock when alighting from train.
	1925						YEAR 1925			
(74)	1-14	Elburz	S-g	X-3212-W	65	Standing	J. B. Harberger	Brakeman	28	Stepped on rock alighting from train.
(75)	2-27	Montello	S-i	X-3206-W	4	2	F. C. Snooks	Conductor	168	Fell from car and run over.
(76)	4-6	Pueblo	S-g	X-1750-W	25	10	W. M. Johnston	Brakeman	24	Fell alighting from train.
(77)	4-12	Montello	S-j	258	94	Standing	C. F. Cook	Brakeman	15	Fell from car to ground.
(78)	4-28	Sparks	S-j	X-4032-E	18	Standing	A. Parker	Brakeman	10	Stepped on piece of wood and sprained ankle.

j- caused from sudden stopping, starting, lurch, or jerk of car or train.

	DATE (1)	LOCATION (2)	I.C.C. CLASS (3)	TRAIN NUMBER (4)	NO. CARS IN TRAIN (5)	SPEED M.P.H. (6)	PERSON INJURED NAME (7)	PERSON INJURED OCCUPATION (8)	ESTIMATED DISABILITY (Days) (9)	DESCRIPTION OF ACCIDENT (10)
	1925						YEAR 1925 (CONTINUED)			
(79)	6-3	Parran	S-i	X-2774-W	78	Standing	H.C.Reichheimer	Brakeman	45	Too close to main track and struck by passenger train.
(80)	6-7	Death	#S-j	X-3204-W	90	35	J. J. Scheer	Brakeman	10	Airhose uncoupled between engine and first car and sudden stop threw brakeman who was on top of caboose over cupola.
(81)	6-10	Cobre	S-g	X-3204-W	75	6 to 7	C. J. Wood	Brakeman	4	Struck knee boarding train.
(82)	6-16	Reno	S-j	X-4024-W	20	20	M. Wiswell	Brakeman	21	Hot sand in eye.
(83)	6-17	Leroy	#S-j	1-280	74	20	J. W. Welch	Brakeman	7	While releasing retainer on car, slack ran in causing brakeman to strike knee against grab iron.
(84)	6-24	Imlay	S-a	312	2	1 to 2	G. Looney	Brakeman	20	Hand caught between knuckles.
(85)	6-29	Wells	S-g	258	71	8 to 10	H. W. Hill	Conductor	15	Stepped in small depression boarding caboose.
(86)	7-1	Upsal	#S-j	X-2852-W	75	5 to 8	H. F. Young	Brakeman	4	Airhose blew off 4th car from engine, throwing brakeman against indicator box and to floor.
(87)	7-13	Coin	#S-c	X-3205-W	100	30	F.J.Blumenstein	Fireman	21	Slack ran in causing fireman to fall against damper.
(88)	7-14	Mina	S-j	23	2	Standing	T. C. Fryberg	Brakeman	30	Stepped on nail.
(89)	7-20	Montello	S-g	X-3206-W	101	8	W. Barney	Brakeman	14	Slipped when getting off engine.
(90)	7-21	Valley Pass	S-c	X-3207-W	19	Standing	E. C. Maw	Brakeman	4	Weight of switch lever dropped on foot.
(91)	8-23	Montello	C-c	1-272	64	Standing	O. D. VanOrden	Brakeman	25	Sprained back closing switch.
(92)	8-24	Montello	S-g	X-2563-W	75	8 to 10	M. W. Jones	Conductor	20	Slipped getting on caboose.
(93)	8-26	Montello	S-j	272	106	Standing	E. L. Anderson	Brakeman	4	Dropped marker on foot.
(94)	8-31	Basalt	S-g	X-17-W	24	6	N. I. Greive	Brakeman	8	Sprained ankle getting on train.
(95)	9-4	Montello	#D-g	X-2856-W	88	7	J. J. Vandermark	Brakeman	10	Emergency stop by engineer to avoid running over a fireman; sudden stop threw brakeman against cupola steps and derailed car.
(96)	9-14	Moor	#S-j	X-3210-W	66	18	H. De Young	Brakeman	10	Train parted due to drawbar pulling out first car behind engine; brakeman thrown against cupola frame and to floor.
(97)	9-26	Haren	S-i	X-1785-W	40	4	A. E.Benson	Brakeman	Killed	Crushed between couplers of caboose and rear car of train.
(98)	10-6	Tecoma	S-c	3-258	80	25	D. Cameron	Fireman	4	Lid of sand box fell on hand.
(99)	10-7	Wells	#S-j	3-280	63	5	N. Josephson	Brakeman	40	Sudden stop due to undesired emergency caused brakeman's arm to be shoved through cupola window.
(100)	10-11	Imlay	S-j	2-280	61	5	J. G. Hancock	Brakeman	4	Stumbled and fell running to throw switch.
(101)	10-13	Montello	S-j	X-3233-W	1	20	J. W. Benham D. E. Lynch	Conductor Brakeman	4 27	Caboose cut off with no one to ride it, while engine attempting to catch it, collided with sufficient impact to injure occupants.
(102)	10-18	Elko	S-g	5-280	65	Standing	M.C. Manley	Brakeman	7	Sprained ankle alighting from caboose.
(103)	10-23	Comus	#S-j	X-2809-W	70	30	C. I. Blanton J. J. Barrett	Brakeman Brakeman	10 6	Sudden stop caused by air pipe on engine breaking, threw one brakeman against cupola and the other to floor.
(104)	11-18	Toy	S-g	X-2784-W	66	5	W.H. Newman	Brakeman	6	Turned foot attempting to board car.
(105)	12-8	Beowawe	S-c	X-2526-W	54	35	G.L. Johnson	Engineer	64	Lost hold on reverse lever and caught foot between reverse lever and step on boiler head.
(106)	12-26	Vista	S-c	X-2592-W	19	5 to 6	L. W. Sawyer	Brakeman	46	Strained self throwing switch.
	1926						YEAR 1926			
(107)	1-17	Valley Pass								

										Weight of switch lever dropped [illegible] feet.
(91)	8-23	Montello	S-e	1-272	64	Standing	O. D. VanOrden	Brakeman	25	Sprained back closing switch.
(92)	8-24	Montello	S-g	X-2563-W	75	8 to 10	M. W. Jones	Conductor	20	Slipped getting on caboose.
(93)	8-26	Montello	S-j	272	106	Standing	E. L. Anderson	Brakeman	4	Dropped marker on foot.
(94)	8-31	Basalt	S-g	X-17-W	24	6	N. I. Greive	Brakeman	8	Sprained ankle getting on train.
(95)	9-4	Montello	#D-g	X-2856-W	88	7	J. J. Vandemark	Brakeman	10	Emergency stop by engineer to avoid running over a fireman; sudden stop threw brakeman against cupola steps and derailed car.
(96)	9-14	Moor	#S-j	X-3210-W	66	18	H. De Young	Brakeman	10	Train parted due to drawbar pulling out first car behind engine; brakeman thrown against cupola frame and to floor.
(97)	9-26	Hazen	S-i	X-1785-W	40	4	A. E.Benson	Brakeman	Killed	Crushed between couplers of caboose and rear car of train.
(98)	10-6	Tacoma	S-c	3-258	80	25	D. Cameron	Fireman	4	Lid of sand box fell on hand.
(99)	10-7	Wells	#S-j	3-280	63	5	M. Josephson	Brakeman	40	Sudden stop due to undesired emergency caused brakeman's arm to be shoved through cupola window.
(100)	10-11	Imlay	S-j	2-280	61	5	J. G. Hancock	Brakeman	4	Stumbled and fell running to throw switch.
(101)	10-13	Montello	S-j	X-3233-W	1	20	J. W. Benham D. E. Lynch	Conductor Brakeman	4 27	Caboose cut off with no one to ride it; while engine attempting to catch it, collided with sufficient impact to injure occupants.
(102)	10-18	Elko	S-g	5-280	65	Standing	M.C. Manley	Brakeman	7	Sprained ankle alighting from caboose.
(103)	10-23	Comus	#S-j	X-2809-W	70	30	C. I. Blanton J. J. Barrett	Brakeman Brakeman	10 6	Sudden stop caused by air pipe on engine breaking, threw one brakeman against cupola and the other to floor.
(104)	11-18	Toy	S-g	X-2784-W	66	5	W.H. Newman	Brakeman	6	Turned foot attempting to board car.
(105)	12-8	Beowawe	S-c	X-2526-W	54	35	G.L. Johnson	Engineer	64	Lost hold on reverse lever and caught foot between reverse lever and step on boiler head.
(106)	12-26	Vista	S-e	X-2592-W	19	5 to 6	L. W. Sawyer	Brakeman	46	Strained self throwing switch.
	1926						YEAR 1926			
(107)	1-11	Valley Pass	S-g	X-3233-W	54	Standing	T.O. Bonzy	Brakeman	20	Slipped on ice and fell.
(108)	1-22	Lawton-Reno	S-i	X-2614-E	5	30	E. Filepe	Trk.walker	Killed	Struck by train.
(109)	1-30	Kodak	S-c	272	62	15	L. J. Henry	Fireman	10	Burned by steam from bursted squirt hose.
(110)	2-4	Beowawe	S-j	314	36	Standing	D.L. Mills	Brakeman	15	Rolled drum of gasoline on finger.
(111)	3-15	Montello	S-j	280	85	15	J. C. McCall	Brakeman	7	Stumbled on protruding screw on running board.
(112)	4-7	Pardo	S-j	258	68	10	F. W. Wallwork	Brakeman	12	Slipped off sand box on engine.
(113)	5-5	Battle Mtn.	S-j	X-2718-W	18	Standing	D. Luna	Sec.Labr.	15	Caught hand between rail and car floor.
(114)	5-15	Thorne	S-j	24	1	Standing	C.B. Hill	Brakeman	7	Lost hold of an dropped barrel on foot.
(115)	6-25	Imlay	S-j	X-3232-W	85	1	R.Dulgar	Brakeman	30	Foot slipped while climbing around pilot of engine.
(116)	7-17	Tioga	#S-j	276	108	10	A.A. Steed	Brakeman	23	Sudden stop due to undesired emergency threw brakeman against cupola.
(117)	8-7	Elburz	S-j	3-280	69	5	S.B. Rider	Brakeman	5	Stumbled on running board.
(118)	8-8	Wells	S-c	X-3223-W	77	Standing	W. Cunningham	Engineer	14	Hand slipped on water column hook and fell on tender railing.
(119)	9-14	Walker	S-j	23	22	Standing	C. Craig	Brakeman	11	Rough coupling threw brakeman against hand brake.
(120)	9-18	Imlay	S-i	X-3270-W	1	15	J.N. Severns	Conductor	60	Apparently attempted to cross track ahead of engine and was struck.
(121)	10-8	Mazie	S-g	1-272	82	Standing	A.E.Laurie	Brakeman	14	Foot slipped while descending ladder of car and fell to ground.
(122)	10-15	Woolsey	S-j	X-3262-W	75	5 to 10	C.W.Mitchell	Brakeman	26 (N.R.)	Apparently misjudged in stepping from high to low car.
(123)	10-21	Preble	#S-j	X-3244-W	67	15	J.E.Bertleson	Brakeman	30	Lost balance and fall from car while making drop of car, when engineer increased speed.

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NR = Not reported to I.C.C.

	DATE (1)	LOCATION (2)	I.C.C. CLASS (3)	TRAIN NUMBER (4)	NO. CARS IN TRAIN (5)	SPEED M.P.H. (6)	PERSON INJURED: NAME (7)	PERSON INJURED: OCCUPATION (8)	ESTIMATED DISABILITY (Days) (9)	DESCRIPTION OF ACCIDENT (10)
	1926						YEAR 1926 CONTINUED			
(124)	11-6	Wells	S-j	2-280	71	Standing	C.A.Knudson	Fireman	14	Foot slipped while passing from running board to pilot.
(125)	12-10	Wells	S-g	258	68	3	B.Stockham	Brakeman	90	Fell to ground when went adjusting rod brake which brakeman used instead of grab-iron.
	1927						YEAR 1927			
(126)	5-4	Clark	S-f	24	25	25	G.Looney	Brakeman	Killed	Leaned out too far from train and struck by strut of bridge.
(127)	7-31	Montello	S-j	X-3220-W	27	6	D.W.Tanner	Conductor	15	Fell between cars when missed footing.
(128)	8-7	Miriam	S-j	X-3261-W	120	30	J.H.Dunn W.B.Hilbish	Brakeman Brakeman	7 14	Air hose blew off 8th car from engine causing sudden stop throwing brakeman down into caboose.
(129)	8-11	Valley Pass	S-j	X-3203-W	20	Standing	R.E.Work	Brakeman	20	Caught thumb on water tank spout.
(130)	8-12	Beowawe	S-g	X-2535-W	32	3	G.L.Osman	Brakeman	18	Turned ankle getting off car.
(131)	9-4	Halleck	S-j	X-3224-W	110	5	W.Barney	Brakeman	7	Undesired emergency caused sudden stop.
(132)	9-10	Ledge	S-j	X-2811-W	45	30	F.S.Wertell	Brakeman	8	Fell on top of caboose account losing hold.
(133)	9-27	Pancalan	S-j	4-276	80	20	J.E.Balch	Conductor	5	Emergency application by engineer to avoid presumed collision.
(134)	9-27	Elburz	S-j	5-276	71	4	C.C.Standard	Brakeman	60	Fell from car.
(135)	10-5	Moor	S-b	5-276	94	18	G.J.Eluth	Conductor	4	Break-in-two due to yoke strap breaking 4th car from engine injuring conductor in caboose and damaging equipment.
(136)	10-14	Ocala	S-j	X-3268-W	60	30	R.Carrigan	Brakeman	Killed	Lost balance and fell from end of car when engine separated from train.
(137)	10-24	Humboldt	S-e	X-2535-W	1	Standing	D. Moore	Fireman	18	Lost balance and fell to ground when handling water spout.
(138)	10-27	Anthony	S-j	X-3217-W	75	5	F.Edginton	Brakeman	17	Turned ankle running to catch caboose.
(139)	11-10	Tule	S-g	X-3266-W	84	6	G.F.Saver	Conductor	13	Strained leg when boarding caboose.
(140)	12-30	Elko	S-b	280	86	10	B.E.Lynch	Brakeman	25	Airhose blew off 83rd car from engine injuring brakeman in caboose.
	1928						YEAR 1928			
(141)	4-29	Battle Mountain	S-j	X-3269-W	102	25	W.M.Johnston F.D.McFarland	Brakeman Brakeman	35(N.R.) 22(N.R.)	Sudden stop due to undesired emergency, injured trainmen in caboose.
(142)	6-23	Anthony	S-j	X-3250-W	99	30	W. Cottam	Brakeman	9(N.R.)	Emergency stop by engineer to avoid striking section gang.
(143)	7-1	Thisbe	S-j	X-3209-W	85	25	J.W.Osmun	Brakeman	33	Airhose burst on 10th car from engine causing sudden stop.
(144)	7-17	Herrin	S-j	X-3229-W	102	35	W.W.Powers	Conductor	30	Sudden stop due to break-in-two 69th car from engine caused by broken branch pipe on engine
(145)	7-25	Moor	S-j	X-3220-W	95	10	A.F.Lavine	Brakeman	8	Airhose burst on 33rd car from engine.
(146)	7-30	Wells	S-j	X-3228-W	11	5	O.R.Bingham	Brakeman	Killed	Fell from top of car and run over during switching move.
(147)	7-31	Valley Pass	S-j	X-3212-W	98	15	C.E.McBride	Fireman	60	Foot slipped getting down to pick up orders.
(148)	8-7	Sparks	S-j	X-3228-W	104	10	(H.F.Young (F.W.Geiger	Brakeman Condr.	60 39	Emergency application of brakes by engineer when engine derailed.
(149)	8-7	Benin	S-j	3-280	78	15	B.Barman	Brakeman	32	Thrown against end of caboose by slack action.
(150)	8-15	Sparks	S-d	X-5033-W	68	Standing	J.F.DeCosta	Brakeman	20	Fell off car while releasing hand brakes.
(151)	8-20	Shoshone	S-i	X-3230-W	72	35	L.Ramaris	Br. [illegible]	[illegible]	[illegible]

(135)	10-5	Moor	#6-b	5-276	94	18	G.J.Bluth	Conductor	4	Break-in-two due to yoke strap breaking 4th car from engine injuring conductor in caboose and damaging equipment.
(136)	10-14	Ocala	#8-j	X-3268-W	60	30	R.Carrigan	Brakeman	Killed	Lost balance and fell from end of car when engine separated from train.
(137)	10-24	Humboldt	8-e	X-2535-W	1	Standing	D. Moore	Fireman	18	Lost balance and fell to ground when handling water spout.
(138)	10-27	Anthony	8-j	X-3217-W	75	5	F.Edgington	Brakeman	15	Turned ankle running to catch caboose.
(139)	11-10	Tule	8-g	X-3266-W	84	6	G.F.Sever	Conductor	13	Strained leg when boarding caboose.
(140)	12-30	Elko	#6-b	280	86	10	B.E.Lynch	Brakeman	25	Airhose blew off 83rd car from engine injuring brakeman in caboose.
	1928						YEAR 1928			
(141)	4-29	Battle Mountain	#8-j	X-3269-W	102	25	W.H.Johnston F.D.McFarland	Brakeman Brakeman	35(N.R.) 22(N.R.)	Sudden stop due to undesired emergency, injured trainmen in caboose.
(142)	4-23	Anthony	#8-j	X-3250-W	99	30	H. Cottam	Brakeman	9(N.R.)	Emergency stop by engineer to avoid striking section gang.
(143)	7-1	Thisbe	#8-j	X-3207-W	85	25	J.W.Comm	Brakeman	33	Airhose burst on 10th car from engine causing sudden stop.
(144)	7-17	Herrin	#8-j	X-3229-W	102	35	W.W.Powers	Conductor	30	Sudden stop due to break-in-two 69th car from engine caused by broken branch pipe on engine
(145)	7-25	Moor	#8-j	X-3220-W	95	10	A.F.Lavine	Brakeman	8	Airhose burst on 33rd car from engine.
(146)	7-30	Wells	8-j	X-3228-W	11	5	O.H.Bingham	Brakeman	Killed	Fell from top of car and run over during switching move.
(147)	7-31	Valley Pass	8-j	X-3212-W	98	15	C.E.McBride	Fireman	60	Foot slipped getting down to pick up orders.
(148)	8-7	Sparks	#8-j	X-3228-W	104	10	H.F.Young F.W.Geiger	Brakeman Condr.	60 39	Emergency application of brakes by engineer when engine derailed.
(149)	8-7	Benin	#8-j	3-280	78	15	B.Barnum	Brakeman	32	Thrown against end of caboose by slack action.
(150)	8-15	Sparks	8-d	X-5033-W	68	Standing	J.F.DeCosta	Brakeman	20	Fell off car while releasing hand brakes.
(151)	8-20	Shoshone	8-i	X-3230-W	72	35	L.Ramoris	Ex. gang laborer	Killed	Struck by train.
(152)	9-3	Sparks	#8-j	X-5032-E	56	7	C.B.Rogers	Brakeman	38	Fell from top of caboose due to alleged jerk of slack.
(153)	9-5	Carlin	8-j	X-3209-W	78	5	W.T.Goddard	Brakeman	60	Stumbled over brake shoe.
(154)	9-8	Cobre	8-j	X-3223-W	59	Standing	A.N.Richotte	Conductor	13	Caught finger when closing car door.
(155)	9-18	Wells	8-j	X-3236-W	76	8	C.T.Fleming	Conductor	30	Knocked from top of car when coupling made during switching move.
(156)	9-21	Montello	8-j	X-3235-E	None at time	Standing	F.W.Snow	Brakeman	10	Wrenched knee moving car by hand.
(157)	9-21	Carlin	8-j	X-1753-W	21	Just moved	W.L.Hintz	Brakeman	15	Rough coupling to caboose by yard engine.
(158)	10-21	Cobre	#8-j	1-258	71	15	J.F.McIntyre	Brakeman	7	Lost balance and fell from flat car, 5 cars from rear, when slack ran in.
(159)	10-24	Booth	#8-j	X-3215-W	77	35	A.F.Levine W.Barney	Brakeman Brakeman	20 10	Sudden stop due to striking horse and breaking brake pipe on front end of engine.
(160)	11-26	Clure	8-j	X-1795-W	13	2	M.Agredsta	Ex-gang foreman	14	Caught foot under tie plowing off ballast by local freight.
(161)	12-23	Tonka	#8-j	258	76	30	D.M.Chase	Brakeman	30	Thrown against cupola steps when slack ran in.
(162)	12-30	Reno	8-e	X-4107-E	60	4	E.Christenson	Brakeman	30	Caught thumb between couplers.
	1929						YEAR 1929			
(163)	1-10	Cobre	8-j	X-3203-W	19	Standing	W.A.Morrison	Engineer	109	While assisting to load pump in car was thrown to floor of car when hand truck stuck on running board.
(164)	1-25	Thorne	8-j	X-1626-W	16	3	F.W.Geiger	Conductor	31(N.R.)	Caught fingers between edge of car and timbers.
(165)	1-31	Golconda	8-j	X-3246-W	100	20	J.M.Crabtree	Fireman	30	Fell to ground from engine while attempting to pick up train orders.

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Sheet 5 [illegible] sheets.

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

(178)	11-11	Cumus	#S-j	X-3209-W	85	35	W.F.Archibald	Brakeman	8 (N.R.)	Sudden stop due to break-in-two caused by some one stepping on cutting lever, fifth car from engine.
(179)	12-5	Perth	S-i	X-3223-W	78	10	R.Noriega	Ex.gang lab.	20	Struck by train.
(180)	12-10	Benin	S-g	X-3268-W	71	8	P.S.Greeley	Conductor	30	Foot slipped on tie when attempting to board caboose.
	1930					YEAR 1930				
(181)	4-10	Valley Pass	#S-j	X-4363-W	94	3	S.C.Bohon	Brakeman	83	Alleged jerk of slack caused brakeman to fall from caboose to track ahead of helper engine which had just been cut off from rear of train.
(182)	5-3	Elburz	S-c	1-292	94	Standing	W.Holt	Fireman	8	Finger caught between spout and manhole when water turned on.
(183)	5-4	Mina	D-e	23	5	25	C.F.Devine	Engineer	Killed	Engine and four cars derailed due to melted snow undermining track.
(184)	5-26	Hazen	S-c	X-4027-W	50	Standing	L.N.Kane	Engineer	9	Lost balance and turned ankle.
(185)	6-6	Hazen	S-i	X-3248-W	67	40 V	F.J.Littleton	Conductor	Killed	Struck and run over by passenger train.
(186)	6-16	Lovelock	#S-j	X-3221-W	80	10	K.F.Young	Brakeman	15	Sudden stop due to airhose blowing off 63rd car from head end.
(187)	7-21	Fernley	S-g	259	71	10	O.W.Stonestreet	Brakeman	15	Brakeman fell to ground due to failure of grab iron.
(188)	8-31	Moleen	#S-j	X-3203-W	126	15	D.E.Lynch	Brakeman	183 (N.R.)	Sudden stop due to airhose blowing off 17th car from head end.
(189)	9-7	Wells	#S-j	X-3242-W	125	10	J.Everett E.W.Camp	Brakeman Conductor	8 34	Sudden stop due to trespasser stepping on cutting lever between 33rd and 34th car from engine.
(190)	9-12	Wells	S-g	2-258	100	5	M.King	Brakeman	230 (N.R.)	Fell to ground descending ladder account defective grab iron.
(191)	9-21	Beowawe	#S-j	3-276	98	6	M.I.Greive	Brakeman	5	Slack of train ran in as train was entering siding.
(192)	9-25	Vista	S-j	X-3273-W	56	Standing	R.J.Johnstone	Fireman	15	Stepped off abutment of bridge to river bed below.
(193)	10-4	Carlin	S-j	2-292	80	4	S.J.Weaver	Brakeman	21	Stumbled over cake of ice.
(194)	10-10	Preble	#M-b	1-280	102	35	W.A.Peel I.S.Orem	Brakeman Brakeman	12 16	Broken journal and collapse of truck 4th car from engine caused sudden stop and injury to men in caboose.
(195)	10-13	Montello	#S-j	1-292	81	12	R.C.King	Conductor	12	Broken wheel 10th car from head end caused sudden stop and injury to man in cab.
	1931					YEAR 1931				
(196)	3-21	Schurz	S-c	24	22	Standing	L.M.Mosier	Fireman	30	Slipped into open manhole.
(197)	6-9	Montello	S-j	X-4359-W	3	2	C.F.Cook	Brakeman	Permanent	Missed footing and fell from car while attempting to get down to brake-platform.
(198)	6-21	Lovelock	S-e	268	78	Standing	C.W.Mitchell	Brakeman	6 (N.R.)	Oil buffer switch handle struck foot.
(199)	7-30	Elko	S-g	276	99	12	J.L.Warner	Conductor	6	Stepped on some object getting off caboose.
(200)	9-20	Halleck	#S-j	X-4332-W	79	5	T.Rankine	Brakeman	50	Alleged slack action caught brakeman off balance in caboose.
(201)	11-2	Golconda	S-j	X-3210-W	15	6	J.C.Walker	Brakeman	10	Slipped while stepping from one car to another.
(202)	11-23	Mill City	S-i	X-3233-W	80	30	G.Gonzales	Sec.Labr.	Killed	Struck by train.
	1932					YEAR 1932				
(203)	2-3	Valley Pass	S-j	1-292	71	Standing	C.A.Peterson	Conductor	13	Slipped in snow.
(204)	2-11	Montello	S-e	X-3647-W	84	Standing	P.L.Burnette	Brakeman	9	Strained back throwing switch.
(205)	6-13	Sparks	S-d	566-	66	Standing	A.C.Bailey	Brakeman	10	Using piece of board to release hand brake instead of brake club.
(206)	7-13	Moleen	#S-j	X-4365-W	125	35	J.E.Batch	Brakeman	22	Run-in of slack on rear of train.
(207)	7-28	Carlin	S-j	1-576	2	3	M.W.Alvord	Brakeman	21	Struck pair of car wheels fouling wheel track while switching.
(208)	8-10	Humana	S-g	X-2772-E	66	8	A.J.Hadkins	Brakeman	Permanent	Fell from car and run over when attempting to get off.
(209)	8-15	Ditho	#S-j	560	114	30	H.C.Sullivan	Brakeman	12	Sudden stop due to break-in-two caused by trespasser stepping on cutting lever seventh car from head end.
(210)	8-29	Moor	#S-j	X-3643-W	102	6	A.E.Higham H.L.Peterson	Conductor Brakeman	306 32	Airhose burst on 31st car from head end injuring men in caboose.
(211)	10-29	Montello	#S-j	X-3228-W	102	6	S.J.Weaver	Brakeman	Permanent	Helper engine crushed caboose and caught brakeman on caboose platform when sudden stop occurred due to broken brake pipe on engine tender.

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NR = not reported to I.C.C.

	DATE (1)	LOCATION (2)	I.C.C. CLASS (3)	TRAIN NUMBER (4)	NO. CARS IN TRAIN (5)	SPEED M.P.H. (6)	PERSON INJURED NAME (7)	PERSON INJURED OCCUPATION (8)	ESTIMATED DISABILITY (Days) (9)	DESCRIPTION OF ACCIDENT (10)
	1932					YEAR 1932 (CONTINUED)				
(212)	12-18	Valery	#8-j	X-4333-W	73	8	W.I.Riles	Conductor	25	Train parted due to knuckle breaking on engine tender due to engineer taking slack out of train too suddenly.
	1933					YEAR 1933				
(213)	1-1	Noor	8-g	X-3618-W	68	Standing	S.N.McCurdie	Brakeman	30	Bolt missing from top grab iron causing man to fall.
(214)	1-28	Noor	8-j	X-3617-W	86	Standing	W.Beveridge	Brakeman	15	Slipped on snow on top of car.
(215)	6-12	Beowawe	8-j	X-2349-E	43	Standing	G.Holly	Conductor	10	Strained self while crossing over between cars.
(216)	6-22	Mirian	#8-j	564	74	8	W.J.May	Conductor	15	Airhose blew off second car from head end, sudden stop injuring conductor in cab.
(217)	6-26	Compos	#8-j	576	97	10	N.Wallace	Brakeman	10	Undesired emergency caused sudden stop and injury to man in caboose.
(218)	7-31	Alason	#D-c	X-3636-W	100	25	A.F.Higbee	Conductor	70	Three cars, 11th to 13th from engine derailed causing sudden stop due to brake rod 5th car from head end coming down and lodging in frog.
(219)	10-11	Loray	8-j	574	105	20	S.M.Welsh	Brakeman	6	Stumbled and fell on top of car while walking over train.
(220)	10-30	Penalon	#8-j	X-3718-W	104	30	O.M.Davidson	Conductor	27	Undesired emergency caused by broken eccentric rod knocking plug out of main reservoir.
(221)	11-2	Carlin	8-j	[illegible]	1	5	F.Edginton	Brakeman	30	Lost balance and fell from water car.
(222)	11-13	Red House	8-j	X-4334-W	10	Standing	J.B.Beach	Fireman	90	Slipped and fell from walk on loading chute.
	1934					YEAR 1934				
(223)	3-16	Cluro	#8-j	X-4328-W	98	40	O.M.Close	Brakeman	34	Sudden stop due to broken branch pipe on 4th car from engine.
(224)	5-11	Avenel	#D-c	X-3735-W	111	35	A.F.Higbee H.L.Petersen	Conductor Brakeman	20 26	Broken arch bar 38th car from engine derailed it and 4 following cars. Sudden stop injured two men in caboose.
(225)	7-5	Carlin	8-i	X-3267-E	none at time	4	J.W.Jones	Car inspr.	30	Struck by engine backing in on house track to pick-up car.
(226)	7-6	Carlin	8-j	1-574	Engine	3	W.Leitch	Brakeman	30	Hand caught between hand rail and deck of engine while taking engine to roundhse.
(227)	7-26	Ceino	8-j	X-3745-E	none at time	Standing	W.M.Graham	Brakeman	10	Finger caught between slat of door and brace on side of car while closing car door.
(228)	7-28	Daley	8-g	X-4373-W	27	6	C.L.Case	Conductor	15	Leg struck switch stand getting on side of car.
(229)	8-24	Carlin	8-j	X-3731-W	125	15	F.Perry	Brakeman	15	Slipped and fell to bottom of gondola car.
(230)	9-5	Elko	8-j	2-576	101	4	W.Todd	Brakeman	15	Lost hand hold and fell from side of car to ground while making drop of car.
(231)	10-1	Pequop	#8-j	X-3712-W	127	6	L.F.Dixon	Brakeman	14	Airhose burst on 19th car from head end, causing sudden stop.
(232)	10-6	Shoshone	8-j	X-4337-W	125	6	W.F.Archibald	Brakeman	30	While handling 60 cars, setting out 2 cars, lost hand-hold and fell from car to ground.
(233)	12-18	Noor	#8-j	X-3735-W	100	10	W.L.Tayler	Conductor	663	Undesired emergency due to failure of train line 66th car from head end injured conductor in caboose.

(212)	12-18	Valery	β8-j	X-4333-W	73	8	W.I.Miles	Conductor	25	Train parted due to knuckle breaking on engine tender due to engineer taking slack out of train too suddenly.
	1933						YEAR 1933			
(213)	1-1	Moor	8-j	X-3618-W	68	Standing	S.M.McCurdie	Brakeman	30	Bolt missing from top grab iron causing man to fall.
(214)	1-28	Moor	8-j	X-3617-W	86	Standing	W.Beveridge	Brakeman	15	Slipped on snow on top of car.
(215)	6-12	Beowawe	8-j	X-2349-E	43	Standing	G.Kelly	Conductor	10	Strained self while crossing over between cars.
(216)	6-22	Miriam	β8-j	564	74	8	W.J.May	Conductor	15	Airhose blew off second car from head end, sudden stop injuring conductor in cab.
(217)	6-26	Compoe	β8-j	576	97	10	H.Wallace	Brakeman	10	Undesired emergency caused sudden stop and injury to man in caboose.
(218)	7-31	Alamos	β8-c	X-3636-W	100	25	A.E.Higbee	Conductor	70	Three cars, 11th to 13th from engine derailed causing sudden stop due to brake rod 5th car from head end coming down and lodging in frog.
(219)	10-11	Loray	8-j	574	105	20	S.M.Welsh	Brakeman	6	Stumbled and fell on top of car while walking over train.
(220)	10-30	Penelen	β8-j	X-3718-W	104	30	O.M.Davidson	Conductor	27	Undesired emergency caused by broken eccentric rod knocking plug out of main reservoir.
(221)	11-2	Carlin	8-j	X-E	1	5	F.Edginton	Brakeman	30	Lost balance and fell from water car.
(222)	11-13	Red House	8-j	X-4334-W	10	Standing	J.S.Beach	Fireman	90	Slipped and fell from walk on loading chute.
	1934						YEAR 1934			
(223)	3-16	Clure	β8-j	X-4328-W	98	40	O.M.Close	Brakeman	34	Sudden stop due to broken branch pipe on 4th car from engine.
(224)	5-11	Avenel	β0-g	X-3735-W	111	35	A.E.Higbee H.L.Peterson	Conductor Brakeman	20 26	Broken arch bar 38th car from engine derailed it and 4 following cars. Sudden stop injured two men in caboose.
(225)	7-5	Carlin	8-i	X-3267-E	none at time	4	J.W.Jones	Car inspr.	30	Struck by engine backing in on house track to pick-up car.
(226)	7-6	Carlin	8-j	1-574	Engine	3	W.Leitch	Brakeman	30	Hand caught between hand rail and deck of engine while taking engine to roundhse.
(227)	7-26	Osino	8-j	X-3745-E	none at time	Standing	W.M.Graham	Brakeman	10	Finger caught between slat of door and brace on side of car while closing car door.
(228)	7-28	Imlay	8-g	X-4373-W	27	6	C.L.Case	Conductor	15	Leg struck switch stand getting on side of car.
(229)	8-24	Carlin	8-j	X-3731-W	125	15	F.Perry	Brakeman	15	Slipped and fell to bottom of gondola car.
(230)	9-5	Elko	8-j	2-576	101	4	W.Todd	Brakeman	15	Lost hand hold and fell from side of car to ground while making drop of car.
(231)	10-1	Pequop	β8-j	X-3712-W	127	6	L.T.Dixon	Brakeman	14	Airhose burst on 19th car from head end, causing sudden stop.
(232)	10-6	Shoshone	8-j	X-4337-W	125	6	W.F.Archibald	Brakeman	30	While handling 60 cars, setting out 2 cars, lost hand-hold and fell from car to ground.
(233)	11-18	Moor	β8-j	X-3735-W	100	10	W.L.Taylor	Conductor	663	Undesired emergency due to failure of train line 66th car from head end injured conductor in caboose.
	1935						YEAR 1935			
(234)	1-13	Valley Pass	8-j	X-3738-W	98	Standing	J.W.Bonham	Brakeman	30	Lost balance when getting in car and fell to ground.
(235)	3-1	Hazen	β8-j	X-4335-W	82	5	S.C.McElwee B.A.Garrett	Brakeman Brakeman	44 7	Sudden stop due to train parting caused by drawbar key dropping out of seventh car from engine.
(236)	8-12	Carlin	β8-j	X-3738-W	85	15	R.C.Shaw	Brakeman	11	Sudden stop due to undesired emergency caused brakeman who was climbing to top of rear car to fall to ground.
(237)	8-22	Carlin	β8-j	X-3761-W	131	10	R.C.Faulkner	Brakeman	12	Sudden stop due to train parting caused by drawbar key failing on 34th car from engine.
(238)	9-20	Ryndon	8-g	X-1753-W	12	Standing	H.P.Robinson	Brakeman	9	Ballast rolled under foot as man dismounted from caboose.
(239)	11-14	Palisade	8-b	X-3267-W	18	Standing	W. Leitch	Brakeman	48	Handle broke off of angle cock while being manipulated, caused man to fall.

β = caused from sudden stopping, starting, lurch, or jerk of car or train.

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Sheet 1 of 7 sheets

ITEM NO.	DATE (1)	LOCATION (2)	I.C.C. CLASS (3)	TRAIN NUMBER (4)	NO. CARS IN TRAIN (5)	SPEED M.P.H. (6)	PERSON INJURED NAME (7)	PERSON INJURED OCCUPATION (8)	ESTIMATED DISABILITY (Days) (9)	DESCRIPTION OF ACCIDENT (10)
1936							YEAR 1936			
(240)	5-26	Red House	ft-j	578	95	30	C.A.Cornwall	Brakeman	9	Fell from cupola to floor of caboose when emergency application of brakes occurred due to airpipe on engine breaking.
(241)	7-8	Elburz	S-j	E-1753-W	12	Standing	H.Cotton	Brakeman	15	Knee injured when piece of freight (metal roofing) slipped.
(242)	7-10	Cosgrave	ft-j	E-3718-W	122	40	R.Sexton W. Leitch	Brakeman Brakeman	57 25	Injured while riding in cupola due to breakage of brake pipe on engine.
(243)	8-6	Granite Point	ft-c	3-562	91	40	E.G.Baker	Brakeman	11	Sudden stop due to derailment caused by burst off journal 31st car from engine
(244)	9-28	Moor	S-g	E-3228-W	12	6	C.D.Carlin	Brakeman	10	Jumped from car in anticipation of derailment.
(245)	10-4	Reno	ft-b	E-4148-W	85	10	R.H.Wells	Conductor	10	Engineer applied brakes in emergency to avoid striking woman on street cross'g
(246)	12-4	Carlin	ft-j	E-3735-W	90	8	J.E.Hansen	Brakeman	7	Sudden stop due to break-in-two account coupler shank breaking.
1937							YEAR 1937			
(247)	1-10	Imlay	ft-j	E-3695-W	76	10	John Corrans	Brakeman	21	Fell against cupola steps when jerk occurred as train was stopping.
(248)	1-17	Montello	S-g	E-3225-E	75	6	J.W.Bonham	Brakeman	30	Slipped on side ladder of car and fell to ground.
(249)	3-24	Mason	S-b	E-3205-W	52	Standing	F.W.Schilling	Brakeman	20	Finger broken when hand came in contact with coupler while separating air hose.
(250)	4-8	Mason	S-g	E-3748-W	57	6	C.B.Huyck	Conductor	Killed	Fell from gangway of moving engine while detached from train and struck by truck structure of tender.
(251)	4-10	Death	S-g	E-1785-E	30	10	R.E.Breitweiser	Brakeman	9	Sprained ankle alighting from train.
(252)	5-26	Hima	S-d	605	6	Standing	S.C.McElwee	Brakeman	25	Hand caught between brake lever and step on end of car.
(253)	6-22	Montello	ft-j	E-3698-E	85	5	L.T.Dixon	Brakeman	8	Lost balance and fell against load machinery 21st car from engine when slight jerk of train occurred stopping.
(254)	8-1	Wells	S-d	3-570	91	Standing	J.E.White	Brakeman	30	Fell from car when foot slipped while preparing to set hand brake.
(255)	8-5	Upeal	ft-j	E-4365-W	93	20	H.I.Grieve	Brakeman	Permanent	Sudden stop due to undesired emergency.
(256)	9-15	Flanigan	S-j	552	66	1	R.C.Rheem	Brakeman	30	Fell to ground when hand slipped off hand rail while getting on running board of engine.
(257)	10-4	Imlay	S-g	E-3696-E	70	8	R.D.Quarry	Brakeman	30	Fell to ground detraining from gangway ladder of locomotive.
(258)	11-16	Anthony	S-j	3-578	100	35	R.C.Erskine	Brakeman	30	Lost hold on side ladder of car and fell to ground.
(259)	12-7	Imlay	S-j	E-4363-W	1 at time	3	W.A.Pool	Brakeman	20	Lost balance on caboose and fell to ground when reaching down to raise lock block of coupler.
(260)	12-15	Wells	ft-j	E-3679-W	86	2	W.B.Doerden	Brakeman	137	Lost hold and fell to ground from caboose step when jerk of train occurred while stopping.
1938							YEAR 1938			
(261)	5-5	Montello	S-c	E-4010-W	Loco at time	Standing	W.A.Roberts	Fireman	10	Struck leg on step to cond dome.
(262)	6-10	Palisade	S-j	570	80.	9	D.L.Lee	L.S.Laborer	30	Jumped from motor car trailer when struck by train.
(263)	7-17	Montello	S-d	3-578	99	Standing	A.J.Thumb	Brakeman	20	Lost balance and fell to ground while releasing hand brake.
(264)	10-10	Montello	S-d	3-574	111	Standing	L.E.Evans	Brakeman	10	Strained body and torn scar tissue from an operation releasing hand brake.
(265)	11-18	Sparks	ft-j	E-4154-E	101	3	C.H.Brown	Conductor	26	Lost balance and fell to floor when slack ran in as train was stopping.

(247)	1-10	Imlay	fb-j	E-3695-E	76	10	John Gerrans	Brakeman	21	Fell against cupola steps when jerk occurred as train was stopping.
(248)	1-17	Montello	S-g	E-3225-E	75	6	J.W.Benham	Brakeman	30	Slipped on side ladder of car and fell to ground.
(249)	2-24	Eaton	S-b	E-3205-E	52	Standing	F.W.Schilling	Brakeman	20	Finger broken when hand came in contact with coupler while separating air hose.
(250)	4-8	Eaton	S-g	E-3748-E	57	6	C.B.Huyck	Conductor	Killed	Fell from gangway of moving engine while detached from train and struck by truck structure of tender.
(251)	4-10	Booth	S-g	E-1785-E	30	10	R.E.Breitenbach	Brakeman	9	Sprained ankle alighting from train.
(252)	5-26	Elko	S-d	605	6	Standing	S.C.McElvee	Brakeman	25	Hand caught between brake lever and step on end of car.
(253)	6-22	Montello	fb-j	E-3698-E	85	5	L.T.Dixon	Brakeman	8	Lost balance and fell against load machinery 21st car from engine when slight jerk of train occurred stopping.
(254)	8-1	Wells	S-d	2-570	91	Standing	J.K.White	Brakeman	30	Fell from car when foot slipped while preparing to set hand brake.
(255)	8-5	Opal	fb-j	E-4365-E	93	20	H.I.Grieve	Brakeman	Permanent	Sudden stop due to undesired emergency.
(256)	9-15	Flanigan	S-j	552	66	1	R.C.Mason	Brakeman	30	Fell to ground when hand slipped off hand rail while getting on running board of engine.
(257)	10-6	Imlay	S-g	E-3696-E	70	8	R.D.Query	Brakeman	30	Fell to ground detraining from gangway ladder of locomotive.
(258)	11-16	Anthony	S-j	3-578	100	35	R.C.Erskine	Brakeman	30	Lost hold on side ladder of car and fell to ground.
(259)	12-7	Imlay	S-j	E-4363-E	1 at time	3	W.A.Peel	Brakeman	20	Lost balance on caboose and fell to ground when reaching down to raise lock block of coupler.
(260)	12-15	Wells	fb-j	E-3679-E	86	2	W.B.Duerden	Brakeman	137	Lost hold and fell to ground from caboose step when jerk of train occurred while stopping.
1938							YEAR 1938			
(261)	5-5	Montello	S-c	E-4010-E	Made at time	Standing	W.A.Roberts	Fireman	10	Struck leg on step to send down.
(262)	6-10	Palisade	S-j	570	80	9	D.L.Lee	L.S.Laborer	30	Jumped from motor car trailer when struck by train.
(263)	7-17	Montello	S-d	2-578	99	Standing	A.A.Thomas	Brakeman	20	Lost balance and fell to ground while releasing hand brake.
(264)	10-10	Montello	S-d	2-574	111	Standing	L.E.Evans	Brakeman	10	Strained body and torn scar tissue from an operation releasing hand brake.
(265)	11-18	Sparks	fb-j	E-4156-E	101	3	C.H.Brown	Conductor	26	Lost balance and fell to floor when slack ran in as train was stopping.
(266)	11-19	Ruse	fb-b	E-4165-E	85	12	C.E.Goeble J.E.Page D.B.Woolverton J.G.Hooker J.C.Pedersen	Conductor Brakeman Brakeman Brakeman Brakeman	286 109 81 58 51	Run in of slack resulting from heavy service application to avoid striking an automobile standing foul of track.
(267)	12-28	Wells	S-j	E-3730-E	3	5	O.C.Johnson	Brakeman	10	Lost balance and fell against car when one car coupled to 2 others during switching movement.
							YEAR 1939			
(268)	2-13	Lovelock	fb-j	560	104	20	W.B.Conway	Brakeman	21	While train being brought to a stop, lost balance and fell against stove.
(269)	3-10	Battle Mountain	S-g	E-3713-E	102	10	J.C.Walker	Conductor	14	Foot slipped off step while getting on caboose.
(270)	7-15	Elko	S-j	1-560	108	5	D.J.Jones	Brakeman	10	Stepped on rock and wrenched knee while running after lining switch.
(271)	8-17	Carlin	S-g	1-576	100	6	H.G.Thurston	Brakeman	21	Stumbled and fell attempting to board car in train.
(272)	8-28	Valley Pass	S-c	E-4034-E	70	5	Harry DeYoung	Brakeman	Killed	Lost balance, fell from caboose steps and run over when helper engine struck caboose.
(273)	10-11	Ruse	fb-j	E-4184-E	69	5	W.H.Richart	Conductor	20	Lost balance and fell against desk as speed of train reduced.
(274)	11- 9	Sutcliffe	S-c	1-559	86	Standing	A.B.Roney	Fireman	30	Lost balance and fell back against railing on tender while taking water, due to ring coming off water spout.
(275)	12-10	Lovelock	fb-j	482	79	30	J.L.Clark	Conductor	4	Thrown against locker and stove while walking from rear platform of caboose when slack ran in.

fb - Caused from sudden stopping, starting, lurch or jerk of car or train.

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

DETAIL OF CASUALTIES TO ALL CLASSES OF EMPLOYES ON DUTY, SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS
ROAD FREIGHT TRAIN OPERATION
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION.

STATE OF NEVADA

	DATE (1)	LOCATION (2)	I.C.C. CLASS (3)	TRAIN NUMBER (4)	NO. CARS IN TRAIN (5)	SPEED M.P.H. (6)	PERSON INJURED NAME (7)	PERSON INJURED OCCUPATION (8)	ESTIMATED DISABILITY (Days) (9)	DESCRIPTION OF ACCIDENT (10)
	1940									
(76)	1-20	Imlay	B-j	574	108	Standing	W. B. Hilbish	Brakeman	20	Strained muscles of back while opening vent on car.
(77)	5-3	Desert	B-j	566	84	5	R. Sexton	Brakeman	20	Lost hand hold and fell from car to ground stepping from one car to another.
(78)	7-27	Battle Mountain	#L-b	X-3753-M	125	20	W. B. Hilbish	Brakeman	10	Right main crank pin failed and injured brakeman in caboose.
(79)	9-15	Carlin	#B-j	578	96	3	W. A. Lashell	Brakeman	15	Lost balance and fell when train stopped.
(80)	10-26	Valory	#L-b	X-3669-M	98	40	J.W.Airhart	Conductor	4	Employe in caboose injured when reverse gear piston rod stuffing box became disconnected, permitting engine to reverse itself.
(81)	11-16	Clark	#B-j	1-562	98	35	F.E.B.Cates	Conductor	21	Lost balance and fell in caboose as train was stopping.
(82)	11-26	Hill City	B-i	2-561	63	40	P. McAvoy	Sec.Foreman	Killed	Motor car struck by train.
(83)	12-10	Valley Pass	B-i	4-576	95	20	W.E.Sorenson	Brakeman	Died	Lost balance and fell between cars.

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= caused from sudden stopping, starting, lurch, or jerk of car or train.

Defendant's Exhibit No. 276 (Witness J.J. Sullivan)
Apr. 30, 1941

[redacted]

[redacted]

ALL CLASSES OF EMPLOYES ON DUTY.
ALL CLASSES OF SERVICE.

[redacted]

(1)	[redacted]	4 977	3 782	4	1	60	42	67	44	14.03	27.45
(2)	[redacted]	4 [illegible]	3 [illegible]	4	2	44	42	50	44	11.69	16.69
(3)	[redacted]	4 971	3 [illegible]	3	1	45	38	47	39	9.39	17.68
(4)	[redacted]	4 [illegible]	3 [illegible]	4	4	36	38	38	286	4.68	17.34
(5)	[redacted]	4 [illegible]	3 [illegible]	2	2	39	38	41	40	4.70	9.80
(6)	[redacted]	4 [illegible]	3 [illegible]	3	4	39	40	35	44	4.84	10.37
(7)	Total [redacted]	[redacted]	[redacted]	22	16	284	242	343	237	Average 6.82	Average 14.20
(8)	[redacted]	4 [illegible]	3 [illegible]	2	1	37	38	39	39	6.50	12.16
(9)	[redacted]	4 [illegible]	3 [illegible]	4	2	40	37	44	33	5.50	9.91
(10)	[redacted]	3 [illegible]	4 [illegible]	1	2	39	43	31	43	3.10	9.31
(11)	[redacted]	3 [illegible]	3 [illegible]	2	2	34	34	33	36	4.93	9.85
(12)	[redacted]	3 [illegible]	3 [illegible]	-	1	31	34	27	33	4.68	7.39
(13)	[redacted]	3 [illegible]	3 [illegible]	-	2	34	39	34	31	4.44	8.47
(14)	Total [redacted]	[redacted]	[redacted]	9	20	95	251	304	271	Average 4.89	Average 9.68
(15)	[redacted]	3 334	4 [illegible]	-	1	8	42	8	44	2.57	10.36
(16)	[redacted]	3 [illegible]	3 [illegible]	1	2	31	44	33	46	3.37	8.84
(17)	[redacted]	4 [illegible]	3 [illegible]	1	1	38	46	39	47	4.75	11.39
(18)	[redacted]	3 [illegible]	4 [illegible]	-	1	36	38	36	39	4.73	7.98
(19)	[redacted]	3 [illegible]	3 [illegible]	* 34	2	* 31	41	* 39	43	9.59	8.28
(20)	[redacted]	3 933	3 [illegible]	1	0	32	34	33	34	3.31	6.16
(21)	Total [redacted]	[redacted]	[redacted]	27	7	84	284	303	273	Average 4.73	Average 8.81
(22)	Total [redacted]	[redacted]	[redacted]	63	33	426	960	649	1 001	Average 6.35	Average 11.03
(23)	[redacted]									Nevada	Arizona
(24)	[redacted] - Decrease									49.9%	32.7%
(25)	[redacted] - Decrease									46.7%	38.7%
(26)	[redacted] - Decrease									1.9%	9.0%
(27)	[redacted] - Decrease									25.1%	20.1%

	Year	(Thousands)		Killed		Injured		Casualties		[illegible]	
		Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
(1)	1923	4 777	3 782	2	1	65	65	67	66	14.03	17.45
(2)	1924	4 350	3 978	6	2	44	62	50	64	11.49	16.09
(3)	1925	4 577	5 739	3	1	40	98	43	99	9.39	17.28
(4)	1926	4 320	5 997	2	6	26	98	28	104	6.48	17.34
(5)	1927	4 464	5 121	2	2	19	98	21	100	4.70	9.80
(6)	1928	4 766	6 272	3	4	30	60	33	64	6.92	10.37
(7)	Total 1923-1928	27 256	31 779	18	16	224	441	242	457	Average 8.88	14.38
(8)	1929	4 835	6 497	2	1	27	78	29	79	6.00	12.16
(9)	1930	4 489	5 666	4	2	20	53	24	55	5.35	9.71
(10)	1931	3 546	4 872	1	2	10	43	11	45	3.10	9.24
(11)	1932	3 045	3 907	1	2	14	34	15	36	4.93	9.21
(12)	1933	2 734	3 383	-	1	11	24	11	25	4.02	7.39
(13)	1934	3 089	3 660	-	2	14	29	14	31	4.64	8.47
(14)	Total 1929-1934	21 665	27 985	8	10	96	261	104	271	Average 4.80	9.68
(15)	1935	3 114	4 249	-	1	8	43	8	44	2.57	10.36
(16)	1936	3 673	5 202	1	2	11	44	12	46	3.27	8.84
(17)	1937	4 000	5 883	1	1	18	66	19	67	4.75	11.39
(18)	1938	3 303	4 888	-	1	16	38	16	39	4.73	7.98
(19)	1939	3 654	5 230	* 14	2	* 21	41	* 35	43	9.58	8.22
(20)	1940	3 933	5 518	1	0	12	34	13	34	3.31	6.16
(21)	Total 1935-40	21 757	30 970	17	7	86	266	103	273	Average 4.73	8.81
(22)	Total 18 Years	70 678	90 734	43	33	406	968	449	1 001	Average 6.35	11.03

(23)	COMPARISON OF AVERAGE CASUALTY RATES DURING DIFFERENT PERIODS	Nevada	Arizona
(24)	Period 1929-1934 compared with 1923-1928 - Decrease	45.9%	32.7%
(25)	Period 1935-1940 compared with 1923-1928 - Decrease	46.7%	38.7%
(26)	Period 1935-1940 compared with 1929-1934 - Decrease	1.5%	9.0%
(27)	Period 1935-1940 compared with 18 year average - Decrease	25.5%	20.1%

* Includes 13 killed and 12 injured in derailment of streamliner CITY OF SAN FRANCISCO at Harney, Nevada, August 12, 1939, caused by malicious tampering with the track.

COMPARISON OF MAIN TRACK MILEAGE OPERATED AS OF DECEMBER 31, 1939	(miles)	(miles)
ARIZONA - Main line, California-Arizona line to Arizona-New Mexico line (via Gila and Bowie)	455.92	
Main line, Ehrenberg to Phoenix via Phoenix	210.42	
Main line, Tucson to Arizona-New Mexico line via Douglas	141.95	
Total main lines		808.29
Branch lines		464.96
Total		1,273.25
NEVADA - Main line, California-Nevada line to Nevada-Utah line	752.56	
Main line, California-Nevada line to Ruralay	67.26	
Total main lines		819.82
Branch lines		153.60
Total		973.42

Defendant's Exhibit No. 277 (Witness J.J. Sullivan)
Apr. 29, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

COMPARISON OF CASUALTIES TO

ALL CLASSES OF EMPLOYES ON DUTY, ROAD FREIGHT TRAIN OPERATION

SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
FOR YEARS 1923 TO 1940, INCLUSIVE

SOUTHERN PACIFIC LINES
STATES OF NEVADA AND ARIZONA

	Year	Freight Train Miles (Thousands)		Freight Train Car Miles (Thousands)		Casualties to All Employes on Duty Road Freight Train Operation						Casualties per Million Train Miles		Casualties per 200 Million Car Miles	
						Killed		Injured		Total Casualties					
		Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)
(1)	1923	2 259	1 622	111 847	91 565	1	0	48	43	49	43	21.69	26.51	43.81	46.96
(2)	1924	2 035	1 777	105 707	98 490	3	0	27	34	30	34	14.74	19.13	28.11	34.52
(3)	1925	2 262	2 448	127 118	124 954	1	0	34	56	35	56	15.47	22.88	27.53	44.82
(4)	1926	2 077	2 704	129 622	137 660	1	3	18	43	19	50	9.15	18.49	14.66	36.32
(5)	1927	2 146	2 796	139 992	148 957	2	2	14	32	16	34	7.46	12.16	11.43	24.12
(6)	1928	2 438	2 850	155 869	145 287	2	3	23	36	25	39	10.34	13.68	15.94	26.84
(7)	Total 1923-28	13 297	14 197	772 122	738 913	10	10	164	246	174	256	Average 13.18	18.03	Average 22.54	34.66
(8)	1929	2 380	3 083	150 672	160 332	1	0	20	39	21	39	9.05	12.65	13.94	24.32
(9)	1930	2 097	2 974	147 888	141 518	2	2	15	33	17	35	8.36	13.60	11.98	24.73
(10)	1931	1 688	2 305	123 433	120 015	1	0	6	28	7	28	4.15	12.70	5.67	23.33
(11)	1932	1 514	1 849	111 084	101 295	0	1	11	21	11	22	7.27	11.90	9.91	21.74
(12)	1933	1 364	1 632	104 643	91 142	0	1	10	12	10	13	7.33	7.97	9.55	14.26
(13)	1934	1 512	1 800	122 086	102 303	0	1	12	15	12	16	7.94	8.89	9.83	15.64
(14)	Total 1929-34	10 455	13 143	759 619	716 499	4	5	74	148	78	153	Average 7.46	11.64	Average 10.27	21.35
(15)	1935	1 996	2 300	125 508	118 598	0	0	7	22	7	22	4.39	10.48	5.67	18.55
(16)	1936	1 929	2 452	144 689	132 505	0	2	8	20	8	22	4.15	8.97	5.53	16.60
(17)	1937	2 007	2 776	151 385	148 232	1	1	13	34	14	35	6.98	12.61	9.25	23.61
(18)	1938	1 647	2 301	131 331	130 053	0	1	11	19	11	20	6.68	8.69	8.38	15.38
(19)	1939	1 814	2 528	144 106	142 754	1	1	7	19	8	20	4.41	7.88	5.55	14.01
(20)	1940	2 046	2 770	164 482	155 909	1	0	7	18	8	18	3.91	6.50	4.86	11.55
(21)	Total 1935-40	11 039	14 957	859 501	828 051	3	5	53	132	56	137	Average 5.07	9.16	Average 6.52	16.54
(22)	Total 18 Years	34 691	42 297	2 391 242	2 283 463	17	20	291	526	308	546	Average 8.88	12.91	Average 12.90	23.91

		Train Mile Basis		Car Mile Basis	
		Nevada	Arizona	Nevada	Arizona
(23)	COMPARISON OF AVERAGE CASUALTY RATES DURING DIFFERENT PERIODS				
(24)	Period 1929-1934 compared with 1923-1928 – Decrease	43.4%	35.4%	54.4%	38.4%
(25)	Period 1935-1940 compared with 1923-1928 – Decrease	61.9%	49.2%	71.1%	52.3%
(26)	Period 1935-1940 compared with 1929-1934 – Decrease	32.0%	21.3%	36.5%	22.5%
(27)	Period 1935-1940 compared with 18 year average – Decrease	42.9%	29.0%	49.4%	30.8%

	Year (a)	TRAIN MILES (Thousands) Regular (b)	TRAIN MILES (Thousands) Arizona (c)	CAR MILES (Thousands) Regular (d)	CAR MILES (Thousands) Arizona (e)	KILLED Regular (f)	KILLED Arizona (g)	INJURED Regular (h)	INJURED Arizona (i)	TOTAL CASUALTIES Regular (j)	TOTAL CASUALTIES Arizona (k)	PER MILLION TRAIN MILES Regular (l)	PER MILLION TRAIN MILES Arizona (m)	PER MILLION CAR MILES Regular (n)	PER MILLION CAR MILES Arizona (o)
(1)	1923	2 859	1 628	111 847	91 565	1	0	48	43	49	43	17.09	26.41	43.81	46.96
(2)	1924	2 835	1 777	105 707	98 480	3	0	27	34	30	34	14.74	29.13	28.11	34.52
(3)	1925	2 262	2 448	127 118	124 934	1	0	34	56	35	56	15.47	22.88	27.53	44.82
(4)	1926	2 077	2 704	129 622	137 660	1	5	28	45	29	50	9.15	29.19	14.66	36.32
(5)	1927	2 146	2 796	139 999	148 997	2	2	24	32	26	34	7.46	12.16	11.43	24.12
(6)	1928	2 438	2 850	156 869	145 287	2	3	23	36	25	39	10.34	13.68	15.94	26.84
(7)	Total 1923-28	13 397	14 297	772 122	736 913	10	10	164	246	234	256	Average 15.18	Average 18.03	Average 22.54	Average 34.46
(8)	1929	2 320	3 083	150 672	160 332	1	0	20	39	21	39	9.05	12.65	13.94	24.32
(9)	1930	2 097	2 974	147 800	141 512	2	2	15	33	17	35	8.26	13.60	11.50	24.73
(10)	1931	1 488	2 305	123 433	130 015	1	0	6	28	7	28	4.25	12.70	5.67	23.30
(11)	1932	1 514	1 849	111 084	101 295	0	1	11	21	11	22	7.27	11.90	9.91	21.74
(12)	1933	1 364	1 632	104 643	91 142	0	1	10	12	10	13	7.33	7.97	9.55	14.26
(13)	1934	1 512	1 800	122 086	102 303	0	1	11	15	12	16	7.94	8.89	9.83	15.64
(14)	Total 1929-34	10 495	13 143	759 619	726 499	4	5	74	148	78	153	Average 7.46	Average 11.64	Average 10.27	Average 21.05
(15)	1935	1 996	2 200	125 908	118 998	0	0	9	22	9	22	4.50	10.48	5.67	18.55
(16)	1936	1 989	2 452	144 689	132 995	0	2	8	20	8	22	4.15	8.97	5.53	16.60
(17)	1937	2 007	2 776	151 385	148 232	1	1	13	34	14	35	6.98	12.61	9.25	23.61
(18)	1938	1 647	2 301	131 331	130 053	0	1	11	29	11	30	6.68	8.69	8.38	15.38
(19)	1939	1 814	2 598	144 106	142 754	1	1	7	19	8	20	4.41	7.68	5.55	14.01
(20)	1940	2 046	2 770	164 482	155 909	1	8	7	18	8	18	3.91	6.50	4.86	11.55
(21)	Total 1935-40	11 039	14 957	859 501	828 051	3	9 5	53	132	56	137	Average 5.07	Average 9.16	Average 6.52	Average 16.54
(22)	Total 18 Years	34 691	42 297	2 391 242	2 283 463	17	20	291	526	308	546	Average 8.88	Average 12.91	Average 12.88	Average 23.91

		TRAIN MILE BASIS		CAR MILE BASIS	
(23)	COMPARISON OF AVERAGE CASUALTY RATES DURING DIFFERENT PERIODS	Nevada	Arizona	Nevada	Arizona
(24)	Period 1929-1934 compared with 1923-1928 - Decrease	43.4%	35.4%	54.4%	38.4%
(25)	Period 1935-1940 compared with 1923-1928 - Decrease	61.9%	49.2%	71.1%	52.9%
(26)	Period 1935-1940 compared with 1929-1934 - Decrease	32.0%	21.3%	36.9%	22.9%
(27)	Period 1935-1940 compared with 18 year average - Decrease	42.9%	29.0%	49.4%	30.8%

COMPARISON OF MAIN TRACK MILEAGE OPERATED AS OF DECEMBER 31, 1939	(miles)	(miles)
ARIZONA - Main line, California-Arizona line to Arizona-New Mexico line (via Gila and Bowie)	493.98	
Main line, Ehrenberg to Phoenix via Phoenix	329.42	
Main line, Tucson to Arizona-New Mexico line via Douglas	143.99	
Total main lines		968.39
Branch lines		464.96
Total		1 373.85
NEVADA - Main line, California-Nevada line to Nevada-Utah line	732.36	
Main line, California-Nevada line to Fernley	67.26	
Total main lines		800.02
Branch lines		153.60
Total		973.62

3372

Defendant's Exhibit No. 278 (Witness J.J. Sullivan)
(Feb. 6, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

CASUALTIES TO ALL CLASSES OF EMPLOYES ON DUTY
ROAD FREIGHT TRAIN OPERATION,
SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
CLASSIFIED AS TO CAUSES AND CLASSES OF EMPLOYES
FOR THE YEARS 1923 TO 1939 INCLUSIVE

SOUTHERN PACIFIC COMPANY
STATES OF NEVADA AND ARIZONA

This exhibit, showing the number of casualties by classes of employes and causes of accident, is supplementary to and explanatory of Exhibit No. 277 which shows the total number of casualties only.

	CAUSE (a)		PERIOD (b)	NUMBER OF CASUALTIES TO EMPLOYES ON DUTY: CONDUCTORS, BRAKEMEN & FLAGMEN — NEVADA KILLED (c)	NEVADA INJURED (d)	ARIZONA KILLED (e)	ARIZONA INJURED (f)	ENGINEERS AND FIREMEN — NEVADA KILLED (g)	NEVADA INJURED (h)	ARIZONA KILLED (i)	ARIZONA INJURED (j)	ALL OTHER EMPLOYES — NEVADA KILLED (k)	NEVADA INJURED (l)	ARIZONA KILLED (m)	ARIZONA INJURED (n)	TOTAL EMPLOYES — NEVADA KILLED (o)	NEVADA INJURED (p)	ARIZONA KILLED (q)	ARIZONA INJURED (r)
(1)	Collisions (C)	a	6 yrs. 1923-28	-	3	-	3	-	-	-	-	-	-	-	1	-	3	-	4
		b	6 yrs. 1929-34	-	-	-	1	-	-	-	2	-	-	-	-	-	-	-	3
		c	5 yrs. 1935-39	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
		d	TOTAL	-	3	-	5	-	-	-	2	-	-	-	1	-	3	-	8
(2)	Derailments (D)	a	6 yrs. 1923-28	-	1	-	-	-	-	-	2	-	-	1	-	-	1	1	2
		b	6 yrs. 1929-34	1	3	-	-	1	-	-	-	-	-	-	-	2	3	-	-
		c	5 yrs. 1935-39	-	1	-	1	-	-	-	-	-	-	-	-	-	1	-	1
		d	TOTAL	1	5	-	1	1	-	-	2	-	-	1	-	2	5	1	3
(3)	Locomotive boiler (B)	a	6 yrs. 1923-28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		b	6 yrs. 1929-34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		c	5 yrs. 1935-39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		d	TOTAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(4)	Other locomotive (L)	a	6 yrs. 1923-28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		b	6 yrs. 1929-34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		c	5 yrs. 1935-39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		d	TOTAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(5)	Miscellaneous train (M)	a	6 yrs. 1923-28	-	6	-	-	-	-	-	-	-	-	-	-	-	6	-	-
		b	6 yrs. 1929-34	-	2	-	2	-	-	-	-	-	-	-	-	-	2	-	2
		c	5 yrs. 1935-39	-	6	-	-	-	-	-	-	-	-	-	-	-	6	-	-
		d	TOTAL	-	14	-	2	-	-	-	-	-	-	-	-	-	14	-	2
(6)	Coupling or uncoupling locomotives or cars (S-a)	a	6 yrs. 1923-28	-	3	-	1	-	-	-	-	-	-	-	-	-	3	-	1
		b	6 yrs. 1929-34	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
		c	5 yrs. 1935-39	1	-	-	1	-	-	-	-	-	-	-	-	1	-	-	1
		d	TOTAL	1	3	-	3	-	-	-	-	-	-	-	-	1	3	-	3
(7)	Coupling or uncoupling air hose, steam hose and safety chains (S-b)	a	6 yrs. 1923-28	-	1	1	-	-	-	-	-	-	1	-	-	-	2	1	-
		b	6 yrs. 1929-34	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2
		c	5 yrs. 1935-39	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		d	TOTAL	-	3	1	2	-	-	-	-	-	1	-	-	-	4	1	2
(8)	Operating locomotives (S-c)	a	6 yrs. 1923-28	-	-	-	-	-	11	-	23	-	-	-	-	-	11	-	23
		b	6 yrs. 1929-34	-	-	-	-	-	3	-	18	-	-	-	-	-	3	-	18
		c	5 yrs. 1935-39	-	-	-	-	-	2	-	12	-	-	-	-	-	2	-	12
		d	TOTAL	-	-	-	-	-	16	-	53	-	-	-	-	-	16	-	53
		a	6 yrs. 1923-28	-	5	1	23	-	-	-	-	-	-	-	-	-	5	1	-
		b	6 yrs. 1929-34	-	1	-	12	-	-	-	-	-	-	-	-	-	-	-	-

		a	6 yrs. 1923-28	-	1	-	-	-	-	-	2	-	-	1	-	-	1	1	2
		b	6 yrs. 1929-34	1	3	-	-	1	-	-	-	-	-	-	-	2	3	-	-
		c	5 yrs. 1935-39	-	1	-	1	-	-	-	-	-	-	-	-	-	1	-	1
(2)	Derailments (D)	d	TOTAL	1	5	-	1	1	-	-	2	-	-	1	-	2	5	1	3
		a	6 yrs. 1923-28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		b	6 yrs. 1929-34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		c	5 yrs. 1935-39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(3)	Locomotive boiler (B)	d	TOTAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		a	6 yrs. 1923-28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		b	6 yrs. 1929-34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		c	5 yrs. 1935-39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(4)	Other locomotive (L)	d	TOTAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		a	6 yrs. 1923-28	-	6	-	-	-	-	-	-	-	-	-	-	-	6	-	-
		b	6 yrs. 1929-34	-	2	-	2	-	-	-	-	-	-	-	-	-	2	-	2
		c	5 yrs. 1935-39	-	6	-	-	-	-	-	-	-	-	-	-	-	6	-	-
(5)	Miscellaneous train (M)	d	TOTAL	-	14	-	2	-	-	-	-	-	-	-	-	-	14	-	2
		a	6 yrs. 1923-28	-	3	-	1	-	-	-	-	-	-	-	-	-	3	-	1
		b	6 yrs. 1929-34	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
	Coupling or uncoupling	c	5 yrs. 1935-39	1	-	-	1	-	-	-	-	-	-	-	-	1	-	-	1
(6)	locomotives or cars (S-a)	d	TOTAL	1	3	-	3	-	-	-	-	-	-	-	-	1	3	-	3
		a	6 yrs. 1923-28	-	1	1	-	-	-	-	-	-	1	-	-	-	2	1	-
		b	6 yrs. 1929-34	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2
	Coupling or uncoupling air hose,	c	5 yrs. 1935-39	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-
(7)	steam hose and safety chains (S-b)	d	TOTAL	-	3	1	2	-	-	-	-	-	1	-	-	-	4	1	2
		a	6 yrs. 1923-28	-	-	-	-	-	11	-	23	-	-	-	-	-	11	-	23
		b	6 yrs. 1929-34	-	-	-	-	-	3	-	18	-	-	-	-	-	3	-	18
		c	5 yrs. 1935-39	-	-	-	-	-	2	-	12	-	-	-	-	-	2	-	12
(8)	Operating locomotives (S-c)	d	TOTAL	-	-	-	-	-	16	-	53	-	-	-	-	-	16	-	53
		a	6 yrs. 1923-28	-	5	1	23	-	-	-	-	-	-	-	-	-	5	1	23
		b	6 yrs. 1929-34	-	1	-	12	-	-	-	-	-	-	-	-	-	1	-	12
		c	5 yrs. 1935-39	-	4	-	14	-	-	-	-	-	-	-	-	-	4	-	14
(9)	Operating hand brakes (S-d)	d	TOTAL	-	10	1	49	-	-	-	-	-	-	-	-	-	10	1	49
		a	6 yrs. 1923-28	-	4	-	3	-	-	-	-	-	-	-	-	-	4	-	3
		b	6 yrs. 1929-34	-	2	-	-	-	-	-	-	-	-	-	-	-	2	-	-
		c	5 yrs. 1935-39	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	2
(10)	Operating switches (S-e)	d	TOTAL	-	6	-	4	-	-	-	1	-	-	-	-	-	6	-	5
		a	6 yrs. 1923-28	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
		b	6 yrs. 1929-34	-	2	-	-	-	1	-	-	-	-	-	-	-	3	-	-
	Coming in contact	c	5 yrs. 1935-39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(11)	with fixed structures (S-f)	d	TOTAL	1	2	-	-	-	1	-	-	-	-	-	-	1	3	-	-
		a	6 yrs. 1923-28	1	29	-	47	-	1	-	1	-	1	-	1	1	31	-	49
		b	6 yrs. 1929-34	-	6	-	26	-	-	-	3	-	-	-	1	-	6	-	30
	Getting on or off cars	c	5 yrs. 1935-39	1	7	-	18	-	-	-	-	-	-	-	-	1	7	-	18
(12)	or locomotives (S-g)	d	TOTAL	2	42	-	91	-	1	-	4	-	1	-	2	2	44	-	97
		a	6 yrs. 1923-28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		b	6 yrs. 1929-34	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
	Accidents at highway	c	5 yrs. 1935-39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(13)	grade crossings (S-h)	d	TOTAL	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
		a	6 yrs. 1923-28	1	4	2	3	-	-	-	-	2	1	2	2	3	5	4	5
		b	6 yrs. 1929-34	1	-	1	-	-	-	-	-	1	2	1	1	2	2	2	1
	Struck or run over by	c	5 yrs. 1935-39	-	-	2	1	-	-	-	-	-	-	-	-	-	-	2	1
(14)	cars or locomotives (S-i)	d	TOTAL	2	4	5	4	-	-	-	-	3	3	3	3	5	7	8	7
		a	6 yrs. 1923-28	4	88	3	127	-	3	-	3	1	2	-	6	5	93	3	136
		b	6 yrs. 1929-34	-	47	2	75	-	4	-	3	-	1	1	-	-	52	3	78
	Miscellaneous train-	c	5 yrs. 1935-39	-	23	3	55	-	-	-	3	-	1	-	6	-	24	3	64
(15)	service accidents (S-j)	d	TOTAL	4	158	8	257	-	7	-	9	1	4	1	12	5	169	9	278
		a	6 yrs. 1923-28	7	144	7	207	-	15	-	29	3	5	3	10	10	164	10	246
		b	6 yrs. 1929-34	2	63	3	120	1	8	-	26	1	3	2	2	4	74	5	148
		c	5 yrs. 1935-39	2	43	5	92	-	2	-	16	-	1	-	6	2	46	5	114
(16)	TOTAL ALL CAUSES	d	GRAND TOTAL	11	250	15	419	1	25	-	71	4	9	5	18	16	284	20	508

Defendant's Exhibit No. 279 (Witness J.J. Sullivan)
Feb. 6, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

COMPARISON OF CASUALTIES TO

EIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN ON DUTY

SUSTAINED IN ROAD AND TRAIN SERVICE ACCIDENTS
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
FOR YEARS 1923 TO 1940, INCLUSIVE

SOUTHERN PACIFIC LINES
STATES OF NEVADA AND ARIZONA

	Year	Freight Train Miles (Thousands)		Freight Train Car Miles (Thousands)		Casualties to Road Freight Conductors Brakemen and Flagmen on Duty						Casualties per Million Train Miles		Casualties per 100 Million Car Miles	
						Killed		Injured		Total Casualties					
	(a)	Nevada (b)	Arizona (c)	Nevada (d)	Arizona (e)	Nevada (f)	Arizona (g)	Nevada (h)	Arizona (i)	Nevada (j)	Arizona (k)	Nevada (l)	Arizona (m)	Nevada (n)	Arizona (o)
(1)	1923	2 259	1 622	111 847	91 565	1	0	43	32	44	32	19.48	19.73	39.34	34.95
(2)	1924	2 035	1 777	106 707	98 480	2	0	22	30	24	30	11.79	16.88	22.49	30.46
(3)	1925	2 262	2 448	127 118	124 954	1	0	31	48	32	48	14.15	19.61	25.17	38.41
(4)	1926	2 977	2 704	139 622	137 560	0	5	14	34	14	39	6.74	14.42	10.80	28.33
(5)	1927	2 146	2 796	139 959	140 997	2	1	13	32	15	33	6.99	11.80	10.72	23.41
(6)	1928	2 438	2 890	156 869	145 287	1	1	21	31	22	32	9.10	11.23	14.02	22.03
(7)	Total 1923-28	13 197	14 197	772 122	738 913	7	7	144	207	151	214	Average 11.44	15.07	Average 19.56	28.96
(8)	1929	2 380	3 083	150 671	180 332	1	0	15	32	16	32	6.90	10.38	10.68	19.96
(9)	1930	2 057	2 574	147 882	141 512	1	1	12	30	13	31	6.32	12.04	8.80	21.91
(10)	1931	1 688	2 205	123 433	130 015	0	0	5	19	5	19	2.96	8.62	4.05	14.63
(11)	1932	1 514	1 849	111 034	101 195	0	0	11	17	11	17	7.27	9.19	9.91	16.80
(12)	1933	1 364	1 632	104 663	91 142	0	1	9	11	9	12	6.60	7.35	8.60	13.17
(13)	1934	1 513	1 880	122 036	102 303	0	1	11	11	11	12	7.28	6.67	9.01	11.73
(14)	Total 1929-34	10 496	13 143	759 629	726 499	2	3	63	120	65	123	Average 6.22	9.36	Average 8.56	17.17
(15)	1935	1 596	2 100	123 928	118 598	0	0	7	17	7	17	4.39	8.10	5.67	14.33
(16)	1936	1 939	2 452	144 689	132 908	0	2	8	13	8	15	4.15	6.12	5.53	11.32
(17)	1937	2 807	2 776	131 389	148 232	1	1	13	31	14	32	6.98	11.53	9.25	21.59
(18)	1938	1 647	2 301	131 331	130 033	0	1	9	17	9	18	5.46	7.82	6.85	13.84
(19)	1939	1 814	2 558	144 386	142 754	1	1	6	14	7	15	3.86	5.86	4.85	10.51
(20)	1940	2 046	2 770	144 482	155 909	0	0	7	15	7	15	3.42	5.42	4.84	9.62
(21)	Total 1935-40	11 039	14 957	899 501	828 051	2	5	50	107	52	112	Average 4.71	7.49	Average 6.05	13.53
(22)	Total 18 Years	34 691	42 297	2 391 242	2 283 463	11	15	257	434	268	449	Average 7.73	10.62	Average 11.21	19.66
(23)	COMPARISON OF AVERAGE CASUALTY RATES DURING DIFFERENT PERIODS											Train Mile Basis		Car Mile Basis	
												Nevada	Arizona	Nevada	Arizona
(24)	Period 1929-1934 compared with 1923-1928 - Decrease											45.6%	37.9%	56.2%	40.7%
(25)	Period 1935-1940 compared with 1923-1928 - Decrease											58.8%	50.3%	69.1%	53.3%
(26)	Period 1935-1940 compared with 1929-1934 - Decrease											24.3%	20.0%	29.3%	21.2%
(27)	Period 1935-1940 compared with 18 year average - Decrease											39.1%	29.5%	46.0%	31.2%

COMPARISON OF [illegible]

	Year (a)	FREIGHT TRAIN MILES (Thousands) Nevada (b)	Arizona (c)	FREIGHT TRAIN CAR MILES (Thousands) Nevada (d)	Arizona (e)	DERAILMENTS AND FIRES ON MAIN LINES KILLED Nevada (f)	Arizona (g)	INJURED Nevada (h)	Arizona (i)	TOTAL CASUALTIES Nevada (j)	Arizona (k)	PER MILLION TRAIN MILES Nevada (l)	Arizona (m)	100 MILLION CAR MILES Nevada (n)	Arizona (o)
(1)	1923	2 209	1 620	111 847	91 965	1	0	43	32	44	32	19.48	19.73	39.34	34.95
(2)	1924	2 020	1 977	105 907	98 480	2	0	22	30	24	30	11.79	16.88	22.49	30.46
(3)	1925	2 202	2 468	127 218	124 934	1	0	31	48	32	48	14.15	19.61	25.17	38.41
(4)	1926	2 077	2 704	139 628	137 660	0	5	14	34	14	39	6.74	14.42	10.80	28.33
(5)	1927	2 145	2 705	139 959	140 997	3	1	13	32	15	33	6.99	11.80	10.72	23.41
(6)	1928	2 438	2 850	156 869	143 297	1	1	21	31	22	32	9.10	11.23	14.02	22.83
(7)	Total 1923-28	13 197	14 197	771 128	738 933	7	7	144	207	151	214	Average 11.44	15.07	Average 19.56	28.96
(8)	1929	3 220	3 023	150 671	140 232	1	0	15	32	16	32	6.90	10.38	10.62	19.96
(9)	1930	2 897	2 574	147 882	143 512	1	1	12	30	13	31	6.32	12.04	8.80	21.91
(10)	1931	1 688	2 368	123 433	120 015	0	0	5	19	5	19	2.96	8.62	4.05	15.83
(11)	1932	1 534	1 849	111 024	101 195	0	0	11	17	11	17	7.27	9.19	9.91	16.80
(12)	1933	1 364	1 632	104 663	91 142	0	1	9	11	9	12	6.60	7.35	8.60	13.17
(13)	1934	1 512	1 800	122 026	102 305	0	1	11	11	11	12	7.28	6.67	9.01	11.73
(14)	Total 1929-34	10 435	13 143	759 619	716 499	2	3	63	130	65	123	Average 6.22	9.36	Average 8.56	17.17
(15)	1935	1 996	2 180	123 908	118 998	0	0	7	17	7	17	4.39	8.10	5.67	14.30
(16)	1936	1 989	2 452	144 689	132 505	0	2	8	13	8	15	4.15	6.12	5.53	11.32
(17)	1937	2 007	2 776	151 385	148 238	1	1	13	31	14	32	6.98	11.53	9.25	21.59
(18)	1938	1 647	2 331	151 331	130 053	0	1	9	17	9	18	5.46	7.72	6.85	13.84
(19)	1939	1 654	2 598	144 284	142 754	1	1	6	14	7	15	3.86	5.86	4.86	10.51
(20)	1940	2 046	2 770	164 482	155 909	0	0	7	15	7	15	3.42	5.42	4.26	9.62
(21)	Total 1935-40	11 039	14 997	899 501	828 051	2	5	50	107	52	112	Average 4.71	7.49	Average 6.05	13.53
(22)	Total 18 Years	34 691	42 297	2 391 242	2 283 463	11	15	257	434	268	449	Average 7.73	10.62	Average 11.21	19.66

		TRAIN MILE BASIS Nevada	TRAIN MILE BASIS Arizona	CAR MILE BASIS Nevada	CAR MILE BASIS Arizona
(23)	COMPARISON OF AVERAGE CASUALTY RATES DURING DIFFERENT PERIODS				
(24)	Period 1929-1934 compared with 1923-1928 - Decrease	45.6%	37.9%	56.2%	40.7%
(25)	Period 1935-1940 compared with 1923-1928 - Decrease	58.8%	50.3%	69.1%	53.3%
(26)	Period 1935-1940 compared with 1929-1934 - Decrease	24.3%	20.0%	29.3%	21.2%
(27)	Period 1935-1940 compared with 18 year average - Decrease	39.1%	29.5%	46.0%	31.2%

COMPARISON OF MAIN TRACK MILEAGE OPERATED AS OF DECEMBER 31, 1939	(miles)	(miles)
ARIZONA - Main line, California-Arizona line to Arizona-New Mexico line (via Yuma and Rowle)	455.92	
Main line, Bellton to Phoenix via Phoenix	220.42	
Main line, Tucson to Arizona-New Mexico line via Douglas	141.95	
Total main lines		822.29
Branch lines		464.96
Total		1,273.25
NEVADA - Main line, California-Nevada line to Nevada-Utah line	752.36	
Main line, California-Nevada line to Fernley	67.26	
Total main lines		819.62
Branch lines		153.60
Total		973.42

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Defendant's Exhibit No. 280 (Witness J.J. Sullivan)
Feb. 6, 1941 Apr. 29, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

COMPARISON OF CASUALTIES TO

FLIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN ON DUTY

SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS

CAUSED FROM SUDDEN STOPPING, STARTING, LURCH AND JERK OF TRAIN

REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
FOR THE YEARS 1923 TO 1940, INCLUSIVE

SOUTHERN PACIFIC LINES
STATES OF NEVADA AND ARIZONA

	Year	FREIGHT TRAIN MILES (Thousands)		FREIGHT TRAIN CAR MILES (Thousands)		CASUALTIES TO ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN ON DUTY						CASUALTIES PER MILLION TRAIN MILES		CASUALTIES PER 200 MILLION CAR MILES	
						Killed		Injured		Total Casualties					
		Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)
(1)	1923	2 259	1 622	111 847	91 565	0	0	18	7	18	7	7.97	4.32	16.09	7.64
(2)	1924	2 035	1 777	106 707	98 450	0	0	8	5	8	5	3.93	2.81	7.50	5.08
(3)	1925	2 262	2 448	127 118	124 954	0	0	8	7	8	7	3.54	2.86	6.29	5.60
(4)	1926	2 077	2 704	119 422	137 660	0	1	2	10	2	11	.96	4.07	1.34	7.99
(5)	1927	2 146	2 796	139 999	140 997	1	0	6	4	7	4	3.26	1.43	5.00	2.84
(6)	1928	2 438	2 850	136 869	145 287	0	0	14	7	14	7	5.79	2.46	8.92	4.82
(7)	Total 1923-28	13 297	14 197	772 122	738 913	1	1	56	40	57	41	Average 4.32	2.89	Average 7.38	5.55
(8)	1929	2 328	3 083	150 672	160 332	0	0	9	6	9	6	3.88	1.95	5.97	3.74
(9)	1930	2 057	2 574	147 882	143 512	0	0	9	11	9	11	4.38	4.27	6.09	7.77
(10)	1931	1 688	2 205	120 433	120 815	0	0	1	10	1	10	.59	4.54	.82	8.33
(11)	1932	1 534	1 849	111 084	101 395	0	0	6	6	6	6	3.95	3.24	5.40	5.93
(12)	1933	1 364	1 632	104 643	91 142	0	0	4	4	4	4	2.93	2.45	3.82	4.39
(13)	1934	1 532	1 800	123 [illegible]	102 303	0	0	5	1	5	1	3.31	.56	4.10	.98
(14)	Total 1929-34	10 455	13 143	759 639	716 489	0	0	34	38	34	38	Average 3.25	2.89	Average 4.48	5.30
(15)	1935	1 596	2 200	123 908	118 598	0	0	4	3	4	3	2.51	1.43	3.24	2.53
(16)	1936	1 929	2 452	144 649	132 505	0	0	6	3	6	3	3.11	1.22	4.15	2.26
(17)	1937	2 007	2 796	151 385	148 232	0	0	4	11	4	11	1.99	3.96	2.64	7.42
(18)	1938	1 647	2 301	131 331	130 053	0	0	6	2	6	2	3.64	.87	4.57	1.54
(19)	1939	1 814	2 598	144 386	142 754	0	0	3	4	3	4	1.65	1.54	2.08	2.80
(20)	1940	2 046	2 770	164 482	155 909	0	0	4	1	4	1	1.96	.36	2.43	.64
(21)	Total 1935-40	11 039	14 957	859 501	828 051	0	0	27	24	27	24	Average 2.45	1.60	Average 3.14	2.90
(22)	Total 18 Years	34 691	42 297	2 391 242	2 283 463	1	1	117	102	118	103	Average 3.40	2.44	Average 4.93	4.51

		TRAIN MILE BASIS		CAR MILE BASIS	
		Nevada	Arizona	Nevada	Arizona
(23)	COMPARISON OF AVERAGE CASUALTY RATES DURING DIFFERENT PERIODS				
(24)	Period 1929 - 1934 compared with 1923-1928 - Decrease	24.8%	-	39.3%	4.5%
(25)	Period 1935 - 1940 compared with 1923-1928 - Decrease	43.3%	44.6%	57.5%	47.7%
(26)	Period 1935 - 1940 compared with 1929-1934 - Decrease	24.6%	44.6%	29.9%	45.3%
(27)	Period 1935 - 1940 compared with 18 year average - Decrease	[illegible]	[illegible]	[illegible]	[illegible]

	Year (a)	FREIGHT TRAIN MILES (Thousands) Nevada (b)	Arizona (c)	FREIGHT TRAIN CAR MILES (Thousands) Nevada (d)	Arizona (e)	CASUALTIES TO ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN ON DUTY — Killed Nevada (f)	Arizona (g)	Injured Nevada (h)	Arizona (i)	Total Casualties Nevada (j)	Arizona (k)	CASUALTIES PER MILLION TRAIN MILES Nevada (l)	Arizona (m)	CASUALTIES PER 100 MILLION CAR MILES Nevada (n)	Arizona (o)
(1)	1929	2 209	1 682	111 847	91 565	0	0	18	7	18	7	7.97	4.32	16.09	7.64
(2)	1930	2 035	1 777	106 707	98 490	0	0	8	5	8	5	3.93	2.81	7.50	5.08
(3)	1931	2 262	2 448	127 118	124 954	0	0	8	7	8	7	3.54	2.86	6.29	5.60
(4)	1932	2 077	2 704	139 622	137 660	0	1	2	10	2	11	.96	4.07	1.54	7.99
(5)	1933	2 146	2 796	139 959	140 997	1	0	6	4	7	4	3.26	1.43	5.00	2.84
(6)	1934	2 438	2 850	156 869	145 897	0	0	14	7	14	7	5.79	2.46	8.92	4.80
(7)	Total 1929-34	13 167	14 257	772 122	738 513	1	1	56	40	57	41	Average 4.32	2.89	Average 7.38	5.55
(8)	1935	2 328	3 083	150 671	160 332	0	0	9	6	9	6	3.88	1.95	5.97	3.74
(9)	1936	2 697	2 974	167 882	143 512	0	0	9	11	9	11	3.30	4.27	6.09	7.77
(10)	1937	1 688	2 305	125 133	120 015	0	0	1	10	1	10	.59	4.34	.81	8.33
(11)	1938	1 514	1 849	111 084	101 295	0	0	6	6	6	6	3.96	3.24	5.40	5.93
(12)	1939	1 944	1 632	104 649	91 142	0	0	4	4	4	4	2.93	2.45	3.82	4.39
(13)	1934	1 512	1 800	122 686	102 303	0	0	5	1	5	1	3.31	.56	4.10	.98
(14)	Total 1935-34	10 495	13 143	799 629	716 499	0	0	34	38	34	38	Average 3.25	2.89	Average 4.48	5.30
(15)	1935	1 596	2 200	125 508	118 598	0	0	4	3	4	3	2.51	1.43	3.24	2.53
(16)	1936	1 929	2 452	144 689	132 585	0	0	6	3	6	3	3.11	1.22	4.15	2.26
(17)	1937	2 807	2 776	151 305	148 252	0	0	4	11	4	11	1.99	3.96	2.64	7.42
(18)	1938	1 647	2 302	131 331	130 053	0	0	6	2	6	2	3.64	.87	4.57	1.54
(19)	1939	1 814	2 538	144 186	142 754	0	0	3	4	3	4	1.65	1.56	2.08	2.80
(20)	1940	2 046	2 770	164 482	155 909	0	0	4	1	4	1	1.96	.36	2.43	.64
(21)	Total 1935-40	11 039	14 957	899 501	828 051	0	0	27	24	27	24	Average 2.45	1.60	Average 3.14	2.90
(22)	Total 18 Years	34 691	42 397	2 391 242	2 283 463	1	1	117	102	118	103	Average 3.40	2.44	Average 4.93	4.51

		TRAIN MILE BASIS		CAR MILE BASIS	
(23)	COMPARISON OF AVERAGE CASUALTY RATES DURING DIFFERENT PERIODS	Nevada	Arizona	Nevada	Arizona
(24)	Period 1929 - 1934 compared with 1929-1928 - Decrease	24.8%	-	59.3%	4.5%
(25)	Period 1935 - 1940 compared with 1929-1928 - Decrease	43.3%	44.6%	57.5%	47.7%
(26)	Period 1935 - 1940 compared with 1929-1934 - Decrease	24.6%	44.6%	29.9%	45.3%
(27)	Period 1935 - 1940 compared with 18 year average - Decrease	27.9%	34.4%	36.3%	35.7%

COMPARISON OF MAIN TRACK MILEAGE OPERATED AS OF DECEMBER 31, 1939	(miles)	(miles)
ARIZONA - Main line, California-Arizona line to Arizona-New Mexico line (via Gila and Bowie)	498.92	
Main line, Gulfton to Phoenix via Phoenix	210.43	
Main line, Thoreau to Arizona-New Mexico line via Douglas	141.95	
Total main lines		851.30
Branch lines		464.96
Total		1,273.25
NEVADA - Main line, California-Nevada line to Nevada-Utah line	728.56	
Main line, California-Nevada line to Ogden	87.26	
Total main lines		855.82
Branch lines		159.60
Total		973.42

Defendan.'s Exhibit No. 281 (Witness Sullivan)
Feb. 6, 1941

FATALITIES, SUBSEQUENT FATALITIES OR AMPUTATION OF LIMBS
ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN,
TRAIN AND TRAIN SERVICE ACCIDENTS

REPORTED TO THE INTERSTATE COMMERCE COMMISSION,

YEARS 1923 TO 1939, INCLUSIVE

SOUTHERN PACIFIC COMPANY IN
STATES OF NEVADA AND ARIZONA

		NEVADA			ARIZONA			PERSON INJURED		NATURE OF INJURY	DETAIL AND CIRCUMSTANCES OF ACCIDENT
	DATE	LOCATION	TRAIN NO.	NO. OF CARS	LOCATION	TRAIN NO.	NO. OF CARS	NAME	OCCUPATION		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
(1)	12-19-23	Hazen	X-2524-W	11	-	-	-	J. F. May	Brakeman	Killed	Fell from top of car and run over during switching move.
(2)	10- 5-24	Hazen	1-272	54	-	-	-	N. N. Smith	Brakeman	Killed	Attempted to get on 4th car from engine and fell under train.
(3)	10-21-24	Kiko	X-3205-W	48	-	-	-	C. C. Finley	Brakeman	Killed	Fell from top of train
(4)	2-27-25	Montello	X-3205-W	4	-	-	-	F. C. Snooks	Conductor	Right leg amputated	Fell from car and run over.
(5)	9-26-25	Hazen	X-1785-W	40	-	-	-	A. E. Benson	Brakeman	Killed	Crushed between couplers of caboose and rear car of train.
(6)	5- 4-27	Clark	24	25	-	-	-	G. Looney	Brakeman	Killed	Leaned out too far from train and struck by bridge.
(7)	10-14-27	Ogilla	X-3268-W	60	-	-	-	R. Carrigan	Brakeman	Killed	Lost balance and fell from end of car when engine separated from train.
(8)	7-30-28	Wells	X-3228-W	11	-	-	-	C. H. Bingham	Brakeman	Killed	Fell from top of car and run over during switching move.
(9)	9-26-29	Kiva	191	5	-	-	-	J. L. Maher	Conductor	Killed	Two cars derailed and turned over account switch not properly lined.
(10)	6- 6-30	Hazen	X-3248-W	67	-	-	-	F. J. Littleton	Conductor	Killed	Struck and run over by passenger train.
(11)	6- 9-31	Montello	X-4359-W	3	-	-	-	C. F. Cook	Brakeman	Both legs amputated	Missed footing and fell from car while attempting to get down to brake-platform.
(12)	8-10-32	Wannamaker	X-2772-E	66	-	-	-	A. J. Hawkins	Brakeman	Right foot amputated	Fell from car and run over when attempting to get off.
(13)	10-29-32	Montello	X-3228-W	102	-	-	-	S. J. Weaver	Brakeman	Left arm amputated	Helper engine crushed caboose and caught brakeman on caboose platform when sudden stop occurred due to broken brake pipe.
(14)	4- 8-37	Hazen	X-3748-W	57	-	-	-	C. B. Huyck	Conductor	Killed	Fell from gangway step of moving engine which was detached from train and was struck by truck structure of tender.
(15)	8-28-39	Valley Pass	X-4034-E	70	-	-	-	Harry DeYoung	Brakeman	Killed	Lost balance, fell from caboose steps and run over when helper engine struck caboose.
(16)	4-24-26	-	-	-	Karro	X-3728-E	64	R. E. Simmons	Brakeman	Left arm amputated	Fell under train while bleeding brake cylinder on car.
(17)	6-27-24	-	-	-	Mohawk	X-2826-W	65	R. L. Shields	Brakeman	Died	Fell from bridge to ground below while getting off train.

(10)	6- 6-30	Hasan	X-3248-W	67	-	-	-	F. J. Littleton	Conductor	Killed	Struck and run over by passenger train.
(11)	6- 9-31	Montello	X-4359-W	3	-	-	-	C. F. Cook	Brakeman	Both legs amputated	Missed footing and fell from car while attempting to get down to brake-platform.
(12)	8-10-32	Wickenburg	X-2772-E	66	-	-	-	A. J. Haskins	Brakeman	Right foot amputated	Fell from car and run over when attempting to get off.
(13)	10-29-32	Montello	X-3228-W	102	-	-	-	S. J. Weaver	Brakeman	Left arm amputated	Helper engine crushed caboose and caught brakeman on caboose platform when sudden stop occurred due to broken brake pipe.
(14)	4- 8-37	Hasan	X-3748-W	57	-	-	-	C. B. Huyck	Conductor	Killed	Fell from gangway step of moving engine which was detached from train and was struck by truck structure of tender.
(15)	8-28-39	Valley Pass	X-4034-E	78	-	-	-	Harry DeYoung	Brakeman	Killed	Lost balance, fell from caboose steps and run over when helper engine struck caboose.
(16)	4-24-26	-	-	-	Karro	X-3728-W	64	R. E. Simmons	Brakeman	Left arm amputated	Fell under train while bleeding brake cylinder on car.
(17)	6-27-24	-	-	-	Mohawk	X-2826-W	66	R. L. Shields	Brakeman	Died	Fell from bridge to ground below while getting off train.
(18)	1- 1-25	-	-	-	Maricopa	X-2594-W	64	F. E. Martin	Brakeman	Left arm amputated	Fell from moving car and run over when cars coupled to others.
(19)	6-12-25	-	-	-	Casador	X-3448-W	31	H. Tipton	Brakeman	Right leg amputated	Fell under car while attempting to board train.
(20)	2- 6-26	-	-	-	Hayden	136	14	A. Millouse	Brakeman	Killed	Caught between cars and run over while coupling air hose.
(21)	3- 2-26	-	-	-	Rillito	X-2516-W	64	C. W. Neal	Brakeman	Killed	Fell between cars and run over when train parted due to broken knuckle.
(22)	6-11-26	-	-	-	Stockham	91	66	H. Inskeep	Brakeman	Died	Fell from top of train when train parted due to undesired emergency.
(23)	6-14-26	-	-	-	Yuma	430	36	R. J. Goldwater	Brakeman	Killed	Struck by light engine.
(24)	6-29-26	-	-	-	Theba	X-2545-W	66	J. N. Crisp	Brakeman	Killed	Struck by passing passenger train.
(25)	9- 8-26	-	-	-	Willcox	X-3713-W	63	C. J. Franklin	Brakeman	Killed	Fell from top of train and run over.
(26)	2- 3-27	-	-	-	Harqua	X-2573-W	20	W. J. Carey	Brakeman	Left arm amputated	Fell under train when he came in contact with hand rail on bridge while getting off train.
(27)	8-29-27	-	-	-	Franklin	175	8	M. Reardon	Conductor	Killed	Fell from top of car while releasing hand brake.
(28)	11-22-28	-	-	-	Fairbank	X-3714-W	59	J. R. Robinson	Brakeman	Killed	Fell from top of train and run over.
(29)	4- 6-30	-	-	-	Marsh	X-3700-W	66	L. D. Oliver	Brakeman	Killed	Fell from top of train and run over.
(30)	9-25-33	-	-	-	Hassayampa	902	70	R. A. Joiner	Brakeman	Killed	Stepped from caboose and fell from bridge to ground below.
(31)	3- 8-34	-	-	-	Bisbee Jct.	X-5033-W	45	R. A. Powers	Conductor	Killed	Fell under train attempting to get on.
(32)	5- 9-36	-	-	-	Phoenix	901		D. B. Rose	Conductor	Killed	Struck and run over while cleaning train by a cut of 18 cars handled by yard engine moving 12 miles per hour.
(33)	7-15-36	-	-	-	Yuma	X-2518-E	59	L. L. Williams	Brakeman	Killed	Struck and run over by engine of his own train moving on adjacent track.
(34)	7- 5-37	-	-	-	Red Rock	903	50	H. S. Thompson	Brakeman	Killed	Fell from top of moving train.
(35)	2-24-38	-	-	-	Picacho	X-3618-W	65	W. C. Ritchie	Brakeman	Killed	Fell from gangway of engine.
(36)	3-29-38	-	-	-	Yuma	X-1721-W	48	W. A. Franks	Conductor	Died	Struck and run over by car handled by yard engine.
(37)	7-30-38	-	-	-	Tucson	962	24	W. F. Kelley	Brakeman	Died	Fell from car to ground when struck by brake club as hand brake released unexpectedly.
(38)	6-28-39	-	-	-	Wellton	902	53	L. W. Milligan	Brakeman	Killed	Fell between moving cars and run over during switching move.

Defendant's Exhibit No. 282 (Witness J.J. Sullivan)
Feb. 6, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

CASUALTIES SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS
FROM ALL CAUSES BY

ALL CLASSES OF EMPLOYES ON DUTY

RESULTING FROM THE OPERATION OF

ROAD FREIGHT TRAINS

REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
FOR THE THREE YEARS 1923-1925
COMPARED WITH
THE THREE YEARS 1937-1939

STATE OF NEVADA

	PERIOD	TOTAL FREIGHT LOCOMOTIVE MILES (THOUSANDS)	TOTAL FREIGHT TRAIN MILES (THOUSANDS)	TOTAL FREIGHT TRAIN CAR MILES (THOUSANDS)	AVERAGE CARS PER TRAIN	NUMBER OF CASUALTIES TO EMPLOYES ON DUTY				TOTAL EMPLOYE CASUALTIES	NUMBER OF EMPLOYE CASUALTIES PER		
						TRAIN AND ENGINEMEN		OTHER EMPLOYES			MILLION LOCOMOTIVE MILES	MILLION TRAIN MILES	100 MILLION FREIGHT CAR MILES
						KILLED	INJURED	KILLED	INJURED				
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)
(1)	1923-1925 (3 years)	6,823	6,556	345,672	52.73	(ß) 4	(+) 106	(ßß) 1	3	114	16.71	17.39	32.98
(2)	1937-1939 (3 years)	5,682	5,468	426,822	78.06	(ßßß) 1	(=) 31	None	1	33	5.81	6.04	7.73
					RATIO						RATIO	RATIO	RATIO
					(1.48)						(2.88)	(2.88)	(4.27)
IMPROVEMENT 3 YEARS 1937-1939 COMPARED WITH 3 YEARS 1923-1925											65.23%	65.27%	76.56%

(ß) A brakeman fell from an 11 car train and was run over and killed at Hazen, December 19th, 1923;
A brakeman fell from a 48 car train and was run over and killed at Elko, October 21st, 1924;
A brakeman fell boarding a 54 car train and killed at Hazen, October 5th, 1924; and
A brakeman was killed between couplers of caboose and train of 40 cars at Hazen, September 26th, 1925.

(ßß) A railway police officer fell from a 60 car train and was run over and killed at Huxley, November 8th, 1924.

(ßßß) A conductor was killed when he fell from gangway ladder of moving engine, which had been detached from a 57 car train, at Hazen, April 8th, 1937.

(+) Includes 96 freight conductors, brakemen and flagmen.

(=) Includes 28 freight conductors, brakemen and flagmen.

Defendant's Exhibit No. 283 (Witness J.J. Sullivan)
Feb. 6, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

CASUALTIES TO ALL CLASSES OF EMPLOYES OFF DUTY

ROAD FREIGHT TRAIN OPERATION
SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

STATE OF ARIZONA

				NUMBER OF CASUALTIES TO EMPLOYES OFF DUTY							CASUALTIES PER MILLION TRAIN MILES			CASUALTIES PER 100 MILLION CAR MILES		
				ROAD FREIGHT CONDUCTORS AND BRAKEMEN OFF DUTY			ALL OTHER EMPLOYES OFF DUTY									
	YEAR	TOTAL FREIGHT TRAIN MILES (THOUSANDS)	TOTAL FREIGHT TRAIN CAR MILES (THOUSANDS)	KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL	GRAND TOTAL ALL CASUALTIES	ROAD FREIGHT CONDUCTORS & BRAKEMEN OFF DUTY	OTHER EMPLOYES OFF DUTY	ALL CLASSES EMPLOYES OFF DUTY	ROAD FREIGHT CONDUCTORS & BRAKEMEN OFF DUTY	OTHER EMPLOYES OFF DUTY	ALL CLASSES EMPLOYES OFF DUTY
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
(1)	1923	1 622	91 566	-	-	-	1	-	-	-	-	-	-	-	-	-
(2)	1924	1 777	98 490	-	-	-	-	2	2	2	-	1.13	1.13	-	2.03	2.03
(3)	1925	2 448	124 954	-	-	-	-	-	-	-	-	-	-	-	-	-
(4)	1926	2 704	137 660	-	-	-	-	-	-	-	-	-	-	-	-	-
(5)	1927	2 796	140 957	-	-	-	-	-	-	-	-	-	-	-	-	-
(6)	1928	2 850	145 287	-	-	-	-	-	-	-	-	-	-	-	-	-
(7)	TOTAL 1923-28	14 197	738 913	-	-	-	-	2	2	2	-	.14	.14	-	.27	.27
(8)	1929	3 083	160 332	-	-	-	-	-	-	-	-	-	-	-	-	-
(9)	1930	2 574	141 512	-	1	1	-	-	-	1	.39	-	.39	.71	-	.71
(10)	1931	2 205	120 015	-	-	-	-	-	-	-	-	-	-	-	-	-
(11)	1932	1 849	101 195	-	-	-	-	-	-	-	-	-	-	-	-	-
(12)	1933	1 632	91 142	-	-	-	-	-	-	-	-	-	-	-	-	-
(13)	1934	1 800	102 303	-	-	-	-	-	-	-	-	-	-	-	-	-
(14)	TOTAL 1929-34	13 143	716 499	-	1	1	-	-	-	1	.08	-	.08	.14	-	.14
(15)	1935	2 100	118 598	-	-	-	-	-	-	-	-	-	-	-	-	-
(16)	1936	2 452	132 505	-	-	-	-	-	-	-	-	-	-	-	-	-
(17)	1937	2 776	148 232	-	1	1	-	1	1	2	.36	.36	.72	.67	.67	1.35
(18)	1938	2 301	130 053	-	-	-	-	-	-	-	-	-	-	-	-	-
(19)	1939	2 558	142 754	-	-	-	-	1	1	1	-	.39	.39	-	.70	.70
(20)	TOTAL 1935-39	12 187	672 142	-	1	1	-	2	2	3	.08	.16	.25	.15	.30	.45
(21)	GRAND TOTAL 1923-39	39 527	2 127 554	-	2	2	-	4	4	6	.05	.10	.15	.09	.19	.28

5857

STATE OF ARIZONA

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

DETAIL OF CASUALTIES TO ALL CLASSES OF EMPLOYES OFF DUTY
ROAD FREIGHT TRAIN OPERATION
SUSTAINED IN TRAIN AND TRAIN-SERVICE ACCIDENTS
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

STATE OF ARIZONA

	DATE (a)	LOCATION (b)	I.C.C. CLASS. (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	PERSONS INJURED: NAME (g)	PERSONS INJURED: OCCUPATION (EMPLOYES OFF DUTY) (h)	ESTIMATED DISABILITY (DAYS) (i)	DESCRIPTION OF ACCIDENT (j)
(1)	2-18-24	Sentinel	# S-j	X-2732-W	60	30	W.J. Waidler	Deadhead engineer	4	Rough stop due to undesired emergency account dirty triple, injured engineer in caboose.
(2)	9-14-24	Tucson	# S-j	X-3661-W	60	6	C.H. Simmonds	Deadhead engineer	20	Slipped on top of engine tank due to run-in of slack.
(3)	5-26-30	Phoenix	S-j	432	55	Standing	W.W. Pettis	Conductor	30	Hand slipped between grab iron and end of car when crossing over between cars.
(4)	7-15-37	Tucson	# S-j	X-3309-W	62	5	G.B. Palmer	Deadhead conductor	7	Thrown against end of caboose when engineer made emergency stop on account of switch not properly lined for train movement.
(5)	9-20-37	Reppy	S-j	884	45	20	R. Tapia	Ex. gang laborer	Permanent	Fell from top of train to ground and run over; right leg severed.
(6)	9- 7-39	Musina	S-j	X-3309-W	54	35	J. Nieto	Ex. gang laborer	45	Lost hold in coach door way and fell from train.

Sudden stopping, starting, lurch or jerk of train or car

Main Track Mileage as of December 31, 1939

ARIZONA	Main Line - California-Arizona Line to Arizona-New Mexico Line, (Via Gila and Bowie).....	455.92	
	Main Line - Wellton to Picacho, via Phoenix	210.42	
	Main Line - Tucson to Arizona-New Mexico Line, via Douglas	141.95	
	Total Main Line		808.29
	Total Branch Lines		464.96
	Grand Total		1,273.25

Defendant's Exhibit No. 284 (Witness J.J. Sullivan)
Feb. 6, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

CASUALTIES TO ALL CLASSES OF EMPLOYES OFF DUTY

ROAD FREIGHT TRAIN OPERATION
SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

STATE OF NEVADA

	YEAR	TOTAL FREIGHT TRAIN MILES (THOUSANDS)	TOTAL FREIGHT TRAIN CAR MILES (THOUSANDS)	NUMBER OF CASUALTIES TO EMPLOYES OFF DUTY							CASUALTIES PER MILLION TRAIN MILES			CASUALTIES PER 100 MILLION CAR MILES		
				ROAD FREIGHT CONDUCTORS AND BRAKEMEN OFF DUTY			ALL OTHER EMPLOYES OFF DUTY			GRAND TOTAL ALL CASUALTIES	ROAD FREIGHT CONDUCTORS & BRAKEMEN OFF DUTY	OTHER EMPLOYES OFF DUTY	ALL CLASSES EMPLOYES OFF DUTY	ROAD FREIGHT CONDUCTORS & BRAKEMEN OFF DUTY	OTHER EMPLOYES OFF DUTY	ALL CLASSES EMPLOYES OFF DUTY
				KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL							
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
(1)	1923	2 259	111 847	-	-	-	-	-	-	-	-	-	-	-	-	-
(2)	1924	2 035	106 707	-	3	3	-	1	1	4	1.47	.49	1.96	2.82	.94	3.76
(3)	1925	2 262	127 118	-	1	1	-	-	-	1	.44	-	.44	.79	-	.79
(4)	1926	2 077	129 622	-	-	-	1	1	2	2	-	.96	.96	-	1.55	1.55
(5)	1927	2 146	139 959	-	-	-	-	-	-	-	-	-	-	-	-	-
(6)	1928	2 418	156 869	-	2	2	-	-	-	2	.83	-	.83	1.28	-	1.28
(7)	TOTAL 1923-28	13 197	772 122	-	6	6	1	2	3	9	.45	.23	.68	.78	.39	1.17
(8)	1929	2 320	150 671	-	-	-	-	-	-	-	-	-	-	-	-	-
(9)	1930	2 057	147 802	-	-	-	-	-	-	-	-	-	-	-	-	-
(10)	1931	1 688	123 433	-	-	-	-	-	-	-	-	-	-	-	-	-
(11)	1932	1 514	111 024	-	-	-	-	-	-	-	-	-	-	-	-	-
(12)	1933	1 364	104 663	-	-	-	-	-	-	-	-	-	-	-	-	-
(13)	1934	1 512	122 026	-	-	-	-	-	-	-	-	-	-	-	-	-
(14)	TOTAL 1929-34	10 455	759 619	-	-	-	-	-	-	-	-	-	-	-	-	-
(15)	1935	1 596	123 508	-	-	-	-	-	-	-	-	-	-	-	-	-
(16)	1936	1 929	144 689	-	1	1	-	-	-	1	.52	-	.52	.69	-	.69
(17)	1937	2 007	151 385	-	-	-	-	-	-	-	-	-	-	-	-	-
(18)	1938	1 647	131 331	-	-	-	-	-	-	-	-	-	-	-	-	-
(19)	1939	1 814	144 106	-	-	-	-	-	-	-	-	-	-	-	-	-
(20)	TOTAL 1935-39	8 993	695 019	-	1	1	-	-	-	1	.11	-	.11	.14	-	.14
(21)	GRAND TOTAL 1923-39	32 645	2 226 760	-	7	7	1	2	3	10	.21	.09	.31	.31	.13	.45

NOTE: Columns (f) and (j) include 6 trainmen "deadheading," of which class none have been injured since September 3, 1928.

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

DETAIL OF CASUALTIES TO ALL CLASSES OF EMPLOYES OFF DUTY
ROAD FREIGHT TRAIN OPERATION
SUSTAINED IN TRAIN AND TRAIN-SERVICE ACCIDENTS
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

STATE OF NEVADA

	DATE (a)	LOCATION (b)	I.C.C. CLASS. (c)	TRAIN NUMBER (d)	NO.CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	PERSONS INJURED NAME (g)	PERSONS INJURED OCCUPATION (EMPLOYES OFF DUTY) (h)	ESTIMATED DISABILITY (DAYS) (i)	DESCRIPTION OF ACCIDENT (j)
(1)	8-25-24	Fenelon	# S-j	X-3233-W	91	5	J.A. Child J.E. White	Deadhead conductor Deadhead brakeman	6 6	Heading out of siding, undesired emergency action of brakes occurred when engineer made service application. Sudden stop knocked caboose off center and injured deadhead trainmen in caboose
(2)	7-28-24	Because	# S-j	X-2831-W	55	2	D. Caballo	Ex. gang laborer	10	Lost balance and fell against stove when engine coupled to cut off outfit cars while switching.
(3)	1-14-24	Imlay	S-g	276	5	4	A.A. Cesmat	Deadhead brakeman	Permanent	Engine handling five cabooses, injured man getting off caboose fell under wheels crushing leg.
(4)	8-15-25	Imlay	# S-j	X-2526-W	55	6	W. Mahood	Deadhead brakeman	30	Sudden stop due to undesired emergency as train being stopped in yard, threw deadhead brakeman against window frame in cupola.
(5)	8- 2-26	Because	S-i	4/272	63	10	J. Lyons	Asst. B&B foreman	60	Walking alongside train intending to board caboose, stumbled on rock and fell under train.
(6)	3-17-26	Mill City	S-i	253	77	30	P. Balderas	Ex. gang laborer	Killed	Struck by train.
(7)	1- 1-28	Elko	# M-b	1/276	88	7	J.A. Wakefield	Deadhead brakeman	7	Train parted due to drawbar pulling out of second car from engine. Sudden stop damaged 74th and 75th cars and caused deadhead brakeman in caboose to sprain ankle.
(8)	9- 3-28	Sparks	# S-j	X-3269-W	76	6	C.D. Bates	Deadhead brakeman	10	Deadhead brakeman in caboose thrown against stove when slack was taken in train as engineer reopened throttle after having shut off approaching yard.
(9)	10-13-36	Imlay	S-j	None	2	Standing	W.B. Hilbish	Brakeman	30	Lost balance and fell from top of caboose to ground.

- Sudden stopping, starting, lurch or jerk of train or cars.

NOTE: No casualties to trainmen deadheading on road freight trains in the State of Nevada since September 3rd, 1928.

Main Track Mileage as of December 31, 1939

NEVADA	Main Line - California-Nevada Line to Nevada-Utah Line	752.56	
	Main Line - California-Nevada Line to Fernley	67.26	
	Total Main Line		819.82
	Total Branch Lines		153.60
	Grand Total		973.42

5860

Defendant's Exhibit No. 285 (Witness J. J. Sullivan) Witness
Feb. 6, 1941

CASUALTIES TO PERSONS CARRIED UNDER CONTRACT
(LIVESTOCK CARETAKERS, BANANA MESSENGERS, ETC.)
ROAD FREIGHT TRAINS, SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS,
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION,
FOR THE YEARS 1923 TO 1939 INCLUSIVE

SOUTHERN PACIFIC COMPANY
IN
STATES OF NEVADA AND ARIZONA

	STATE OF NEVADA						
	DATE (a)	LOCATION (b)	TRAIN NUMBER (c)	NO. OF CARS (d)	CASUALTIES (e)	DISABILITY (DAYS) (f)	DETAILS AND CIRCUMSTANCES OF ACCIDENT (g)
(1)	11-20-25	Hazen	X-2521-W	54	1 Livestock caretaker	60	Going over top of train toward engine, misjudged footing and fell between cars. Hand crushed and face bruised.

NO REPORTABLE CASUALTIES TO CARETAKERS, ETC., ON FREIGHT TRAINS IN NEVADA SINCE NOVEMBER 20th, 1925

	STATE OF ARIZONA						
(2)	2-10-23	Rillito	2-244	58	1 Banana messenger	5	Rough stop caused by undesired emergency threw man against cupola steps.
(3)	12-23-23	San Simon	E-3660-E	50	1 Banana messenger	3	Sudden stop caused by emergency application by engineer to avoid running through switch threw man down in caboose.
(4)	3- 8-25	Aztec	X-2778-E	68	1 Livestock caretaker	30	Kicked by steer when inside of car.
(5)	1-26-26	Lewis Springs	X-3653-W	70	1 Livestock caretaker	3	Sudden stop due to train parting.
(6)	8-17-26	Luzena	417	47	1 Emig. mov. caretaker	30	Car cut off while switching collided with caboose of train injuring man therein.
(7)	6- 7-28	Palfa	437	56	1 Livestock caretaker	8	Rough coupling to caboose during switching move.
(8)	7- 4-28	Douglas	1-310	59	1 Livestock caretaker	30	Sudden stop due to train parting.
(9)	4-23-31	Phoenix	431	68	1 Livestock caretaker	30	Thrown down in caboose when engineer applied brakes in emergency to avoid striking automobile on street crossing.
(10)	11-21-31	Gila	X-3616-W	66	1 Livestock caretaker	30	Missed footing when alighting from caboose.
(11)	9- 2-33	Bowie	X-5023-E	55	1 Livestock caretaker	7	Foot slipped and knee struck grab iron of car.
(12)	2-17-34	Yuma	X-5022-E	61	1 Livestock caretaker	3	Caught finger in door fastener while securing car door.

NO REPORTABLE CASUALTIES TO CARETAKERS, ETC. ON FREIGHT TRAINS IN ARIZONA SINCE FEBRUARY 17th, 1934.

Defendant's Exhibit No. 286 (Witness J.J. Sullivan)
Apr. 29, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

DERAILMENTS CAUSED BY DEFECTS IN OR FAILURES OF FREIGHT CAR EQUIPMENT

ROAD FREIGHT TRAINS, INCLUDING MIXED REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1940, INCLUSIVE

STATE OF ARIZONA

	Year	Freight Train Miles (Thousands)	Freight Train Car Miles (Thousands)	DESCRIPTION OR NATURE OF DEFECT OR FAILURE OF EQUIPMENT, AND I.C.C. CAUSE CODE NUMBERS: TRUCKS (ICC 2300 TO 2388)		WHEELS & AXLES (ICC 2400 TO 2488)		AIR-BRAKES AND APPURTENANCES (ICC 2500 TO 2588)		HAND BRAKES AND BRAKE RIGGING (ICC 2600 TO 2688)		COUPLERS (ICC 2700 TO 2788)		DRAFT RIGGING (ICC 2800 TO 2888)		CAR BODIES & OTH PARTS OF EQUIPME (ICC 2900 TO 298	
				Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Dama
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)
(1)	1923	1 622	91 565	-	-	3	$985	2	$2 820	-	-	-	-	-	-	1	$
(2)	1924	1 777	98 490	1	$222	5	30 029	1	300	-	-	-	-	-	-		
(3)	1925	2 448	124 954	(a) 9	16 934	7	37 661	1	290	-	-	-	-	-	-	-	-
(4)	1926	2 704	137 660	1	490	8	7 421	1	1 560	1	$525	-	-	1	$960	2	1 5
(5)	1927	2 796	140 957	3	1 016	4	13 938	-	-	-	-	-	-	-	-	-	-
(6)	1928	2 850	145 287	4	1 382	2	1 207	-	-	-	-	(b) 1	$653	-	-	-	-
(7)	Total 6 years 1923-1928	14 197	738 913	18	20 044	29	91 241	5	4 970	1	525	-	-	-	-	-	-
(8)	1929	3 083	160 332	2	11 198	3	2 125	-	-	1	6 663	(b) 1	653	1	960	3	2 4
(9)	1930	2 574	141 512	2	1 264	2	413	-	-	-	-	-	-	-	-	-	-
(10)	1931	2 205	120 015	1	202	-	-	-	-	2	4 891	-	-	1	330	-	-
(11)	1932	1 849	101 195	-	-	1	381	-	-	-	-	-	-	1	9 027	-	-
(12)	1933	1 632	91 142	-	-	-	-	2	1 090	-	-	-	-	-	-	-	-
(13)	1934	1 800	102 303	-	-	1	500	1	534	-	-	-	-	1	328	-	-
(14)	Total 6 years 1929-1934	13 143	716 499	5	12 664	7	3 419	3	1 624	3	11 554	-	-	-	-	-	-
(15)	1935	2 100	118 598	1	656	1	10 118	1	1 500	-	-	-	-	3	9 685	-	-
(16)	1936	2 452	132 505	-	-	1	3 848	-	-	-	-	-	-	-	-	-	-
(17)	1937	2 776	148 232	5	7 601	4	8 491	-	-	1	971	-	-	1	370	-	-
(18)	1938	2 301	130 053	-	-	2	2 108	-	-	1	619	-	-	2	1 085	-	-
(19)	1939	2 558	142 754	1	180	1	924	-	-	-	-	-	-	1	461	-	-
(20)	1940	2 770	155 909	1	867	2	2 134	-	-	-	-	-	-	-	-	-	-

FREIGHT CAR EQUIPMENT

...ERCE COMMISSION

...D I.C.C. CAUSE CODE NUMBERS								
...3 ...2 2766)	DRAFT RIGGING (IOC 2800 TO 2868)		CAR BODIES & OTHER PARTS OF EQUIPMENT (IOC 2800 TO 2868)		TOTAL (IOC 2800 TO 2868)		NUMBER OF DERAILMENTS PER	
Damage	Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Damage	Million Train Miles	100 Million Car Miles
(n)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)
-	-	-	1	$945	6	84 750	3.70	6.55
-	-	-	-	-	7	30 551	3.94	7.11
-	1	$960	2	1 501	(a) 20	57 346	8.17	16.01
-	-	-	-	-	11	9 996	4.07	7.99
$653	-	-	-	-	(b) 8	15 607	2.86	5.68
-	-	-	-	-	6	2 589	2.11	4.13
							Average	
653	1	960	3	2 446	(a) (b) 58	120 839	4.09	7.85
-	-	-	-	-	6	19 986	1.95	3.74
-	1	330	-	-	5	2 007	1.94	3.53
-	1	9 027	-	-	4	14 120	1.81	3.33
-	-	-	-	-	1	381	.54	.99
-	1	328	-	-	3	1 418	1.84	3.29
-	-	-	-	-	2	1 034	1.11	1.95
							Average	
-	3	9 685	-	-	21	38 946	1.60	2.93
-	-	-	-	-	3	12 274	1.43	2.53
-	1	370	-	-	2	4 218	.82	1.51
-	2	1 085	-	-	12	18 148	4.32	8.10
-	1	461	-	-	4	3 188	1.74	3.08
-	-	-	-	-	2	1 104	.78	1.40
-	-	-	-	-	4	3 68...	1.4...	2.6...

	Year	Freight Train Miles (Thousands)	Freight Train Car Miles (Thousands)	DESCRIPTION OR NATURE OF DEFECT OR FAILURE OF EQUIPMENT, AND I.C.C. CAUSE CODE NUMBERS														
				TRUCKS (ICC 2300 TO 2388)		WHEELS & AXLES (ICC 2400 TO 2488)		AIR-BRAKES AND APPURTENANCES (ICC 2500 TO 2588)		HAND BRAKES AND BRAKE RIGGING (ICC 2600 TO 2688)		COUPLERS (ICC 2700 TO 2788)		DRAFT RIGGING (ICC 2800 TO 2888)		CAR BODIES & OTHER PARTS OF EQUIPMENT (ICC 2900 TO 2988)		(ICC
				Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Damage	Number of Accident
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
(1)	1923	1 622	91 565	-	-	3	$985	2	$2 820	-	-	-	-	-	-	1	$945	6
(2)	1924	1 777	98 490	1	$222	5	30 029	1	300	-	-	-	-	-	-	-	-	7
(3)	1925	2 448	124 954	(a) 9	16 934	7	37 661	1	290	-	-	-	-	1	$960	2	1 501	(a) 20
(4)	1926	2 704	137 660	1	490	8	7 421	1	1 560	1	$525	-	-	-	-	-	-	11
(5)	1927	2 796	140 957	3	1 016	4	13 938	-	-	-	-	(b) 1	$653	-	-	-	-	(b) 8
(6)	1928	2 850	145 287	4	1 382	2	1 207	-	-	-	-	-	-	-	-	-	-	6
(7)	Total 6 years 1923-1928	14 197	738 913	18	20 044	29	91 241	5	4 970	1	525	(b) 1	653	1	960	3	2 446	(a) (b) 58
(8)	1929	3 083	160 332	2	11 198	3	2 125	-	-	1	6 663	-	-	-	-	-	-	6
(9)	1930	2 574	141 512	2	1 264	2	413	-	-	-	-	-	-	1	330	-	-	5
(10)	1931	2 205	120 015	1	202	-	-	-	-	2	4 891	-	-	1	9 027	-	-	4
(11)	1932	1 849	101 195	-	-	1	381	-	-	-	-	-	-	-	-	-	-	1
(12)	1933	1 632	91 142	-	-	-	-	2	1 090	-	-	-	-	1	328	-	-	3
(13)	1934	1 800	102 303	-	-	1	500	1	534	-	-	-	-	-	-	-	-	2
(14)	Total 6 years 1929-1934	13 143	716 499	5	12 664	7	3 419	3	1 624	3	11 554	-	-	3	9 685	-	-	21
(15)	1935	2 100	118 598	1	656	1	10 118	1	1 500	-	-	-	-	-	-	-	-	3
(16)	1936	2 452	132 505	-	-	1	3 848	-	-	-	-	-	-	1	370	-	-	2
(17)	1937	2 776	148 232	5	7 601	4	8 491	-	-	1	971	-	-	2	1 085	-	-	12
(18)	1938	2 301	130 053	-	-	2	2 108	-	-	1	619	-	-	1	461	-	-	4
(19)	1939	2 558	142 754	1	180	1	924	-	-	-	-	-	-	-	-	-	-	2
(20)	1940	2 770	155 909	1	867	2	2 136	-	-	1	681	-	-	-	-	-	-	4
(21)	Total 6 Years 1935-1940	14 957	828 051	8	9 304	11	27 625	1	1 500	3	2 271	-	-	4	1 916	-	-	27
(22)	Total 18 Years 1923-1940	42 297	2 283 463	31	42 012	47	122 285	9	8 094	7	14 350	1	653	8	12 561	3	2 446	106
(23)	Total 18 Years 1923-1940	Number of Accidents Per 100 Million Car Miles		1.36	-	2.06	-	.39	-	.31	-	.04		.35	-	.13	-	4.64

(a) 1 engineer killed
(b) 1 telegraph lineman killed

"DAMAGE" includes damage to equipment, track and structures, and cost of clearing wrecks.

) I.C.C. CAUSE CODE NUMBERS								
) 2788)	DRAFT RIGGING (ICC 2800 TO 2868)		CAR BODIES & OTHER PARTS OF EQUIPMENT (ICC 2900 TO 2968)		TOTAL (ICC 2300 TO 2968)		NUMBER OF DERAILMENTS PER	
Damage	Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Damage	Million Train Miles	100 Million Car Miles
(n)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)
-	-	-	1	$945	6	$4 750	3.70	6.55
-	-	-	-	-	7	30 551	3.94	7.11
-	1	$960	2	1 501	(a) 20	57 346	8.17	16.01
-	-	-	-	-	11	9 996	4.07	7.99
$653	-	-	-	-	(b) 8	15 607	2.86	5.68
-	-	-	-	-	6	2 589	2.11	4.13
							Average	
653	1	960	3	2 446	(a) (b) 58	120 839	4.09	7.85
-	-	-	-	-	6	19 986	1.95	3.74
-	1	330	-	-	5	2 007	1.94	3.53
-	1	9 027	-	-	4	14 120	1.81	3.33
-	-	-	-	-	1	381	.54	.99
-	1	328	-	-	3	1 418	1.84	3.29
-	-	-	-	-	2	1 034	1.11	1.95
							Average	
-	3	9 685	-	-	21	38 946	1.60	2.93
-	-	-	-	-	3	12 274	1.43	2.53
-	1	370	-	-	2	4 218	.82	1.51
-	2	1 085	-	-	12	18 148	4.32	8.10
-	1	461	-	-	4	3 188	1.74	3.08
-	-	-	-	-	2	1 104	.78	1.40
-	-	-	-	-	4	3 684	1.44	2.57
							Average	
-	4	1 916	-	-	27	42 616	1.81	3.26
							Average	
653	8	1 561	3	2 446	106	202 401	2.51	4.64
	.35	-	.13	-	4.64	-	-	-

t of clearing wrecks.

Defendant's Exhibit No. 287 (Witness J.J. Sullivan)
Apr. 29, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

DERAILMENTS CAUSED BY DEFECTS IN OR FAILURES OF FREIGHT CAR EQUIPMENT

ROAD FREIGHT TRAINS, INCLUDING MIXED REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1940, INCLUSIVE

STATE OF NEVADA

Year	Freight Train Miles (Thousands)	Freight Train Car Miles (Thousands)	DESCRIPTION OR NATURE OF DEFECT OR FAILURE OF EQUIPMENT, AND I.C.C. CAUSE CODE NUMBERS: TRUCKS (ICC 2300 TO 2388)		WHEELS & AXLES (ICC 2400 TO 2488)		AIR-BRAKES AND APPURTENANCES (ICC 2500 TO 2588)		HAND BRAKES AND BRAKE RIGGING (ICC 2600 TO 2688)		COUPLERS (ICC 2700 TO 2788)		DRAFT RIGGING (ICC 2800 TO 2888)		CAR BODIES & OTHER PARTS OF EQUIPMENT (ICC 2900 TO 2988)		TOTAL (ICC 2300 TO 2988)		NUMBER OF DERAIL... PER	
			Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Damage	Number of Accidents	Damage	Million Train Miles	100 Mi... Car Mi...
	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)
23	2 259	111 847	-	-	4	$2 626	-	-	1	$200	1	$1 160	1	$183	-	-	7	$4 169	3.10	6.2
24	2 035	106 707	-	-	4	12 161	-	-	-	-	-	-	-	-	-	-	4	12 161	1.97	3.7
25	2 262	127 118	2	900	4	5 570	2	1 080	1	228	-	-	2	888	-	-	11	8 666	4.86	8.6
26	2 077	129 622	-	-	-	-	-	-	1	432	-	-	-	-	-	-	1	432	.48	.7
27	2 146	139 959	1	305	2	1 498	-	-	1	4 846	-	-	3	2 203	1	285	8	9 137	3.73	5.7
28	2 418	156 869	-	-	4	1 906	-	-	-	-	-	-	1	3 200	1	425	6	5 531	2.48	3.8
Years 1928	13 197	772 122	3	1 205	18	23 761	2	1 080	4	5 706	1	1 160	7	6 474	2	710	37	40 096	Average 2.80	4.7
29	2 320	150 671	2	536	-	-	-	-	-	-	-	-	-	-	-	-	2	536	.86	1.3
30	2 057	147 802	-	-	3	1 452	-	-	-	-	1	1 703	-	-	1	900	5	4 055	2.43	3.3
31	1 688	123 433	-	-	-	-	-	-	1	180	1	945	1	315	-	-	3	1 440	1.78	2.4
32	1 514	111 024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	1 364	104 663	-	-	-	-	-	-	(a) 1	437	1	1 049	-	-	-	-	(a) 2	1 486	1.47	1.9
34	1 512	122 026	(b) 1	3 000	1	162	-	-	-	-	1	200	-	-	-	-	(b) 3	3 362	1.98	2.4
Years 1934	10 455	759 619	3	3 536	4	1 614	-	-	2	617	4	3 897	1	315	1	900	15	10 879	Average 1.43	1.9
35	1 595	123 508	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	1 929	144 689	1	443	(a) 2	39 532	-	-	1	667	-	-	-	-	-	-	(a) 4	40 642	2.07	2.7
37	2 007	151 385	2	1 182	1	495	-	-	-	-	-	-	2	1 135	-	-	5	2 812	2.49	3.3
38	1 647	131 331	1	1 623	1	667	-	-	-	-	-	-	1	1 229	-	-	3	3 519	1.82	2.4
39	1 814	14 106	-	-	1	2 193	-	-	-	-	-	-	-	-	-	-	82	2 193	.55	.6
40	3 046	164 495	1	155	2	1 471	-	-	2	514	-	-	-	-	-	-	5	1 670	2.44	3.0
Years 1940	11 039	859 501	5	3 403	7	44 088	-	-	3	1 181	-	-	3	2 364	-	-	18	51 036	Average 1.63	2.0

Freight Train Miles (Thousands) (b)	Freight Train Car Miles (Thousands) (c)	DESCRIPTION OR NATURE OF DEFECT OR FAILURE OF EQUIPMENT, AND I.C.C. CAUSE CODE NUMBERS: TRUCKS (ICC 2300 TO 2388) Number of Accidents (d)	Damage (e)	WHEELS & AXLES (ICC 2400 TO 2488) Number of Accidents (f)	Damage (g)	AIR-BRAKES AND APPURTENANCES (ICC 2500 TO 2588) Number of Accidents (h)	Damage (i)	HAND BRAKES AND BRAKE RIGGING (ICC 2600 T 2688) Number of Accidents (j)	Damage (k)	COUPLERS (ICC 2700 TO 2788) Number of Accidents (l)	Damage (m)	DRAFT RIGGING (ICC 2800 TO 2888) Number of Accidents (n)	Damage (o)	CAR BODIES & OTHER PARTS OF EQUIPMENT (ICC 2900 TO 2988) Number of Accidents (p)	Damage (q)	TOTAL (ICC 2300 TO 2988) Number of Accidents (r)	Damage (s)	NUMBER OF DERAILMENT PER: Million Train Miles (t)	100 Milli Car Mile (u)
2 259	111 847	-	-	4	$2 626	-	-	1	$200	1	$1 160	1	$183	-	-	7	$4 169	3.10	6.26
2 035	106 707	-	-	4	12 161	-	-	-	-	-	-	-	-	-	-	4	12 161	1.97	3.75
2 262	127 118	2	900	4	5 570	2	1 080	1	228	-	-	2	888	-	-	11	8 666	4.86	8.65
2 077	129 622	-	-	-	-	-	-	1	432	-	-	-	-	-	-	1	432	.48	.77
2 146	139 959	1	305	2	1 498	-	-	1	4 846	-	-	3	2 203	1	285	8	9 137	3.73	5.72
2 418	156 869	-	-	4	1 906	-	-	-	-	-	-	1	3 200	1	425	6	5 531	2.48	3.82
																		Average	
13 197	772 122	3	1 205	18	23 761	2	1 080	4	5 706	1	1 160	7	6 474	2	710	37	40 096	2.80	4.79
2 320	150 671	2	536	-	-	-	-	-	-	-	-	-	-	-	-	2	536	.86	1.33
2 057	147 802	-	-	3	1 452	-	-	-	-	1	1 703	-	-	1	900	5	4 055	2.43	3.38
1 688	123 433	-	-	-	-	-	-	1	180	1	945	1	315	-	-	3	1 440	1.78	2.43
1 514	111 024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 364	104 663	-	-	-	-	-	-	(a) 1	437	1	1 049	-	-	-	-	(a) 2	1 486	1.47	1.91
1 512	122 026	(b) 1	3 000	1	162	-	-	-	-	1	200	-	-	-	-	(b) 3	3 362	1.98	2.46
																		Average	
10 455	759 619	3	3 536	4	1 614	-	-	2	617	4	3 397	1	315	1	900	15	10 879	1.43	1.97
1 566	123 508	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 929	144 689	1	443	(a) 2	39 532	-	-	1	667	-	-	-	-	-	-	(a) 4	40 642	2.07	2.76
2 007	151 385	2	1 182	1	495	-	-	-	2	-	-	2	1 135	-	-	5	2 812	2.49	3.30
1 647	131 331	1	1 623	1	667	-	-	-	-	-	-	1	1 229	-	-	3	3 519	1.82	2.28
1 814	144 106	-	-	1	2 193	-	-	-	-	-	-	-	-	-	-	1	2 193	.55	.69
2 046	164 482	1	155	2	1 401	-	-	2	514	-	-	-	-	-	-	5	2 870	2.44	3.04
																		Average	
11 039	859 501	5	3 403	7	44 088	-	-	3	1 181	-	-	3	2 364	-	-	18	51 036	1.63	2.09
																		Average	
34 691	2 391 242	11	8 124	29	69 463	2	1 080	9	7 504	5	5 057	11	9 153		1 610	70	102 011	2.02	2.93
Number of accidents per 100 million car miles		.46	-	1.21	-	.08	-	.38	-	.21	-	.46	-	.13	-	2.93	-	-	-

(a) 1 trainman injured.
(b) 2 trainmen injured.

"DAMAGE" includes damage to equipment, track and structures and cost of clearing wrecks.

SUMMARY OF DERAILMENTS SHOWN ABOVE

Cause (v)	Total (w)	70 Cars And Less (x)	Over 70 Cars (y)
(23) Trucks	11	5	6
(24) Wheels and axles	29	18	11
(25) Air-brakes and appurtenances	2	-	
(26) Hand brakes, etc.	9	6	
(27) Couplers	5	1	
(28) Draft rigging, etc.	11	4	
(29) Car bodies, etc.	3	1	
(30) Total	70	35	

5863

Defendant's Exhibit No. 288 (Witness J.J. Sullivan)
Feb. 6, 1941 Apr. 29, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

COMPARISON OF THE TOTAL DERAILMENTS CAUSED BY DEFECTS IN OR FAILURE OF FREIGHT CAR EQUIPMENT SHOWN IN EXHIBIT NO. 287 FOR STATE OF NEVADA, AND EXHIBIT NO. 286 FOR STATE OF ARIZONA
YEARS 1923 TO 1940, INCLUSIVE

Year	Freight Train Miles (Thousands)		Freight Train Car Miles (Thousands)		Derailments Caused by Defects in or Failure of Freight Car Equipment				Number of Derailments and Damage to Property per Million Train Miles				Number of Derailments and Damage to Property per 100 Million			
					Number of Accidents		Damage to Property		Number of Accidents		Damage to Property		Number of Accidents		Damage	
	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	
1923	2 259	1 622	111 847	91 565	7	6	$4 169	$4 750	3.10	3.70	$1 846	$2 928	6.26	6.55	$3 727	
1924	2 035	1 777	106 707	98 490	4	7	12 161	30 551	1.97	3.94	5 976	17 222	3.75	7.11	11 397	
1925	2 262	2 448	127 118	124 954	11	20	8 666	57 346	4.86	8.17	3 831	23 426	8.65	16.01	6 817	
1926	2 077	2 704	129 622	137 660	1	11	435	9 996	.48	4.07	208	3 697	.77	7.99	333	
1927	2 146	2 796	139 959	140 957	8	8	9 137	15 607	3.73	2.86	4 258	5 582	5.72	5.68	6 528	
1928	2 418	2 850	156 869	145 287	6	6	5 531	2 589	2.48	2.11	2 287	908	3.82	4.13	3 526	
Total 6 years 1923-1928	13 197	14 197	772 122	738 913	37	58	40 096	120 839	Average 2.80	4.09	Average 3 038	8 513	Average 4.79	7.85	Av 5 193	
1929	2 320	3 083	150 671	160 332	2	6	536	19 986	.86	1.95	231	6 483	1.33	3.74	356	
1930	2 057	2 574	147 802	141 513	5	5	4 055	2 007	2.43	1.94	1 971	780	3.38	3.53	2 744	
1931	1 688	2 205	123 433	120 015	3	4	1 440	14 120	1.78	1.81	853	6 404	2.43	3.33	1 167	
1932	1 514	1 849	111 024	101 195	-	1	-	381	-	.54	-	206	-	.99	-	
1933	1 364	1 632	104 663	91 142	2	3	1 486	1 418	1.47	1.84	1 089	869	1.91	3.29	1 420	
1934	1 512	1 800	122 026	102 303	3	2	3 362	1 034	1.98	1.11	2 224	574	2.46	1.95	2 755	
Total 6 years 1929-1934	10 455	13 143	799 619	716 499	15	21	10 879	38 946	Average 1.43	1.60	Average 1 041	2 963	Average 1.97	2.93	Ave 1 432	
1935	1 596	2 100	123 508	118 598	<	3	-	12 274	-	1.43	-	5 845	-	2.53	-	
1936	1 929	2 452	144 689	132 505	4	2	40 642	4 218	2.07	.82	21 069	1 720	2.76	1.51	28 089	
1937	2 007	2 776	151 385	148 232	5	12	2 812	18 148	2.49	4.32	1 401	6 537	3.30	8.10	1 858	
1938	1 647	2 301	131 331	130 053	3	4	3 519	3 188	1.82	1.74	2 137	1 385	2.28	3.08	2 679	

Year	Freight Train Miles (Thousands) Nevada	Freight Train Miles (Thousands) Arizona	Freight Train Car Miles (Thousands) Nevada	Freight Train Car Miles (Thousands) Arizona	Derailments Caused by Defects in or Failure of Freight Car Equipment: Number of Accidents Nevada	Number of Accidents Arizona	Damage to Property Nevada	Damage to Property Arizona	Number of Derailments and Damage to Property per Million Train Miles: Number of Accidents Nevada	Number of Accidents Arizona	Damage to Property Nevada	Damage to Property Arizona	Number of Derailments and Damage to Property per 100 Million: Number of Accidents Nevada	Number of Accidents Arizona	Damage to Nevada
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
23	2 259	1 622	111 847	91 565	7	6	$4 169	$4 750	3.10	3.70	$1 846	$2 928	6.26	6.55	$3 727
24	2 035	1 777	106 707	98 490	4	7	12 161	30 551	1.97	3.94	5 976	17 222	3.75	7.11	11 397
25	2 262	2 448	127 118	124 954	11	20	8 666	57 346	4.86	8.17	3 831	23 426	8.65	16.01	6 817
26	2 077	2 704	129 622	137 660	1	11	432	9 996	.48	4.07	208	3 697	.77	7.99	333
27	2 146	2 796	139 959	140 957	8	8	9 137	15 607	3.73	2.86	4 258	5 582	5.72	5.68	6 528
28	2 418	2 850	156 869	145 287	6	6	5 531	2 589	2.48	2.11	2 287	908	3.82	4.13	3 526
tal ears 1923-1928	13 197	14 197	972 122	738 913	37	58	40 096	120 839	Average 2.80	4.09	Average 3 038	8 513	Average 4.79	7.85	Aver 5 193
29	2 320	3 083	150 671	160 332	2	6	536	19 986	.86	1.95	231	6 483	1.33	3.74	356
30	2 057	2 574	147 802	141 512	5	5	4 055	2 007	2.43	1.94	1 971	780	3.38	3.53	2 744
31	1 688	2 20[illegible]	123 433	120 015	3	4	1 440	14 120	1.78	1.81	853	6 404	2.43	3.33	1 167
32	1 514	1 849	111 024	101 195	-	1	-	381	-	.54	-	206	-	.99	-
33	1 364	1 632	104 663	91 142	2	3	1 486	1 418	1.47	1.84	1 089	869	1.91	3.29	1 420
34	1 512	1 800	122 026	102 303	3	2	3 362	1 034	1.98	1.11	2 224	574	2.46	1.95	2 755
tal ears 1929-1934	10 455	13 143	759 619	716 499	15	21	10 879	38 946	Average 1.43	1.60	Average 1 041	2 963	Average 1.97	2.93	Avera 1 432
35	1 996	2 100	123 508	118 998	-	3	-	12 274	-	1.43	-	5 845	-	2.53	-
36	1 929	2 452	144 689	132 505	4	2	40 642	4 218	2.07	.82	21 069	1 720	2.76	1.51	28 089
37	2 007	2 776	151 385	148 232	5	12	2 812	18 148	2.49	4.32	1 401	6 537	3.30	8.10	1 858
38	1 647	2 301	131 331	130 053	3	4	3 519	3 188	1.82	1.74	2 137	1 385	2.28	3.08	2 679
39	1 814	2 558	144 106	142 754	4	2	2 193	1 104	.55	.78	1 209	432	.69	1.40	1 522
40	2 046	2 770	164 482	155 909	5	4	1 870	3 684	2.44	1.44	914	1 330	3.04	2.57	1 137
al ars 1935-1940	11 039	14 957	859 501	828 051	18	27	51 036	42 616	Average 1.63	1.81	Average 4 623	2 849	Average 2.09	3.26	Avera 5 938
al ars 1923-1940	34 691	42 297	2 391 242	2 283 463	70	106	102 011	202 401	Average 2.02	2.51	Average 2 941	4 785	Average 2.93	4.64	Averag 4 266

SOURCE: Columns (f) and (g) from column (r) of exhibits referred to in title of this exhibit.
Columns (h) and (i) from column (s) of exhibits referred to in title of this exhibit.
Columns (j) and (k) from column (t) of exhibits referred to in title of this exhibit.
Columns (n) and (o) from column (u) of exhibits referred to in title of this exhibit.

Defendant's Exhibit No. 289 (Witness J.J. Sullivan)
Feb. 6, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

DETAIL OF TRAIN ACCIDENTS,
ROAD FREIGHT TRAIN OPERATION
REPORTED TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

STATE OF ARIZONA

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (DAYS) (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1923						YEAR 1923				
(1)	1-12	Ivalon	C-h	E-2594-W	67	12	None	-	-	$ 490	Cars being shoved to passing track collided with other cars due to brakeman lining wrong switch.
(2)	1-20	Stockham	D-i	E-3639-W	58	8	H. A. Miller	Fireman	25	3,445	Engine derailed and partly turned over and two following cars derailed and turned over after engine truck climbed guard rail while moving through turnout.
(3)	1-30	Sibyl	D-d	E-3667-W	50	4-5	None	-	-	405	Derailment caused by bridle rod breaking on switch point derail.
(4)	2-20	Lirim	D-e	E-2758-W	67	30	None	-	-	470	Derailment caused by broken flange in cast iron wheel.
(5)	4-18	Eloy	M-b	E-2774-W	68	8	None	-	-	2,000	Trespassers smoking in car started fire which destroyed super-structure of car.
(6)	6-10	Covot	D-a	E-3665-W	66	15	None	-	-	2,610	Derailment caused by undesired emergency application of air brakes due to defective triple.
(7)	6-13	Wellton	D-g	2-426	46	10	None	-	-	750	Train backed into motor car near spur switch, motor car jambing under caboose trucks.
(8)	7-10	Patio	C-b	E-2583-W	47	3	P. Rosales	Car repairer	20	965	Engineer misjudged braking power of his train; failed to start making stop in time to avoid overrunning signal, train colliding with standing engine.
(9)	8-24	Maricopa	D-a	E-2789-W	65	8	None	-	-	210	Derailment caused by air brakes applying in emergency due to dirty triple.
(10)	9-4	Sibyl	M-b	E-3654-W 110	66 12	2 40	C. E. Yeats	Express messenger	21	858	Airhose burst on car, slack running in and breaking car in center, car bulging out toward main track and raking cars in passing passenger train, causing injury to express messenger in baggage car.
(11)	10-21	Tucson-Stockham	M-b	1-244	51	10	None	-	-	350	Car and contents caught on fire, probably due to lighted substance thrown by passenger from train 107 which was passed at Jaynes.
(12)	11-29	Pantano	D-e	E-3656-W	42	15	None	-	-	300	Derailment caused by broken flange in cast iron wheel.
(13)	12-11	Bowie	D-i	E-3639-W	17	3	None	-	-	945	Weak wooden frame car buckled while cars were being shoved in ordinary switching movement.
(14)	12-16	Bowtry	D-e	E-3658-W	65	25-30	None	-	-	215	Derailment caused by broken cast iron wheel.
	1924						YEAR 1924				
(15)	1-23	Karro	D-e.	E-3639-E	67	30	None	-	-	2,835	Derailment caused by broken cast iron wheel.
(16)	1-24	Cahe--									

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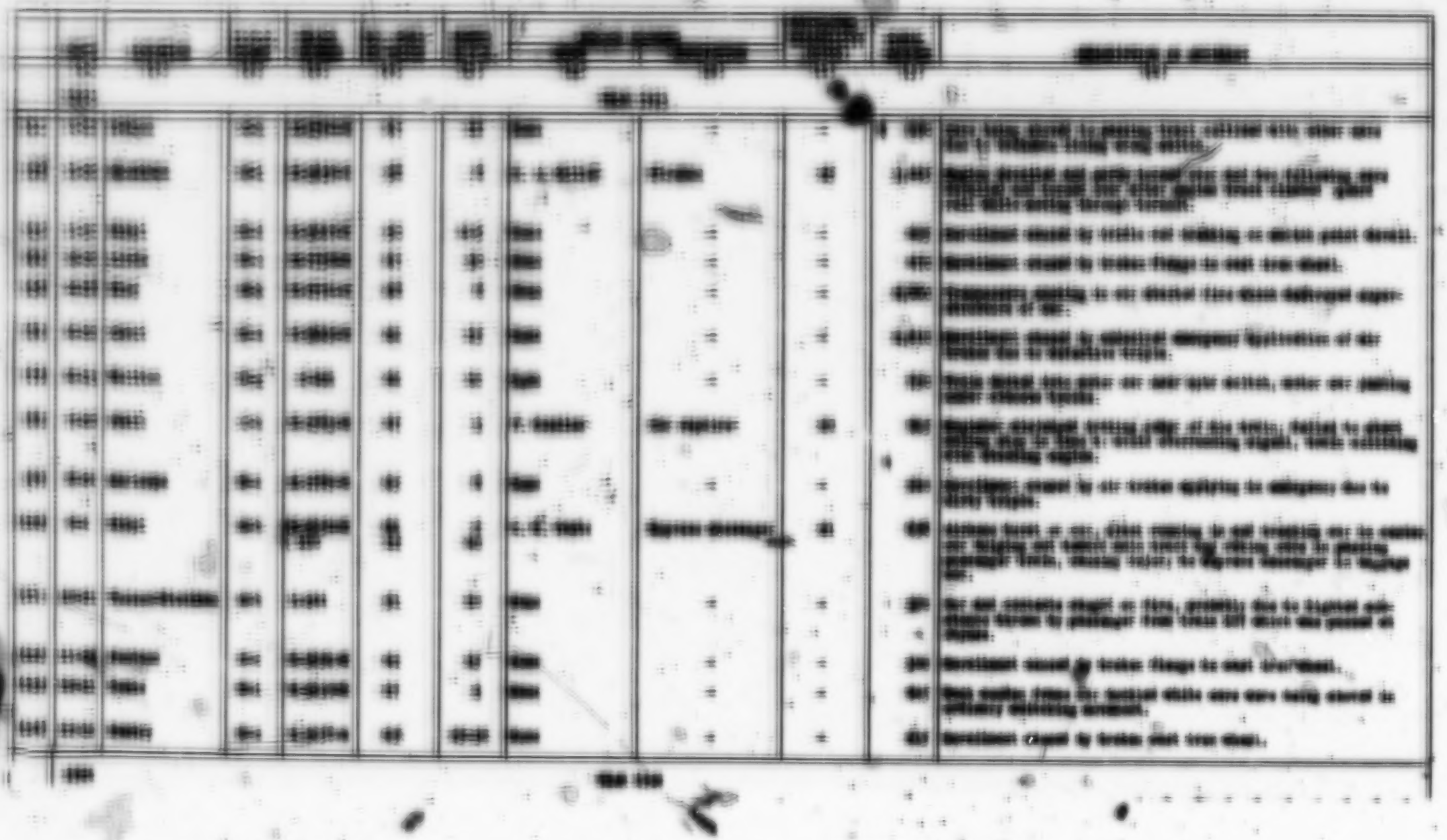
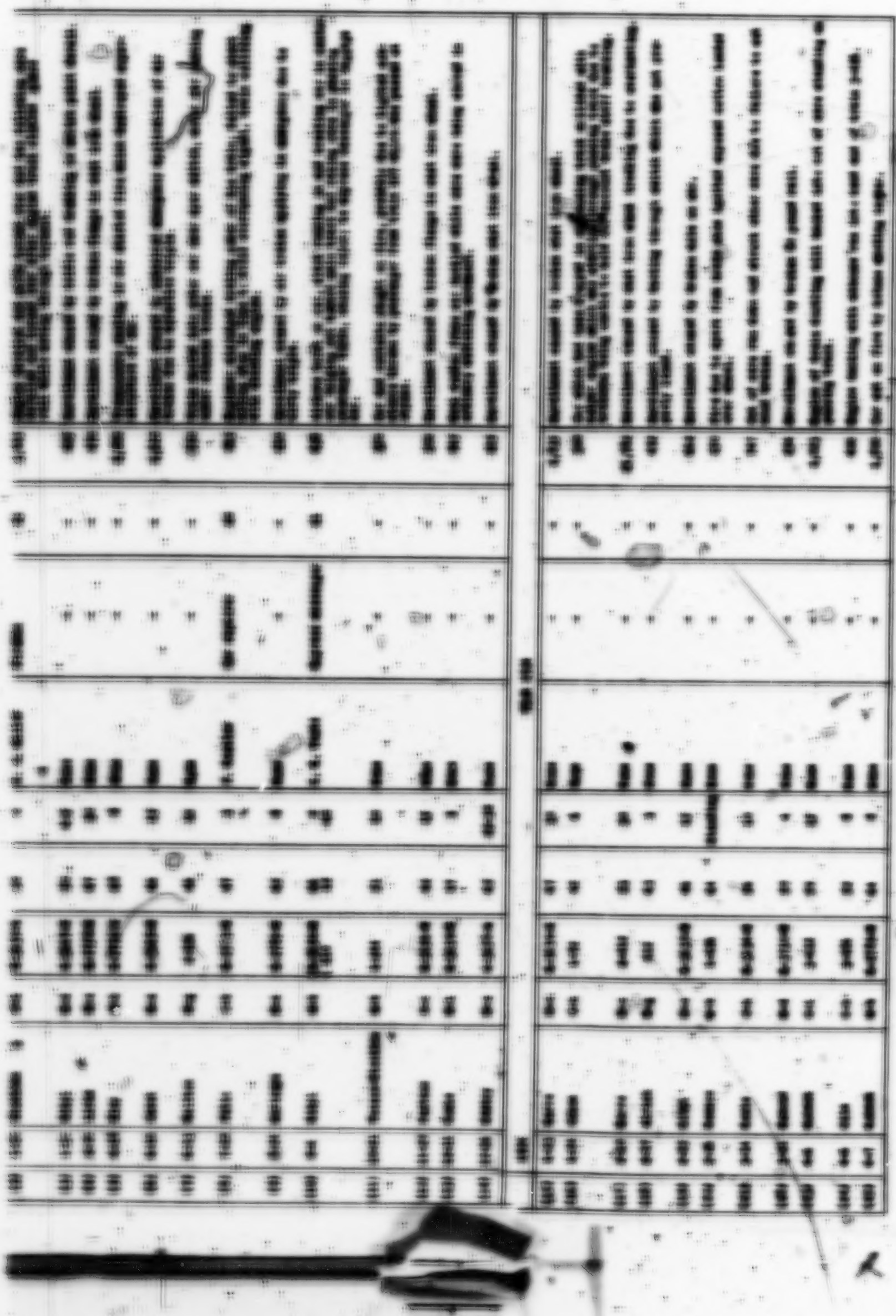
[illegible]





	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
	1934							YEAR 1934 (Continued)			
(28)	6-11	Kerrodale	G-5	2-[illegible]-0	45	8	Some	-	-	$ 485	Collision caused by car not sufficiently secured by hand brakes rolling down grade.
(29)	6-17	Tyndall	G-1	1-254	46	12	Some	-	-	200	Grain parted due to some unauthorized person stepping on cutting lever.
(30)	6-27	Kerrodale	G-5	2-[illegible]-0	50	4	None	-	-	200	Fire started by trespassers smoking in car.
(31)	6-30	Elgin	G-1	2-[illegible]-0	39	12	Some	-	-	300	Derailment caused by wheel breaking due to brakes sticking on on account defective triple.
(32)	7-11	Hankow	G-1	1-[illegible]	35	10	Some	-	-	222	Derailment caused by arch bar dropping down due to box bolts shearing off.
(33)	7-13	Ellis	G-5	412	35	8	Some	-	-	225	Collision caused by brakeman lining wrong switch for engine and cars which were backing.
(34)	7-16	Guilford	Dog	254	38	3-6	Some	-	-	185	Caboose struck water car and derailed due to brakeman giving back up signal before he lined switch and then not getting switch line
(35)	7-20	Estrella	G-5	91	46	12	Some	-	-	405	Hard coupling made by two cars which were dropped, allegedly due to hand brake not holding.
(36)	11-21	Kennerlin	G-1	42[illegible]	31	20	Some	-	-	300	Derailment caused by cast iron wheel breaking.
(37)	10-10	Kenton	G-5	412	3	11	Some	-	-	1,007	Two cars cut off train struck other cars, allegedly because hand brake would not hold.
(38)	10-12	Hayden Junction	G-1	2-[illegible]-0	15	20	Some	-	-	315	Lead truck of tender derailed due to axle breaking.
(39)	10-18	Charleston	G-5	2-[illegible]-0	35	25	Some	-	-	200	Train struck motor car on track due to insufficient flag protection being provided.
(40)	10-27	Douglas	G-5	(2-[illegible]-0 (2-[illegible]-0	Some Some	Standing 4	Some	-	-	296	Engine 288 backed into engine 292.
(41)	10-31	Tenor	G-1	2-[illegible]-0	47	15	Some	-	-	250	Derailment caused by cast iron wheel breaking.
	1935							YEAR 1935			
(42)	1-24	Kline	L-5	141	40	15	Some	-	-	265	Left main rod broke on helper engine.
(43)	1-23	Phoenix	G-1	129	19	15	Some	-	-	270	Derailment caused by broken arch bar.
(44)	1-27	Collier	L-1	2-[illegible]-0	22	12	Some	-	-	590	Driver axle of engine broke.
(45)	2-5	Shannon	G-5	2-[illegible]-0	40	20	Some	-	-	300	Undesired emergency application air brakes caused break-in-two and pulled end sill and drawbar out of weak car.
(46)	2-6	Buell	G-1	418	43	20	Some	-	-	175	Car derailed when box bolt broke, permitting wheels to come out from under car.
(47)	2-21	Felix	G-1	2-[illegible]-0	45	20-25	Some	-	-	979	Broken arch bar on car caused derailment.
(48)	2-21	Irene	G-1	2-[illegible]-0	53	10	Some	-	-	190	Car derailed due to forward truck mounting rail.
(49)	2-23	Tucson	G-5	2-[illegible]-0	35	6	Some	-	-	850	Train backed into cars when it backed in on wrong track.
(50)	3-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

(34)	11-10	Sahuarita	D-e	481	31	20	None					405	Hard coupling made by two cars which were dropped allegedly du. to hand brake not holding.
(35)	12-10	Bowie	C-h	412	3	15	None					500	Derailme caused by cast iron wheel breaking.
(36)	12-12	Hayden Junction	D-e	X-903-E	35	20	None					1,007	Two cars of off train struck other cars, allegedly because han brake would not hold.
(37)	12-18	Charleston	M-b	X-282-W	36	25	None					315	Lead truck of tender derailed due to axle breaking.
(38)	12-25	Douglas	C-d	(X-288-E (X-292-E	None None	Standing 4	None					200 296	Train struck motor car on track due to insufficient flag protection being provided. Engine 288 backed into engine 292.
(39)	12-31	Vamar	D-e	X-3654-W	67	15	None					250	Derailment caused by cast iron wheel breaking.
	1925												YEAR 1925
(40)	1-14	Rice	L-b	141	40	15	None					265	Left main rod broke on helper engine.
(41)	1-23	Phoenix	D-e	129	19	15	None					270	Derailment caused by broken arch bar.
(42)	1-27	Cutter	L-e	X-669-E	22	12	None					590	Driver axle of engine broke.
(43)	2-5	Rhemont	M-b	X-3635-W	60	20	None					300	Undesired emergency application air brakes caused break-in-two and pulled end sill and drawbar out of weak car.
(44)	2-6	Buell	D-e	418	43	20	None					175	Car derailed when box bolt broke, permitting wheels to come out from under car.
(45)	2-15	Pelvo	D-e	X-3730-W	43	20-25	None					979	Broken arch bar on car caused derailment.
(46)	2-20	Irene	D-j	X-3728-W	53	10	None					190	Car derailed due to forward truck mounting rail.
(47)	2-22	Tucson	C-g	X-2723-W	15	6	None					850	Train backed into cars when it backed in on wrong track.
(48)	2-26	Bolton	D-j	X-2594-W	68	35	None					315	Derailment caused by wheel breaking due to overheating account defective triple.
(49)	3-17	Cutter	L-b	X-671-W	58	3	None					300	Strap bolts, back end main rod of engine broke.
(50)	3-21	Davis	C-g	2-426	56	6-8	H.L.Hunt H.Rozell	Brakeman Brakeman			5 10	2,300	Train entering siding collided with standing cut of cars.
(51)	3-28	Rankin	D-e	X-3682-W	64	20-25	None					960	Derailment caused by drawbar pulling out of car due to coupler draft coming out.
(52)	3-31	Tucson	D-e	X-369-W	49	15	None					770	Derailment caused by plow on ballast car dropping down account iron strap breaking.
(53)	4-5	Lee	D-d	X-3423-E	30	35	None					3,933	Broken 80 lb. rail derailed ten cars.
(54)	4-10	Patio Yard	C-h	(X-2771-E (Yd. Eng.	1 21	8 4	None					680	Engine of extra east which was dropping caboose, collided with yard engine.
(55)	4-13	Benson	D-e	412	67	15	None					12,445	Derailment caused by cast iron wheel of car breaking.
(56)	4-17	Burns	M-b	X-3277-E	54	15	None					500	Bridge caught on fire, probably due to burning waste falling from hot box on train.
(57)	4-21	Pisacho	M-b	2-412	65	25	None					650	Train struck motor cars which were not properly protected by flag.
(58)	4-21	Karro	D-e	X-3702-E	68	30	None					1,861	Car derailed due to loose wheel under rear truck.
(59)	5-18	Lusana	D-e	418	25	5	None					165	Derailment caused by lead wheel of forward truck of car climbing rail, due to bound trucks on the car.

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (DAYS) (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1925						YEAR 1925 (Continued)				
(60)	5-23	Willcox	D-e	426	64	25	None	-	-	$10,728	Derailment caused by broken wheel on car.
(61)	5-26	Coleton	D-e	X-2752-W	66	30	None	-	-	698	Journal box bolt sheared off, letting arch bar down, causing derailment.
(62)	6-1	Vail	C-h	418	8	12	None	-	-	469	Cut of cars which brakeman failed to ride collided with car on spur.
(63)	6-13	Mobile	D-e	3-92	66	8	None	-	-	825	Box bolts sheared off, letting arch bar drop, causing derailment.
(64)	6-20	Granite Spur	C-h	X-2797-W	68	15	None	-	-	500	Two cars dropped at excessive speed collided with other cars.
(65)	7-8	Douglas	L-e	94	25	6	None	-	-	600	Main axle of engine broke due to old defect.
(66)	7-14	Kingdon	D-i	X-669-W	37	12	None	-	-	731	Badly bowed car with high unbalanced load derailed on curve.
(67)	7-14	Tacna	D-e	2-92	66	22	None	-	-	585	Journal broke off, due to overheating at some previous time, causing derailment.
(68)	7-19	San Simon	D-e	1-412	70	30	None	-	-	516	Derailment caused by box bolts shearing off forward truck of car.
(69)	7-23	Piedra	D-e	426	54	32	W. J. Woodmansee	Engineer	10	13,240	Eleven cars derailed due to loosened box bolt on 31st car from engine shearing off, allowing arch bar to buckle and truck to drop down, derailed car striking engine of work train on siding, causing injury to engineer.
(70)	8-10	Gila	C-h	X-3662-W	8	12	None	-	-	450	Two cars ahead of engine being dropped; brakeman failed to throw switch for main track, letting engine and two cabooses ahead of engine collide with cars.
(71)	8-17	Burns	D-e	128	28	25	None	-	-	877	Derailment caused by defective flange in wheel of car breaking.
(72)	8-25	Steval	D-e	X-4301-W	67	35	None	-	-	566	Derailment caused by truckside breaking at old weld.
(73)	9-13	Tucson	M-b	X-2812-W	67	25	None	-	-	245	Train broke-in-two due to severe slack action caused by improper application of air by engineer.
(74)	9-16	Maricopa	D-a	X-2798-W	67	3	None	-	-	290	Derailment caused by undesired emergency application of air brakes while stopping due to dirty, slow-acting triple.
(75)	9-16	Ligurta	M-b	2-412	68	30	None	-	-	270	Projecting timber on car struck signal.
(76)	9-20	Maricopa	C-h	X-2583-W	24	8	None	-	-	175	Engine backing up struck empty box car due to failure of brakeman to ride rear of engine.
(77)	10-18	San Pedro	M-b	X-3304-W	65	6	None	-	-	200	Air brakes went into undesired emergency causing car to buckle.
(78)	11-16	Bisbee	M-b	67	2	Standing	None	-	-	500	Ceiling lamp in coach exploded, setting fire to coach.
(79)	12-19	Tempe	C-h	129	7	1-2	None	-	-	265	Cars being backed in on track collided with standing outfit cars.
(80)	12-21	Cohoa	D-e	X-3658-W	58	25	None	-	-	10,850	Derailment caused by broken flange on car.
	1926						YEAR 1926				
(81)	1-10	Rose	M-b	426	70	25	None	-	-	880	Wheel broke on car due to overheating.
(82)	1-30	Tucson	D-g	X-3692-W	69	10	None	-	-	219	Derailment caused by running through switch which was damaged and cocked due to having previously been run through.

												drop down, derailed car striking engine of work train on siding, causing injury to engineer.
(70)	8-10	Gila	C-h	X-3662-W	5	12	None	-	-	450	Two cars ahead of engine being dropped; brakeman failed to throw switch for main track, letting engine and two cabooses ahead of engine collide with cars.
(71)	8-17	Burns	B-e	128	28	25	None	-	-	877	Derailment caused by defective flange in wheel of car breaking.
(72)	8-25	Stoval	B-e	X-4301-W	67	35	None	-	-	566	Derailment caused by truckside breaking at old weld.
(73)	9-13	Tucson	M-b	X-2812-W	67	25	None	-	-	245	Train broke-in-two due to severe slack action caused by improper application of air by engineer.
(74)	9-16	Maricopa	B-a	X-2798-W	67	3	None	-	-	290	Derailment caused by undesired emergency application of air brakes while stopping due to dirty, slow-acting triple.
(75)	9-16	Ligurta	M-b	2-412	68	30	None	-	-	270	Projecting timber on car struck signal.
(76)	9-20	Maricopa	C-h	X-2583-W	24	8	None	-	-	175	Engine backing up struck empty box car due to failure of brakeman to ride rear of engine.
(77)	10-18	San Pedro	M-b	X-3304-W	65	6	None	-	-	200	Air brakes went into undesired emergency causing car to buckle.
(78)	11-16	Bisbee	M-b	67	2	Standing	None	-	-	500	Ceiling lamp in coach exploded, setting fire to coach.
(79)	12-19	Tempe	C-h	129	7	1-2	None	-	-	265	Cars being backed in on track collided with standing outfit cars.
(80)	12-21	Ochoa	B-e	X-3658-W	58	25	None	-	-	10,850	Derailment caused by broken flange on car.
	1926					YEAR 1926					
(81)	1-10	Rase	M-b	426	70	25	None	-	-	880	Wheel broke on car due to overheating.
(82)	1-30	Tucson	B-g	X-3692-W	69	10	None	-	-	219	Derailment caused by running through switch which was damaged and cocked due to having previously been run through.
(83)	2-4	Brannman	B-e	X-3276-W	33	22	None	-	-	497	Flange of wheel on car broke due to concealed defect in construction.
(84)	2-6	Douglas	B-e	94	52	25	None	-	-	225	Derailment caused by broken wheel on car.
(85)	2-7	Casador	B-e	X-3657-W	53	10-12	None	-	-	425	Derailment caused by broken journal on car.
(86)	2-7	Gila	C-h	X-2702-W	65	10	None	-	-	575	Cars dropped on descending grade collided with other cars.
(87)	2-10	Maricopa	C-h	2-129	41	4	None	-	-	250	Standing cars shoved into while making switching move because proper signals were not given.
(88)	2-18	San Carlos	B-g	142	65	4	None	-	-	575	Derailment caused by improper handling of train by engineer in making stop.
(89)	2-19	Cruz	M-e	X-2851-W	48	35	None	-	-	600	Derailment caused by broken wheel on car.
(90)	2-19	Tempe	B-e	X-1697-E	67	8-10	None	-	-	902	Derailment caused by excessive accumulation of dirt on road crossing.
(91)	2-24	Marsh	M-b	94	66	-	None	-	-	440	Car buckled while train was stopping due to delapidated condition of car.
(92)	2-26	Kelton	B-e	X-3464-W	26	8	None	-	-	177	Engine and tender derailed due to cinders on track.
(92a)	3-18	Hayden Jct.	C-h	X-3732-W	2	6	None	-	-	500	Two cars on which insufficient hand brakes had been set, rolled back and struck engine.
(93)	3-26	Charleston	M-b	B-3657-W	70	5	None	-	-	458	Emergency stop made to keep from running through switch which brakeman had not thrown due to his switch key being so worn it would not unlock switch lock.

	1926										
(94)	6-16	Dragoon	D-d	486	38	6	Bare	"	"		
(95)	6-19	Fort Thomas	D-d	142	35	30	Bare	"	"		
(96)	5-1	Tempe	C-c	[illegible]	38	10-15 standing	Bare	"	"		
(97)	5-2	Gilfred	D-c	91	63	6	Bare	"	"		
(98)	5-3	Tucson	D-b	1-430	53	6	Bare	"	"		
(99)	6-19	Stanwix	D-c	91	64	35	Bare	"	"		
(100)	6-29	Bowie	D-d	2-3700-E	67	8	Bare	"	"		
(101)	7-1	Sequillan	D-c	1-312	48	35	Bare	"	"		
(102)	7-17	Wellton	C-b	2-2716-E	65	3	Bare	"	"		
(103)	7-21	Dan	D-d	2-2565-E	65	8	Bare	"	"		
(104)	7-22	Colgate	D-c	2-2527-E	59	25	Bare	"	"		
(105)	8-22	Borego	D-c	2-1835-E	35	30	Bare	"	"		
(106)	8-29	Sibyl	D-d	2-3585-E	70	10	Bare	"	"		
(107)	8-30	Gila	D-c	2-425	1	8	Bare	"	"		
(108)	9-2	Fairbank	D-b	2-3659-E	70	35	Bare	"	"		
(109)	10-3	Sarro	D-c	1-412	54	35	Bare	"	"		
(110)	10-6	Bay Junction	C-b	(2-2562-E (SSW Eng.	1 34	2-3 30	Bare	"	"		
(111)	11-5	Mobile	D-c	412	46	7	Bare	"	"		
(112)	11-11	Piedra	D-b	2-426	67	Standing	Bare	"	"		
(113)	11-27	Rita	D-c	2-3692-E	69	25	Bare	"	"		
(113a)	12-11	Eloy	C-b	2-2226-E	62	3-4	Bare	"	"		
	1927						MAR 1927				
(114)	1-8	Tombstone	D-b	165	2	20	Bare	"	"		
(115)	1-14	Tully	D-c	2-3714-E	48	30	Bare	"	"		
(116)	1-23	Yuma	C-c	{ 354 { 74 Eng.	74 4	6 7	Bare	"	"		

	Date (a)	Location (b)	I.C.C. Class (c)	Train Number (d)	No. Cars in Train (e)	Speed M.P.H. (f)	Derail Equipment (g)				Remarks (Cause of Accident)
	1927						TRAIN 1927 (Continued)				
(134)	9-21	Casa Grande	D-1	X-2733-B	66	6-8	P. R. Timber	Loaded	151.60	$ 651	Engine separated from train due to lost bolt on [illegible] pulling it derail [illegible] account of emergency, [illegible] main line or rear of train.
(135)	9-29	Peacocks	D-b	91	67	6	None	-	-	315	Train [illegible] due to trespasser on [illegible]
(136)	9-13	Safford	D-c	162	47	5	None	-	-	3'6	Derailment caused by [illegible] broken, due to flaw in [illegible]
(137)	9-25	Bellsham	D-d	X-2753-B	52	8	Sand	-	-	9-0	Drive rope [illegible] broke, derailing two cars in a [illegible] to delays to connecting [illegible] [illegible] loading point [illegible].
(138)	9-1	Charleston	D-b	X-2314-B	70	30	None	-	-	850	[illegible] rear end of car and [illegible] to cool off flanges.
(139)	10-10	Gila	C-a	(Train # 426	1 None	3 Standing	None				[illegible] derailed, 4 cars and [illegible] due to failure of [illegible] No. 24's crew to provide [illegible] protection.
(140)	10-13	Strauss	C-g	428	58	27	None	-	-	61	Derailment caused by small [illegible] due to [illegible] broken shifting.
(141)	11-18	Conger	D-c	432	67	25	None	-	-	415	Derailment caused by journal box [illegible] out of [illegible] to the old [illegible] box [illegible] [illegible] the other box [illegible]
(142)	12-8	Ewing	D-b	91	58	30	None	-	-	850	Signal circuit was tracked over by preceding [illegible]
(143)	12-11	Arlington	D-c	X-2757-B	57	8	None	-	-	310	Derailment caused by [illegible] truck [illegible] due to [illegible]
(144)	12-14	Stark	D-d	310	44	25	None	-	-	815	Derailment caused by [illegible] due to [illegible]
	1928						TRAIN 1928				
(135)	2-27	Hayden Junction	D-c	128	25	6	None	-	-	385	Derailment caused by broken flange to wheel.
(136)	3-20	Empire	D-c	X-3702-B	70	25	None	-	-	417	Derailment caused by arch bar [illegible] due to flaw.
(137)	4-8	Rico	D-b	X-2803-B	25	20	None	-	-	1,800	Fire started inside [illegible] engine on fire due to [illegible] employe [illegible] of lighting [illegible]
(138)	6-26	Phoenix	C-g	(433 (Yd.Eng.	60 None	Standing 12	None	-	-	481	Cars in standing train [illegible] by engine while engine running without [illegible]
(139)	10-2	Tucson	D-b	1-312	47	2	None	-	-	1.5	Derailment caused by crossing pulling out of [illegible] two bolts in draft rigging.
(140)	10-25	Benson Junction	D-c	190	45	35	None	-	-	641	Derailment caused by axle breaking due to crystallization
(141)	11-12	Florence	C-b	128	49	4	None	-	-	369	Flue core [illegible] dropped out between [illegible] rivet [illegible] and separating core in [illegible] portion of train.
(142)	11-14	Aldrich	D-c	418	65	6	None	-	-	450	Derailment caused by [illegible] wheels of forward truck of [illegible] rail due to journal box wedge rocked in car.
(143)	11-18	Hereford	D-c	X-3705-B	60	30	None	-	-	2.6	Derailment caused by arch bar breaking.

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	None				62	Derailment caused by wheel breaking due to overh brakes sticking.
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	None				193	Derailment caused by journal box coming out of t to the oil-box bolt missing and the other bolt s
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	None				260	Signal struck and knocked over by projecting tim
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	None				190	Derailment caused by arch bar truck dropping due
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	None				1,815	Derailment caused by axle breaking due to old fr
	1928						YEAR 1928					
[illegible]	2-27	Hayden Junction	D-c	128	25	6	None				565	Derailment caused by broken flange in wheel.
[illegible]	3-20	Empire	D-c	2-3702-B	30	25	None				417	Derailment caused by arch bar breaking due to fl
[illegible]	4-8	Rico	D-c	2-2813-B	25	20	None				1,600	Fire started inside carnival wagon or fire car b employe smoking or lighting match.
[illegible]	4-26	Phoenix	Org	(433 (21 Eng.	60 None	Standing 12	[illegible]				483	Cars in standing train struck by engine which running without due caution.
[illegible]	10-2	Tucson	D-c	2-322	45	8	None				115	Break-in two caused by drawbar pulling out of dr ive bolts in draft rigging.
[illegible]	10-25	Saguaro Junction	D-c	190	45	35	None.				644	Derailment caused by axle breaking due to cryst
413	11-12	Florence	C-c	128	49	4	None				269	Five cars being dropped got beyond control of ri down and cornering cars in head portion of train
[illegible]	11-17	Clarion	D-c	418	45	6	None				400	Derailment caused by lead wheels of forward truc rail due to journal box wedge locked in box?
[illegible]	11-18	Hereford	D-c	2-3726-B	60	30	None				274	Derailment caused by arch bar breaking.
[illegible]	11-27	Marana	L-c	2-428	59	25-30	None				296	Main driver axle on engine broke due to concea
[illegible]	12-8	Ethyl	D-d	2-3717-B	63	10	None				783	Derailment caused by broken rail.
1463	12-21	Cottle	D-c	2-428	58	35	None				294	Derailment caused by arch bar breaking due to a
	1929						YEAR 1929					
1473	1-19	Ehrenberg	D-c	2-2565-B	69	25	None				797	Derailed 34th car from engine when wheel broke heating account brakes sticking.
1482	2-19	Happy	D-d	241	61	20	None				860	Derailed 41st, 42nd and 43rd cars, due to brok in main track.
1493	2-25	Blaisdell	D-d	2-412	57	8	None				271	Derailed 36th to 41st cars due to rail in siding engine.
1508	3-22	Tucson	D-c	2-2584-B	35	30	None				198	One car derailed due to arch bar breaking.
1513	3-2	Smelter	D-d	174	None	4	None				225	Engine switching on industry track derailed due missing filler block bolts causing guard rail t
1528	3-21	Kingston	D-i	2-2855-B	22	15	None				240	Derailed 17th to 20th cars when 18th car from e high mining timbers, rolled badly on reverse cu of car.
1538	3-29	Tucson	C-d	(Yd. Eng. (2-2583-B	16 51	6 4	None				547	Yardman released hand brakes on cut of cars ag cars were shoved to a coupling, coupling failin cars running down and cornering train, derailin
1543	3-29	Duras	M-b	2-3276-B	38	20	None				367	Train struck motor car on track.

= Caused by sudden stopping, starting, lurch or jerk of car or train.

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CAR IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (DAYS) (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1929						YEAR 1929 (Continued)				
(155)	5-27	Yuma	C-g	(X-2705-E (Td. Exp.	53 Alone	10 Standing	None			800	Train over-ran block signal in stop position and co yard engine beyond.
(156)	6-11	Perilla	D-e	X-3694-E	66	25	None			756	Derailment caused by cast iron wheel breaking due t account brake sticking.
(157)	7-28	Estrella	C-h	1-428	56	3	None			195	Helper engine being cut out of train and not yet in nered when road engine backed up.
(158)	8-14	Boquillas	B-e	310	49	35	None			11,000	Derailed 17th to 25th cars when arch bar broke on 17 to old progressive fracture.
(159)	8-29	Aztec	C-h	473	40	8-10	None			175	Car on which brakeman failed to set hand brakes pro down and cornered another car.
(160)	10-10	Wooley	C-a	(X-2546-E (Wk.Ex.2235	60 6	4 Standing	None			702	Freight train collided with work train due to failu work train proper flag protection and failure of eng freight train to run with caution.
(161)	10-25	Hayden Junction	B-g	X-3276-E	35	4	None			390	Two cars derailed when movement reversed after shovi improperly lined switch.
(162)	10-31	Bowie	C-d	142 3700-E	None 28	4 10	None			600	Engine 2754 of Train 142 backed into side of cut of pulled by engine 3700.
(163)	11-13	Picacho	B-e	434	68	15	None			572	Derailed one car when journal broke due to overheati
(164)	12-10	San Juan	B-g	326	42	35	None			26,265	Derailed 11th to 27th cars from engine due to rail b
(165)	12-25	Liberty	B-e	432	34	35	None			445	Left main axle of engine broke.
(166)	12-28	Delcan	B-e	2-426	68	15-20	None			6,663	Derailed seven cars when brake beam on car came down in heel block of switch.
	1930						YEAR 1930				
(167)	1-29	Casa Grande	B-e	2-428	68	20	None			360	Derailed 35th car from engine due to arch bar breaki engaging frog.
(168)	1-31	Wellton	B-d	X-2599-E	65	20	None			3,062	Six cars derailed due to irregular movement of inter switch while train was passing over the switch.
(169)	2-17	Randolph	B-b	X-253[illegible]	15	35	None			312	Block signal knocked down by object protruding from passing train.
(170)	2-22	Red Rock	B-e	433	64	35	None			212	One car derailed due to cast iron wheel breaking.
(171)	3-9	Tucson	B-g	X-2837-E	68	8-10	None			1,492	Seven cars of backing train derailed due to sw not properly secured in switch stand latch
(172)	3-22	Benson	C-i	X-3717-E	70	3	None			275	Head portion of train backed into rear portion.
(173)	4-11	Mesa	B-g	X-434	39	4	None			215	One car derailed due to brakeman failing to line dor cars were shoved.
(174)	4-25	Otero	C-h	482	70	8	None			225	Cars rolled down and struck rear of train due to cr to make coupling.

(162)	10-31	Bowie	C-d	[illegible] (X-3700-W	20	10					572	Derailed one car when journal broke due to overheating.
(163)	11-13	Picacho	B-c	434	68	15	None				26,265	Derailed 11th to 27th cars from engine due to rail bro
(164)	12-10	San Juan	B-d	326	41	35	None				245	Left main axle of engine broke.
(165)	12-20	Liberty	L-c	432	34	35	None				6,663	Derailed seven cars when brake beam on car came down a in heel block of switch.
(166)	12-28	Delosa	B-c	2-426	68	15-20	None					

YEAR 1930

	1930											
(167)	1-29	Casa Grande	B-c	2-428	68	20	None				360	Derailed 35th car from engine due to arch bar breaking engaging frog.
(168)	1-31	Wellton	B-d	X-2599-W	65	20	None				3,062	Six cars derailed due to irregular movement of interlo switch while train was passing over the switch.
(169)	2-17	Randolph	M-b	X-2535-W	25	35	None				312	Block signal knocked down by object protruding from co passing train.
(170)	2-22	Red Rock	B-c	433	67	35	None				212	One car derailed due to cast iron wheel breaking.
(171)	3-9	Tucson	B-d	X-2837-W	68	8-10	None				1,492	Seven cars of backing train derailed due to swit not properly secured in switch stand latch.
(172)	3-22	Benson	C-i	X-3747-W	70	3	None				275	Head portion of train backed into rear portion.
(173)	4-11	Noon	B-g	1-434	39	4	None				215	One car derailed due to brakeman failing to line dera cars were shoved.
(174)	4-25	Otero	C-h	482	70	8	None				225	Cars rolled down and struck rear of train due to car to make coupling.
(175)	5-13	Mohawk	M-b	X-2520-W	65	8	None				395	Car broke-in-two because too weak, due to old defects stand ordinary train usage.
(176)	5-28	Tacna	M-b	X-2513-W	65	40	None				470	Emergency application of brakes caused by main reser on engine breaking.
(177)	6-11	Chemiso	B-c	2-412	70	30	None				330	Derailed 37th car from engine due to drawbar of 35th out and falling between rails.
(178)	7-6	Tucson	C-h	X-3765-W	67	15	None				650	Brakemen failed to control speed of two cabooses cut moving train, cabooses colliding with train when tra suddenly.
(179)	7-10	Lirim	B-c	3-434	34	25	None				201	One car derailed due to axle breaking.
(180)	9-5	Kendall	B-g	433	60	3	None				725	Caboose and two cars of backing train derailed due failure to line derailer.
(181)	10-22	Certa	B-g	X-3319-E	27	10	None				151	Caboose struck rear of train and derailed when brake overtake caboose to control its movement due to st falling.
(182)	11-17	Crook	B-c	X-3319-E	70	20	None				90	One car derailed due to broken truck frame.

YEAR 1931

	1931											
(183)	1-3	Benson	M-b	X-5004-W	70	12	None				1,055	Six cars buckled and damaged due to heavy run in of result of emergency application when branch pipe b car from engine.
(184)	1-16	Dylan	M-b	142	11	25	None				210	Train struck motor car on track.

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (DAYS) (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1931										YEAR 1931 (Continued)
(185)	--	Ramona	L-e	310	62	10	None			$ 200	Frame broken on locomotive due to concealed flaw.
(186)	-22	Waco	L-e	2-312	59	4	None			250	Driving axle on locomotive broke.
(187)	-21	Calumet	D-e	X-5029-E	46	30	None			202	One car derailed due to broken truck frame.
(188)	-15	Gran Grande	M-b	421	59	Standing	None			350	Fire of unknown origin destroyed caboose.
(189)	5-28	Coolidge	D-g	433	61	5	None			436	Engine derailed due to cocked switch.
(190)	5-31	Amary	D-c	X-3752-E	57	35	None			9,027	Derailed 5th to 10th cars due to draft arm breaking off body of 5th car and draft rigging dropping on track.
(191)	6-1	Tucson	D-g	X-3324-W	4	6	None			252	Engine derailed at derailing switch.
(192)	6-6	Avon	D-c	432	35	18	None			4,649	Derailed 10th to 14th cars due to brake beam on 9th car coming down and catching in heel block of switch point.
(193)	7-10	Vine	D-c	X-3073-E	35	12	None			1,070	Left main driver of engine derailed due to journal breaking
(194)	7-10	Kin-Steval	D-c	2-414	65	20	None			14,450	Derailed 7th to 16th cars due to heavy rains undermining track.
(195)	7-11	Tucson	D-d	X-3752-W	66	6	None			565	Three cars derailed while backing, due to defective switch.
(196)	7-21	Parkano	L-b	310	44	20	None			635	Back side rod on engine broke due to old flaw.
(197)	-3	Concord	C-i	410	55	30	S. F. Mote J. F. Martin H. T. Stapp	Engineer Fireman Brakeman	6 Permanent 30.	4,488	Engine backing with two cars ahead of engine collided with rear of train due to engine being unable to stop account of reservoir pipe of engine breaking off.
(198)	-10	Germantown	L-b	2-310	54	20	None			500	Main rod strap on engine broke.
(199)	-22	San Carlos	L-e	142	34	5	None			750	Main axle on engine broke due to hidden defect.
(200)	8-28	Tucson	D-e	X-3316-W	66	10	None			242	Derailed 41st and 42nd cars due to brake beam dropping down breaking account brake hanger key bolt missing.
(201)	9-12	Douglas	D-i	169	18	25	None			1,095	Derailed 12th and 13th cars due to heavy overload of ore and uneven superelevation of track.
(202)	9-21	Chavez	L-b	482	35	15	None			800	Main rod strap on engine broke.
											YEAR 1932
(203)	1-19	Thebe	L-e	X-2546-W	65	3	None			175	Main axle on engine broke due to progressive fracture.
(204)	2-2	Pembroke-Colfred	M-b	X-3324-W	69	38	None			255	One car derailed due to arch bar breaking.
(205)	-25	Amole	L-b	1-410	70	30	None			250	Middle main rod strap broke on locomotive.
(206)	3-3	Dragoon	L-b	414	70	10	None			280	Side rod of engine failed due to flaw.
(207)	3-4	Tucson	L-b	2-412	70	5	None			220	Middle main rod of engine broke due to flaw.
(208)	3-11	Gran Grande	L-e	1-416	70	1	None			250	Main axle of engine broke due to flaw.

(193)	7-1	Kirk	A-1	[illegible]	[illegible]	[illegible]	[illegible]				14,450	Derailed 7th to 16th cars due to heavy rain undermining track.
(194)	7-10	Kim-Stoval	D-e	2-414	65	20	None				565	Three cars derailed while backing, due to defective [illegible]
(195)	7-11	Wagon	D-d	X-3752-W	66	6	None				635	Back side rod on engine broke due to old flaw.
(196)	7-20	Fortuno	L-b	320	44	20	None				4,688	Engine backing with two cars ahead of engine collided ances of train due to engine being unable to stop reco reservoir pipe of engine breaking off.
(197)	7-6	Oxford	C-i	610	55	30	S. T. Mote J. F. Martin H. T. Stapp	Engineer Fireman Brakeman	6 Permanent 30			
(198)	7-20	Copperdine	L-b	2-310	54	20	None				500	Main rod strap on engine broke.
(199)	7-22	San Carlos	L-c	142	34	5	None				750	Main axle on engine broke due to hidden defect.
(200)	7-28	Tucson	D-e	X-3316-W	66	15	None				242	Derailed 41st and 42nd cars due to brake beam droppin breaking account brake hanger key bolt missing.
(201)	8-12	Douglas	B-1	67	18	25	None				1,095	Derailed 12th and 13th cars due to heavy carload of c and uneven superelevation of track.
(202)	12-1	Chevas	L-b	402	35	15	None				800	Main rod strap on engine broke.

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(203)	1-29	Thebe	L-c	X-2546-W	65	3	None				175	Main axle on engine broke due to progressive fractur
(204)	2-2	Pembroke-Colfred	M-b	X-3324-W	69	38	None				255	One car derailed due to arch bar breaking.
(205)	2-3	Amole	L-b	1-410	70	10	None				250	Middle main rod strap broke on locomotive.
(206)	3-3	Oregoun	L-b	414	70	10	None				280	Side rod of engine failed due to flaw.
(207)	3-4	Acacos	L-b	2-412	70	5	None				220	Middle main rod of engine broke due to flaw.
(208)	3-13	San Grande	L-c	1-415	70	1	None				250	Main axle of engine broke due to flaw.
(209)	3-21	Bisbee Junction	L-b	190	69	15	None				200	Center crank pin of locomotive broke.
(210)	3-24	Gerlach	L-b	310	61	20	None				300	Middle main rod of engine broke.
(211)	4-5	Hanford	L-c	X-5011-W	67	15	None				300	Cylinder head of locomotive knocked out due to head and middle main rod.
(212)	4-20	Blanch	L-b	1-856	65	Standing	None				450	Axle on engine broke due to flaw.
(213)	5-26	Reno	L-b	X-5021-W	67	6	J. B. H. Hunt.	Br man		18	250	Train broke-in-two due to defective knuckle on firel
(214)	5-5	Arlington-Marie	L-b	902	68	30	None				500	Right crosshead brake and right cylinder of [illegible]
(215)	6-8	Javot	L-c	X-5014-W	67	5	None				500	Main axle of engine broke.
(216)	6-22	Javot	L-c	1-852	70	10	None				400	Main axle of engine broke.
(217)	6-29	Wilcox	L-c	X-5026-W	68	35	None				500	Main axle of engine broke.
(218)	7-1	Javot	L-c	1-852	70	8	None				180	Main axle of engine broke.
(219)	7-13	Lee	L-c	960	63	25	None				1,820	Car destroyed by fire, probably due to match or cig dropped in car during process of loading.
(220)	7-15	Pinacno	M-h	1-904	52	Standing	None				400	Engine derailed due to main axle on engine breaking
(221)	7-15	Tuma	D-e	2-848	52	2	None				799	Three cars which were being dropped derailed at dec ability to hold cars with hand brakes.
(222)	8-11	Wagon	D-i	X-5023-W	5	10	None					

* - Caused from sudden stipping, starting, lurch, or jerk of car or train

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED: NAME (g)	PERSON INJURED: OCCUPATION (h)	ESTIMATED DISABILITY (DAYS) (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1932						YEAR 1932 (Continued)				
(223)	8-16	Nemo	L-c	X-2834-E	21	6	None	-	-	$ 400	Main axle of engine broke.
(224)	11-11	Continental	D-c	872	24	30	None	-	-	381	Derailed one car due to journal being turned off car.
(225)	12-29	Willcox	M-b	866	57	10	M. T. Quint	Conductor	1	760	Engineer applied airbrakes in emergency when middle shoe of strap of engine broke, coupler being knocked off center the conductor in cabooge injured.
	1933						YEAR 1933				
(226)	2-5	Cary	L-b	1-862	70	10	None	-	-	750	Middle main rod of engine broke.
(227)	3-3	Fairbank	D-g	945	5	5	None	-	-	175	Engine derailed by point derail which was not properly set
(228)	6-7	Sibyl	L-b	2-868	53	5	None	-	-	500	Crank pin on locomotive engine broke, causing wreck to ap crushing eleven panels of underframing.
(229)	7-10	Lee	L-c	962	56	15	None	-	-	250	No. 2 crank axle of engine broke.
(230)	7-21	Marsh	D-a	X-3752-E	67	35	None	-	-	890	Undesired emergency caused by cars protecting spring rod o pin triple on car pulled derailer out of 2nd car, derailing 3rd and 4th cars.
(231)	7-26	Blaisdell	L-b	1-848	64	3	None	-	-	250	Right intermediate side rod of engine broke due to old cut
(232)	8-16	Vail-Irene	M-b	868	48	25	None	-	-	3,525	Fire started in carload of timber by trespassers.
(233)	9-4	Bowie	M-b	866	70	10	None	-	-	165	Trespasser stepped on cutting lever of 4th car from engine sudden stop and severe slack action damaging 63rd, 64th 69th cars from head end.
(234)	10-29	Benson	L-b	1-868	69	20	None	-	-	300	Main crank pin on engine broke.
(235)	11-15	Yuma	C-d	901 Yd.Eng.	68 12	6 6	None	-	-	520	Yard engine kicking up forward engine of train pulling in
(236)	11-15	Crook	D-b	964	70	20	None	-	-	328	Coupler pulled out of 13th car, fell on track and derailed car from engine.
(237)	11-24	Benson	L-b	X-5030-E	70	10	None	-	-	200	Cylinder head of engine knocked out due to piston rod bei out or breaking.
(238)	12-1	Bisbee Junction	D-a	X-5015-W	60	30	None	-	-	200	Derailed 5th and 6th cars from engine due to siphons burst on 5th car, causing dresser to pull out of 3rd car and fo track.
(239)	12-15	Cohen	L-c	1-862	64	15	None	-	-	2,650	Main axle of engine broke.
	1934						YEAR 1934				
(240)	1-2	Tempe Junction	M-a	904	25	20	None	-	-	283	Truck ran into side of train passing over public crossing.
(241)	2-27	Corta	C-h	X-3426-W	4	20	None	-	-	205	Brakemen were unable to control speed of four cars runnin descending grade, the cars striking another cut of cars.
(242)	4-2	Benson	M-b	8-3	70	2	None	-	-	700	Failure of engineer to properly control slack and cause co

(229)	9-10	Lee	L-e	962	56	15	None	-	-	250	No. 2 crank axle of engine broke.
(230)	9-21	Ekron	D-e	E-3752-B	67	35	None	-	-	890	Undesired emergency caused by weak graduating spring and sluggish triple on car pulled drawbar out of 2nd car, derailing 3rd and 4th cars.
(231)	9-26	Blaisdell	L-b	1-848	64	5	None	-	-	250	Right intermediate side rod of engine broke due to old defect.
(232)	8-16	Vail-Ireon	M-b	868	48	25	None	-	-	1,525	Fire started in carload of timber by trespassers.
(233)	9-4	Bowie	M-b	866	70	10	None	-	-	165	Trespasser stepped on cutting lever of 4th car from engine, sudden stop and severe slack action damaging 63rd, 68th and 69th cars from head end.
(234)	10-29	Benson	L-b	1-868	69	20	None		-	300	Main crank pin on engine broke.
(235)	11-15	Yuma	C-d	901 76.Emp.	68 12	6 6	None	-	-	520	Yard engine backing up cornered engine of train pulling into ya
(236)	11-15	Crook	D-b	964	70	20	None	-	-	328	Coupler pulled out of 13th car, fell on track and derailed 24t car from engine.
(237)	11-24	Benson	L-b	X-5030-E	70	10	None	-	-	200	Cylinder head of engine knocked out due to piston rod key losi out or breaking.
(238)	12-1	Bisbee Junction	D-e	X-5015-W	60	30	None	-	-	200	Derailed 5th and 6th cars from engine due to airhose bursting on 5th car, causing drawbar to pull out of 3rd car and fall on track.
(239)	12-15	Cochise	L-e	1-862	64	15	None	-	-	2,650	Main axle of engine broke.
	1934						YEAR 1934				
(240)	1-8	Tempe Junction	M-e	904	25	20	None	-	-	283	Truck ran into side of train passing over public crossing.
(241)	2-27	Coria	C-h	X-3426-W	4	20	None	-	-	205	Brakemen were unable to control speed of four cars rolling on descending grade, the cars striking another cut of cars.
(242)	5-7	Benson	M-b	862	70	2	None	-	-	700	Failure of engineer to properly control slack and weak conditio of car caused damage to car just ahead of helper engine.
(243)	5-31	Bosque	D-e	X-3613-W	63	35	None	-	-	500	One car derailed due to defective cast iron wheel breaking.
(244)	6-5	Drury	L-b	1-862	48	20	None	-	-	350	Valve stem of engine stops due to crystallization.
(245)	6-6	Silva	D-e	871	61	30	None	-	-	534	Air hose blew off car, causing drawbar to pull out of 1st car in train and fall on track, derailing 2nd to 10th cars from eng
(246)	7-28	Avra	D-e	903	39	35	None	-		400	Main axle of engine broke due to progressive fracture, derailing engine.
(247)	9-15	Crook	L-e	X-5013-W	59	15	None	-	-	600	Cylinder head of engine blew out due to excessive pound in back and middle main rod.
(248)	10-1	Bowtry	L-e	2-866	70	25	None	-	-	700	Main axle of engine broke.
	1935						YEAR 1935				
(249)	1-24	Cholla-Bowie	L-e	2-866	68	25-35	None	-	-	2,942	Train parted due to failure of coupler on car just ahead of helper engine which was cut in ahead of two cabooses, read end of train with helper engine colliding with head portion of tra
(250)	1-28	Pembroke	L-e	X-3616-E	69	30	None	-	-	350	Main axle of engine broke.
(251)	2-6	Tremaine	C-h	X-3317-E	54	15	None	-	-	200	Engine making drop of cars collided with cars standing on siding
(252)	3-5	Fenner	L-b	3-866	43	15	None	-	-	300	Left main crank pin of engine broke, striking main frame

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (DAYS) (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1935						YEAR 1935 (Continued)				
(253)	3-30	Mansora	L-b	E-5001-W	61	20	None	-	-	$ 450	Back and middle main rod strap of engine broke.
(254)	4-26	Solomon	L-c	883	23	1	None	-	-	300	Main axle of engine broke.
(255)	4-29	Buell	L-b	962	66	15	None	-	-	200	Left middle connection side rod of locomotive broke off due to flaw.
(256)	5-1	Willcox	D-a	2-862	70	8	None	-	-	1,500	Airhose burst on first car ahead of helper engine cut-in rear of train, causing derailment and buckling of 13th car ahead of helper engine.
(257)	5-4	Tucson	C-1	1-862	50	6-8	None	-	-	200	Engineer failed to use proper care in backing his engine onto train, causing severe impact and telescoping head car in train.
(258)	6-22	Buell	L-c	962	48	10	None	-	-	2,000	Main axle of engine broke.
(259)	6-26	Red Rock	D-c	903	64	40	None	-	-	656	Arch bar broke on 31st car from engine, causing derailment of one car.
(260)	6-30	Colfred	M-b	X-3611-W	64	1	None	-	-	200	Train parted when starting, drawbar being pulled out of 34th car due to brakes not being released, center sill and end frame being pulled off the car.
(261)	6-30	Rillito	L-c	3-854	64	1	None	-	-	350	Back driving axle of engine broke.
(262)	7-19	Mohawk-Colfred	M-b	X-3614-W	65	30-40	None	-	-	1,500	Rails in track kinked account excessive speed with two dead engines in train.
(263)	8-21	Wellton	D-c	X-3614-W	63	35	None	-	-	10,118	Loose wheel on 43rd car from engine intermittently derailed and rerailed for a distance of 9.9 miles.
(264)	8-28	Benson	M-b	866	68	8	None	-	-	200	Emergency application of air brakes due to trespasser stepping on cutting lever with helper engine shoving rear of train buckled 61st car from head end.
(265)	9-9	Picacho	M-b	X-3647-W	44	39	None	-	-	722	Tie rods holding load of structural steel broke, load toppling over and striking water and oil columns.
(266)	9-22	Tucson	C-d	(X-3316-W (Yd. Eng.	49 6	15 3	None	-	-	987	Cars coming off scale track collided with train pulling out of yard, due to failure to hold out of cars with hand brakes after weighing them.
(267)	10-4	Ocapos	L-c	2-854	69	10	None	-	-	400	Main axle of locomotive broke.
(268)	10-21	Vail	L-c	3-866	52	20	None	-	-	233	Main driving tire of engine broke.
(269)	11-5	Yuma	M-b	826	54	10	None	-	-	255	Brake rigging came down on car, engaging duck-boards in front of passenger station and dragging them, damaging switchstand, switch point, tie plates, duck boards and selector box.
(270)	12-7	Curve	L-b	862	53	18	None	-	-	625	Middle main rod strap of engine broke.
(271)	12-30	Buell	L-c	2-866	70	20	None	-	-	1,156	Left middle side rod of engine broke.
	1936						YEAR 1936				
(272)	1-15	Bowie	L-b	864	43	8	None	-	-	250	Left middle connection side rod of engine broke.
(273)	1-15	Tartron	L-c	1-844	63	40	None	-	-	300	Journal of right No. 4 driving wheel of engine broke

	(261)	6-30	Rillito	L-e	3-854	64	1	None	-	-	350	Back driving axle of engine broke.
	(262)	7-19	Mohawk-Colfred	M-b	X-3614-W	65	30-40	None	-	-	1,500	Rails in track kinked account excessive speed with two dead engines in train.
	(263)	8-21	Wellton	D-c	X-3614-W	63	35	None	-	-	10,118	Loose wheel on 43rd car from engine intermittently derailed and rerailed for a distance of 9.9 miles.
	(264)	8-28	Benson	M-b	866	68	8	None	-	-	200	Emergency application of air brakes due to trespasser stepping on cutting lever with helper engine shoving rear of train buckled 61st car from head end.
	(265)	9-9	Picacho	M-b	X-3647-W	44	30	None	-	-	722	Tie rods holding load of structural steel broke, load toppling over and striking water and oil columns.
	(266)	9-22	Tucson	C-d	(X-3316-W (Yd. Eng.	49 6	15 3	None	-	-	987	Cars coming off scale track collided with train pulling out of yard, due to failure to hold out of cars with hand brakes after weighing them.
	(267)	10-4	Ocapos	L-e	2-854	69	10	None	-	-	400	Main axle of locomotive broke.
	(268)	10-21	Vail	L-e	3-866	52	20	None	-	-	233	Main driving tire of engine broke.
	(269)	11-5	Yuma	M-b	826	54	10	None	-	-	255	Brake rigging came down on car, engaging duck-boards in front of passenger station and dragging them, damaging switchstand, switch point, tie plates, duck boards and selector box.
	(270)	12-7	Curvo	L-b	862	53	18	None	-	-	625	Middle main rod strap of engine broke.
	(271)	12-30	Buell	L-e	2-866	70	20	None	-	-	1,156	Left middle side rod of engine broke.
		1936					YEAR 1936					
	(272)	1-15	Bowie	L-b	864	43	8	None	-	-	250	Left middle connection side rod of engine broke.
	(273)	1-15	Tartron	L-e	1-844	63	40	None	-	-	300	Journal of right No. 4 driving wheel of engine broke.
	(274)	2-11	Sentinel	D-c	X-3616-W	63	15	None	-	-	3,848	Cast iron wheel on 14th car from engine broke due to concealed flaw in metal, derailing and turning over that car and following two cars.
	(275)	2-26	Vail	L-e	X-5029-W	61	Standing	None	-	-	651	Main axle of engine broke.
	(276)	6-9	Estrella	L-c	2-856	55	20	None	-	-	350	Main axle of engine broke.
	(277)	7-10	Curvo	D-c	X-5023-W	66	6	None	-	-	360	Main axle of engine broke.
	(278)	8-17	Litchfield	C-h	901	64	6	None	-	-	662	Three cars on which hand brakes had not been secured rolled out and fouled west house track switch just as engine started out of house track, engine cornering second car in the cut.
	(279)	8-17	Naco	C-h	X-5014-W	40	10	None	-	-	441	Cars being shoved by engine cornered car which was not at proper clearance on adjoining track.
	(280)	9-6	Fairbank	C-h	962	39	6	None	-	-	165	Engine backing onto siding cornered car on main track which was not clear of siding.
	(281)	9-15	Arizola	D-i	X-3643-W	64	40	None	-	-	3,696	Derailment caused by steel billet falling from 24th car from engine, fouling track and engaging forward trucks of following car.
	(282)	10-3	Blaisdell-Dome	D-c	X-3625-W	68	10	None	-	-	370	Drawbar pulled out of 15th car from engine due to old break in draft arm, dropping on track and derailing cars.
	(283)	10-7	Tucson	C-b	(2-854 (Yd. Eng.	59 27	3 6	None	-	-	5,587	Yard engine collided with engine of freight train due to control of air brakes being lost on yard engine due to left main driving adjustment rod breaking.

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (DAYS) (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1936						YEAR 1936 (Continued)				
(284)	11-1	Dublin	D-i	X-8766-E	63	10	None	-	-	$1,071	Derailment caused by cow running on track in front of train, being struck by engine and rolling under train.
(285)	11-5-8	Gila	C-h	Unknown	-	-	-	-	-	800	Caboose damaged. Cause of accident, train involved, and exact date of accident undetermined.
(286)	11-11	Tucson	M-b	1-854	58	4	None	-	-	700	Break-in-two caused by undesidered emergency as train was stopping in yard, slack action buckling 20th car from engine.
(287)	11-7	Toltec	M-b	2-854	66	30	None	-	-	1,680	Carload of cedar poles caught or set on fire.
(288)	12-5	Bosque	L-c	1-856	61	2	None	-	-	350	Main axle of locomotive broke.
(290)	12-6	Sibyl	L-b	2-864	70	10	None	-	-	545	Middle main rod strap of engine broke.
(291)	12-19	Cavot	L-c	2-866	63	12	None	-	-	350	Main axle of locomotive broke.
(292)	12-24	Clifton	D-d	952	8	4	None	-	-	547	Derailment caused by uneven surface of track.
	1937						YEAR 1937				
(293)	1-1	Gila	C-h	X-3312-E	66	5	None	-	-	800	Wooden underframe caboose buckled by hard coupling.
(294)	1-10	Cutter	D-d	X-2766-E	18	25	None	-	-	1,675	Derailment caused by rail breaking under 12th car from engine.
(295)	1-18	Gila	C-h	X-3636-W	66	6	None	-	-	1,040	Caboose coupled to rear of train at excessive speed, causing damage to caboose and engine.
(296)	1-18	Gila	C-h	1-854	63	3	None	-	-	155	Caboose cornered in switching movement.
(297)	1-24	Casa Grande	L-c	3-854	63	8	None	-	-	350	Main axle on locomotive broke.
(298)	2-13	Aztec	M-b	X-4316-E	42	1	None	-	-	350	Water column broke when fireman pulled spout around before engine stopped, the spout hitting hand rail and catching on sprinkler valve.
(299)	2-14	Lusena	L-b	2-862	62	30	None	-	-	200	Left eccentric crank pin on engine broke off.
(300)	2-26	San Carlos	D-d	884	48	15	None	-	-	172	Derailment caused by rail breaking under train.
(301)	2-23	Oasipos	D-c	3-843	45	30	None	-	-	325	Derailment caused by heavy thrust on left front side bearing due to rigidity of car.
(302)	3-25	Gila	L-b	1-854	53	1	None	-	-	250	Left main rod of engine broke.
(303)	3-26	Empire	D-c	X-5035-E	65	35	None	-	-	1,805	Derailment caused by wheel breaking on 38th car from engine due to overheating on account of defective triple.
(304)	3-31	San Pedro	M-b	X-5011-W	62	25	None	-	-	165	Motor car struck by locomotive due to failure to provide flag protection.
(305)	4-2	Ligurta	M-b	902	64	25	None	-	-	2,112	Truck side broke under 11th car from engine, truck dropping down and damaging track.
(306)	4-13	Rasa	L-b	X-5042-E	66	30	None	-	-	350	Piston rod to middle cylinder of engine broke due to concealed progressive fracture.

(292)	12-24	Clifton	D-d	952	8	4	None		-	-	547	Derailment caused by uneven surface of track.
	1937						YEAR 1937				
(293)	1-1	Gila	C-h	X-3312-E	66	5	None		-	-	800	Wooden underframe caboose buckled by hard coupling.
(294)	1-10	Cutter	D-d	X-2766-E	18	25	None		-	-	1,675	Derailment caused by rail breaking under 12th car from engine.
(295)	1-18	Gila	C-h	X-3636-W	66	6	None		-	-	1,040	Caboose coupled to rear of train at excessive speed, causing damage to caboose and engine.
(296)	1-18	Gila	C-h	1-854	63	3	None		-	-	155	Caboose cornered in switching movement.
(297)	1-24	Casa Grande	L-s	3-854	63	8	None		-	-	350	Main axle on locomotive broke.
(298)	2-13	Aztec	M-b	X-4316-W	42	1	None		-	-	350	Water column broke when fireman pulled spout around before engine stopped, the spout hitting hand rail and catching on sprinkler valve.
(299)	2-14	Lucena	L-b	2-862	62	30	None		-	-	200	Left eccentric crank pin on engine broke off.
(300)	2-16	San Carlos	D-d	884	48	15	None		-	-	172	Derailment caused by rail breaking under train.
(301)	2-23	Oempos	D-e	3-843	45	30	None		-	-	325	Derailment caused by heavy thrust on left front side bearing due to rigidity of car.
(302)	3-25	Gila	L-b	1-854	53	1	None		-	-	250	Left main rod of engine broke.
(303)	3-26	Empire	D-e	X-5035-E	65	35	None		-	-	1,805	Derailment caused by wheel breaking on 38th car from engine due to overheating on account of defective triple.
(304)	3-31	San Pedro	M-b	X-5011-W	62	25	None		-	-	165	Motor car struck by locomotive due to failure to provide flag protection.
(305)	4-2	Liguria	M-b	902	64	25	None		-	-	2,112	Truck side broke under 11th car from engine, truck dropping down and damaging track.
(306)	4-13	Rasa	L-b	X-5042-W	66	30	None		-	-	350	Piston rod to middle cylinder of engine broke due to concealed progressive fracture.
(307)	4-22	Yuma	D-e	3-824	69	12	None		-	-	971	Derailment caused by bottom rod under 15th car from engine dropping under car and engaging duck boards.
(308)	4-28	Curve	D-e	X-5030-W	66	15	None		-	-	311	Derailment caused by rigid truck on 42nd car from engine.
(309)	5-5	Gila	D-e	3-843	55	6	None		-	-	450	Main axle of engine broke.
(310)	6-17	Oempos	D-e	3-843	64	25	None		-	-	360	Rear truck of 43rd car derailed on curve, apparently due to rigidity of truck.
(311)	6-23	Chella	D-e	1-864	65	40	None		-	-	5,863	Derailment caused by cast iron wheel breaking under 61st car from engine.
(312)	6-25	Cavet	L-e	1-862	64	10	None		-	-	450	Main axle of engine broke.
(313)	6-26	Gila	C-h	X-3615-W	66	12	None		-	-	300	Cars rolled down grade and collided with rear of train due to failure to set sufficient hand brakes to hold cars on grade.
(314)	7-17	Radium	D-e	X-2587-E	21	15	None		-	-	1,370	Lead truck of 9th car from caboose derailed due to rigidity of truck, causing derailment of following 7 cars and caboose.
(315)	8-2	Irene	M-b	3-864	53	20	None		-	-	400	Second car from caboose buckled due to heavy service application of air brakes made to stop train when engine struck cow.
(316)	8-6	Mohawk	D-e	1-842	70	6	None		-	-	264	Inside rail on curve turned outward, derailing engine, apparently due to rigidity of engine while rounding curve.
(317)	8-20	Sibyl	L-b	1-864	70	10	None		-	-	415	Back-end middle main rod strap of engine broke.

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED: NAME (g)	PERSON INJURED: OCCUPATION (h)	ESTIMATED DISABILITY (DAYS) (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1937						YEAR 193 (Continued)				
(318)	8-27	Gaspos	D-c	2-843	40	25	None	-	-	$ 525	Derailment caused by axle breaking on 6th car from caboose.
(319)	9-4	Phoenix	M-n	901	61	8	None	-	-	210	Train struck auto on public crossing.
(320)	9-5	Chelle	D-g	4-864	70	4	None	-	-	335	Engine derailed due to failure to line derailer for movement out of siding.
(321)	9-9	Clifton	D-d	X-17-7-E	9	15	None	-	-	420	One car derailed due to irregular and excessive superelevation of track.
(322)	9-9	Glen	M-c	866	36	3	None	-	-	290	One car derailed due to axle breaking.
(323)	9-11	Marsh	M-b	1-865	50	35	None	-	-	445	Derailment caused by coupler of car dropping between rails due to horizontal key working out.
(324)	9-21	Buckeye	M-i	901	59		None	-	-	225	Engine trucks and drivers of engine derailed on 2 degree curve due to insufficient weight on engine trucks and wide gauge of track.
(325)	9-22	Bene	D-g	2-864			None	-	-	535	Derailment caused by reversing movement after engine ran through switch.
(326)	9-27	Peoria	M-b	1-845	3		None	-	-	175	Water column broke when fireman pulled water spout around while engine was moving.
(327)	10-6	Fontana	M-b	1-866	67		None	-	-	500	Middle main rod of engine broke.
(328)	10-29	Yuma	M-b	1-844	70		None	-	-	500	Right main pin of engine broke off.
(329)	11-12	Gila	C-d	(3-857 (3-844)			None	-	-	1,710	Engine backing with water car behind engine and caboose ahead of engine side raked three cars in approaching train.
(330)	11-17	Bisbee Junction	D-b	X-3314-E			None	-	-	640	Derailment caused by drawbar pulling out of 50th car from engine due to failure of metal at back of coupler yoke.
(331)	12-11	Stanwix	D-c	2-841	47	10	None	-	-	5,235	Derailment of ten cars caused by truck frame breaking at old weld.
	1938						YEAR 1938				
(332)	1-7	Clifton	D-d	952	7	6	None	-	-	395	Engine derailed due to wide gauge of track approaching frog.
(333)	1-22	Mohawk	L-b	2-841	49	2	None	-	-	300	Left intermediate front connecting rod of engine broke.
(334)	1-23	Coolidge	D-g	X-3240-E	23	4	None	-	-	686	Engine and tender derailed due to trakeman's failure to get switch over before engine hit switch points.
(335)	2-8	Gila	D-d	1-842	70	3	None	-	-	412	Derailment of four cars caused by loose wheel on lead truck of car.
(336)	2-24	Yuma	C-d	(357 (70 Eng.	12 56	Standing 1	None	-	-	240	Yard engine pulling 54 cars cornered road engine on lead.
(337)	3-3	Chandler	L-c	X-3318-E	49	6	None	-	-	400	Main journal of engine broke.
(338)	3-27	Mesa	M-n	1-904	48	6	None	-	-	0 750	Train struck auto truck and trailer on city street crossing.
(339)	4-29	Thebe	C-b	X-3652-E	63	8	None	-	-	325	Engine and water car backing up in switching movement made hard coupling with cars not in train.
(340)	4-?	Bene									

(328)	10-29	Yuma	L-b	844	72	3	None					500	Middle main rod of engine broke.
(329)	11-12	Gila	C-d	(3-843 (3-843								500	Right main pin of engine broke off.
(330)	11-17	Bisbee Junction	D-b	X-3304			None					1,710	Engine backing with water car behind engine and caboose ahead of engine side raked three cars in approaching train.
(331)	12-11	Stanwix	D-c	2-861	49	10	None					640	Derailment caused by drawbar pulling out of 50th car from engine due to failure of metal at back of coupler yoke.
	1938											5,235	Derailment of ten cars caused by truck frame breaking at old weld
							YEAR 1938						
(332)	1-7	Clifton	D-d	952	7	8	None					395	Engine derailed due to wide gauge of track approaching frog.
(333)	1-22	Mohawk	L-b	2-861	69	2	None					300	Left intermediate front connecting rod of engine broke.
(334)	1-23	Coolidge	D-b	X-3220-B	23	4	None					685	Engine and tender derailed due to brakeman's failure to get switch over before engine hit switch points.
(335)	2-6	Gila	D-c	1-842	70	8	None					412	Derailment of four cars caused by loose wheel on lead truck of car.
(336)	2-24	Yuma	C-d	(357 (Yd. Eng.	32 56	Standing 1	None					240	Yard engine pulling 54 cars cornered road engine on lead.
(337)	3-3	Chandler	L-c	X-3812-B	49	6	None					400	Main journal of engine broke.
(338)	3-27	Mesa	M-b	1-904	58	6	None					750	Train struck auto truck and trailer on city street crossing.
(339)	4-29	Thebe	C-d	X-3652-B	63	3	None					325	Engine and water car backing up in switching movement made hard coupling with cars not in train.
(340)	6-7	Bowie	L-b	2-923-A	70	1	None					250	Fireman swung water spout over tank as engineer moved engine to make re-spot, spout catching on brake wheel and being broken off.
(341)	6-13	Tucson	C-b	(X-3613-B (Yd. Eng.	65 2	1 30	C. T. Bruce	Conductor	7			235	Car cut off without rider made hard coupling with another car, cars running down and colliding with caboose.
(342)	7-17	Sentinel	D-c	2-844	70	25	None					1,696	Derailment caused by journal breaking off on 42nd car from engine due to overheating.
(343)	7-22	Benson	L-c	862	70	1	None					450	No. 2 crank axle of locomotive broke.
(344)	7-27	Stark	L-b	962	59	18	None					175	Middle crosshead of engine broke.
(345)	8-1	Sibyl	L-c	2-845	69	20	None					450	Main driving axle of engine broke.
(346)	8-22	Yuma	M-b	901	66	6	None					450	Three deadhead cabooses on rear of train damaged when emergency stop made to avoid striking another engine.
(347)	9-3	Mohawk	D-c	X-3612-B	66	35	[illegible]	Conductor	6			355	Scale car next ahead of caboose derailed and reraised, caboose derailed due to up and down motion caused by ballasted weights, breaking train line, sudden stop of train causing injury to conductor in caboose.
(348)	9-[illegible]	[illegible]	D-c	962	28	3	None					165	Rear drivers of locomotive climbed rail on curve, causing derailment of all drivers, due to radial buffer between engine and tender being too tight.
(349)	9-[illegible]	[illegible]	M-b	X-3619-B	58	5	None					200	Trespasser stepped on cutting lever, parting train, air brakes going into emergency causing rough stop.
(350)	9-[illegible]	[illegible]	L-b	X-803-B	26	5	None					195	Left main pin of engine broke.

- Caused by sudden stopping, starting, lurch or jerk of car or train

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (DAYS) (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1938						YEAR 1938 (Continued)				
(351)	9-12	Tucson	D-e	1-843	60	8	None	-	-	$ 619	Derailment caused by hand brake chain rod breaking on car, clevis end dropping down and catching between rail and switch point.
(352)	10-22	Tucson	D-i	4-866	43	5	None	-	-	210	Car derailed on curve due to irregular superelevation of track and dry center plate of car.
(353)	10-23	San Simon	L-e	2-866	70	25	None	-	-	200	Left front driver tire of engine broke.
(354)	11-21	Bowie	C-h	X-5042-E	46	3	None	-	-	625	Cut of 41 cars being shoved cornered four cars fouling lead.
(355)	11-28	Curve	D-i	2-845	52	20	None	-	-	310	Derailment caused by combination of slow speed on curve and insufficient lateral in drawbars of two coupled cars.
(356)	12-24	Ochoa	D-i	2-845	43	25	None	-	-	2,242	Car derailed on curve because load of lead bullion shifting.
(357)	12-24	Blaisdell	D-e	X-3612-W	65	18	None	-	-	461	Car derailed on curve due to insufficient side lateral in drawbar of car.
	1939						YEAR 1939				
(358)	3-12	Coolidge	C-h	(903 (904	47 58	5 5	None	-	-	270	Car kicked to main track by westward train collided with engine of opposing train moving into siding.
(359)	3-14	Cavot	L-b	866	67	15	None	-	-	612	Main rod of engine broke.
(360)	3-21	Fenner	L-b	864	69	15	None	-	-	300	Inside main rod strap of engine broke.
(361)	3-23	Burns	D-e	X-3224-E	38	20	None	-	-	180	Car derailed due to truck side breaking.
(362)	3-28	Somerton	C-h	X-1684-W	13	8	None	-	-	240	Engine struck by cars due to engine failing to get in clear after dropping the cars.
(363)	[redacted]	Gila	D-h	3-854	63	2	None	-	-	243	Engine derailed by derailer which is believed to have been thrown by unauthorized person.
(364)	6-8	Cowden	C-h	901	66	3	None	-	-	180	Cars being dropped struck rear of engine tender due to wrong switch being lined and tender not being in clear.
(365)	8-15	Smelter	D-d	952	9	20	None	-	-	469	Car derailed on curve due to excessive and irregular super-elevation of track, dry center bearings of car, and light load in steel box car.
(366)	9-26	Hayden Junction	D-e	X-3224-E	8	8	None	-	-	924	Car derailed due to broken flange in cast iron wheel.
(367)	10-7	Fortuna	M-b	1-842	70	6	None	-	-	402	Train broke-in-two due to undesired emergency when stopping.
(368)	10-12	Mescal	D-d	X-5034-W	62	20	None	-	-	822	Car derailed at compromise joint between 110 lb. and 90 lb. rail on curve.

											point.
(352)	10-22	Tucson	D-i	4-866	63	5	None	-	-	210	Car derailed on curve due to irregular superelevation of track and dry center plate of car.
(353)	10-23	San Simon	L-c	2-866	70	25	None	-	-	200	Left front driver tire of engine broke.
(354)	11-21	Bowie	C-h	X-5042-E	46	3	None	-	-	625	Car of 41 cars being shoved cornered four cars fouling lead.
(355)	11-28	Curve	D-i	2-845	52	20	None	-	-	310	Derailment caused by combination of slow speed on curve and insufficient lateral in drawbars of two coupled cars.
(356)	12-24	Ochoa	D-i	2-845	43	25	None	-	-	2,242	Car derailed on curve because load of lead bullion shifting.
(357)	12-24	Blaisdell	D-c	X-3612-W	65	18	None	-	-	461	Car derailed on curve due to insufficient side lateral in drawbar of car.
	1939						YEAR 1939				
(358)	3-12	Coolidge	C-h	(903 (904	47 58	5 5	None	-	-	270	Car kicked to main track by westward train collided with engine of opposing train moving into siding.
(359)	3-14	Cavot	L-b	866	67	15	None	-	-	612	Main rod of engine broke.
(360)	3-21	Fenner	L-b	864	69	15	None	-	-	300	Inside main rod strap of engine broke.
(361)	3-23	Burns	D-c	X-3224-E	38	20	None	-	-	180	Car derailed due to truck side breaking.
(362)	3-28	Somerton	C-h	X-1624-W	13	8	None	-	-	240	Engine struck by cars due to engine failing to get in clear after dropping the cars.
(363)	6-6	Gila	D-h	3-854	63	2	None	-	-	243	Engine derailed by derailer which is believed to have been thrown by unauthorized person.
(364)	6-8	Cowden	C-h	901	66	3	None	-	-	180	Cars being dropped struck rear of engine tender due to wrong switch being lined and tender not being in clear.
(365)	8-15	Smelter	D-d	952.	9	20	None	-	-	469	Car derailed on curve due to excessive and irregular super-elevation of track, dry center bearings of car, and light load in steel box car.
(366)	9-26	Hayden Junction	D-c	X-3224-E	8	8	None	-	-	924	Car derailed due to broken flange in cast iron wheel.
(367)	10-7	Fortuna	M-b	1-842	70	6	None	-	-	402	Train broke-in-two due to undesired emergency when stopping.
(368)	10-12	Mescal	D-d	X-5034-W	62	20	None	-	-	822	Car derailed at compromise joint between 110 lb. and 90 lb. rail on curve.
(369)	10-23	Safford	D-d	X-2565-E	10.	6	None	-	-	669	Engine backing out of spur with ten cars derailed due to track conditions.
(370)	11-16	Kendall	C-h	X-3122-E	60	25	None	-	-	2,642	Light engine backing up collided with cars which were supposed to have been left at Tovrea switch, but actually rolled toward engine on slightly descending grade.
(371)	11-30	Fenner	L-b	1-866	69	5	None	-	-	200	Intermediate connection rod of engine broke.
(372)	12-7	Chandler	D-d	X-3634-E	62	5	None	-	-	195	Engine derailed on crossover due to wide gauge of track.
(373)	12-23	Benson	D-g	X-5037-W	65	6	None	-	-	180	Conductor applied brakes from caboose because engineer backed up without signal and switch to siding had not been thrown, slack action stopping, damaging two cars and causing derailment of one car.

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

DETAIL OF TRAIN ACCIDENTS,
ROAD FREIGHT TRAIN OPERATION
REPORTED TO THE INTERSTATE COMMERCE COMMISSION

STATE OF ARIZONA

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (DAYS) (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1940							YEAR 1940			
(374)	1-14	Curve	D-c	2-862	66	20	None	-	-	$ 695	One car derailed account broken flange 5th car ahead of caboose damaged two cars.
(375)	2-2	Crook	L-b	X-5019-M	59	10	None	-	-	300	Middle main rod broke on locomotive - old progressive fracture.
(376)	3-14	Mohawk	L-b	2-842	69	4	None	-	-	350	Crank pin on engine broke off account progressive fracture.
(377)	3-26	Smelte	D-d	953	13	15	None	-	-	225	One car derailed account irregular superelevation of track.
(378)	4-4	Benson	L-c	X-5028-M	68	5	None	-	-	550	Journal broke on engine account progressive fracture.
(379)	4-19	Heaton	M-b	3-854	65	30	None	-	-	225	Home automatic block signal damaged evidently by timber projecting from car in train.
(380)	4-30	Cavot.	C-b	3-864 X-3652-M	580 Lt.Eng.	10 Standing	None	-	-	425	Collision between light engine and freight train due to light engine occupying main track without authority account enginemen overlooking superior train.
(381)	5-14	Lirim	D-c	5-843	64	30	None	-	-	867	One car derailed account truck side gave way on 40th car from engine.
(382)	5-31	Maricopa	D-g	2-856	69	8	None	-	-	173	Caboose derailed account brakeman throwing switch under car.
(383)	6-2	Muggins	D-c	X-3701-M	65	35	None	-	-	681	Sixteenth car ahead caboose derailed account brake beam dropped down under car wheel.
(384)	6-14	Yuma	D-d	X-1643-E	30	8	None	-	-	565	Derailed one car account irregular elevation in track.
(385)	7-11	Gila	M-b	852	64	4	None	-	-	1,000	Portable caboose lamp fell on car floor, fire destroying superstructure of caboose.
(386)	7-13	Canador	L-b	X-5004-M	60	25	None	-	-	325	Middle main rod failed on engine.
(387)	7-18	Hayden	C-h	X-3908-M	2	10	None	-	-	600	Loaded ore car not properly secured, ran down heavy grade and collided with another car under load.
(388)	7-21	Radium	D-i	X-2521-E	14	15	None	-	-	525	Car derailed account uneven track and high load.
(389)	7-26	Naviska	L-b	X-3687-M	70	35	None	-	-	306	Left main crank pin broke on engine.
(390)	8-2	Phoenix	L-b	902	36	6	None	-	-	280	Journal burned off car [illegible]

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (DAYS) (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1940						YEAR 1940				
(374)	1-14	Curvo	D-c	2-862	66	20	None	-	-	$ 695	One car derailed account broken flange 5th car ahead of caboose damaged two cars.
(375)	2-2	Crook	L-b	X-5019-W	59	10	None	-	-	300	Middle main rod broke on locomotive - old progressive fracture.
(376)	3-14	Mohawk	L-b	2-842	69	4	None	-	-	350	Crank pin on engine broke off account progressive fracture.
(377)	3-26	Smelte	D-d	953	13	15	None	-	-	225	One car derailed account irregular superelevation of track.
(378)	4-4	Benson	D-c	X-5028-W	68	5	None	-	-	500	Journal broke on engine account progressive fracture.
(379)	4-19	Heaton	M-b	3-854	65	30	None	-	-	225	Home automatic block signal damaged evidently by timber projecting from car in train.
(380)	4-30	Cavot	C-b	3-864 X-3652-W	58 Lt.Eng.	10 Standing	None	-	-	425	Collision between light engine and freight train due to light engine occupying main track without authority account enginemen overlooking superior train.
(381)	5-14	Lirim	D-c	5-843	64	30	None	-	-	867	One car derailed account truck side gave way on 40th car from engine.
(382)	5-31	Maricopa	D-g	2-856	69	8	None	-	-	173	Caboose derailed account brakeman throwing switch under car.
(383)	6-2	Muggins	D-c	X-3701-W	65	35	None	-	-	681	Sixteenth car ahead caboose derailed account brake beam dropped down under car wheel.
(384)	6-14	Yuma	D-d	X-1643-E	30	8	None	-	-	565	Derailed one car account irregular elevation in track.
(385)	7-11	Gila	M-b	852	64	4	None	-	-	1,000	Portable caboose lamp fell on car floor, fire destroying superstructure of caboose.
(386)	7-13	Casador	L-b	X-5004-W	60	25	None	-	-	325	Middle main rod failed on engine.
(387)	7-18	Hayden	C-h	X-3208-E	2	10	None	-	-	600	Loaded ore car not properly secured, ran down heavy grade and collided with another car under load.
(388)	7-21	Radium	D-i	X-2521-E	14	15	None	-	-	525	Car derailed account uneven track and high load.
(389)	7-26	Navieta	L-b	X-3687-W	70	35	None	-	-	306	Left main crank pin broke on engine.
(390)	8-2	Phoenix	M-b	902	36	6	None	-	-	280	Journal burned off car, allowing truck side to drop.
(391)	9-7	Smelter	D-d	952	6	15	None	-	-	412	One car derailed account irregular elevation of track.
(392)	9-21	Toltec	D-c	X-3309-W	58	40	None	-	-	1,441	One car derailed account broken overheated wheel 9th car from engine.
(393)	9-26	Altich	L-c	2-845	63	12	None	-	-	400	Main crank pin on engine broke.
(394)	10-13	Curvo	C-a	X-5033-W X-3319-W	66 Lt.Eng.	Standing 10	None	-	-	500	Light engine collided with caboose of train standing in siding.
(395)	10-29	Douglas	L-b	962	70	8	None	-	-	350	Middle crank pin on engine 5019 broke.
(396)	12-21	Tucson	D-d	X-3327-E	60	15	None	-	-	335	Engine and 5 cars derailed account broken switch point.
(397)	12-23	Tucson	C-d	3-845 Eng.3710	63 Lt.Eng.	7 7	None	-	-	1,677	Light engine moving to roundhouse side-raked cars in moving train.
(398)	12-25	Hayden Jct.	D-i	X-3207-E	18	6	None	-	-	340	Engine and 2 cars derailed when slack run in at switch.

Defendant's Exhibit No. 290 (Witness J.J. Sullivan)
Feb. 6, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

DETAIL OF TRAIN ACCIDENTS,
ROAD FREIGHT TRAIN OPERATION,
REPORTED TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

STATE OF NEVADA

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED NAME (g)	OCCUPATION (h)	ESTIMATED DISABILITY (Days) (i)	TOTAL DAMAGE ($) (j)	DESCRIPTION OF ACCIDENT (k)
	1923										
(1)	1-21	Mazan	D-g	X-2595-W	74	10 to 12	None			$ 615	Derailed 1 car and damaged 6 others, when train parted due to knuckle breaking while attempting to cut off Extra 2566 which was helping train out of yard.
(2)	5-27	Tioga	D-c	2-280	57	20	None			627	Derailed 25th car from caboose due to broken defective cast-iron wheel.
(3)	5-22	Gerald	D-d	X-2565-W	65		None			218	Derailed 47th and 48th cars from engine on siding due to broken rail.
(4)	5-26	Argo	M-b	X-2525-W	72		None			200	Piece of 4-1/2 inch pipe 16 feet long fell from 8th car from caboose and damaged automatic block signal.
	6-9	Carlin	C-d	1-276 (Yard eng.	55	10	None			6,078	Yard engine side swiped train pulling into yard on yard track, damaging 47 cars and derailing yard engine, negligence of enginemen.
	6-14	Desert	D-d	1-276						977	Derailed 8 cars on siding due track out of line apparently caused by sun kink.
(7)	6-21	Montello	D-d	X-321						441	Derailed 2 cars on yard track as train was pulling out of yard due broken lug on switch stand allowing connecting rod to come loose.
(8)	6-15	Pequop	D-g	1-262	69	3 to 4				598	Derailed 7 cars on main track due to a brakeman of train in siding unlocking switch and partially throwing switch.
(9)	6-27	Carlin	M-b	X-3209-W	97	5	None			400	30th car from caboose buckled due to run-in of slack as train was stopping.
(10)	7-26	Sparks	C-i	X-2588-W	75	5 to 8	None			850	Two cars with hand brakes insufficiently set, rolled out of yard track and collided with side of train pulling into yard, damaging 4 cars.
(11)	7-25	Osino	D-b	X-2800-W	55	25	None			1,160	Derailed 6 cars behind engine, due to coupler pulling out of engine tender and falling on track caused by emergency action of brakes due to knuckles slipping by between 2nd and 3rd cars ahead of caboose.
(12)	7-8	Granite Point	M-b	X-2577-W	85	3	W.S. Roberts	Brakeman	15	720	Sudden stop due to undesired emergency as train was stopping in siding caused injury to brakeman in caboose cupola, and damaged 26th and 27th cars from caboose.
(13)	8-19	Imlay	C-h	X-2983-W	Caboose at time	7 to 10	A.C. Bailey W.A. Truesdale	Conductor Brakeman	30 20	990	Incoming engine which had been detached from train and moving on lead collided with 2 cabooses which had been taken off train, injured men being inside one of the cabooses.
(14)	8-4	Hazen	D-c	4-280	56	10	None			684	Derailed 21st and 22nd cars from caboose, due to wheel on 22nd car breaking caused by overheating.
(15)	8-14	Stone House	D-c	X-2762-W	54	35	None			183	Derailed 2nd car from engine due to defective [illegible]

												out of yard.
(2)	5-21	Tiago	D-c	2-280	57	26	None			-	627	Derailed 25th car from caboose due to broken defective cast-iron wheel.
(3)	5-22	Gerald	D-dc	X-2565-W	65	4	None			-	218	Derailed 47th and 48th cars from engine on siding due to broken rail.
(4)	5-16	Argo	M-b	X-2524-W	72	25	None			-	200	Piece of 4-1/2 inch pipe 16 feet long fell from 8th car from caboose and damaged automatic block signal.
(5)	6-9	Carlin	G-d	(1-276 (Yard dir.	55	10	None			-	6,078	Yard engine side swiped train pulling into yard on yard track, damaging 47 cars and derailing yard engine, negligence of enginemen.
(6)	6-20	Desert	D-d	1-262			None			-	977	Derailed 8 cars on siding due track out of line apparently caused by sun kink.
(7)	6-21	Montello	D-d	X-3810-W			None			-	441	Derailed 2 cars on yard track as train was pulling out of yard due broken lug on switch stand allowing connecting rod to come loose.
(8)	6-15	Pequop	D-g	1-262	49	3 to 4	None			-	598	Derailed 7 cars on main track due to a brakeman of train in siding unlocking switch and partially throwing switch.
(9)	6-27	Carlin	M-b	X-3209-W	97	5	None			-	400	30th car from caboose buckled due to run-in of slack as train was stopping.
(10)	7-26	Sparks	C-i	X-2528-W	75	5 to 8	None			-	850	Two cars with hand brakes insufficiently set, rolled out of yard track and collided with side of train pulling into yard, damaging 4 cars.
(11)	7-25	Osino	D-b	X-2800-W	55	25	None			-	1,160	Derailed 6 cars behind engine, due to coupler pulling out of engine tender and falling on track caused by emergency action of brakes due to knuckles slipping by between 2nd and 3rd cars ahead of caboose.
(12)	7-8	Granite Point	M-b	X-2577-W	85	3	#G.E.Roberts	Brakeman	15		720	Sudden stop due to undesired emergency application of train was stopping in siding, caused injury to brakeman in caboose cupola, and damaged 26th and 27th cars from cabooses
(13)	8-17	Imlay	C-h	X-2783-W	Caboose at time	7 to 10	A.C.Bailey W.A.Truesdale	Conductor Brakeman	30 20		990	Incoming engine which had been detached from train and moving on lead, collided with 2 cabooses which had been taken off train, injured men being inside one of the cabooses.
(14)	8-4	Mazen	D-c	4-280	56	10	None			-	684	Derailed 21st and 22nd cars from caboose, due to wheel on 22nd car breaking caused by overheating.
(15)	8-14	Stone House	D-c	X-2762-W	54	35	None			-	183	Derailed 2nd car from engine due to defective drawbar pulling out of the 1st car from engine.
(16)	8-22	Fernley	D-g	X-2718-W	23	4	None			-	353	Derailed 4 cars on yard track due to movement reversed after running through switch which had not been properly lined by brakeman.
(17)	8-30	Clark	D-g	4-276	69	8	None			-	319	Derailed rear car of train and caboose due to deadhead fireman on a light engine in siding throwing switch under train.
(18)	8-28	Fernley	D-h	6-262	37	8	None			-	178	Derailed and buckled 5th and 6th cars from engine and damaged car behind engine due to emergency action of brakes caused by trespasser stepping on cutting lever as train backing in siding.
(19)	9-30	Peliçade	D-i	4-276	50	8	None			-	329	Derailed 24th car from head end due to combination of low joint in track on outside of curve and rigid truck.
(20)	10-15	Moor	C-4	(X-3226-W (X-3231-W		8 to 9) 3)	None			-	5,320	Helper engine after helping train 2-262 and turning on wye, fouled main track and was struck by train moving on main track (11:42 AM).
(21)	10-16	Imlay	D-c	1-262	50	8	None			-	750	Derailed 3 cars ahead of caboose and damaged 4th car as train was pulling out of yard, due to 34 inch piece of flange broken out of wheel, 2nd car ahead of caboose which had not been detected by car inspectors at Imlay.
(22)	10-2	Winnemucca	C-f	2-280	50	6	None			-	850	Engine with caboose and one outfit car collided with standing portion of train while replacing caboose on train, after setting out 2 sleeping cars from rear of train.
(23)	11-13	Imlay	C-h	2-262	55	10 to 15	None			-	825	Engine with caboose ahead of it, collided with standing portion of train and demolished the caboose while making drop of car behind the engine, due to brakeman throwing wrong switch.

- Caused from sudden stopping, starting, lurch, or jerk of car or train.

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED NAME (g)	OCCUPATION (h)	ESTIMATED DISABILITY (Days) (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1923						YEAR 1923 (CONTINUED)				
(24)	11-5	Felaia	D-c	1-280	54	4		-	-	200	Derailed 3rd and 4th car from engine on siding, caused by brake beam coming down on 3rd car due to broken brake beam hanger.
(25)	11-26	Desert	D-c	1-276	61	20 to 25	None	-	-	565	Derailed 17th car from caboose on main track due to broken cast-iron wheel caused by overheating.
(26)	11-30	Vivian	M-b	X-2520-W	85	10	#A.E.Higbee #S.C.Bohon #J.S.Cosgrave	Conductor Brakeman Brakeman	10 4 8	395	Train parted as it was being stopped due to drawbar in engine tender falling out on account of carrier-iron breaking. Emergency action of brakes caused damage to 7 cars and injured trainmen in caboose.
(27)	12-1	Imlay	C-h	5-280	54	8 to 10	None	-	-	750	Engine with caboose ahead of it, collided with standing portion of train and demolished the caboose while placing the caboose on train.
	1924						YEAR 1924				
(28)	1-21	Fernley	C-h	X-2522-E	39	5 to 10	None	-	-	815	Engine collided with standing portion of train damaging head car, while making drop of car due to brakeman improperly handling switch.
(29)	1-14	Golconda	L-b	X-2755-W	55	35	None	-	-	160	Front end of right main rod broke through wrist pin hole on engine 2755.
(30)	4-12	Sodaville	D-c	192	12	25 to 30	None	-	-	350	Engine tender derailed due to broken axle.
(31)	5-16	Belleville	D-g	192	12	6	None	-	-	237	Engine and car derailed due to brakeman not properly throwing switch during switching move.
(32)	6-12	Moor	D-g	258	104	6	None	-	-	982	Derailed 1 car and buckled another, while making stop in siding due to improper handling of independent brake by engineer.
(33)	7-20	Tecoma	C-h	X-3202-W	94	8 to 12	B. Stoddhan	Brakeman	10	1,661	Engine shoving 44 cars on Tuttle Branch for storage collided with standing cut of 61 cars which had been left there by same crew, due to failure of conductor to properly safeguard move. Brakeman knocked from car when impact occurred.
(34)	8-5	Sparks	D-g	X-2718-E	75	6 to 8	None	-	-	339	Derailed 3rd and 4th car from engine as train was pulling into yard due to yardman throwing switch under train. Derailed cars sideswiped passenger engine standing on track, fireman of which was injured when he jumped from engine in anticipation of collision.
(35)	8-17	Desert	M-b	X-2852-W	84	25	None	-	-	530	Airhose burst on 7th car from engine. Emergency action of brakes buckled 9th car from caboose.
(36)	8-27	Verdi	D-c	X-4003-E	55	18	None			9,070	Derailed 1 car with considerable damage to track account broken wheel due to overheating.
(37)	9-16	Sutcliffe	M-a	(X-2762-W (X-1795-W	42 Light	Standing) 10 to 15)	None	-	-	910	Light Extra 1795-West collided with rear of Extra 2762 West demolishing caboose, and damaging car ahead of caboose and engine 1795, due to failure of flagman of freight train to protect rear of his train.
(38)	9-12	Montello	C-h	2-276	5	10	S. Guie	Contract cook	4	175	Two cars cut off during switching move collided with occupied outfit cars in violation of rules.
(39)	9-21	Ditho	D-c	1-258	55	25	None	-	-	2,476	Derailed 10th car ahead of caboose, due to broken cast-iron wheel caused by old flaw.
(40)	10-27	Elko	D-d	1-280	60		None		-	595	Engine derailed due to defective switch caused by it having been run through previously and yardman failing to safeguard the defective condition.
(41)	10-5	Palisade	M-b	1-276	53	20	None	-	-	250	M. of W. gasoline motor car struck by train.
(42)	11-24	Ditho	D-c	1-258	60	20 to 25	one	-	-	265	Derailed 21st car from engine due to broken cast-iron wheel caused by overheating.

1)	5-16	Belleville	D-g	192	12	6	None	-	-	-	237	Engine and car derailed due to brakeman not properly throwing switch during switching move.
32)	6-12	Moor	D-g	258	104	6	None	-	-	-	982	Derailed 1 car and buckled another, while making stop in siding due to improper handling of independent brake by engineer.
33)	7-20	Tecoma	C-h	X-3202-W	94	8 to 12	B. Stockham	Brakeman	10	-	1,661	Engine shoving 44 cars on Tuttle Branch for storage collided with standing cut of 61 cars which had been left there by same crew, due to failure of conductor to properly safeguard move. Brakeman knocked from car when impact occurred.
34)	8-5	Sparks	D-g	X-2718-W	75	6 to 8	None	-	-	-	339	Derailed 3rd and 4th car from engine as train was pulling into yard due to yardman throwing switch under train. Derailed cars sideswiped passenger engine standing on track, fireman of which was injured when he jumped from engine in anticipation of collision.
35)	8-17	Desert	M-b	X-2852-W	87	25	None	-	-	-	530	Airhose burst on 7th car from engine. Emergency action of brakes buckled 9th car from caboose.
36)	8-27	Verdi	D-c	X-4003-E	55	18	None				2,070	Derailed 1 car with considerable damage to track account broken wheel due to overheating.
37)	9-16	Sutcliffe	C-a	(X-2762-W (X-1795-W	42 Light	Standing) 10 to 15)	None	-	-	-	910	Light Extra 1795-West collided with rear of Extra 2762 West demolishing caboose, and damaging car ahead of caboose and engine 1795, due to failure of flagman of freight train to protect rear of his train.
38)	9-12	Montello	C-h	2-276	5	10	S. Guie	Contract cook	4	-	175	Two cars but off during switching move collided with occupied outfit cars in violation of rules.
39)	9-21	Ditho	D-c	1-258	55	25	None	-	-	-	2,476	Derailed 10th car ahead of caboose, due to broken cast-iron wheel caused by old flaw.
40)	10-27	Elko	D-d	1-280	60		None	-	-	-	595	Engine derailed due to defective switch caused by it having been run through previously and yardman failing to safeguard the defective condition.
41)	10-5	Palisade	M-b	1-276	53	20	None	-	-	-	250	M. of W. gasoline motor car struck by train.
42)	11-24	Ditho	D-c	1-258	68	20 to 25	one	-	-	-	265	Derailed 21st car from engine due to broken cast-iron wheel caused by overheating.
43)	12-14	Farren	C-d	(X-2526-W (X-2825-W	54 52	2 10 to 20)	None	-	-	-	1,374	Extra 2825 West moving on main track collided with Extra 2526 West pulling out of siding, due to failure of employes on Extra 2526-West to protect before fouling main track.
44)	12-23	Hunter	M-b	272	54	25	None	-	-	-	175	M. of W. gasoline motor car struck by train.
	1925						YEAR 1925					
3)	1-18	Comus	D-c	X-2710-W	54	30	None	-	-	-	278	Derailed 3rd car ahead of caboose due to broken journal caused by flaw.
4)	1-19	Sparks	M-b	X-2531-W	83	5	None	-	-	-	175	Run-in of slack caused the 16th car from caboose to be telescoped by the 15th car.
7)	2-22	Tioga	D-c	272	94	6 to 8	None	-	-	-	573	Derailed 38th car from head end due to drawbar falling out of car caused by keeper in drawbar key losing out.
9)	3-24	Carlin	M-b	X-3203-E	84	4 to 6	None	-	-	-	375	Sudden stop due to undesired emergency as train was stopping in yard, buckled 10th and 11th cars from caboose.
)	4-27	Desert	D-c	X-2569-W	5	30 to 35	None	-	-	-	690	Derailed 1st car behind engine due to broken defective arch bar.
	5-1	Elburz	D-c	X-280	67	5	None	-	-	-	210	Derailed 15th car from engine pulling out of siding due to new car with rigid trucks and reverse elevation in turnout.
)	6-13	Halleck	M-b	X-2563-W	55	30	None	-	-	-	1,350	The 28th car from caboose discovered on fire, apparently originating from brake shoe friction, car set out of train at Elburz and was entirely destroyed.
)	7-10	Oreana	D-a	X-2852-W	90	20	None	-	-	-	610	Derailed 20th car ahead of caboose due to draft rigging pulling out of car and falling on track when undesired emergency action of brakes occurred, caused by defective triple.

- Caused from sudden stopping, starting, lurch, or jerk of car or train.

Sheet 3 of 9 sheets.

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (Days) (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1925						YEAR 1925 (CONTINUED)				
(53)	7-15	Alason	D-b	X-3209-W	87	20	None	-	-	$ 315	Four cars behind engine derailed caused by drawbar pulling out of first car behind engine, due to drawbar key losing out.
(54)	7-26	Cosgrave	D-g	X-2766-W	84	8	None	-	-	155	Derailed 3 cars while pulling out of siding with 16 cars, due to reverse movement being made through a switch just previously run through.
(55)	8-5	Tioga	D-c	276	54	15 to 18	None	-	-	850	Derailed 11th car from engine caused by broken cast-iron wheel due to overheating.
(56)	8-4	Montello	D-i	1-280	101	5 to 6	None	-	-	470	Derailed 18th and 19th cars ahead of caboose caused by sudden stop due to undesired emergency.
(57)	8-4	Ocino	M-b	X-3216-W	86	5 to 6	None	-	-	263	Four cars damaged as train being stopped in siding due to undesired emergency.
(58)	8-31	Ocala	M-b	2-272	66	35	None	-	-	350	Run-away M. of W. gasoline motor car struck by train.
(59)	9-4	Montello	D-g	X-2856-W	88	7	J.J.Vandermark	Brakeman	10	918	Derailed and telescoped 32nd car from caboose and slightly damaging 4 other cars, helper engine shoving on rear, when engineer applied brakes in emergency to avoid running over a fireman who stumbled and fell attempting to cross track in front of train. Brakeman in caboose injured.
(60)	9-16	Comus	M-b	X-2532-W	56	35	None	-	-	300	M. of W. gasoline motor car struck by train.
(61)	10-5	Sparks	C-b	5 2-272	5 55	20 to 35) Standing)	W.K.Smith F.P.Kummer	Passgr. Engr. Passenger Fireman	Killed Killed	15,840	Passenger train collided with standing freight train on yard track due to switch being left open by yardman, and failure of engine crew on passenger train to be on lookout for signals. No one injured on freight train.
(62)	10-2	Elko	D-c	5-272	57	12	None	-	-	3,528	Derailed 49th, 52nd and 53rd cars from engine and damaged one other car due to loose wheel on 49th car.
(63)	10-4	Clure	L-b	4-280	60	20	None	-	-	517	Back end strap of left main rod broke on engine 2829.
(64)	11-8	Carlin	C-d	2-276 yd. eng.	58 2	8) 8 to 10)	None	-	-	862	Yard engine collided with side of freight train pulling into yard, damaging yard engine and 17 cars in freight train, due to switch not being properly lined.
(65)	11-19	Death	D-c	X-3213-W	55	15	None	-	-	228	Derailed 15th and 51st cars from engine caused by brake beam coming down on 15th car and lodging in switch point.
(66)	12-13	Rose Creek	D-c	1-280	50	15	None	-	-	914	Derailed 30th, 31st and 32nd cars from engine caused by broken journal on 31st car due to overheating.
	1926						YEAR 1926				
(67)	1-31	Death	L-b	2-276	75	15	None	-	-	250	Broke strap on back end of left main rod and knocked out cylinder head engine 3201.
(68)	2-11	Miriam	M-b	278	80	Standing	None	-	-	2,055	Car, 32nd from caboose, set out of train account hot journal, later found entirely destroyed by fire, apparently having originated from hot journal.
(69)	5-23	Imlay	C-b	253 278	12 21	4) 4)	None	-	-	185	No. 278's engine with 20 cars backed into a cut of 12 cars being handled through cross-over by engine of No. 253, damaging 6 cars.

(59)	9-4	Montalle	D-g	L-2856-W	88	7	Jos.Vandermark	Brakeman	--		other cars, helper engine shoving on rear, when engineer applied brakes in emergency to avoid running over a fireman who stumbled and fell attempting to cross track in front of train. Brakeman in caboose injured.
(60)	9-16	Camas	M-b	L-2532-W	56	35	None	-	-	300	M. of W. gasoline motor car struck by train.
(61)	10-5	Sparks	C-b	5 2-272	5 55	20 to 35) Standing)	W.K.Smith F.P.Kummer	Passgr. Engr. Passenger Fireman	Killed Killed	15,840	Passenger train collided with standing freight train on yard track due to switch being left open by yardman, and failure of engine crew on passenger train to be on lookout for signals. No one injured on freight train.
(62)	10-2	Elko	D-e	5-272	59	12	None	-	-	3,528	Derailed 49th, 52nd and 53rd cars from engine and damaged one other car due to loose wheel on 49th car.
(63)	10-4	Cluro	L-b	4-280	60	20	None	-	-	517	Back end strap of left main rod broke on engine 2829.
(64)	11-8	Carlin	C-d	2-276 (yd. eng.	58 2	8 8 to 10)	None	-	-	862	Yard engine collided with side of freight train pulling into yard, damaging yard engine and 17 cars in freight train, due to switch not being properly lined.
(65)	11-19	Death	D-e	L-3213-W	55	15	None	-	-	228	Derailed 15th and 51st cars from engine caused by brake beam coming down on 15th car and lodging in switch point.
(66)	12-13	Rose Creek	D-e	1-280	50	15	None	-	-	914	Derailed 30th, 31st and 32nd cars from engine caused by broken journal on 31st car due to overheating.
	1926						YEAR 1926				
(67)	1-31	Death	L-b	2-276	75	15	None	-	-	250	Brake strap on back end of left main rod and knocked out cylinder head engine 3201.
(68)	2-11	Miriam	M-b	278	80	Standing	None	-	-	2,055	Car, 32nd from caboose, set out of train account hot journal, later found entirely destroyed by fire, apparently having originated from hot journal.
(69)	5-23	Imlay	C-b	253 278	12 21	4 4	None	-	-	185	No. 278's engine with 20 cars backed into a cut of 12 cars being handled through cross-over by engine of No. 253, damaging 6 cars.
(70)	5-25	Reno	D-e	276	55	55	None	-	-	432	Derailed 3rd to 6th cars from caboose account brake lever coming down on 7th car from caboose and lodging between stock rail and throw rail of trailing point switch.
(71)	7-18	Acme	M-b	L-2252-W	16	30	None	-	-	250	M. of W. gasoline motor car struck by train.
(72)	9-5	Mason	C-d	L-1785-W	36	8	None	-	-	210	Car cornered and damaged while switching, due to switch improperly lined by brakeman.
(73)	9-1	Imlay	D-d	L-2718-W	85	6	None	-	-	720	Derailed engine and 4 cars on yard track caused by defective switch due to it having been previously run through.
(74)	9-2	Bliss	M-b	2-272	55	35	None	-	-	200	M. of W. section motor car struck by train.
(75)	10-13	Noble	M-b	L-3230-W	69	25	None	-	-	390	Two cars damaged due to engineer making heavy application of air and not properly controlling slack, and helper engine shoving on rear.
	1927						YEAR 1927				
(76)	1-8	Ditho	C-b	L-2572-W	26	8	None	-	-	300	Train backing in on siding to pick up outfit cars, collided with the cars and damaged two of the outfit cars.
(77)	1-4	Noor	D-e	280	105	8	None	-	-	845	Derailed and buckled 52nd car from caboose due to emergency action of brakes caused by broken defective yoke strap 28th car from engine.
(78)	3-28	Mina	C-b	24	5	15	None	-	-	175	Two cars left standing, not secured by hand brakes, run away and collided with other cars standing.
(79)	4-16	Noor	D-e	276	107	8	None	-	-	788	Derailed and buckled 64th and 65th cars from engine due to emergency action of brakes when train parted due to defective draw-bar yoke strap breaking on 10th car from engine.
(80)	4-17	Thisbe	D-e	1-270	22	30	None	-	-	285	Derailed M. of W. Jordan Spreader, caboose and 1 other car due to wings of spreader dropping on track.
(81)	5-5	Lawton	D-e	L-5026-E	66	20	None	-	-	570	Derailed 20th and 21st cars from engine caused by drawbar pulling out of 16th car from engine and falling on track due to draft key losing out.

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	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED: NAME (g)	PERSON INJURED: OCCUPATION (h)	ESTIMATED DISABILITY (Days) (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1927						YEAR 1927 (CONTINUED)				
(82)	5-24	Benin	D-d	E-3263-W	75	25	None	-	-	$ 2,623	Derailed 49th, 52nd, 54th, 59th to 69th cars from head end, caused by improper maintenance of track while making tie renewals.
(83)	6-28	Wesley	D-e	E-3243-W	84	30	None	-	-	4,846	Derailed 13 cars due to brake beam coming down and lodging between main track and siding rail.
(84)	6-29	Moor	M-b	2-272	123	3	None	-	-	950	Buckled 48th car from head end, due to weakened condition of car, as train was being stopped to cut out helper.
(85)	7-28	Toulon	D-e	2-278	81	30	None	-	-	305	Derailed 11th car from engine due to failure of Vulcan truck side.
(86)	8-21	Hunter	D-e	1-280	120	25	None	-	-	725	Derailed 12th car ahead of caboose due to broken wheel caused by overheating from brakes sticking.
(87)	9-5	Valley Pass	M-b	E-3218-W	143	5	None	-	-	556	Buckled 70th car from head end due to slack action as train being brought to a stop.
(88)	9-5	Valley Pass	M-b	E-3209-W	9	3	None	-	-	600	Buckled 58th car from engine while stopping in siding due to undesired emergency.
(89)	10-22	Imlay	C-h	2-276	70	5	None	-	-	600	Engine shoving caboose on to train collided with standing portion of train.
(90)	10-1	Montello	M-b	5-272	81	40	None	-	-	275	Drivers of engine damaged attempting to stop train which got out of control due to brake pipe between 1st and 2nd car from engine becoming obstructed due to water freezing.
(91)	10-5	Moor	M-b	5-276	94	18	G. J. Bluth	Conductor	4	865	Buckled 13th car from caboose due to emergency action of brakes caused by train parting, 4th car from engine, due to draw-bar yoke strap breaking. Conductor thrown to floor of caboose.
(92)	11-30	Carlin	C-d	(E-3202-W Light (E-3236-E Light	115 4 6		None	-	-	297	Helper engine sideswiped freight train pulling into yard, 18th car back of engine, due to negligence of hostler.
(93)	11-13	Montello	D-e	1-258	81	10	None	-	-	773	Derailed 12th car ahead of caboose due to broken wheel caused by overheating from sticking brakes.
(94)	12-30	Elko	M-b	280	86	10	D.E. Lynch	Brakeman	25	354	Airhose blew off 4th car ahead of caboose, causing train to part between 10th and 11th cars from engine due to broken coupler, damaging 4 cars and injuring brakeman in caboose.
	1928						YEAR 1928				
(95)	1-1	Elko	M-b	1-276	88	7	J.A.Wakefield	D.H.Brakeman	7	200	Train parted due to drawbar pulling out of 2nd car from engine. Sudden stop damaged 74th and 75th cars from head end and injuring deadhead brakeman in caboose.
(96)	2-3	Carlin	D-g	316	50	6-10	None	-	-	886	Derailed and buckled 45th car from engine and damaged 3 other cars, due to improper handling of air by engineer.
(97)	4-13	Noble	D-e	E-3235-W	100	15	None	-	-	3,200	Derailed and damaged 19th to 22nd cars from caboose due to emergency action of brakes when train parted caused by drawbar yoke breaking on 8th car from engine.
(98)	4-2	Ullin	D-e	276	77	20	None	-	-	425	Derailed and buckled 2nd car from engine, which was a wooden underframe, when conductor used conductor's valve to stop train when he believed train in trouble. Conductor responsible for picking up wooden frame car on head end.
(99)	5-19	Montello	M-b	E-3226-W	92	10	None	-	-	300	Buckled 2nd car from caboose due to sudden stop caused by undesired emergency when stopping in yards.
(100)	5-20	Moor	M-b	1-292	117	5	None	-	-	315	Damaged 19th, 45th and 46th cars from head end when recoupling train

(87)	9-5	Valley Pass	M-b	X-3218-W	143	5	None	-	-	556	Buckled 70th car from head end due to slack action as train being brought to a stop.
(88)	9-5	Valley Pass	M-b	X-3209-W	90	3	None	-	-	600	Buckled 58th car from engine while stopping in siding due to undesired emergency.
(89)	10-22	Imlay	C-h	2-276	70	5	None	-	-	600	Engine shoving caboose on to train collided with standing portion of train.
(90)	10-1	Montello	M-b	5-272	81	40	None	-	-	275	Drivers of engine damaged attempting to stop train which got out of control due to brake-pipe between 1st and 2nd car from engine becoming obstructed due to water freezing.
(91)	10-5	Moor	M-b	5-276	94	18	G. J. Bluth	Conductor	4	865	Buckled 13th car from caboose due to emergency action of brakes caused by train parting, 4th car from engine, due to draw-bar yoke strap breaking. Conductor thrown to floor of caboose.
(92)	11-30	Carlin	C-d	(X-3202-W (X-3236-E	115 Light	4) 6)	None	-	-	297	Helper engine sideswiped freight train pulling into yard, 18th car back of engine, due to negligence of hostler.
(93)	11-13	Montello	D-e	4-258	81	10	None	-	-	773	Derailed 12th car ahead of caboose due to broken wheel caused by overheating from sticking brakes.
(94)	12-30	Elko	M-b	280	86	10	D.E. Lynch	Brakeman	25	356	Airhose blew off 4th car ahead of caboose, causing train to part between 10th and 11th cars from engine due to broken coupler, damaging 4 cars and injuring brakeman in caboose.
	1928						YEAR 1928				
(95)	1-1	Elko	M-b	1-276	88	7	J.A.Wakefield	D.H.Brakeman	7	200	Train parted due to drawbar pulling out of 2nd car from engine. Sudden stop damaged 74th and 75th cars from head end and injuring deadhead brakeman in caboose.
(96)	2-3	Carlin	D-g	316	50	6-10	None	-	-	886	Derailed and buckled 45th car from engine and damaged 3 other cars, due to improper handling of air by engineer.
(97)	4-13	Noble	D-e	X-3235-W	100	15	None	-	-	3,200	Derailed and damaged 19th to 22nd cars from caboose due to emergency action of brakes when train parted caused by drawbar yoke breaking on 8th car from engine.
(98)	4-2	Ullin	D-e	276	77	20	None	-	-	425	Derailed and buckled 2nd car from engine, which was a wooden underframe, when conductor used conductor's valve to stop train when he believed train in trouble. Conductor responsible for picking up wooden frame car on head end.
(99)	5-19	Montello	M-b	X-3228-W	92	10	None	-	-	300	Buckled 2nd car from caboose due to sudden stop caused by undesired emergency when stopping in yard.
(100)	5-20	Moor	M-b	1-292	117	5	None	-	-	315	Damaged 19th, 45th and 46th cars from head end when recoupling train at too high rate of speed, after cutting out helpers.
(101)	6-5	Knight's Spur	M-b	280	78	25	None	-	-	1,160	Journal burned off 11th car from engine but car did not derail; dragging journal box damaging track.
(102)	9-7	Gerald	D-e	1-276	71	15	None	-	-	185	Derailed 24th car from head end caused by loose wheel.
(103)	9-21	Wells	D-g	1-292	71	8	None	-	-	458	Derailed engine while switching, due to reversing movement through switch which had been split due to brakeman not properly throwing switch.
(104)	9-3	Clure	L-b	2-276	80	10	None	-	-	300	Back cylinder, crosshead and bottom guide broken and piston rod bent when wedge bolt in back end of left main rod broke.
(105)	10-13	Rose Creek	D-e	X-3256-W	78	30	None	-	-	194	Derailed 37th car from head end due to loose wheel.
(106)	11-22	Verdi	D-c	X-4003-E	63	20	None	-	-	660	Derailed 3rd car from caboose due to broken cast-iron wheel caused by overheating.
(107)	11-28	Verdi	D-e	X-4015-E	49	20	None	-	-	867	Derailed 16th car from caboose due to broken cast-iron wheel caused by overheating.
(108)	12-26	Rennex	C-d	(292 (WPRR X-9-E	83 7	Standing) 8 to 10)	None	-	-	10,500	West.Pacific RR No. 9.East collided with engine attached to S.P. train No. 292 due to failure of crew on No. 292 to properly protect rear of their train and Western Pacific train moving too high rate of speed.

	DATE	LOCATION	I.C.C. CLASS	TRAIN NUMBER	NO. CARS IN TRAIN	SPEED M.P.H.	PERSON INJURED: NAME	PERSON INJURED: OCCUPATION	ESTIMATED DISABILITY (Days)	TOTAL DAMAGE	DESCRIPTION OF ACCIDENT
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
	1929						YEAR 1929				
(109)	2-6	Moor	M-b	292	122	15	None	-	-	$ 457	Buckled 21st car from head end due to hidden defects in center sill as train was stopping to cut out helper engines.
(110)	5-8	Allison	D-d	2-292	88	1	None	-	-	375	Derailed engine on spur while switching caused by rail turning over.
(111)	9-4	Iron Point	D-c	X-3241-W	72	30	None	-	-	276	Derailed 27th car from caboose due to failure of arch bar truck.
(112)	9-26	Nima	D-g	191	5	2	J.L.Maher	Conductor	Killed	200	Derailed and turned over 2 cars due to switch not being properly lined.
(113)	10-3	Montello	C-b	X-3229-W	80	8	None	-	-	650	Engine collided with head portion of standing train.
(114)	10-21	Palais	D-c	X-3248-W	49	35	None	-	-	260	Derailed 4th car from caboose due to failure of arch bar truck.
(115)	10-19	Elburz	L-b	4-276	76	30	None	-	-	250	Broken left main crank pin engine 3256, due to flaw.
(116)	11-2	Libby	D-d	183	43	20	None	-	-	1,568	Derailed 5th to 15th cars from engine due to broken rail.
(117)	12-5	Vesa	D-g	3-292	78	8	None	-	-	376	Derailed engine and 2 cars account overrunning derail.
	1930						YEAR 1930				
(118)	1-15	Big Canyon	C-a	2-184 1-184	23 None	15 Standing	None	-	-	2,268	Freight train 2-284 collided with 2 engines coupled running as 1-284, due to failure of enginemen to provide flag protection.
(119)	5-4	Wilbur	D-e	23	5	25	C.P.Devine	Engineer	Killed	2,103	Derailed engine and 4 cars due to melted snow washing out levee and undermining track.
(120)	6-18	Redwave	M-b	276	111	3	None	-	-	470	Buckled 6th car from engine when emergency action of brakes occurred while backing on siding due to trespasser stepping on cutting lever.
(121)	7-8	Valley Pass	M-b	X-4375-W	140	5	None	-	-	700	Buckled 70th and 124th cars from head end when slack ran in as train was being brought to a stop.
(122)	7-22	Cobre	M-b	X-4375-W	140	8	None	-	-	950	Buckled 68th and 135th cars from head end when slack ran in as train was being brought to a stop.
(123)	7-24	Ryndon	M-b	X-3225-W	126	20	None	-	-	2,089	Train parted caused by drawbar pulling out of first car behind engine due to draft key falling out, damaging 6 cars.
(124)	8-16	Bristol	D-i	259	68	25	None	-	-	310	Derailed 18th car from caboose due to it being improperly loaded.
(125)	9-19	Rennox	D-i	1-276	102	3	None	-	-	250	Derailed engine due to rigid engine and guard rail slightly out of position.
	10-7	Thisbe	D-b	276	112	20	Trespasser	-	10	1,703	Derailed 54th car from engine and damaged engine tender, 1st, 2nd and 53rd cars, due to train parting, caused by knuckle breaking on 24th car from engine.
(127)	10-29	Dithe	D-c	1-276	100	35	None	-	-	769	Derailed 24th car from caboose due to broken cast-iron wheel caused by flaw.
(128)	10-12	Lovelock	M-a	2-292	79	6	None	-	-	250	Buckled 72nd car from engine when emergency application of brakes made by engineer to avoid striking auto truck.
(129)	10-10	Preble	M-b	1-280	102	35	W. A. Peel I. S. Oram	Brakeman Brakeman	12 16	1,290	Broken journal and collapse of truck caused by flaw 4th car from engine; train parted between 3rd and 4th cars. Sudden stop injured trainmen in caboose.
(130)	11-5	Upsal	D-c	X-3212-W	64	40	None	-	-	283	Derailed 1st car behind engine due to broken cast-iron wheel caused from overheating.
		Dola	D-c	X-4[illegible]-W	104	40	None	-	-	400	Derailed 26th car from caboose due to broken cast-iron wheel caused from

		Winn	D-e	23	5	25	C.P.Devine	Engineer	Killed	2,103	Derailed engine and 4 cars due to melted snow washing out levee and undermining track.
(120)	6-18	Necwiwe	M-b	276	111	3	None	-	-	470	Buckled 6th car from engine when emergency action of brakes occurred while backing on siding due to trespasser stepping on cutting lever.
(121)	7-8	Valley Pass	M-b	X-4375-W	140	5	None	-	-	700	Buckled 70th and 124th cars from head end when slack ran in as train was being brought to a stop.
(122)	7-12	Cobre	M-b	X-4375-W	140	8	None	-	-	950	Buckled 68th and 135th cars from head end when slack ran in as train was being brought to a stop.
(123)	7-24	Ryndon	M-b	X-3225-W	126	20	None	-	-	2,089	Train parted caused by drawbar pulling out of first car behind engine due to draft key falling out, damaging 6 cars.
(124)	8-16	Bristo	D-i	259	68	25	None	-	-	310	Derailed 18th car from caboose due to it being improperly loaded.
	8-17	Herndox	D-i	1-276	102	3	None	-	-	250	Derailed engine due to rigid engine and guard rail slightly out of position.
	10-7	Thisbe	D-b	276	112	30	Trespasser	-	10	1,703	Derailed 54th car from engine and damaged engine tender, 1st, 2nd and 53rd cars, due to train parting, caused by knuckle breaking on 24th car from engine.
	10-23	Ditho	D-c	1-276	100	35	None	-	-	769	Derailed 24th car from caboose due to broken cast-iron wheel caused by flaw.
(128)	10-12	Lovelock	M-a	2-292	79	6	None	-	-	250	Buckled 72nd car from engine when emergency application of brakes made by engineer to avoid striking auto truck.
(129)	10-10	Preble	M-b	1-280	102	35	W. A. Peel I. S. Oram	Brakeman Brakeman	12 16	1,290	Broken journal and collapse of truck caused by flaw 4th car from engine; train parted between 3rd and 4th cars. Sudden stop injured trainmen in caboose.
(130)	11-5	Upsal	D-c	X-3212-W	64	40	None	-	-	283	Derailed 1st car behind engine due to broken cast-iron wheel caused from overheating.
		la	D-c	X-4400-W	104	40	None	-	-	400	Derailed 26th car from caboose due to broken cast-iron wheel caused from overheating.
		lle	D-i	2-276	102	3	None	-	-	900	Derailed 25th car and buckled 24th car from engine account 24th car not in suitable condition to withstand ordinary train usage.
(133)	12-11	Tioga	M-b	276	123	10	None	-	-	850	Buckled 56th car from engine account weak construction when branch pipe broke on 37th car from engine.

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(134)	1-16	Hazen	L-b	194	2	15	None	-	-	200	Right main rod pin broke off next to wheel center and knocked out right cylinder head, engine 2173.
(135)	1-19	Eglon	C-h	X-1785-W	33	6	None	-	-	373	One car collided with another during a switching move, due to car being left standing on grade without hand brake being set.
(136)	1-25	Zenobia	D-c	259	110	28	None	-	-	315	Derailed 53rd car from engine due to airhose blowing off 18th car from engine which caused steel draft arm 53rd car to be broken off at body bolster and truck pulled out from under car.
(137)	1-22	Wolis	D-h	X-4336-W	133	8	None	-	-	678	Derailed and buckled 53rd car from caboose when emergency action of brakes occurred due to trespasser stepped on cutting lever between 5th and 6th cars.
(138)	8-11	Flanigan	D-c	183	33	3	None	-	-	180	Derailed 23rd car from head end due to bottom rod dropping down and raising truck from rails, while switching on interchange track.
(139)	8-9	Cobre	M-b	292	98	15	None	-	-	600	Buckled 69th car from engine when emergency action of brakes occurred due to defective branch pipe on 69th car.
(140)	8-21	Walls	M-b	X-4373-W	87	8	None	-	-	785	Buckled 79th and 80th cars from engine when emergency action of brakes occurred due to trespasser stepping on cutting lever 10th car from engine.

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (Days). (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1931						YEAR 1931 (CONTINUED)				
(141)	9-22	Moor	M-b	2-292	125	2	None	-	-	$ 500	Buckled 66th car from engine while train moving in siding due to too much braking power on head end and engineer improperly handling air.
(142)	10-26	Wells	M-b	1-292	125	4	None	-	-	505	Buckled 58th car from engine due to undesired emergency action of brakes as train was stopping in siding.
(143)	11-24	Alaxon	D-b	3-292	80	15	None	-	-	945	Derailed 4th car from engine due to defective drawbar pulling out of 3rd car and falling on track.
	1932						YEAR 1932				
(144)	1-31	Valley Pass	D-e	292	85	5	None	-	-	300	Derailed engine truck due to ice and snow on track.
(145)	3-20	Grouse	L-b	X-4332-W	71	15	None	-	-	350	Front end of left main rod broke due to flaw and knocked out left front cylinder head engine 4332.
(146)	4-2	Pluto	L-b	X-4373-W	54	40	None	-	-	370	Left back side rod failed engine 4373 due to flaw.
(147)	4-11	Reno	L-b	24	21	5	None	-	-	300	Left main rod strap broke on engine 2339 due to flaw.
(148)	4-17	Icarus	L-b	X-4328-W	92	10	None	-	-	249	Right intermediate side rod failed on engine 4328 due to flaw.
(149)	4-18	Ryndon	L-b	X-4329-W	105	20	None	-	-	493	Left middle connecting rod broke on engine 4329 due to flaw.
(150)	7-14	Wells	L-c	570	73	15	None	-	-	1,075	Right No. 2 axle broke off inside of driving box engine 3619. Caboose buckled when engineer made emergency application of brakes.
(151)	7-12	Imlay	M-b	X-4363-W	85	6	None	-	-	250	Damaged 1st and 2nd car behind engine while 85 cars being backed in on yard track, due to trespasser stepping on cutting lever.
(152)	8-28	Dumphy	D-d	574	101	4	None	-	-	356	Engine derailed while shoving 4 cars in on house track preparatory to picking up 1 car, due to poor condition of ties in track.
(153)	8-2	Hazen	L-b	X-3619-W	98	20	None	-	-	800	Left cross-head broke at piston fit, breaking cylinder head and bottom portion of cylinder engine 3619.
(154)	9-18	Cedar	L-b	2-576	125	10	None	-	-	300	Right main pin broke damaging cylinder and bending rods engine 4365.
(155)	10-17	Sparks	L-b	566	105	10	None	-	-	160	Right middle connecting rod broke on engine 4332, due to flaw.
(156)	10-27	Wells	L-b	4-574	103	Starting	None	-	-	160	Right middle connecting rod broke on engine 4334, due to flaw.
(157)	11-12	Cosgrave	L-b	3-574	95	25	None	-	-	250	Left main rod broke and knocked out cylinder head engine 4364 due to progressive fracture.
	1933						YEAR 1933				
(158)	1-3	Lovelock	D-g	562	99	10	None	-	-	438	Derailed engine tender and 2 cars while switching due to switch being improperly lined.
(159)	4-10	Beowawe	L-b	578	91	Starting	None	-	-	190	Right main rod broke on engine 4334 due to flaw.
(160)	5-12	Fernley	L-b	X-4332-W	111	12	None	-	-	450	Right main rod broke on engine 4332 due to progressive fracture.
(161)	7-13	Imlay	D-b	2-562	95	20	None	-	-	279	Derailed 3rd car from engine when drawbar in head car in train pulled out and fell on track.

	1932					YEAR 1932					
(144)	1-31	Valley Pass	D-e	292	85	5	None	-	-	300	Derailed engine truck due to ice and snow on track.
(145)	3-20	Grouse	L-b	X-4332-W	71	15	None	-	-	350	Front end of left main rod broke due to flaw and knocked out left front cylinder head engine 4332.
(146)	4-2	Piute	L-b	X-4373-W	54	40	None	-	-	370	Left back side rod failed engine 4373 due to flaw.
(147)	4-11	Nano	L-b	24	21	5	None	-	-	300	Left main rod strap broke on engine 2339 due to flaw.
(148)	4-17	Icarus	L-b	X-4328-W	92	10	None	-	-	249	Right intermediate side rod failed on engine 4328 due to flaw.
(149)	4-18	Ryndon	L-b	X-4329-W	105	20	None	-	-	493	Left middle connecting rod broke on engine 4329 due to flaw.
(150)	7-14	Wells	L-c	570	73	15	None	-	-	1,075	Right No. 2 axle broke off inside of driving box engine 3619. Caboose buckled when engineer made emergency application of brakes.
(151)	7-12	Imlay	M-b	X-4363-W	85	6	None	-	-	250	Damaged 1st and 2nd car behind engine while 85 cars being backed in on yard track, due to trespasser stepping on cutting lever.
(152)	8-28	Dunphy	D-d	574	101	4	None	-	-	356	Engine derailed while shoving 4 cars in on house track preparatory to picking up 1 car, due to poor condition of ties in track.
(153)	8-2	Hazen	L-b	X-3619-W	98	20	None	-	-	800	Left cross-head broke at piston fit, breaking cylinder head and bottom portion of cylinder engine 3619.
(154)	8-18	Cedar	L-b	2-576	125	10	None	-	-	300	Right main pin broke damaging cylinder and bending rods engine 4365.
(155)	10-17	Sparks	L-b	566	105	10	None	-	-	160	Right middle connecting rod broke on engine 4332, due to flaw.
(156)	10-27	Wells	L-b	4-574	103	Starting	None	-	-	160	Right middle connecting rod broke on engine 4334, due to flaw.
(157)	11-12	Cosgrave	L-b	3-574	95	25	None	-	-	250	Left main rod broke and knocked out cylinder head engine 4364 due to progressive fracture.
	1933					YEAR 1933					
(158)	1-3	Lovelock	D-g	562	99	10	None	-	-	438	Derailed engine tender and 2 cars while switching due to switch being improperly lined.
(159)	4-10	Becmaw	L-b	578	91	Starting	None	-	-	190	Right main rod broke on engine 4334 due to flaw.
(160)	5-12	Fernley	L-b	X-4332-W	111	12	None	-	-	450	Right main rod broke on engine 4332 due to progressive fracture.
(161)	7-13	Imlay	D-b	2-562	95	20	None	-	-	279	Derailed 3rd car from engine when drawbar in head car in train pulled out and fell on track.
(162)	7-31	Alason	D-b	X-3636-W	100	25	A.E.Righam	Conductor	70	437	Derailed 11th to 13th cars from engine due to bottom rod on 5th car from engine dropping down and lodging in frog. Conductor walking in body of caboose at time was thrown against cupola steps.
(163)	8-13	Carlin	M-b	570	102	5	None	-	-	500	Buckled 62nd car and damaged 87th car from engine due to undesired emergency as engineer commenced service application of brakes to stop train on yard track.
(164)	10-3	Moor	C-d	574	95	4	None	-	-	390	Helper engine backed into side of another helper engine having hold of 2 cars and caboose, due to mistaking signals and trainmen not in proper position.
(165)	10-30	Red House	D-i	1-574	111	8	None	-	-	1,049	Derailed and buckled 2nd car from engine while backing train in siding to let No. 10 depart, due to some unknown person stepping on cutting lever 62 cars from engine.
(166)	11-9	Toiyabe	M-b	1-576	111	10	None	-	-	216	Buckled 46th car from engine while train was pulling out of siding when engineer made service application of brakes, due to car being too weak to withstand ordinary train operation.
(167)	12-21	Cobre	D-[illegible]	X-3761-W	79	5	None	-	-	1,686	Derailed engine caused by condition of wheels due to sliding.

	DATE	LOCATION	I.C.C. CLASS	TRAIN NUMBER	NO. CARS IN TRAIN	SPEED M.P.H.	PERSONS INJURED: NAME	PERSONS INJURED: OCCUPATION	ESTIMATED DISABILITY (Days)	TOTAL DAMAGE	DESCRIPTION OF ACCIDENT
	[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]	[j]	[k]
	1934						YEAR 1934				
(168)	5-11	Avenel	D-e	I-3733-W	111	25	#A.E.Higbee #H.L.Peterson	Conductor Brakeman	20 25	$3,000	Derailed 38th to 42nd cars from head end due to broken arch bar on the 38th car. Sudden stop injured trainmen in caboose.
(169)	5-5	Hazen	D-i	I-4343-W	95	8	None	-	-	200	Derailed 54th to 57th cars from engine due to "jack-knife" action of short pivoted draw bars on empty P.R.R. passenger refrigerator cars as train was being brought to a stop.
(170)	6-16	Wells	D-i	I-3739-W	137	5	None	-	-	800	Derailed and damaged one car due to emergency action of brakes caused by trespasser stepping on cutting lever 30 cars from head end
(171)	6-15	Montello	L-b	I-3731-W	127	8	None	-	-	185	Left front crank pin broke.
(172)	9-30	Carlin	C-4	(574 (Eng.4389	22 None	10) 10)	None	-	-	585	Light engine collided with cut of 22 cars being handled by No. 574's engine backing on main track.
(173)	9-23	Death	D-e	I-3730-W	104	6	None	-	-	168	Derailed 19th car from caboose while train was pulling out of siding due to loose wheel.
(174)	11-26	Valley Pass	M-b	I-3758-W	80	5	None	-	-	600	Buckled 68th car from head end stopping to cut out helpers caused by undesired emergency action of brakes due to water in triple of auxiliary water car.
(175)	11-26	Valley Pass	C-i	I-3758-W	80	4	None	-	-	307	Helper engine shoving rear portion of train consisting of 3 cars and caboose after helper cut out, collided with rear end of standing portion of train due to trainmen not being in proper position.
	1935						YEAR 1935				
(176)	1-4	Bliss	M-b	1-370	100	30	None	-	-	875	Damaged 90th and 91st cars from head end and broke eye out of 12th car from head end, due to branch pipe failing on 92nd car from head end.
(177)	1-21	Sparks	D-g	488	54	4	None	-	-	485	Engine and 3 cars derailed pulling into yard account defective switch due to it having been previously run through.
(178)	4-19	Sparks	M-b	I-4143-E	79	10	None	-	-	724	Buckled 62nd car from head end, account knuckle breaking on 1st car in train, due to air brakes being released at too slow rate of speed.
(179)	9-18	Icarus	L-b	I-3735-W	39	30	None	-	-	980	Right main pin broke off in wheel center.
(180)	9-21	Piute	L-b	I-4366-W	91	40	None	-	-	400	Left main pin broke.
(181)	10-23	Montello	D-g	3-692	103	5	None	-	-	250	Brakeman threw switch while car passing over it during switching move, derailed car and knocked down water column.
(182)	11-11	Ditho	D-d	566	92	5	None	-	-	2,015	Broken rail in siding while train heading in, derailed 11th to 13th cars from head end and damaged 8 other cars when emergency stop made account of derailment.
	1936						YEAR 1936				
(183)	2-28	Paquop	D-e	I-3746-W	77	30	None	-	-	667	Derailed rear trucks of 21st car from engine, due to body bolster breaking on that car when air went into emergency due to brake shoe dropping off car, then striking and uncoupling air hose.
(184)	3-27	Winnemucca	D-g	572	3	5	None	-	-	319	Two cars derailed, one of the two being partly tipped over, when movement reversed after running through switch.
(185)	4-24	Reno	D-e	I-4111-E	70	15	None	-	-	4,308	Derailed 38th to 41st cars, 39th to 41st cars being turned over on their

(173)	9-25	Death	D-e	X-3730-W	104	6	None	-	-	188	Derailed 19th car from caboose while train was pulling out of siding due to loose wheel.
(174)	11-26	Valley Pass	M-b	X-3738-W	80	3	None	-	-	600	Buckled 68th car from head end stopping to cut out defects caused by undesired emergency action of brakes due to water in triple of auxiliary water car.
(175)	11-26	Valley Pass	C-i	X-3738-W	80	4	None	-	-	309	Helper engine shoving rear portion of train consisting of 3 cars and caboose after helper cut out, collided with rear end of standing portion of train due to trainman not being in proper position.
	1936					YEAR 1936					
(176)	1-4	Bliss	M-b	1-890	100	30	None	-	-	275	Damaged 90th and 91st cars from head end and broke eye out of 12th car from head end, due to branch pipe falling on 92nd car from head end.
(177)	1-21	Sparks	D-g	488	54	4	None	-	-	485	Engine and 3 cars derailed pulling into yard account defective switch due to it having been previously run through.
(178)	4-19	Sparks	M-b	X-4145-E	79	10	None	-	-	734	Buckled 62nd car from head end, account knuckle breaking on 1st car in train, due to air brakes being released at too slow rate of speed.
(179)	9-18	Icarus	L-b	X-3738-W	39	30	None	-	-	980	Right main pin broke off in wheel center.
(180)	9-21	Piute	L-b	X-4366-W	91	40	None	-	-	400	Left main pin broke.
(181)	10-23	Montello	D-g	3-892	103	5	None	-	-	250	Brakeman threw switch while car passing over it during switching move, derailed car and knocked down water column.
(182)	11-11	Ditho	B-d	566	92	5	None	-	-	2,015	Broken rail in siding while train heading in, derailed 11th to 13th cars from head end and damaged 8 other cars when emergency stop made account of derailment.
	1936					YEAR 1936					
(183)	2-28	Pequop	D-e	X-3746-W	77	30	None	-	-	667	Derailed rear trucks of 21st car from engine, due to body bolster breaking on that car when air went into emergency due to brake shoe dropping off car, then striking and uncoupling air hose.
(184)	3-27	Winnemucca	D-g	572	3	5	None	-	-	319	Two cars derailed, one of the two being partly tipped over, when movement reversed after running through switch.
(185)	4-24	Reno	D-e	X-4111-E	90	15	None	-	-	4,308	Derailed 38th to 41st cars, 39th to 41st cars being turned over on their sides when journal broke on 38th car from engine due to overheating and derailed wheels contacted planking in street crossing.
(186)	5-6	Reno	C-h	488	53	4	None	-	-	225	Cut of 19 cars being coupled to train struck rear portion of train with sufficient force to damage 15th car back from engine, due to failure of engineer to act on signals of trainmen.
(187)	5-21	Hallock	M-b	X-3830-W	12	12	None	-	-	200	Train order semaphore knocked down by boom of hoist on car which swung around due to boom not being secured and leaky throttle on hoist.
(188)	6-26	Huxley	M-b	560	99	10	None	-	-	228	Journal on 74th car from engine broke due to overheating.
(189)	7-16	Valley Pass	D-j	X-3696-W	96	15	None	-	-	299	Derailed caboose when lead wheels of forward truck climbed guard rail, caboose sluing cross-wise of track and helper engine shoving against it.
(190)	7-25	Mina	C-h	605	4	5	None	-	-	260	Damaged three cars in 10 car cut when four cars being dropped struck the cut, due to conductor lining wrong switch.
(191)	8-5	Red House	L-b	578	95	35	None	-	-	250	Right main rod on engine broke due to progressive flaw.
(192)	8-6	Granite Point	D-e	3-848	91	40	ϕE.G.Baker	Brakeman	11	36,284	Journal broke on 31st car from engine due to overheating, car derailing and tearing out switch, causing derailment of following 27 cars, 10 being turned over and 2 tipped on edge, brakeman in cupola of caboose being injured.

ϕ - Caused from sudden stopping, starting, lurch or jerk of car or train

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (Days) (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1936						YEAR 1936 (Continued)				
(193)	9-15	Ditho	C-c	3-564	64	35	None	-	-	$1,500	Damaged 22nd and 23rd cars from engine when train parted between 59th and 60th cars due to airhose uncoupling causing emergency application of brakes, separating train, the rear end running into head end of train.
(194)	10-4	Reno	M-b	X-4148-W	85	10	R.H.Wells	Conductor	10	290	75th, 76th, 79th, and 84th cars from engine damaged when emergency stop made to avoid striking intoxicated woman on crossing, conductor in caboose being injured.
(195)	10-24	Carlin	C-h	1-578	5	10	None	-	-	525	5 cars placed on track 4 on which brakeman failed to set handbrakes, rolled out and struck out of 17 cars, damaging 3 of the cars.
(196)	10-26	Elko	D-c	1-576	92	35	None	-	-	443	Derailed rear pair of wheels of lead truck of 35th car when truck-side broke due to 35% old break, in web of truck-side.
(197)	11-15	Sparks	D-c	X-2811-E	None	4	None	-	-	191	Number 1 driving journal of engine broke due to overheating, left No. 1 driver derailing at frog.
(198)	12-17	Verran	L-c	X-3719-W	73	35	None	-	-	180	Right main driving tire of engine broke due to old concealed crack.
	1937						YEAR 1937				
(199)	1-11	Tule	D-c	X-3746-W	72	2	None	-	-	874	Car with broken arch bar being moved into clear on siding, derailed when truck frame contacted planks of plank crossing.
(200)	1-23	Stone House	D-c	X-3725-W	74	35	None	-	-	495	Derailed rear pair of wheels of forward truck of 23rd car when journal broke due to overheating.
(201)	2-14	Zampa	D-c	1-574	66	40	None	-	-	308	Derailed forward wheels of lead truck of 12th car due to truck-side breaking on account of old concealed flaw.
(202)	3-5	Cobre	D-c	X-3718-W	50	6	None	-	-	220	Engine truck derailed at guard rail of switch due to coil spring on engine truck breaking.
(203)	4-30	Palisade	L-c	594	104	30	None	-	-	295	Main axle on engine broke due to progessive fracture.
(204)	6-3	Missle	D-c	566	73	40	None	-	-	18,027	Auxiliary tender and following 15 cars derailed, due to rear axle of eng. tender breaking account of progressive fracture, derailed cars running 2,500 feet on ground.
(205)	6-23	Tulasco	L-b	X-3679-W	95	35	None	-	-	290	Left No. 2 crank pin of engine broke due to progressive fracture.
(206)	7-1	Reno	M-b	X-4151-W	None	25	None	-	-	175	Motor car and push car left standing on track struck by light engines.
(207)	8-5	Sparks	L-b	X-4365-W	99	10	None	-	-	175	Left middle connection rod of engine broke due to progressive flaw.
(208)	8-5	Osino	L-b	X-3680-W	110	35	None	-	-	205	Right main crank pin on engine broke due to progressive fracture.
(209)	8-10	Mt. Montgomery	L-c	611	22	15	None	-	-	874	Derailed 5th to 9th cars following engine when drawbar and draft rigging of 4th car pulled out, due to failure of draft bolts, and dropping in center of track.
(210)	9-7	Humboldt	L-c	566	102	35	None	-	-	200	Left No. 4 driving tire on engine broke due to progressive fracture.
(211)	10-8	Hawes	D-c	606	25	35	None	-	-	261	Derailed rear wheels of rear truck of 15th car, when rear truck knocked out from under 16th car, when drawhead of 13th car came out, due to loss of retainer key and dropped in center of track.

(197)	1-15	Sparks	D-c	I-2311-E	None	4	None	-	-	-	191	Number 1 driving journal of engine broke due to overheating, left No. 1 driver derailing at frog.
(198)	12-17	Perran	L-c	I-3719-E	73	35	None	-	-	-	180	Right main driving tire of engine broke due to old concealed crack.
	1937						YEAR 1937					
(199)	1-11	Tule	D-c	I-3246-E	72	8	None	-	-	-	874	Car with broken arch bar being moved into clear on siding, derailed when truck frame contacted planks of plank crossing
(200)	1-23	Stone House	D-c	I-3722-E	74	35	None	-	-	-	495	Derailed rear pair of wheels of forward truck of 22rd car when journal broke due to overheating.
(201)	2-14	Sampoe	D-c	1-574	66	40	None	-	-	-	308	Derailed forward wheels of lead truck of 12th car due to truck side breaking on account of old, concealed flaw.
(202)	3-8	Cobre	L-c	I-3718-E	80	6	None	-	-	-	220	Engine truck derailed at guard rail of switch due to coil spring on engine truck breaking.
(203)	4-30	Palisade	L-c	594	104	20	None	-	-	-	296	Main axle on engine broke due to progessive fracture.
(204)	6-3	Massie	D-c	588	73	40	None	-	-	-	18,027	Auxiliary tender and following 15 cars derailed, due to rear axle of eng. tender breaking account of progressive fracture, derailed cars running 2,500 feet on ground.
(205)	6-23	Tulasco	L-b	I-3679-E	85	35	None	-	-	-	290	Left No. 2 crank pin of engine broke due to progressive fracture.
(206)	7-1	Reno	M-b	I-4151-E	None	25	None	-	-	-	175	Motor car and push car left standing on track struck by light engines.
(207)	8-6	Sparks	L-b	I-4365-E	99	10	None	-	-	-	175	Left middle connection rod of engine broke due to progressive flaw.
(208)	8-8	Osino	L-b	I-3680-E	110	35	None	-	-	-	205	Right main crank pin on engine broke due to progressive fracture.
(209)	8-10	Mt. Montgomery	L-c	611	22	15	None	-	-	-	874	Derailed 5th to 9th cars following engine when drawbar and draft rigging of 4th car pulled out, due to failure of draft bolts, and dropping in center of track.
(210)	9-7	Humboldt	L-c	566	102	35	None	-	-	-	200	Left No. 4 driving tire on engine broke due to progressive fracture.
(211)	10-6	Hawes	D-c	606	35	35	None	-	-	-	261	Derailed rear wheels of rear truck of 18th car, when rear truck knocked out from under 18th car, when drawhead of 13th car came out, due to loss of retainer key and dropped in center of track.
(212)	10-12	Carlin	C-d	1-576 & yard engine	101	8 None 2	None	-	-	-	670	2nd to 7th cars in train moving on main track side raked by yard engine, due to yard crews failure to note alignment of cross-over switch.
(213)	10-18	Sparks	D-g	486	76	8	None	-	-	-	250	Engine derailed passing over switch which had previously been run through.
	1938						YEAR 1938					
(214)	3-2	Pequop	D-c	2-578	72	30	None	-	-	-	1,229	Draft arms on 38th car failed due to old break subsequent to emergency application caused by branch pipe breaking on first car, coupler and yoke falling in center of track, derailing 39th car.
(215)	3-21	Anthony	L-c	I-4369-E	67	35	None	-	-	-	400	Left and right No. 3 driving tires on engine broke due to flaws.
(216)	5-17	Cedar	L-b	576	103	10	None	-	-	-	250	Left main crank pin on helper engine broke due to progressive fracture.
(217)	5-27	Iron Point	D-c	I-3678-E	99	40	None	-	-	-	667	Derailed rear wheels of rear truck of 64th car when journal broke due to overheating wheels running on ground 4,329 feet before car stopped.
(218)	6-10	Palisade	M-b	570	80	9	None	-	-	-	920	Motor car and four trailers left on track by Western Pacific extra gang struck by train. Engine damaged due to flattening driving wheels when emergency stop made.

#.- Caused from sudden stopping, starting, lurch or jerk of car or train.

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (Days) (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1938										
							YEAR 1938 (Continued)				
(219)	7-2	Anthony	L-b	1-574	103	25	None	-	-	$ 885	Right No. 2 crank pin of engine broke due to progressive fracture.
(220)	8-29	Mina	D-i	605	11	30	None	-	-	710	Lead wheels of lead truck of 3rd car derailed due to slight irregularities in track and car down on side bearings, the car running 3,000 feet on ground before train stopped.
(221)	9-6	Fernley	L-e	605	4	5	None	-	-	230	Main driving axle of engine broke due to progressive fracture.
(222)	10-10	Cosgrave	D-c	X-3751-W	79	40	None	-	-	1,623	Derailed 56th and 57th cars behind engine, due to arch bar column bolt breaking, strap of arch bar truck engaging diverging rail to siding, causing derailment.
(223)	10-12	Beowawe	M-b	X-3730-W	85	15	None	-	-	275	Train struck motor cars and trailers on track, due to engineer's failure to properly respect flag protection.
(224)	10-21	Red House	M-b	3-574	103	4	None	-	-	173	Coupler pulled out of the 78th car from engine by heavy run out of slack due to improper handling of air by engineer while backing up at slow speed.
(225)	11-19	Reno	M-b	X-4165-W	85	12	#C.E.Goeble	Conductor	286	278	Train stopped suddenly when due to heavy service application made to avoid striking automobile foul of track, conductor and brakemen, all of whom were riding in caboose, being injured.
							#J.E.Page	Brakeman	109		
							#D.B.Woolverton	Brakeman	81		
							#J.C.Hooker	Brakeman	58		
							#J.C.Padoven	Brakeman	51		
(226)	12-11	Golconda	L-b	576	91	30	None	-	-	384	Nut on left piston rod failed due to stripped thread caused by water in cylinder.
	1939										
							YEAR 1939				
(227)	1-5	Montello	M-b	X-3708-W	88	20	None	-	-	187	Undesired emergency as train was stopping caused end to be pulled out of 39th car from engine and broken knuckle on first and fifth cars from engine.
(228)	2-1	Lovelock	D-i	X-3751-E	90	8	None	-	-	697	Second car from engine buckled and derailed by emergency stop due to knuckle pin raising on 56th car from engine separating train while train was backing in on siding.
(229)	2-7	Ditho	L-b	X-3693-W	79	35	None	-	-	168	Left side rod collar on engine broke due to progressive fracture.
(230)	7-19	Ocala	D-c	556	88	40	None	-	-	2,193	Derailed 83rd, 84th and 85th cars from engine account of axle breaking on 83rd car due to progressive fracture.
(231)	8-31	Kampos	D-g	1-578	42	4-6	None	-	-	200	Two cars of cut being backed in on spur track were backed off end of track.
(232)	12-8	Halleck	L-b	X-3688-W	100	35	None	-	-	265	Eccentric crank arm trunnion, left main pin, of engine broke, due to progressive fracture.

- Caused from sudden stopping, starting, lurch or jerk of car or train.

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

DETAIL OF TRAIN ACCIDENTS,
ROAD FREIGHT TRAIN OPERATION,
REPORTED TO THE INTERSTATE COMMERCE COMMISSION

STATE OF NEVADA

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED M.P.H. (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (DAYS) (i)	TOTAL DAMAGE (j)	DESCRIPTION OF ACCIDENT (k)
	1940						YEAR 1940				
(233)	1-18	Reno	D-c	X-4178-E	63	15	None	-	-	$ 275	One car derailed account brake beam coming down on 9th car from engine and catching in frog.
(234)	2-7	Imlay	D-c	X-3743-E	34	3	None	-	-	155	Two cars derailed account transom post on 15th car from engine breaking falling from car and lodging in switch.
(235)	2-21	Palisade	D-i	X-3713-E	94	35	None	-	-	214	Second car ahead caboose derailed account slight irregularity in track and rigid condition of coupler.
(236)	3-1	Hazen	L-b	562	95	3	None	-	-	161	Right main rod broke.
(237)	3-21	Deeth	L-b	570	80	35	None	-	-	161	Eccentric crank arm trunion broke.
(238)	4-15	Lux	D-c	605	18	35	None	-	-	551	One car derailed account axle breaking 8th car from engine.
(239)	5-24	Argenta	L-c	X-3761-E	99	40	None	-	-	191	Driving tire on locomotive broke.
(240)	5-31	Preble	M-b	1-576	104	36	None	-	-	360	Truck motor car struck by train.
(241)	6-16	Kosel	M-b	X-3688-W	94	0	None	-	-	492	Locomotive tender frame broke down.
(242)	6-23	Hunter	L-b	574	82	40	None	-	-	161	Crank pin on engine broke.
(243)	7-19	Sparks	D-c	X-4178-E	62	4	None	-	-	239	One car derailed account brake rigging dropped down and lodged in switch.
(244)	7-27	Battle Mountain	L-b	X-3753-E	125	20	W.B.Hilbish	Brakeman	10	275	Right main crank pin broke.
(245)	8-10	Imlay	M-b	1-561	One at time	1	None	-	-	175	Water column damaged.
(246)	9-16	Battle Mountain	D-g	X-2344-E	8	8	None	-	-	409	Engine and 1 car derailed account switch not properly secured.
(247)	10-26	Valery	L-b	X-3669-E	98	40	J.W.Airhart	Conductor	4	265	Reverse gear piston rod stuffing box disconnected, causing engine to reverse itself, employe in caboose injured.
(248)	11-14	Ullin	M-b	X-3693-E	99	25	None	-	-	226	Helper engine and car damaged when coupler slipped by between road engine and first car.
(249)	11-26	Mill City	D-c	2-561	61	40	None	-	-	650	One car derailed account journal breaking 14th car from engine.
(250)	12-12	Woolsey	L-b	3-561	68	45	None	-	-	490	Piston rod broke.

Vol. IX

TRANSCRIPT OF RECORD

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Supreme Court of the United States

OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY, APPELLANT,

vs.

STATE OF ARIZONA, EX REL. JOE CONWAY, ATTORNEY GENERAL OF THE STATE OF ARIZONA

APPEAL FROM THE SUPERIOR COURT OF THE STATE OF ARIZONA, COUNTY OF PIMA

FILED APRIL 12, 1944.

SUPREME COURT OF THE UNITED STATES

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VOL. IX

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JUDD & DETWEILER (INC.), PRINTERS, WASHINGTON, D. C., JULY 20, 1944.

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	Original	Print
294—Detail of casualties to all classes of persons, except trespassers, operation of passenger trains, S. P. Co., State of Arizona, March and April, 1940	5903	3423
295—Detail of train and train service accidents road freight train operation reportable to the I.C.C., S. P. Co., in State of Arizona, April 1940	5904	3424
296—A. T. & S. F. Ry., Casualties to road freight trainmen and enginemen on duty while on or off road freight trains (through, local and mixed). Main line territory between Clovis and Gallup, New Mexico, compared with main line territory between Gallup, N. M., and Needles, Calif., as reported to the I.C.C., years 1923–1939, inclusive	5905	3425
297—S. P. Co., Pacific Lines, estimated cost of a terminal at the Arizona-New Mexico State Line for the reconsisting of freight trains	5906	3426
298—S. P. Co., Pacific Lines, Yuma, Ariz. to El Paso, Tex. via Gila and Lordsburg, estimated number of meets and passes eliminated by long train operation June and August, 1938, expanded to annual basis	5907	3427
299—S. P. Co., Pacific Lines, Redispatch study—June and August, 1938, extra-territorial effect of Arizona Train Limit Law between Arizona-New Mexico State Line and El Paso, Texas	5909	3429
305—Statement of main track mileage, S. P. Co. main and branch lines, State of Nevada and Arizona, years 1923–1939	5910	3430
313—Classes and numbers of employees on the Tucson Division for each of the calendar years 1930–1940, inclusive, transportation division	5911	3431
314—AT&SF freight tonnage ratings of locomotives between Needles, Calif., and Clovis, New Mexico	5912	3432
315—Redispatch Study — locomotive mileage, Yuma, Ariz., to El Paso, Tex., for the period June and Aug. 1938	5913	3433
316—Same as above for period April 4–30, 1940. Actual operation compared with redispatched operation with no restriction and using AC power and long sidings	5914	3434

Record from Superior Court of State of Arizona in and for County of Pima—Continued
Statement of evidence—Continued
Defendant's exhibits—Continued

	Original	Print
317—Redispatch study—locomotive shop repairs, Yuma, Ariz., to El Paso, Texas, for period June and Aug. 1938	5915	3435
318—Same as above for period April 4–30, 1940. Actual operation compared with redispatched operation with no restriction and using AC power and long sidings	5916	3436
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321—Form S-2370, Time Return and Delay Report of engine and train employees, April 12, 1940	5917	3437
322—Conductor's Time Return and Delay Report, April 13, 1940	5918	3438
323-324-325—Form T's—Hausman Accidents	5919	3439
326—Warning to caretakers and others	5925	3447
327—Excerpts from Santa Fe instructions for operating and maintaining air-brake apparatus	5927	3445
328—Excerpts from S. P. Co. (Pac. Lines) air brake rules and regulations	5935	3454
334—Highway grade crossing accidents where auto involved: Table 24, I.C.C. Accident Bulletin, Arizona-New Mexico-Nevada, 1929–1939, incl.	5941	3461
335—Highway grade crossing accidents, Table 24, I.C.C. Accident Bulletin, Arizona-New Mexico-Nevada, 1929–1939, inclusive	5942	3462
336—Grade crossing accidents classified as to trains striking autos and autos running into trains. I.C.C. Accident Bulletin, Table 50, Years 1935 to 1939, inclusive	5943	3463
337—Casualties to non-trespassers, Table 51, I.C.C. Accident Bulletins, Arizona-Nevada	5944	3464
338—S. P. Co., Pac. Lines, Casualties to employees. Train and train service accidents. Freight service in the State of New Mexico, year 1930	5945	3465
339—Accident report of the Santa Fe occurring on the Albuquerque Division on July 27, 1939	5952	3472
350—Preliminary revised population estimate for continental United States	5965	3482
351—S. P. Co., Pac. Lines. Casualties to employees, Los Angeles Division, freight service, train and enginemen, year 1930	5969	3483
362—S. P. Co., Pac. Lines, Casualties to passengers and passenger employes, train and train service accidents, State of New Mexico, year 1930	5990	3501

	Original	Print
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Plaintiff's exhibits—Continued		
363—Same as above for Los Angeles Division	5996	3507
364—S. P. Co., Pacific Lines in New Mexico, Casualties to train and engine service employees, year 1940	6006	3518
365—S. P. Co., Pacific Lines, Los Angeles Division, Casualties to train and engine service employees, year 1940	6008	3519
366—Same as above for State of Arizona	6011	3522
367—Same as above for Salt Lake Division	6013	3524
367-a—Casualties to passengers and passenger employees, year 1940; S. P. Co., Pacific Lines, State of Nevada	6016	3526
368—Same as above, Lines in New Mexico	6017	3527
369—Same as above for the State of Arizona	6018	3528
370—Same as above for Los Angeles Division	6020	3529
382—I.C.C. Bureau of Statistics, Accident Bulletin 105, Calendar Year 1936, Table 24	6021	3530
383—Same as above, Table 50	6022	3531
384—Same as above, Table 51	6023	3532
Defendant's exhibits:		
386—Comparison of casualties to employees on duty, and non-trespassers. Road freight train operation sustained in train and train service accidents, reported to the I.C.C., years 1930-1940, inclusive. S. P. Co. Pac. Lines, Los Angeles Division	6024	3533
387—Same as above for the State of New Mexico	6040	3548
388—Train accidents reported to the I.C.C., years 1930-1940 inclusive, S. P. Co., Pacific Lines, State of New Mexico	6049	3558
389—Comparison of number and accident rate per million freight train miles and per one hundred million freight train car miles. Derailment due to defects in or failures of freight car equipment, New Mexico, Arizona and Nevada, 1930-1940 inclusive	6056	3565
390—Train accidents, showing classes and causes, Class I Railroads of the U. S.; reflected by the statistics of the I. C. C., years 1923-1939, incl.	6057	3566
391—Train accidents, classified, casualties sustained therein, etc. State of Arizona	6058	3567
392—Same as above for State of Nevada	6059	3568
393—Consist of train No. 3, departing Tucson April 12, 1940, Conductor G. Shaw, Engineer B. Cheek	6060	3569
394—Consist train No. 44, departing Yuma April 13, 1940	6061	3570

		Original	Print
Record from Superior Court of State of Arizona in and for County of Pima—Continued			
Statement of evidence—Continued			
Defendant's exhibits—Continued			
395—1940 service records of conductors A. T. Ash, L. A. Fail, and E. V. Shaw		6062	3571
396—American Railway Assn., Mechanical Division, specifications for freight brakes, standard, adopted 1933		6063	3572
397—Delays to freight and passenger trains associated with equipment, or defects therein as reported by conductors on time returns and delay reports, Jan. 1 to June 30, 1940, Lordsburg, New Mexico, to El Paso, Texas		6069	3578
Findings of fact and conclusions of law		6070	3879
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Note re findings and conclusions		6077	3887
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Defendant's Exhibit No. 291 (Witness J. J. Sullivan)
Feb. 6, 1941

CASUALTIES TO

ALL CLASSES OF PERSONS, EXCEPT TRESPASSERS

SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS
WHILE ON, EMPLOYED ON, OR GETTING ON OR OFF

PASSENGER TRAINS

REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE
SOUTHERN PACIFIC COMPANY LINES IN

STATE OF NEVADA

	YEAR	NUMBER OF REVENUE PASSENGERS CARRIED	REVENUE PASSENGERS ONE MILE (THOUSANDS)	PASSENGER TRAIN MILES (THOUSANDS)	NUMBER OF CASUALTIES TO PERSONS												CASUALTIES TO PASSEN	
					PASSENGERS		EMPLOYES ON DUTY								ALL OTHER NON-TRESPASSERS		TOTAL ALL PERSONS EXCEPT TRESPASSERS		MILLION PASSENGERS CARRIED	100 MILLIO PASSENGER MILES
							TRAINMEN		ENGINEMEN		OTHER EMPLOYES		TOTAL EMPLOYES							
					KILLED	INJURED	KILLED	INJURED	KILLED	INJURED	KILLED	INJURED	KILLED	INJURED	KILLED	INJURED	KILLED	INJURED		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)
(1)	1923	475,677	119,053	1,359	-	-	-	1	-	1	-	2	-	4	-	-	-	4	-	-
(2)	1924	452,520	109,861	1,062	-	3	-	4	-	1	-	-	-	5	-	2	-	10	6.63	2.84
(3)	1925	484,315	105,112	1,511	-	1	-	-	2	-	-	1	2	1	-	-	2	2	2.20	.95
(4)	1926	423,408	103,405	1,540	-	1	-	-	-	-	-	3	-	3	-	-	-	4	2.36	.92
(5)	1927	408,922	102,304	1,554	-	1	-	-	-	1	-	-	-	1	-	-	-	2	2.44	.98
(6)	1928	384,794	101,200	1,525	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-
(7)	TOTAL 1923-28	2,599,636	629,735	9,361	-	6	-	5	2	3	-	6	2	14	-	3	2	23	2.31	.95
(8)	1929	385,946	101,126	1,618	-	1	-	1	-	-	-	1	-	2	-	-	-	3	2.59	.99
(9)	1930	323,795	87,949	1,650	-	1	-	-	-	-	-	-	-	-	-	-	-	1	3.09	1.14
(10)	1931	294,497	78,954	1,276	-	3	-	1	-	-	-	-	-	4	-	-	-	4	10.12	3.96
(11)	1932	199,182	52,741	1,087	-	3	1	-	-	-	-	-	1	-	-	-	1	3	15.00	5.09
(12)	1933	199,326	55,833	963	-	-	-	-	-	-	-	-	-	-	-	2	-	2	-	-
(13)	1934	198,144	60,830	1,055	-	1	-	-	-	-	-	-	-	-	-	1	-	2	5.06	1.64
(14)	TOTAL 1929-34	1,592,459	434,438	7,649	-	9	1	2	-	-	-	1	1	3	-	3	1	15	5.65	2.07
(15)	1935	228,701	70,232	1,056	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(16)	1936	277,141	89,934	1,179	-	2	-	1	-	-	-	1	-	2	-	1	-	5	7.22	2.22
(17)	1937	320,942	107,126	1,380	-	2	-	-	-	2	-	-	-	2	-	1	-	5	6.23	1.87
(18)	1938	305,139	102,447	1,238	-	-	-	-	-	1	-	-	-	1	-	-	-	1	-	-

TAL ALL ES EXCEPT PASSERS INJURED (r)	CASUALTIES TO PASSENGERS PER MILLION PASSENGERS CARRIED (s)	CASUALTIES TO PASSENGERS PER 100 MILLION PASSENGER MILES (t)	CASUALTIES TO PASSENGERS PER MILLION TRAIN MILES (u)	CASUALTIES TO EMPLOYEES PER MILLION TRAIN MILES (v)	CASUALTIES TO OTHER NON-TRESPASSERS PER MILLION TRAIN MILES. (w)	CASUALTIES TO ALL PERSONS PER MILLION TRAIN MILES (x)
4	-	-	-	2.41	-	2.41
10	6.63	2.84	1.92	3.20	1.28	6.40
2	2.20	.95	.66	1.99	-	2.65
4	2.36	.97	.65	1.95	-	2.60
2	2.44	.98	.64	.64	-	1.28
1	-	-	-	-	.66	.66
23	2.31	.95	.64	1.71	.32	2.67
3	2.59	.99	.62	1.23	-	1.85
1	3.09	1.14	.60	-	-	.60
4	10.12	3.95	2.35	.78	-	3.13
3	15.06	5.69	2.76	.92	-	3.68
2	-	-	-	-	2.08	2.08
2	5.05	1.84	1.94	-	.94	1.88
15	5.65	2.07	1.18	.52	.39	2.09
-	-	-	-	-	-	-
5	7.22	2.22	1.70	1.70	.85	4.24
5	6.23	1.87	1.45	1.45	.72	3.62
1	-	-	-	.81	-	.81
34	83.51	23.73	22.43	19.33	2.32	44.08
45	22.31	6.71	5.37	4.88	.81	11.06
83	8.46	3.08	2.07	2.16	.47	4.71

1/ passengers, trainmen and all other employes injured in derailment

SOUTHERN PACIFIC COMPANY LINES IN

STATE OF NEVADA

	YEAR	NUMBER OF REVENUE PASSENGERS CARRIED	REVENUE PASSENGERS ONE MILE (THOUSANDS)	PASSENGER TRAIN MILES (THOUSANDS)	NUMBER OF CASUALTIES TO PERSONS														CASUALTIES TO PASSENGERS	
					PASSENGERS		EMPLOYES ON DUTY.								ALL OTHER NON-TRESPASSERS		TOTAL ALL PERSONS EXCEPT TRESPASSERS		MILLION PASSENGERS CARRIED	100 MILLION PASSENGER MILES
							TRAINMEN		ENGINEMEN		OTHER EMPLOYES		TOTAL EMPLOYES							
					KILLED	INJURED	KILLED	INJURED	KILLED	INJURED	KILLED	INJURED	KILLED	INJURED	KILLED	INJURED	KILLED	INJURED		
	[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]	[j]	[k]	[l]	[m]	[n]	[o]	[p]	[q]	[r]	[s]	[t]
(1)	1923	475,677	119,053	1,459	-	-	-	2	-	1	-	2	-	4	-	-	-	4	-	-
(2)	1924	452,520	105,861	1,062	-	3	-	4	-	1	-	-	-	5	-	2	-	10	6.63	2.84
(3)	1925	454,315	105,112	1,811	-	1	-	-	2	-	-	1	2	1	-	-	2	2	2.20	.95
(4)	1926	425,408	103,405	1,540	-	1	-	-	-	-	-	3	-	3	-	-	-	4	2.36	.97
(5)	1927	408,922	102,304	1,554	-	1	-	-	-	1	-	-	-	1	-	-	-	2	2.44	.98
(6)	1928	384,794	101,800	1,525	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-
(7)	TOTAL 1923-28	2,599,636	629,735	9,361	-	6	-	5	2	3	-	6	2	14	-	3	2	23	2.31	.95
(8)	1929	385,946	101,128	1,418	-	1	-	1	-	-	-	1	-	2	-	-	-	3	2.59	.99
(9)	1930	323,794	87,949	1,650	-	1	-	-	-	-	-	-	-	-	-	-	-	1	3.09	1.14
(10)	1931	296,497	75,954	1,276	-	3	-	1	-	-	-	-	-	1	-	-	-	4	10.12	3.95
(11)	1932	199,188	52,741	1,087	-	3	1	-	-	-	-	-	1	-	-	-	1	3	15.06	5.69
(12)	1933	100,096	55,833	963	-	-	-	-	-	-	-	-	-	-	-	2	-	2	-	-
(13)	1934	198,144	60,830	1,055	-	1	-	-	-	-	-	-	-	-	-	1	-	2	5.05	1.64
(14)	TOTAL 1929-34	1,592,459	434,438	7,449	-	9	1	2	-	-	-	1	1	3	-	3	1	15	5.65	2.07
(15)	1935	228,701	70,232	1,056	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(16)	1936	277,141	89,934	1,179	-	2	-	1	-	-	-	1	-	2	-	1	-	3	7.22	2.22
(17)	1937	320,942	107,126	1,380	-	2	-	-	-	2	-	-	-	2	-	1	-	3	6.23	1.87
(18)	1938	305,139	102,447	1,238	-	-	-	-	-	1	-	-	-	1	-	-	-	1	-	-
(19)	1939 ø	347,270	122,211	1,293	9	28	-	1	-	-	13	11	13	12	1	2	23	34	83.51	23.73
(20)	TOTAL ø 1935-39	1,479,193	491,940	6,148	9	24	-	2	-	3	13	12	13	17	1	4	23	45	22.31	6.71
(21)	GRAND ø TOTAL	5,671,288	1,556,113	23,158	9	39	1	9	2	6	13	19	16	34	1	10	26	83	8.46	3.08

ø Figures for year 1939, for 4 years 1936-1939 and the Grand Total, includes 9 passengers, 13 other employes and 1 other non-trespasser killed; and 18 passengers, 1 trainman and 11 other employes injured in derailment of Streamliner CITY OF SAN FRANCISCO at Harney, Nevada, August 12, 1939, caused by malicious tampering with the track.

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NUMBER OF CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	CLASS OF PERSON INJURED (g)	ESTIMATED DISABILITY (DAYS) (h)	DETAILS AND CIRCUMSTANCES OF ACCIDENT (i)
	1928								
(23)	10-21	Reno	S-g	28	12	4	Non-trespasser	18	Visitor on train, fell and bruised hand and face attempting to get off moving train.
	1929								
(24)	1-6	Verdi	S-j	10	12	25	Passenger	8	Fell and caught finger between door and door frame.
(25)	7-5	Sparks	S-g	20	15	3	Passenger brakeman	12	Right shin bruised, missing hand rail while boarding engine.
(26)	8-29	Carlin	S-j	28	15	15	Own. car porter	10	Eyelid pierced when spring on observation car curtain slipped from hand.
	1930								
(27)	5-25	Montello	S-j	3-28	13	3	Passenger	42	Broken collar bone caused by fall when train made rough stop.
	1931								
(28)	1-4	Reno	S-g	21	11	Standing	Passenger	90	Broken leg caused by fall when detraining due to heel coming off shoe.
(29)	1-14	Carlin	S-g	9	11	Standing	Passenger	30	Slipped on frozen ground when detraining from coach.
(30)	3-24	Tecoma	S-j	10	14	50	Passenger	15	Fell on broken bottle and cut hand.
(31)	8-9	Elburz	S-g	19	10	Standing	Passenger brakeman	14	Wrenched knee getting off coach.
	1932								
(32)	3-18	Reno	S-j	22	11	20	Passenger brakeman	Killed	Apparently fell from rear platform of car.
(33)	5-25	Cobre	S-j	1-20	13	5	Passenger	30	Lost balance and fell in car when train stopped.
(34)	6-17	Toulon	S-j	20	12	30	Passenger	21	Fainted and fell, striking head on door stop.
(35)	7-9	Pamelon	S-g	21	11	40	Passenger	Died	Demented passenger jumped through window of coach.
	1933								
(36)	3-2	Wells	S-g	10	12	12	Pullman porter	60	Fractured hip, when missed hand-hold attempting to get on moving train.
(37)	10-14	Imlay	S-j	1-28	11	Standing	Express messenger	30	Broken foot due to stumbling and falling over box while unloading express.
	1934								
(38)	6-7	Thisbe	S-g	21	12	40	Passenger	Died	Demented passenger jumped from train.
(39)	7-19	Golconda	S-j	9	8	Unknown	Railway mail clerk	25	Fractured elbow when fell backward in car due to mail catcher arm breaking.
	1935								
(40)						NONE			

(Sheet 4 of 4 sheets)

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NUMBER OF CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	CLASS OF PERSON INJURED (g)	ESTIMATED DISABILITY (DAYS) (h)	DETAILS AND CIRCUMSTANCES OF ACCIDENT (i)
	1936								
(41)	1-10	Oreana	S-g	14	14	35	Passenger	5	Jumped from moving train account mentally unbalanced.
(42)	2-27	Cobre	S-j	30	10	Standing	Express messenger	10	Back strained when car door came off track when closing.
(43)	5-17	Hazen	S-j	27	16	50	4th cook	6	Ankle sprained when heel of shoe caught in floor rack.
(44)	10-24	Lovelock	S-j	1-9	16	2	Passenger	10	Lost balance and stepped on buffer plate resulting in foot being caught between apron and buffer.
(45)	12-7	Sparks	S-i	210	10	6	Passenger Brakeman	30	Struck by engine which had been detached from its train.
	1937								
(46)	3-26	Palisade	D-e	3-21	11	25-30	Passenger engineer Passenger fireman U.S. mail clerk	10 20 20	Engine and 6 cars derailed account striking rocks on track.
(47)	3-8	Battle Mountain	S-j	1-21	12	Starting	Passenger	20	Fell to floor of car due to alleged jerk when train started.
(48)	4-16	Argo	D-c	27	13	60	Passenger	2	Claims thrown to floor in club car when sudden stop occurred due to failure of locomotive driver tire.
	1938								
(49)	4-17	Comus	S-j	87	13	60	Passenger fireman	12	Struck thumb against back of cab.
	1939								
(50)	7-12	Carlin	S-g	87	16	Standing	Passenger	30	Slipped and fell while getting off coach.
(51)	8-12	Harney	D-h	101	14	60	9 passengers 18 passengers 8 waiters 3 cooks 2 stewards Pullman porter Pantryman 2 cooks 6 waiters Bartender Stewardess Passenger conductor	Killed 5 to 60 Killed Killed Killed Killed Died 10 to 60 10 to 60 10 11 60	Train derailed due to malicious tampering with track.
(52)	9-17	Sparks	S-j	81	16	Standing	Passenger brakeman (off duty)	10	Foot slipped, lost balance and fell to ground, while reaching down to close vestibule door.
(53)	11-5	Verdi	S-j	87	17	30	Passenger	10	Elderly passenger (75 yrs) stood up in seat to remove baggage and hat from rack, lost balance and fell from seat to floor.
(54)	12-10	Elko	S-j	81	12	30	Express messenger	30	Box of express fell from pile and struck foot.

5901

Defendant's Exhibit No. 292 (Witness J.J. Sullivan)
Feb. 6, 1941

CASUALTIES TO

ALL CLASSES OF PERSONS, EXCEPT TRESPASSERS,

SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS
WHILE ON, EMPLOYED ON, OR GETTING ON OR OFF

PASSENGER TRAINS

REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE
SOUTHERN PACIFIC COMPANY LINES IN

STATE OF ARIZONA

	YEAR	NUMBER OF REVENUE PASSENGERS CARRIED	REVENUE PASSENGERS ONE MILE (THOUSANDS)	PASSENGER TRAIN MILE (THOUSANDS)	NUMBER OF CASUALTIES TO PERSONS												CASUALTIES TO PASSENGERS PER:		
					PASSENGERS		EMPLOYES ON DUTY: TRAINMEN		ENGINEMEN		OTHER EMPLOYES		TOTAL EMPLOYES		ALL OTHER NON-TRESPASSERS		TOTAL ALL PERSONS EXCEPT TRESPASSERS		MILLION PASSENGERS CARRIED	100 MILLION PASSENGER MILES	MILLION TRAIN MILES
					KILLED	INJURED	KILLED	INJURED	KILLED	INJURED	KILLED	INJURED	KILLED	INJURED	KILLED	INJURED	KILLED	INJURED			
	[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]	[j]	[k]	[l]	[m]	[n]	[o]	[p]	[q]	[r]	[s]	[t]	[u]
(1)	1923	446,417	115,156	1,259	-	5	-	-	-	-	-	3	-	3	-	2	-	10	11.18	4.34	5.97
(2)	1924	452,223	117,411	1,330	-	12	-	1	1	2	-	5	1	8	-	1	1	21	26.54	10.22	1.02
(3)	1925	511,531	132,862	2,011	-	6	-	1	-	2	-	6	-	9	-	-	-	15	11.73	4.52	2.98
(4)	1926	502,867	134,753	1,945	-	4	-	2	-	3	-	6	-	11	-	-	-	15	7.95	2.97	2.06
(5)	1927	471,341	133,450	2,012	-	7	-	5	-	2	-	3	-	10	-	-	-	17	14.62	5.25	3.48
(6)	1928	457,750	131,257	2,015	1	2	-	2	-	3	-	1	-	6	-	2	1	10	6.56	2.29	1.49
(7)	TOTAL 1923-28	2,844,129	764,889	10,572	1	36	-	11	1	12	-	24	1	47	-	5	2	88	13.01	4.84	3.50
(8)	1929	482,293	139,928	2,039	-	1	-	2	1	1	-	3	1	6	-	-	1	7	2.07	.71	.49
(9)	1930	428,919	128,661	1,964	-	9	-	-	-	2	-	3	-	5	-	1	-	15	20.98	7.00	4.58
(10)	1931	374,963	113,920	1,760	1	10	-	-	2	-	-	3	2	5	-	-	3	13	29.34	9.66	6.25
(11)	1932	342,935	75,231	1,412	-	2	-	-	-	2	-	5	-	7	-	1	-	10	8.23	2.69	1.42
(12)	1933	203,158	63,559	1,203	-	2	-	-	-	-	-	-	-	-	-	1	-	3	9.86	3.35	1.66
(13)	1934	267,518	80,835	1,214	-	5	-	1	-	1	-	1	-	3	-	2	-	10	18.69	6.19	4.12
(14)	TOTAL 1929-34	1,999,786	602,134	9,592	1	29	-	3	3	6	-	15	3	24	-	5	4	58	15.00	4.98	3.13
(15)	1935	327,246	100,559	1,511	-	10	-	1	-	4	-	2	-	7	-	1	-	18	30.56	9.94	7.63
(16)	1936	406,966	127,930	1,731	1	8	-	2	-	1	-	6	-	9	-	-	1	17	22.01	7.04	5.20

L ALL EXCEPT ASSERS INJURED	CASUALTIES TO PASSENGERS PER:			CASUALTIES TO EMPLOYEES PER MILLION TRAIN MILES	CASUALTIES TO OTHER NON-TRESPASSERS PER MILLION TRAIN MILES	CASUALTIES TO ALL PERSONS PER MILLION TRAIN MILES
	MILLION PASSENGERS CARRIED	100 MILLION PASSENGER MILES	MILLION TRAIN MILES			
[r]	[s]	[t]	[u]	[v]	[w]	[z]
10	11.15	4.34	3.97	2.38	1.59	7.94
11	26.58	10.22	1.02	6.77	.75	18.54
5	11.73	4.52	2.98	4.48	-	7.46
15	7.95	2.97	2.06	5.66	-	7.71
17	14.05	5.25	3.49	4.97	-	8.45
10	6.56	2.29	1.49	2.96	.99	5.46
69	13.01	4.84	3.50	4.54	.47	8.51
7	2.07	.71	.49	3.43	-	3.92
15	20.98	7.00	4.56	2.55	.51	7.64
13	29.34	9.66	6.25	2.84	-	9.09
10	8.25	2.66	1.42	4.96	.71	7.08
3	9.84	3.15	1.66	-	.83	2.49
10	18.39	6.19	4.12	2.47	1.65	8.24
56	15.00	4.99	3.15	2.81	.52	6.46
18	30.56	9.94	7.63	5.34	.76	13.73
17	22.01	7.04	5.80	5.80	-	10.40
27	35.71	11.25	9.07	4.80	.53	14.41
10	10.26	3.29	2.56	3.85	-	6.39
14	15.84	5.00	3.72	5.23	-	9.14
86	23.23	7.41	5.74	4.87	.25	10.86
232	16.50	5.65	4.01	4.03	.43	8.48

...TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE
SOUTHERN PACIFIC COMPANY LINES IN
STATE OF ARIZONA

	YEAR	NUMBER OF REVENUE PASSENGERS CARRIED	REVENUE PASSENGERS ONE MILE (THOUSANDS)	PASSENGER TRAIN MILE (THOUSANDS)	NUMBER OF CASUALTIES TO PERSONS														• CASUA MILL PASSEN CARR
					PASSENGERS		EMPLOYES ON DUTY								ALL OTHER NON-TRESPASSERS		TOTAL ALL PERSONS EXCEPT TRESPASSERS		
							TRAINMEN		ENGINEMEN		OTHER EMPLOYES		TOTAL EMPLOYES						
	(a)	(b)	(c)	(d)	KILLED (e)	INJURED (f)	KILLED (g)	INJURED (h)	KILLED (i)	INJURED (j)	KILLED (k)	INJURED (l)	KILLED (m)	INJURED (n)	KILLED (o)	INJURED (p)	KILLED (q)	INJURED (r)	(s)
(1)	1923	448,417	115,156	1,259	-	5	-	-	-	-	-	3	-	3	-	2	-	10	11.1
(2)	1924	452,223	117,411	1,330	-	12	-	1	1	2	-	5	1	8	-	1	1	11	26.5
(3)	1925	511,531	132,862	2,[illegible]	-	6	-	1	-	2	-	6	-	9	-	-	-	5	11.[illegible]
(4)	1926	502,867	134,753	1,945	-	4	-	2	-	3	-	6	-	11	-	-	-	15	7.0
(5)	1927	471,341	133,450	2,012	-	7	-	5	-	2	-	3	-	10	-	-	-	17	14.[illegible]
(6)	1928	457,750	131,257	2,015	1	2	-	2	-	3	-	1	-	6	-	2	1	10	6.5
(7)	TOTAL 1923-28	2,844,129	764,889	10,572	1	36	-	11	1	12	-	26	1	47	-	5	2	68	13.0
(8)	1929	482,293	139,923	2,039	-	1	-	2	1	1	-	3	1	6	-	-	1	7	2.[illegible]
(9)	1930	428,919	128,661	1,964	-	9	-	-	-	2	-	3	-	5	-	1	-	15	20.9
(10)	1931	374,963	113,920	1,760	1	10	-	-	2	-	-	3	2	3	-	-	3	13	29.3
(11)	1932	342,955	75,231	1,412	-	2	-	-	-	2	-	5	-	7	-	1	-	10	8.2
(12)	1933	303,158	63,559	1,203	-	2	-	-	-	-	-	-	-	-	-	1	-	3	9.8
(13)	1934	267,518	80,835	1,214	-	5	-	1	-	1	-	1	-	3	-	2	-	10	18.6
(14)	TOTAL 1929-34	1,999,786	602,134	9,592	1	29	-	3	3	6	-	15	3	24	-	5	4	58	15.0
(15)	1935	327,246	100,559	1,311	-	10	-	1	-	1	-	2	-	7	-	1	-	18	30.5
(16)	1936	408,966	127,930	1,731	1	8	-	2	-	1	-	6	-	9	-	-	1	17	22.0
(17)	1937	476,095	151,068	1,874	-	17	-	-	-	4	-	5	-	9	-	1	-	27	35.7
(18)	1938	388,960	121,504	1,585	-	4	-	3	-	1	-	2	-	6	-	-	-	10	10.2
(19)	1939	378,714	120,108	1,331	-	6	-	-	-	2	-	6	-	8	-	-	-	14	15.8
(20)	TOTAL 1935-39	1,979,981	621,169	8,012	1	45	-	6	-	12	-	21	-	39	-	2	1	86	23.2
(21)	GRAND TOTAL	6,823,896	1,988,192	28,176	3	110	-	20	4	30	-	60	4	110	-	12	7	232	16.5

SOURCE: Columns (b), (c) and (d), Annual Reports of Southern Pacific Company to Arizona Corporation Commission.

Columns (e) to (r) inclusive, Form T accident reports of Southern Pacific Company to the Interstate Commerce Commission.

DETAIL OF CASUALTIES TO ALL CLASSES OF PERSONS, EXCEPT TRESPASSERS
SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS, WHILE ON, EMPLOYED ON, OR GETTING ON OR OFF PASSENGER TRAINS
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION

YEARS 1923 TO 1939, INCLUSIVE
SOUTHERN PACIFIC COMPANY LINES IN
STATE OF NEVADA

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NUMBER OF CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	CLASS OF PERSON INJURED (g)	ESTIMATED DISABILITY (DAYS) (h)	DETAILS AND CIRCUMSTANCES OF ACCIDENT (i)
	1923								
*(1)	2-1	Coburn	S-j	1-22	9	Standing	Passenger brakeman	7	Running to catch train after closing switch, stepped on tie and foot slipped off.
(2)	7-18	Wells	S-j	2	12	Standing	Dining car waiter	12	Struck side against edge of table, removing bedding from diner.
(3)	10-10	Death	S-c	3-1	13	Standing	Passenger fireman	10	Both eyes slightly burned by hot grease from rod cup.
(4)	11-15	Battle Mountain	S-j	19	10	30-40	Chair car porter	6	Door struck side of head as it was being opened.
	1924								
(5)	2-6	Hazen	S-g	19	9	Unknown	Passenger	18	Bruised face; claims jumped through chair car window.
(6)	2-27	Ditho	S-g	22	8	45	Passenger	2	Attempted to jump through window of coach while mentally deranged.
(7)	3-11	Granite Point	D-d	9	10	45-50	Mail clerk Mail clerk	6 2	Derailment due to broken switch tie rod.
(8)	4-11	Imlay-Humboldt	S-j	19	9	40	Passenger brakeman	10	Caught thumb in door.
(9)	5-28	Fenelon	S-j	20	10	40	Passenger brakemah	8	Caught thumb in door.
(10)	8-8	Sparks	S-g	20	Detached from train	Standing	Passenger fireman	20	Jumped from engine, detached from train at time, to avoid injury by derailed freight train.
(11)	9-30	Moor	S-g	22	11	8-10	Freight brakeman	15	Dislocated shoulder boarding engine.
(12)	12-13	Hazen	S-j	19	9	10	Passenger	10	Fractured collar bone, falling from train.
(13)	12-23	Death	S-j	10	15	Standing	Passenger brakeman	7	Feet frozen while flagging due to extreme cold.
	1925								
(14)	8-8	Kiko-Wells	S-j	20	9	40-50	Passenger	45	Back bruised falling against lavatory.
(15)	10-6	Winnemucca	S-j	19	12	Standing	Dining car cook	10	Fall from ladder while cleaning ceiling of diner kitchen.
(16)	10-8	Sparks	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NUMBER OF CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	CLASS OF PERSON INJURED (g)	ESTIMATED DISABILITY (DAYS) (h)	DETAILS AND CIRCUMSTANCES OF ACCIDENT (i)
	1923								
(1)	2-1	Cobre	S-j	1-22	9	Standing	Passenger brakeman	7	Running to catch train after closing switch, stepped on tie and foot slipped off.
(2)	7-18	Wells	S-j	2	12	Standing	Dining car waiter	12	Struck side against edge of table, removing bedding from diner.
(3)	10-10	Deeth	S-c	2-1	13	Standing	Passenger fireman	10	Both eyes slightly burned by hot grease from rod cup.
(4)	11-15	Battle Mountain	S-j	19	10	30-40	Chair car porter	6	Door struck side of head as it was being opened.
	1924								
(5)	2-8	Hazen	S-g	19	9	Unknown	Passenger	12	Bruised face; claims jumped through chair car window.
(6)	2-27	Ditho	S-g	22	8	45	Passenger	2	Attempted to jump through window of coach while mentally deranged.
(7)	3-11	Granite Point	D-d	9	10	45-50	Mail clerk Mail clerk	6 2	Derailment due to broken switch tie rod.
(8)	4-11	Imley-Humboldt	S-j	19	9	40	Passenger brakeman	10	Caught thumb in door.
(9)	5-28	Fenelon	S-j	20	10	40	Passenger brakeman	8	Caught thumb in door.
(10)	8-8	Sparks	S-g	20	Detached from train	Standing	Passenger fireman	20	Jumped from engine, detached from train at time, to avoid injury by derailed freight train.
(11)	9-30	Moor	S-g	22	11	8-10	Freight brakeman	15	Dislocated shoulder boarding engine.
(12)	12-13	Hazen	S-j	19	9	10	Passenger	10	Fractured collar bone, falling from train.
(13)	12-23	Deeth	S-j	10	15	Standing	Passenger brakeman	7	Feet frozen while flagging due to extreme cold.
	1925								
(14)	3-5	Elko-Wells	S-j	20	9	40-50	Passenger	45	Back bruised falling against lavatory.
(15)	10-6	Winnemucca	S-j	19	12	Standing	Dining car cook	10	Fell from ladder while cleaning ceiling of diner kitchen.
(16)	10-5	Sparks	C-b S-j	23 2-272	5 55	20-35 Standing	Passenger engineer Passenger fireman	Killed Killed	Passenger train collided with standing freight train due to failure to observe open unattended switch.
	1926								
(17)	1-24	Devoura	S-j	20	10	45	Dining car cook	14	Burned fingers with hot grease account alleged jerk of train.
(18)	3-11	Sparks	S-j	6	6	Standing	Train baggageman	5	Bitten by dog in baggage car.
(19)	3-16	Patna	S-j	2	11	Standing	Dining car cook	12	Struck hand against top edge of coal box door.
(20)	11-26	Red House	S-j	20	13	Standing	Passenger	20	Bruised finger when lavatory door opened and knocked coach door shut.
	1927								
(21)	9-29	Orenna	S-c	19	15	Standing	Passenger engineer	15	Wrenched back when slipped on pilot step of engine.
(22)	10-4	Golconda	S-j	20	14	20	Passenger	7	Alleged dislocation of shoulder due to rough stop of train.

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COMPARISON OF

NUMBER OF CASUALTIES AND CASUALTY RATES

ARIZONA AND NEVADA

		NUMBER OF CASUALTIES TO PERSONS														PASSENGER CASU	
		PASSENGERS		EMPLOYES ON DUTY								ALL OTHER NON-TRESPASSERS		TOTAL ALL PERSONS EXCEPT TRESPASSERS		PASSENGERS CARRIED BASIS	PASSENG MILE BASIS
				TRAINMEN		ENGINEMEN		OTHER EMPLOYES		TOTAL EMPLOYES							
		KILLED	INJURED	KILLED	INJURED	KILLED	INJURED	KILLED	INJURED	KILLED	INJURED	KILLED	INJURED	KILLED	INJURED		
		[a]	[b]	[c]	[d]	[e]	[f]	[g]	[h]	[i]	[j]	[k]	[l]	[m]	[n]	[o]	[p]
(1) 6 YEARS 1923 - 1928	ARIZONA	1	36	1	11	1	12	-	24	1	47	-	5	2	88	13.01	4.84
	NEVADA	-	6	-	5	2	3	-	6	2	14	-	3	2	23	2.31	93
	RATIO, ARIZONA RATES TO NEVADA RATES →															5.63	5.06
(2) 6 YEARS 1929 - 1934	ARIZONA	1	29	-	3	3	6	-	15	3	24	-	5	4	58	15.00	4.98
	NEVADA	-	9	1	2	-	-	-	1	1	3	-	3	1	15	5.65	2.07
	RATIO, ARIZONA RATES TO NEVADA RATES →															2.65	2.41
(3) 5 YEARS 1935 - 1939	ARIZONA	1	45	-	6	-	12	-	21	-	39	-	8	1	86	23.23	7.41
	NEVADA	9	24	-	2	-	3	13	12	13	17	1	4	23	45	22.31	6.71
	RATIO, ARIZONA RATES TO NEVADA RATES →															1.04	1.10
	RATIO, NEVADA RATES TO ARIZONA RATES →																
(4) GRAND TOTAL 17 YEARS	ARIZONA	3	110	-	20	4	30	-	60	4	110	-	18	7	232	1.56	5.69
	NEVADA	9	39	1	9	2	6	13	19	16	34	1	10	26	83	8.46	3.08
	RATIO, ARIZONA RATES TO NEVADA RATES →															1.96	1.84
	RATIO, NEVADA RATES TO ARIZONA RATES →																

PASSENGER CASUALTY RATE			EMPLOYE CASUALTY RATE PASSENGER TRAIN MILE BASIS	OTHER NON-TRESPASSER RATE PASSENGER TRAIN MILE BASIS	CASUALTY RATE ALL PERSONS PASSENGER TRAIN MILE BASIS	
PASSENGERS CARRIED BASIS	PASSENGER MILE BASIS	PASSENGER TRAIN MILE BASIS				
(o)	(p)	(q)	(r)	(s)	(t)	
13.01	4.84	3.50	4.54	.47	8.51	ARIZONA
2.31	95	.64	1.71	.32	2.67	NEVADA
5.63	3.09	3.47	2.65	1.47	3.19	
15.00	4.98	3.13	2.81	.52	6.46	ARIZONA
3.65	2.07	1.18	.82	.39	2.09	NEVADA
2.65	2.41	2.65	3.40	1.33	3.09	
23.23	7.41	5.74	4.87	.25	10.86	ARIZONA
22.31	6.71	5.37	4.88	.81	11.06	NEVADA
1.04	1.10	1.07	1.008	3.24	1.02	
3.56	3.68	4.01	4.05	.43	3.48	ARIZONA
8.46	3.08	2.07	2.15	.47	4.71	NEVADA
1.96	1.84	1.94	1.88	1.06	1.80	

(Sheet 3 of 10 sheets)

DETAIL OF CASUALTIES TO ALL CLASSES OF PERSONS, EXCEPT TRESPASSERS
SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS, WHILE ON, EMPLOYED ON, OR GETTING ON OR OFF PASSENGER TRAINS
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION

YEARS 1923 TO 1938, INCLUSIVE
SOUTHERN PACIFIC COMPANY LINES IN
STATE OF ARIZONA .

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NUMBER OF CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	CLASS OF PERSON INJURED (g)	ESTIMATED DISABILITY (DAYS) (h)	DETAILS AND CIRCUMSTANCES OF ACCIDENT (i)
	1923								
(1)	3-11	Maricopa	S-g	3	10	5	Special officer	7	Turned ankle on rock[s] getting off engine tender.
(2)	3-4	Avra	S-j	110	9	35	Express helper	30	Caught heel on fish rack in car, barrel falling on abdomen.
(3)	6-13	Vail-Tucson	S-j	101	10	Unknown	Passenger	14	Fell from upper berth to aisle floor of sleeping car.
(4)	8-30	Maricopa	S-j	2	10	2	Passenger	14	Elderly passenger (76 yrs.) thrown against seat as train recoupled after making pickup.
(5)	9-4	Sibyl	M-b	(110 (X3654W	12 66	40 2	Express messenger	21	Thrown to floor of baggage car account of train scraped by freight car of train on siding.
(6)	9-12	Mohawk	S-j	101	8	20	Pantryman	14	Feet slipped on wet floor, striking arm against bread can in diner.
(7)	9-16	Yuma	S-j	102	8	4	Train baggageman	9	Feet slipped on threshold of baggage car, causing a fall to the ground.
(8)	12-2	Gavot	S-g	110	11	18-20	Passenger	10	Jumped through toilet window of car of moving train.
(9)	12-16	Kim-Mohawk	S-j	109	13	20	Passenger	2	Lost balance and fell while standing on arm seat, attempting to take lunch basket from hat rack.
(10)	12-23	Estrella	S-j	102	9	20	Passenger	7	Fell while getting into upper berth.
	1924								
(11)	1-20	Yuma	S-j	3-3	8	Unknown	Passenger	30	Claimed two ribs broken allegedly by sudden stop of train while running at high speed.
(12)	2-6	Dome	S-g	2-1	11	5	Passenger	20	Jumped or fell from moving train
(13)	2-26	Tucson	S-j	102	11	Standing	Station baggageman	10	Boxes and iron bars fell on leg while working inside of baggage car.
(14)	3-1	Tucson	S-g	101	12	Standing	Special officer	30	Feet slipped and fell while attempting to get in horse car.
(15)	3-20	Yuma	S-j	3-4	9	Standing	Passenger	7	Finger caught in jamb of car door.
								8	Cut thumb when knife slipped cutting bread in diner.

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	DETAILS AND CIRCUMSTANCES OF ACCIDENT (i)
	1923								
(1)	3-11	Maricopa	S-g	3	10	5	Special officer	7	Turned ankle on rock getting off engine tender.
(2)	3-4	Avra	S-j	110	9	35	Express helper	30	Caught heel on fish rack in car, barrel falling on abdomen.
(3)	6-13	Vail-Tucson	S-j	101	10	Unknown	Passenger	14	Fell from upper berth to aisle floor of sleeping car.
(4)	8-30	Maricopa	S-j	2	10	2	Passenger	14	Elderly passenger (76 yrs.) thrown against seat as train recoupled after making pickup.
(5)	9-4	Sibyl	M-b	110 (X3654W	12 66	40 2	Express messenger	21	Thrown to floor of baggage car account of train scraped by freight car of train on siding.
(6)	9-12	Mohawk	S-j	101	8	30	Pantryman	14	Feet slipped on wet floor, striking arm against bread can in diner.
(7)	9-16	Yuma	S-j	102	8	4	Train baggageman	9	Feet slipped on threshold of baggage car, causing a fall to the ground.
(8)	12-2	Cavot	S-g	110	11	18-20	Passenger	10	Jumped through toilet window of car of moving train.
(9)	12-16	Kim-Mohawk	S-j	109	13	20	Passenger	2	Lost balance and fell while standing on arm seat, attempting to take lunch basket from hat rack.
(10)	12-23	Estrella	S-j	102	9	30	Passenger	7	Fell while getting into upper berth.
	1924								
(11)	1-20	Yuma	S-j	3-3	8	Unknown	Passenger	30	Claimed two ribs broken allegedly by sudden stop of train while running at high speed.
(12)	2-6	Dome	S-g	3-1	11	5	Passenger	20	Jumped or fell from moving train
(13)	2-26	Tucson	S-j	102	11	Standing	Station baggageman	10	Boxes and iron bars fell on leg while working inside of baggage car.
(14)	3-1	Tucson	S-g	101	12	Standing	Special officer	30	Feet slipped and fell while attempting to get in horse car.
(15)	3-20	Yuma	S-j	3-4	9	Standing	Passenger	7	Finger caught in jamb of car door.
(16)	3-21	Tucson	S-j	110	11	Standing	3rd cook	8	Cut thumb when knife slipped cutting bread in diner.
(17)	3-25	Yuma	S-j	3	10	Standing	Express messenger	3	Trunk fell on foot while unloading baggage and express.
(18)	3-29	Jaynes	S-j	1	11	40	Passenger	2	Broken glass from light globe entered eye.
(19)	5-29	Rillito	S-j	110	8	25	Passenger	4	Car window dropped on thumb.
(20)	7-14	Enid	S-j	110	11	35	Passenger	10	Car window dropped on hand account defective catch.
(21)	9-24	Lirim-Bon	D-h	102	10	45	Passenger fireman Passenger engineer Passenger conductor 5 passengers	Killed 4 14 3 to 14	Derailment caused by malicious tampering with track.
(22)	10-25	Yuma	S-j	109	13	Standing	Passenger	7	Attempting raise window, finger caught between windows.
(23)	10-25	Benson	S-j	110	10	Standing	3rd cook	14	Hot grease splashed from pan, burning hand.
(24)	12-4	Phoenix	S-g	1	8	10	Police officer	11	Stepped on stone getting off train.
(25)	12-5	Escala	S-j	102	12	35	Passenger engineer	5	Foreign particle in eye.

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NUMBER OF CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	CLASS OF PERSON INJURED (g)	ESTIMATED DISABILITY (DAYS) (h)	DETAILS AND CIRCUMSTANCES OF ACCIDENT (i)
	1925								
(26)	1-21	Ligurta-Adonde	S-j	12	9	35	Passenger	3	Child passenger caught finger in door.
(27)	2-1	Phoenix	S-c	134	2	Standing	Passenger fireman	4	Face burned while relighting fire in firebox when gas ignited and flame flared out
(28)	3-19	Tucson	S-c	122	5	Standing	Passenger fireman	15	Arm and leg scalded when steam hose between engine and tender blew off.
(29)	3-17	Dome	S-j	101	9	40	2nd cook	15	Hot grease spilled on hand.
(30)	4-27	Tucson	S-g	109	7	3-3	Car repairer	4	Sprained ankle getting off moving train.
(31)	4-4	Cortaro	S-j	110	11	50	Passenger brakeman	4	Hot sand flew in eyes.
(32)	4-16	Bernardino	S-j	4	10	45	Passenger	3	Some other passenger stepped on toe.
(33)	5-27	Bowie	S-j	1-12	13	45	Passenger	7	Struck over right eye when curtain rod in Pullman berth fell.
(34)	5-27	Bisbee Jct.	S-j	4	12	30-40	Passenger	7	Elderly woman passenger fell in aisle of sleeping car.
(35)	9-26	Phoenix	S-j	34	3	Standing	Dining car waiter	7	Fell when foot slipped while standing on dresser.
(36)	11-20	Bisbee Jct.	S-j	1-8	2	20	Passenger	5	A mother closed lavatory door on child passenger's thumb.
(37)	12-8	Phoenix	S-j	32	11	Standing	Passenger	30	Slipped on banana peel on floor of car and fell.
(38)	12-14	Maricopa	S-j	1	12	Standing	3rd cook	14	Cut finger when slicing meat in kitchen of dining car.
(39)	12-29	Mohawk	S-j	109	13	10	Chair car porter	7	Groin bruised when trap door unexpectedly flew up while opening trap.
(40)	12-17	San Simon	S-j	12	12	40	Chef	9	Cut thumb when reaching for knife in rack.
	1926								
(41)	1-3	Tucson	S-j	1	14	Standing	3rd Cook	10	Hot grease from pan being handled splashed on hand.
(42)	1-10	Stockham	S-j	1	9	10	Passenger brakeman	12	Closed car door on thumb.
(43)	1-16	Wellton	S-j	2-101	11	Standing	4th cook	10	Punctured thumb on ragged edge of shelf on dresser.
(44)	2-12	Maricopa	S-j	2	9	3	Passenger	2	Thrown against mirror in lavatory in tourist sleeper when rough coupling made.
(45)	2-18	Drury	S-g	101	11	12	Passenger brakeman	10	Strained ligaments in leg getting off train.
(46)	2-16	Bowie	S-j	[illegible]	9	40	3rd cook	7	Severed end of little finger peeling potatoes.
(47)	3-29	Yuma	S-g	4	10	Standing	Passenger	10	Turned ankle getting off car.
(48)	3-30	Piedra	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

(27)	8-1	Phoenix	S-c	134	2	Standing	Passenger fireman		
(28)	3-19	Tucson	S-c	122	5	Standing	Passenger fireman	15	Arm and leg scalded when steam hose between engine and tender blew off.
(29)	3-17	Dome	S-j	101	9	40	2nd cook	15	Hot grease spilled on hand.
(30)	4-27	Tucson	S-g	109	7	2-3	Car repairer	4	Sprained ankle getting off moving train.
(31)	4-4	Cortaro	S-j	110	11	50	Passenger brakeman	4	Hot sand flew in eyes.
(32)	4-16	Bernardino	S-j	4	10	45	Passenger	3	Some other passenger stepped on toe.
(33)	5-27	Bowie	S-j	1-12	13	45	Passenger	7	Struck over right eye when curtain rod in Pullman berth fell.
(34)	5-27	Bisbee Jct.	S-j	4	12	30-40	Passenger	7	Elderly woman passenger fell in aisle of sleeping car.
(35)	9-26	Phoenix	S-j	34	3	Standing	Dining car waiter	7	Fell when foot slipped while standing on dresser.
(36)	11-20	Bisbee Jct.	S-j	1-8	2	20	Passenger	5	A mother closed lavatory door on child passenger's thumb.
(37)	12-8	Phoenix	S-j	32	11	Standing	Passenger	30	Slipped on banana peel on floor of car and fell.
(38)	12-14	Maricopa	S-j	1	12	Standing	3rd cook	14	Cut finger when slicing meat in kitchen of dining car.
(39)	12-29	Mohawk	S-j	109	13	10	Chair car porter	7	Groin bruised when trap door unexpectedly flew up while opening trap.
(40)	12-17	San Simon	S-j	12	12	40	Chef	9	Cut thumb when reaching for knife in rack.
	1926								
(41)	1-3	Tucson	S-j	1	14	Standing	3rd Cook	10	Hot grease from pan being handled splashed on hand.
(42)	1-10	Stockham	S-j	1	9	10	Passenger brakeman	12	Closed car door on thumb.
(43)	1-16	Wellton	S-j	2-101	11	Standing	4th cook	10	Punctured thumb on ragged edge of shelf on dresser.
(44)	2-12	Maricopa	S-j	2	9	3	Passenger	2	Thrown against mirror in lavatory in tourist sleeper when rough coupling made.
(45)	2-18	Drury	S-g	101	11	12	Passenger brakeman	10	Strained ligaments in leg getting off train.
(46)	2-16	Bowie	S-j	1	9	40	3rd cook	7	Severed end of little finger peeling potatoes.
(47)	3-29	Yuma	S-g	4	10	Standing	Passenger	10	Turned ankle getting off car.
(48)	3-30	Piedra	S-j	11	10	40	Dining car waiter	6	Slipped on slat floor in diner kitchen and fell.
(49)	3-12	Douglas	S-j	3	10	1	Passenger	3	Struck knee against seat as train started to move for short distance.
(50)	6-13	Aztec	S-c	103	9	50	Passenger fireman	5	Particle of hot carbon blew into eye.
(51)	8-17	Tucson	S-j	103	10	1-2	Car inspector	20	Thrown from top of diner in train to ground when unexpected movement of train was
(52)	9-12	Phoenix-Tucson	S-c	108	3	Unknown	Passenger fireman	12	Shoulder burned by continuous exposure of body to heat from fire box door while shoveling coal into fire box.
(53)	9-23	Whetstone	S-j	103	11	40	Passenger	15	Finger caught between dining car door and jamb.
(54)	10-27	Sacate	S-c	3	3	35	Passenger fireman	14	Fell against seat box when foot slipped on deck apron.
(55)	12-21	Red Rock	S-j	1	12	35	Dining car chef	13	Burned by hot grease spilled out of pan.

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NUMBER OF CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	CLASS OF PERSON INJURED (g)	ESTIMATED DISABILITY (DAYS) (h)	DETAILS AND CIRCUMSTANCES OF ACCIDENT (i)
	1927								
(56)	1-31	Chandler	S-j	1	14	Standing	Pantryman	10	Cut finger slicing bread when knife slipped.
(57)	2-19	Phoenix	S-g	1	11	Standing	Passenger	14	Fell to platform while detraining account someone stepping on heel.
(58)	2-22	Maricopa	S-j	103	11	30	4th cook	7	Milk can dropped on foot.
(59)	3-20	Cortaro	C-a	103	12	40	Passenger fireman Passenger brakeman Passenger brakeman 4 passengers	30 30 7 3 to 7	Passenger train No. 103 collided with rear of Extra 2801 West on main track.
(60)	3-22	Tempe	S-j	101	10	25	Passenger conductor	60	Caught foot in berth-curtain and fell to floor of car.
(61)	3-4	Douglas	S-j	3	8	10	Pantryman-waiter	7	Cut thumb while slicing bread.
(62)	4-21	Benson	S-g	1	8	5	Passenger	7	Thrown to ground attempting to board moving train.
(63)	5-25	Rillito	S-g	104	14	4-6	Passenger brakeman	14	Turned ankle on ballast getting off moving train.
(64)	5-8	Tempe Jct.	S-j	108	7	Standing	Passenger brakeman	25	Stumbled over slag and fell while running ahead to throw switch.
(65)	7-13	Yuma	S-c	3	6	Standing	Passenger engineer	4	Fell on engine when foot slipped off end of sand box.
(66)	9-4	Litchfield	S-j	2	10	50	Passenger	30	Fell to floor of car getting out of upper berth when foot slipped off ladder.
	1928								
(67)	3-25	Tanque	D-d	152	3	35	Passenger	21	Fracture rib when train derailed due to a broken rail.
(68)	3-28	Yuma	S-j	102	10	Standing	Pullman porter	10	Closed car door on finger.
(69)	3-25	Empire	S-j	1	9	30	Express messenger	14	Hand cut by metal tag on wet box of express which slipped through hands.
(70)	6-13	Pembroke	S-c	104	12	15	Passenger engineer Passenger fireman	15 25	Burned by flare of flame out of fire box door account explosion of gasses in fir
(71)	6-9	Lewis Springs	S-j	103	11	30	Passenger brakeman	10	Passenger closed coach door on fingers which were resting between edge and sill vestibule door.
(72)	7-2	Cochise	S-c	1	8	2	Passenger fireman	15	Burned by fire kicking back out of fire box door.
(73)	7-7	Bowie	S-j	11	13	Standing	Passenger	10	Coach window dropped on hand.

(58)	3-22	Maricopa	S-j	103	11	30	4th cook	7	Milk can dropped on foot.
(59)	3-20	Cortaro	C-a	103	12	40	Passenger fireman Passenger brakeman Passenger brakeman 4 passengers	30 30 7 3 to 7	Passenger train No. 103 collided with rear of Extra 2801 West on main track.
(60)	3-22	Tempe	S-j	101	10	25	Passenger conductor	60	Caught foot in berth-curtain and fell to floor of car.
(61)	3-4	Douglas	S-j	3	8	10	Pantryman-waiter	7	Cut thumb while slicing bread.
(62)	4-21	Benson	S-g	1	8	5	Passenger	7	Thrown to ground attempting to board moving train.
(63)	5-25	Rillito	S-g	104	14	4-6	Passenger brakeman	14	Turned ankle on ballast getting off moving train.
(64)	5-8	Tempe Jct.	S-j	108	7	Standing	Passenger brakeman	25	Stumbled over slag and fell while running ahead to throw switch.
(65)	7-13	Yuma	S-c	3	6	Standing	Passenger engineer	4	Fell on engine when foot slipped off end of sand box.
(66)	9-4	Litchfield	S-j	2	10	50	Passenger	30	Fell to floor of car getting out of upper berth when foot slipped off ladder.
	1928								
(67)	3-25	Tanque	D-d	152	3	35	Passenger	21	Fracture rib when train derailed due to a broken rail.
(68)	3-28	Yuma	S-j	102	10	Standing	Pullman porter	10	Closed car door on finger.
(69)	3-25	Empire	S-j	1	9	30	Express messenger	14	Hand cut by metal tag on wet box of express which slipped through hands.
(70)	6-13	Pembroke	S-c	104	12	15	Passenger engineer Passenger fireman	15 25	Burned by flare of flame out of fire box door account explosion of gasses in fire box.
(71)	6-9	Lewis Springs	S-j	103	11	30	Passenger brakeman	10	Passenger closed coach door on fingers which were resting between edge and sill of vestibule door.
(72)	7-2	Cochise	S-c	1	8	2	Passenger fireman	15	Burned by fire kicking back out of fire box door.
(73)	7-7	Bowie	S-j	11	13	Standing	Passenger	10	Coach window dropped on hand.
(74)	8-19	Kofa	S-j	12	15	60	News agent.	12	Finger cut when bottle of beverage broke.
(75)	9-8	Sentinel	S-j	104	12	Standing	Passenger brakeman	20	Backed into semaphore post while pulling baggage truck toward train.
(76)	10-31	Ligurta	S-g	2	14	55	Passenger	Killed	Handcuffed prisoner jumped through car window of moving train.
	1929								
(77)	1-14	Araby	S-c	103	11	5	Passenger brakeman	30	Claims ruptured side throwing switch after train had pulled out of siding.
(78)	2-27	Maricopa	S-c	107	3	Standing	Passenger brakeman	10	Closing switch, hand slipped and finger got caught in slot under lever of switch stand.
(79)	2-8	Yuma	S-g	101	11	Standing	Passenger	30	Ankle fractured when feet slipped detraining from sleeping car.
(80)	5-23	Tucson	S-g	1	11	1	4th cook	45	Sprained both ankles detraining from moving train to obtain piece of ice.
(81)	6-27	Red Rock	S-j	104	14	30	Passenger fireman	8	Particle sand in eye.

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NUMBER OF CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	CLASS OF PERSON INJURED (g)	ESTIMATED DISABILITY (DAYS) (h)	DETAILS AND CIRCUMSTANCES OF ACCIDENT (i)
	1929 (Contd)								
(82)	7-3	Casa Grande	S-j	103	11	25	2nd cook	6	Cut thumb when knife slipped while slicing meat.
(83)	8-26	Naco	S-j	4	13	45	2nd cook	6	Dropped pot of boiling water on leg and foot.
(84)	9-20	Cortaro	S-f	4	11	55	Passenger engineer	Killed	Struck by mail crane while looking out of gangway of engine alongside of train.
	1930								
(85)	1-18	Stockham	S-j	12	11	30	Pullman conductor	20	Stumbled over grip in aisle of car and fractured rib.
(86)	4-1	Tucson	S-j	103	14	1	Passenger	20	Claimed that jerk of train when stopping, threw him to car floor.
(87)	5-27	Buckeye	S-c	13	13	Standing	Passenger fireman	14	Fell into open manhole of engine tender.
(88)	5-11	Tucson	S-g	104	13	Standing	Passenger fireman	20	Turned ankle getting off engine when alighting on ground.
(89)	8-7	Mesa	S-j	103	11	50	4th cook	7	Claims fell in bed trap floor of diner.
(90)	8-7	Mesa	S-j	11	11	45	Passenger	4	Coach window dropped on hand.
(91)	8-23	Chandler	S-j	103	12	55	Waiter	7	Leg cut when lamp dropped from bracket.
(92)	9-15	Yuma	S-g	150	5	2	Passenger	2	Fell getting off moving train.
(93)	9-22	Yuma	S-g	11	14	Standing	Passenger	14	Slipped and fell to platform when detraining from coach.
(94)	9-26	Phoenix	S-g	104	14	Standing	Passenger	Unknown	Claims fell from sleeping car step to platform account porter not providing stepping
(95)	9-27	Tucson	S-g	3	11	Standing	Passenger	7	Fell from sleeping car steps to station platform.
(96)	9-20	Gila	S-j	13	6	Unknown	Lunch car attendant	7	Cut on hand on broken dish.
(97)	10-29	Tucson	S-g	103	12	Standing	Passenger	14	Claims when alighting from train, made misstep and fell account step box not provided.
(98)	12-12	Tempe	S-g	107	2	Standing	Passenger	30	Slipped on steps and fell to platform.
(99)	12-10	Coolidge	S-j	102	11	30	Passenger	Unknown	Emergency stop by engineer due to mistaking signal, caused overnight bag to be thrown from head rest of berth on to passengers back.
	1931								
(100)	5-24	Tucson	S-g	108	2	Standing	Passenger	14	Slipped and fell when detraining.
(101)	5-23	Bowie							

(84)	9-20	Cortaro	S-f	4	11	55	Passenger engineer	Killed	Struck by mail crane while looking out of gangway of engine alongside of train.
	1930								
(85)	1-18	Stockham	S-j	12	11	30	Pullman conductor	20	Stumbled over grip in aisle of car and fractured rib.
(86)	4-1	Tucson	S-j	103	14	1	Passenger	20	Claimed that jerk of train when stopping, threw him to car floor.
(87)	5-27	Buckeye	S-c	13	13	Standing	Passenger fireman	14	Fell into open manhole of engine tender.
(88)	5-11	Tucson	S-g	104	13	Standing	Passenger fireman	20	Turned ankle getting off engine when alighting on ground.
(89)	8-7	Mesa	S-j	103	11	50	4th cook	7	Claims fell in bed trap floor of diner.
(90)	8-7	Mesa	S-j	11	11	45	Passenger	4	Coach window dropped on hand.
(91)	8-23	Chandler	S-j	103	12	55	Waiter	7	Leg cut when lamp dropped from bracket.
(92)	9-15	Yuma	S-g	150	5	2	Passenger	2	Fell getting off moving train.
(93)	9-22	Yuma	S-g	11	14	Standing	Passenger	14	Slipped and fell to platform when detraining from coach.
(94)	9-26	Phoenix	S-g	104	14	Standing	Passenger	Unknown	Claims fell from sleeping car step to platform account porter not providing steppi
(95)	9-27	Tucson	S-g	3	11	Standing	Passenger	7	Fell from sleeping car steps to station platform.
(96)	9-20	Gila	S-j	13	6	Unknown	Lunch car attendant	7	Cut on hand on broken dish.
(97)	10-29	Tucson	S-g	103	12	Standing	Passenger	14	Claims when alighting from train, made misstep and fell account step box not provid
(98)	12-12	Tempe	S-g	107	2	Standing	Passenger	30	Slipped on steps and fell to platform.
(99)	12-10	Coolidge	S-j	102	11	30	Passenger	Unknow	Emergency stop by engineer due to mistaking signal, caused overnight bag to be thro from head rest of berth on to passengers back.
	1931								
(100)	5-24	Tucson	S-g	108	2	Standing	Passenger	14	Slipped and fell when detraining.
(101)	5-23	Bowie	S-j	11	14	Standing	Passenger	7	Child standing in car seat, fell forward and struck head against iron brace of chai
(102)	5-31	Drury	S-j	11	14	Standing	Passenger	7	Pulled baggage car door shut on finger.
(103)	6-16	Marsh	S-j	11	13	30	Passenger	2	Claims tripped on carpet in aisle of car and fell.
(104)	6-5	Dome	D-g	1-104	3	Unknown	Passenger engineer Passenger fireman 3 passengers	Killed Killed 3 to 7	Derailment caused by excessive speed in restricted curve territory
(105)	8-27	Red Rock	S-g	12	8	35	Passenger	11	Deranged passenger jumped through car window.
(106)	8-10	Cochise	S-j	104	11	30	Passenger	14	Lost balance and fell against window latch, while lowering window in chair car.
(107)	8-15	Kofa	S-j	11	12	55	Passenger	Killed	Fell from observation car of moving train.
(108)	9-1	Fairbank	S-j	103	14	30	Waiter	5	Finger lacerated by broken vinegar cruet.
(109)	10-20	Rillito	S-j	104	11	Standing	Waiter	7	Finger cut on ragged edge of cream can.
(110)	10-5	Hereford	S-j	4	11	45	Waiter	13	Finger cut when jar of fruit broke.
(111)	12-1	Phoenix	S-g	104	13	Standing	Passenger	3	Sprained ankle detraining from chair car.

	DATE (a)	LOCATION (b)	L.C.C. CLASS (c)	TRAIN NUMBER (d)	NUMBER OF CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	CLASS OF PERSON INJURED (g)	ESTIMATED DISABILITY (DAYS) (h)	DETAILS AND CIRCUMSTANCES OF ACCIDENT (i)
	1932								
(112)	1-7	Phoenix	S-j	36	2	1	Passenger	30	Stumbled or slipped and fell in aisle of smoking compartment.
(113)	1-16	Pantano	S-j	104	12	30	Passenger Engineer	90	Fell from gangway of engine of moving train.
(114)	1-29	Douglas	S-j	103	10	15	2nd cook	15	Right hand cut by knife allowed to remain on car dresser.
(115)	3-25	Mescal-Tucson	S-j	11	9	35	3rd cook	7	Thumb cut while cutting bread in diner kitchen.
(116)	7-1.	Bowie	S-j	1	14	Unknown	3rd cook	10	Finger cut trimming ear of corn in diner kitchen.
(117)	10-25	Phoenix	S-g	12	11	Standing	Passenger	60	Passenger fell alighting from train when shoe heel caught on coach step.
(118)	10-3	Mobile	S-j	1	10	50	3rd cook	10	Thumb cut on broken light globe.
(119)	11-7	Luzena	S-j	1	11	40	2nd cook	14	Hand cut on knife when slicing peppers.
(120)	12-10	Yuma	S-j	3	14	Standing	Passenger fireman	90	Removing indicators from engine, fell off running board to ground.
(121)	12-20	Red Rock	S-j	1	12	50	Express messenger	5	Slipped on wet drain boards in baggage car.
	1933								
(122)	2-20	Benson	S-j	1	10	Standing	Express messenger	7	Cement cylinder dropped on foot.
(123)	3-29	Yuma	S-g	362	3	Standing	Passenger	3	Strained knee detraining from coach.
(124)	10-27	Yuma	S-j	11	8	30	Passenger	20	Coach window dropped on arm account latch improperly fastened.
	1934								
(125)	1-14	Phoenix	S-g	12	10	Standing	Passenger	14	Fell from coach steps to station platform while detraining.
(126)	1-27	Phoenix	S-g	4	13	Standing	Pullman porter	30	Turned and fractured ankle detraining from sleeping car.
(127)	2-20	Buckeye	S-g	11	9	Standing	Passenger	5	Sprained instep jumping from coach step to station platform.
(128)	2-15	Tucson	S-j	2	10	Standing	News agent	11	Sprained back picking up case of beer.
(129)	4-2	Phoenix	S-g	11	14	Standing	Passenger	60	Slipped and fell detraining from coach.
(130)	5-8	Bowie	S-g	1	13	Standing	Passenger	30	Fell and fractured ankle detraining from tourist car.

									...car dresser.
(115)	3-25	Mescal-Tucson	S-j	11	9	35	3rd cook	7	Thumb cut while cutting bread in diner kitchen.
(116)	7-1	Bowie	S-j	1	14	Unknown	3rd cook	10	Finger cut trimming ear of corn in diner kitchen.
(117)	10-25	Phoenix	S-g	12	11	Standing	Passenger	60	Passenger fell alighting from train when shoe heel caught on coach step.
(118)	10-1	Mobile	S-j	1	10	50	3rd cook	10	Thumb cut on broken light globe.
(119)	11-7	Luzena	S-j	1	11	40	2nd cook	14	Hand cut on knife when slicing peppers.
(120)	12-10	Yuma	S-j	5	14	Standing	Passenger fireman	90	Removing indicators from engine, fell off running board to ground.
(121)	12-20	Red Rock	S-j	1	12	50	Express messenger	5	Slipped on wet drain boards in baggage car.
	1933								
(122)	2-20	Benson	S-j	1	10	Standing	Express messenger	70	Cement cylinder dropped on foot.
(123)	3-29	Yuma	S-g	362	3	Standing	Passenger	3	Strained knee detraining from coach.
(124)	10-27	Yuma	S-j	11	8	30	Passenger	20	Coach window dropped on arm account latch improperly fastened.
	1934								
(125)	1-14	Phoenix	S-g	12	10	Standing	Passenger	14	Fell from coach steps to station platform while detraining.
(126)	1-27	Phoenix	S-g	4	13	Standing	Pullman porter	50	Turned and fractured ankle detraining from sleeping car.
(127)	2-20	Buckeye	S-g	11	9	Standing	Passenger	5	Sprained instep jumping from coach step to station platform.
(128)	3-15	Tucson	S-j	2	10	Standing	News agent	11	Sprained back picking up case of beer.
(129)	4-2	Phoenix	S-g	11	14	Standing	Passenger	60	Slipped and fell detraining from coach.
(130)	5-8	Bowie	S-g	1	13	Standing	Passenger	30	Fell and fractured ankle detraining from tourist car.
(131)	5-22	Red Rock	S-g	1	14	2	Passenger brakeman	6	Trap door of sleeping car dropped on thumb.
(132)	5-28	Tucson	S-j	4	13	10	Express messenger	20	Finger caught between door handle and door frame.
(133)	10-25	Phoenix	S-j	11	10	15	Passenger	3	Fell against lavatory door when defective toilet seat slipped off.
(134)	12-3	Randolph	S-f	4	13	55	Passenger fireman	60	Head came in contact with mail crane.
	1935								
(135)	1-1	Campo	S-j	4	14	50	Passenger	90	Elderly passenger (76 yrs) stumbled and fell in car aisle alleged due to jerk
(136)	1-14	Benson	S-j	2-1	14	1	Passenger	2	Alleged jerk or jar of train when starting, threw passenger to car floor.
(137)	1-24	Jaynes	S-j	11	10	Standing	Express messenger	25	Fell to ground when gang plank slipped while loading milk cans into express ca
(138)	2-24	Mesa	S-j	3	13	10	Passenger	30	Two ribs broken when sudden stop and break-in-two of train occurred, due to engineer applying brakes in emergency when he observed water spout foul of t

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NUMBER OF CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	CLASS OF PERSON INJURED (g)	ESTIMATED DISABILITY (DAYS) (h)	DETAILS AND CIRCUMSTANCES OF ACCIDENT (i)
	1935 (Contd)								
(139)	3-27	Crag	S-j	4	14	60	Chair car porter	10	Closed door against thumb.
(140)	4-4	Buckeye	S-c	11	9	Standing	Passenger fireman	5	Finger caught by valve wheel when taking water on engine.
(141)	4-5	Picacho	S-j	2	12	30	Passenger	14	Lavatory door closed on finger.
(142)	5-23	Papago	S-j	2-4	14	50	4th cook	20	Hot water being handled by another employe spilled on back.
(143)	6-4	Phoenix	S-g	3	14	Standing	Passenger	3	Slipped and fell getting off steps of chair car.
(144)	7-1	Apache-Mora	S-j	4	13	50	Passenger	45	Lost balance and fell to floor as was arising from chair in observation car.
(145)	8-17	Bowie	S-g	2	14	Standing	Passenger	7	Strained leg getting off coach or chair car.
(146)	8-8	Mobile	S-j	1	14	35	Passenger engineer	5	Particle of hot sand blew in eye.
(147)	8-31	Phoenix-Tucson	S-j	(Passr. (X2751	7	Unknown	Passenger engineer	8	Sand blew into eye.
(148)	10-27	Tucson	S-g	3	13	Standing	Passenger	7	Fell detraining from Pullman sleeper.
(149)	11-11	Naco	S-c	12	13	35	Passenger engineer	30	Claims while standing on deck of locomotive, lost balance and fell against sand box.
(150)	11-17	Empire	S-j	3	14	50	Passenger brakeman	7	Foreign object lodged in eye.
(151)	11-18	Chiricahua	S-j	12	12	50	Passenger	45	Aisle door of dining car closed on hand.
(152)	12-11	Solomon	S-g	381	2	30	Passenger	30	Deranged passenger jumped through car window.
	1936								
(153)	1-3	Bowie	S-j	1-1	10	15	Passenger conductor	6	Cinder blew into eye.
(154)	2-9	Tucson	S-g	4	13	15	Asst. Special Agent	4	Getting off moving train, struck leg against dwarf signal.
(155)	3-6	Stockham	S-j	2	14	40	Chef	21	Reaching for meat, struck knife in hand of another employe.
(156)	4-22	Fenner	S-j	2	14	35	Passenger	10	Clawed by a lion in baggage car.
(157)	5-10	Dixie	S-j	1-3	10	55	4th cook	8	Claims lurch of train caused hand to be thrust into dish of hot water.
(158)	6-22	Yuma	S-j	3-6	7	Standing	Passenger conductor	4	Sprained ankle - stepped on water hose nozzle on platform.
(159)	7-26	Buckeye	S-c	1-2	8	Standing	Passenger fireman	14	Scalded feet in hot water from injector.
(160)	7-15	Tucson	S-j	1-4	11	Standing	Car laborer	30	Dropped ice on foot while on car placing ice in bunker.

(143)	6-4	Phoenix	S-g	3	14	Standing	Passenger	3	Slipped and fell getting off steps of chair car.
(144)	7-1	Apache-Mora	S-j	4	13	50	Passenger	45	Lost balance and fell to floor as was arising from chair in observation ca
(145)	8-17	Bowie	S-g	2	14	Standing	Passenger	7	Strained leg getting off coach or chair car.
(146)	8-8	Mobile	S-j	1	14	35	Passenger engineer	5	Particle of hot sand blew in eye.
(147)	8-31	Phoenix-Tucson	S-j	(Passgr. (X2751E	7	Unknown	Passenger engineer	8	Sand blew into eye.
(148)	10-27	Tucson	S-g	3	13	Standing	Passenger	7	Fell detraining from Pullman sleeper.
(149)	11-11	Naco	S-c	12	13	35	Passenger engineer	30	Claims while standing on deck of locomotive, lost balance and fell against t
(150)	11-17	Empire	S-j	3	14	50	Passenger brakeman	7	Foreign object lodged in eye.
(151)	11-18	Chiricahua	S-j	12	12	50	Passenger	45	Aisle door of dining car closed on hand.
(152)	12-11	Solomon	S-g	381	2	30	Passenger	30	Deranged passenger jumped through car window.
	1936								
(153)	1-3	Bowie	S-j	1-1	10	15	Passenger conductor	6	Cinder blew into eye.
(154)	2-9	Tucson	S-g	4	13	15	Asst. Special Agent	4	Getting off moving train, struck leg against dwarf signal.
(155)	3-6	Stockham	S-j	2	14	40	Chef	21	Reaching for meat, struck knife in hand of another employe.
(156)	4-22	Fenner	S-j	2	14	35	Passenger	10	Clawed by a lion in baggage car.
(157)	5-10	Dixie	S-j	1-3	10	55	4th cook	8	Claims lurch of train caused hand to be thrust into dish of hot water.
(158)	6-22	Yuma	S-j	3-6	7	Standing	Passenger conductor	4	Sprained ankle - stepped on water hose nozzle on platform.
(159)	7-26	Buckeye	S-c	1-2	8	Standing	Passenger fireman	14	Scalded feet in hot water from injector.
(160)	7-15	Tucson	S-j	1-4	11	Standing	Car laborer	30	Dropped ice on foot while on car placing ice in bunker.
(161)	7-26	Douglas	S-j	1-4	12	Standing	Passenger	3	Closed coach door on hand.
(162)	8-17	Sabino	S-j	5	12	Unknown	Passenger	60	Passenger claimed jerk of train threw her off balance striking arm against
(163)	9-30	Dome-Yuma	S-j	1	10	Unknown	4th cook	5	Mixing bowl fell out of locker and struck nose.
(164)	10-12	Tucson	S-j	2	13	Unknown	Passenger	60	Fell over cane which had become caught under car seat.
(165)	10-23	Serapo	S-j	1	12	50	3rd cook	20	Arm scalded by hot water.
(166)	10-13	Fairbank	S-j	1-3	12	50	Passenger	Killed	Apparently fell or in some unknown manner detrained.
(167)	11-8	Mesa	S-g	3-11	14	Standing	Passenger	10	Shoved, while detraining and fell down car steps.
(168)	11-21	Tucson	S-g	3-4	10	Standing	Passenger	14	Claims slipped on lower car steps and step box in detraining and fell to pl
(169)	11-1	Douglas	S-g	1-4	12	Standing	Passenger	14	Lost balance and fell detraining from coach steps.
(170)	12-30	Phoenix	S-g	3-4	14	Standing	Passenger	10	Slipped and fell detraining.

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NUMBER OF CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	CLASS OF PERSON INJURED (g)	ESTIMATED DISABILITY (DAYS) (h)	DETAILS AND CIRCUMSTANCES OF ACCIDENT (i)
	1937								
(171)	1-12	Chandler	S-j	43	12	1	Passenger	7	Claims car door sprung against her ankle.
(172)	2-12	Tucson	S-g	5	12	Standing	Passenger	12	Turned ankle detraining from sleeping car.
(173)	2-20	Jaynes	S-j	44	12	60	Passenger	30	Lost balance and fell getting out of upper berth in sleeping car.
(174)	2-1	Hereford	S-j	11	10	15	Passenger	30	Lost balance and fell in compartment of sleeping car.
(175)	3-23	Hereford	S-g	3	11	Standing	Passenger	30	Alleged foot turned stepping on step box to entrain on sleeping car.
(176)	3-18	Phoenix	S-j	43	14	Standing	Passenger fireman	30	Fell from running board of engine to ground.
(177)	3-25	Red Rock	S-j	43	11	30	3rd cook	11	Grease splashed on wrist while frying meat in diner kitchen.
(178)	4-11	Randolph	S-c	3	13	60	Passenger engineer Passenger fireman	30 19	Scalded and burned by hot water and steam when top pipe to water column in engine broke off.
(179)	4-29	Curvo	S-c	2	14	Standing	Passenger engineer	10	Wrist scalded by steam opening drain valve on feed-water pump.
(180)	4-11	Tempe	S-j	11	13	50	Passenger	3	Car door closed against fingers.
(181)	5-7	Tucson-Phoenix	S-j	43	12	Unknown	Chair car porter	8	Flying particle of sand blew in eye.
(182)	5-8	Yuma	S-j	1	11	Standing	3rd cook	15	Struck ankle against ragged edge of opened can.
(183)	5-12	Mescal	S-j	6	11	40	Passenger	20	Claims fell to floor in dressing room of sleeping car.
(184)	6-26	Phoenix-Wellton	S-j	43	14	Unknown	Passenger	11	Alleges tool bag fell from baggage rack and struck shoulder.
(185)	8-10	Litchfield	S-j	43	14	60	Passenger	7	Fell into open trap or well in diner vestibule.
(186)	8-12	Dixie	S-j	1	11	60	Passenger	14	Fell to floor of car getting down from upper berth.
(187)	8-12	Mesa	S-j	43	14	1	Passenger	3	Lost balance and fell to floor of car alleged rough start of train.
(188)	8-18	Tucson	S-j	44	14	1	Passenger	14	Claims train jerked when starting.
(189)	8-26	Jean	S-j	44	14	50	Chef	21	Scalded by hot water spilled by 3rd cook as train rounded curve.
(190)	9-23	Phoenix	S-g	44	12	Standing	Passenger	14	Claims when detraining, step box slipped or turned over.
(191)	9-1	Buckeye	S-j	44	14	5	Express messenger	14	Opening car door, caught hand between handle and door facing.
(192)	9-30	Pinal	S-j	881	8	25	Passenger	5	Caught thumb between car windows.
(193)	10-30	Phoenix	S-g	43	13	Standing	Passenger	14	Claims foot slipped off step box when detraining.

(178)	3-12	Tucson	S-g	5	12	Standing	Passenger	12	Turned ankle detraining from sleeping car.
(179)	3-20	Jaynes	S-j	44	12	60	Passenger	30	Lost balance and fell getting out of upper berth in sleeping car.
(174)	3-1	Hereford	S-j	11	10	15	Passenger	30	Lost balance and fell in compartment of sleeping car.
(175)	3-23	Hereford	S-g	3	11	Standing	Passenger	30	Alleged foot turned stepping on step box to entrain on sleeping car.
(176)	3-18	Phoenix	S-j	43	14	Standing	Passenger fireman	30	Fell from running board of engine to ground.
(177)	3-25	Red Rock	S-j	43	11	30	3rd cook	11	Grease splashed on wrist while frying meat in diner kitchen.
(178)	4-11	Randolph	S-c	3	13	60	Passenger engineer Passenger fireman	30 19	Scalded and burned by hot water and steam when top pipe to water column in engine broke off.
(179)	4-29	Curvo	S-c	2	14	Standing	Passenger engineer	10	Wrist scalded by steam opening drain valve on feed-water pump.
(180)	4-11	Tempe	S-j	11	13	30	Passenger	3	Car door closed against fingers.
(181)	5-7	Tucson-Phoenix	S-j	43	12	Unknown	Chair car porter	8	Flying particle of sand blew in eye.
(182)	5-8	Yuma	S-j	1	11	Standing	3rd cook	15	Struck ankle against ragged edge of opened can.
(183)	5-12	Mescal	S-j	6	11	40	Passenger	20	Claims fell to floor in dressing room of sleeping car.
(184)	6-26	Phoenix-Wellton	S-j	43	14	Unknown	Passenger	11	Alleges tool bag fell from baggage rack and struck shoulder.
(185)	8-10	Litchfield	S-j	43	14	60	Passenger	7	Fell into open trap or well in diner vestibule.
(186)	8-12	Dixie	S-j	1	11	60	Passenger	14	Fell to floor of car getting down from upper berth.
(187)	8-12	Mesa	S-j	43	14	1	Passenger	3	Lost balance and fell to floor of car alleged rough start of train.
(188)	8-18	Tucson	S-j	44	14	1	Passenger	14	Claims train jerked when starting.
(189)	8-26	Jean	S-j	44	14	50	Chef	21	Scalded by hot water spilled by 3rd cook as train rounded curve.
(190)	9-23	Phoenix	S-g	44	12	Standing	Passenger	14	Claims when detraining, step box slipped or turned over.
(191)	9-1	Buckeye	S-j	44	14	5	Express messenger	14	Opening car door, caught hand between handle and door facing.
(192)	9-30	Pinal	S-j	381	8	25	Passenger	5	Caught thumb between car windows.
(193)	10-30	Phoenix	S-g	43	13	Standing	Passenger	14	Claims foot slipped off step box when detraining.
(194)	10-2	Tempe	S-j	2-4	11	Standing	Passenger	14	Claims groin strained and ligaments torn when lifting car window.
(195)	10-23	Buckeye	S-j	1	11	Unknown	Passenger	14	Alleged jerk of train caused another passenger to step on her foot.
(196)	12-20	Hyder	S-j	44	14	60	Waiter	10	Porcelain top of power juice extractor cracked, cutting hand.
	1958								
(197)	1-15	Charleston	S-j	12	11	45	Passenger brakeman	4	Foreign object lodged in left eye.
(198)	1-16	Douglas	S-j	44	13	10	Chef	12	Dislocated shoulder when lost balance reaching to prevent pan falling from shelf.
(199)	3-28	Hyder	S-c	3	13	20	Passenger fireman	20	Fell when foot slipped on grab iron on front end of engine tender.

	DATE	LOCATION	I.C.C. CLASS	TRAIN NUMBER	NUMBER OF CARS IN TRAIN	SPEED (M.P.H.)	CLASS OF PERSON INJURED	ESTIMATED DISABILITY (DAYS)	DETAILS OF CIRCUMSTANCES OF ACCIDENT
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
	1938 (Contd)								
(200)	4-23	Land	D-1	941	2	18	Freight brakeman	6	Thrown into corner of coach when car derailed.
(201)	4-11	Phoenix	S-h	44	12	6	Passenger	10	Rough stop caused by emergency stop of train due to striking delivery truck.
(202)	9-3	Tucson	S-g	3	13	Standing	Passenger	2	Slipped and fell to station platform detraining.
(203)	9-22	Yuma	S-g	1-2	13	Standing	Passenger	7	Made misstep on to stepping box, detraining from train.
(204)	9-17	Benson	S-j	2-43	13	30	Passenger brakeman	8	Foreign particle lodged in eye.
(205)	9-18	Tucson	S-j	2	12	Unknown	Passenger	3	Thumb caught between door and jamb.
(206)	10-2	Wellton	S-j	1	11	Unknown	Waiter	10	Claims particle of glass entered finger.
	1939								
(207)	1-30	Phoenix	S-g	2	14	Standing	Passenger	14	Slipped or stumbled and fell back against car steps when detraining.
(208)	2-14	Yuma	S-j	44	11	Unknown	Passenger	30	Elderly passenger (77) claims was thrown down by sudden stop of train in aisle sleeping car.
(209)	2-24	Tucson	S-j	43	12	Standing	Passenger fireman	180	Slipped when putting up indicators, and to avoid falling, jumped to ground.
(210)	2-24	Casa Grande	S-j	6	13	40	Waiter	20	Stumbled over broom handle in diner pantry.
(211)	3-7	Phoenix	S-g	44	10	Standing	Passenger	60	Turned ankle on car step when detraining.
(212)	6-3	Aztec	S-j	1	10	50	3rd cook	14	Cut finger on ragged edge of meat can.
(213)	6-11	Coolidge	S-j	44	13	Standing	Waiter	20	Cut finger on broken salt shaker.
(214)	7-29	Tucson	S-j	4	13	Standing	2nd cook	5	Arm strained when putting ice in fish box of diner.
(215)	9-15	Phoenix	S-j	43	11	30	Chair car porter	11	Fingers caught under vestibule apron.
(216)	9-23	Coolidge	S-j	2	14	Standing	Passenger fireman	21	Fell on engine tender when tank hook broke while pulling water spout around.
(217)	10-18	Yuma	S-g	363	4	Standing	Passenger	30	Slipped on car step and fell when boarding train.
(218)	10-14	Red Rock	S-j	5	14	50	Passenger	7	Fell to car floor when arising from table in diner.
(219)	10-17	Kim	S-j	1	12	50	Passenger	30	Claims lurch of train threw her down in dressing room of sleeping car.
(220)	12-2	Tucson	S-j	43	14	Standing	Baggage helper	21	Lost balance and fell backward while handling baggage in baggage car.

Defendant's Exhibit No. 293 (Witness J.J. Sullivan)
Feb. 6, 1941

HIGHWAY GRADE CROSSING ACCIDENTS IN WHICH AUTOMOBILES WERE INVOLVED
ALL RAILROADS

STATE OF ARIZONA

REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION
AND
THOSE WHICH OCCURRED ON LINES OF SOUTHERN PACIFIC COMPANY
YEARS 1923 TO 1939, INCLUSIVE

YEAR (a)		NUMBER OF ACCIDENTS (b)	NUMBER OF CASUALTIES KILLED (c)	NUMBER OF CASUALTIES INJURED (d)	NUMBER OF CASUALTIES TOTAL (e)	NUMBER OF AUTOMOBILES REGISTERED (f)	CASUALTIES FOR STATE PER 10,000 AUTOMOBILES REGISTERED KILLED (g)	CASUALTIES FOR STATE PER 10,000 AUTOMOBILES REGISTERED INJURED (h)	CASUALTIES FOR STATE PER 10,000 AUTOMOBILES REGISTERED TOTAL (i)	CASUALTY RATE FOR ENTIRE UNITED STATES (j)
1923	All railroads	8	2	22	24	49,175	.41	4.47	4.88	4.76
	S. P. only	1	-	1	1					
1924	All railroads	9	5	21	26	57,838	.86	3.61	4.47	4.17
	S. P. only	1	-	5	5					
1925	All railroads	12	5	15	20	68,029	.73	2.20	2.93	3.85
	S. P. only	9	5	12	17					
1926	All railroads	11	4	12	16	73,682	.54	1.63	2.17	3.83
	S. P. only	6	3	6	9					-
1927	All railroads	22	9	27	36	81,047	1.11	3.33	4.44	3.47
	S. P. only	14	7	16	23					
1928	All railroads	21	3	44	47	94,372	.32	4.66	4.98	3.42
	S. P. only	10	2	19	21					
1929	All railroads	17	3	20	23	109,013	.28	1.83	2.11	3.18
	S. P. only	6	3	3	6					
1930	All railroads	19	8	23	31	110,525	.72	2.08	2.80	2.60
	S. P. only	12	6	17	23					
1931	All railroads	11	9	14	23	105,572	.85	1.33	2.18	2.29
	S. P. only	7	9	7	16					
1932	All railroads	7	3	5	8	94,947	.32	.53	.85	3.11
	S. P. only	5	-	5	5					
1933	All railroads	8	5	5	10	89,496	.56	.56	1.12	2.02
	S. P. only	5	4	2	6					
1934	All railroads	6	2	8	10	96,586	.21	.83	1.04	2.17
	S. P. only	1	-	1	1					
1935	All railroads	19	9	19	28	103,122	.87	1.84	2.71	2.24
	S. P. only	14	8	10	18					
1936	All railroads	13	5	15	20	115,035	.43	1.30	1.73	2.19
	S. P. only	9	5	9	14					
1937	All railroads	9	3	11	14	129,210	.23	.85	1.08	2.19
	S. P. only	6	1	8	11					

1924	All railroads S. P. only	9 1	5 -	21 5	26 5	57,828	.86	3.61	4.47	4.17
1925	All railroads S. P. only	12 9	5 5	15 12	20 17	68,029	.73	2.20	2.93	3.85
1926	All railroads S. P. only	11 6	4 3	12 6	16 9	73,682	.54	1.63	2.17	3.83
1927	All railroads S. P. only	22 14	9 7	27 16	36 23	81,047	1.11	3.33	4.44	3.47
1928	All railroads S. P. only	21 10	3 2	44 19	47 21	94,372	.32	4.66	4.98	3.42
1929	All railroads S. P. only	17 6	3 3	20 3	23 6	109,013	.28	1.83	2.11	3.18
1930	All railroads S. P. only	19 12	8 6	23 17	31 23	110,525	.72	2.08	2.80	2.60
1931	All railroads S. P. only	11 7	9 9	14 7	23 16	105,572	.85	1.33	2.18	2.29
1932	All railroads S. P. only	7 5	3 -	5 5	8 5	94,947	.32	.53	.85	2.11
1933	All railroads S. P. only	8 5	5 4	5 2	10 6	89,496	.56	.56	1.12	2.02
1934	All railroads S. P. only	6 1	2 -	8 1	10 1	96,586	.21	.83	1.04	2.17
1935	All railroads S. P. only	19 14	9 8	19 10	28 18	103,122	.87	1.84	2.71	2.24
1936	All railroads S. P. only	13 9	5 5	15 9	20 14	115,035	.43	1.30	1.73	2.19
1937	All railroads S. P. only	9 6	3 3	11 8	14 11	129,210	.23	.85	1.08	2.39
1938	All railroads S. P. only	16 10	6 4	19 13	25 17	128,791	.47	1.48	1.95	1.72
1939	All railroads S. P. only	12 7	1 -	22 13	23 13	131,355	.08	1.67	1.75	1.61

β = Number of accidents not reported for year 1923.

SOURCE: Figures for all railroads, Interstate Commerce Commission Accident Bulletins, Summary No. 24.

Southern Pacific Co. figures from Form T reports to Interstate Commerce Commission.

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31223

Ex Defendant's Exhibit No. 294 (Witness J.J. Sullivan)
Feb. 6, 1941

DETAIL OF CASUALTIES TO ALL CLASSES OF PERSONS, EXCEPT TRESPASSERS
OPERATION OF PASSENGER TRAINS
SOUTHERN PACIFIC COMPANY

STATE OF ARIZONA

MARCH AND APRIL, 1940

LINE NO.	DATE (a)	LOCATION (b)	TRAIN NUMBER (c)	NO. OF CARS IN TRAIN (d)	SPEED (M.P.H.) (e)	CLASS OF PERSON INJURED (f)	ESTIMATED DISABILITY (DAYS) (g)	DETAIL AND CIRCUMSTA (h)
	1940							
1	Mar. 16	Dock-Phoenix	Nos. 5 & 43 (Consolidated)	26	Unknown	Passenger	7	Woman passenger alleged that while in sudden jerk and threw her backward, st leg. Trains Nos. 43 and 5 had been co Phoenix, account failure of engine on tween engine and tender on account of s Olberg and Dock.
2	Mar. 16	Olberg-Dock	43	12	Unknown	Passenger	45	Woman passenger claims was thrown agai coach when train made a sudden stop
3	Mar. 20	Tucson	44	14	2	Passenger	7	Woman passenger claims that while stand detrain, stepping box fell over on to r
4	Mar. 28	Phoenix	44	12	Standing	Passenger	14	Woman passenger slipped and fell on co
5	Mar. 31	Phoenix	4	14	Standing	Passenger	14	Woman passenger slipped and fell detrai heel caught on car step.
6	Apr. 10	Mesa	44	9	8	Non-trespasser (Occupant of automobile)	60	Passenger automobile struck by train at
7	Apr. 24	Phoenix	44	12	Standing	Passenger	3	Male passenger slipped on wet floor of strike ankle against iron base of seat.

DETAIL AND CIRCUMSTANCES OF ACCIDENT (h)
ger alleged that while in dressing room of coach, train gave and threw her backward, striking back of head against chair
Nos. 43 and 5 had been consolidated at Dock for movement to unt failure of engine on No. 43 due to broken oil line bet- nd tender on account of striking boulder on track between ock.
ger claims was thrown against washbowl in dressing room of rain made a sudden stop
ger claims that while standing in vestibule, getting ready to pping box fell over on to right great toe.
er slipped and fell on coach steps when detraining.
ger slipped and fell detraining from Pullman sleeper when n car step.
omobile struck by train at street crossing.
r slipped on wet floor of coach causing him to fall and against iron base of seat.

Defendant's Exhibit No. 295 (Witness J. J. Sullivan)
Feb. 6, 1941

DETAIL OF
TRAIN AND TRAIN SERVICE ACCIDENTS
ROAD FREIGHT TRAIN OPERATION
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
SOUTHERN PACIFIC COMPANY IN
STATE OF ARIZONA

APRIL 1940

	DATE	LOCATION	I.C.C. CLASS	TRAIN NUMBER	NO. CARS IN TRAIN	SPEED M.P.H.	PERSON INJURED		ESTIMATED DISABILITY	DAMAGE TO EQUIPMENT	DETAILS
							NAME	OCCUPATION			
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	
(1)	4-1	Tucson	S-h	903	65	10	Occupant of automobile		30		Passenger automobile ran into
(2)	4-4	Dixie	S-g	901	67	Standing	J.C.Slade	Brakeman	25		Turned and sprained ankle step
(3)	4-4	Benson	L-c	[illegible]-5028-[illegible]	68	5	None			$500	Broken No. 2 axle on engine ac
(4)	4-11	Lancha	S-g	1-866	64	Standing	W.G.Old	Brakeman	5		Turned and sprained ankle on l
(5)	4-12	Gila	S-g	[illegible]-3714-[illegible]	91	8	G.M.Barringer	Brakeman	60		Fell across rail when stepped tached from train and being ha
(6)	4-19	Heaton	M-b	3-854	65	30	None			$225	Home automatic block signal da train.
(7)	4-30	Cavot	C-b	X-3652-[illegible] 3-864	None 58	Standing 10	None			$425	Collision between light engine track without authority accoun

FREIGHT TRAIN AND FREIGHT TRAIN CAR MILES OPERATED
STATE OF ARIZONA
APRIL 1940

	FREIGHT TRAIN MILES	FREIGHT TRAIN CAR MILES	AVERAGE CARS PER TRAIN
	(l)	(m)	(n)
TRAINS OF 70 CARS AND LESS	199,761	10,533,262	52.73
TRAINS OF OVER 70 CARS	37,257	3,180,278	85.36
TOTAL	237,018	13,713,540	57.85

DETAILS AND CIRCUMSTANCES OF ACCIDENT (k)
ile ran into side of train
ed ankle stepping on piece of slag getting off car.
on engine account progressive fracture.
ed ankle on loose slag alighting from caboose.
when stepped on slag ballast alighting from caboose which was de- and being handled alone by engine.
lock signal damaged evidently by timber projecting from car in
n light engine and freight train due to light engine occupying main thority account enginemen overlooking superior train.

AVERAGE CARS ER TRAIN (n)
52.73
85.36
57.85

Defendant's Exhibit No. 296 (Witness E.C. Bruns)
Feb. 6, 1941

ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

CASUALTIES TO ROAD FREIGHT TRAINMEN AND ENGINEMEN ON DUTY WHILE ON OR GETTING ON OR OFF ROAD FREIGHT TRAINS
(Through, Local and Mixed)

Main Line Territory between Clovis, New Mexico, and Gallup, New Mexico, Compared with Main Line Territory between Gallup, New Mexico, and Needles, C
as Reported to the Interstate Commerce Commission - Years 1923 to 1939, Inclusive

	Year	Freight Train Miles		Freight Car Miles		Casualties to Enginemen				Casualties to Trainmen				Total Casualties				Total Casualties	Total Casualties	
		Clovis to Gallup	Gallup to Needles	Clovis to Gallup	Gallup to Needles	Clovis to Gallup		Gallup to Needles		Clovis to Gallup		Gallup to Needles		Clovis to Gallup		Gallup to Needles		Clovis to Gallup	Gallup to Needles	Cl Ga
						Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured			
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	
1	1923	1 175 346	1 960 891	76 115 151	88 156 075	0	4	0	2	1	7	0	10	1	11	0	12	12	12	
2	1924	1 140 306	1 698 814	75 556 360	84 653 953	0	4	0	2	0	8	0	17	0	12	0	19	12	19	
3	1925	1 195 872	1 634 851	81 264 647	89 079 648	0	2	0	1	0	1	0	27	0	3	0	28	3	28	
4	1926	1 171 228	1 628 608	82 968 327	88 392 993	0	1	0	3	1	3	0	10	1	4	0	13	5	13	
5	1927	1 290 853	1 801 731	94 394 619	99 414 342	2	1	0	1	3	6	0	18	5	7	0	19	12	19	
6	1928	1 231 455	1 716 715	91 988 648	97 722 751	0	1	0	0	1	13	0	15	1	14	0	15	15	15	
7	6 year period 1923-1928,inc.	7 205 060	10 440 910	502 287 752	547 419 755	2	13	0	9	6	38	0	97	8	51	0	106	59	106	
8	1929	1 309 064	1 793 971	95 155 812	102 365 961	0	0	0	1	0	8	2	7	0	8	2	8	8	10	
9	1930	1 099 683	1 528 121	80 877 423	88 858 774	0	1	0	1	0	9	0	13	0	10	0	14	10	14	
10	1931	893 347	1 331 527	67 232 573	78 107 725	0	1	0	3	0	9	0	10	0	10	0	13	10	13	
11	1932	804 039	1 223 178	61 344 551	71 689 489	0	0	0	1	0	1	0	8	0	1	0	9	1	9	
12	1933	801 770	1 178 002	59 277 107	68 972 780	0	3	0	0	0	2	0	11	0	5	0	11	5	11	
13	1934	906 205	1 497 165	65 635 580	75 580 016	0	0	0	5	0	0	0	4	0	0	0	9	0	9	
14	6 year period 1929-1934,inc.	5 814 108	8 552 964	429 473 046	485 574 745	0	5	0	11	0	29	2	53	0	34	2	64	34	66	
15	1935	1 074 834	1 668 739	75 012 697	88 121 066	0	1	0	1	0	2	1	5	0	3	1	6	3	7	
16	1936	1 286 576	1 778 901	85 966 636	98 992 578	0	1	0	2	0	6	0	11	0	7	0	13	7	13	
17	1937	1 380 033	1 845 289	92 268 686	103 456 758	0	2	0	1	1	1	0	12	1	3	0	13	4	13	
18	1938	1 187 564	1 656 791	84 957 728	94 595 398	0	2	0	0	1	0	0	5	1	2	0	5	3	5	
19	1939	1 251 246	1 754 961	89 761 348	98 712 427	0	2	0	1	0	7	1	7	0	9	1	8	9	9	
20	5 year period 1935-1939,inc.	6 180 253	8 704 681	427 957 095	483 878 227	0	8	0	5	2	16	2	40	2	24	2	45	26	47	
21	Total-17 years	19 199 421	27 698 555	1 359 717 893	1 516 872 727	2	26	0	25	8	83	4	190	10	109	4	215	119	219	
22	PERIOD 1935-1939 COMPARED WITH PERIOD 1923-1928													- - - - -			IMPROVEMENT			
23	PERIOD 1935-1939 COMPARED WITH PERIOD 1929-1934													- - - - -			IMPROVEMENT			

DETAIL OF FATALITIES

Clovis, New Mexico to Gallup, New Mexico

April 23, 1923 - Grants, N.M. ..... A brakeman murdered by hobos on 84-car train.
Aug., 25, 1926 - Thoreau, N.M. ..... A conductor of a 70-car train killed when a cut of 14 outfit cars being shoved ahead of engine collided with hand car.
[illegible] 15, 1927 - Tolar, N.M. ..... A brakeman fell and run over while attempting to get on 12-car train after lining switch to enter siding.
Sept. 23, 1927 - Mountainair, N.M. .... An engineer and fireman of 99-car train moving 8 miles per hour killed by locomotive boiler explosion.
Oct. 18, 1927 - Tejon, N.M. ..... Conductor and brakeman in caboose of 59-car train standing on siding, killed when another train collided with rear end.
[illegible] 17 1928 - [illegible] Brakeman on 10-car local freight fell and run over while cleaning car after unloading screenings.

Gallup, New

Jan. 7, 1929 - Holbrook, Ariz. ..... A brakeman on si
Sept.30, 1929 - Seligman, Ariz. ..... A brakeman on 6
June 20, 1935 - Williams, Ariz. ..... A conductor on
of lead car a
Sept.30, 1939 - Joseph City, Ariz. ..... A brakeman on 6
top of 11th c

EIGHT TRAINS

p, New Mexico, and Needles, California

Total Casualties	Total Casualties	Freight Train Miles Per Casualty		Freight Car Miles Per Casualty		Average Cars Per Train			
Clovis to Gallup (r)	Gallup to Needles (s)	Clovis to Gallup (t)	Gallup to Needles (u)	Clovis to Gallup (v)	Gallup to Needles (w)	Clovis to Gallup (x)	Gallup to Needles (y)	Year (z)	
12	12	97 946	163 408	6 342 929	7 346 340	64.8	45.0	1923	1
12	19	95 026	89 411	6 296 363	4 455 471	66.3	49.8	1924	2
3	28	398 624	58 388	27 088 215	3 181 416	68.0	54.5	1925	3
5	13	234 246	125 278	16 593 665	6 799 461	70.8	54.3	1926	4
12	19	107 571	94 828	7 866 218	5 232 334	73.1	55.2	1927	5
15	15	82 097	114 401	6 132 577	6 514 850	74.7	56.9	1928	6
59	106	122 120	98 499	8 513 352	5 164 337	69.7	52.4	6 year period 1923-1928,inc.	7
8	10	163 633	179 397	11 894 477	10 236 596	72.7	57.1	1929	8
10	14	109 968	109 223	8 087 742	6 347 055	73.5	58.1	1930	9
10	13	89 335	102 425	6 723 257	6 008 286	75.3	58.7	1931	10
1	9	904 039	135 908	61 344 551	7 965 498	76.3	58.6	1932	11
5	11	160 354	107 091	11 845 421	6 270 253	73.9	58.6	1933	12
0	9	-	166 352	-	8 397 780	72.4	50.5	1934	13
34	66	171 003	129 590	12 631 560	7 357 193	73.5	56.8	6 year period 1929-1934,inc.	14
3	7	358 278	238 391	25 000 899	12 588 724	69.8	52.8	1935	15
7	13	183 797	136 838	12 280 948	7 614 813	66.8	55.6	1936	16
4	13	345 008	141 945	23 067 172	7 958 212	66.9	56.1	1937	17
3	5	395 855	331 358	28 319 243	18 919 080	71.5	57.1	1938	18
9	9	139 027	194 996	9 973 483	10 968 047	71.7	56.2	1939	19
26	47	237 702	185 206	16 459 888	10 295 281	69.2	55.6	5 year period 1935-1939,inc.	20
119	219	161 340	126 477	11 426 201	6 926 359	70.8	54.8	Total-17 years	21
EMENT		94.65%	88.03%	93.34%	99.35%				22
EMENT		39.00%	42.92%	30.30%	39.93%				23

Gallup, New Mexico to Needles, California

..... A brakeman on side ladder of car, 70-car train, struck head against water column and killed.
..... A brakeman on 60-car train, walking over train, fell from train and run over.
..... A conductor on lo; run handling 26 cars, shoving 16 and pulling 10 cars, fell from lead end of lead car and was run over.
is. ..... A brakeman on 67-car train fell or jumped from top of train. When last seen was seated on top of 11th car from engine. Body found outside of track. Had not been run over.

Main Line Territory between Clovis, New Mexico, and Gallup, New Mexico, Compared with Main Line Territory between Gallup, New Mexico, and Needles, Ca
as Reported to the Interstate Commerce Commission - Years 1923 to 1939, Inclusive

	Year	Freight Train Miles		Freight Car Miles		Casualties to Enginemen				Casualties to Trainmen				Total Casualties				Total Casualties	Total Casualties	
		Clovis to Gallup	Gallup to Needles	Clovis to Gallup	Gallup to Needles	Clovis to Gallup		Gallup to Needles		Clovis to Gallup		Gallup to Needles		Clovis to Gallup		Gallup to Needles		Clovis to Gallup	Gallup to Needles	Clov Gal
						Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured			
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	
1	1923	1 175 346	1 960 891	76 115 151	88 156 075	0	4	0	2	1	7	0	10	1	11	0	12	12	12	
2	1924	1 140 306	1 698 814	75 556 360	84 653 953	0	4	0	2	0	8	0	17	0	12	0	19	12	19	
3	1925	1 195 872	1 634 851	81 264 647	89 079 641	0	2	0	1	0	1	0	27	0	3	0	28	3	28	
4	1926	1 171 228	1 628 608	82 968 327	88 392 993	0	1	0	3	1	3	0	10	1	4	0	13	5	13	
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6	1928	1 231 455	1 716 015	91 988 648	97 722 751	0	1	0	0	1	13	0	15	1	14	0	15	15	15	
7	6 year period 1923-1928,inc.	7 205 060	10 440 910	502 287 752	547 419 755	2	13	0	9	6	38	0	97	8	51	0	106	59	106	
8	1929	1 309 064	1 793 971	95 155 812	102 365 961	0	0	0	1	0	8	2	7	0	8	2	8	8	10	
9	1930	1 099 683	1 529 121	80 877 423	88 858 774	0	1	0	1	0	9	0	13	0	10	0	14	10	14	
10	1931	893 347	1 331 527	67 232 573	78 107 725	0	1	0	3	0	9	0	10	0	10	0	13	10	13	
11	1932	804 039	1 223 178	61 344 351	71 689 489	0	0	0	1	0	1	0	8	0	1	0	9	1	9	
12	1933	801 770	1 178 002	59 227 107	68 972 780	0	3	0	0	0	2	0	11	0	5	0	11	5	11	
13	1934	906 205	1 497 165	65 635 580	75 580 016	0	0	0	5	0	0	0	4	0	0	0	9	0	9	
14	6 year period 1929-1934,inc.	5 814 108	8 552 964	429 473 046	485 574 745	0	5	0	11	0	29	2	53	0	34	2	64	34	66	
15	1935	1 074 834	1 668 739	75 002 697	88 121 066	0	1	0	1	0	2	1	5	0	3	1	6	3	7	
16	1936	1 286 576	1 778 901	85 966 636	98 992 578	0	1	0	2	0	6	0	11	0	7	0	13	7	13	
17	1937	1 380 033	1 845 289	92 268 686	103 456 758	0	2	0	1	1	1	0	12	1	3	0	13	4	13	
18	1938	1 187 564	1 656 791	84 957 728	94 595 398	0	2	0	0	1	0	0	5	1	2	0	5	3	5	
19	1939	1 251 246	1 754 961	89 761 348	98 712 427	0	2	0	1	0	7	1	7	0	9	1	8	9	9	
20	5 year period 1935-1939,inc.	6 180 253	8 704 681	427 957 095	483 878 227	0	8	0	5	2	16	2	40	2	24	2	45	26	47	
21	Total-17 years	19 199 421	27 698 555	1 359 717 893	1 516 872 727	2	26	0	25	8	83	4	190	10	109	4	215	119	219	
22						PERIOD 1935-1939 COMPARED WITH PERIOD 1923-1928								- - - - - -			IMPROVEMENT			
23						PERIOD 1935-1939 COMPARED WITH PERIOD 1929-1934								- - - - - -			IMPROVEMENT			

DETAIL OF FATALITIES

Clovis, New Mexico to Gallup, New Mexico		Gallup, New
April 23, 1923 - Grants, N.M.	A brakeman murdered by hobos on 84-car train.	
Aug. 25, 1926 - Thoreau, N.M.	A conductor of a 70-car train killed when a cut of 14 outfit cars being shoved ahead of engine collided with hand car.	
Feb. 15, 1927 - Tolar, N.M.	A brakeman fell and run over while attempting to get on 12-car train after lining switch to enter siding.	
Sept. 23, 1927 - Mountainair, N.M.	An engineer and fireman of 99-car train moving 8 miles per hour killed by locomotive boiler explosion.	
Oct. 18, 1927 - Tejon, N.M.	Conductor and brakeman in caboose of 59-car train standing on siding, killed when another train collided with rear end.	
May 17, 1928 - Largo, N.M.	Brakeman on 10-car local freight, fell and run over while cleaning car after unloading screenings.	
May 16, 1937 - Rio Puerco, N.M.	Brakeman riding on top of 1st car back of engine of 68-car train which struck a bull on a bridge; engine remained on track but 35 head cars were derailed, killing brakeman.	
March 23, 1938 - Wingate, N.M.	Brakeman on 17-car train walking over train toward head end, fell from train and was run over.	
		Jan. 7, 1929 - Holbrook, Ariz. ..... A brakeman on sid
		Sept.30, 1929 - Seligman, Ariz. ..... A brakeman on 60-
		June 20, 1935 - Williams, Ariz. ..... A conductor on lo of lead car and
		Sept.30, 1939 - Joseph City, Ariz. ..... A brakeman on 67- top of 11th car

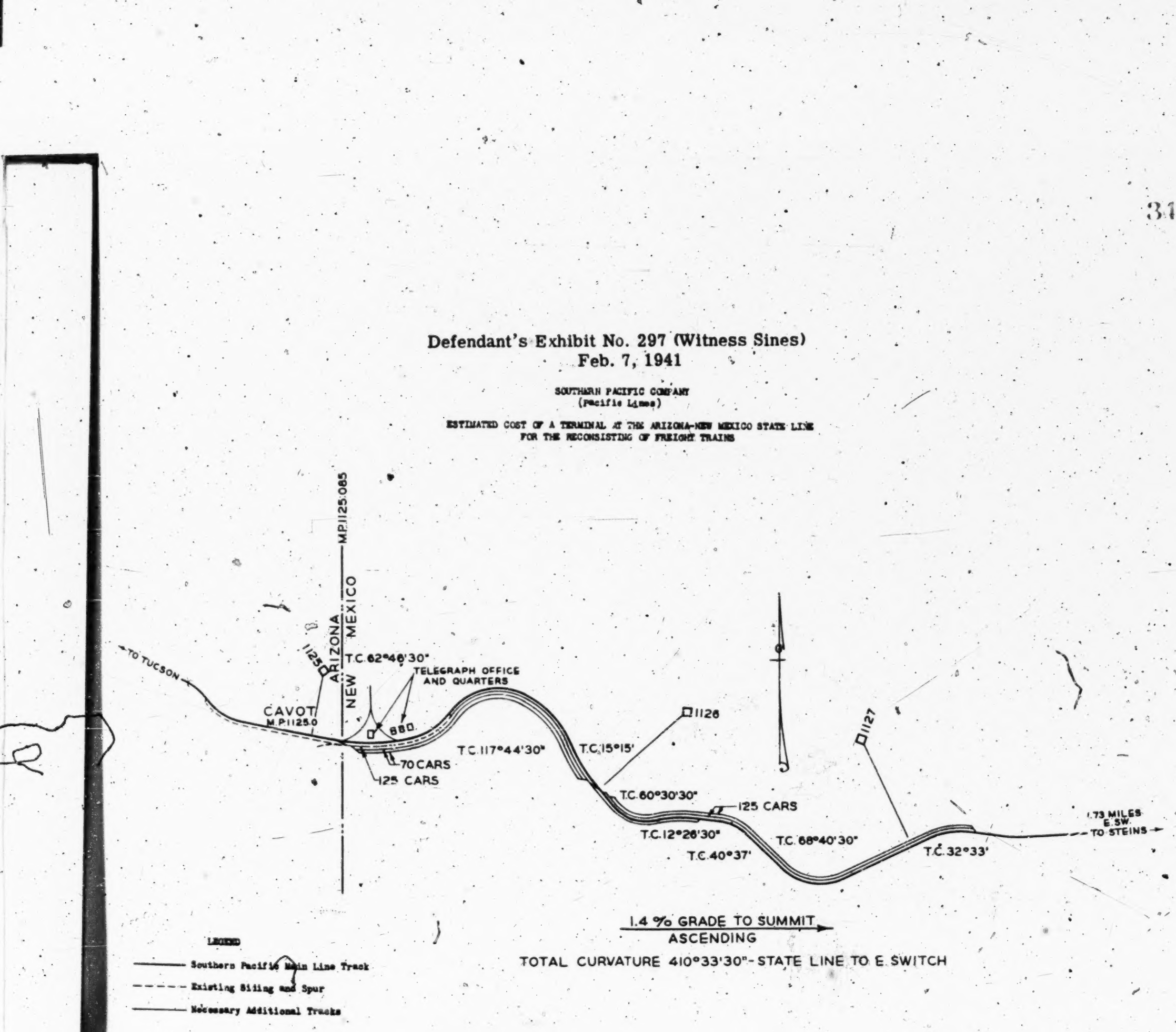
MAIN LINE MILEAGE

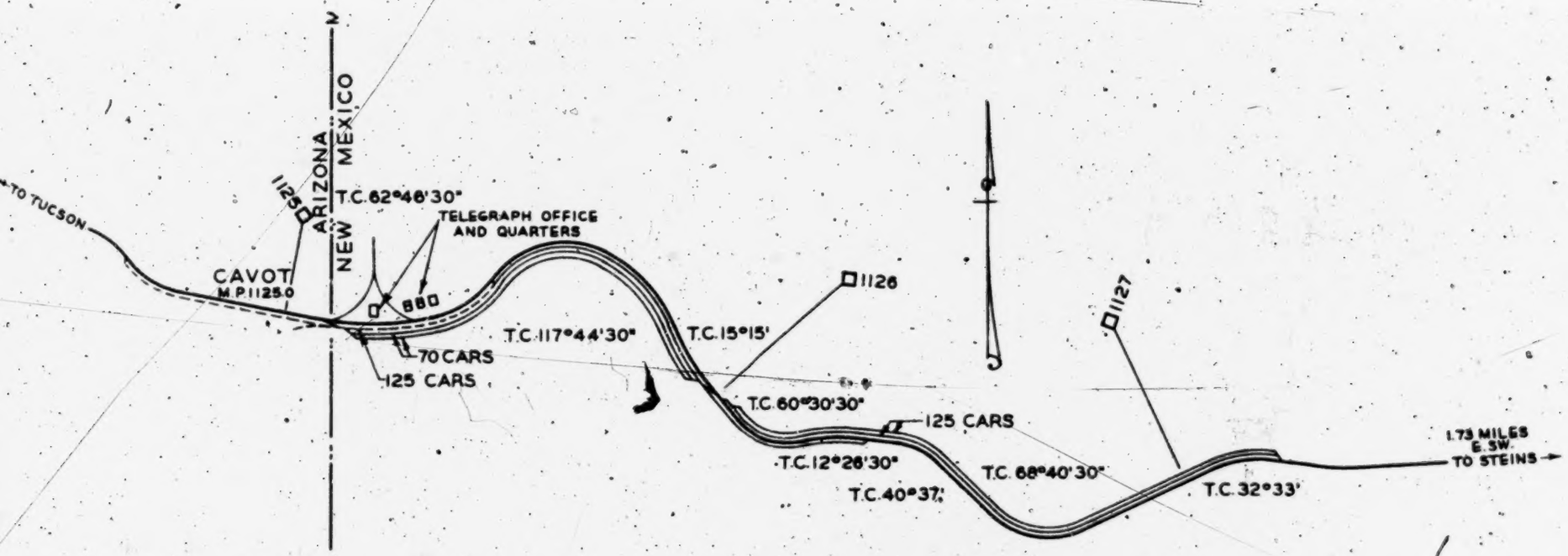
Clovis, New Mexico to Gallup, New Mexico - 383.9 miles
Gallup, New Mexico to Needles, California - 419.7 miles (includes 385.7 miles in Arizona)
Gallup, New Mexico to New Mexico-Arizona State Line - 22 miles
Needles, California to Arizona-California State Line - 12 miles

Defendant's Exhibit No. 297 (Witness Sines)
Feb. 7, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

ESTIMATED COST OF A TERMINAL AT THE ARIZONA-NEW MEXICO STATE LINE
FOR THE RECONSISTING OF FREIGHT TRAINS





TOTAL CURVATURE 410°33'30"- STATE LINE TO E SWITCH

LEGEND

——— Southern Pacific Main Line Track

– – – – – Existing Siding and Spur

——— Necessary Additional Tracks

(1)	Track cost, includes the following. 25,889 track feet of new siding, 2,600 track feet of new wye tracks, Relocate 1 main line switch, Install 9 S. H. 90 lb. siding switches, Install 6 new 112 lb. main line switches, Install 4 new derails. TOTAL TRACK COST, ...		$ 78,193
(2)	Grading: 89,150 cu. yds. rock cut @ $0.75	$21,863	
	135,430 cu. yds. dirt fill @ $0.20.	27,083	
			48,946
(3)	Extend 16 concrete culverts		14,400
(4)	Relocate automatic block signals.		15,080
	(includes dispatcher's phone and other apparatus in telegraph office)		
(5)	Purchase land for wye track including legal expenses, ...		150
(6)	Relocate 42 Western Union poles and raise 4 Western Union Poles		2,000
(7)	Build telegraph office 16 ft x 30 ft. @ $2,300		
	and 3 frame dwellings @ $2,500, ...		9,800
(8)	Well and water tower for domestic water supply, ...		1,000
			169,509
(9)	Contingencies, (10%).		16,951
(10)	T O T A L		$186,460

5906

Defendant's Exhibit No. 298 (Witness Sines)
Feb. 7, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

YUMA, ARIZONA TO EL PASO, TEXAS VIA GILA AND LORDSBURG,
ESTIMATED NUMBER OF MEETS AND PASSES
ELIMINATED BY LONG TRAIN OPERATION JUNE AND AUGUST, 1938;
EXPANDED TO ANNUAL BASIS

DATE	ACTUAL				REDISPATCHED			
	TRAINS			NUMBER OF MEETS AND PASSES	TRAINS			NUMBER OF MEETS AND PASSES
	FREIGHT	PASSENGER	TOTAL		FREIGHT	PASSENGER	TOTAL	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
JUNE 1938								
1	42	12	54	93	29	12	41	56
2	44	12	56	101	30	12	42	59
3	55	12	67	141	33	12	45	67
4	53	15	68	145	35	15	50	81
5	56	15	71	156	40	15	55	97
6	60	12	72	160	43	12	55	97
7	53	10	63	126	38	10	48	76
8	61	14	75	174	42	14	56	101
9	71	12	83	211	52	12	64	129
10	73	16	89	244	52	16	68	145
11	71	14	85	221	49	12	61	118
12	73	13	86	226	47	12	59	110
13	60	12	72	160	42	12	54	93
14	64	12	76	179	45	12	57	104
15	66	12	78	187	45	12	57	104
16	68	12	80	196	47	12	59	110
17	73	12	85	221	49	12	61	118
18	75	14	89	244	53	14	67	141
19	71	12	83	211	45	12	57	104
20	70	12	82	206	48	12	60	114
21	62	12	74	169	41	12	53	90
22	60	13	73	165	40	12	52	87
23	56	13	69	148	40	12	52	87
24	55	12	67	141	37	12	49	79
25	61	15	76	179	43	16	59	110

26	64	16	80	196	48	16	64	129
27	66	12	78	187	42	12	54	93
28	56	12	68	145	37	12	49	79
29	62	12	74	169	43	12	55	97
30	60	16	76	179	47	16	63	126
AUG. 1938								
1	32	12	44	64	29	12	41	56
2	30	13	43	61	24	13	37	46
3	35	15	50	81	26	15	41	56
4	37	12	49	79	29	12	41	56
5	39	12	51	84	29	12	41	56
6	46	12	58	107	34	12	46	70
7	42	12	54	93	30	12	42	59
8	39	12	51	84	34	12	46	70
9	34	12	46	70	24	12	36	43
10	31	12	43	61	24	12	36	43
11	37	12	49	79	30	12	42	59
12	34	12	46	70	28	12	40	53
13	39	12	51	84	27	12	39	50
14	38	12	50	81	29	12	41	56
15	31	12	43	61	25	12	37	46
16	33	14	47	73	23	13	36	43
17	26	15	41	56	24	15	39	50
18	34	12	46	70	26	12	38	48
19	39	15	54	93	31	15	46	70
20	38	11	49	79	32	11	43	61
21	40	13	53	90	32	13	45	67
22	36	13	49	79	31	13	44	64
23	34	12	46	70	28	12	40	53
24	32	12	44	64	24	12	36	43
25	38	12	50	81	27	12	39	50
26	41	12	53	90	31	12	43	61
27	38	13	51	84	30	12	42	59
28	36	15	51	84	25	12	37	46
29	35	12	47	73	29	12	41	56
30	27	12	39	50	20	12	32	34
31	27	12	39	50	25	12	37	46
TOTAL	2,959	777	3,736	7,625	2,142	768	2,910	4,671

Meets and passes eliminated by Redispatch Study, June and August, 1938 2,954

Meets and passes eliminated for year by long train operation

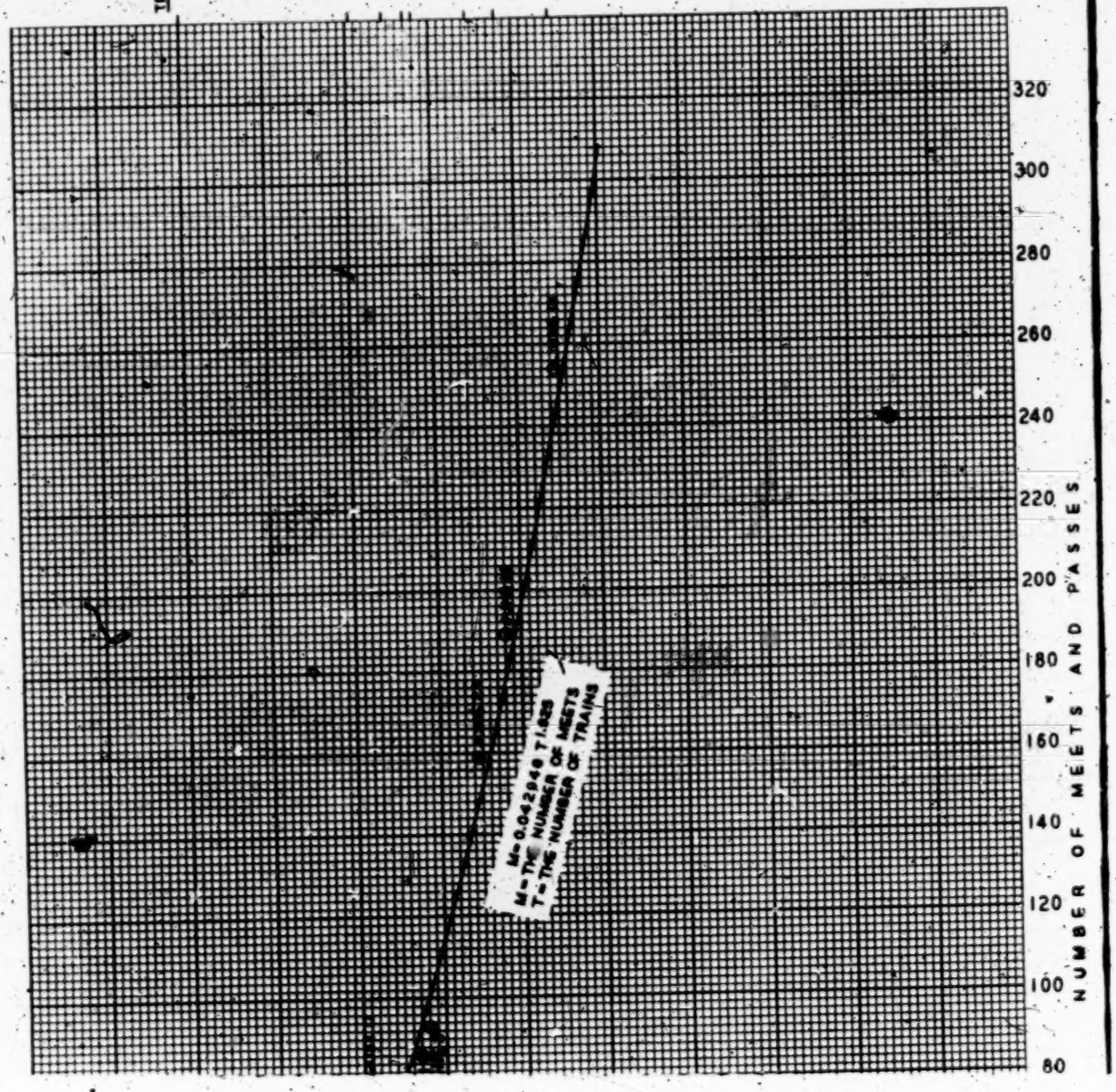
2,954 expanded in ratio of 17.89% to 100.00 16,512

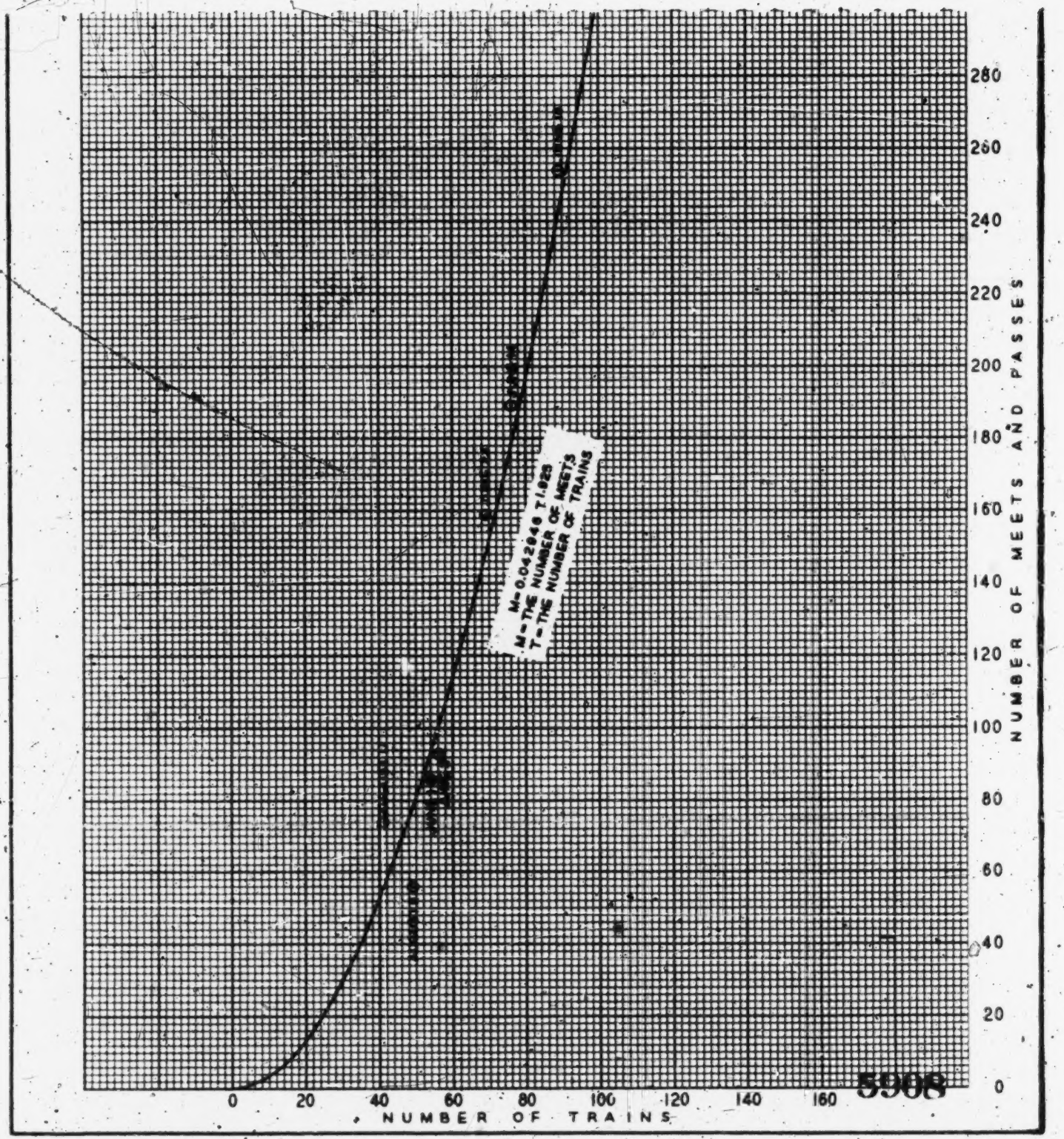
SOUTHERN PACIFIC COMPANY
PACIFIC LINES

RELATION BETWEEN NUMBER OF TRAINS AND NUMBER OF MEETS AND PASSES

YUMA, ARIZONA – EL PASO, TEXAS VIA GILA, TUCSON AND LORDSBURG

BASED ON OBSERVATIONS DURING JUNE AND AUGUST 1938




M = 0.042848 T 1.823
M = THE NUMBER OF MEETS
T = THE NUMBER OF TRAINS
NUMBER OF MEETS AND PASSES
NUMBER OF TRAINS
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
5908

5908

Defendant's Exhibit No. 299 (Witness Sines)
Feb. 7, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY - JUNE AND AUGUST, 1938
EXTRA-TERRITORIAL EFFECT
OF ARIZONA TRAIN LIMIT LAW
BETWEEN ARIZONA-NEW MEXICO STATE LINE AND EL PASO, TEXAS

LINE NO.	DISTRICT	ACTUAL TRAIN MILES (a)	REDISPATCHED TRAIN MILES (b)	TRAIN MILE SAVING (a) minus (b) (c)	PER CENT SAVING (c) divided by (a) (d)
1	Arizona-New Mexico State Line to Lordsburg, New Mexico, 23 miles 749 actual trains 519 redispatched trains For period June and August, 1938	17,227	11,937	5,290	30.7%
2	Lordsburg, New Mexico to El Paso, Texas, 149 miles For period June and August, 1938	100,152	78,287	21,865	21.8%
3	Total for period (Lines 1 and 2)	117,379	90,224	27,155	23.1%
4	Train mile saving for year (saving for period increase in ratio of 17.89% to 100.00%)			151,789	
5	Monetary saving for year, (Line 4 x $0.4988*)			$ 75,712	

* - Exhibit No._____shows annual saving $318,510 Yuma, Arizona to El Paso, Texas, (freight only), and 638,569 train miles eliminated equals $0.4988 per train mile saved.

5000

(1) Track cost, includes the following.
25,889 track feet of new siding.

Defendant's Exhibit No. 305 (Witness J.J. Sullivan)

Southern Pacific Company
(Pacific Lines)

MAIN TRACK MILEAGE
(As of December 31st)

	ARIZONA			NEVADA		
YEAR	MAIN LINE	BRANCH	TOTAL	MAIN LINE	BRANCH	TOTAL
1923	399.95	144.93	544.88	549.74	303.47	853.21
1924	574.81	647.98	1222.79	731.45	303.47	1034.92
1925	576.44	656.92	1233.36	731.45	295.58	1027.03
1926	808.53	575.13	1383.66	731.45	295.58	1027.03
1927	808.27	575.06	1383.33	731.45	295.58	1027.03
1928	808.32	573.21	1381.53	731.45	295.58	1027.03
1929	808.29	572.93	1381.22	816.48	228.31	1044.79
1930	808.29	572.97	1381.26	816.48	228.31	1044.79
1931	808.29	559.94	1368.23	816.48	228.31	1044.79
1932	808.29	559.94	1368.23	816.46	222.80	1039.26
1933	808.29	486.02	1294.31	816.46	222.80	1039.26
1934	808.29	469.94	1278.23	816.37	196.53	1012.90
1935	808.29	467.89	1276.18	816.38	196.53	1012.91
1936	808.29	467.89	1276.18	816.38	196.53	1012.91
1937	808.29	467.82	1276.11	819.82	196.53	1016.35
1938	808.29	467.82	1276.11	819.82	153.60	973.42
1939	808.29	464.96	1273.25	819.82	153.60	973.42

Defendant's Exhibit No. 313 (Witness B.S. Sines)
Apr. 9, 1941

CLASSES AND NUMBER OF EMPLOYEES, TUCSON DIVISION
YEARS 1930 TO 1940, INCLUSIVE
(TRANSPORTATION DIVISION ONLY)

(Data abstracted from "I.C.C. Wage Statistics", Forms A and B, "Monthly Report of Employees, Service, and Compensation". Number of employees who received pay during month - averaged to annual basis.)

LINE NO. (a)	DIVISION NUMBER (b)	REPORTING DIVISION (c)	1930 (d)	1931 (e)	1932 (f)	1933 (g)	1934 (h)	1935 (i)	1936 (j)	1937 (k)	1938 (l)	1939 (m)
1	111	Road Passenger Conductors	20	19	16	13	14	15	19	19	17	16
2	113	Road Freight Conductors (through freight)	31	37	32	38	44	53	57	65	55	59
3	114	Road Freight Conductors (local and way freight)	13	11	7	4	3	6	7	9	7	8
4	115	Road Passenger Baggagemen	-	-	-	-	-	-	-	-	3	3
5	116	Road Passenger Brakemen and Flagmen	35	31	27	30	31	31	34	38	33	29
6	117	Road Freight Brakemen and Flagmen (through freight)	91	111	97	166	184	197	220	239	210	240
7	118	Road Freight Brakemen and Flagmen (local and way freight)	34	30	18	14	13	20	26	32	25	25
8	119	Yard Conductors and Yard Foremen	19	16	13	12	12	17	19	24	18	21
9	120	Yard Brakemen and Yard Helpers	59	48	40	58	64	74	81	95	89	95
10	121	Road Passenger Engineers and Motormen	26	28	23	19	20	21	27	29	27	25
11	122	Road Freight Engineers and Motormen (through freight)	41	50	41	56	65	77	83	94	79	89
12	123	Road Freight Engineers and Motormen (local and way freight)	14	11	7	4	4	6	9	12	8	8
13	124	Yard Engineers and Motormen	22	17	13	16	15	18	22	26	22	25
14	125	Road Passenger Firemen and Helpers	23	22	19	20	19	20	26	25	23	22
15	126	Road Freight Firemen and Helpers (through freight)	41	50	42	72	85	97	97	114	98	111
16	127	Road Freight Firemen and Helpers (local and way freight)	14	11	7	6	6	9	10	13	8	9
17	128	Yard Firemen and Helpers	20	16	12	19	21	26	24	28	22	24
18	907	TOTAL (Transportation - Train and Engine)	503	508	414	547	600	687	761	862	744	809

NO. (a)	DIVISION NUMBER (b)	REPORTING DIVISION (c)	1930 (d)	1931 (e)	1932 (f)	1933 (g)	1934 (h)	1935 (i)	1936 (j)	1937 (k)	1938 (l)	19 (m)
1	111	Road Passenger Conductors	20	19	16	13	14	15	19	19	17	1
2	113	Road Freight Conductors (through freight)	31	37	32	38	44	53	57	65	55	5
3	114	Road Freight Conductors (local and way freight)	13	11	7	4	3	6	7	9	7	
4	115	Road Passenger Baggagemen	-	-	-	-	-	-	-	-	3	
5	116	Road Passenger Brakemen and Flagmen	35	31	27	30	31	31	34	38	33	2
6	117	Road Freight Brakemen and Flagmen (through freight)	91	111	97	166	184	197	220	239	210	24
7	118	Road Freight Brakemen and Flagmen (local and way freight)	34	30	18	14	13	20	26	32	25	2
8	119	Yard Conductors and Yard Foremen	19	16	13	12	12	17	19	24	18	2
9	120	Yard Brakemen and Yard Helpers	59	48	40	58	64	74	81	95	89	9
10	121	Road Passenger Engineers and Motormen	26	28	23	19	20	21	27	29	27	2
11	122	Road Freight Engineers and Motormen (through freight)	41	50	41	56	65	77	83	94	79	8
12	123	Road Freight Engineers and Motormen (local and way freight)	14	11	7	4	4	6	9	12	8	
13	124	Yard Engineers and Motormen	22	17	13	16	15	18	22	26	22	2
14	125	Road Passenger Firemen and Helpers	23	22	19	20	19	20	26	25	23	2
15	126	Road Freight Firemen and Helpers (through freight)	41	50	42	72	85	97	97	114	98	11
16	127	Road Freight Firemen and Helpers (local and way freight)	14	11	7	6	6	9	10	13	8	
17	128	Yard Firemen and Helpers	20	16	12	19	21	26	24	28	22	2
18	907	TOTAL (Transportation - Train and Engine)	503	508	414	547	600	687	761	862	744	80

		RECAPITULATION OF LINES 1 TO 18 DIVISION NOS. 111 TO 128.										
19	121 & 125	Enginemen - passenger service	49	50	42	39	39	41	53	54	50	4
20	122 & 126	Enginemen - through freight service	82	100	83	128	150	174	180	208	177	20
21	123 & 127	Enginemen - local freight service	28	22	14	10	10	15	19	25	16	1
22	124 & 128	Enginemen - yard service	42	33	25	35	36	44	46	54	44	5
23	111, 115 & 116	Trainmen - passenger service	55	50	43	43	45	46	53	57	53	4
24	113 & 117	Trainmen - through freight service	122	148	129	204	228	250	277	304	265	29
25	114 & 118	Trainmen - local freight service	47	41	25	18	16	26	33	41	32	3
26	119 & 120	Trainmen - yard service	78	64	53	70	76	91	109	119	107	11
27	907	TOTAL (Transportation - Train and Engine)	503	508	414	547	600	687	761	862	744	80

Defendant's Exhibit No. 314 (Witness B.S. Sines)
Apr. 9, 1941

ATCHISON, TOPEKA & SANTA FE RAILWAY COMPANY

FREIGHT TONNAGE RATINGS OF LOCOMOTIVES
BETWEEN NEEDLES, CALIFORNIA AND CLOVIS, NEW MEXICO

BETWEEN NEEDLES AND SELIGMAN

WESTWARD	CLASS OF POWER 9-1600 1674-3010 Tons (a)	1950 Tons (b)	1798 3160 Tons (c)	3129 Tons (d)	3800 3900 Tons (e)	5001 Tons (f)
Seligman to Pica	1900	1450	1750	1600	2700	3000
Pica to Yampai	1700	1250	1500	1400	2100	2400
Yampai to Needles	3000	2000	2500	2400	3500	3750
EASTWARD						
Needles to Topock	2300	1600	2100	2000	3000	3250
Topock to Louise	1600	1100	1400	1300	2050	2350
Louise to Hackberry	1700	1200	1500	1400	2200	2450
Hackberry to Yampai	1600	1100	1350	1300	2050	2350
Yampai to Seligman	2200	1500	1700	1650	3000	3500

BETWEEN SELIGMAN AND BELEN

WESTWARD	CLASS OF POWER 5001 Tons (a)	3800 Tons (b)	1674 Tons (c)	900 1600 3010 Tons (d)	1798 3160 Tons (e)	3129 Tons (f)	1950 Tons (g)	3700 Tons (h)	1309 1337 3500 Tons (i)
Belen to Dalies	-	2300	1650	1650	1400	1350	1250	1350	1000
Dalies to Gonzales	-	4000	3000	3000	2800	2500	1800	2400	1300
Gonzales to Winslow	-	CL	CL	CL	CL	CL	CL	CL	CL
Winslow to Riordan	2300	2000	1650	1600	1350	1300	1050	1150	825
Riordan to Williams	2300	2150	1700	1650	1400	1350	1100	1175	875
Williams to Seligman	2300	2000	1650	1600	1350	1300	1050	1150	825
EASTWARD									
Seligman to Ash Fork	2300	2000	1700	1650	1350	1300	1100	1175	850
Ash Fork to Williams	1650	1600	1300	1250	900	875	775	875	625
Williams to Nevin	2300	2000	1700	1650	1350	1300	1100	1175	850
Nevin to Riordan	2300	2500	1900	1850	1500	1450	1300	1200	900
Riordan to Winslow	CL	CL	CL	CL	CL	CL	2000	2000	1600
Winslow to Gonzales	-	4000	2900	2900	3100	2500	1600	2400	1300
Gonzales to Belen	-	4000	3200	3100	3400	2600	2150	2400	1350

BETWEEN BELEN AND CLOVIS

	CLASS OF POWER 1000	900

	(a)	(b)	(c)	(d)	(e)	(f)
Seligman to Pica	1900	1450	1750	1600	2700	3000
Pica to Yampai	1700	1250	1500	1400	2100	2400
Yampai to Needles	3000	2000	2500	2400	3500	3750
EASTWARD						
Needles to Topock	2300	1600	2100	2000	3000	3250
Topock to Louise	1600	1100	1400	1300	2050	2350
Louise to Hackberry	1700	1200	1500	1400	2200	2450
Hackberry to Yampai	1600	1100	1350	1300	2050	2350
Yampai to Seligman	2200	1500	1700	1650	3000	3500

BETWEEN SELIGMAN AND BELEN

	CLASS OF POWER								
	5001 Tons	3800 Tons	1674 Tons	900 1600 3010 Tons	1798 3160 Tons	3129 Tons	1950 Tons	3700 Tons	1309 1337 3500 Tons
WESTWARD	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
Belen to Dalies	-	2300	1650	1650	1400	1350	1250	1350	1000
Dalies to Gonsales	-	4000	3000	3000	2800	2500	1800	2400	1300
Gonsales to Winslow	-	CL	CL	CL	CL	CL	CL	CL	CL
Winslow to Riordan	2300	2000	1650	1600	1350	1300	1050	1150	825
Riordan to Williams	2300	2150	1700	1650	1400	1350	1100	1175	875
Williams to Seligman	2300	2000	1650	1600	1350	1300	1050	1150	825
EASTWARD									
Seligman to Ash Fork	2300	2000	1700	1650	1350	1300	1100	1175	850
Ash Fork to Williams	1650	1600	1300	1250	900	875	775	875	625
Williams to Nevin	2300	2000	1700	1650	1350	1300	1100	1175	850
Nevin to Riordan	2300	2500	1900	1850	1500	1450	1300	1200	900
Riordan to Winslow	CL	CL	CL	CL	CL	CL	2000	2000	1600
Winslow to Gonsales	-	4000	2900	2900	3100	2500	1600	2400	1300
Gonsales to Belen	-	4000	3200	3100	3400	2600	2150	2400	1350

BETWEEN BELEN AND CLOVIS

	CLASS OF POWER										
	1000 1050 1200 Tons	1309 1337 Tons	1400 Tons	1800 Tons	900 1600 1674 Tons	3800 Tons	3160 4000 Tons	5000 5001- Tons	3430 Tons	3450 Tons	3700 3750 Tons
WESTWARD	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
Clovis to Vaughn	1400	1500	700	1800	3700	3900	3500	4750	1800	3000	3200
Vaughn to Mountainair	1400	1500	700	1800	3700	4000	3500	4750	1800	3000	3200
Mountainair to Belen	3000	3100	1500	4500	5000	5000	5000	6000	4500	5000	5000
EASTWARD											
Belen to Mountainair	1000	1100	500	1300	2200	2500	1800	6000#	1300	1600	1700
Mountainair to Vaughn	1600	1700	800	2500	4500	5000	4500	6000	2500	4000	4300
Vaughn to Clovis	1600	1700	800	2500	4500	5000	4500	6000	2500	4000	4300

= Helper

CL = Car Limit

Defendant's Exhibit No. 315 (Witness B.S. Sines)

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY - LOCOMOTIVE MILEAGE
YUMA, ARIZONA TO EL PASO, TEXAS
FOR PERIOD JUNE AND AUGUST, 1938

LINE NO.	TYPE OF LOCOMOTIVE (a)	ACTUAL LOCOMOTIVE MILES (b)	REDISPATCHED LOCOMOTIVE MILES (c)
1	Mogul	296	120
2	Consolidation 9, 10	3,958	3,122
3	Mikado 2, 4	2,764	298
4	Mikado 5 - 9	71,324	13,884
5	Pacific 12	456	341
6	Mountain 1 - 5	3,738	1,126
7	F - 1	155,239	27,036
8	F 3 - 5	81,877	10,437
9	SP 1 - 3	221,619	64,916
10	AC 8	-	277,153
11	TOTAL	541,271	398,433
12	SAVING FOR PERIOD		142,838
13	SAVING FOR YEAR - Saving for period expanded in ratio of 17.89% to 100.00%		798,424

5913

Defendant's Exhibit No. 316 (Witness B.S. Sines)
Apr. 9, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY - LOCOMOTIVE MILEAGE
YUMA, ARIZONA TO EL PASO, TEXAS
FOR PERIOD APRIL 4TH TO APRIL 30TH, 1940
ACTUAL OPERATION COMPARED WITH REDISPATCHED OPERATION
WITH NO RESTRICTION AND USING AC POWER AND LONG SIDINGS.

LINE NO.	TYPE OF LOCOMOTIVE (a)	ACTUAL LOCOMOTIVE MILES (b)	REDISPATCHED LOCOMOTIVE MILES (c)
1	Consolidation 9, 10	280	280
2	Mikado 2, 4	149	149
3	Mikado 5 - 9	17,762	5,074
4	Pacific 5, 11, 12	96	374
5	Mountain 1 - 5	1,649	551
6	F 1	21,443	248
7	F 3 - 5	110,488	22,805
8	SP 1 - 3	132,419	27,635
9	AC 8	-	164,762
10	TOTAL	284,286	222,678
11	SAVING FOR PERIOD	61,608	

5914

Defendant's Exhibit No. 317 (Witness B.S. Sines)
Apr. 9, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY - LOCOMOTIVE SHOP REPAIRS
YUMA, ARIZONA TO EL PASO, TEXAS
FOR PERIOD JUNE AND AUGUST, 1938

LINE NO.	TYPE OF LOCOMOTIVE (a)	ACTUAL LOCOMOTIVE MILES (b)	SHOP REPAIR COST PER MILE (CENTS) (c)	TOTAL SHOP REPAIRS FOR PERIOD (d)	REDISPATCHED LOCOMOTIVE MILES (e)	SHOP REPAIR COST PER MILE (CENTS) (f)	TOTAL SHOP REPAIRS FOR PERIOD (g)
1	Mogul	296	10.01	$ 29.63	120	10.01	$ 12.01
2	Consolidation 9, 10	3,958	12.96	512.96	3,122	12.96	404.61
3	Mikado 2, 4	2,764	14.35	396.63	298	14.35	42.76
4	Mikado 5 - 9	71,324	13.73	9,792.79	13,884	13.73	1,906.27
5	Pacific 12	456	13.36	60.92	341	13.36	45.56
6	Mountain 1 - 5	3,738	13.36	499.40	1,126	13.36	150.43
7	F - 1	155,239	13.36	20,739.93	27,036	13.36	3,612.01
8	F 3 - 5	81,877	16.67	13,648.90	10,437	16.67	1,739.85
9	SP 1 - 3	221.619	19.24	42,639.50	64,916	19.24	12,489.84
10	AC 8	-	-	-	277,153	22.18 #	61,472.54
11	TOTAL	541,271	-	$88,320.66	398,433	-	$81,875.88
12	SAVING FOR PERIOD						$6,444.78
13	SAVING FOR YEAR (SAVING FOR PERIOD EXPANDED IN RATIO OF 17.89% TO 100.00%)						$36,024.48

Defendant's Exhibit No. 318 (Witness B.S. Sines)
Apr. 9, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY - LOCOMOTIVE SHOP REPAIRS
YUMA, ARIZONA TO EL PASO, TEXAS
FOR PERIOD APRIL 4TH TO APRIL 30TH, 1940
ACTUAL OPERATION COMPARED WITH REDISPATCHED OPERATION
WITH NO RESTRICTION AND USING AC POWER AND LONG SIDINGS

LINE NO.	TYPE OF LOCOMOTIVE	ACTUAL LOCOMOTIVE MILES	SHOP REPAIRS COST PER MILE (CENTS)	TOTAL SHOP REPAIRS PERIOD	REDISPATCHED LOCOMOTIVE MILES	SHOP REPAIR COST PER MILE (CENTS)	TOTAL SHOP REPAIRS FOR PERIOD
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
1	Consolidation 9, 10	280	12.96	$ 36.29	280	12.96	$ 36.29
2	Mikado 2, 4	149	14.35	21.38	149	14.35	21.38
3	Mikado 5 - 9	17,762	13.73	2,438.72	5,874	13.73	806.50
4	Pacific 5 - 12	96	13.36	12.83	374	13.36	49.97
5	Mountain 1 - 5	1,649	13.36	220.31	551	13.36	73.61
6	F-1	21,443	13.36	2,864.78	248	13.36	33.13
7	F 3 - 5	110,488	16.67	18,418.35	22,805	16.67	3,801.59
8	SP 1 - 3	132,419	19.24	25,477.42	27,635	19.24	5,316.97
9	AC - 8	-	-	-	164,762	22.18	36,544.21
10	TOTAL	284,286	-	$49,490.08	222,678	-	$46,683.65
11	SAVING FOR PERIOD					$2,806.43	

5916

Plaintiff's Exhibit No. 321 (Witness Check) Ex. No. 321 (Witness Check)

SOUTHERN PACIFIC COMPANY—PACIFIC LINES

TIME RETURN AND DELAY REPORT OF ENGINE AND TRAIN EMPLOYES

DIVISION Tucson STATION 2 (FOR YARD CREWS ONLY) 3 (FOR YARD CREWS ONLY) PARTICULAR LOCATION OR YARD 4 YARD CREW OR RUN NO. P 14 TRAINMEN 5 CONDR 6 DATE 7/12 '48 REPORT NO. 8

1	FIRST WENT ON DUTY PLACE 9	DATE 9A	TIME 11	FINALLY WENT OFF DUTY PLACE 14	DATE 14A	TIME 16	TOTAL TIME ON DUTY 17	TOTAL TIME 18	TIME CLAIMED 19	PUTTYCHING 20	21	NAMES FIRST NAMES TO BE SHOWN IN FULL AS CONDUCTED DO NOT USE INITIALS 21	SPACE FOR TIMEKEEPING DURING 27 S.T.	28 A.T.	29 CREDIT.
Mt	Tuc 7/12	6	Yuma 7/12	130	730	730	1442	394				Cond G J Shaw			
"	"	"	"	"	"	"	"	"				H CW McCorkle			
"	"	"	"	"	"	"	"	"				R C A Ferguson			

RELEASED 28 Foster S Haynes 7/12 906-737 29 CAUSE OF DELAY P Check E Davis

30 TIME OUT FOR MEALS TO DATE 6 12 6 10 6 10 6 10 6 10 31 TRAIN COUPLED TOGETHER AT 32 ENGINES ON 33 AIR TESTED AT 34 ENGINES ASSIGNED DESIGNATED POINT FINAL TERMINAL DELAY DOUBLE 35 5-TONS PAY PENALTY AT DOUBLE-ARMY-FOOD-ARMS TERMINAL OR TURN-POINT

PUSH-TOW-TUC DIV-TT
5.054 (294) 14.86
3.633 (294) 10.68
3.633 (294) 10.68

36 TRAIN NO.	37 ENGINE NO.	DEPARTURE 38 STATION	39 TIME WENT ON DUTY	40 TIME TRAIN DEPARTED	ARRIVAL 41 STATION	42 TIME TRAIN ARRIVED	43 TIME ENGINE ARRIVED	44 TIME WENT OFF DUTY	45 TIME TAKEN (Hrs. of Service)	46 TIME TABLE MILES	47 No. Cars & Tons Lbs.	Loads	Mty.
3	#356	Tucson	6	620	Yuma	1220	1220	130	Pax	294	18		
	#334	Phx			Yuma				Mex Pax	13			

35-CHARGE PAYROLL DESTINATION TO 36-CONDUCTOR'S NAME AS IT SHOULD BE SIGNED G J Shaw Condr

DELAY REPORT

50 NAME	DURATION OF DELAY 51 FROM	51 TO	52 CLAIMED TIME	REMARKS
Tuc.	6	628	3	Arr Yuma Eng Rel
Co. Ext.	736	738	2	Mt Ex
Chandler		718		
Mesa	842	853	8	Mt No 4
Tempe	902	904	2	Mt E
Phoenix	920	945	6	Eng Arr Eng 945
Buckeye		918		
Arlington	1027	1030	13	Ext Rel Eng Arr
Hyder	1127	1132	3	Ex m
Wellton	1218	1227		Ex E

54 INSTRUCTIONS

1. The report shall be rendered for all crews and train service, including yard crews, helper crews, wreck crews, dead head crews, work train crews, and all others, whether paid by the hour, day, week, month or mileage basis. The report shall be rendered by the conductor for the crew and by the engineman for the engine crew and by the fireman or assistant if and if employed, and by the flagman or brakeman if and if employed, for each assigned service performed by each.

2. The report shall be dated as of the date on which the employee goes on duty.

3. Under "Remarks" shall be shown any explanation of the items of delay. If any employee is detained from duty for any period between the time he is relieved from duty and the time specified in the call for the next service, the time of such detention shall also be shown under "Remarks," giving the time at which the relief is given, the time at which the call was issued, and the time at which it was received. Time of delay to crews in transfer service, and crews and engines in wreck service, shall also be shown. Time of delay to any part of a train or engine by reason of the failure of any part of the train or engine, or by reason of the loading or unloading of the train, shall be shown, stating the cause of the delay, the name of the employee responsible for the delay, or the name of the employee reporting the delay.

4. Whenever time is shown A. M. or P. M. shall be given.

5. In reporting delays the names of each delay or the time each is terminated, the name of a train shall be given. Delays due to different causes shall be shown separately.

6. All delays to passenger trains shall be shown, on the regular basis of ten minutes or more, on each engine and on the caboose. Delays to yard and switching crews shall be shown.

7. When any delay is claimed against the Company, the employee shall give to the Division Superintendent or his representative, at the time of the delay, a written statement of the cause of the delay.

8. If any employee is relieved for any reason from duty at a point other than his home terminal, he shall report to the Division Superintendent or his representative at the point where relieved.

| | | |

Superior Court, Pima Co., Arizona
State v. S.P. Co., No. 20087

Plaintiff's Exhibit No. 322 (Witness Cheek)

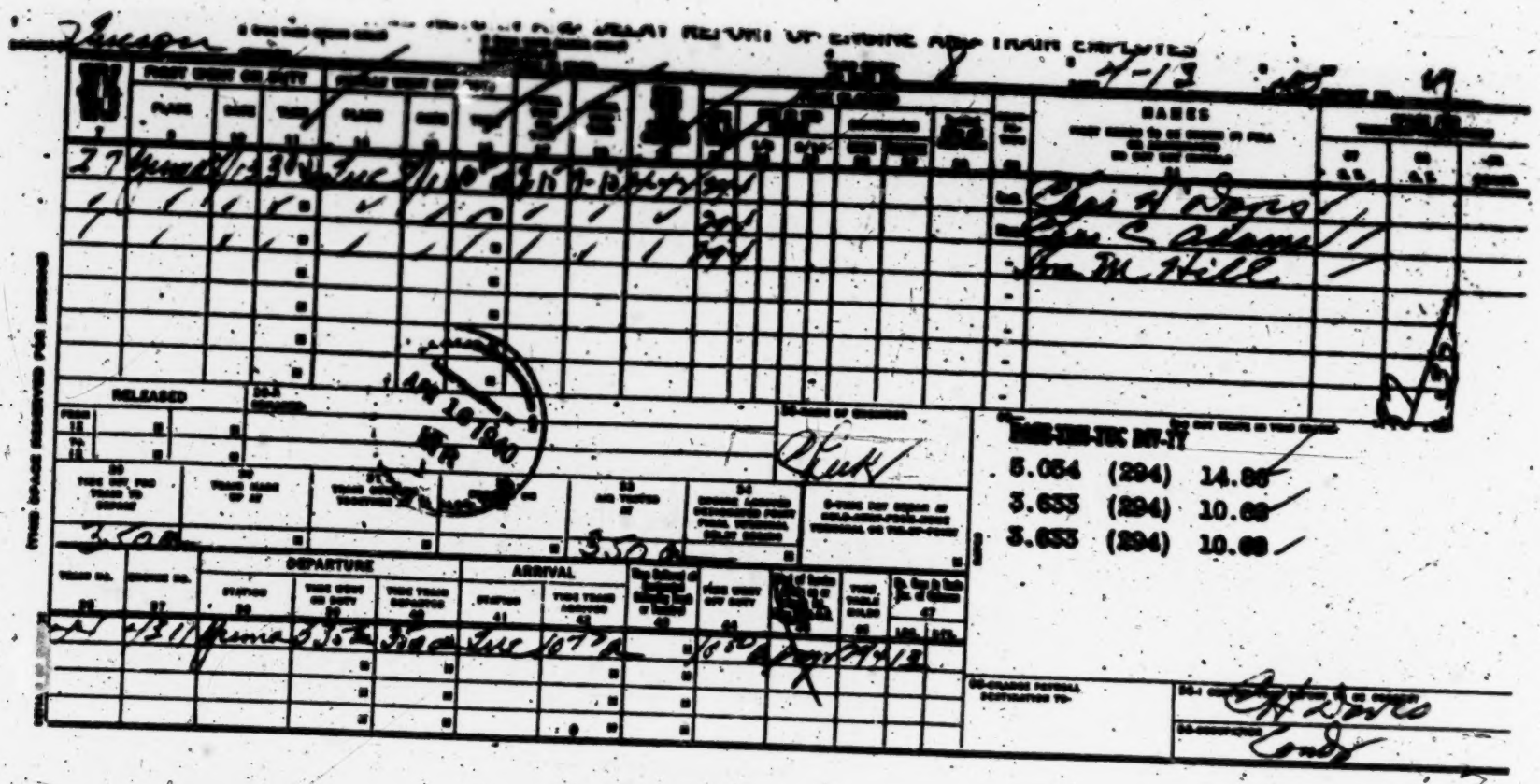
Pl. Ex. No. 322 Witness CHEEK

SOUTHERN PACIFIC COMPANY—PACIFIC LINES

TIME RETURN AND DELAY REPORT OF ENGINE AND TRAIN EMPLOYES

Tucson — 4-13 — 9

| | | |



DELAY REPORT

PLACE	DURATION OF DELAY			
Hayden	8:45	9:45	3	Water
Parker	7:50	8:37	7	Awaiting Train
Blythe				Pilot
Mill Creek	8:21	8:45	4	Eng 3
Parker	12:47	1:47	3	Water

5918

Apr. 14, 1941

T

MONTHLY REPORT OF RAILWAY ACCIDENTS

TO THE BUREAU OF STATISTICS
INTERSTATE COMMERCE COMMISSION

SHEET No. 89

Name of reporting carrier (1): SOUTHERN PACIFIC COMPANY-Pacific Lines — For the month of: APRIL 1931, 19

If "joint operation," or crossing collision, name roads involved (2): - - -

If "joint operation," name road whose superintendent is in charge of track (3): - - -

Carrier's number (4): 3390 — Carrier's division (5): Los Angeles — Date of accident (6): 19th — Time of day (7): 1005PM — I. C. C. class (8): S-j

Place of accident: Name of State (9): Cal — Nearest station (10): Flowing Well — Nearest milepost (11): 673 — Estimated distance and direction from station named (12): At

Kind of accident (13): Train Service — Clear, cloudy, or foggy? (14): Clear — Raining or snowing? (15): Neither — Daylight or dark? (16): Dark

Cause (briefly) (17): Thrown off balance in caboose due to undesired emergency application

Kind of train	Train No. (18a)	Number of cars in train (18b)	Engine Nos. (19)	Direction (20)	Speed (21)	
Frt.	Extra	125	5002	West	20	m. p. h.

(22) Method of operation: ____ (23) Number of main tracks: ____

(Answers to questions 22 and 23 required only in connection with collisions)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45

I. C. C. use only

(24) DETAILS OF CASUALTIES TO PERSONS

Name and address of person (a)	Class of person (b)	I. C. C. use only 29	30	31	32	33	Killed or nature and extent of injuries (c)	I. C. C. use only 34	35	36	Days disability A=Actual P=Probable (d)
Wm. H. Hausman, 40-M-M, Indio, Cal.	Brakeman A-137						Right arm bruised above elbow.				P-30
A TRUE COPY											

NAME OF ROAD	(a) Equipment	(b) Way and Structures	(c) Clearing Wreck	(d) Total
	$	$	$	$
TOTAL				

(26) Detail of cause, nature, and circumstances of accident; responsibility and experience of employees responsible.

While descending the Iris Hill, to control speed of train

Cause (briefly) (17) Thrown off balance in caboose due to undesired emergency application

Kind of train	Train No. (18a)	Number of cars in train (18b)	Engine Nos. (19)	Direction (20)	Speed (21)
Frt.	Extra	125	5002	West	20 m. p. h.

(22) Method of operation

(Answers to questions 22 and 23 required only in connection with collisions) (23) Number of main tracks

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45

I. C. C. use only

(24) DETAILS OF CASUALTIES TO PERSONS

Name and address of person (a)	Class of person (b)	I. C. C. use only 29	30	31	32	33	Killed or nature and extent of injuries (c)	I. C. C. use only 34	35	36	Days disability A = Actual P = Probable (d)
Wm. L. Hausman, 40-M-M, Indio, Cal.	Brakeman A-137						Right arm bruised above elbow.				P-30

A TRUE COPY

NAME OF ROAD	(a) Equipment	(b) Way and Structures	(c) Clearing Wreck	(d) Total
	$	$	$	$
TOTAL				

(26) Detail of cause, nature, and circumstances of accident; responsibility and experience of employees responsible.

While descending the Iris Hill, to control speed of train engineer placed automatice brake valve in lap position for a few seconds and just as he started to make a service application, brakes suddenly went into and undesired emergency, causing a sudden and abrupt stop on the rear end, resulting in Brakeman Hausman, who was seated on bench on south side of caboose,

(Signature) (ORIGINAL SIGNED) E. F. DONNATIN (Title) SUPERINTENDENT

Form T

(SEE INSTRUCTIONS ON REVERSE OF SHEET) (over) 5919 12—1033

(SPACE BELOW AVAILABLE FOR RETURNS)

ICC -Form #"T"-#2

b ng thrown against the desk and to floor, sustaining injuries shown. As no report of the undesired action was made on arrival of train at Indio, no examination of train was made to locate cause.

INSTRUCTIONS REGARDING ENTRIES ON FACE OF THIS SHEET

(References are to sections of the Commission's Rules governing Monthly Reports of Railway Accidents, 1922 Revision)

1. The significant words in the name of the reporting carrier should be given in full, so far as practicable.

2 and 3. Concerning train accidents occurring on terminal or other track operated jointly or in common, or classifiable as crossing collisions, see, respectively, sections 5, 5a, and 5b, and 8 (*e*) and (*f*) of Rules.

4. Enter the number of the accident as recorded in the carrier's operating records.

5. Enter the name of the operating division on which the accident occurred.

6. State the day of the month.

7. State the time o'clock in hours and minutes, a.m. or p.m.

8. Enter a capital letter to indicate the class (see section 20 of the Rules) and a small letter to indicate the subclass (see sections 8 to 13).

9. The customary abbreviation for the name of a State may be used.

10. Give the name of the station nearest to the place where the accident occurred (or was first discovered) and indicate whether it occurred on main track, or on yard track or sidings. This information should be given both for train accidents and train-service accidents. Main tracks within yards are not to be regarded as yard tracks. Sidings not used exclusively as passing tracks are to be regarded as yards. See section 25 of Rules.

11. The giving of the number of the milepost nearest to the place of the accident is optional; and instead of giving it in the case of either a train or a train-service accident, if the accident occurred at a station, that fact should be stated, or, if it occurred within a yard, the name or description of the yard should be given.

12. Distance, estimated in miles or rods, should be given when appropriate.

18. Show the kind of train, as freight, passenger, work, switching, etc. If light engine, state to what class of service assigned. See section 26 of Rules.

20. Give the time-table direction.

21. Give the estimated speed in miles per hour.

22. In case of a collision, show whether trains were operated under a block system at point of accident, stating specifically what method of blocking, if any, was employed.

23. Give number of main tracks in use in locality of accident.

24. (*b*) See section 31 of Rules.

INSTRUCTIONS REGARDING ENTRIES ON FACE OF THIS SHEET

(References are to sections of the Commission's Rules governing Monthly Reports of Railway Accidents, 1922 Revision)

1. The significant words in the name of the reporting carrier should be given in full, so far as practicable.

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18. Show the kind of train, as freight, passenger, work, switching, etc. If light engine, state to what class of service assigned. See section 26 of Rules.

20. Give the time-table direction.

21. Give the estimated speed in miles per hour.

22. In case of a collision, show whether trains were operated under a block system at point of accident, stating specifically what method of blocking, if any, was employed.

23. Give number of main tracks in use in locality of accident.

24. (*b*) See section 31 of Rules.

24. (*c*). See section 30 of Rules.

25. State the amount of damage to equipment (including damage to foreign cars), to other railway property, and cost of clearing wreck, with the total amount as provided. In case of a "joint-operation" accident, figures for the several items should be given for *each road involved*, the name of which should be clearly indicated. If no other road is involved, respondent may make the requisite entries on "Total" line only. See section 29 of Rules.

26. For information in general pertinent to the matter of returns, see sections 1 to 13, 17, 20, and 22 to 31 of Rules. If the space afforded on Form T is insufficient for *all* the requisite entries concerning a particular accident, blank sheets of like size, suitably identified and completed, may be attached to a single Form T containing the introductory details applicable to the accident as a whole.

U. S. GOVERNMENT PRINTING OFFICE 12—1003

5920

Plaintiff's Exhibit No. 324
Apr. 14, 1941

THLY REPORT OF RAILWAY ACCIDENTS

T

TO THE BUREAU OF STATISTICS
INTERSTATE COMMERCE COMMISSION

SHEET No. 90

Name of reporting carrier (1) Southern Pacific Co.-Pacific Lines — For the month of June 1935, 19

If "joint operation," or crossing collision, name roads involved (2) ---

If "joint operation," name road whose superintendent is in charge of track (3) ---

Carrier's number (4) 509 — Carrier's division (5) Los Angeles — Date of accident (6) 24th — Time of day (7) 11:15PM — I. C. C. class (8) S-1

Place of accident: Name of State (9) Cal. — Nearest station (10) Stoneman — Nearest milepost (11) 489 — Estimated distance and direction from station named (12) At

Kind of accident (13) Train Service — Clear, cloudy, or foggy? (14) Clear — Raining or snowing? (15) Neither — Daylight or dark? (16) Dark

Cause (briefly) (17) Thrown off balance in caboose by slack action of train.

Kind of train (18) Frt. — Train No. (18a) 826 — Number of cars in train (18b) 96 — Engine Nos. (19) 5048, 5017 — Direction (20) East — Speed (21) 30 m. p. h.

(22) Method of operation

(23) Number of main tracks

(Answers to questions 22 and 23 required only in connection with collisions)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45

I. C. C. use only

(24) DETAILS OF CASUALTIES TO PERSONS

Name and address of person (a)	Class of person (b)	I. C. C. use only 29	30	31	32	33	Killed or nature and extent of injuries (c)	I. C. C. use only 34	35	36	Days disability A=Actual P=Probable (d)
Wm. F. Hausman, 48-K-M, LosAngeles, Cal.	Brakeman A-118						Bruised ribs and side. 3/15/1923				P-21

A TRUE COPY

(24) COST	NAME OF ROAD	(a) Equipment	(b) Way and Structures	(c) Clearing Wreck	(d) Total
		$	$	$	$

accident (13) [illegible] or foggy? (14) Clear raining or snowing? (15) Neither Daylight or dark? (16) Dark

Cause (briefly) (17) Thrown off balance in caboose by slack action of train.

Kind of train: Frt. | Train No. (18a): 826 | Number of cars in train (18b): 96 | Engine Nos. (19): 5048, 5007 | Direction (20): East | Speed (21): 30 m. p. h.

(22) Method of operation

(Answers to questions 22 and 23 required only in connection with collisions) (23) Number of main tracks

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45

I. C. C. use only

(24) DETAILS OF CASUALTIES TO PERSONS

Name and address of person (a)	Class of person (b)	I. C. C. use only 29	30	31	32	33	Killed or nature and extent of injuries (c)	I. C. C. use only 34	35	36	Days disability A=Actual P=Probable (d)
Wm. H. Hausman, 48-k-M, LosAngeles, Cal.	Brakeman A-118						Bruised ribs and side. 3/15/1923				P-21

A TRUE COPY

NAME OF ROAD	(a) Equipment	(b) Way and Structures	(c) Clearing Wreck	(d) Total
(28) COST	$	$	$	$
TOTAL				

(26) Detail of cause, nature, and circumstances of accident; responsibility and experience of employees responsible.

Brakeman, while seated on locker seat at desk in caboose, claims he was thrown off balance by slack action, striking his side against aboose desk. There was no unusual handling of train, no defects in equipment, and accident was due to failure of brakeman to properly protect himself while riding over district with which he was thoroughly familiar.

(ORIGINAL SIGNED)

(Signature) C. F. DONNATIN (Title) SUPERINTENDENT

Form T

(SEE INSTRUCTIONS ON REVERSE OF SHEET)

5921

13—1000

INSTRUCTIONS REGARDING ENTRIES ON FACE OF THIS SHEET

(References are to sections of the Commission's Rules governing Monthly Reports of Railway Accidents, 1922 Revision)

1. The significant words in the name of the reporting carrier should be given in full, so far as practicable.

2 and 3. Concerning train accidents occurring on terminal or other track operated jointly or in common, or classifiable as crossing collisions, see, respectively, sections 5, 5*a*, and 5*b*, and 8 (*e*) and (*f*) of Rules.

4. Enter the number of the accident as recorded in the carrier's operating records.

5. Enter the name of the operating division on which the accident occurred.

6. State the day of the month.

7. State the time o'clock in hours and minutes, a.m. or p.m.

8. Enter a capital letter to indicate the class (see section 20 of the Rules) and a small letter to indicate the subclass (see sections 8 to 13).

9. The customary abbreviation for the name of a State may be used.

10. Give the name of the station nearest to the place where the accident occurred (or was first discovered) and indicate whether it occurred on main track, or on yard track or sidings. This information should be given both for train accidents and train-service accidents. Main tracks within yards are not to be regarded as yard tracks. Sidings not used exclusively as passing tracks are to be regarded as yards. See section 25 of Rules.

11. The giving of the number of the milepost nearest to the place of the accident is optional; and instead of giving it in the case of either a train or a train-service accident, if the accident occurred at a station, that fact should be stated, or, if it occurred within a yard, the name or description of the yard should be given.

12. Distance, estimated in miles or rods, should be given when appropriate.

13. Show the kind of train, as freight, passenger, work, switching, etc. If light engine, state to what class of service assigned. See section 26 of Rules.

20. Give the time-table direction.

21. Give the estimated speed in miles per hour.

22. In case of a collision, show whether trains were operated under a block system at point of accident, stating specifically what method of blocking, if any, was employed.

23. Give number of main tracks in use in locality of accident.

24. (*b*) See section 31 of Rules.

24. (*c*) See section 30 of Rules.

25. State the amount of damage to equipment (including damage to foreign cars), to other railway property, and cost of clearing wreck, with the total amount as provided. In case of a "joint-operation" accident, figures for the several items should be given for *each road involved*, the name of which should be clearly indicated. If no other road is involved, respondent may make the requisite entries on "Total" line only. See section 29 of Rules.

26. For information in general pertinent to the matter of returns, see sections 1 to 13, 17, 20, and 22 to 31 of Rules. If the space afforded on Form T is insufficient for *all* the requisite entries concerning a particular accident, blank sheets of like size, suitably identified and completed, may be attached to a single Form T containing the introductory details applicable to the accident as a whole.

Form T U. S. GOVERNMENT PRINTING OFFICE 12—1003

5922

Plaintiff's Exhibit No. 325
Apr. 15, 1941

FORM No. 195

MONTHLY REPORT OF RAILWAY ACCIDENTS

ARIZONA CORPORATION COMMISSION

SHEET No. ACC #8607

Carrier (1) Southern Pacific Company - Pacific Lines For the month of October, 1937

If "joint operation," or crossing collision, name roads involved (2): - - -

If "joint operation," name road whose Superintendent is in charge of track (3): - - -

Carrier's number (4)	Carrier's division (5)	Date of accident (6)	Time of day (7)	ICC Class (8)
661	Tucson	21st	6:35 AM	S-3

Place of accident (9)	Nearest station (10)	Nearest milepost (11)	Estimated distance and direction from station named (12)
Ariz	Yuma Yard	733	At

Kind of accident (13)	Clear, cloudy or foggy? (14)	Raining or snowing? (15)	Daylight or dark? (16)
Train Service	Clear	No	Day

Cause (briefly) (17) Automatic train brakes went into undesired emergency, causing rough stop

Kind of train (18)	Thru Train No. (18A)	Number of cars in train (18B)	Engine Nos. (19)	Direction (20)	Speed (21)
Frt.	Extra	122	5025	East	12 m. p. h.

(22) Method of operation (23) Number of main tracks

(Answers to questions 21 and 22 required only in connection with collisions.)

(24) DETAILS OF CASUALTIES TO PERSONS

Name and address of person (a)	Class of person (b)	Killed or nature and extent of injuries (c)	Days disability. (If killed, so state) Actual (d)	Probable (e)
O. C. Klaus (49)	A-113	Left hip and shoulder bruised, left	P-21	
M.M. - 733 Woodbury Road	Road Frt.	wrist sprained	4-27-20	
Altadena, Calif.	Conductor			
W. H. Hausman (52)	A-117	Nose badly cut and bruised, 2 ribs	P-14	
M.M. - 2684 Thorpe St.,	Road Frt.	fractured, left knee sprained	3-15-23	
Los Angeles, Calif.	Brakeman			

(25) COST

NAME OF ROAD	(a) Equipment	(b) Way and Structures	(c) Clearing Wreck	(d) Total
	$	$	$	$
		None	None	None

Kind of accident (13): Train Service | Clear, cloudy or foggy? (14): Clear | Raining or snowing? (15): No | Daylight or dark? (16): Day

Cause (briefly) (17): Automatic train brakes went into undesired emergency, causing rough stop

Kind of train (18): Thru Frt. | Train No. (18A): Extra | Number of cars in train (18B): 122 | Engine Nos. (19): 5025 | Direction (20): East. | Speed (21): 12 m.p.h.

(22) Method of operation

(Answers to questions 21 and 22 required only in connection with collisions.) (23) Number of main tracks

(24) DETAILS OF CASUALTIES TO PERSONS

Name and address of person (a)	Class of person (b)	Killed or nature and extent of injuries (c)	Days disability. (If killed, so state) Actual (d)	Probable (e)
O. C. Klaus (49) M.M. - 733 Woodbury Road Altadena, Calif.	A-113 Road Frt. Conductor	Left hip and shoulder bruised, left wrist sprained	P-21 4-27-20	
W. H. Hausman (52) M.M. - 2684 Thorpe St., Los Angeles, Calif.	A-117 Road Frt. Brakeman	Nose badly cut and bruised, 2 ribs fractured, left knee sprained	P-14 3-15-23	

(25) COST

NAME OF ROAD	(a) Equipment	(b) Way and Structures	(c) Clearing Wreck	(d) Total
TOTAL	None	None	None	None

(26) Detail of cause, nature, and circumstances of accident; responsibility and experience of employees responsible; estimate and description of damage to railway property. (With regard to collisions involving any question of train orders, it should be stated whether a "19" order or a "31" order was used.)

Train consisted of 122 empties, and engineer made a kick-off, prior to making service application preparatory to making final stop in Yard, and as he moved brake handle over, got only a short preliminary exhaust, train brakes going into undesired emergency, causing a rough stop on rear of train as slack ran in, throwing Condr Klaus, rear Brakeman Hausman and swing Brakeman J. A. Sutton down in caboose, resulting above injuries to Klaus and Hausman; Sutton sustained slight injury to right knee and back of head, and was not incapacitated.

(Signature) Wm. Wilson, (Title) Superintendent

(SEE INSTRUCTIONS ON REVERSE OF SHEET)

INSTRUCTIONS REGARDING ENTRIES ON FACE OF THIS SHEET

This Report Must Be Rendered Monthly to the ARIZONA CORPORATION COMMISSION, Phoenix, Arizona.
Accidents resulting in loss of life must be reported by telegraph, at the earliest possible moment.

1. The significant words in the name of the reporting carrier should be given in full, so far as practicable.

2 and 3. Concerning train accidents occuring on terminal or other track operated jointly or in common, or classifiable as crossing collisions, give full details as to rseponsibility.

4. Enter the number of the accident as recorded in the carrier's operating records.

5. Enter the name of the operating division on which the accident occurred.

6. State the day of the month.

7. State the time o'clock in hours and minutes, a.m. or p.m.

8. Enter a capital letter to indicate the class and a small letter to indicate the subclass.

10. Give the name of the station nearest to the place where the accident occurred (or was first discovered) and indicate whether it occurred on main track, or on yard track or sidings. This information should be given both for train accidents and train-service accidents. Main tracks within yards are not to be regarded as yard tracks. Sidings not used exclusively as passing tracks are to be regarded as yards.

11. The giving of the number of the milepost nearest to the place of the accident is optional; and instead of giving it in the case of either a train or a train-service accident, if the accident occurred at a station, that fact should be stated, or, if it occurred within a yard, the name or description of the yard should be given.

12. Distance, estimated in miles or rods, should be given when appropriate.

18. Show the kind of train, as freight, passenger, mixed, special, official, pay, work, switching, etc. If light engine, state to what class of service assigned.

20. Give the time-table direction.

21. Give the estimated speed in miles per hour.

22. In case of a collision, show whether trains were operated under a block system at point of accident, stating specifically what method of blocking, if any, was employed.

23. Give number of main tracks in use in locality of accident.

25. State the amount of damage to equipment (including damage to foreign cars), to other railway property, and cost of clearing wreck, with the total amount as provided. In case of a "joint-operation" accident, figures for the several items should be given for each road involved, the name of which should be clearly indicated. If no other road is involved, respondent may make the requisite entries on "Total" line only.

26. If the space afforded on this form is insufficient for all the requisite entries concerning a particular accident, blank sheets of like size, suitably identified and completed, may be attached to a single Form 195 containing the introductory details applicable to the accident as a whole.

5924

3111

[fol. 5925] PLAINTIFF'S EXHIBIT NO. 326. APR. 15, 1941

[fol. 5926]

WARNING

To Caretakers and Others

A freight train may start or stop suddenly at any time.

Guard against falling or being thrown over or between cars.

Avoid stepping on uncoupling lever as a break in two of train may be caused.

Failure in either case may result in your injury or death.

SOUTHERN PACIFIC LINES

In Texas and Louisiana

[fol. 5927] Sheet 1 of 8 sheets

PLAINTIFF'S EXHIBIT NO. 327

Admitted and Filed Apr. 16, 1941

Excerpts from a Volume Entitled "Santa Fe—Instructions for Operating and Maintaining Air Brake Apparatus (Form 2501 Standard)

Brake Sticking (Page 12)

As a general rule the cause for brakes sticking is due to the failure to raise the brake pipe pressure quickly above the auxiliary reservoir pressure, which must be done in order to move the triple valve parts to release position.

It is more difficult to release the brakes on a long than on a short train, and there is a difference between triple valves that stick and fail to release, and those that release with the others and reapply, or those that creep on when the brakes are not being used. The first mentioned may be due to failure to raise the brake pipe pressure promptly, or an individual triple valve having a bad packing ring; the second mentioned (which is most likely to occur on the

head end) can be due to a slight overcharge; while the third mentioned (the creeper) can only be caused by an erratic working feed valve, a closed angle cock, or the engineman moving brake valve to release and back to running position after train is charged; and with a little study of the operation of the equipment, if the experience of every day practice is made use of, much of the trouble can be anticipated and prevented.

Enginemen, Trainmen and Inspectors (Page 16)

The difference in grade over which the train may be passing when the brakes are applied—for example, one portion of the train may be on an ascending grade, when the grade would assist the brake in stopping the cars; and another portion of the train may be on a descending grade, in which case the grade would oppose the effort of the brake to stop the cars. Such a condition requires care and judgment on the part of the engineman as regards the time and manner of operating the brake to prevent as far as possible severe shocks and strains due to the action of the slack in the train.

[fol. 5928] Sheet 2 of 8 sheets

Enginemen, Trainmen and Inspectors (Page 16)

While the loss in shoe friction, or holding power, is a serious item when the speed is raised considerably, the increased work the brake will have to do to stop a car on account of the increased speed is not generally appreciated. To illustrate the latter, with all else the same if the speed of a car was increased from 10 miles per hour to 20 miles per hour the brake would have to do four times as much work to stop it. At 30 as compared with 10 miles per hour the work would be nine times as great; while at 40 as compared with 10 miles per hour the work would be sixteen times as great.

This is due entirely to the loss of friction between the shoe and wheel caused by the increase in speed.

The brake safety of a train is measured by the distance that would be required for making an unexpected stop, and the distance required will be more on a descending grade and less on an ascending grade than on the level. Dividing

the total train tonnage by the number of good brakes will give the number of tons each brake will have to control or stop.

Shocks from Application and Release (Page 17)

Shocks are caused by the difference in holding power and speed throughout the train and to consequent running of the slack. The longer the train the greater may these differences become. If the brakes are applied while the slack is stretched it will run toward the engine and the lower the speed and the heavier the application, the greater will be the shock, while if the brakes are released on a moving train the slack will run out unless some means is at hand for preventing it (see "ET Equipment" and "K Triple Valve") and will result in pulling strains on the draft gear which will be aggravated by low speed and heavy brake pipe reduction. Parts of the train being on different grades at the same time, and car loading are among the causes for one portion of the train slowing down more rapidly than another. These are conditions that have to be met, and enginemen and trainmen are expected to understand them and exercise such judgment as will prevent damaging shocks.

Train Handling (Pages 28-30)

Excess Pressure and Releasing Brakes

Excess pressure is the amount in pounds in the main res-

[fol. 5929] Sheet 3 of 8 sheets

ervoir over that in the brake pipe and auxiliary reservoirs and is required to charge and release brakes. It is indicated with brakes off or on by the difference between the two hands of the gage, provided, if brakes are applied, the brake pipe reduction does not exceed that necessary to fully apply any one or more brakes. The amount to be carried in any service will be determined by those in authority.

It follows from the foregoing that the nearer brakes are applied to full service application the more promptly will they commence to release. Also that as a light reduction results in less excess, it is more liable to be followed by brakes failing to release. Where made from standard pressure it is also likely to be followed by overcharging in the attempt to insure release. This becomes more pronounced

the longer the train. Therefore, it is undesirable as a general rule to attempt to release following a light reduction from standard pressure.

Should a light reduction be necessary to accomplish the desired results, increase it before attempting to release if the conditions will permit.

The proper length of time to leave the brake valve in release to effect a release of all brakes, and yet avoid overcharging, depends to such an extent on the conditions just explained, the length of the brake pipe and on the main reservoir volume and whether full or partial release is used, that no fixed rule can be established. Tests have demonstrated that following a full service application with a 50 car train it often takes from 6 to 10 seconds for the release wave of air to pass from the engineer's valve to the rear car.

The most common fault by far is in not leaving the brake valve handle in release position long enough. Another one is moving it back and forth between release and running position several times, this breaking up the strong flow of air and preventing the quick and considerable rise in pressure desired at the rear end, remembering that a quick raise in pressure insures more positive release than does a slow raise even if heavy. The right way is to move the handle to release, leave it there the proper length of time, then return it to running position. With very long trains it is best within 8 to 12 seconds to move to full release and back at once to running position, in order to "kick off" any head brakes which released with the others but slightly overcharged and then reapplied. Do not practice returning to release again when the signal is given to start or when approaching a hard pull as this results in overcharging and is very liable to be followed by brakes sticking.

Excess Pressure and Releasing Brakes

To release the brakes on a train of 50 cars or more the brake valve handle should ordinarily be left in full release for about 15 seconds, assuming a reasonable amount of excess pressure is available. With the information given and a knowledge of the conditions surrounding each case, it re-

quires merely the exercise of judgment on the part of the engineer to insure a prompt release and avoid overcharging. The time for releasing as given does not cover recharging.

To release the brakes upon any train, it is absolutely necessary that the brake pipe pressure be raised promptly in order to insure releasing brakes. Any method of braking that does not provide for a prompt rise of brake pipe pressure upon releasing should be discouraged; because a slow increase in brake pipe pressure will not release many brakes and if a stop is not to be made at the time of release some brakes will be left applied, contributing to overheated, cracked, broken and slid flat wheels.

Where high speeds are maintained with brakes applied, the wheel heat is generated faster than it can be radiated and the wheel heat increases until it is abnormal. When brakes are held applied for long distances, the brakes that are holding well are called upon to do the braking, and it might be possible that the pressure on the good brakes is gradually increased without making the other brakes effective if the brake pipe pressure is raised slowly and increased only a few pounds and then reduced without recharging. Continuing this operation for long distances will cause the wheels on some cars to be overheated, while other cars in the train will have the wheels cold or nearly so. The conditions are the same as would be the case if several brakes failed to release and the train was operated for a considerable distance at normal speed.

In handling trains, where brakes are used for controlling the speed, the main consideration is to maintain such a speed and sufficient pressure throughout the brake system to provide for stopping in a reasonable distance. The method of braking to provide this condition must be such that the majority of brakes in any train shall be made to do their share of braking.

When operating on light grades where braking is necessary, particularly when retaining valves are not used, care must be exercised to build up the braking power in light steps by making as light brake pipe reductions as are practical for train, grade and speed conditions, adding subsequent reductions within a few seconds following the initial reduction to make the brake application as heavy as possible without exceeding a full service application by the time a release is necessary or desirable.

Train Handling (Page 29)

Excess Pressure and Releasing Brakes

The nearer brakes are applied to full service and the quicker the application is brought about the less trouble will be experienced with brakes sticking.

The brakes should be applied gradually enough to provide for the elimination of slack action, avoiding holding on to light applications for long periods. When the brakes are applied lightly and held so there is opportunity for the brake cylinder pressure to equalize with the brake pipe pressure if any leakage exists past the emergency valve or check case gasket in the triple valve. On the other hand if the brake application is continued until the brake pipe and brake cylinder pressure equalize, and the rate of application is at the same or a greater rate than is brought about by leakage through the triple valve, the brake cylinder and auxiliary reservoir pressure will be lower, which will lessen the difficulty of releasing brakes and offset the tendency for some brakes to develop excessive brake cylinder pressure.

When the brake applications are prolonged from light reductions the brakes having full pressures develop wheel heat at a much greater rate than others which contribute to cracked plates and broken wheels.

With a 50 car train a full service application will, unless a good portion of the train is equipped with K triple valves, cause the pressure near the head end of the brake pipe to reduce about 5 pounds faster than that at the rear end. This results in the head brakes applying in advance of the rear ones, which tends to bunch the train and compress the coupler springs. In releasing with a train of this length the head brakes commence so much before those at the rear that they are practically off, so far as holding power is concerned, before the rear ones start to release, this causing the slack to run out rapidly. How serious the results may be is largely dependent on how heavily the brakes were applied, the amount the coupler springs were compressed and how slow the train is moving. The latter is very important because of the rapid increase in holding power at low speed. At low speed it is almost sure to

break the train in two unless there is retained at the head end some powerful holding power, such as is possible with straight air, or the holding feature of the ET equipment acting on the driver and tender brakes, or unless a sufficient number of K triple valves are present at the head end of the train so their retarded release feature can prevent the running out of slack.

[fol. 5932] Sheet 6 of 8 sheets

Service Braking (Page 31)

The critical time in regard to train damage from brake applications is while the slack is running in or out, as trains are seldom pulled in two, or buckled, from steady pulling or pushing strains; therefore if the slack can be kept stretched or bunched the liability of train damage from brake operations will be greatly reduced. This condition is most nearly obtained by applying the brakes far enough away to complete the stop without making a heavy brake pipe reduction, it will not require as heavy reduction to move the triple valves from lap to service on the second or any succeeding reduction as it would to move them from release to service with the first reduction.

A method that may be used to advantage is to keep the slack stretched by making the initial reduction before shutting off steam, then shut off steam gradually, the object in working steam being to prevent the slack running in as the brake application is made, which in turn will prevent severe jerks due to slack running out as the rear brakes become effective. It is undesireable to make heavy initial reductions at low speed. The objection is mainly due to the high brake shoe friction at low speed, and to the more rapid application of the head than the rear brakes, which latter occurs under all conditions with long trains but is less if the train is equipped with K triples.

(Page 32)

Draft rigging in fair to good condition is not pushed in nor pulled out. It is either driven in or jerked out, both implying a severe blow. The severity cannot be judged by any shock felt by those riding trains, particularly the engineer of a heavy locomotive. For a shock to be felt the speed must change suddenly and considerably. The amount of the instant reduction in speed or jerk of a modern freight locomotive that is necessary to cause a break-in-two is too

little to be felt as the severe shock that it is to draft rigging.

The secret of smooth train handling lies in ability to control the slack, in how to prevent it from running in or out harshly. Where so controlled no draft gear in fair to good condition will be damaged. Slack action cannot be prevented, but by enginemen acquiring knowledge of the various causes for it and exercising forethought in the use of steam, train brakes, independent engine brakes and sand, it can generally be controlled, even to the extent of avoiding further injury to damaged draft gear. The heavier the locomotive and the longer the train the greater is the care required. In train handling harsh running out of slack is the usual trouble.

[fol. 5933] Sheet 7 of 8 sheets

Instructions for Enginemen (Page 33)

Where a long train has just been started, and while the engine is working heavily, if steam is shut off suddenly and a heavy service application is made at once there is liability of driving in couplers or damaging weak cars near or ahead of the middle of the train.

When slack runs in or out rapidly one part of the train gradually attains a lower speed than the other and the shock is the result of the draft rigging having to suddenly make the speed uniform on the instant the slack is all in or out. How heavy the shock will be depends mainly on the difference in speed that must instantly be made uniform and on the weight that must suddenly be altered in speed. Weight is important, but change in speed is more so as changing it suddenly 3 m.p.h. will cause nine times more shock than will a similar quick change of 1 m.p.h.

Charging and Testing (Page 35)

Do not assume that the presence of "K" triple valves will permit of releasing long trains at low speeds. Also, do not assume that the holding power that can be retained on the engine will alone permit of this. It is a help, but has its limitations.

Short Cycle Method of Grade Braking (Page 43)

This method of braking will have to be employed when controlling trains with air alone on descending grades,

because it is the only method by which the auxiliaries can be kept charged as near the maximum as possible, the braking power and wheel heat be most uniformly distributed and developed, and most uniform speed maintained. While the short cycle method is easy to master, it differs radically from the methods practiced by enginemen who have learned mountain grade braking with hand brake assistance, the principal difference being more frequent brake applications and short holds.

Engineman's Brake Practice (Page 44)

No fixed rule can be made to cover the amount of reduction that should be made during each application, as different trains hold differently, but the engineman can determine by the result of the first few applications about how much brake power will be required to produce the desired result. Speaking generally the brakes should be [fol. 5934] applied each time the auxiliaries are recharged,

Sheet 8 of 8 sheets

Engineman's Brake Practice (Page 44)

and released as soon as the speed begins to reduce from the effect of the brake application. Where at all possible the interval between applications should not exceed 1 to 1¼ minutes, and this time should be divided as follows: 20 to 30 seconds applying and holding the brakes on, 20 to 25 seconds in release position, then move the brake valve to running position to allow the pressure to equalize throughout the train and in about 10 or 15 seconds again place the brake valve in release for a few seconds to "kick off" any triples that may have reapplied from overcharge; allow a few seconds for such triples to exhaust the brake cylinder pressure down to the value of the retainer, and make the next application. While the above will have to be varied for different trains, it will serve for a general idea of the short cycle method, and if the train is handling well no very great departure from the method suggested above will be necessary.

Overheated and Sliding Wheels. (Page 45)

While trains are in motion on descending grades trainmen must watch the wheels for signs of overheating or

sliding. If either is noticed, the retainer should be turned down—provided, however, that not more than two retainers are turned down in the portion of a train under the care of each trainman.

Trainmen should watch particularly for wheel sliding at low speed, and when starting the train from any stop while the retainers are turned up.

[fol. 5935] PLAINTIFF'S EXHIBIT No. 328

Admitted and Filed Apr. 16, 1941

Sheet 1 of 6 sheets

Excerpts from a Volume Entitled "Southern Pacific Company (Pacific Lines)—Air Brake Rules and Regulations —Governing Train Handling, Operation and Tests of Air Brake and Air Signal Apparatus—Effective February 1, 1939"

Train Handling Regulations (Page 8-9)

Smooth train handling depends on the ability to control the slack and how to prevent it from running in or out harshly. Where so controlled, no draft gear in fair to good condition will be damaged. Slack action cannot be prevented, but by acquiring knowledge of the various causes for it, and exercising forethought in the use of steam, train brakes, independent engine brake and sand, it can be controlled, even to the extent of avoiding further injury to damaged draft gear. The heavier the engine and the longer the train the greater is the care required.

When slack runs in or out one part of the train gradually attains a lower speed than the other and the shock is the result of draft gears having suddenly to make the speed uniform on the instant slack is all in or out. How heavy the shock will be depends mainly on the difference in speed that must instantly be made uniform and on the weight that must suddenly be altered in speed.

Excess pressure is the amount in pounds in the main reservoir over that in the brake pipe and auxiliary reservoirs and is required to charge brake system and release brakes. It is indicated by the difference between the hands on the air gage.

The nearer brakes are applied to full service, the more promptly will they commence to release. A light brake pipe

reduction results in less excess, and is more liable to be followed by brakes failing to release. Where made from standard pressure, a light reduction is also likely to be followed by overcharging in the attempt to insure release, and is more pronounced with longer trains.

With high pressures and large main reservoirs it is very easy to overcharge the head end of the train; many detrimen-

[fol. 5936] Sheet 2 of 6 sheets

Train Handling Regulations

(Page 9)

tal effects result, such as stuck brakes, flat and broken wheels. Many are of the impression that because the brake pipe gage shows higher than the auxiliary reservoir pressure is intended to be, that all brakes are released; as a matter of fact, this is a condition that exists only on the first few cars in the train, the pressure at the rear not having sufficiently increased to release the brakes. In fact, 25 cars back from the engine it cannot be determined whether the brake valve handle is in release or running position. With a large capacity feed valve the brake valve handle should be held in release position not to exceed 25 seconds when releasing brakes only is the object. The exceptions to this rule are when charging the brake system and braking on grades under all conditions.

(Page 10).

Where high speeds are maintained with brakes applied, the wheel heat is generated faster than it can be radiated and increases until it is abnormal. When brakes are held applied for long distances, those that are holding well are called upon to do the braking and it might be possible that the brake cylinder pressure on such cars is gradually increased without making the other brakes effective if the brake pipe pressure is slowly raised and increased only a few pounds, and then reduced without recharging. Continuing this operation will cause the wheels on some cars to be overheated, while on others they will remain cold or nearly so.

(Page 11)

Where the brakes are used for controlling speed for short distances, the main consideration is to maintain a safe speed and ample pressure throughout the brake system for

stopping in a reasonable distance. The method of braking to provide this condition must be such that the majority of brakes shall be made to do their share of braking. When brake applications are prolonged from light reductions, the brakes having greater pressures develop wheel heat at a much faster rate than others, thus contributing to cracked plates and broken wheels.

An automatic brake application will cause the brake pipe pressure to reduce faster at the head end of train than at rear. This results in the head brakes applying in advance of those at the rear, and tends to bunch the train and compress the draft gears. In releasing, the head brakes commence so much before those at the rear that, as far as holding power is concerned, they are practically off before the rear ones start to release, causing the slack to run out rapidly. Just how serious the results may be largely depends on how heavily they are applied, the amount the draft gears are compressed, and how slowly the train is

[fol. 5937] Sheet 3 of 6 sheets

Train Handling Regulations

(Pages 11-12)

moving. The latter is very important because the rapid increase in holding power at low speed, which is almost sure to break the train in two unless there is retained at the head end some powerful brake, such as retaining valves or independent brake on the engine.

The engine brake may be used to good advantage if the time necessary to gently run the slack in or out is used. This is also true when switching.

When retaining valves are used, it is practicable to release at somewhat lower speeds than when not used. While the head brakes always start to release before those at the rear, the retaining valves cause a much slower fall of brake cylinder pressure, the result being that slack runs out more gradually.

Draft gears in fair to good condition are not pushed in nor pulled out. They are either driven in or jerked out, both implying a severe shock. The severity cannot always be judged by enginemen, particularly if on a heavy engine. For a shock to be felt the speed must be changed suddenly and considerably. The amount of the instant reduction in

speed or jerk of a large engine that is necessary to cause a break-in-two is too little to be felt.

The critical time in regard to train damage from brake applications is while the slack is running in or out, as trains are not pulled in two, or buckled from steady pulling or pushing strains; therefore, if the slack can be kept stretched or bunched, the liability of train damage from brake valve manipulation will be greatly reduced. This condition is most nearly obtained by applying the train brakes far enough away to complete the stop without making a heavy reduction.

A method that may be used to advantage is to keep the slack stretched by making a light initial reduction, then closing throttle to a drifting position and keeping engine brake released. The object in working steam is to keep the slack from running in as the brake application is made, thus preventing severe jerks due to slack running out as the rear brakes become effective. It is undesirable to make a heavy initial reduction at low speed, due to the high brake shoe friction and to the more rapid application of the head brakes than those at the rear.

When make-up of train or grade conditions are such that

they would have a tendency to bunch the slack, the brakes should be operated with slack bunched. When such tendency would be to stretch the slack, the brakes should be operated with the slack stretched.

At how low speeds brakes can be released without liability of damage depends on how heavily they are applied, the amount of main reservoir pressure, the length of train, whether slack is in or out, lightly or heavily, and on whether track conditions (sags, humps, and curves) favor releasing. Engineers must exercise judgment in this, but taking all chances on the side of stopping.

Some of the most important facts relating to heavy grade braking may be summed up as follows:

(1) The brake work required for a stop increases much more rapidly than the speed.

(2) On level track the braking power is available fo stopping.

(3) On a descending grade a certain portion of th braking power is required to prevent an increase i speed.

(4) On a descending grade the work required of eac brake to maintain uniform speed increases wit the weight of the load per operative brake.

(5) The braking power available for stopping is tha in excess of what is necessary to prevent an in crease in speed.

(6) The braking power obtained from a certain brak shoe pressure always increases as the speed re duces.

(7) The longer the distance required for a stop, th more will it be lengthened by brake cylinder leak age.

Another very important factor and one which cannot be determined by the ordinary brake test, is the condition of triple valve feed grooves. If any are considerably choked with dirt, a longer time will be required to recharge their reservoirs, the train will be more difficult to control and will require greater care. For this reason, extreme care and low speed should be observed on beginning the descent.

Where conditions are similar, the ability to obtain the maximum braking power possible is dependent on brake system being charged to standard pressure, and the proper use of same.

[fol. 5939] Sheet 5 of 9 Sheets

Train Handling Regulations (Pages 17, 18-19)

While it is desired to accomplish a given amount of work with the least possible consumption of air, train safety is of the greatest importance; therefore, the speed of compressor should not be retarded at the expense of safety.

Although a standing brake test with knowledge of M per operative brake and number of cars is necessary be

fore starting, the ability to control or stop a train must be, for the sake of safety, confirmed by the first running application after passing the summit. Speed should be kept low until this is determined and later increased accordingly.

Where conditions are not favorable speed should be reduced, or if necessary, train stopped.

When using sand for the purpose of preventing wheel sliding at or near the completion of stop, it should not be started running until after the brakes are applied, to prevent sand getting between shoes and wheels. Sand once started should be continued until the train stops or brakes are finally released. Failure to accomplish this is liable to cause rather than prevent wheel sliding, as when once sliding, sand will not start them revolving but will rapidly cause large flat spots. In case of emergency, sand should be started as soon as possible.

When starting with 2 or more engines ahead, the second engineer should allow lead engineer to start the train if possible, or to almost stall before aiding him. Starting together will cause a severe shock if any slack is in.

With one or more helper engines back in the train, helper engineers must be the first to use steam in starting. The lead engineer should be prepared to start promptly and carefully before the helpers become stalled. If train cannot be so started, lead engineer should take slack back to lead helper. Then, if necessary, rear helper engineer will take slack, and lead engineer will keep the throttle open but be prepared to ease off temporarily to prevent a lunge while starting. All slacking must be done carefully.

Slipping of drivers should be avoided, as it causes severe shocks to draft gears and damage to machinery and rails. The draft springs cause the slack to change quickly, and this is usually followed by a severe shock with the renewed use of steam. Hence, when slipping is probable, sand should be used and no more throttle than necessary. The beginning of slipping will instantly reduce the steam pressure in the cylinders, and the quick and slight closing of the throttle will at once "steady" the engine without much change of slack or loss of speed. With 2 or more engines in a train, excessive slipping of one will often cause the others to slip.

Release while Running (Page 36)

Where a light application is made, it should be increased as much as practical before attempting to release. It may be necessary at times to release after a slow-down without increasing the application, but this should be avoided as far as practicable.

Air brakes on trains of 100 or more cars must not be released until train stops, except that when all cars are equipped with "AB" brakes, they may be released at speeds above 20 miles per hour.

Air brakes on trains of 75 to 100 cars must not be released until train stops unless brakes are operated with the slack stretched and speed is not below 20 miles per hour, or all cars are equipped with "AB" brakes and speed is not below 15 miles per hour.

Air brakes on trains of 50 to 75 cars must not be released at any speed below 15 miles per hour.

When retaining valves are used on trains of any length, air brakes may be released at any speed above 8 miles per hour.

After brakes are released, while running, additional steam must not be used until it is known that the slack has had time to adjust itself, and even then it must gradually be increased.

(Page 39)

The required number must be turned up solid on head end of train before beginning descent and left until train has descended the grade, except that retaining valves must be turned down on cars having overheated wheels, and an equal number turned up on other cars.

Plaintiff's Exhibit No. 334 (Witness Hardwicke)
Apr. 17, 1941

HIGHWAY GRADE CROSSING ACCIDENTS
where auto involved. Table 24
I.C.C. Accident Bulletin

ARIZONA

NEW MEXICO
1929-1939 inclusive

NEVADA

Year	Accidents	Casualties	Autos Registered.	Accidents	Casualties	Autos Registered	Accidents	Casualties	Autos Registered.
1929	17	23	109,013	20	48	78,374	4	5	31,915
1930	19	31	110,525	12	46	84,150	4	6	29,645
1931	11	23	105,572	10	21	81,325	6	12	32,168
1932	7	8	94,947	13	23	76,767	7	9	31,830
1933	8	10	89,496	6	12	76,643	4	4	28,324
1934	6	10	95,586	7	10	82,900	3	4	32,230
1935	19	28	103,122	12	19	92,457	6	12	34,858
1936	13	20	115,035	11	24	108,729	7	8	38,509
1937	9	14	129,210	15	20	118,106	3	3	40,655
1938	16	25	128,791	12	21	116,537	3	5	36,424
1939	12	23	131,355	9	20	120,441	2	2	40,771
	137	215	1,213,652	127	264	1,036,429	49	70	379,329

Accidents per 10,000 registered autos 1.12

Accidents per 10,000 registered autos 1.22

Accidents per 10,000 registered autos 1.29

5941

Plaintiff's Exhibit No. 335
Apr. 17, 1941

HIGHWAY GRADE CROSSING ACCIDENTS
Table 24 - Interstate Commerce Commission.
Accident Bulletin

Year	ARIZONA Acci-dents	Casual-ties.	Autos Regis-tered.	NEW MEXICO Acci-dents.	Casual-ties.	Autos Regis-tered.	NEVADA Acci-dents.	Casual-ties.	Autos Regis-tered.
				1929-1939 inclusive					
1929	19	20	109,013	24	58	78,374	5	6	31,915
1930	20	32	110,525	14	48	84,150	5	7	29,645
1931	14	26	105,572	10	21	81,325	6	12	32,168
1932	8	9	94,947	16	26	76,767	7	9	31,830
1933	10	12	89,496	7	13	76,643	4	4	28,324
1934	7	11	96,586	7	10	82,900	4	5	32,230
1935	20	29	103,122	13	19	92,457	7	13	34,858
1936	13	20	115,035	11	24	108,729	10	11	38,509
1937	9	14	129,210	15	20	118,106	4	4	40,655
1938	16	25	128,791	13	22	116,537	5	7	38,424
1939	14	25	131,355	10	21	120,441	4	4	40,771
	160	225	1,213,652	140	278	1,036,429	61	82	379,329
	Accidents per 10,000 registered auto's 1.25			Accidents per 10,000 registered auto's 1.35			Accidents per 10,000 registered auto's 1.6		

5942

Plaintiff's Exhibit No. 336 (Witness Hardwicke)
Apr. 17, 1941

SUPERIOR COURT, PIMA COUNTY, ARIZONA
State vs. Southern Pacific Company
No. 20087

Plaintiff's Ex. No. 336 Witness

Grade crossing accidents classified as to trains striking autos and autos running into trains. I.C.C. Accident Bulletin Table 50 - Years 1935 - 1939 inclusive.

	Struck by train	Ran into side of train
1935 -	2434	1381
1936 -	2680	1441
1937 -	2816	1515
1938 -	2270	1108
1939 -	2229	1123

5943

Plaintiff's Exhibit No. 337 (Witness Hardwicke)
Apr. 17, 1941

CASUALTIES TO NON-TRESPASSERS
Table 51
Interstate Commerce Commission
ACCIDENT BULLETINS.

	ARIZONA			NEVADA		
	Killed	Injured	Total Casualties	Killed	Injured	Total Casualties
1929	9	179	188	3	44	47
1930	16	141	157	7	33	40
1931	15	107	122	3	35	38
1932	5	63	68	2	31	33
1933	8	61	69	1	22	23
1934	6	71	77	7	28	35
1935	12	98	110	2	32	34
1936	11	99	110	9	36	45
1937	6	128	134	2	46	48
1938	7	81	88	9	53	62
#1939	7	230	237	*25	65	90

includes 140 injured in accident on Santa Fe, Grand Canyon Line.

* includes 23 killed, 30 injured in derailment at Harney, Nevada.

(Form T reports on file Arizona and Nevada)

Plaintiff's Exhibit No. 338 (Witness Hardwicke)
Apr. 17, 1941

SOUTHERN PACIFIC COMPANY
PACIFIC LINES
CASUALTIES TO EMPLOYEES — TRAIN AND TRAIN SERVICE ACCIDENTS
FREIGHT SERVICE IN THE STATE OF NEW MEXICO
Year 1930

DATE	LOCATION	TRAIN NO.	NO CARS IN TRAIN	SPEED M.P.H.	DAYS DISAB.	CLASS PERSON	NAME OF PERSON	ICC CLASS	DESCRIPTION OF ACCIDENT
1/7	Corona, N.M.	3/227	59	4	All	C	P.E. Russell	S-J	*Abrupt stop and slack action of train
2/1	Escondido, N.M.	232	47	Standing	P 40	B	C.E. Roe	S-D	Racket dey missing on hand brake
2/15	Mongoka, N.M.	Ex 3318 E	70	30	A 7	B	Roy C East	S-J	*Broken air pipe
3/27	Palomas, N.M.	2/226	18	20	P 7	F	H.W. Beasley	S-C	Jumped from engine and fell, after super heater flue had broken
3/27	Desert, N.M.	1/229	70	Standing	P-5	B	H. W. Van Stone	S-J	Stepped on piece of slag
4/28	DeVay, N.M.	Ex 3324 W	99	25	None	C	W.H. Prickett	S-J	*Air hose bursted (Bruised L.Shld)
					P 7	B	H.M. Province	S-J	(Badly sprained L. wrist)
					None	B	R.C. East	S-J	)Bruised about L. hip)
5/5	Corona, N.M.	203	57	Standing	A-8	B	W.E. Grumbles	S-J	Post fell on foot
6/13	Alamagordo, N.M.	201	89	Standing	A-5	F	W.G. Roswell	S-C	Poppet valve on stoker opened
8/9	High Rolls, N.M.	213	18	8	P-30	B	Spencer Gates	S-G	Foot slipped on ground
12/24	Luna, N.M.	Ex.3657	70	7	P 20	C	R.R. Sale	S-J	Derailment caused by train striking hatch cover on track

YEAR 1931

1/14	Deming N.M.	Ex 366W	100	10	A-14	E	M.E. Shemeley	S-C	Struck back of finger on some object
2/21	Hargis, N.M.	2/226	60	12	P-20	B	Wm. Gebo	S-G	Claims stepped in hole getting off train-sprain

5945

5946

Sheet 2 of 7 sheets

DATE	LOCATION	TRAIN NO.	No.Cars IN TRAIN	SPEED M.P.H.	DAYS DISAB.	CLASS PERSON	NAME OF PERSON S.W.	ICC CLASS	Description of Accident
4/5	Vaughn, N.M.	Ex 3655W	70	6	P-45	B	S.W. Van Stone	S-J	*Desired emergency of train brakes
4/23	El Paso - Ice House N.M.	2/410	100	15	A-18	B	H.R. Provence	S-J	*Slack running in on train, badly bruised and sprained
6/7	Alamagordo,N.M	Ex 3653W	91	Stndg	A-15	F	G.W. Boswell	S-C	Particles of foreign matter in eye
6/16	Carne, N.M.	2/426	68	40	A9	E	A.F. Leifeste	S-C	Claims got hot cinder in eye
6/26	Rodeo, N.M.	Ex5005W	70	15	P30	C	H.E. Gilvin	S-J	*Service application caused run in on rear of train, fracturing ribs
7/14	Lordsburg, N.M.	412	0	6	A10	F	FC Ollerton	S-J	Struck hand on reverse lever
7/5	Elwood,N.M.	Ex 3655W	70	6	A4	B	C.E. Roe	S-J	Slipped on slag and sprained leg
9/4	Animas,N.M.	8	21	Stndg	A16	B	W.C. Archer	S-J	Piece of ice slipped bruising right ankle
12/12	Gage, N.M.	Ex3317W	102	10	P21	B	R.C. Carden	S-J	*Air burst on moving car, bruises of shoulder, leg and back
					YEAR 1932				
1/26	Mills, N.M	X3415-E	8	3	P90	C	B.G. Haire	S-J	Brakeman cut cars, moving head cut just as cond. stepped over
5/19	Arena, N.M.	X5029W	58	Stndg	P15	F	S.B. Marner	S-J	Foot slipped on head block of switch
5/31	Temporal, N.M.	X3307W	100	25	P30	BK	R.E. Hoffman	S-J	*Air hose blew off car, fracturing and breaking ribs
7/6	Oscura,N.M.	X3657W	70	5	P24	CD	C.C. Whitington	S-J	Stumbledon top of car, fell off
8/26	Alamagordo,N.M	E3304-W	88	15	P10	BK	F.E. Hedrick	S-J	Hot cinder in right eye
10/4	Lordsburg,N.M.	980	62	6	P30	CD	W.H. Prickett	S-G	Rough coupling of cabooses

DATE	LOCATION	TRAIN NO.	NO CARS IN TRAIN	SPEED M.P.H.	DAYS DISAB.	CLASS PERSON	NAME OF PERSON	ICC CLASS	DESCRIPTION OF ACCIDENT
12/22	Afton, N.M.	1-982	69	40	A7	F	Clyde B Hilton	S-C	Cinder flew in eye
12/28	Deming, N.M	X3655W	100	Stdg	P15	BR	Fred R. Hughes	S-G	Slipped on ice covered ladder on water car
				Year 1933					
10/30	Lizard, N.M.	994	47	40	A6	BK	J. Mousier	S-J	Cinder in eye
12/22	Carrizozo, N.M	X2507E	3	Stndg	A8	BK	W.J. Loughrey	S-G	Fell getting off water car
12/6	Polley, N.M	X3694W	100	20	P21	CD	A.M. Hardin	S-J	*Train broke in two-derailed
12/17	Hachita, N.M.	X5019W	96	15	P60	BK	J.S. McCranie	S-J	*Fell from train when slack ran in
				YEAR 1934					
3/22	Unknown	Ex3714W	100	Unknown	P8	F	V.T. Springer	S-C	Grain of sand in eye
5/22	Paxton, N.M.	Ex3659W	104	38	P10	C	S. Gates.	S-J	*Air hose separated from coupling
6/24	Afton, N.M.	1/982	70	10	P14	B	J.W. Ralley	S-G	Stepped on piece of ballast-sprained right knee
7/1	Newman, N.M.	994	58	35	A7	E	J.D. Richardson	S-J	Cinder in eye
8/12	Cuervo, N.M.	EX3716W	17	Stndg	P14	B	C.N. Lemon	S-J	Falling between cars in standing train
9/3	Orogrande, N.M.	970	1	5	P20	B	O.L. Pruitt	S-J	Stepped on square edge of tie, sprained ankle
9/3	Hawkins, N.M.	Ex3655W	66	4	A13	B	A.A. Dean	S-J	Lost footing and fell running for caboose
9/6	Vaughn, N.M.	994	55	8	P180	C	S.G. Allen	S-J	Lost hold on side ladder of car falling to ground
10/13	Cuervo, N.M.	Ex3655W	32	Stndg	P7	C	J.M. Justus	S-D	Lost hold on brake wheel while letting off brake
10/3	Alamagordo, N.M	992	47	5	A5	B	G.J. Dingwall	S-J	Foreign object in eye
10/17	" "	970	2	6	A5	B	C.B. McNeil	S-J	Hot sand in eye
10/21	Deming, N.M.	1/980	92	4	P14	C	R.C. Carden	S-J	*Lost hand hold on ladder of car when slack run out

DATE	LOCATION	TRAIN NO.	NO. CARS IN TRAIN	SPEED M.P.H.	DAYS DISAB.	CLASS PERS
12/1	Carrizozo, N.M.	Ex3657W	48	2	A14	F
12/28	Tularoso, N.M.	992	36	Stndg	A-4	C
				YEAR 1935		
3/26	Carrizozo, N.M.	Ex3656W	0	1	P45	B
3/2	Tucumcari, N.M.	Yd3403	10	3	P10	C
3/12	Afton, N.M.	X5047W	100	30	A4	CD
4/10	Newman, N.M.	990	57	Stndg	A4	F
4/17	Vevay, N.M.	X5010W	35	35	P21	BK
6/9	Salinas, N.M.	X3694W	42	40	A4	F
6/14	Sefar, N.M.	X5023W	100	8	A5	BK
6/25	Orogrande, N.M.	X3716W	48	5	P15	BK
7/1	North, N.M.	1-992	48	Stndg	P10	F
9/15	Vevay, N.M.	X3695W	101	30	P30	E
11/12	Tucumcari, N.M.	Yd3424	6	4	A8	BK
11/13	Deming, N.M.	X3687W	67	Stndg	A7	BK
				YEAR 1936		
1/13	Lordsburg, N.M.	X5030W	66	8	A7	BK
2/23	Alamagordo, N.M.	X3691W	36	Stndg	P14	E
2/1	Coyote, N.M.	X3692W	67	6	A9	Bk

S ON	NAME OF PERSON	ICC CLASS	DESCRIPTION OF ACCIDENT
	Jack Adams	S-J	Hot cinder in eye
	A.L. Walker	S-J	Lost hold on side ladder of car falling to ground
	J.W. Vickery	S-A	Hand slipped while attempting to adjust coupler on caboose
	E.S. Raggsdill	S-J	Lost balance and fell from car when coupling of cars was made
	Chas. Lewis	S-J	*Bursted hose emergency stop, thrown to floor of caboose
	R.O. Bargenbolt	S-C	Hook slipped off water spout fell to ground
	C.E. Hudson	S-J	*Emergency stop of train, broken train line, thrown to floor of caboose
	T.J. Gorman	S-J	Opened blow off cock and foreign object struck left eye
	G.O. Brookmiller	S-J	*Action of train caused jar of caboose struck head against window frame
	L.J. Fiebig	S-J	*Sudden stop, lost balance and fell against caboose window
	T.J. Gorman	S-C	Hand caught in stoker
	E.R. Layman	S-C	Flue burst, burned by steam and water
	F.C. Sears	S-J	Lost balance and fell while being switched
	John Folkers	S-J	Fell from platform of stock chute, injured shoulder
	C.W. Adams	S-G	Lost footing and fell
	J.B. Perkins	S-C	Hand caught in stoker
	R.J. Woods	S-J	Stepped on rock or in hole

DATE	LOCATION	TRAIN NO.	NO. CARS IN TRAIN	SPEED M.P.H.	DAYS DISAB.	CLASS PERSON	NAME OF PERSON	ICC CLASS	DESCRIPTION OF ACCIDENT
					YEAR 1936 Cont-				
3/9	Deming, N.M.	X5003W	102	4	P10	BK	J.D.Gomilion	S-G	Stepped on slag while detraining
4/10	Vaughn,N.M.	992	54	Stndg	P20	BK	C.H. Strass	S-G	Slipped from lader of car
4/18	Oscura,N.M.	X3699W	41	25	P45	BK	J.L. Thompson	S-J	Fell from gangway of engine
5/28	Wooten,N.M.	X2511E	28	Stndg	P30	F	R.G, Skinner	S-J	Caugnt between cab and water spout
6/16	Ancho,N.M.	X3714W	69	12	P30	C	Geo Ramsdale	S-G	Lost hold fell from caboose
6/16	Vaughn,N.M.	X3655W	65	Stndg.	P20	F	L.W. Rolands	S-C	Fell in man hole, burned by hot compound
6/17	Alamagordo,N.M.	X3692W	100	15	P30	BK	P.M. Weosh	S-J	*Lost balance and fell from train
7/18	Hachita,N.M.	X3653W	50	2	P20	BK	L.L. Barker	S-D	Lost hand hold, fell from top of car while coupling
8/2	Alamagordo,N.M	2-992	57	10	A7	C	A.M. Hardin	S-G	Stepped on something while detraining
10/13	Anapra,N.M.	X5011W	19	Stndg	C9	BK	E.L. Crowe	S-J	Struck by tie plate falling from car
10/25	Aden, N.M.	3-980	70	4	A5	BK	F.E. Pierce	S-J	Foreign object in eye
					YEAR 1937				
1/29	Simmons, N.M	990	53	12	P15	B	R.R. Griggs	S-J	Lost balance and jumped from running board of engine
3/19	Lordsburg,N.M.	Ex5004W	65	10	A5	C	J.J. McMahon	S-G	Claims stepped on rock covered with oil, sprained left groin
4/29	Ancho,N.M.	1/992	46	Stndg	P10	C	Wm. Gebo	S-J	Permitted finger to be caught between hatch cover and plug of a P.F.E. car
5/14	Lordsburg,N.M.	2/980	70	6	P26	B	R.B. Miller	S-D	Lost balance and fell from car when coupling was made
6/30	Mongolo,N.M.	EX4360W	100	25	2-21	B	C.E. Hudson	S-J	*Air applied in emergency resulting in sudden stop, throwing brakeman to floor of caboose
					2-21	B	V.L. Fountaine	S-J	
7/4	Gallinas,N.M.	Ex 3655W	70	5	1-14	C	F.B. Potts	S-J	*Reduction in speed of train, thrown to floor of caboose
7/7	Anapra,N.M.	Ex5000W	65	10	1-13	B	C.L. Mathews	S-J	*Standing in caboose lost balance when reducing speed, sprained back

DATE	LOCATION	TRAIN NO.	NO CARS IN TRAIN	SPEED M.P.H.	DAYS DISAB.	CLASS PERSON
7/15	Lordsburg,N.M.	2/984	58	Stdg	1-9	C
8/6	Polly, N.M.	996	44	15	1-4	F
12/6	Cloudcroft,N.M.	970	4	7	A 7	B
					YEAR 1938	
5/1	Santa Rosa, N.M.	990	41	Stndg	A7	F
5/2	Three Rivers,N.M.	EX3691W	66	35	A5	B
6/9	Lordsburg,N.M.	2/984	66	2	A4	B
6/25	Mongola,N.M	1/982	69	4	A4	B
6/22	Deming, N.M.	2/980	60	Stndg	P30	C
8/26	Roy, N.M.	974	16	Stndg	P42	B
10/12	Victorio,N.M	Ex5001E	29	35	A4	B
11/12	Rodeo, N.M.	Ex5009W	46	Stndg	P7	B
					YEAR 1939	
1/19	Deming, N.M.	980	70	Stndg	P10	E
2/12	Steins, N.M.	Ex5003W	66	4	A7	B
2/2	Montoya, N.M.	Ex3702	70	Stndg	A6	B

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Sheet 6 of 7 sheets

NAME OF PERSON	ICC CLASS	DESCRIPTION OF ACCIDENT
L.F. Abbott	S-J	Foreign object lodged in eye
J.A. Handy	S-J	Foreign object striking eye
C.L. Pruitt	S-J	Brakeman jarred from running board of tank car, falling to ground when car derailed
C.A. Heath	S-C	Slipped and fell on locomotive tender
C.C. Ward	S-J	Foreign object lodged in right eye
R.E. Harmon	S-G	Stepped on piece of slag ballast and sprained ankle
R.S. New	S-G	Stepped on rock and sprained right ankle
L.A. Fail	S-J	Vent plug struck hernia in right groin
B.W.Higginbotham	S-J	Lost balance and fell, fracture of right hand
Geo M. Donegan	S-J	Foreign object lodged in right eye
Walter E.Robinson	S-J	Box of freight slipped from hands
E.R. Layman	S-G	While descending from locomotive slipped and fell
S.M. Stinson	S-J	Foot slipped while running, ankle sprained
Roy J. Woods	S-J	Stepped on rock ankle sprained

DATE	LOCATION	TRAIN NO	NO CARS IN TRAIN	SPEED M.P.H.	DAYS DISAB.	CLASS PERSON	NAME OF PERSON	ICC CLASS	DESCRIPTION OF ACCIDENT
6/16	Steins N.M.	EX3616W	Helper	2	Per.	F	J.A. Dowdy	S-2	Engine backing up struck and run over fireman
6/7	Vaughn,N.M.	1/996	47	15	P10	C	W.P. Dolan	S-J	Lost balance and fell when descending from cupola of caboose
6/15	Rio Grande,N.M.	990	58	Stndg	A4	F	R.S.Peterson	S-J	Ash pan hopper door sticking momentarily.
9/26	Chappel,N.M.	4/980	59	35	A5	F	Wm.M.Clark	S-C	Foreign object lodged in eye
10/18	Tulurose,N.M.	Ex3656W	67	3	A13	C	L.J. Benson	S-J	Lost balance and fell

* Slack action

5951

Plaintiff's Exhibit No. 339

STATE OF ARIZONA

ARIZONA

CORPORATION COMMISSION

GREAT SEAL OF THE STATE OF ARIZONA — DITAT DEUS — 1912

To all to Whom these Presents shall Come, Greeting.

I, WILLIS G. ETHEL, SECRETARY OF THE ARIZONA CORPORATION COMMISSION, DO HEREBY CERTIFY THAT the annexed is a true and complete transcript of the

ACCIDENT REPORT - SHEET NO. 28

OF THE

ATCHINSON, TOPEKA AND SANTA FE RAILWAY COMPANY

OF THE

ACCIDENT OCCURING ON ITS ALBUQUERQUE DIVISION NEAR THE

STATION OF COCONINO ON JULY 27th, 1939

To all to Whom these Presents shall Come, Greeting:

I, WILLIS G. ETHEL ~~WILLIS G. STEPHENSON~~ SECRETARY OF THE ARIZONA CORPORATION COMMISSION, DO HEREBY CERTIFY THAT the annexed is a true and complete transcript of the

ACCIDENT REPORT - SHEET NO. 28
OF THE
ATCHINSON, TOPEKA AND SANTA FE RAILWAY COMPANY
OF THE
ACCIDENT OCCURING ON ITS ALBUQUERQUE DIVISION NEAR THE
STATION OF COCONINO ON JULY 27th, 1939

Which was filed in the office of the said Arizona Corporation Commission as provided in Paragraph 701, Revised Statutes of 1928.

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND AND AFFIXED THE OFFICIAL SEAL OF THE ARIZONA CORPORATION COMMISSION, AT THE CAPITOL, IN THE CITY OF PHOENIX, THIS 21st DAY OF March, 1941 A. D.

Willis G. Ethel
SECRETARY.

BY

ASSISTANT SECRETARY

5952

MONTHLY REPORT OF RAILWAY ACCIDENTS

FORM No. 320

ARIZONA CORPORATION COMMISSION

SHEET No. 28

Name of reporting Carrier (1) The Atchinson, Topeka & Santa Fe Ry. Co. Coast Lines — For the month of July, 1939

If "joint operation," or crossing collision, name roads involved (2) —

If "joint operation," name road whose Superintendent is in charge of track (3) —

Carrier's number (4) 84415 — Carrier's division (5) Alburquerque — Date of accident (6) 27th — Time of day (7) 8:17 PM — ICC Class (8) D-5

Place of accident (9) Arizona — Nearest station (10) Coconino — Nearest milepost (11) 57 — Estimated distance and direction from station named (12) .51 Mi east

Kind of accident (13) Derailment — Clear, cloudy or foggy? (14) Clear — Raining or snowing? (15) No. — Daylight or dark? (16) Dark

Cause (briefly) (17) Excessive speed on curve, resulting in derailment two engines and four passanger cars.

Kind of train (18) Passenger — Train No. (18A) Over flow extra — Number of cars in train (18B) 13 — Engine Nos. (19) 3853 3704 — Direction (20) West — Speed (21) 35 to 40 m. p. h.

(22) Method of operation —

(Answers to questions 21 and 22 required only in connection with collisions.) (23) Number of main tracks —

(24) DETAILS OF CASUALTIES TO PERSONS

Name and address of person	Class of person	Killed or nature and extent of injuries	Days disability. (If killed, so state) Actual (d)	Probable (e)
(See Attached List)				

(25) COST	NAME OF ROAD	(a) Equipment	(b) Way and Structures	(c) Clearing Wreck	(d) Total
	The AT & SF RY. CO-CL	$ 46,000.00	$ 900.00	$ 4,801.74	$ 51,701.74
	TOTAL	46,000.00	900.00	4,801.74	51,701.74

(26) Detail of cause, nature, and circumstances of accident; responsibility and experience of employees responsible; estimate

station (10) ..... milepost (11) ..... tion from station named (12) .51 Mi east

Kind of accident (13) Derailment — Clear, cloudy or foggy? (14) Clear — Raining or snowing? (15) No. — Daylight or dark? (16) Dark

Cause (briefly) (17) Excessive speed on curve, resulting in derailment two engines and four passanger cars.

Kind of train (18) Passenger — Train No. (18A) Over / flow / extra — Number of cars in train (18B) 13 — Engine Nos. (19) 3853 / 3704 — Direction (20) West — Speed (21) 35 to 40 m. p. h.

(22) Method of operation .....

(23) Number of main tracks .....

(Answers to questions 21 and 22 required only in connection with collisions.)

(24) DETAILS OF CASUALTIES TO PERSONS

Name and address of person	Class of person	Killed or nature and extent of injuries	Days disability. (If killed, so state) Actual (d)	Probable (e)
(See Attached List)				

(25) COST

NAME OF ROAD	(a) Equipment	(b) Way and Structures	(c) Clearing Wreck	(d) Total
The AT & SF RY. CO-CL	$ 46,000.00	$ 900.00	$ 4,801.74	$ 51,701.74
TOTAL	46,000.00	900.00	4,801.74	51,701.74

(26) Detail of cause, nature, and circumstances of accident; responsibility and experience of employees responsible; estimate and description of damage to railway property. (With regard to collisions involving any question of train orders, it should be stated whether a "19" order or a "31" order was used.)

Overflow Extra Passenger train, when running 35 to 40 miles per hour, derailed engines 3853 and 3704, combination car No. 2547 and tourist sleepers Nos. 4070, 4260 and 4267, due to excessive speed on 10 degree 4 minute curve, lead engine 3853, causing heavy stress on 90 pound rail, Santa Fe standard section, rolled by Colorado Fuel and Iron Company in 1912, relaid in curve No. 92 on Grand Canyon District 1928 - no defects. Accident due to negligence of Engineman B. H. Sparks. Experience 26 years as locomotive engineer and 8 years as

(Signature) Robt. Irwin (Title) General Claim Agent

(SEE INSTRUCTIONS ON REVERSE OF SHEET)

5953

(SPACE BELOW AVAILABLE FOR RETURNS)

[redacted] fireman, with this company; 3 years as fireman for Union Pacific

Estimated damage	Engine 3853	$ 9,000.00
	Engine 3704	13,000.00
	Comb. Car 2547	7,000.00
	Tourist Sleeper No. 4070	12,000.00
	" " " 4260	3,000.00
	" " " 4267	2,000.00
	Track	900.00
	Winslow Wrecker-Labor Supplies	1,876.00
	Needles Wrecker-Labor Supplies	1,329.74
	Work train switching	1,596.00
	Total	$ 51,701.74

INSTRUCTIONS REGARDING ENTRIES ON FACE OF THIS SHEET

This report Must Be Rendered Monthly to the ARIZONA CORPORATION COMMISSION, Phoenix, Arizona. Accidents resulting in loss of life must be reported by telegraph, at the earliest possible moment.

1. The significant words in the name of the reporting carrier should be given in full, so far as practicable.

2 and 3. Concerning train accidents occuring on terminal or other track operated jointly or in common, or classifiable as crossing collisions, give full details as to rseponsibility.

4. Enter the number of the accident as recorded in the carrier's operating records.

5. Enter the name of the operating division on which the accident occurred.

6. State the day of the month.

7. State the time o'clock in hours and minutes, a.m. or p.m.

8. Enter a capital letter to indicate the class and a small letter to indicate the subclass.

10. Give the name of the station nearest to the place where the accident occurred (or was first discovered) and indicate whether it occurred on main track, or on yard track or sidings. This information should be given both for train accidents and train-service accidents. Main tracks within yards are not to be regarded as yard tracks. Sidings not used exclusively as passing tracks are to be regarded as yards.

11. The giving of the number of the milepost nearest to the place of the accident is optional; and instead of giving it in the case of either a train or a train-service accident, if the accident occurred at a station, that fact should be stated, or, if it occurred within a yard, the name or description of the yard should be given.

12. Distance, estimated in miles or rods, should be given when appropriate.

[illegible] Wrecker- Labor Supplies	1,810.00
Needles Wrecker-Labor Supplies	1,329.74
Work train switching	1,896.00
Total	$ 51,701.74

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5. Enter the name of the operating division on which the accident occurred.

6. State the day of the month.

7. State the time o'clock in hours and minutes, a.m. or p.m.

8. Enter a capital letter to indicate the class and a small letter to indicate the subclass.

10. Give the name of the station nearest to the place where the accident occurred (or was first discovered) and indicate whether it occurred on main track, or on yard track or sidings. This information should be given both for train accidents and train-service accidents. Main tracks within yards are not to be regarded as yard tracks. Sidings not used exclusively as passing tracks are to be regarded as yards.

11. The giving of the number of the milepost nearest to the place of the accident is optional; and instead of giving it in the case of either a train or a train-service accident, if the accident occurred at a station, that fact should be stated, or, if it occurred within a yard, the name or description of the yard should be given.

12. Distance, estimated in miles or rods, should be given when appropriate.

18. Show the kind of train, as freight, passenger, mixed, special, official, pay, work, switching, etc. If light engine, state to what class of service assigned.

20. Give the time-table direction.

21. Give the estimated speed in miles per hour.

22. In case of a collision, show whether trains were operated under a block system at point of accident, stating specifically what method of blocking, if any, was employed.

23. Give number of main tracks in use in locality of accident.

25. State the amount of damage to equipment (including damage to foreign cars), to other railway property, and cost of clearing wreck, with the total amount as provided. In case of a "joint-operation" accident, figures for the several items should be given for each road involved, the name of which should be clearly indicated. If no other road is involved, respondent may make the requisite entries on "Total" line only.

26. If the space afforded on this form is insufficient for all the requisite entries concerning a particular accident, blank sheets of like size, suitably identified and completed, may be attached to a single Form 195 containing the introductory details applicable to the accident as a whole.

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[fol. 5955]

Name and Address (a)	Class of person (b)	Extent of injuries (c)	Days Disability
Aisla White Kalamazoo, Mich.	C–1 (a)	Lacerations right knee Left ankle & right shoulder dislocated	P–21
Michael Sachs Newark, N. J.	C–1 (a)	Eye and chest injuries possible fractured ribs	P–21
G. B. Parker Scarborough, England	C–1 (a)	Fractured ribs	P–14
Minnie Hafemeister Milwaukee, Wis.	C–1 (a)	Dislocated right shoulder Lascerations left ear and back	P–14
Lillian Aston Akron, Ohio	C–1 (a)	Shoulder cut and shock	P–14
G. H. Knight Oak Park, Ill.	C–1 (a)	Neck injury and lacerations of head and leg	P–7
Cora Fisher Long Prarie, Minn.	C–1 (a)	Bruised right hand and shoulder	P–5
Frances Columbo Detroit, Mich.	C–1 (a)	Bruised about face, lacerated Jaw	P–5
Bernice Thompson Indianapolis, Ind.	C–1 (a)	Knee cap bruised, cut on left leg	P–5
Alice Srock Detroit, Mich.	C–1 (a)	Body bruises and shoulder sprained	P–4
Jennie Hatch Ann Harbor, Mich.	C–1 (a)	Body bruises and cut over eye	P–4
P. B. Gillenwater Glasgow, Ky.	C–1 (a)	Bruised arm and legs	P–10
Dorothy Friedrick, Hobart, Ind.	C–1 (a)	Sprained back, pelvis and forehead bruised	P–10
Nevada McGann, Minneapolis, Minn.	C–1 (a)	Right leg and arm bruised	P–5
Carolyn Station Oak Park, Ill.	C–1 (a)	Lacerations right elbow and forehead bruised	P–10

[fol. 5956]

Ethel Stephenson, Chicago, Ill.	C–1 (a)	Forehead and right hand cut, also bruises	P–5
Katherine Vietler Kenosha, Wis.	C–1 (a)	Back and chest bruises	P–15
Helen McLane Litchfield, Minn.	C–1 (a)	Lacerations left hand, hip and leg bruises	P–21

Name and Address (a)	Class of person (b)	Extent of injuries (c)	Days Disability
Hilda Hansen Litchfield, Minn.	C–1 (a)	Head and back injuries and multiple bruises	P-14
Hazel Anderson Lexington, Ky.	C–1 (a)	Bruised left arm and hip	P-2
Mrs. R. T. Anderson, Lexington, Ky.	C–1 (a)	Bruised leg and elbow	P-2
Wm. F. Belmer Cincinnati, Ohio	C–1 (a)	Minor bruises and shock	P-2
Mrs. Wm. F. Belmer Cincinnati, Ohio	C–1 (a)	Minor bruises and shock	P-2
Marion E. Deputy Glenolden, Penn.	C–1 (a)	Bruises and nervous shock	P-2
G. A. Feiereisen Minneapolis, Minn.	C–1 (a)	Body Bruises and nervous shock	P-2
Lucille Feiereisen Minneapolis, Minn.	C–1 (a)	Body bruises and nervous shock	P-10
Louise Glardon, Chicago, Illinois	C–1 (a)	Back, left side and knee cap injured	P-7
Frank Guyon Detroit, Mich.	C–1 (a)	Bruised head, shock and sore back	P-10
Angela Guyon Detroit, Mich.	C–1 (a)	Bruised about spine back and neck	P-7
Mary Henry Tampa, Florida	C–1 (a)	Left arm sprained and bruised, back injury	P-21,
Esther Hoge Milwaukee, Wis.	C–1 (a)	Thigh bruised, right and left legs bruised	P-14
Isabella Heuppert, Detroit, Mich.	C–1 (a)	Body bruises and shock	P-3
[fol. 5957]			
Arthur L. Jones Three Rivers, Mich.	C–1 (a)	Left arm and hip bruised, shock	P-5
Helen Kaye, Cleveland, Ohio	C–1 (a)	Bumped head and nervous shock	P-3
Margaret C. Kelley, Washington, D. C.	C–1 (a)	Bruised elbow and hips	P-5
Mrs. G. W. Koenigkramer Cincinnati, Ohio.	C–1 (a)	Bruised shoulder	P-2
Janet Koenigkramer Cincinnati, Ohio	C–1 (a)	Cut chin and bruised shoulder	P-4
A. W. Light Cincinnati, Ohio	C–1 (a)	Both legs bruised and neck strained	P-5

Name and Address (a)	Class of person (b)	Extent of injuries (c)	Days Disability
ginia Light cinnati, Ohio	C-1 (a)	Nerve shock, neck, elbow and hip bruised	P-5
h L. Light cinnati, Ohio	C-1 (a)	Head and neck bruised, nervous shock	P-7
n. McCloskey, Jr. ladelphia, Penn.	C-1 (a)	Body bruises	P-5
rie B. McCloskey ladelphia, Penn.	C-1 (a)	Body bruises	P-4
rie E. Matz dson Hts., N. J.	C-1 (a)	Bruised left thigh, right leg and shock	P-5
R. Metcalf tsburg, Penn.	C-1 (a)	Bruised head	P-3
th A. Metcalf tsburg, Penn.	C-1 (a)	Right shoulder, forearm, left elbow, bruised and back injured	P-10
W. Niemar Paul, Minn.	C-1 (a)	Left hand, fingers and wrist injured	P-3
ncis J. O'Brien anta, Ga.	C-1 (a)	Head injury and body bruises	P-15
retta O'Brien thlehem, Penn.	C-1 (a)	Body bruises and shock	P-5
a E. Paist, ladelphia, Penn.	C-1 (a)	Lacerations back of head and nerve shock	P-4
a K. Paist ladelphia, Penn.	C-1 (a)	Laceration left leg below knee, Nerve shock	P-7
5958]			
J. Pearson gara Falls, N. Y.	C-1 (a)	Sprained neck and back, shock	P-5
. R. J. Pearson gara Falls, N. Y.	C-1 (a)	Head and kidney injuries, shock	P-20
E. Peck tsburg, Penn.	C-1 (a)	Left shin bruised, shock	P-3
a Pelosi, Louis, Mo.	C-1 (a)	Back injury	P-14
garet L. Rohrer leton, Penn.	C-1 (a)	Bruised head	P-5
garet Rohrer (minor) letown, Penn.	C-1 (a)	Abrasion of elbow, brush burns	P-2
el Saunier ark, N. J.	C-1 (a)	Head and neck bruised, shock	P-5
H. Schaer n, Ohio	C-1 (a)	Shock, neck wrenched and stiffness	P-7

Name and Address (a)	Class of person (b)	Extent of injuries (c)	Days Disabilit
Hilda Schaer Akron, Ohio.	C-1 (a)	Bruised arms, neck, sore, shock	P-10
H. E. Schlitz Canton, Ohio	C-1 (a)	Neck and back sprained	P-5
Winifred Schlitz Canton, Ohio	C-1 (a)	Left leg, neck and back sprained	P-5
K. A. Wells, Oak Park, Ill.	C-1 (a)	Wrenched back	P-2
Henrietta Wurtsmith Detroit, Mich.	C-1 (a)	Elbows bruised	P-3
Mrs. E. K. Yoder Cleveland, Ohio	C-1 (a)	Bruised elbows and shock	P-10
Sophia Zuelke Milwaukee, Wis.	C-1 (a)	Legs bruised from hip to ankle	P-10
Betty Miller Clinton Hill, N. Y.	C-1 (a)	Cuts and bruises about body	P-3
Virginia Cronin Chicago, Ill.	C-1 (a)	Head bruised and neck strained	P-3
Laura Duggan Milwaukee, Wis.	C-1 (a)	Back knee and right shoulder bruised	P-3
[fol. 3959]			
Maude B. Duncan, St. Johns, Mich.	C-1 (a)	Legs, Hips and wrist bruised and sprained	P-10
Lydia Edling Minneapolis, Minn.	C-1 (a)	Knees and arms bruised	P-3
Geo. S. Foster Decatur, Ill.	C-1 (a)	Shoulder bruised	P-3
Ward B. Garret South Bend, Ind.	C-1 (a)	Bruised head over left eye and wrenched shoulder	P-7
Paul Hatchet Glasgow, Ky.	C-1 (a)	Head cut and shoulder bruised	P-5
William Hoge Milwaukee, Wis.	C-1 (a)	Lacerations and bruises right arm and both thighs	P-3
Marie Larpenteur Minneapolis, Minn.	C-1 (a)	Body bruises and shock	P-3
Carl C. McKee Avilla, Ind.	C-1 (a)	Left shoulder bruised	P-2
Emma Metzger Philadelphia, Penn.	C-1 (a)	Side strained and nervous shock	P-3
Emma Murmane Minneapolis, Minn.	C-1 (a)	Severe Shock	P-3
A. C. Pobloske Chicago, Ill.	C-1 (a)	Head bruised and side strained	P-3

Name and Address (a)	Class of person (b)	Extent of injuries (c)	Days Disability
Clara Schwaiger Kenosha, Wis.	C-1 (a)	Body bruises	P-2
Jenny Duffy Clinton Hill, N. Y.	C-1 (a)	Cuts and bruises about body	P-2
E. T. Shuttleworth Philadelphia, Pa.	C-1 (a)	Bruised chin, knee and shin	P-2
Mrs. Oscar Sieben Chicago, Ill.	C-1 (a)	Both arms, back and shoulders bruised and lacerated	P-21
Oscar W. Sieben Chicago, Ill.	C-1 (a)	Bruised legs, thighs and back	P-10
Martha Tillman Chicago, Ill.	C-1 (a)	Body bruises	P-2
Rosalie Schopp White Plains, N. Y.	C-1 (a)	Sprained shoulders and back	P-3
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Mary E. Seitz Glen Rock, Penn.	C-1 (a)	Contusion left arm, sprained neck	P-2
Ellen B. Knight Oak Park, Ill.	C-1 (a)	Badly sprained neck	P-5
Bernice Carver Columbia, Ind.	C-1 (a)	Sprained shoulder	P-2
Fern W. Hammer Columbia, Ind.	C-1 (a)	Sprained neck	P-2
Mrs. W. W. Sotherland Toledo, Ohio	C-1 (a)	Bruised knees	P-2
Helen M. Kelly Chicago, Ill.	C-1 (a)	Nervous shock	P-2
Lucille Rapp Chicago, Ill.	C-1 (a)	Nervous shock	P-2
Christine M. Pack Mt. Lebanon, Penn.	C-1 (a)	Bruised legs	P-5
Florence Buckingham Washington, D. C.	C-1 (a)	Nervous shock	P-2
Flora Mae Jones Three Rivers, Mich.	C-1 (a)	Bruised left hand and nerve shock	P-4
Beverly Jones Three Rivers, Mich.	C-1 (a)	Shaken up and nervous shock	P-3
J. M. Fox Portland, Mich.	C-1 (a)	Sprained hands and back	P-4
Ida Zuelke Milwaukee, Wis.	C-1 (a)	Shaken up and nerve shock	P-3
Chas. E. Caswell Fleeting, W. Va.	C-1 (a)	Bruised left shoulder, strained back and right shoulder	P-5

Name and Address (a)	Class of person (b)	Extent of injuries (c)	D Dis
C. M. Sherbourne Pawtucket, R. I.	C-1 (a)	Back and neck wrenched	F
Mrs. J. H. Geiger Baltimore, Md.	C-1 (a)	Head injuries	F
Irene Fedor Chicago, Ill.	C-1 (a)	Bruised back, pelvic bone, left arms and shoulders and legs	F
Agnes L. West Chestwood, N. Y.	C-1 (a)	Knees cut	F
[fol. 5961]			
Marie Eitman Muscatine, Iowa	C-1 (a)	Scraped and bruised legs	F
Lenora Eitman Muscatine, Iowa	C-1 (a)	Bruise under left eye and abrasions of knees	F
Madelina P. Metzger Philadelphia, Penn.	C-1 (a)	Abrasions about legs, contusions on hips and shoulders	F
Paul A. Metzger Philadelphia, Penn.	C-1 (a)	Abrasions forehead and left leg, contusions to shoulder and left knee	F
Amy Magnell Detroit, Mich.	C-1 (a)	Hand cut and elbow bruised	F
Elizabeth Lowber Dover, Del.	C-1 (a)	Various scratches and bruises	F
Katherine Glardon Chicago, Ill.	C-1 (a)	Bruised and sprained back and right lower side, left arm and shoulder	F
Dorothy Glardon Chicago, Ill.	C-1 (a)	Bruised leg and chest	F
James R. Wilson Edgewood, Penn.	C-1 (a)	Back injury and bruises on arms and legs	F
Gertrude Wilson Edgewood, Penn.	C-1 (a)	Bruises on legs and left ankle sprained	F
Elizabeth Sherbourne Pawtucket, R. I.	C-1 (a)	Bruise on right thigh and right arm	F
Ruth Caswell, Wheeling, W. Va.	C-1 (a)	Wrenched back and side strained	F
[fol. 5962]			
Adolph Bosen Chicago, Ill.	A-96	Head bruised and back strained	F
B. T. Turner Chicago, Ill.	A-97	Lumbar spine injuries	
W. W. Watkins Chicago, Ill.	A-97	Sprained back	
A. A. Wohlgemuth Chicago, Ill.	A-95	Right hip bruised	

Name and Address (a)	Class of person (b)	Extent of injuries (c)	Days Disability
Joseph Amherd Chicago, Ill.	A-96	Right knee, left arm bruised, kidney injuries	P-10
Mike Allen Maywood, Ill.	A-96	Bruised arms and ribs, burns on head and neck	P-5
F. J. Pustelnaik Chicago, Ill.	A-96	Right shoulder, hip and head bruised	P-3
Wm. King Chicago, Ill.	A-97	Shaken up and body bruises	P-2
Jewel Adams Chicago, Ill.	A-97	Shaken up and body bruises	P-2
Elmer Ridley Chicago, Ill.	A-97	Shaken up and body bruises	P-2
C. N. Houston Chicago, Ill.	A-97	Shaken up and body bruises	P-2
J. C. Carter, Jr. Chicago, Ill.	A-97	Shaken up and body bruises	P-2
Wm. McPherson Chicago, Ill.	A-101	Shaken up, shock and bruises	P-2
[Id. 5963]			
Robert J. Smith Chicago, Ill. Pullman Porter	D-a	Possible fracture right hand	P-30
P. Thompson Chicago, Ill. Pullman Porter	D-a	Nose and face bruised	P-2
Arthur Burton Chicago, Ill. Pullman Porter	D-a	Back wrenched	P-10
Emmet Eddings Chicago, Ill. Pullman Porter	D-a	Right leg bruised below knee	P-3
A. Simmonson Chicago, Ill. Pullman porter	D-a	Spine and back injury	P-15
W. E. Brown Pullman porter Chicago, Ill.	D-a	Head and face bruised	P-3
W. V. Cardwell Chicago, Ill. Pullman Porter	D-a	Bruised about head and body, also right foot bruised	P-5
C. S. Smith Chicago, Ill. Pullman porter	D-a	Bruises and sprained back	P-3
Andrew L. Martin Chicago, Ill. Pullman porter	D-a	Sprained arm and shoulder	P-10

Name and Address (a)	Class of person (b)	Extent of injuries (c)	Days Disabilit
[fol. 5964]			
William T. Weidinger Winslow, Arizona Road passenger brakeman	A-116	Strained back and lumbar muscled	P-14
Burton Sparks Winslow, Arizona Road passenger engineer	A-121	Body bruises and shock	P-10

(Here follow 4 photolithographs, side folios 5965-5978)

(Here follow 4 photolithographs, side folios 5965-5968)

Plaintiff's Exhibit No. 350

PRELIMINARY REVISED POPULATION ESTIMATES FOR CONTINENTAL UNITED STATES, TERRITORIES AND POSSESSIONS, STATES, AND CITIES OF 100,000 OR MORE: 1930-1939

Preliminary estimates of the population of continental United States, its territories and possessions, States, and cities of 100,000 or more for the years 1930 to 1939 were announced today by Acting Director Vergil D. Reed of the Bureau of the Census, Department of Commerce. Some of these estimates represent revisions of estimates made before the taking of the 1940 Census. Final revised estimates cannot be computed until additional intercensal data are available, but the figures for continental United States and the Territories and possessions will probably be changed only very slightly.

In Table 1 is given the estimated population of continental United States for January 1 and July 1 of each year during the last intercensal period. The population increase in each six-month period and the distribution of that increase between natural increase and net migration from abroad are also presented, in addition to the annual increase. Starting with the census population of April 1, 1930, births and immigrants were added, and deaths and emigrants were subtracted, to produce successive estimates. Allowances were made for underregistration of births and deaths, and a final very slight adjustment was made to produce the exact 1940 census figure. Only the provisional character of the data on births and deaths for the first three months of 1940 prevents the estimates from being final.

The estimated population of States and of cities having 100,000 inhabitants or more at the Census of 1930 are presented for July 1 of each year from 1930 to 1939, in Tables 2 and 4. The basic method used was linear interpolation between two census figures, that is, it was assumed that the amount of increase or decrease for a given area was the same for each intercensal year. Six States and twenty cities were covered by local censuses for one or more years between the Federal censuses. (These States and cities are noted on the tables.) These local census figures were used as additional base points for linear interpolations. The difference between the sum of all the State estimates for any given year and the United States estimate described above was prorated among those States not having a special census. The adjustment factor never exceeded 0.3 percent for any year. After the tabulation of 1940 census data on each person's place of residence on April 1, 1935, and the compilation of school statistics and other local series associated with population, final annual estimates that reflect the ebb and flow of population growth during the decade will be prepared.

The population of the Hawaiian Islands for July 1 of each year 1930 to 1939 was estimated on the basis of births, deaths, and migration, just as the population of continental United States was estimated. Estimates for the other Territories and possessions, which have less reliable vital statistics, were obtained by linear interpolation. (See Table 4.) The Census of Puerto Rico taken in 1935 by the Puerto Rico Reconstruction Administration was used in the same manner as were the State censuses.

The estimates are presented as computed, to the last digit (instead of being rounded), not because they are assumed to be accurate to the last unit, but for convenience in summation.

TABLE 1 ESTIMATED POPULATION OF CONTINENTAL UNITED STATES BY SIX MONTH PERIODS, JULY 1, 1930 TO JANUARY 1, 1940

(Estimates are preliminary)

Date	Estimated population	Net increase in preceding year		Net increase in preceding six mo.		Gain or loss in preceding six months			
		Number	Percent	Number	Percent	Births	Deaths	Excess of births over deaths	Net immigration
April 1, 1940 (census)	131,669,275	--	--	[2]213,558	[2]0.16	604,682	[2]402,877	[2]201,985	[2]11,573
January 1, 1940	131,455,717	1,051,251	0.81	577,954	0.44	1,211,987	668,487	543,500	34,454
July 1, 1939	130,877,763	1,054,561	0.81	473,297	0.36	1,170,392	747,752	422,657	50,640
January 1, 1939	130,404,466	1,051,515	0.81	561,264	0.43	1,219,884	685,141	534,743	46,521
July 1, 1938	129,843,202	999,892	0.78	470,251	0.36	1,164,992	724,442	440,550	9,721
January 1, 1938	129,352,951	879,305	0.68	529,641	0.41	1,181,456	687,980	493,476	33,023
July 1, 1937	128,823,310	771,442	0.60	349,744	0.27	1,132,414	792,140	340,274	9,470
January 1, 1937	128,473,566	755,073	0.59	421,698	0.33	1,135,703	715,039	420,664	1,034
July 1, 1936	128,051,868	802,741	0.63	333,375	0.26	1,104,852	794,378	310,474	8,101
January 1, 1936	127,718,493	854,549	0.67	469,366	0.37	1,142,986	673,563	469,423	-57
July 1, 1935	127,249,127	876,250	0.69	385,183	0.30	1,128,216	747,612	375,604	9,579
January 1, 1935	126,863,944	853,294	0.68	491,067	0.39	1,174,251	679,456	494,795	-3,728
July 1, 1934	126,372,877	794,809	0.63	362,227	0.29	1,105,128	745,955	359,173	3,054
January 1, 1934	126,010,650	788,216	0.63	432,582	0.34	1,088,900	657,300	431,600	982
July 1, 1933	125,578,068	738,087	0.59	355,634	0.28	1,099,620	712,196	387,424	-31,790
January 1, 1933	125,222,434	747,284	0.60	382,453	0.31	1,143,592	663,901	479,691	-97,238
[illegible]	[illegible]	[illegible]	0.65	364,831	0.29	1,154,560	718,271	436,289	-71,458

continental United States and the territories and possessions will probably be changed only very slightly.

In Table 1 is given the estimated population of continental United States for January 1 and July 1 of each year during the last intercensal period. The population increase in each six-month period and the distribution of that increase between natural increase and net migration from abroad are also presented, in addition to the annual increase. Starting with the census population of April 1, 1930, births and immigrants were added, and deaths and emigrants were subtracted, to produce successive estimates. Allowances were made for underregistration of births and deaths, and a final very slight adjustment was made to produce the exact 1940 census figure. Only the provisional character of the data on births and deaths for the first three months of 1940 prevents the estimates from being final.

The estimated population of States and of cities having 10,000 inhabitants or more at the Census of 1930 are presented for July 1 of each year from 1930 to 1939, in Tables 2 and 3. The basic method used

United States estimate described above was prorated among those States not having a special census. The adjustment factor never exceeded 0.3 percent for any year. After the tabulation of 1940 census data on each person's place of residence on April 1, 1935 and the compilation of school statistics and other local series associated with population, final annual estimates that reflect the ebb and flow of population growth during the decade will be prepared.

The population of the Hawaiian Islands for July 1 of each year 1930 to 1939 was estimated on the basis of births, deaths, and migration, just as the population of continental United States was estimated. Estimates for the other Territories and possessions, which have less reliable vital statistics, were obtained by linear interpolation. (See Table 4.) The census of Puerto Rico taken in 1935 by the Puerto Rico Reconstruction Administration was used in the same manner as were the State censuses.

The estimates are presented as computed, to the last digit (instead of being rounded), not because they are assumed to be accurate to the last unit, but for convenience in summation.

TABLE 1.—ESTIMATED POPULATION OF CONTINENTAL UNITED STATES BY SIX MONTH PERIODS, JULY 1, 1930 TO JANUARY 1, 1940

(Estimates are preliminary)

Date	Estimated population	Net increase in preceding year		Net increase in preceding six months		Gain or loss in preceding six months			
		Number	Percent	Number	Percent	Births	Deaths	Excess of births over deaths	Net immigration[1]
April 1, 1940 (census)	131,669,275	--	--	[2]213,550	[2]0.16	[2]604,482	[2]402,877	[2]201,985	[2]11,573
January 1, 1940	131,455,717	1,051,251	0.81	577,954	0.44	1,211,987	668,487	543,500	34,454
July 1, 1939	130,877,763	1,054,561	0.81	473,297	0.36	1,172,392	747,731	422,659	50,640
January 1, 1939	130,404,466	1,051,515	0.81	581,264	0.45	1,219,884	685,141	534,743	46,521
July 1, 1938	129,823,202	999,892	0.78	470,251	0.36	1,168,972	724,442	460,530	9,721
January 1, 1938	129,352,951	879,385	0.68	529,641	0.41	1,176,456	687,838	490,618	39,023
July 1, 1937	128,823,310	771,442	0.60	349,744	0.27	1,132,414	792,140	340,274	9,470
January 1, 1937	128,473,566	752,078	0.59	421,698	0.33	1,135,703	735,039	400,664	1,034
July 1, 1936	128,051,868	802,741	0.63	333,375	0.26	1,101,652	794,378	307,274	8,101
January 1, 1936	127,718,493	854,549	0.67	469,366	0.37	1,142,966	673,563	469,423	-57
July 1, 1935	127,249,127	876,250	0.69	385,183	0.30	1,123,218	747,612	375,604	9,579
January 1, 1935	126,863,944	853,294	0.68	491,067	0.39	1,174,251	679,456	494,795	-3,728
July 1, 1934	126,372,877	794,809	0.63	362,227	0.29	1,105,128	745,955	359,173	3,054
January 1, 1934	126,010,650	788,216	0.63	432,582	0.34	1,088,900	657,300	431,600	982
July 1, 1933	125,578,068	738,087	0.59	355,634	0.28	1,099,620	712,196	387,424	-31,790
January 1, 1933	125,222,434	747,284	0.60	382,453	0.31	1,143,592	663,901	479,691	-97,238
July 1, 1932	124,839,981	800,609	0.65	364,831	0.29	1,154,560	718,271	436,289	-71,458
January 1, 1932	124,475,150	832,248	0.69	435,778	0.35	1,170,963	645,931	525,032	-89,254
July 1, 1931	124,039,372	962,687	0.78	396,470	0.32	1,184,563	748,864	435,679	-39,209
January 1, 1931	123,642,902	--	--	566,217	0.46	1,218,809	673,120	545,689	20,528
July 1, 1930	123,076,685	--	--	[2]301,639	[2]0.25	[2]614,905	[2]360,802	[2]254,103	[2]47,536
April 1, 1930 (census)	122,775,046	--	--	--	--	--	--	--	--

[1] A minus sign (-) denotes net emigration.

[2] Three-month period.

TABLE 2. ESTIMATED POPULATION OF THE UNITED STATES BY DIVISIONS AND STATES, JULY 1, 1950--JULY 1, 1959

(Estimates are preliminary)

Division and State	Census population, April 1, 1950	Estimated population as of July 1, —										Census population, April 1, 1940
		1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	
UNITED STATES	151,325,798	152,271,417	154,878,972	157,553,000	160,184,192	163,026,000	165,931,291	168,903,000	171,984,000	174,882,000	177,830,000	131,669,275
GEOGRAPHIC DIVISIONS:												
New England	9,314,351	9,374,000	9,438,000	9,500,000	9,561,000	9,621,000	9,680,000	9,739,000	9,797,000	9,854,000	9,911,000	8,437,220
Middle Atlantic	34,167,983	34,380,000	34,598,000	34,816,000	35,035,000	35,255,000	35,477,000	35,700,000	35,926,000	36,153,000	36,382,000	29,539,437
East North Central	30,399,368	30,668,000	30,942,000	31,218,000	31,498,000	31,780,000	32,067,000	32,356,000	32,649,000	32,945,000	33,244,000	26,936,848
West North Central	14,061,581	14,202,000	14,345,000	14,489,000	14,636,000	14,785,000	14,936,000	15,089,000	15,244,000	15,402,000	15,562,000	13,515,990
South Atlantic	21,182,559	21,505,000	21,833,000	22,165,000	22,502,000	22,844,000	23,191,000	23,543,000	23,900,000	24,262,000	24,630,000	17,659,151
East South Central	11,477,143	11,599,000	11,722,000	11,847,000	11,973,000	12,101,000	12,230,000	12,361,000	12,494,000	12,629,000	12,766,000	10,778,228
West South Central	16,951,777	17,211,000	17,475,000	17,744,000	18,017,000	18,295,000	18,578,000	18,866,000	19,159,000	19,457,000	19,760,000	13,044,588
Mountain	5,074,998	5,151,000	5,229,000	5,308,000	5,388,000	5,469,000	5,552,000	5,636,000	5,722,000	5,809,000	5,898,000	4,150,003
Pacific	19,151,486	19,381,417	19,696,972	20,066,000	20,374,192	20,757,000	21,220,291	21,663,000	22,093,000	22,571,000	23,058,000	19,723,848
NEW ENGLAND:												
Maine	797,423	799,813	806,980	810,790	813,068	819,689	824,797	828,813	828,824	827,468	848,013	847,226
New Hampshire	533,242	536,448	540,897	545,481	549,180	552,807	556,927	560,527	564,827	568,827	572,880	491,524
Vermont	377,747	379,911	382,979	386,469	389,184	390,007	392,947	395,400	398,778	398,949	399,033	359,231
Massachusetts[1]	4,690,514	4,694,948	4,676,971	4,697,986	4,718,988	4,740,847	4,747,884	4,741,148	4,684,880	4,688,119	4,691,908	4,316,721
Rhode Island[1]	687,497	687,802	686,082	686,842	683,668	682,428	681,806	684,881	698,880	699,806	707,987	713,346
Connecticut	1,809,109	1,811,188	1,824,274	1,834,804	1,848,971	1,888,987	1,869,106	1,870,990	1,878,485	1,889,884	1,700,803	1,709,848
MIDDLE ATLANTIC:												
New York	12,588,066	12,629,879	12,785,880	12,822,109	12,900,498	12,988,888	13,078,889	13,148,971	13,218,818	13,306,898	13,404,710	13,479,142
New Jersey	4,041,334	4,048,588	4,067,888	4,078,741	4,087,188	4,098,184	4,109,886	4,115,911	4,121,067	4,134,810	4,148,901	4,160,165
Pennsylvania	9,481,880	9,648,984	9,648,275	9,717,889	9,788,958	9,760,719	9,787,051	9,800,108	9,810,990	9,840,881	9,874,419	9,900,180
EAST NORTH CENTRAL:												
Ohio	7,946,627	7,960,934	6,998,198	6,722,998	6,743,430	6,768,067	6,798,787	6,810,218	6,825,229	6,853,897	6,894,140	6,907,612
Indiana	3,934,224	3,948,668	3,971,387	3,988,700	3,908,874	3,924,101	3,942,857	3,957,062	3,970,480	3,990,488	3,011,665	3,427,796
Illinois	8,712,176	7,643,896	7,686,648	7,710,806	7,730,979	7,755,964	7,782,198	7,797,858	7,811,762	7,840,801	7,872,788	7,897,241
Michigan[2]	6,371,766	4,982,970	4,798,060	4,737,230	4,719,410	4,681,590	4,713,911	4,827,978	4,948,148	5,004,318	5,170,480	5,256,106
Wisconsin	3,434,575	2,947,088	2,978,808	2,991,513	3,008,871	3,028,098	3,047,796	3,063,948	3,078,182	3,098,967	3,130,924	3,137,587
WEST NORTH CENTRAL:												
Minnesota	2,982,483	2,972,980	2,999,885	2,622,191	2,642,864	2,665,127	2,687,835	2,706,873	2,725,260	2,748,908	2,773,801	2,792,300
Iowa	2,470,939	2,475,297	2,486,864	2,498,609	2,497,241	2,503,481	2,510,022	2,518,208	2,525,834	2,523,825	2,531,783	2,538,268
Missouri	3,629,367	3,627,091	3,659,094	3,673,980	3,685,364	3,701,100	3,716,428	3,726,707	3,736,138	3,752,903	3,770,879	3,784,664
North Dakota	620,845	620,591	677,992	673,858	669,884	665,238	661,401	656,375	651,880	647,985	644,468	641,935
South Dakota[3]	652,740	651,975	650,480	684,385	681,490	677,998	673,998	667,440	660,927	654,394	647,661	642,961
Nebraska	1,377,963	1,377,884	1,374,070	1,367,562	1,360,178	1,353,654	1,347,200	1,339,288	1,330,846	1,325,053	1,319,746	1,315,834
Kansas[3]	1,900,999	1,848,385	1,815,408	1,821,078	1,826,821	1,829,709	1,843,715	1,835,059	1,817,604	1,807,089	1,807,486	1,801,028
SOUTH ATLANTIC:												
Delaware	238,380	239,336	242,380	246,350	247,940	250,721	253,523	256,977	258,389	261,257	264,848	266,505
Maryland	1,631,526	1,638,000	1,659,980	1,670,604	1,696,186	1,714,812	1,733,708	1,750,881	1,766,821	1,785,814	1,806,991	1,821,244
District of Columbia	466,869	491,795	510,836	527,900	545,104	562,534	580,249	597,053	613,674	631,464	649,506	663,091
Virginia	3,421,851	3,450,617	3,480,776	3,485,936	3,509,466	3,534,543	3,560,080	3,581,995	3,603,389	3,629,705	3,657,073	3,677,773
West Virginia	1,729,205	1,735,357	1,755,750	1,772,716	1,788,521	1,806,428	1,822,421	1,837,384	1,851,579	1,869,406	1,887,944	1,901,974
North Carolina	3,170,276	3,183,673	3,229,648	3,269,131	3,306,567	3,346,030	3,386,022	3,421,374	3,455,870	3,497,022	3,539,515	3,571,623
South Carolina	2,117,027	2,144,334	2,168,867	2,179,654	2,194,279	2,210,010	2,226,027	2,239,552	2,252,432	2,269,289	2,286,554	1,899,804
Georgia	3,444,578	3,516,968	3,543,708	3,564,686	3,589,733	3,004,626	3,025,998	3,048,845	3,059,778	3,082,213	3,105,881	3,123,723
Florida[2]	2,771,305	2,795,111	2,808,713	2,830,315	2,887,917	2,945,519	2,999,123	3,078,500	3,156,877	3,235,254	3,313,631	1,897,414
EAST SOUTH CENTRAL:												
Kentucky	2,944,806	2,922,136	2,950,942	2,979,367	2,994,445	2,716,988	2,739,961	2,759,196	2,777,765	2,801,[illegible]	2,826,696	2,845,627
Tennessee	3,291,718	3,286,813	3,661,470	3,690,935	2,718,636	2,748,008	2,777,815	2,803,815	2,829,131	2,859,896	2,891,755	2,915,841
Alabama	3,061,743	3,058,730	3,077,134	3,095,809	3,711,700	2,729,829	2,748,362	2,763,151	2,777,289	2,796,795	2,817,361	2,832,961
Mississippi	2,178,914	2,016,300	2,031,311	2,044,339	2,070,027	2,086,992	2,104,289	2,118,714	2,122,681	2,150,665	2,169,518	2,183,796
WEST SOUTH CENTRAL:												
Arkansas	1,909,482	1,858,619	1,871,621	1,880,756	1,888,669	1,897,756	1,907,148	1,913,941	1,920,297	1,930,[illegible]	1,941,168	1,949,387
Louisiana	2,101,593	2,110,380	2,140,413	2,166,278	2,190,713	2,216,498	2,242,431	2,265,698	2,288,187	2,315,090	2,342,880	2,363,880
Oklahoma	2,396,040	2,397,088	2,396,341	2,388,879	2,380,882	2,374,584	2,368,271	2,356,963	2,349,167	2,343,989	2,339,578	2,336,434
Texas	9,484,715	9,845,844	9,915,154	9,973,116	8,027,148	6,084,934	6,143,644	6,198,996	6,248,880	6,303,687	6,366,956	6,414,884
MOUNTAIN:												
Montana	537,606	538,721	541,864	543,945	545,673	547,740	549,895	551,307	552,386	554,939	557,301	559,456
Idaho	445,032	447,501	436,298	464,210	471,615	479,707	487,675	494,770	502,135	510,864	518,591	524,873
Wyoming	225,565	226,433	229,369	231,827	234,162	236,631	239,139	241,319	243,439	246,029	248,713	250,742
Colorado	1,035,791	1,039,077	1,049,688	1,056,248	1,066,117	1,074,645	1,083,343	1,090,564	1,097,522	1,104,602	1,116,100	1,123,296
New Mexico	423,317	426,481	436,115	445,904	459,393	470,158	480,996	491,167	501,199	512,191	523,383	531,818
Arizona	435,573	437,627	444,788	451,989	457,081	463,308	469,708	475,414	480,998	487,507	494,204	499,261
Utah	507,847	509,447	514,606	518,758	522,572	526,710	530,980	534,426	537,795	542,202	546,815	550,310
Nevada	91,058	91,686	93,721	95,686	97,467	99,367	101,223	103,059	104,809	106,756	108,748	110,247

South Atlantic	15,798,569	15,880,691	16,069,198	16,254,299	16,489,727	16,814,283	16,606,281	17,006,281	17,198,488	17,421,484	17,680,888	17,888,181
East South Central .	9,897,214	9,919,969	10,086,897	10,114,180	10,194,889	10,281,819	10,370,487	10,444,879	10,516,815	10,609,054	10,708,880	10,778,888
West South Central .	12,176,880	12,211,989	12,888,889	12,409,086	12,487,488	12,878,878	12,661,711	12,788,998	12,800,471	12,888,089	12,990,988	13,064,888
Mountain	3,701,738	3,716,988	3,788,689	3,818,611	3,854,880	3,888,816	3,948,888	4,000,881	4,066,480	4,116,088	4,180,000	
Pacific	8,194,488	8,241,618	8,410,488	8,888,078	8,700,888	8,888,181	9,018,788	9,186,888	9,888,606	9,488,188	9,[illegible]600	9,788,888
NEW ENGLAND:												
Maine	797,488	799,818	808,980	810,780	818,088	819,888	884,797	888,818	888,884	897,488	848,018	847,888
New Hampshire	488,888	488,488	488,887	478,481	474,888	477,188	478,778	481,788	488,887	488,887	488,888	481,884
Vermont	888,811	888,981	880,879	880,488	880,184	880,007	888,947	888,400	888,778	888,848	888,088	888,881
Massachusetts[1]	4,848,814	4,884,948	4,878,871	4,897,888	4,818,988	4,840,847	4,847,884	4,841,148	4,884,880	4,888,117	4,881,408	4,818,781
Rhode Island[2]	887,487	887,888	888,088	884,848	888,888	888,488	881,888	885,881	888,880	899,908	707,887	718,848
Connecticut	1,808,908	1,811,188	1,884,894	1,884,804	1,848,871	1,888,987	1,888,108	1,870,980	1,878,488	1,888,884	1,700,808	1,709,848
MIDDLE ATLANTIC:												
New York	12,888,088	12,888,878	12,788,880	12,888,108	12,900,488	12,988,888	13,078,888	13,148,971	13,818,818	13,888,888	13,404,710	13,478,148
New Jersey	4,041,804	4,048,588	4,057,888	4,078,741	4,087,188	4,088,184	4,108,888	4,118,711	4,121,087	4,184,810	4,148,981	4,180,888
Pennsylvania	9,681,880	9,648,884	9,898,878	9,717,888	9,788,988	9,780,719	9,789,081	9,800,108	9,810,990	9,840,881	9,874,419	9,900,180
EAST NORTH CENTRAL:												
Ohio	6,648,887	6,680,884	6,898,188	6,722,988	6,748,480	6,788,087	6,788,787	6,810,878	6,888,888	6,858,887	6,884,140	6,907,618
Indiana	3,288,508	3,848,648	3,871,887	3,889,700	3,808,874	3,884,101	3,848,887	3,887,088	3,890,480	3,890,488	3,411,448	3,427,788
Illinois	7,680,884	7,648,898	7,710,808	7,780,978	7,788,984	7,788,188	7,787,888	7,811,782	7,840,801	7,878,788	7,897,841	
Michigan[3]	4,848,888	4,882,870	4,798,080	4,787,880	4,719,410	4,681,580	4,718,911	4,887,978	4,948,148	5,086,818	5,170,480	5,856,108
Wisconsin	2,889,004	2,947,088	2,972,808	2,991,818	3,008,871	3,088,098	3,047,794	3,088,848	3,078,188	3,098,887	3,180,984	3,187,587
WEST NORTH CENTRAL:												
Minnesota	2,568,958	2,572,880	2,588,885	2,622,191	2,648,844	2,665,127	2,687,885	2,706,878	2,788,880	2,748,808	2,778,801	2,792,800
Iowa	2,470,988	2,475,287	2,486,864	2,498,809	2,487,841	2,508,481	2,510,088	2,518,884	2,528,887	2,581,788	2,58[illegible],268	
Missouri	3,629,867	3,687,091	3,659,094	3,678,980	3,686,884	3,701,100	3,716,488	3,726,707	3,736,188	3,752,809	3,770,878	3,784,664
North Dakota	680,845	680,581	677,888	678,958	669,884	665,886	661,801	656,578	651,680	647,988	644,488	641,988
South Dakota[4]	692,849	691,978	688,680	684,988	681,490	677,998	678,988	667,480	660,927	654,894	647,861	642,961
Nebraska	1,877,968	1,877,884	1,874,070	1,867,542	1,860,178	1,858,854	1,847,850	1,889,888	1,880,866	1,825,068	1,819,748	1,815,884
Kansas[5]	1,880,999	1,868,888	1,815,408	1,881,078	1,886,821	1,889,709	1,848,718	1,888,088	1,817,804	1,807,088	1,807,488	1,801,988
SOUTH ATLANTIC:												
Delaware	288,880	289,888	848,580	845,850	847,980	850,721	858,588	858,977	858,889	861,857	884,848	888,505
Maryland	1,681,588	1,688,000	1,659,980	1,678,804	1,696,188	1,714,818	1,788,708	1,750,881	1,788,881	1,785,814	1,805,991	1,821,244
District of Columbia	486,889	491,795	510,888	527,900	548,106	562,884	580,849	597,058	618,674	681,444	649,508	668,091
Virginia	2,421,851	2,480,817	2,460,778	2,488,986	2,509,468	2,584,848	2,560,080	2,581,995	2,608,889	2,629,705	2,657,078	2,677,778
West Virginia	1,729,805	1,788,857	1,788,750	1,778,716	1,788,581	1,805,488	1,822,681	1,887,884	1,851,579	1,869,606	1,887,948	1,901,974
North Carolina	3,170,274	3,188,678	3,229,548	3,269,181	3,806,567	3,340,080	3,886,022	3,421,874	3,455,870	3,497,082	3,539,515	3,571,628
South Carolina	1,788,788	1,744,684	1,788,887	1,779,656	1,794,879	1,810,010	1,828,087	1,839,558	1,858,488	1,889,289	1,886,856	1,899,804
Georgia	2,808,506	2,918,988	2,948,706	2,964,686	2,988,788	3,004,826	3,028,998	3,048,845	3,059,772	3,082,818	3,105,881	3,128,728
Florida[6]	1,468,811	1,475,111	1,508,718	1,580,815	1,587,917	1,585,519	1,688,128	1,678,500	1,736,877	1,[illegible]96,254	1,852,581	1,887,414
EAST SOUTH CENTRAL:												
Kentucky	2,614,589	2,628,186	2,650,942	2,672,587	2,694,445	2,716,988	2,739,961	2,759,198	2,777,785	2,801,698	2,826,696	2,845,627
Tennessee	2,616,556	2,686,818	2,661,470	2,690,988	2,718,486	2,748,008	2,777,815	2,803,819	2,829,181	2,859,896	2,891,755	2,915,841
Alabama	2,646,848	2,658,780	2,677,184	2,695,809	2,711,780	2,727,829	2,748,862	2,763,151	2,777,289	2,796,795	2,817,861	2,832,961
Mississippi	2,009,821	2,015,800	2,087,811	2,054,889	2,070,027	2,086,998	2,104,289	2,118,714	2,128,681	2,150,665	2,169,518	2,188,796
WEST SOUTH CENTRAL:												
Arkansas	1,854,488	1,858,819	1,871,621	1,880,756	1,888,569	1,897,754	1,907,148	1,913,941	1,920,297	1,930,369	1,941,168	1,949,387
Louisiana	2,101,998	2,110,380	2,140,413	2,166,275	2,190,719	2,216,498	2,242,681	2,265,692	2,288,187	2,315,090	2,342,880	2,363,660
Oklahoma	2,296,040	2,297,088	2,295,841	2,288,879	2,280,882	2,274,584	2,268,271	2,256,963	2,249,167	2,243,939	2,239,578	2,236,434
Texas	5,884,715	5,845,744	5,915,154	5,973,116	6,027,168	6,084,934	6,143,644	6,198,998	6,242,880	6,309,587	6,366,956	6,414,884
MOUNTAIN:												
Montana	537,606	538,721	541,864	542,965	545,673	547,740	549,995	551,803	552,588	554,998	557,501	559,456
Idaho	445,088	447,501	456,298	464,210	471,615	479,707	487,575	494,970	508,185	510,864	518,591	524,873
Wyoming	225,568	226,488	229,288	231,687	234,162	236,631	239,139	241,319	243,489	246,029	248,713	250,742
Colorado	1,035,791	1,039,077	1,049,608	1,056,248	1,066,119	1,074,648	1,083,343	1,090,584	1,097,522	1,106,802	1,116,100	1,123,296
New Mexico	423,817	426,681	426,115	448,904	459,393	470,158	480,996	491,187	501,199	512,191	523,383	531,818
Arizona	436,578	437,627	444,788	451,088	457,081	463,858	469,708	475,414	480,998	487,507	494,804	499,861
Utah	507,847	509,447	514,606	518,758	522,572	526,710	530,980	534,486	537,795	542,802	546,815	550,810
Nevada	91,058	91,636	93,721	95,686	97,487	99,867	101,888	103,059	104,807	104,756	106,748	110,847
PACIFIC:												
Washington	1,563,896	1,569,874	1,589,476	1,606,478	1,622,426	1,639,878	1,656,578	1,671,518	1,688,046	1,708,885	1,722,806	1,736,191
Oregon	968,786	968,198	978,817	988,945	999,722	1,018,112	1,086,660	1,088,800	1,080,675	1,064,578	1,078,820	1,089,684
California	5,677,851	5,714,041	5,847,808	5,969,649	6,067,880	6,209,678	6,888,498	6,446,848	6,558,894	6,688,770	6,811,848	6,907,887

[1] Based partly on State census of January 1, 1935. [2] Based partly on State census of January 1, 1936. [3] Based partly on F.E.R.A. census of January 14, 1935.
[4] Based partly on State census of May 1, 1935. [5] Based partly on State censuses as of March 1, 1931 to 1936. [6] Based partly on State census of April 8, 1935.

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TABLE 3. ESTIMATED POPULATION OF CITIES OF 100,000 OR MORE IN 1930, JULY 1, 1930 TO JULY 1, 1939

(Estimates are preliminary)

City	Estimated population as of July 1,--									
	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Akron, Ohio	254,784	253,789	252,734	251,709	250,684	249,659	248,634	247,609	246,585	245,560
Albany, N. Y.	127,491	127,808	128,124	128,441	128,757	129,074	129,390	129,707	130,023	130,340
Atlanta, Ga.	271,164	274,326	277,548	280,741	283,933	287,125	290,317	293,509	296,702	299,894
Baltimore, Md.	804,280	811,652	817,075	822,497	827,920	833,343	838,765	844,188	849,610	855,033
Birmingham, Ala.	259,678	260,686	261,487	262,247	263,036	263,828	264,619	265,409	266,200	266,990
Boston, Mass.[1]	782,110	790,800	798,489	806,179	813,868	813,247	804,314	795,381	786,448	777,516
Bridgeport, Conn.	146,736	146,787	146,807	146,848	146,888	146,929	146,969	147,010	147,050	147,091
Buffalo, N. Y.	573,147	573,429	573,712	573,994	574,277	574,559	574,842	575,124	575,407	575,689
Cambridge, Mass.[1]	113,628	114,809	115,742	116,675	117,605	117,390	116,019	114,648	113,278	111,907
Camden, N. J.	118,671	118,588	118,438	118,322	118,205	118,089	117,973	117,856	117,740	117,623
Canton, Ohio	104,993	105,343	105,692	106,042	106,391	106,741	107,090	107,440	107,789	108,139
Chattanooga, Tenn.	120,007	120,844	121,680	122,517	123,353	124,190	125,026	125,863	126,699	127,536
Chicago, Ill.[2]	3,386,689	3,387,395	3,396,161	3,374,926	3,389,079	3,391,293	3,313,507	3,335,720	3,357,934	3,380,148
Cincinnati, Ohio[3]	452,237	456,544	460,854	465,163	469,471	473,114	469,429	465,744	462,059	458,374
Cleveland, Ohio	900,577	897,567	895,458	893,349	891,039	888,530	886,821	884,412	882,202	879,993
Columbus, Ohio	290,952	292,804	294,067	296,609	297,161	298,714	300,266	301,818	303,370	304,923
Dallas, Texas	261,321	264,757	268,193	271,609	275,036	278,461	281,887	285,313	288,739	292,165
Dayton, Ohio	201,225	202,199	203,173	204,146	205,120	206,093	207,067	208,041	209,014	209,988
Denver, Colo.	287,725	292,180	293,635	299,090	302,545	306,000	309,455	312,910	316,366	319,821
Des Moines, Iowa	142,990	144,716	146,442	148,168	149,894	151,620	153,346	155,072	156,798	158,524
Detroit, Mich.[4]	1,568,463	1,542,847	1,521,971	1,501,095	1,480,279	1,482,720	1,512,347	1,541,975	1,571,603	1,601,231
Duluth, Minn.	101,463	101,413	101,373	101,334	101,294	101,254	101,214	101,174	101,135	101,095
Elizabeth, N. J.	114,472	114,004	113,537	113,069	112,601	112,134	111,666	111,198	110,730	110,263
El Paso, Texas	102,281	101,720	101,159	100,597	100,036	99,475	98,914	98,353	97,792	97,231
Erie, Pa.	115,992	116,090	116,189	116,288	116,387	116,486	116,584	116,683	116,782	116,881
Evansville, Ind.	102,119	101,601	101,082	100,563	100,045	99,526	99,007	98,486	97,970	97,451
Fall River, Mass.[1]	115,387	115,837	116,288	116,738	117,189	117,225	116,847	116,468	116,090	115,712
Flint, Mich.[4]	156,810	153,082	150,354	147,627	144,899	144,146	145,703	147,260	148,818	150,375
Fort Wayne, Ind.	115,033	115,379	115,725	116,072	116,418	116,765	117,111	117,457	117,804	118,150
Fort Worth, Texas	163,802	165,224	166,645	168,067	169,488	170,910	172,331	173,753	175,174	176,596
Gary, Ind.	100,708	101,838	102,967	104,096	105,228	106,355	107,484	108,613	109,743	110,872
Grand Rapids, Mich.[4]	168,077	166,019	163,961	161,903	159,845	159,226	160,293	161,359	162,426	163,492
Hartford, Conn.	164,127	164,346	164,566	164,785	165,005	165,224	165,444	165,663	165,883	166,102
Houston, Texas	294,656	303,872	313,088	322,305	331,521	340,737	349,953	359,169	368,386	377,602
Indianapolis, Ind.	364,731	367,012	369,293	371,575	373,856	376,137	378,418	380,699	382,980	385,261
Jacksonville, Fla.[5]	130,381	133,708	137,035	140,362	143,689	147,484	152,870	158,255	163,640	169,026
Jersey City, N. J.	316,326	314,772	313,218	311,664	310,110	308,555	307,001	305,447	303,893	302,339
Kansas City, Kans.[6]	121,624	120,751	120,300	120,691	121,706	123,233	124,758	125,641	126,906	125,586
Kansas City, Mo.	399,732	399,675	399,618	399,561	399,505	399,448	399,391	399,334	399,277	399,221
Knoxville, Tenn.	105,946	106,524	107,102	107,680	108,258	108,835	109,413	109,991	110,569	111,147
Long Beach, Calif.	142,588	144,812	147,036	149,260	151,484	153,707	155,931	158,155	160,379	162,603
Los Angeles, Calif.	1,244,704	1,271,[illegible]	1,297,980	1,324,572	1,351,195	1,377,818	1,404,441	1,431,064	1,457,687	1,484,310
Louisville, Ky.	308,088	309,161	310,235	311,428	312,561	313,694	314,827	315,961	317,094	318,227
Lowell, Mass.[1]	100,228	100,202	100,177	100,152	100,127	100,235	100,478	100,721	100,964	101,207
Lynn, Mass.[1]	101,242	101,949	101,662	101,355	101,068	100,644	100,113	99,582	99,052	98,521
Memphis, Tenn.	254,138	258,118	262,098	266,078	270,058	274,037	278,017	281,997	285,977	289,957
Miami, Fla.[5]	111,481	114,859	118,236	121,614	124,991	129,637	138,592	147,547	156,501	165,456
Milwaukee, Wis.	578,480	579,402	580,324	581,246	582,169	583,091	584,013	584,936	585,858	586,780
Minneapolis, Minn.	465,054	467,858	470,659	473,461	476,262	479,063	481,865	484,666	487,468	490,269
Nashville, Tenn.	154,204	155,558	156,911	158,265	159,619	160,972	162,326	163,680	165,033	166,387
Newark, N. J.	442,023	440,785	439,547	438,249	436,992	435,734	434,476	433,219	431,961	430,703
New Bedford, Mass.[1]	112,461	111,919	111,377	110,836	110,293	110,052	110,113	110,174	110,235	110,295
New Haven, Conn.	162,604	162,399	162,194	161,989	161,784	161,579	161,374	161,169	160,964	160,759
New Orleans, La.	459,634	463,234	466,811	470,389	473,966	477,544	481,121	484,699	488,276	491,854
New York, N. Y.	6,943,560	6,996,015	7,048,470	7,100,924	7,153,379	7,205,834	7,258,289	7,310,744	7,363,199	7,415,654
Norfolk, Va.	130,078	131,538	133,000	134,462	135,924	137,387	138,849	140,311	141,773	143,236
Oakland, Calif.	284,516	286,326	288,136	289,946	291,756	293,566	295,376	297,186	298,996	300,806
Oklahoma City, Okla.	185,685	187,786	189,672	191,575	193,479	195,382	197,286	199,189	201,093	202,996
Omaha, Nebr.	214,258	215,236	216,220	217,203	218,187	219,171	220,155	221,139	222,123	223,106
Paterson, N. J.	138,542	138,656	138,770	138,884	138,999	139,113	139,227	139,342	139,456	139,570
Peoria, Ill.	104,972	104,984	104,996	105,007	105,019	105,031	105,043	105,055	105,066	105,078
Philadelphia, Pa.	1,950,470	1,948,508	1,946,545	1,944,582	1,942,620	1,940,657	1,938,694	1,936,731	1,934,769	1,932,806
Pittsburgh, Pa.	669,863	670,047	670,231	670,416	670,600	670,784	670,968	671,152	671,337	671,521
Portland, Ore.	301,904	302,262	302,620	302,978	303,336	303,694	304,052	304,410	304,768	305,126
Providence, R. I.[7]	252,547	250,813	249,078	247,343	245,608	243,873	244,241	246,711	249,181	251,651
Reading, Pa.	111,156	111,096	111,035	110,975	110,915	110,854	110,794	110,734	110,674	110,613
Richmond, Va.	183,182	184,193	185,204	186,216	187,227	188,238	189,250	190,261	191,272	192,284
Rochester, N. Y.	328,053	327,737	327,422	327,106	326,790	326,475	326,159	325,843	325,527	325,212
St. Louis, Mo.	821,812	821,221	820,630	820,039	819,447	818,856	818,265	817,674	817,083	816,491
St. Paul, Minn.	272,009	273,622	275,235	276,848	278,461	280,074	281,687	283,300	284,913	286,526
Salt Lake City, Utah	140,509	141,475	142,442	143,409	144,375	145,342	146,309	147,275	148,242	149,209
San Antonio, Texas	232,100	234,331	236,562	238,793	241,025	243,256	245,487	247,718	249,949	252,181
San Diego, Calif.	149,379	154,913	160,448	165,982	171,517	177,052	182,586	188,121	193,655	199,190
San Francisco, Calif.	634,398	634,412	634,426	634,440	634,454	634,469	634,483	634,497	634,511	634,525
Scranton, Pa.	143,357	143,054	142,751	142,449	142,146	141,843	141,540	141,237	140,934	140,631
Seattle, Wash.	365,851	365,923	366,195	366,467	366,739	367,010	367,282	367,554	367,826	368,098
Somerville, Mass.[1]	103,743	103,083	102,423	101,763	101,103	100,907	101,174	101,442	101,709	101,976
South Bend, Ind.	104,120	103,827	103,535	103,242	102,950	102,657	102,365	102,072	101,780	101,487

Denver, Colo.	301,225	302,199	303,173	274,007	275,035	278,461	281,887	285,313	303,370	304,823
Des Moines, Iowa	288,725	292,180	295,636	204,168	205,180	206,093	207,067	208,041	288,739	292,165
	142,990	144,716	146,442	299,090	302,545	306,000	309,455	312,910	209,014	209,988
Detroit, Mich.[4]				148,168	149,894	151,620	153,346	155,072	316,396	319,821
Duluth, Minn.	1,569,463	1,542,667	1,521,871	1,501,075	1,480,279	1,482,720	1,512,367	1,541,975	156,906	156,524
Elizabeth, N. J.[5]	101,483	101,413	101,373	101,334	101,294	101,254	101,214	101,174	1,571,603	1,601,231
El Paso, Texas	114,472	114,004	113,537	113,069	112,601	112,134	111,666	111,198	101,135	101,098
Erie, Pa.[3]	102,881	101,730	101,159	100,587	100,036	99,475	98,914	98,353	110,730	110,463
Evansville, Ind.	115,992	116,090	116,189	116,288	116,387	116,486	116,584	116,683	97,782	97,231
Fall River, Mass.[4]	102,119	101,601	101,082	100,563	100,045	99,526	99,007	98,488	116,782	116,881
Flint, Mich.[4]	115,387	115,837	116,288	116,738	117,189	117,225	116,847	116,468	97,970	97,451
Fort Wayne, Ind.	156,210	153,082	150,364	147,687	144,899	144,144	142,703	147,266	116,090	115,712
Fort Worth, Texas	118,083	115,379	115,725	116,072	116,418	116,765	117,111	117,457	148,818	150,375
	163,802	165,224	166,645	168,067	169,488	170,910	172,331	173,753	117,804	116,150
Gary, Ind.	100,708	101,838	102,967	104,096	105,226	106,355	107,484	108,613	175,174	176,596
Grand Rapids, Mich.[4]	168,077	166,019	163,961	161,903	159,845	159,826	160,293	161,339	109,743	110,873
Hartford, Conn.	164,127	164,346	164,566	164,785	165,005	165,224	165,444	165,663	162,426	163,492
Houston, Texas	294,656	303,872	313,088	322,305	331,521	340,737	349,953	359,169	165,883	166,102
Indianapolis, Ind.	364,731	367,012	369,293	371,575	373,856	376,137	378,418	380,699	366,386	377,602
Jacksonville, Fla.[3]	130,361	133,708	137,036	140,362	143,689	147,484	152,870	158,255	382,980	385,261
Jersey City, N. J.	316,326	314,772	313,218	311,664	310,110	308,555	307,001	305,447	163,640	169,036
Kansas City, Kans.[4]	121,624	120,751	120,300	120,691	121,706	123,833	124,758	128,641	303,893	302,339
Kansas City, Mo.	399,732	399,075	399,418	399,561	399,505	399,448	399,391	399,334	126,906	125,588
Knoxville, Tenn.	105,948	106,524	107,102	107,680	108,258	108,836	109,413	109,991	399,277	399,221
Long Beach, Calif.	142,568	144,812	147,036	149,260	151,484	153,707	156,931	156,155	110,569	111,147
Los Angeles, Calif.	1,244,704	1,271,327	1,297,950	1,324,572	1,351,195	1,377,818	1,404,441	1,431,064	160,379	162,603
Louisville, Ky.	308,088	309,161	310,295	311,428	312,561	313,694	314,827	315,961	1,457,887	1,484,510
Lowell, Mass.[1]	100,228	100,202	100,177	100,152	100,127	100,235	100,478	100,721	317,094	318,227
Lynn, Mass.[1]	102,846	101,949	101,052	101,355	101,058	100,644	100,113	99,582	100,964	101,207
Memphis, Tenn.	254,128	258,118	262,098	266,078	270,058	274,037	278,017	281,997	99,052	98,521
Miami, Fla.[3]	111,481	114,859	118,236	121,614	124,991	129,637	138,592	147,547	285,977	289,957
Milwaukee, Wis.	578,480	579,402	580,324	581,246	582,169	583,091	584,013	584,936	156,501	165,456
Minneapolis, Minn.	485,056	467,858	470,659	473,461	476,262	479,063	481,865	484,666	586,859	586,780
Nashville, Tenn.	154,204	156,558	158,912	159,265	159,619	160,972	162,326	163,680	487,468	490,269
Newark, N. J.	442,023	440,765	439,507	438,249	436,992	435,734	434,476	433,219	160,033	164,387
New Bedford, Mass.[4]	112,481	111,919	111,377	110,835	110,293	110,052	110,113	110,174	431,961	430,703
New Haven, Conn.	162,834	162,399	162,194	161,989	161,784	161,579	161,374	161,169	110,235	110,296
New Orleans, La.	459,656	463,234	466,811	470,389	473,966	477,544	481,121	484,699	160,964	160,759
New York, N. Y.	6,963,560	6,996,015	7,048,470	7,100,924	7,153,379	7,205,834	7,258,289	7,310,744	488,276	491,854
Norfolk, Va.	130,076	131,536	133,000	134,462	135,924	137,387	138,849	140,311	7,363,199	7,415,654
Oakland, Calif.	284,516	286,326	288,136	289,946	291,756	293,566	295,376	297,186	141,773	143,236
Oklahoma City, Okla.	186,865	187,768	189,672	191,575	193,479	195,382	197,286	199,189	296,996	300,806
Omaha, Nebr.	214,252	215,238	216,226	217,203	218,187	219,171	220,156	221,139	201,093	202,998
Paterson, N. J.	138,542	136,656	136,770	136,884	136,999	139,113	139,227	139,342	218,122	223,106
Peoria, Ill.	104,972	104,984	104,996	105,007	105,019	105,031	105,043	105,055	139,456	136,570
Philadelphia, Pa.	1,950,470	1,948,508	1,946,545	1,944,582	1,942,620	1,940,657	1,938,694	1,936,731	105,066	105,078
Pittsburgh, Pa.	669,883	670,047	670,231	670,416	670,600	670,784	670,968	671,152	1,934,769	1,932,806
Portland, Ore.	301,904	302,262	302,620	302,978	303,336	303,694	304,052	304,410	671,337	671,521
Providence, R. I.	252,547	250,613	249,078	247,543	245,608	243,673	244,241	244,711	304,768	305,126
Reading, Pa.	111,156	111,096	111,035	110,975	110,915	110,854	110,794	110,734	249,181	251,651
Richmond, Va.	183,182	184,193	185,204	186,216	187,227	188,238	189,250	190,261	110,674	110,613
Rochester, N. Y.	328,053	327,737	327,422	327,106	326,790	326,475	326,159	325,843	191,272	192,284
St. Louis, Mo.	821,812	821,221	820,630	820,039	819,447	818,856	818,265	817,674	325,527	325,212
St. Paul, Minn.	272,009	273,622	275,236	276,848	278,461	280,074	281,687	283,300	817,083	816,491
Salt Lake City, Utah	140,509	141,475	142,442	143,409	144,375	145,342	146,309	147,276	284,913	286,526
San Antonio, Texas	232,100	234,331	236,562	238,793	241,025	243,256	245,487	247,718	148,242	149,209
San Diego, Calif.	149,379	154,913	160,448	165,982	171,517	177,052	182,586	188,121	249,949	252,181
San Francisco, Calif.	634,998	634,412	634,826	634,440	634,454	634,469	634,483	634,497	193,655	199,190
Scranton, Pa.	143,357	143,054	142,751	142,449	142,146	141,843	141,540	141,237	634,511	634,525
Seattle, Wash.	365,651	364,923	366,195	366,467	366,739	367,010	367,282	367,554	140,934	140,631
Somerville, Mass.[4]	103,743	103,083	102,423	101,763	101,103	100,907	101,174	101,442	367,826	368,098
South Bend, Ind.	104,120	103,827	103,535	103,242	102,950	102,657	102,365	102,072	101,709	101,976
Spokane, Wash.	115,678	116,323	116,974	117,622	118,271	118,920	119,568	120,217	121,780	121,487
Springfield, Mass.[4]	149,886	149,632	149,378	149,123	148,869	149,634	149,617	149,600	120,866	121,514
Syracuse, N. Y.	209,242	208,906	208,570	208,234	207,898	207,563	207,227	206,891	149,583	149,567
Tacoma, Wash.	106,862	107,141	107,400	107,659	107,918	108,177	108,436	108,695	206,555	206,219
Tampa, Fla.[3]	101,111	100,910	100,709	100,507	100,306	100,588	102,163	103,839	108,954	109,214
Toledo, Ohio	290,509	289,672	288,834	287,998	287,161	286,324	285,487	284,650	105,494	107,149
Trenton, N. J.	123,390	123,584	123,858	123,792	123,926	124,060	124,194	124,328	283,814	284,[illegible]
Tulsa, Okla.	141,280	141,370	141,460	141,550	141,640	141,730	141,820	141,910	124,462	124,596
Utica, N. Y.	101,709	101,587	101,466	101,343	101,221	101,098	100,976	100,854	142,000	142,090
Washington, D. C.	491,796	510,358	528,920	548,106	562,634	580,249	597,053	613,674	100,732	100,610
Wichita, Kans.[3]	109,912	105,886	103,299	100,985	100,782	102,914	103,441	104,194	631,464	649,506
Wilmington, Del.	106,745	107,335	107,926	108,517	109,107	109,698	110,289	110,880	107,458	112,717
Worcester, Mass.[1]	195,056	194,037	193,018	191,999	190,980	190,778	191,392	192,006	111,470	112,061
Yonkers, N. Y.	134,845	135,640	136,435	137,230	138,026	138,821	139,616	140,411	192,620	193,234
Youngstown, Ohio	169,945	169,717	169,489	169,260	169,032	168,804	168,576	168,348	141,806	142,002
									168,119	167,891

[1] Based partly on State census of January 1, 1935. [2] Based partly on C.W.A. census of January 9, 1934. [3] Based partly on F.E.R.A. census of May 31, 1935. [4] Based partly on F.E.R.A. census of January 14, 1935. [5] Based partly on State census of April 8, 1935. [6] Based partly on State censuses as of March 1, 1931 to 1939. [7] Based partly on State census of January 1, 1936.

TABLE 4.- ESTIMATED POPULATION OF TERRITORIES AND POSSESSIONS OF THE UNITED STATES, JULY 1, 1930-JULY 1, 1939

(Estimates are preliminary)

Date	Alaska	American Samoa	Guam	Hawaii*	Panama Canal Zone	Philippine Islands	Puerto Rico[1]	Virgin Islands
April 1, 1940 (census)	[2]73,186	12,908	22,290	423,330	51,827	[3]16,355,678	1,869,255	24,889
July 1, 1939	72,193	12,694	22,006	415,705	50,900	[3]16,142,453	1,844,034	24,673
July 1, 1938	70,868	12,409	21,628	409,960	49,664	15,858,154	1,810,406	24,386
July 1, 1937	69,544	12,123	21,250	400,816	48,428	15,573,854	1,776,778	24,098
July 1, 1936	68,219	11,838	20,872	396,072	47,192	15,289,554	1,743,150	23,810
July 1, 1935	66,894	11,553	20,494	389,562	45,956	15,005,255	1,710,327	23,522
July 1, 1934	65,570	11,268	20,116	384,331	44,720	14,720,955	1,678,629	23,235
July 1, 1933	64,245	10,982	19,738	383,973	43,484	14,436,655	1,646,931	22,947
July 1, 1932	62,921	10,697	19,360	385,013	42,248	14,152,355	1,615,233	22,659
July 1, 1931	61,596	10,412	18,982	377,530	41,012	13,868,056	1,583,535	22,372
July 1, 1930	60,271	10,126	18,604	367,880	39,776	13,583,756	1,551,838	22,084
April 1, 1930 (census)	[4]59,940	10,055	18,509	368,336	39,467	[5]13,512,681	1,543,913	22,012

* See fourth paragraph, page 1.

[1] Based partly on Puerto Rico Reconstruction Administration census of December 1, 1935.

[2] Estimate derived by extrapolation from the census figures for October 1, 1929 (59,278) and October 1, 1939 (72,524).

[3] Estimate derived by extrapolation from the census figures for December 31, 1918 (10,314,310) and January 1, 1935 (16,000,303).

[4] Estimate derived by interpolation between the census figures for 1929 and 1939.

[5] Estimate derived by interpolation between the census figures for 1918 and 1939.

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Southern Pacific Company

Pacific Lines

Casualties to Employees — Los Angeles Division — Freight Service Train & Enginemen

Year 1930

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
1/27	Niland, Cal.	X2451W	55	Unknown	P21	F	John Howe	S-C	Lost balance and fell off tender
1/4	Niland, Cal.	X2788E	15	Unknown	P45	B	Volney D. Richards	S-J	Brass fell on foot
1/28	Aurant, Cal.	X3737W	57	10	P21	B	Lon N. Davis	S-J	Caboose door closed on hand
2/10	Ventura, Cal.	X2713W	55	Unknown	A24	B	F. J. Koening	S-J	Stumbled and fell while running from exploding gasoline
3/12	Vindale, Cal.	142	24	5	P45	B	Autie C. Haynie	S-A	Slipped on damp grass while running along side of train to cut off car
3/26	Redlands, Cal.	X1815W	5	5	P30	B	Frank E. Lillis	S-D	Thrown off balance when cut he was riding coupled into cars on main track
3/1	Mecca, Cal.	X5020W	79	8	A8	C	Frank H. Collins	S-J	Stepped on rock while running along side of train
3/3	El Centro, Cal.	X1619W	3	—	A21	B	Geo. T. Knox	S-J	While disconnecting brake rigging from derailed car, bar which he was using slipped
3/10	Heber, Cal.	X3757E	1	—	A6	B	Raymond K. Meyers	S-J	Ice chopper fell from car
4/26	Aurant, Cal.	X2813W	58	6	P45	C	Robert B. Cooper	S-H	Driverless truck and trailer rolled foul of track
[fol. 5970]									
5/31	Tustin, Cal.	X1809W	8	—	P21	B	Ambrose J. Bierman	S-D	Struck by flying air hose
5/13	Los Angeles, Cal.	X5046W	98	40	P45	B	Elmer T. Canutson	S-J	Undersired emergency, application of airbrakes
					A8	C	M. S. JanDell	S-J	
6/6	Alhambra, Cal.	Yd2659E	15	—	A16	F	Harry C. Schachleiter	S-C	Burned by hot water and steam from bursted hose

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
7/6	El Centro, Cal.	Yd1683E	4	0	A5	C	Wm. H. Hausman	S-G	Stepped on nail
7/19	Indio, Cal.	X5002	123	3	A6	B	E. H. Rives	S-G	Stepped on rock while getting off moving car
7/1	El Centro, Cal.	Yd1711	2	0	A8	Yd B	Lillo G. Hart	S-J	Piece of ice slipped and struck finger
8/14	Los Angeles, Cal.	128	89	25	A24	C	Frank Soutar	S-J	*Thrown off balance by slack action on rear end
9/28	Los Angeles, Cal.	X5000W	86	6	P21	B	John W. Stephens	D-C	*Weak car buckled
10/10	Indio, Cal.	X5024W	100	6	A7	B	Carl E. Butler	S-J	*Undersired emergency application air brake caused severe slack action on rear end of train
11/17	Los Angeles, Cal.	X1803E	15	3	P30	B	Henry F. Thompson	S-H	Knocked down and run over by speeding auto which he attempted to flag
12/31	Oretega, Cal.	X2704W	64	—	P30	B	Hiland J. Wallin	S-D	Hand brake suddenly released after being set
[fol. 5971]									
1/3	Ventura, Cal.	Ex2719E	16	Unknown	A10	B	L. M. Miller	S-D	Struck by brake club when brake suddenly released
1/13	Pomona, Cal.	Ex2544E	16	—	A7	C	Henry C. Johnson	S-H	Struck by auto while crossing street
1/10	Bryn Mawr, Cal.	Ex5006W	99	18	A14	B	Harry F. Blake	S-J	*Thrown off balance when train broke in two account trespasser stepping on cut lever
1/24	Niland, Cal.	Ex5026W	97	10	P30	B	Chas. W. Jones	S-J	*Undesired emergency of air brakes due to trespasser stepping on cut lever
2/4	Beaumont, Cal.	Eng3678E	0	0	A4	F	Mark N. Gedds	S-C	Slipped and fell when climbing from tank of engine to cab
		[illegible]E	43	12	A6	F	Paul S. Wolgamot	S-C	Burned by hot water from squirt hose

[illegible]	[illegible], Cal.	Ex3502W	20	10	P45	B	Deforrest Morgan	S-G	Caught foot between ends of ties while boarding ballast spreader
4/19	Flowing Well, Cal.	Ex5002W	125	30	P30	B	Wm. H. Hausman	S-J	*Thrown off balance in caboose due to undesired emergency application
4/22	Imperial, Cal.	Ex3678W	27	0	P30	C	Albert J. Murphy	S-J	Stepped on rock fracturing bone in foot
5/25	Niland, Cal.	Ex5020W	123	8	(P30 (P30 (All	C B B	John P. McLaughlin Geo. B. Woodward Jno. B. Brown (SPEC. ATT.)	D-G) D-G) D-G)	*Switch thrown under engine, engineer applying air in emergency causing severe slack action on rear end, buckling cars in middle of train
[fol. 5972]									
5/18	Raymer, Cal.	Ex2708W	97	0	P60	F	E. B. Gaddy	S-C	Stepped backward and fell into culvert
6/19	Iris, Cal.	Ex5000W	118	35	P30	F	Chas. A. Hunt	S-C	Hot water from squirt hose burned ankle
6/13	Imperial, Cal.	Ex5007W	86	4	A6	B	Sam J. Rice	S-J	*Thrown off balance due to slack action account train parting
6/20	Los Angeles, Cal.	Ex3676W	99	10	P30	B	Marion B. Godbold	S-J	*Thrown off balance due to slack action of train
6/28	Roscoe, Cal.	264	85	15	P30	B	Geo. H. Brumage	S-J	*Thrown off balance and into ice bunker of car due to severe slack action
7/17	Tunnel, Cal.	265	64	8	P30	B	J. D. Cummins	S-J	Hands and feet burned from heat in tunnel
8/13	Los Angeles, Cal.	Ex2777E	61	6	P45	C	James H. Weeks	C-D	*Cars rolled out of adjoining track sideswiping train casuing derailment, injury caused from slack action
8/15	Santa Barbara, Cal.	Eng.3757	0	4	A9	B	Jas. G. Wyatt	S-J	Stumbled and fell over switch stand
9/30	Chino, Cal.	Ex1810W	18	4	P21	B	B. F. Rean	S-D	Struck by club account hand brakes suddenly releasing
10/1	Vindale, Cal.	Ex1625E	20	6	P45	B	Chas. Self	S-G	Fell while boarding car

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
11/27	Redlands, Cal.	Ex1810E	3	4	A9	B	A. C. Shackford	S-H	Auto collided with cut of cars
11/6	Santa Paula, Cal.	Ex2809W	2	0	A7	B	J. W. Higley	S-J	Cut by piece of wire when attempting to remove from hand hold of car
[fol. 5973]									
11/18	Ontario, Cal.	X2547W	52	4	A5	B	D. R. Stipp	S-J	*Lost hold and fell off car account of slack action
11/21	Garnet, Cal.	270	52	8	A11	B	Geo. G. Hall	S-J	Struck by rock thrown by trespasser
12/29	Brawley, Cal.	X2557E	6	8	P30	B	Geo. R. Powers	S-J	Struck by open door on adjoining track
11/19	Colton, Cal.	X5036W	52	15	A4 A19	C B	John J. Breen John T. Curley	S-J	*Sudden stop of train caused slack action and run in on rear of train throwing them off balance in caboose
12/25	Ventura, Cal.	1-812	74	10	A6	B	Lyle T. Sullivan	S-G	Claims fell while boarding caboose of moving train
12/14	Pomona, Cal.	828	24	8	P28	B	Charles H. Cox	S-H	Auto drove in front of train
12/14	Colton, Cal.	1-832	77	1	P60	E	Lewis H. White	S-1	Claims fell while running to board engine left foot severed
12/9	So. Fontana, Cal.	X5005W	77	30	P14	B	Ed Jennings	S-J	*Emergency application air brakes caused by train parting.
12/28	Cabazon, Cal.	830	51	Standing	P14	B	John W. Clark	S-J	Claims slipped and fell off car in standing train.
				Casualties to Freight Employees Year 1932					
2/16	Los Angeles, Cal.	X2741W	58	Not shown	A19	E	J. E. Connor	S-C	Slipped and fell as he stepped down from sand box to apron of engine
2/6	Los Angeles, Cal.	X2741W	74	6	A7	B	Wm. W. Lockwood	S-J	Particle of sand lodged in eye
2/24	Vindale, Cal.	X1619W	4	12	Killed	B	Arthur H. Davison	S-J	Apparently fell from moving

3/30	Hoge, Cal.	X30841	None	2	Died	F	Harry L. Small	S-I	Struck and run over by engine in backing movement
3/18	Myoma, Cal.	X5006W	62	30	Died	B	Robert H. Hayes	S-J	Knocked off moving train by trespasser
3/19	El Centro, Cal.	X5022W	125	6	P15 A12	B B	Frank L. Combs Walter W. Cox	S-J	Trespasser stepped on cut lever causing train to part
5/7	So. Fontana, Cal.	X3737W	82	—	P21	B	John R. Coleman	S-A	Caught thumb in coupler while coupling cars
5/4	Hasson, Cal.	X2704W	34	—	A6	B	Clarence C. Burwell	S-D	Sprained arm setting hand brake
5/8	Bassett, Cal.	X3737W	79	—	A11	B	Byrd E. Weeden	S-G	Stepped on board while getting off train turning ankle
5/17	Aurant, Cal.	822	111	8	P21	B	Frank Soutar	S-J	*Undesired emergency application of air brakes due to break in two
6/22	Aurant, Cal.	X5035W	112	8	A46	C	Carl G. Shaw	S-J	*Undesired emergency of air brakes due to train parting
6/24	Colton, Cal.	X5044W	101	8	A6	B	David A. Wooster	S-J	*Sudden stop due to derailment of engine
7/6	Los Angeles, Cal.	2649W	0	6	A13	E	Wm. F. Bergendorf	S-C	Struck side against arm rest on engine cab
7/6	Los Angeles, Euclid Ave.	X1761E	5	—	P120	B	Albert J. Murphy	S-D	Fell off brake platform while releasing hand brake
7/6	West Anaheim, Cal.	X1750W	33	10	P60	B	Russell Politte	S-J	Fell off car as coupling made
7/8	Indio, Cal.	X5026W	99	10	(P90 (P14	B B	Walter Q. Orr Hugh Jones	S-J S-J	*Sudden stop due to air hose blowing off car
8/24	Colton, Cal.	X5017W	86	20	A4	B	John A. Sutton	S-J	*Particle of sand in eye
[fol. 5975]									
9/2	Oxnard, Cal.	X1831E	23	4	A13	B	Fred W. Lee	S-J	*Lost hand hold through slack action of train
9/7	Cabazon, Cal.	826	97	12	A7	B	Archie Wing	S-J	*Thrown off balance due to slack action due to undesired emergency application of brakes
10/23	Santa Susana, Cal.	X3727W 3725	72	—	P30	B	Edward Stimson	S-J	*Thrown off balance due to rough stop

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
11/20	Heber, Cal.	X1726W	1	—	A10	B	Ross C. Newton	S-B	Struck by air hose
11/14	Wahoo, Cal.	X2665W	43	—	P21	B	John O'Reilly	S-J	Finger caught between rerailing frog and bracket on engine.
					Year 1933				
1/25	Strathern, Cal.	X3703W	62	—	P30	E	D. J. Purcell	S-C	Stepped backward and fell off bridge
1/17	Bertram, Cal.	X2746W	18	1	P30	B	Thos. C. Cline	S-J	While adjusting chain on car hand caught between chain and bottom of car as train moved forward
1/27	Walnut, Cal.	X5026W	79	30	P30	B	Roy H. Allen	S-J	*Thrown off balance due to slack action on rear of train
3/13	Elcasco, Cal.	X5048W	98	1	A4	B	Thomas S. Powell	S-J	*Thrown off balance due to slack action
3/25	Ontario, Cal.	828	27	0	P21	B	Harry H. Hartley	S-J	Slipped or stumbled and fell while crossing track
4/30	Beaumont, Cal.	828	99	15	(P30	C	James H. Weeks	M-B)	*Thrown off balance due to
					(P30	B	W. A. Wheeler	B-B)	severe slack action due to break in two of train
5/18	Brawley, Cal.	X2820E	12	2	P21	B	Otis A. Gates	S-D	Fell off car as coupling made
6/28	Brawley, Cal.	X1761E	4	0	A11	C	Wm. T. Sanders	S-G	Stepped on rock while getting off car
[fol. 5976]									
6/23	Garnett, Cal.	824	84	30	A15	B	Harry F. Faust	S-J	Foreign substance in eye
8/15	Whittier, Cal.	X1662E	9	10	P14	B	James W. Higley	S-F	Struck by overhead wire while riding on top of train
10/26	Colton, Cal.	X5036W	57	15	P15	B	Frank Soutar	S-J	*Thrown off balance in cab due to slack action when train parted.
11/15	San Bernardino, Cal.	X2746W	3	0	A11	B	Max W. Justice	S-E	Switch box cover dropped on foot
11/10	Alhambra, Cal.	826	97	15	Killed	B	Frank L. Flaherty	S-J	Apparently fell between cars

12/30	Moor Park, Cal.	X3673E	48	Standing	P15	F	Albert D. Olin	S–C	Hook slipped off water spout while pulling spout in position
12/24	Niland, Cal.	822	74	12	Killed	B	Edward F. Love	S–J	Apparently fell while stepping from top of car to brake platform
					Year 1934				
3/15	Indio, Cal.	X5024E	8	2	P10	B	Geo. N. Lacey	S–G	Stepped on rock while getting off car
4/20	Pomona, Cal.	X3697W	58	3	P21	B	James W. Higley	S–H	*Auto collided with engine causing emergency application of air on rear
5/1	Calipatria, Cal.	X2746W	19	0	P21	B	John C. Turner	S–J	Finger caught while closing door
5/29	Downey, Cal.	X1632W	16	0	A7	B	Walter E. Dretelbis	S–J	Strained stomach muscles while lifting heavy box freight
7/4	Loma Linda, Cal.	1–832	99	12	A4	F	Jack Sears	S–G	Hand slipped off grab iron while boarding engine
[fol. 5977]									
7/4	Santa Susana, Cal.	X3681W	72	Standing	P30	B	James Cowsert	S–J	Slipped and fell off bridge while inspecting train
7/7	El Casco, Cal.	X5032W	101	15	P30	B	Wm. F. Thomason	S–J	*Thrown off balance in caboose by slack action on rear of train
7/7	Caliapatria, Cal.	X5004W	79	12	A7	B	D. F. Morgan	S–J	*Thrown off balance in caboose due to undesired emergency application of brakes
8/5	Moorpark, Cal.	X3696W	48	6	A14	B	Edward Stinson	S–J	Tripped and fell while running too close switch
8/20	Bloomington, Cal.	826	86	30	Z26	B	Virgil L. Rippy	S–J	Burned by hot water from squirt hose
8/25	Pomona, Cal.	X5021W	110	6	(P45	C	Wesley A. Franks	S–J)	*Thrown off balance by slack action on rear end account train parting due to trespasser stepping on cut lever
					(P45	B	Harry A. Faust	S–J)	
					(P30	B	Charles Self	S–J)	
9/6	Seacliff, Cal.	X3742W	124	4	A10	C	Thos. S. Powell	S–J	*Thrown off balance in caboose by slack action on rear of train

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
10/25	Saugus, Cal.	815	71		P28	B	Roy E. Williams	S-J	Stepped in hole while walking alongside of standing train
10/31	Burbank, Cal.	X2520W	19	10	A11	B	Michael J. Donovan	S-J	Ran into side of auto while crossing highway
11/25	Amos, Cal.	X5008W	124	10	C14	B	Wm. P. Church	S-G	Stepped on rock while boarding moving train
12/2	Glamis, Cal.	X5040W	117	2	P21	C	Wm. H. Cromwell	S-J	Thrown off balance in caboose when train started
					Year 1935				
1/1	Mecca, Cal.	X5000W	74	40	P21	B	Emery M. Byrd	S-J	Broken hand rail on tank car
[fol. 5978]									
1/7	Mesquite, Cal.	X5024W	99	12	P21	B	Matt M. Murphy	S-J	Thrown off balance in caboose due to undesired emergency application of air brakes
1/10	Vicinity of N. Brd. Bldg. L. A.	X5004W	61	15	A6	B	James W. Higley	S-J	Particle hot sand lodged in eye
2/9	Pomona, Cal.	814	74	20	A6	B	Clyde H. Mathews	S-J	Foreign particle lodged in eye
3/22	Van Nuys, Cal.	X2544E	10	20	A9	B	Michael A. Nuget	S-G	Slipped in wet weeds and grass while getting off moving car
3/20	Glamis, Cal.	X5022W	124	30	P30	B	George N. Lacey	S-J	Thrown off balance by slack action due to undesired emergency application of air brakes
4/1	Los Angeles enroute to train	Eng. 3673	—	—	P21	F	Robert W. Fallon	S-C	Burned about face and stomach by fire from firebox
5/28	El Centro, Cal.	X1828E	—	4	P14	B	DeForrest Morgan	S-G	Claimed stepped on end of tie while getting off pilot of engine
5/13	Firestone Park, Cal.	X2520W	34	—	P21	C	Dugal W. McIntyre	S-J	Attacked and beaten by unknown assailant
5/29	Chatsworth, Cal.	X2544E	35	—	P14	B	Bert M. Prodor	S-J	Dropped metal running board on foot
6/29	Dryden, Cal.	X5048W	76	10	P30	B	Robert A. Graves	S-G	Fell while getting off moving

6/30	Drylyn, Cal.	X2488W	11	2	Killed	B	Earl E. Witten	S-H	Struck by auto while flagging
8/17	West Anaheim, Cal.	X1760W	11	2	P30	B	Walter W. Whitney	S-J	Dropped running board on foot
6/7	Whittier, Cal.	X1639W	2	—					
[fol. 5979]									
6/20	Enroute to train Los Angeles	Eng.4330	—	—	P14	F	Hugh L. Taff	S-J	Thrown off balance as engine coupled into by another engine
6/23	Mecca, Cal.	X3708W	46	—	P14	B	Ernest H. Rives	S-J	Claims tripped over tie wire on car
6/24	Stonemap, Cal.	826 (5048 (5007	96	30	P21	B	Wm. H. Hausman	S-J	*Thrown off balance in caboose by slack action of train
7/13	Mecca, Cal.	X1660W	4	—	P21	B	John R. Blankenship	S-E	Dropped switch lever weight on foot
7/3	Fillmore, Cal.	X1787W	—	1	P21	B	John P. Fowler	S-G	Caught foot between foot board of engine and ground
7/14	Indio, Cal.	2-832	76	8	P60	B	Charles L. Kuhney	S-1	Struck and run over by engine in back up movement
7/9	Camarillo, Cal.	X3669W	97	30	P30	B	John A. Sutton	S-J	*Thrown off balance in caboose by slack action of train
7/22	Heber, Cal.	X1810W	12	—	P21	B	Charles Bockmen	S-J	Struck by air hose
8/1	Bloomington, Cal.	XW 105	30	4	Died	B	George A. McCoy	S-D	Fell off top of car
8/2	So. Fontana, Cal.	XW 2578E	2	Standing	P15	B	Isaac D. Street	S-D	Fell off top of car
9/11	Anaheim, Cal.	X1746E	12	2	A7	B	Charles W. Jones	S-D	Claims while releasing hand brake struck by club
9/17	Niland, Cal.	X1726W	12	—	P14	B	Norris E. Jordan	S-E	Dropped switch lever ball on foot
9/19	Mesquite, Cal.	824	97	—	P30	B	Samuel J. Rice	S-J	*Claims thrown off balance in cupola of caboose as stop made
9/30	Los Angeles, Cal.	X2681E	21	—	P21	B	Wm. H. Hausman	S-J	Claims fell while walking through caboose
[fol. 5980]									
10/1	Indio, Cal.	X5036W	64	6	P45	B	John A. Sutton	S-J	Claims thrown off balance as train stopped
11/17	Glendale, Cal.	811	54	25	P60	B	Geo. B. Burch	S-J	Shot by unknown person
12/23	Los Angeles, Cal.	X4307W	43	6	P21	B	Lawrence E. Richardson	S-J	Claims knocked off top of train by sudden stop of train

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
12/26	Gausti, Cal.	X2788E	13	—	A6	B	Claude Plummer	S–J	Claims struck by rerailing frog which he was handling
12/29	El Casco, Cal.	830	19	—	P21	B	Ben B. Reeves	S–J	Claims sprained back unloading freight from car
					Year 1936				
1/8	Indio, Cal.	2–830	99	8	A10	B	Carl A. McCullum	S–G	Claims stepped on rock while getting off car
2/26	Santa Barbara, Cal.	X3669W	4	0	P14	B	Wm. J. Sherer	S–D	Brake staff broke while setting hand brake
2/10	Los Angeles, Cal.	826	108	6	P21	B	Leo Y. Pironi	S–J	Claims thrown off balance when train parted due to trespasser stepping on cut lever
4/4	Indio, Cal.	834	86	8	A8	B	Fred W. Lee	S–G	While detraining from moving caboose collided with man riding on side of moving car on adjoining train
4/17	Narod, Cal.	X5033W	61	15	P60	B	Virgil E. Holland	S–J	Fell off top of train
5/28	Colton, Cal.	X5007W	58	0	A7	B	Leo Y. Pironi	S–D	Struck by brake club when releasing hand brake
5/1	Tweedy, Cal.	X2423E	8	2	P28	B	Albert J. Murphy	S–J	Claims stepped on block of wood lying on ground
5/2	Indio, Cal.	X5013W	64	0	A4	B	Matt M. Murphy	S–J	Claims sprained wrist prodding livestock
5/29	Colton, Cal.	2–832	96	0	P21	B	Maurice S. Jan Dell	S–J	Stepped on rock while running to board engine
[fol. 5981]									
6/29	San Fernando, Cal.	X3305W	0	0	P45	F	J. P. Cavanaugh	S–C	Fell while getting down off front of engine
6/30	Van Nuys, Cal.	X1678W	54	8	A6	F	M. J. Crowley	S–C	Thrown off balance in cab of engine
6/16	Edom, Cal.	3–832	49	Standing	A10	B	Lyle T. Sullivan	S–G	Fell while getting off car in standing train

6/25	Heber, Cal.	X1809E	2		P14	B	Wm. F. Clark	S-G	Stepped in depression when getting off standing car
6/29	Keith, Cal.	X2559E	32	6	P14	B	Milo P. Hards	S-G	Stepped on rock while running to board moving cars
6/21	Saugus, Cal.	X3752W	0	6	A8	E	Edward Rudolph	S-J	Struck by piece of lumber extending from side of car in passing train
7/7	Indio, Cal.	X5041W	99	0	P90	B	Willard McCubbin	S-G	Fell while getting off standing car
7/12	Banning, Cal.	830	23	0	P28	B	Ashby D. Lane	S-J	Fell off standing car
7/28	Knob, Cal.	X5043W	60	20	A4	B	Lilo C. Hart	S-J	Claims piece of hot sand lodged in eye
8/21	San Fernando, Cal.	X3707W	0	0	A8	F	Clarence R. Smith	S-C	Claims fell while getting off standing engine
8/28	Los Angeles, Cal.	2-812	74	3	P21	B	Russell Politte	S-J	Claims thrown off balance by sudden stop of train
9/19	Los Angeles, Cal. (going out)	Eng. 4325E	—	Standing	P45	F	Werl W. Watt	S-C	Fell off standing engine
9/2	So. Fontana, Cal.	X5018W	74	20	A20	B	Autie C. Haney	S-J	Fell on top of car due to running board breaking
9/6	Spadra, Cal.	X5042W	111	30	P28	B	Carl A. McCullum	S-J	Undesired emergency application air brakes
9/27	Oxnard, Cal.	X1784E	5	8	P21	B	Frank R. Cowlishaw	S-J	Thrown off balance as coupling made
10/2	Colton, Cal.	X2451W	34	—	A5	B	George J. Abel	S-D	Fell off car while releasing hand brake
10/2	Los Angeles, Cal.	X2448E	83	—	P14	B	Wm. J. Green	S-D	Struck by brake lever releasing hand brake
[fol. 5982]									
10/10	Iris, Cal.	822	88	—	A5	B	Vernon W. VonSeidletz	S-G	Stepped on rock getting off standing train
10/11	Niland, Cal.	824	86	12	P21	B	Robert R. Robinson	S-G	Fell while detraining from moving train
10/19	Niland, Cal.	X5048W	100	4	P30	B	Richard E. Talbert	S-J	Stepped on rock wrenching knee
11/24	Oxnard, Cal.	X2557E	3	4	P30	B	Jesse E. Harmon	S-D	Fell from car as coupling made
11/25	Santa Paula, Cal.	X2711W	7	4	P21	B	Leroy Foster	S-D	Knocked off car while releasing hand brake

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
11/17	El Casco, Cal.	X5024W	47	10	A18	B	Harry F. Faust	S-G	Stepped on rock while getting off moving train
11/19	Iris, Cal.	1-822	68	5	P14	B	Loutz E. Allen	S-G	Stepped on rough ground getting off moving train
11/24	Indio, Cal.	(5025 (X5020W	59	20	P21	B	Walter A. Boyd	S-G	Fell while boarding moving train
11/13	Indio, Cal.	Eng. 2366W	—	—	P28	F	James R. Glamen	S-J	Stepped in depression between ties
					Year 1937				
1/14	Hewitt, Cal.	3/1	23	Standing	A5	B	Jess Herndon	S-B	Claims burned by hot water while opening steam hose valve
1/25	Saugus, Cal.	X3308E	14	1	A5	B	Henry Oswald	S-G	Claims stepped in hole while getting off train
1/7	Redlands, Cal.	819	9	Standing	A7	B	H. L. St. Clair	S-J	Claims slipped and fell off top of car in standing train
1/25	Caleb, Cal.	X5036W	62		A12	C	J. A. Sutton	S-J	Foreign particle in eye
2/16	Oxnard, Cal.	X2551E	25	3	A4	B	R. F. Sugg	S-G	Turned ankle when getting off moving car
3/12	Ailsa, Cal.	X3707W	111	25	A4	C	R. T. Aird	D-B	Carrier iron broke permitting draw bar to drop causing train to break in two throwing conductor off balance, causing injury.
[fol. 5983]									
3/24	Brawley, Cal.	X1707E	3	4	P28	C	Wm. Sullivan	S-H	Auto drove in front of trnia on public crossing striking conductor
4/2	Los Angeles, Cal.	Eng. 1678E.	0	Standing	A20	F	H. F. Anderson	S-C	Slipped and fell while climbing over boiler of engine
4/4	Cabazon, Cal.	3/836	63	15	A9	B	Earl Wittfeldt	S-G	Fell while boarding moving train

4/15	Los Angeles, Cal.	Eng. 1309	0	4	P60	F	R. A. Walcott	S-1	Struck by engine while walking in center of track
4/17	Narod, Cal.	824	68	20	Killed	B	C. E. Smith	S-1	Apparently fell against moving train on adjacent track
4/7	Pomona, Cal.	X2799W	24	Standing	P45	B	O. M. Preece	S-J	Struck by missile thrown by unknown person
4/16	South Gate, Cal.	X1798E	5	9	P60	B	Russell Politte	S-J	Fell off car when coupling made
4/29	El Centro, Cal.	X1794W	0	Standing	P21	B	R. L. Kruger	S-J	Burned by hot water from engine injector
5/8	Redlands, Cal.	X1829E	4	—	P21	B	Wm. G. Gates	S-D	Claims strained back while releasing hand brake on car
5/8	Linco, Cal.	X2711E	11	2	A8	B	H. W. Morgan	S-D	Struck by brake club while releasing hand brake
5/24	Mecca, Cal.	X2804E	44	Standing	P21	B	B. W. Bierderman	S-E	Dropped switch lever on ball of foot
4/27	Ontario, Cal.	X2559W	14	2	P21	B	B. A. Reeves	S-G	Claims fot slipped while getting off footboard of engine
5/4	Tweedy, Cal.	X1798W	16	3	A13	B	Chas. R. Fassino	S-J	Claims caught between and knocked off side swiped car
5/23	Knob, Cal.	X5032W	123	2	P21	C	Wm. A. Jordan	S-J	Claims thrown off balance in caboose by slack action on rear end of train
6/7	Saugus, Cal.	Eng. 3320E	0	Standing	P28	F	W. B. Mayfield	S-C	Claims slipped and fell whilef climbing down off tank of engine
[fol. 5984]									
6/12	Edom, Cal.	Eng. 3766W	0	—	P21	F	J. W. Walden	S-G	Claims stepped on rock while getting off engine
6/17	El Centro, Cal.	X1736E	0	—	A11	B	H. R. Bowles	S-J	Claims foreign particle lodged in eye
6/17	Roscoe, Cal.	X2849E	55	7	A5	B	F. L. Combs	S-J	Claims thrown off balance when coupling was made.
6/22	"	X2747E	1	8	A4	B	J. M. Kelly	S-J	Claims sprained ankle while stepping on cut lever to uncouple engine from caboose

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
6/28	El Centro, Cal.	X2713E	21	8	P14	B	G. F. Frey	S-J	*Fell off rear end of caboose as emergency stop was made.
7/12	Indio, Cal.	X1739W	2	Standing	P21	B	Jess E. Harmon	S-D	Claims brake staff bent while setting brake
7/8	Dryfyn, Cal.	X5025W	122	8	P90	B	E. F. Donahue	S-G	Foot caught under wheel head end caboose of moving train
7/16	N. Los Angeles, Cal.	X2559W	73	6	A16	B	L. E. Richardson	S-G	Claims slipped on ballast shoulder while getting off train
7/12	Colton, Cal.	Eng. 2601E	12	8	P21	B	L. R. Casey	S-J	Claims knocked off side of cut by car standing at close clearance on adjoining track.
7/13	Bertram, Cal.	Ex5018W	119	20	A7	B	G. L. Oswald	S-J	*Thrown off balance in caboose due to car derailing causing sudden stop
7/14	Brawley, Cal.	Ex1736W	8	4	P45	B	F. F. George	S-J	Claims lost balance and fell from train when coupling was made
7/14	Niland, Cal.	Ex5039W	124	5	P21	B	J. E. Finley	S-J	Claims foot slipped off end of tie while running to catch caboose
7/17	Los Angeles, Cal.	X2294 1801	72	8	P60	B	H. E. Miller	S-J	*Felt off train when sudden stop was made to avoid striking auto on crossing
8/16	Indio, Cal.	X5032W	123	6	A10	B	J. F. Eshenower	S-J	*Thrown off balance in caboose when train parted due to trespasser stepping on cut lever causing emergency application of air brakes.
[fol. 5985]									
8/17	Ausant, Cal.	X3734W	86	20	A6	E	J. E. Patterson	S-J	Foreign particle in eye
9/4	Chatworth, Cal.	1/812	84	20	P14	B	J. F. Fahey	S-J	Fell off moving train
10/15	Oxnard, Cal	2/2	25	Standing	P28	F	C. A. Kelsey	S-C	Claims finger caught between water spout & edge of engine manhole

10/14	Moorpark, Cal.	X3724W	58	8	P21	B	H. H. Bradshaw	S–G	while setting hand brake on car Claims while boarding train slipped on ballast and fell
10/31	Los Angeles, Cal.	811	66	15	P60	C	James A. McGee	S–G	Apparently missed footing while boarding caboose of moving train
10/7	Dry Camp, Cal.	1/836	67	25	A20	B	D. L. Dillon	S–J	Missed monkey bar in cupola of caboose losing balance and falling on oil locker
10/21	Niland, Cal.	X5025	125	8	P21	C	A. B. Mason	S–J	Knocked off rear end caboose due to emergency stop caused by train parting causing emergency stop
11/10	Araz, Cal.	X5005W	81	4	P21	B	W. E. Allbright	S–D	Claims chain broke while setting hand brake on car
11/23	Calexico, Cal.	Eng. 1773W	0	12	Killed	B	Geo. Robinson	S–J	Caught between engine tender and car on adjoining track
11/23	Bloomington, Cal.	828	77	25	P14	B	C. C. Koontz	S–J	Claims lost balance and fell while getting out of caboose cupola
12/23	Summerland, Cal.	X1742W	0	0	P21	B	J. L. Todd	S–A	Claims finger caught between cut lever while cutting off cars
[fol. 5986]									
12/28	So. Fontana, Cal.	X5017W	106	10	P14 P14	B B	Geo. N. Lacy H. S. Bolster	S–J S–J	Thrown against caboose by slack action when train parted causing emergency stop
					Year 1938				
1/26	Roscoe, Cal.	813	66	3	P21	B	Roy A. Williams	S–G	Ladder rung came loose while climbing up side of car
1/26	N. Los Angeles, Cal.	Ex1784W	16	Standing	A5	E	Patrick Dowd	S–J	Struck by lubricator door falling from passing train
2/10	Saugus, Cal.	815	69	—	A4	B	Wm. S. Brown	S–E	Claims strain while operating switch lever
2/23	Banning, Cal.	Ex2842E	20	5	P45	B	J. E. Harris	S–G	Claims stepped on rock while getting off moving car.

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
2/16	Spadra, Cal.	X5025W	58	2	A18 P60	C B	W. E. Driebelis B. B. Reeves	S-J S-J	Thrown off balance in caboose due to severe slack action caused by undesired emergency application from engine
3/26	Narod, Cal.	Ex4307W	56	10	P21	B	M. S. Jan Dell	S-G	Apparently twisted foot while getting off moving train
3/20	Lagol, Cal.	X3723W	74	35	A14	B	D. M. Payne	S-J	Struck by water box falling from engine tender
4/8	Indio, Cal.	X5032W	123	Standing	A-6	B	C. W. White	S-D	Strained back while setting hand brake on car
5/20	Glamis, Cal.	X5044W	99	6	A4	B	R. J. Mourning	S-G	Claims stepped on rock while getting off moving car
6/30	Brawley, Cal.	X1809W	1	3	P14	B	J. E. Harmon	S-D	Claims strained back while setting hand brake on car
6/10	Colton, Cal.	828	94	Standing	P14	B	J. L. Todd	S-G	Claims foot slipped off stirrup while getting off standing car
6/25	Pomona, Cal.	X2746W	—	10	A6	B	P. G. Walton	S-G	Claims strained side while getting off moving car
[fol. 5987]									
6/12	Hugo, Cal.	836	94	20	P21	B	H. O. Davidson	S-J	Claims stepped on nail head protruding from deck of car
6/30	Santa Barbara, Cal.	X3657W	67	5	P14	B	Wm. W. Lockwood	S-J	Claims thrown against wash basin in caboose due to slack action on rear end of train
7/12	Saugus, Cal.	815	70	Standing	A12	F	R. T. Townsend	S-C	Struck by chain while raising spout after taking water
8/10	Hobbs, Cal.	X2813W	6	Standing	P30	B	C. C. Stephens	S-D	Fell off car while releasing hand brake
8/6	Frink, Cal.	X5025W	121	40	Killed	B	H. V. Crank	S-1	Apparently fell from moving train
9/1	Saugus, Cal.	X2842W	4	Standing	A24	B	P. D. Robinson	S-G	While getting off standing car slipped on sugar beet lying on ground

								head of caboose door	
10/21	Indio-Beaumont, Cal.	{5018 {5025W	64	?	P28	F	A. L. Dentenberg	S–C	Claims injured wrist operating injector water valve on engine
10/3	Santa Paula, Cal.	X2713W	12	Standing	A13	B	Wm. P. Church	S–D	Struck by spoke of brake wheel while releasing hand brake on car
10/12	Colton, Cal.	X3671W	86	—	P30	B	Geo. N. Lacey	S–D	Fell off car while releasing hand brake
10/6	Ventura, Cal.	X3675W	51	20	A5	B	E. S. Northrup	S–J	Thrown against caboose ladder on rear platform due to slack action on rear of train
11/28	El Centro, Cal.	X1739E	1	2	P14	C	Rito Frain	S–G	Fell while stepping from ladder to brake platform of car
12/20	Newhall, Cal.	815B	59	Standing	A4	B	E. F. Donahue	S–G	Foot slipped off ladder of engine
12/25	Indio, Cal.	X5039W	86	6	P21	B	J. T. Curley	S–J	Sprained knee while running to board caboose of moving train
[fol. 5988]									
1/16	Indio, Cal.	834	12	3	P120	B	D. A. Randolph	S–J	Lost balance and fell from moving car
1/19	Oxnard, Cal.	X3689E	85	8	A8	B	N. J. Personne	S–J	Claims while stepping from one car to another missed footing and fell to top of car
2/8	Pomona, Cal.	X2741W	17	5	P60	B	G. W. Rugg	S–D	Fell from car while setting hand brake
2/22	Tweedy, Cal.	X1736W	7	2	P30	B	D. M. Payne	S–D	Fell from car when wheel came off while setting hand brake
4/16	Cabazon, Cal.	836	96	Standing	Killed	B	A. C. Reeves	S–D	Fell from car while releasing hand brakes
5/4	El Monte, Cal.	X5024W	64	20	A4	B	K. P. Carrington	S–J	Struck by rock thrown at train hitting him in face
6/13	El Centro, Cal.	X1794	?	?	A5	B	H. R. Bowles	S–J	Foreign particle lodged in eye
6/13	Estelle, Cal.	X4302E	6	?	—	C	M. S. Jan Dell	S–J	Unbalanced in caboose when coupling made

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
6/18	Colton, Cal.	2/828	66	3	P30	B	F. E. Cushing	S–J	*Thrown over chair, against desk in caboose due to slack action caused by undesired emergency application
8/10	San Fernando, Cal.	X2747E	28	Standing	A10	F	Howard Niday	S–C	Fell on engine tank while taking water
8/19	Fillmore, Cal.	X2577W	32	—	P28	E	D. W. Pillsbury	S–C	Claims strained back while operating reverse lever on engine
8/26	Ontario, Cal.	X2711E	16	—	A7	B	L. R. Stickler	S–D	Lost hold on brake wheel and fell to ground while releasing hand brake
8/3	Edcm, Cal.	2/834	99	5	P45	B	M. J. Russell	S–G	*Fell from moving train due to slack action of train causing him to lose his hold
8/22	Newhall, Cal.	816	55	20	A6	B	E. B. Harris	S–J	Claims piece of hot sand lodged in eye
[fol. 5989]									
9/11	Bassett, Cal.	2/824	31	5		B	R. E. Wing	S–G	Struck knee on ladder rung while boarding car in moving train
11/4	Ontario, Cal.	X2711W	10	10		B	Max Burt	S–G	Claims stepped on rock while getting off moving car
11/4	Hugo, Cal.	X4197W	58	Standing	P45	B	W. H. Rose	S–J	Car end door dropped on hand
11/9	Tweedy, Cal.	X1760W	42	—	A9	B	S. A. Huff.	S–J	Tripped over tie and fell against low sw/stand
11/9	Bassett, Cal.	X4319W	46	?	A14	C	G. C. Sutton	S–J	*Unbalanced by slack action on rear end of train
11/13	Colton, Cal.	X5048W	63	20	A13	B	H. R. Bowles	S–J	Foreign particle in eye
11/24	Niland, Cal.	X5026W	97	10	P3	Live stock Caretaker	I. B. Allen	S–J	*Undesired emergency applica-

PLAINTIFF'S EXHIBIT NO. 362 (Witness Hardwicke)

April 17, 1941

Southern Pacific Company

Pacific Lines

Casualties to Passengers and Passenger Employees • Train and Train Service Accident

State of New Mexico

Year 1930

Date	Location	Train No.	No. Cars in Train	Speed MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
11/25	Three River, N. M.	12	13	Stndg	P15	C	J. H. Jennings	S-J	Stepped on piece of slag or rock and sprained knee
12/6	Anapra, N. M.	3	12	50	A6	DC Waiter	Edwin A. White	S-J	Hand slipped off can opener

Year 1931

3/9	Alamagordo, N. M.	3	13	Stndg	A9	Fire	W. H. Bowling	S-C	Lost balance getting down off tank ladder
3/25	Tucumcari, N. M.	12	13	Stndg	P30	Bag-handler	Jack L. Haight	S-J	Slipped on wet deck of baggage truck
11/3	Carrizozo, N. M.	12	14	Stndg	A13	DC Waiter	Edward Johnson	S-J	Knife slipped cutting finger and thumb

Year 1932

1/26	Santa Rosa, N. M.	11	9	5	P45	BK	E. J. McFarlin	S-G	Slipped on ice on station platform
11/13	Gallinas, N. M.	12	12	Stndg	A9	BK	C. L. Eisert	S-J	Struck by object believed to have been thrown from #11

Year 1933

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
3/21	Anapra, N. M.	2	8	40	P10	Pass	Chas. Lewis	S-J	Passenger collided with Lewis in coach
8/29	Hargis, N. M.	4	11	20	Killed	E	C. J. Crofts	D-E	Erosion of east embankment of bridge gave way under train
					Killed	F	J. Randall		
					P30	B	John Harvey		
					P7	Tr. Att	Milton Gray		
					P30	"	G. L. Moffett		
					Killed	Pass	P. D. Cook		
					Killed	Pass	M. H. Barley		
					Killed	Pass	Mrs. M. H. Barley		
					Killed	Pass	Mrs. J. C. Whitney		
					Killed	Pass	Michael Lombardi		
					Killed	Pass	Tiovanni Tommaso		
					Killed	Pass	Mrs. Margaret Blackburn		
					Killed	Pass	Mrs. Catherine Sammon		
					Killed	Pass	Sister Mary Ceciala		
					P21	Pass	Anguli Saverio		
					P60	Pass	Miss Julia Buchanan		
					P21	Pass	Chas. Bevelli		
					P120	Pass	Rev. P. F. Beaton		
					P30	Pass	Mrs. F. B. Benson		
					P365	Pass	Miss Kathaleen Badgley		
					P120	Pass	Mrs. W. B. Clark		
					P120	Pass	Holger Christenson		
					P30	Pass	Sister Beatrice Gority		
					P60	Pass	Mrs. Clara Bell Greenbaum		
					P14	Pass	Jack Horner		
					P90	Pass	Bro. Albert P. Hewett		
					P7	Pass	Miss Ann Hines		
					P90	Pass	Mrs. W. E. Jordan		
					P30	Pass	Mrs. Julia Law		
					P60	Pass	Quannah Moore		

[fol. 5991]

					P90	Pass	Mrs. M. J. Meagher		
					P90	Pass	Mrs. Nell McKinzed		
					P30	Pass	Mrs. R. E. McNew		
					?	Pass	" daughter		
					P30	Pass	Mrs. Jennie Nerming		
					P30	Pass	Mrs. Idella Perrin		
					P15	Pass	Gerald Reiffer		
					P30	Pass	Mrs. Bessie Nyhus		
					P108	Pass	Mrs. Nellie Roland		
					P30	Pass	W. E. Richardson		
					P180	Pass	Sister Mary Rose		
					P365	Pass	Mrs. H. B. Tripp		
[fol. 5992]					P7	Pass	N. M. Chambers		
					P30	Pass	Miss Josephine Trott		
					P30	Pass	Miss Marjorie Watkins		
					P30	Pass	Miss Virginia Williams		
					P180	Pass	Mrs. Lillian Whitledge		
					P30	Pass	Geo. W. Weigland		
					P14	Pass	Sister Zita Ryan		
					P7	Pass	Thomas McCauley		
					P30	Pass	Dan Kelley		
					P7	Pass	Mrs. Oscar Simpson		
					P90	Pass	J. E. Hathaway		
					P180	P.P.	J. F. Hennigan		
					P30	P.P.	Thoe F. Wheelock		
12/13	Carrizozo, N. M.	11	8	Stndg	P10	P	A. J. Phillips	S-J	Lost balance and fell as train stopped
					Year 1934				
2/3	Vaughn, N. M.	3	13	45	P60	Pass	Mrs. H. Unger	S-J	Fainted and fell to floor of wash room
4/24	Newman, N. M.	3	14	40	A31	DC cook	Bernard Hays	S-J	Hot water burn on foot
5/9	Wooten, N. M.	970	14	3	P180	Pass	Mrs. Geo. Dixon	S-J	Fell to floor when train making stop

YEAR 1934

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
6/22	Alamagordo, N. M.	3	14	3	P10	Pass	Mrs. Angeline Sporer	S-J	Lost balance and fell, sprained knee
10/5	Deming, N. M.	2	13	Stndg	P10	B	W. A. Zabrisko	S-B	Steam valve knocked open burning thigh and leg
10/8	Orogrande, N. M.	12	7	50	P15	DC chef	Clarence R. Johnson	S-J	Splinter in palm of right hand
11/20	Strauss, N. M.	1	11	35	A2	Pass	Geo. A. Noel	S-J	Passenger slipped on wet floor of vestibule, sprained back

Year 1935

1/21	Deming, N. M.	2	12	Stndg	P18	CC Porter	John C. Givens	S-J	Kicked by passenger while detraining
4/10	Santa Rosa	3	14	Stndg	P45	C	O. L. Snider	S-D	Strained groin setting brake on dining car

[fol. 5993]

4/11	Tularosa, N. M.	12	6	Stndg	P2	P	Mrs. Lorena Thomas	S-G	Lost footing detraining and fell
4/10	" " "	X3699W	40	10	A5	R. Foreman-Eng.	A. G. Newell	S-J	Foot slipped and fell to ground
5/4	Mt. Riley, N. M.	4	14	3	P14	Rev. Pass	Mrs. L. Mercey	S-J	Lost balance as train started spraining ankle
6/5	Corona, N. M.	X2428W	14	Stndg	P60	F	R. Meikle	S-C	Lost balance and fell off running board, fractured leg
6/6	Hachita, N. M.	4	14	50	A10	DC waiter	H. F. Howard	S-J	Broken glass cut hand
8/21	Hachita, N. M.	3	14	Unknown	P14	BK	C. L. Eisert	S-J	Piece of steel lodged in eye
10/18	Tucumcari, N. M.	11	14	Stndg	P7	P	Mrs. F. W. Strawhun	S-J	Caught hand between seat and coach window while adjusting seat
10/30	Columbus, N. M.	2-3	9	50	A12	DC cook #2	Frank Anderson	S-J	Knife slipped cutting hand
12/28	[illegible]	11	10	[illegible]	P45	BK	F. W. Loucks	S-J	Accidentally struck eye [illegible]

2/20	Orogrande, N. M.	4	16	50	A8	B	E. J. McFarlin	S–J	Foreign object in eye
3/17	Corrizozo, N. M.	3	15	Stndg	P21	Pass	Christian Zeiss	S–J	Lost hand hold fell from upper berth
4/1	Bet. Malpais & Altair, N. M.	1–4	7	45	P7	Pass	Mrs. Rose Turouh	S–J	Tripped on carpet in tourist car and fell
5/30	Newman, N. M.	2–4	12	50	P9	BK	E. McConhie	S–J	Foreign object in eye
6/21	Sefar, N. M.	2–1	14	50	P15	Pass	Miss A. Bourett	S–J	Sprained ankle when alighting from berth
7/15	Tucumcari, N. M.	12	10	20	P20	New Agent	Frank Lewis	S–J	Foreign object lodged in eye
8/9	Animas, N. M.	11	9	30	A7	Bag. man	L. W. Morrison	S–J	Storage mail fell striking leg leg and ankle
8/27	Santa Rosa, N. M.	11	9	50	P7	Pass	Mrs. Dorothy Berline	S–J	Coach door closed on foot
[fol. 5994]									
9/2	Columbus, N. M.	1–3	9	4	P–10	DC Cook	Turner Nixon	S–I	Lurch of train spilled hot grease on hand
12/3	Anapra, N. M.	6	12	30	A–10	BK	R. J. Stewart	S–J	Foreign object in eye
					Year 1937				
1/3	Near Rio Grande, N. M.	43	10	50	A–5	DC chef	Henry Bailey	S–J	Wrist cut by broken glass
1/11	Paxton, N. M.	12	10	40	1–4	B	J. E. Bosta	S–J	Foreign object lodged in eye
3/8	Malapais, N. M.	11	9	50	A1–5	F	Carl Goers	S–C	Grain of sand lodged in right eye
4/13	Continental, N. M.	44	13	55	P7	Pass	Aubrey Lancaster	S–J	Passenger claims stumbled over broken bottle lying on floor of car
4/15	Between Deming, N. M. and El Paso, Tex.	2	12	Unknown	1–4	E	C. A. Telford	S–J	Foreign object lodged in eye
4/26	Orogrande, N. M.	44	10	2	2–30	Pass	Mrs. Minnie Johnson	S–J	Lost balance and fell
5/2	Tularosa, N. M.	11	9	Stndg	2–20	B	E. J. McFarlin	S–J	Baggage car door and bar fell on foot
5/4	Bet. Lordsburg, N. M. & El Paso, Tex.	6	12	Unknown	1–4	E	S. H. Rogers	S–C	Foreign object in eye

Date	Location	Train No.	No. Cars in Train	Speed MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
6/28	Montoya, N. M.	Ex4387W	9	Stndg	2-10	WH 4 man	J. M. Beauchamp	S-J	Trunk fell striking left foot
6/22	Carrizozo, N. M.	12	10	Stndg	2-7	Pass	Max Heizler	S-G	Lost balance while detraining from steps of car, spraining ankle
7/6	Akela, N. M.	6	11	45	1-5	Pass	C. J. Wyatt	S-J	Foreign object lodged in eye
7/13	Animas, N. M.	43	13	Unknown	1-7	DC waiter	Henry Ganaway	S-J	Knife slipped while opening package of cereal
9/19	Deming, N. M.	1	12	60	1-8	E	C. E. Vaughn	S-J	Flying particle in eye
10/13	Bet. Duran & Torrence, N. M.	11	8	45	P30	Bag. man	K. E. Silvey	S-J	Claims lurch of train strained ligaments in knee
4/14	Valmont, N. M.	4	14	50	P4	Pass	Mrs. P. C. Rubush	S-J	Slipped while attempting to descend in upper berth in pullman car
[fol. 5995]									
6/18	Vevay, N. M.	2	11	50	P-7	F	C. R. McDowell	S-C	Slipped and squirt hose struck foot
6/29	Separt, N. M.	2	10	60	P25	Pass	Mrs. May Lane	S-J	Lost balance and fell
8/11	Quincey, N. M.	1	12	Unknown	P-10	Pass	Mary E. Powell	S-J	Alleged brakeman turned seat on foot
11/1	Bet. Rodeo and Hachita, N. M.	4	12	Unknown	A7	F	G. H. Hester	S-J	Alleged sand blew in right eye
11/4	Wilna, N. M.	43	11	60	P14	DC chef	Wm. Miller	S-J	Cut finger with knife
11/24	Pastura, N. M.	43	9	30	P14	B	A. R. Mousier	S-J	Lost footing and fell
					Year 1939				
2/4	Hachita, N. M.	4	12	50	A5	Pass B	R. C. Scott	S-J	Foreign object lodged in eye
2/14	Afton, N. M.	2	13	20	A5	B	John C. Ford	S-J	Foreign object lodged in eye
8/15	Pyra, N. M.	43	13	50	A6	DC	Louis Mickens	S-J	Splinter lodged in eye when struck

9/17	Afton, N. M.	2	13	30	A4	Cook B	A. A. Crenshaw	S–J	car cutting right arm Foreign substance lodged in eye
1/30	Columbus, N. M.	5	14	50	P-8	DC	B. J. Henton	S–J	Spilled hot grease on back of knuckle
10/14	Carrizozo, N. M.	44	11	2 or 3	P45	Cook Pass	Mrs. E. T. Moffitt	S–J	Lost balance and fell

[fol. 5996]

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PLAINTIFF'S EXHIBIT No. 363 (Witness Hardwicke)

April 17, 1941

Southern Pacific Company

Pacific Lines—Los Angeles, Division

Injuries to Passenger and Passenger Employees

Year 1930

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
1/18	Bet. Cabozon & Palm Springs, Cal.	4	12	45	P30	Exp. M	J. M. Bingham	S–J	Dropped box express on foot
1/11	Alhambra, Cal.	1–3	11	8	A5	Yd-man	Raymond A. Shafer	S–J	Struck baggage truck while hanging on side of car
1/2	Simi, Cal.	70	11	Not shown	A–2	Pass	Rosey A. Printz	S–G	Caught heel on edge of car step while detraining
2/10	Ventura, Cal.	102	15	8	A20 P45	E F	L. A. Everley W. H. Goettsche	M–A	Truck drove in front of train
3/1	Los Angeles, Cal.	60	14	Stndg.	A6	Pass	Steve Pappas	S–G	Slipped on steps of car while detraining
4/3	Santa Barbara, Cal.	32	4	Not shown	P3	Pass	Mrs. D. D. Rogers	S–G	Tripped on step while boarding train
4/11	El Casco, Cal.	104	13	25	P45	Pan-try man	Edward Johnson	S–J	Garbage can on which he was standing tilted causing him to fall
4/18	Hewitt, Cal.	76	15	35	A6	Waiter	Frank La Vigne	S–J	Glass which was wiping broke
8/18	N. Los Angeles, Cal.	77	7	20	A13	F	Patrick Dowd	S–J	Struck head against arm of mail crane

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Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
8/19	Saugus, Cal.	37	2	0	A5	B	Frank Van Duzen	S–G	Slipped on car steps
8/28	Loma Linda, Cal.	2–11	12	50	P60	Pass	James B. Dunlap	S–J	Elderly and feeble passenger unbalanced by ordinary movement of train
8/26	Mira Flores, Cal.	X1768E (mixed)	2		A5	PB	Wm. F. Clark	S–J	Stepped on rock when walking along side of cut to make coupling
8/11	Puente, Cal.	12	10	40	A14	DCW	Wm. Elbert	S–J	Cut finger against plunger of insect sprayer
9/25	Ventura, Cal.	71	9	40	A10	Cook	Samuel Benbo	S–J	Knife slipped, cutting finger
[fol. 5997]									
9/24	Alhambra, Cal.	11	12	15	A9	Telegrapher	Horace E. Summer	S–I	Stepped foul of track on which train was moving
10/15	Los Angeles, Cal.	2–73	7	Stndg.	A7	CC Porter	Calia Reed	S–J	Thrown off balance as coupling was made
10/18	Chatworth, Cal.	76	15	40	A20	Chef	Frank Croon	S–J	Pan hot coffee overturned
12/31	Los Angeles, Cal.	59	12	Stndg.	P21	B	Eric Jacobson	S–J	Slipped and fell while hanging up markers on train
					Year 1931				
1/26	Palm Springs, Cal.	103	10	—	P21	DCW	Ernest Adams	S–J	Strained back while picking up table
2/6	Los Angeles, Cal.	60	10	8	A4	RMS Clerk	W. E. Larson	S–I	Struck by moving train
2/2	Burbank, Cal.	70	7	20	P30	Pass	Mrs. W. J. Powers	S–J	Pullman step box turned over on foot
3/7	Bassett, Cal.	102	15	45	A6	DCW	E. R. Smith	S–J	Glass broke in hand while wiping it
3/23	Alhambra, Cal.	11	12	20	A18	News Agt.	O. T. Gillett	S–J	Claims jerk of train caused him to strain back
6/1	Coachella, Cal.	3	13	20	A15	B	A. W. Paugh	S–J	Tripped on edge of car carpet
6/16	Salvia, Cal.	102	9	0	P21	PcP	A. J. Lawrence	S–J	Car door closed on thumb

6/24	Santa Barbara, Cal.	78	6	20	A10	CC Porter	Russell Johnson	S–J	Drinking glass broke in hand
7/30	Los Angeles, Cal.	3	10	Stndg.	P7	Pass	Mrs. G. Theopill	S–G	Missed footing while detraining and fell
8/6	Alhambra, Cal.	12	8	4	A14	DC Cook	Drury Caldwell	S–J	Spilled hot soup on foot
9/8	Santa Barbara, Cal.	32	3	Stndg.	A16	B	H. B. Williamson	S–D	Finger caught between brake lever and top plate while releasing brake
11/27	Pomona, Cal.	104	12	35	A7	DC Cook	Samuel Slade	S–J	Cut finger with knife which he was using
12/18	Burbank, Cal.	76	17	40	A10	DC Helper	Chas. McCormick	S–J	Cut hand with broken drinking glass
[fol. 5998]									
3/3	Indio, Cal.	X5006W	100	5	P90	Live stock	Garnett A. Gibson (Columbus, N. M.)	S–J	Trespasser stepped on cut lever causing undesired emergency
					P30	care-takers	Alfred S. White (Deming, N. M.)	S–J	application of air brake; Gibson had fractured left hip and White fractured right ribs
6/25	Los Angeles, Cal.	71	9	—	A7	Exp. M.	G. C. Davis	S–J	Trunk fell over on foot
8/5	Santa Barbara, Cal.	1–76	15	—	A4	Chef	Norris Brown	S–J	Cut finger on orange juice extractor
10/9	Tortuga, Cal.	3	10	20	P14	Pass	Miss Violet Barrell	D–D	Undermined track due to heavy rainfall
					P14	Pass	Byron P. Carey	D–D	
					P14	Pass	Laura Goodman	D–D	
					P14	Pass	Mrs. M. B. Glidewell	D–D	
					P14	Pass	Mrs. Edna B. Jewett	D–D	
					P45	Tres.	C. R. Green	D–D	
					P30	News A	Willia, C. Stokes	D–D	
19/9	Camarillo, Cal.	69	11	35	A5	B	Louis D. Overstreet	S–J	Foreign substance blew in eye
11/14	Chatworth, Cal.	69	8	35	P14	Pass	Edward F. Sherwood	S–G	Mentally unbalanced passenger jumped from moving train

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
10/15	Calexico, Cal.	Mixed 357	5	None	P21	B	John H. Prtichard	S-J	Stepped on rock spraining ankle
10/25	Glendale, Cal.	76	13	40	P10	2nd Cook	Alfred Farley	S-J	Spilled hot grease on hand
12/11	Los Angeles, Cal.	2	15	Stndg	A5	Pantryman	Walter Lanigan	S-J	Razor blade in tray rack
					Year 1933				
1/12	Etiwa, Cal.	Mixed 820	7	35	(Killed	F	Robert R. Kounce	D-E)	Drift of sand over track
1/30	Santa Barbara, Cal.	78	13	0	(Died	E	Davis W. Courtney	D-E)	
1/9	Glendale, Cal.	26	12	35	P14	F	Stephen T. Sharp	S-D	Tripped by trespasser on top of engine and fell to ground
1/31	Los Angeles, Cal.	353	2	4	A7	DCW	Arthur J. Starr	S-J	Knife slipped while cutting orange
[fol. 5999]					P14	C	Robert L. Thomson	S-J	Car door closed on finger
2/15	Pct. Ontario So. Fontana, Cal.	2	16	35	Killed	C	J. U. C. Caster	S-J	Gun fight between train bandits
					Killed	T	Geo. C. Powers	S-J	and conductor. Hold up
					P14	Pass	Fred D. Byers	S-J	
5/9	Glendale, Cal.	79	12	8	P30	B	David F. Orman	S-G	Fell while attempting to board moving train
5/13	Banning, Cal.	3	16	0	P6	Pass	Mrs. Walter L. Hart	S-G	Sprained ankle when detraining
					Year 1934				
1/28	Los Angeles, Cal.	75	13	18	P15	Pass	Mrs. Eugene Sternberger	S-J	Thrown off balance due to train parting acct. emergency application of air to avoid running over trespasser lying on track
2/23	Santa Barbara, Cal.	78	12	Stndg	P21	C	A. B. Sipes	S-J	Claims stepped on small stone

9/18	Los Angeles, Cal.	1-26	16	7	A5	DCW	Wm. Batchelor	D-C	Jumped off engine to avoid injury in collision Worn flange on engine truck wheel and undue stress in negotiating 12-30° curve
10/22	Los Angeles, Cal.	77	15	50	P7	Pass	Mr. Roy La Marr	S-J.	Claims to have fallen over stepping box in vestibule of car
					Year 1935				
2/10	Los Angeles, Cal.	2	10	Stndg	P60	P	Mrs. M. T. Garss	S-G	Caught heel of shoe or turned ankle on car step while detraining
5/5	Oxnard, Cal.	78	14	35	A9	Chef	Chandler Haynes	S-J	Foot burned by hot grease
6/3	Los Angeles, Cal.	51	8	Stndg	P14	P	Mrs. W. E. Henry	S-G	Caught heel of shoe on car step while detraining
6/21	Drylyn, Cal.	1	11	55	P60	P	E. M. Glass	S-G	Mentally deranged passenger jumped off moving train
[fol. 6000]									
6/1	Araz Junc., Cal.	1-363	11	8	P180	P	Mrs. A. R. Ewing	S-J	Became overbalanced and fell backwards in car
6/23	Los Angeles, Cal.	1	14	—	P30	P	Miss Stella Gans	S-J	Claims thrown off balance as stop made
7/30	Bet. Colton & Alhambra, Cal.	3	13	45	P21	P	Ferdinand W. Cole	S-J	Claims fell off seat of car
8/8	Los Angeles, Cal.	76	16	6	P21	P	Miss Louise Park	S-J	Claims thrown off balance as stop made
8/12	Los Angeles, Cal.	25	17	8	P14	Steward	W. D. Gazley	S-J	Thrown off balance by emergency stop to avoid striking vehicle
8/14	Glendale, Cal.	52	9	35	A4	Porter	Shuba Kelley	S-J	Car window dropped on hand
9/7	Glendale, Cal.	1-76	11	35	A5	4th cook	Arthur C. Henderson, Jr.	S-J	Dish broke in hand
10/19	West Glendale, Cal.	76	16	45	P7 P21	P P	Jane S. Coward Mrs. E. M. Early	D-F	Struck truck on crossing, derailing and damaging train

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
					P30	P	Al Gomez		
					P10	P	David B. Hanna		
					P10	P	F. C. Herman		
					P30	P	Glenn Kellogg		
					P10	P	Philip Meislin		
					P15	P	Chas. Mason		
					P21	P	Mrs. H. E. Toomey		
					P30	2nd cook	Alfred Farley		
					P10	3rd cook	Druary Caldwell		
					P6	4th cook	Joseph S. Bailey		
					P10	Pantryman	Fred Thornton		
					P5	Waiter	Henry Harrison		
					P10	Waiter	Edwin A. White		
					P15	Waiter	Carey Robinson		
[fol. 6001]									
					P10	Porter	L. J. Green		
					A2	Pull. busboy	C. Scurry		
					A2	Pull. busboy	E. Robinson		
10/23	Glendale, Cal.	25	15	20	P20	P	W. H. McKinzie	S-G	Fell while getting off moving train
11/8	El Casco, Cal.	1	11	25	P30	P	John E. Finley	S-J	Car door closed on hand
12/19	Los Angeles, Cal.	1-26	11	Stndg	P30	P	Mrs. May B. Carlson	S-G	Fell while detraining
12/18	Los Angeles, Cal.	1-12	9	8	A5	News Agent	P. W. Brown	S-J	Cardoor closed on hand
12/20	Oxnard, Cal.	1-76	14	20	P28	Tele.	Nathan S. Gillum	S-J	Struck by bundle of U. S. mail

5/26	Beaumont, Cal.	5	9	—	P60	P	Mrs. Fanny Cake	S–J	coupling Claims unbalanced by stop of train
6/10	Los Angeles, Cal.	72	6	Stndg	P3	P	Miss Lorretto Height	S–G	Fell while detraining from standing train
6/13	Los Angeles, Cal.	76	16	8	P7	P	Miss Fannie Marshal	S–J	Thrown off balance by emergency stop made to avoid striking auto
9/30	Los Angeles, Cal.	2–4	9	Stndg	P21	F	George Hamilton	S–C	Claims foot slipped off pilot step while climbing down off standing engine
9/30	Knob, Cal.	1–3	9	50	P3	P	Harry Worth	S–G	Apparently fell or jumped from moving train
9/23	Los Angeles, Cal.	75	15	Stndg	A8	DCW	Jefferson D. Butler	S–J	Bottle while being opened broke in hand
10/10	Venture, Cal.	1	17	50	A7	DCW	Hobert Sampson	S–J	Claims thrown off balance by lurch of train
11/5	Burbank Jct., Cal.	59 (2–1	13 25	10 Std)	P10	P Porter	Wm. H. Hill	C–A	Passed home signal displaying stop indication
[fol. 6002]									
12/23	Los Angeles, Cal.	2–59	8	Stndg	P21	F	Sidney Jordan	S–C	Fell while climbing out of cab window of engine
					Year 1937				
2/25	Tunnel, Cal.	1/59	14	35	P21	Bagm	J. I. Brown	S–J	Claims struck by baggage falling from pile in car
3/2[illegible]	Van Nuys, Cal.	X2430E	3	Stndg.	A13	B	A. F. Monk	S–B	Struck by air hose as angle cock opened
3/28	Alhambra, Cal.	1	10	—	P7	Pass	Miss L. Author	S–G	Fell when detraining from standing train
4/23	Bet. Amos & Niland, Cal.	5	12	35	P21	B	W. J. Hauser	S–J	Attacked by demented passenger

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
					P14	Pass	Nelson Brushaver		Cut by breaking bottles
5/20	El Monte, Cal.	11	9	Stndg	DCW		J. S. Strawn	S-J	Claims glass being washed broke in hand
5/20	Edom, Cal.	11	9	40	A4	F	C. F. Steffes	S-J	Claims foreign particle lodged in eye
5/11	Indio, Cal.	12	6	Stndg	A2½	Pass	J. I. Gytoh	S-J	Claims while detraining kicked ankle with heel of shoe
7/10	Los Angeles, Cal.	70	16	—	¼	14 Pass	H. E. Freeman	S-G	Claims stepped off stepping box while detraining from standing train
7/24	Glendale, Cal.	98	12	50	A7	DC cook	M. Dennis	S-J	Claims cut finger on glass
8/19	S.a. Susana, Cal.	72	14	40	P15	DC cook	E. Spencer	S-J	Burned by hot grease
8/22	Los Angeles, Cal.	352	5	4	P21	Pass	Miss N. Marquez	S-J	Moving train collided with standing equipment
					P21	Pass	Miss M. File	S-J	
					P10	Pass	Miss A. Wagner	S-J	
					P30	Pass	Miss J. Kelly	S-J	
					P14	Pass	Mrs. R. Fryer	S-J	
					P10	Pass	Mrs. E. L. Clark	S-J	
					P7	Pass	Mrs. K. Monroe	S-J	
					P7	Pass	Nick Fischer	S-J	
					P45	Pass	Mrs. M. E. Cupps	S-J	
					P40	Pass	Miss A. Bramley	S-J	
9/12	Los Angeles, Cal.	2/75	14	2	P14	Pass	Rev. R. A. Cromwell	S-G	Claims turned ankle while boarding moving train
[fol. 6003]									
9/18	Los Angeles, Cal.	56	8	25	P21	B	H. R. Eaton	S-J	Claims overbalanced by lurch of train
10/15	Colton, Cal.	44	13	Stndg	P7	Pass	Miss Thelka Schearr	S-J	Slipped and fell while standing on car seat
11/18	Hewitt, Cal.	70	15	0	P15	DC	Charles T. Jackson	S-J	Hand contacted sharp blade of knife

12/6	Simi, Cal.	71	8	50	Killed	P	J. P. Cavanaugh		S–P	Struck by mail crane while leaning out gangway of engine
12/15	Glamis, Cal.	1	11	65	A5	B	L. E. Smithley		S–J	Foreign particle lodged in eye
					Year 1938					
2/5	Brawley, Cal.	92	2	Stndg.	P7	Pass	Mrs. Ella James		S–J	Stepped on object on car floor, turning ankle
2/23	Cammarillo, Cal.	349	2	4	A2	Ex Mess	C. W. Peterson		S–J	Foreign parricle lodged in eye
2/26	Los Angeles, Cal.	1/5	13	8	(A8	DC cook	Wm. D. Hudson		S–J)	Claims thrown off balance by sudden stop of train
					(A8	DCW	J. S. Clark		S–J)	
3/24	Tortuga, Cal.	3	11	50	P21	RMC	J. A. Rittmayer		S–J	Tripped over mail sorting rack standard on floor
4/6	Chatsworth, Cal.	76	16	60	P28	DCW	Earnest Roach		S–J	Jabbed finger while washing silverware
6/30	Los Angeles, Cal.	5	14	8	A2	Pass	Grant Stewart		S–J	Thrown off balance when emergency stop made
7/28	Lagol, Cal.	1/99	14	45	P7	DC cook	Floyd Phillips		S–J	Arm contacted range as train rounded curve
9/20	Tortuga, Cal.	(5	14	40	Killed	E	R. N. Richardson		C–B	Main track switch inadvertently
		(44	11	Stnd	"	F	H. R. Parsons		"	lined for siding on which train
					P60	B	C. H. Cox		"	No. 44 was standing as train
					P21	C	J. D. Cantrell		"	No. 5 approached at speed
					P21	B	Frank Soutar		"	
					Killed	F	C. E. Morton		"	
					P21	C	C. R. Rankins		"	
					P10	DCW	J. R. Davis		"	
					P10	Ex Mess	Otto Ruf		"	
					P60	RMC	P. J. Burlie		"	
					P60	"	I. N. Candelarie		"	

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
[fol. 6004]					P60	RMC	C. L. James	C-B	
					Killed	Pass	Miss D. Blocker	"	
					"	"	Miss R. Easter	"	
					"	"	Mrs. M. Green	"	
					"	"	Mrs. E. W. Hall	"	
					"	"	Miss Amy King	"	
					"	"	Mrs. Lynn Monroe	"	
					"	"	Mrs. Avis Sorrel	"	
					"	"	Florence A. Tabor	"	
					P14	"	Elmer Eslabrook	"	
					P14	"	Mrs. P. Erickson	"	
					P21	"	Mary Holt	"	
					P7		Mrs. A. Keich	"	
					P21	Pass	Mrs. A. Lively	"	
					P21	"	Ella Mitchell	"	
					P21	"	Minnie Morris	"	
					P21	"	Marie Nogain	"	
					P14	"	Lillian Richards	"	
					P21	"	Mrs. D. Rose	"	
					P21	"	Mrs. R. B. Thornton	"	
					P21	"	T. B. Wilson	"	
					P21	"	Mrs. Lucille Bell	"	
					P30	"	Mae Loyd	"	
					P30	"	Mrs. Ella E. Mulford	"	
					P45	"	Mrs. M. McGruder	"	
					P60	"	Mrs. D. Umruh	"	
					P14	"	Mrs. A. L. McCullough	"	
					P21	"	Virginia Green	"	
9/30	Glendale, Cal.	352	2	Stndg.	A14	Bag man	E. C. Ness	S-G	Claims tripped over sack of mail while stacking baggage in car
10/6	Oxnard, Cal.	98	13	50	P21	DC	Wm. E. Duke	Sub	Head-[illegible]

10/18	Glendale, Cal.	1/2	14	15	A12	News Agt.	F. W. Brown	train-strained back ligiment
11/24	Santa Barbara, Cal.	72	7	Stndg	A8	B	L. D. Overstreet	S–B Burned by steam while coupling steam hose between cars
[fol. 6005]								
1/10	Montalvo, Cal.	99	12	50	P7	Pass	Mrs. J. Marks	S–J Claims slipped while walking through car of moving train
2/11	Saugus, Cal.	59	13	35	P21	DC cook	Melvin Zimmons	S–J Claims unbalanced by motion of train
2/26	Ventura, Cal.	2	14	45	P7	DCW	Hayward Buchanan	S–J Claims knife slipped which he was using
4/17	Glendale, Cal.	98	14	Stndg	P14	Pass	Mrs. U. E. Thompson	S–G Fell while detraining from standing train
7/19	Banning, Cal.	2/5	12	40	P14	DCW	Virgil Telsie	S–J Stepped into open storage box in floor of diner
8/3	Oxnard, Cal.	1/98	14	Stndg.	A4	DC cook	Berry L. Young	S–J Cooler door closed on hand
8/30	Newhall-Saugus, Cal	51	11	35	A11	News Agt.	Wm. C. Gagain	S–J Cut thumb on broken bottle
9/15	Hasson	(373	33	15				
		(72	9	3	A9	F	J. M. Burns	C–B Failure of train 373 to move
					P21	Pass	Miss Helen Frank	C–B prepared to stop—causing head
					P7	Pass	Mrs. B. Mancilla	C–B on collision
					P14	Pass	A. F. Neill	C–B
					P7	Pass	Mrs. Ellen Scott	C–B
					P	Pass	Miss D. Watson	C–B
9/17	Moorpark, Cal.	70	16	Stndg.	P30	Pass	Mrs. Andy Davis	S–G Claims strained back while boarding standing train
10/1	Knob, Cal.	44	10	45	P30	Pass	Stanley Samuelson	S–J Fell in aisle of car
11/16	Loma Linda, Cal.	5	13	50	A6	F	P. A. Wolcott	S–C Foreign particle in eye
11/10	Glendale, Cal.	2/76	7	30	A4	DCW	E. J. Pinkney	S–J Claims diner chill box door closed on hand

[fol. 6006]

PLAINTIFF'S EXHIBIT No. 364

April 17, 1941

Southern Pacific Company
Pacific Lines in New Mexico

1940

Casualties to Train and Engine Service Employees

Date	Location	Train	No. Cars	MPH	Disability	Cl. of Person	Name of Person	ICC Class	Description of Accident
1-13	Carrizozo, N. M.	X3704W	93	—	A6	B	A. R. Taylor	SJ	Foreign object lodged in left eye
2-13	Santa Rosa	X3811W	98	8	P10	C	A. R. Jones	SJ	Cut lever on car being lifted by
					P10	B	S. W. Hunt		*known person causing air to apply in emergency
3-29	Alamogordo	990	76	3	P6	B	R. P. Clayton	SJ	*Alleged adjustment of slack when trains brought to stop
4-10	Lordsburg	X5023W	100	8	P25	B	W. A. Kidd	SJ	*Emergency application of train brakes to avoid striking engine
4-29	Kenzin	1-981	62	St'd.	A7	B	M. E. Huff	SJ	Foreign object lodged in right eye
6-24	Lisbon	X5023W	100	40	A12	B	H. W. Bridges	SJ	*Undesired emergency application of brakes
6-28	Bet. Akela & Cambray	X5033W	67	10	A7	C	J. P. Hendrix	SJ	Foreign object lodged in right eye
3-5	Gollinas	996	39	6	P15	B	R. L. Butler	SG	Rear hand hold on right side of engine broke off at top
8-18	Myndus	X3320W	66	10	P10	B	G. J. Gullander	SJ	*Emergency stop of train account wrong switch lined and to prevent derailment
9-1	Gallinas	994	76	St'd.	P60	B	O. J. Bradley	SJ	Foot slipped and fell into manhole of engine tender
10-26	Mosquero	975	27		A9	B	Robt. Whitlock	SJ	Finger pushed between crate of machinery and floor of baggage

11-10	Ancinas	962	24	St'd.	A4	C	J. S. McCraine	SJ	Cattleloading board fell on instep
11-18	Carrizozo	X3801W	68	8	A7	C	L. J. Benson	SJ	*Lost balance and fell to floor of caboose as train departing terminal alleged due to adjustment of slack
11-26	Lordsburg	X5013W	70	St'd.	P30	B	H. F. Muse	SJ	Attacked by trespasser
3-26	Steins, N. M.	2-866	61	3	P20	B	J. W. Pence$	SJ	Walking over cattleguard foot slipped turning ankle
6-7	Cavot	1-845	60	20	P180	B	H. D. Wester$	DC	Flange broke off car in moving train causing derailment

* Denotes slack action.
$ Tucson Division but happened in New Mexico.

[fol. 6008]

PLAINTIFF'S EXHIBIT NO. 365

April 17, 1941

Southern Pacific Company
Pacific Lines—Los Angeles Div.

1940

Casualties to Train and Engine Service Employees

Date	Location	Train	No. Cars	MPH	Disability	Cl. of Person	Name of Person	ICC Class	Description of Accident
1-29	West Anaheim, Calif.	X1813E	17	St'd.	P28	F	Geo. A. Hiltz	SC	Fell off engine tender
1-26	Los Angeles	830	—	—	P14	C	Clarence G. Burwell	SI	Struck by cut of cars while standing foul of track
1-20	Tweedy	X1760	22	St'd.	P60	B	Bennett T. Turner	SJ	Stepped on main track in front of approaching motor car

Date	Location	Train No.	No. Cars	MPH	Disab.	Class Person	Name of Person	ICC Class	Description of Accident
1-28	Niland	822	97	St'd.	P21	B	Andrew B. Gibson	SJ	Fingers caught while lifting broken draw bar onto end sill of car
2-1	Vinvale	X1760E	2	St'd.	P28	B	Raymond E. Hall	SD	Struck by brake club while releasing hand brake on standing car
2-23	Somerland	X2546W	4	10	A6	C	Thos. S. Powell	SG	Fell while boarding caboose of moving train
3-8	Pomona	X2842E	2	St'd.	A19	B	Morris S. Jandell	SD	Struck by brake wheel while releasing hand brake on standing car
4-24	Mecca	X4192W	98	40	A12	B	Leon P. Jones	DC	Burned off journal on car emergency application Brakeman injured in cab
4-17	Riverside	X1736E	1	St'd.	A5	B	Lewis Creller	SD	Thumb struck by brake wheels spoke while releasing hand brake on car
5-28	Banning	X5008W	40	St'd.	P14	B	Javious E. Harris	SD	Struck by brake club while releasing hand brake on standing car
5-15	Coachella	X4187W	87	8	A19	B	Wayne C. DeuPree	SJ	Fell to top of car when unbalanced by coupling
5-2	Edom	X4200W	99	8	A5	C	Clarence G. Burwell	SJ	Unbalanced in caboose by undesired emergency application of air brakes
6-3	Tweedy	X3617E	5	St'd.	P21	B	Buster Altizer	SD	While setting hand brake fell against end of car when brake suddenly released
[fol. 6009]									
6-13	San Gabriel	X2851E	10	St'd.	A6	B	Leonard R. Sickler	SJ	Stepped on piece of ballast while running to board moving car
7-25	South Fontana	2 824	94	St'd.	A4	C	Paul S. Thomas	SD	Strained arm [illegible] while [illegible]

7-12	Los Angeles	2-824	86	15	A16	C	Russell W. Cooper	SJ	slack action of train
7-31	Chino	X2820W	5	3	A4	C	James A. Galloway	SJ	Bent rack shifted on car as coupling made
8-16	Los Angeles	0	0	0	P28	B	Wm. E. Albright	SG	Rope around piece of ice which he was carrying as he was in the act of getting off moving car, broke, causing him to lose balance and fall
8-6	Ailsa	X2820W	57	30	P28	B	Kenneth M. Beal	SJ	Foreign particle in eye
8-17	Oxnard	X1742E	4	4	P21	C	Weldon W. Wirt	SJ	While walking alongside of moving cars giving stop signal with lantern in right hand, door of parallel car closed [redacted] left hand
9-6	Indio	X5001E	94	St'd.	P60	B	Frank J. Costello	SG	Fell from car while setting hand brakes
9-15	Oxnard	X1793E	6	5	P60	B	Raymond E. Hall	SG	Fell from car when coupling made
9-24	Colton	Ex4201W	65	6	P21	B	Wm. E. Albright	SG	Fell while in act of boarding caboose of moving train
9-2	Indio	Ex5024E	78	25	Killed	B	Lillo G. Hart	SI	Walked into side of engine of moving train
9-5	El Centro	Ex1721W	16	3	Killed	C	Gordon Smith	SI	Run over by train
9-28	Mecca	Ex1809E	—	—	A9	C	Humbert J. Saizan	SJ	Foreign particle in eye
9-29	Los Angeles	Eng.2307W	—	—	A7	E	Paul E. Gordon	SJ	While inspecting engine slipped on wash rack runway
[fol. 6010]									
10-7	Ventura	Ex4200E	91	—	P-28	B	Harry F. Faust	SD	Claims hand brake released while setting brake on standing car
10-22	Amos	Ex4195W	66	40	Killed	B	Volney D. Richards	SI	Fell from and run over by train
11-17	Beaumont	Ex5044W	101	8	P-21	B	Bert W. Biederman	SG	Fell while boarding moving train
12-17	Los Angeles	822	84	—	P-21	B	Henry H. Cheminitzer	SD	Struck by brake club while releasing hand brake on standing train

Date	Location	Train No.	No. Cars	MPH	Disab.	Class Person	Name of Person	ICC Class	Description of Accident
12-26	Ventura	Ex4187W	58	15	A10	B	Chas. E. Murphy	SG	Fell while attempting to board moving train
12-4	Indio	Ex5043W	100	12	P60	B	Leonard R. Sickler	SI	*Fell from and run over by train right foot severed at ankle
12-10	Tweedy	Ex1809E	1	4	P21	B	Wm. O. Williams	SJ	Fell from car as coupling made
12-28	Mecca	Ex5005W	123	35	P14	C	John A. Sutton	SJ	*Unbalanced by sudden stop when undesired application of air brakes occurred.

* Denotes slack action.

[fol. 6011]

PLAINTIFF'S EXHIBIT No. 366

April 17, 1941

Southern Pacific Company
Pacific Lines in Arizona

1940

Casualties to Train & Engine Service Employees

Date	Location	Train	No. Cars	MPH	Disability	Cl. of Person	Name of Person	ICC Cl	Description of Accident
2/23	Tucson Ariz.	X3643W	60	St'd.	P-21	B	W. R. Eaton	S-D	Fell from top of standing car apparently while releasing hand brake
3/16	Dragoon	2/862	70	3	P-45	B	W. C. Alexander	S-J	Train made rough coupling to caboose
4-4	Dixie	901	67	St'd.	P-25	B	J. C. Slade	S-G	Getting off standing car stepped on slag and turned ankle

5/28	H. Hutchins	943	7	20-31	P-50	B	[illegible]	S-J	when hand brake suddenly released
5/14	Bowie	2/866	69	2	A-6	B	James K. Bragg	S-G	Claims alighting from engine stepped on piece of slag and turned ankle
5/3	Wymola	904	47	6	P-20	B	J. S. Hardwicke	S-J	Claims fell over piece of slag or rock striking knee on tie
6/3	Red Rock	X3663W	56	8	A-6	C	W. H. Gladden	S-J	*Slack action in train
6/6	Red Rock	904	35	St'd.	P-10	F	C. R. McGowan	S-J	Claims when shoving water spout into manhole in tank—foot slipped in between boards
6/15	Gila	X3742W	63	8	P-90	B	T. O. Lowe	S-J	Fell from top of car in switching movement
6/22	Yuma	3/841	66	8	P-60	B	D. R. Mills	S-J	Riding in engine cab leg was caught between cab and tender
[fol. 6012]									
7/11	Sibyl	X3660W	0	St'd.	A-4	F	F. H. Rhodes	S-G	Claims when getting on engine turned ankle on slag
7/25	Benson	3/866	55	St'd.	P-14	B	Jack Gray	S-G	Stepped on piece of broken glass bottle as alighting from engine
7/17	Tucson	Eng.5026	0	St'd.	A-4	F	C. F. Samuelson	S-J	Slipped on piece of ice on engine as reached out to avoid falling wrenched back
10/23	Cashion	901	68	4	A-4	B	J. W. Vance	S-G	Brakeman jumped off car as it went over derail
11/8	Tanque	883	49	St'd.	A-5	F	J. F. Stubblefield	S-J	Claims when descending from water car misstepped and fell against foot board of tender
11/10	Buckeye	901	37	St'd.	A-15	C	C. C. Pennington	S-J	Heavy crate on truck became over balanced throwing weight against man wheeling truck
12/23	Fairbank	964 X3305W	69 70	5 St'd.	A-5	B	H. I. Schetter	S-J	Stepped in opening between engine boards of engine and tender

* Denotes slack action

[fol. 6013]

PLAINTIFF'S EXHIBIT No. 367 (Witness Hardwicke)

April 17, 1941

Southern Pacific Company
Pacific Lines—Salt Lake Division

1940

Casualties to Employees in Train and Engine Service

Date	Location	Train	# Cars	MPH	Disab.	Class Person	Name of Person	ICC Class	Description of Accident
1/20	Emlay, Nev.	574	108	Stndg.	P-20	B	W. B. Hilbish	S-J	Claims strained muscles in back while opening vent on car
5/3	Desert "	566	84	5	P20	B	R. Sexton	S-J	Brakeman lost hold and fell from car to ground
5/10	Sparks, Nev.	Eng.4154	0	Stndg.	P15	F	Otis L. Hocker	S-J	While stepping from marker box fell and sprained ankle
5/27	Fernley, "	552	48	2	P10	F	Ralph W. O'Neil	S-J	Claims lost balance and fell against desk when coupling to caboose
7/27	Battle Mt. "	Ex3753W	125	20	P10	B	W. B. Hildbish	L.B.	*Right main crank pin broke due to progressive fracture, brakeman lost balance fell to floor of caboose
7/29	Sparks "	Eng.4173	0	Stndg	P10	E	M. W. Hurto	S-C	Struck throttle lever as he raised up.
7-15	Carlin, "	578	96	3	P15	B	W. A. Lashelle	S-J	*Lost balance and fell when train stopped
9/24	Ditto,	1/562	97	30	P10	DHB	F. W. Schilling	S-J	*Lost balance and fell against window of cupalo due sudden stop
10/26	Valcrs,	Ex3669W	98	40	A-4	C	Jas. W. Airhart	L.B.	*Reverse gear piston rod stuffing box disconnected and air train [illegible]

1/14	Bet. Deeth and Elko, Nev.	39	9	.55	A–5	DCW	Emile Aubert	S–J	*Claims he bruised right eye due to lurch of train

[fol. 6014]

2–25	Verdi, Nev.	9	13	35	Perm.	Pass	Gilber E. Theil	S–G	Passenger jumped from train
8–24	Rye Patch*	2/88	15	40	P30	Pass	Herman J. Rothstein	S–G	Attempted suicide by jumping from train account demented
10/10	Lovelock,	87	11	Stndg	A–3	Pass	A. P. Russell	S–G	Claims stepping box slipped when alighting from train
10/22	Cobre	2/28	15	4	P15	C	G. E. Bowers	S–G	Claims foot slipped while boarding car in moving train

* Slack action

[fol. 6015]

PLAINTIFF'S EXHIBIT No. 367 (Witness————————)

April 29, 1941

Southern Pacific Company
Pacific Lines* 1940

Casualties to Employees in Train and Engine Service

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
1/20	Emlay, Nev.	574	108	Stndg.	P–20	B	W. B. Hilbish	S–	Claims strained muscles in back while opening vent on car
5/3	Desert "	566	84	5	P–20	B	R. Sexton	S–J	Brakeman lost hold and fell from car to ground
5/10	Sparks, Nev.	Eng.4154	0	Stndg.	P–15	F	Otis L. Hocker	S–J	While stepping from marker box fell and sprained ankle
5/27	Fernley, "	552	48	2	P–10	F	Ralph W. O'Neil	S–J	Claims lost balance and fell against desk when coupling to caboose

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
7/27	Battle Mt. Nev.	Ex3753W	125	20	P-10	B	W. B. Hildbish	L-B	*Right main crank pin broke due to progressive fracture, brakeman lost balance fell to floor of caboose
7/29	Sparks "	Eng.4173	0	Stndg.	P10	E	M. W. Hurto	S-C	Struck throttle lever as he raised up
7/15	Carlin, "	578	96	3	P-15	B	W. A. Lashelle	S-J	*Lost balance and fell when train stopped
9/24	Ditho, "	1/562	97	30	P-10	DHB	F. W. Schilling	S-J	*Lost balance and fell against window of cupalo due sudden stop
10/26	Valery, "	Ex3669W	98	40	A-4	C	Jas. W. Airhart	L-B	*Reverse gear piston rod stuffing box disconnected and as train came to stop conductor injured in caboose
11/16	Clark, Nev.	1/562	98	35	P-21	C	F. E. B. Gates		*Lost balance and fell in caboose
12/10	Valley Pass,	4/576	95	20	Died	B	Wallace E. Sorenson	S-J	*Lost balance and fell between cars

* Slack Action

[fol. 6016]

PLAINTIFF'S EXHIBIT No. 367A (Witness————————)

April 29, 1941

Southern Pacific Company
Pacific Lines—1940

Casualties to Passengers and Passenger Employees

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab	Class Person	Name of Person	ICC Class	Description of Accident
1/14	Bet. Death and	39	9	55	A-5	DCW	Emile Aubert	S-J	*Claims he lurched [illegible]

10/10	Lovelock,	87	11	Stndg	A-3	Pass	A. P. Russell	S-G	Claims stepping [illegible] when alighting from train
10/22	Cobre	2/28	15	4	P15	C	G. E. Bowers	S-G	Claims foot slipped while boarding car in moving train.

* Slack Action.

[fol. 6017]

PLAINTIFF'S EXHIBIT No. 368 (Witness Hardwicke)

April 17, 1941

Southern Pacific Company
Pacific Lines in New Mexico 1940

Casualties to Passenger and Passenger Employees

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
2-13	Lordsburg, N. M.	2	14	Stndg	P15	P.B.	C. L. Roberts	S-G	Sprained ankle detraining from standing car.
2/10	Lordsburg,	43	13	—	P21	P.F.	Thos. J. Durkin	S-J	Failure super heater supply pipe flange studs due to fatigue of metal-burns and sprained ankle.
4/8	Vaughn, N. M.	4	13	55	A-9	Ex. Mess	A. P. Weiler	S-J	Strained back lifting express car door on track.
6/14	Tucumcari, N. M.	3	13	Stndg	A-4	News Agt.	J. E. Barrett	S-J	Lost balance and foot caught between trunk being loaded on coach and vestibule door.
8/26	Oro Grande, N. M.	43	12	60	A6	DCW	Fred Thornton	S-J	Can fruit fell from locker in diner and struck head.
9/2	Robsart, N. M.	4	13	40	A9	Pass	F. H. Keith	S-J	Alleged foreign object lodged in right eye.
11/10	Tucumcari, N. M.	4	12	Stndg	P3	Pass	Albert del Castillo	S-G	Slipped and fell while detraining from passenger car

3697

[fol. 6018]

PLAINTIFF'S EXHIBIT No. 369 (Witness Hardwicke)

April 17, 1941

Southern Pacific Company
Pacific Lines in Arizona

Casualties to Passengers and Passenger Employees, 1940

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
2/14	Fairbank, Ariz.	44	14	50	A-6	DC cook	Wm. H. Miller	SJ	Foreign object in left eye
3/28	Phoenix, "	44	12	Stndg	P14	Pass	Mrs. Georgia Beenam	SG	Slipped and fell on coach steps when detraining
3/16	Bet. Bridge 947.11 & dock	43	12	Not known	P45	Pass	Mrs. Richard Sharp	SJ	Alleged sudden stop of train
3/31	Phoenix, Ariz.	4	14	Stndg	P14	Pass	Mrs. Bean LaGrange	SG	Heel caught on car step when detraining
3/16	Bet. Dock & Phoenix, Ariz.	5 & 43 consol.	26	Not known	P7	Pass	Mrs. Leessie Walker	SJ	*Alleged jerk of train complained of severe pains in head, arm and right leg.
3/20	Tucson, Ariz.	44	14	2	P7	Pass	Mrs. Ozelia Rach-Walski	SJ	Step box fell over on passenger foot
4/24	Phoenix, Ariz.	44	12	Stndg	P3	Pass	James E. Hines	SJ	Claims slipped on wet floor of car and fell
5/24	Bet. Raso and Drury	43	11	50	P10	Pass	Miss Helen Murray	SJ	*Claims train jerked as going out car-door
7/16	Cozador	44	14	48	P6	DCW	Franklin Eddings	SJ	*Water glass broke while being dried
10/1	Coolidge	5	14	Stndg	P3	Pass	L. M. Russell	SG	Man claims when detraining that he slipped on car step and

11/21	Chandler, Ariz.	2-43	13	5	P7	Pass	Mrs. C. H. Henbuer	S-J	*Engineer applied air in emergency to avoid striking people crossing track in front of engine.
12/23	Phoenix, Ariz.	2-43	13	5	P7	Pass	Mrs. C. H. Henbuer	S-J	

* Slack action.

[fol. 6020]

PLAINTIFF'S EXHIBIT No. 370 (Witness Hardwicke)

April 17, 1941

Southern Pacific Company
Pacific Lines—Los Angeles Division 1940

Casualties to Passenger and Passenger Employees

Date	Location	Train No.	No. Cars in Train	MPH	Days Disab.	Class Person	Name of Person	ICC Class	Description of Accident
1-7	Ventura, Cal.	69	12	50	P10	Pass	Mrs. Benj. F. Adams	S-J	Tripped and fell while passing through vestibule of car
2-9	Sta. Barbara	76	10	—	P7	Ex. Mess T.B.M.	Dan Kintner	S-J	Bitten by dog while attempting to get check attached to collar
5/10	Ontario, Cal.	3	12	—	P21	Ex. Mess	Marshall P. Phillips	S-J	Struck by closing car door fracturing jaw
6/27	Indio, Cal.	44	11	12	A-7	B	Albert W. Paugh	S-G	Claims stepped on rock while getting off moving train
8/22	Ordway, Cal.	44	11	40	Killed	Pass	Mrs. Alice M. Von Hermann	S-G	Jumped from moving train with suicidal intent.
8/6	Sta. Barbara	76	14	—	P28	P.C.	Harry J. Hatch	S-J	Fell in open bed well in diner hallway
8/26	Ventura, Cal.	2/99	8	30	P14	DCW	Anthony Desdunes	S-J	Finger contacted broken drinking glass in kitchen sink
10/25	Tortuga	43	10	25	A7	B	Geo. W. Ballinger	S-J	While looking ahead for signal foreign particle lodged in eye
11/6	Sangus	56	13	2	P7	Pass	Mrs. L. R. Sullivan	S-J	Unbalanced as train started

Plaintiff's Exhibit No. 382
Apr. 29, 1941

INTERSTATE COMMERCE COMMISSION

SUMMARY No. 24.—*Highway grade-crossing accidents, showing by States, total casualties and accidents in which automobiles were involved, for the year ended Dec. 31, 1938*

No.	State	Train and train-service casualties at highway grade crossings				Casualties resulting from accidents in which automobiles were involved					
		Number of accidents	Percent of casualties in highway grade-crossing accidents	Total persons		Number of accidents	Percent of casualties in accidents involving automobiles	Total persons		Number of automobiles registered[1]	Casualties per 10,000 automobiles registered
				Killed	Injured			Killed	Injured		Killed / Injured
1	Alabama	86	1.26	37	68	[illegible]	1.26	14	63	297,252	0.47 / 2.12
2	Arizona	13	.29	5	[illegible]	[illegible]	.29	3	15	115,038	.26 / 1.30
3	Arkansas	88	1.03	39	[illegible]	[illegible]	1.07	14	[illegible]	227,287	.62 / 4.39
4	California	[illegible]	4.03	139	283	[illegible]	4.70	111	265	2,227,594	.50 / 1.19
5	Colorado	69	1.09	17	88	88	1.07	17	69	244,670	.84 / 1.83
6	Connecticut	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7	Delaware	[illegible]	.32	6	17	34	.32	4	16	208,284	.19 / .69
8	Florida	[illegible]	.13	5	7	6	.13	3	6	83,000	.60 / .96
9	Georgia	88	1.88	34	87	88	1.88	20	69	255,057	.79 / 1.96
10	Idaho	11	.39	1	10	9	.37	1	10	136,227	.69 / 1.39
11	Illinois	[illegible]	10.97	247	689	288	10.99	288	488	1,688,720	1.20 / 2.81
12	Indiana	[illegible]	6.66	178	291	264	7.09	126	288	984,688	1.72 / 2.12
13	Iowa	[illegible]	2.67	82	141	118	2.98	46	124	728,414	.63 / 1.81
14	Kansas	[illegible]	2.88	88	163	108	2.86	30	107	577,888	.48 / 2.73
15	Kentucky	[illegible]	1.88	31	73	88	1.47	24	67	373,876	.84 / 1.80
16	Louisiana	75	1.67	19	68	69	1.71	16	69	288,488	.88 / 2.88
17	Maine	9	.19	6	7	7	.18	5	6	291,544	.39 / .92
18	Maryland	[illegible]	.68	7	36	22	.69	4	26	238,488	.11 / .67
19	Massachusetts	[illegible]	.42	11	17	18	.31	6	13	894,711	.67 / 1.46
20	Michigan	[illegible]	6.96	127	349	263	7.12	114	228	1,878,670	.68 / 2.87
21	Minnesota	[illegible]	2.77	62	144	110	2.83	36	130	788,627	.46 / 1.77
22	Mississippi	[illegible]	1.09	39	68	63	1.02	26	66	268,669	1.26 / 4.88
23	Missouri	131	3.36	53	173	117	3.41	45	103	888,614	.88 / 2.06
24	Montana	13	.21	2	13	11	.21	1	13	167,189	.60 / .72
25	Nebraska	[illegible]	1.69	26	75	57	1.54	28	72	433,787	.88 / 1.74
26	Nevada	10	.16	4	7	7	.13	2	6	38,888	.82 / 1.88
27	New Hampshire	6	.12	1	7	6	.13	1	7	132,288	.60 / .67
28	New Jersey	[illegible]	1.18	14	61	69	1.16	13	66	948,412	.14 / .61
29	New Mexico	11	.26	9	16	11	.29	9	15	108,720	.82 / 1.38
30	New York	[illegible]	4.11	84	193	168	4.04	67	169	2,468,942	.27 / .76
31	North Carolina	[illegible]	1.34	24	61	54	1.34	27	56	804,817	.34 / 1.11
32	North Dakota	21	.45	7	22	18	.49	7	18	167,241	.42 / 1.08
33	Ohio	[illegible]	8.55	162	362	230	8.89	184	377	1,777,048	.87 / 2.12
34	Oklahoma	[illegible]	2.67	38	108	81	2.67	33	105	681,914	.48 / 1.97
35	Oregon	62	1.10	17	57	49	1.15	14	57	333,729	.42 / 1.71
36	Pennsylvania	[illegible]	4.80	69	242	184	4.21	41	220	1,918,116	.21 / 1.14
37	Rhode Island	1	.01		1	1	.03		1	168,140	[illegible]
38	South Carolina	[illegible]	1.21	31	68	41	1.16	18	44	278,838	.65 / 1.57
39	South Dakota	[illegible]	.32	6	30	21	.37	6	29	188,688	.32 / 1.55
40	Tennessee	68	1.47	16	82	56	1.41	13	73	888,788	.33 / 1.97
41	Texas	[illegible]	5.72	66	319	288	5.34	56	276	1,478,124	.37 / 1.86
42	Utah	17	.43	4	25	15	.44	4	22	188,840	.34 / 1.97
43	Vermont	10	.20	3	17	10	.22	3	17	98,185	.30 / 2.88
44	Virginia	[illegible]	1.13	22	44	28	1.12	25	44	417,488	.60 / 1.06
45	Washington	[illegible]	1.19	9	71	52	1.28	8	70	488,788	.16 / 1.49
46	West Virginia	[illegible]	1.24	16	67	47	1.25	13	64	288,688	.46 / 2.29
47	Wisconsin	127	3.35	43	182	114	3.48	38	174	888,178	.43 / 2.08
48	Wyoming	8	.16	1	9	7	.14	1	8	78,688	.13 / 1.04
49	District of Columbia	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	181,318	[illegible]
50	Total	4,277	100.00	1,788	4,980	3,788	100.00	1,519	4,882	28,221,291	.54 / 1.66

[1] Figures furnished by Bureau of Public Roads, United States Department of Agriculture.

No.	State	Number of accidents	Percent of accidents to highway grade crossing accidents	Total persons		Casualties resulting from accidents to vessels automobiles were involved							
				Killed	Injured	Number of accidents	Percent of casualties to accidents involving automobiles	Total persons		Number of automobiles registered [1]	Casualties per 10,000 automobiles registered		
								Killed	Injured		Killed	Injured	
1	Alabama	[illegible]	1.26	17	[illegible]	[illegible]	1.26	14	[illegible]	[illegible]	[illegible]	[illegible]	
2	Arizona	[illegible]	1.69	[illegible]	[illegible]	[illegible]	1.69	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
3	Arkansas	[illegible]	1.69	[illegible]	[illegible]	[illegible]	1.69	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
4	California	[illegible]	4.68	[illegible]	[illegible]	[illegible]	4.78	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
5	Colorado	[illegible]	1.49	17	[illegible]	[illegible]	1.49	17	[illegible]	[illegible]	[illegible]	[illegible]	
6	Connecticut	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
7	Delaware	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
8	Florida	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
9	Georgia	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
10	Idaho	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
11	Illinois	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
12	Indiana	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
13	Iowa	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
14	Kansas	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
15	Kentucky	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
16	Louisiana	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
17	Maine	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
18	Maryland	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
19	Massachusetts	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
20	Michigan	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
21	Minnesota	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
22	Mississippi	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
23	Missouri	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
24	Montana	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
25	Nebraska	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
26	Nevada	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
27	New Hampshire	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
28	New Jersey	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
29	New Mexico	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
30	New York	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
31	North Carolina	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
32	North Dakota	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
33	Ohio	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
34	Oklahoma	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
35	Oregon	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
36	Pennsylvania	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
37	Rhode Island	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
38	South Carolina	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
39	South Dakota	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
40	Tennessee	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
41	Texas	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
42	Utah	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
43	Vermont	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
44	Virginia	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
45	Washington	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
46	West Virginia	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
47	Wisconsin	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
48	Wyoming	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
49	District of Columbia	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
50	Total	4,277	100.00	1,706	4,100	3,700	100.00	1,510	4,002	28,221,201	.54	1.65	

[1] Figures furnished by Bureau of Public Roads, United States Department of Agriculture, and cover passenger automobiles, motortrucks, and motorbuses.

[2] Figures include 80 train accidents at crossings in which damage to railway property amounted $100, but which resulted in no reportable casualties as follows: California, 12; Connecticut, 1; Delaware, 2; Illinois, 3; Indiana, 4; Iowa, 1; Kansas, 2; Kentucky, 1; Maryland, 1; Massachusetts, 2; Michigan, 2; Minnesota, 2; Mississippi, 1; Nebraska, 4; New Jersey, 7; New York, 4; North Carolina, 2; Ohio, 12; Oklahoma, 1; Pennsylvania, 3; South Carolina, 2; South Dakota, 1; Texas, 1; Virginia, 2; Washington, 1; West Virginia, 1.

INTERSTATE COMMERCE COMMISSION

TABLE No. 50.—*CASUALTIES IN HIGHWAY GRADE-CROSSING ACCIDENTS, showing kind of protection afforded at crossing at the time of accident, for the year ended Dec. 31, 1938*

	Total			Pedestrians			Passenger automobiles			Motor-buses			Motor-trucks			Motor-cycles or bicycles			Trolley cars			Animal-drawn vehicles			Other vehicles or machines			Pedestrians passing over or under trains or cars			All other grade-crossing accidents		
	Number of accidents	Persons		Number of accidents	Persons		Number of accidents	Persons		Number of accidents	Persons		Number of accidents	Persons		Number of accidents	Persons		Number of accidents	Persons		Number of accidents	Persons		Number of accidents	Persons		Number of accidents	Persons		Number of accidents	Persons	
		Killed	Injured		Killed	Injured		Killed	Injured		Killed	Injured		Killed	Injured		Killed	Injured		Killed	Injured		Killed	Injured		Killed	Injured		Killed	Injured		Killed	Injured
TOTAL—TRAIN AND TRAIN-SERVICE ACCIDENTS																																
1 Not reported																																
2 Closed crossing gates	126	77	87	75	62	33	39	39	47				8	1	6	4	3	2				1		1				2	1	1			
3 Crossing watchman	434	92	883	63	18	25	365	43	459	2		15	59	17	74	6	2	4										5	3	2	30	9	17
4 Audible and visible signal	309	193	434	46	35	13	279	123	318	1		10	72	34	93	1		1	1		5	1		1				1		1	1		2
5 Audible signal	135	74	149	18	12	3	88	45	118				28	15	27	3	2	1														
6 Visible signal	475	261	822	82	36	16	337	162	387	1		6	74	40	77	6	1	4	2	1	3	1		1	1		1	1	1		1	1	
7 Other warning signal																																
9 Unprotected	3,620	1,110	3,165	125	79	60	1,667	709	2,432	9	9	22	534	210	805	8	6	3	7		16	15	6	16	9	2	9	13	4	14	21	4	19
9 Total	4,197	1,708	4,699	358	222	130	2,939	1,121	3,739	13	9	53	704	317	951	28	13	15	8	1	29	18	6	19	10	2	10	27	9	18	60	14	38
TRAIN-SERVICE ACCIDENTS																																
Struck by train																																
10 Not reported																																
11 Closed crossing gates	102	73	85	71	63	34	22	27	34				5	1	4	3	2	1				1		1								
12 Crossing watchman	213	80	266	39	18	21	144	39	206				29	7	40	1	1															
13 Audible and visible signal	202	148	263	42	34	12	171	88	133	1		10	45	34	60				1		5	1		1								
14 Audible signal	80	69	91	14	11	3	62	41	77				29	14	10																	
15 Visible signal	329	198	315	51	36	16	276	134	260	1		6	46	29	51	1	1					1		1	1		1					
16 Other warning signal																																
17 Unprotected	1,857	847	1,618	110	78	40	1,094	599	1,141	6		12	369	165	338	2	2		1		14	15	6	16	9	2	9						
18 Total	2,894	1,324	2,611	234	219	130	1,691	919	1,857	8		27	524	282	547	7	6	1	2		19	18	6	19	10	2	10						
Ran into side of train																																
19 Not reported																																
20 Closed crossing gates	22	3	28	4		4	17	3	23																							
21 Crossing watchman	178	19	267	4		4	152	11	240	2		15	15	7	24	1		1														
22 Audible and visible signal	111	26	151	2	1	1	96	30	128				14	5	22																	
23 Audible signal	26	6	54	1	1		25	5	45				7	1	7	3	2	1														
24 Visible signal	113	19	139	2		2	101	14	144				6	5	5	3		4	1		3											
25 Other warning signal																																
26 Unprotected	933	188	1,435	9	1	8	750	161	1,255	3		6	129	20	161	6	4	3	1		3											
27 Total	1,368	269	2,113	22	3	19	1,139	224	1,836	4		21	167	38	219	13	7	13	2		5											
TRAIN ACCIDENTS																																
Struck by train																																
28 Not reported																																
29 Closed crossing gates																																
30 Crossing watchman	9	4	17				8	1	9				4	3	8																	
31 Audible and visible signal	14	7	10				7	4	4				7	3	6																	
32 Audible signal	3	2	3				1	2					1		2																	
33 Visible signal	16	22	26				7	14	5				8	7	19				1	1	5											
34 Other warning signal																																
35 Unprotected	45	44	43				15	10	13	1	9	4	29	25	26																	
36 Total	86	79	99				38	31	29	1	9	4	49	38	61				1	1	5											
Ran into side of train																																
37 Not reported																																
38 Closed crossing gates																																
39 Crossing watchman	4	1	4				3	1	2				2		2																	
40 Audible and visible signal	9	3	7				2	1	1																							

TOTAL—TRAIN AND TRAIN-SERVICE ACCIDENTS

1	Not reported																																						
2	Closed crossing gates	126	77	87	75	42	33	39	30	47				5	1	4	4	3	2				1		1					2	1	1						
3	Crossing watchman	434	92	888	43	18	25	388	43	449	2		15	89	17	74	3	2	4											5	3	2	388	9	17			
4	Audible and visible signal	208	102	434	48	35	13	278	123	318	1		10	72	24	83	1		1	1		5	1		1					1		1	5		2			
5	Audible signal	135	74	169	15	12	3	82	45	118				28	15	27	3	2	1																			
6	Visible signal	675	261	880	83	36	19	237	142	387	1		6	74	40	77	4	1	4	2	1	3	1		1	1		1	1	1		1	1					
7	Other warning signal																																					
8	Unprotected	2,628	1,140	3,165	128	70	48	1,887	780	2,422	9	9	22	324	210	885	8	6	3	7		16	15	6	16	9	2	9	13	4	14	21	4	19			
9	Total	4,197	1,706	4,699	393	223	139	2,939	1,193	3,726	13	9	53	764	317	851	28	13	15	5	1	29	18	6	19	10	2	10	27	9	18	49	14	38			

TRAIN-SERVICE ACCIDENTS

Struck by train

10	Not reported																																					
11	Closed crossing gates	102	73	88	71	42	29	32	27	34				5	1	4	3	2	1				1		1													
12	Crossing watchman	313	88	388	30	18	21	144	30	386				39	7	40	1	1																				
13	Audible and visible signal	202	146	262	42	34	12	171	88	185	1		10	45	24	80						1		5	1		1											
14	Audible signal	80	60	91	14	11	3	82	41	72				20	14	16																						
15	Visible signal	320	199	316	83	36	16	276	134	340	1		6	85	39	81	1	1							1		1	1		1								
16	Other warning signal																																					
17	Unprotected	1,263	647	1,618	118	70	40	1,086	589	1,141	6		12	389	169	388	2	2		1		14	13	6	16	9	2	9										
18	Total	2,286	1,264	2,611	336	219	120	1,691	919	1,857	8		27	824	253	847	7	6	1	2		19	13	6	19	10	2	10										

Ran into side of train

19	Not reported																																					
20	Closed crossing gates	27	3	28	4		4	17	3	33							1		1																			
21	Crossing watchman	178	19	267	4		4	102	11	260	2		15	18	7	34	5	1	4																			
22	Audible and visible signal	111	38	161	2	1	1	90	30	128				14	5	22																						
23	Audible signal	26	6	54	1	1		25	2	46				7	1	7	3	2	1																			
24	Visible signal	113	19	188	2		2	101	14	144				6	5	5	3		4	1		3																
25	Other warning signal																																					
26	Unprotected	922	186	1,435	9	1	8	760	161	1,255	2		6	128	30	161	6	4	3	1		2																
27	Total	1,388	269	2,113	22	3	19	1,189	261	1,824	4		31	167	38	219	18	7	13	2		5																

TRAIN ACCIDENTS

Struck by train

28	Not reported																																					
29	Closed crossing gates																																					
30	Crossing watchman	9	4	17				5	1	9				4	3	8																						
31	Audible and visible signal	14	7	10				7	4	4				7	3	6																						
32	Audible signal	2	2	2				1	2					1		2																						
33	Visible signal	16	22	25				7	14	3				8	7	19				1	1	5																
34	Other warning signal																																					
35	Unprotected	45	44	43				15	10	13	1	9	4	20	25	35																						
36	Total	1 86	79	98				35	31	28	1	9	4	49	38	81				1	1	5																

Ran into side of train

37	Not reported																																					
38	Closed crossing gates																																					
39	Crossing watchman	4	1	4				2	1	2				2		2																						
40	Audible and visible signal	9	3	7				2	1	1				6	2	5	1		1																			
41	Audible signal	1		2										1		2																						
42	Visible signal	5	2	3				1		1				4	2	2																						
43	Other warning signal																																					
44	Unprotected	29	30	36				18	20	23				11	5	12																						
45	Total	1 48	31	52				23	22	27				24	9	24	1		1																		

1 In addition to the 134 train accidents shown, there were 80 train accidents at highway grade crossings in which the damage to railway property exceeded $150 but which resulted in no reportable casualties, viz:

Struck by train.—Crossing unprotected, 14 passenger automobiles, 11 motortrucks, 3 other vehicles; crossing protected by visible signal, 4 passenger automobiles, 1 motorbus, 5 motortrucks, 2 other vehicles; crossing protected by audible signal, 1 passenger automobile, 3 motortrucks; crossing protected by audible and visible signal, 1 passenger automobile, 4 motortrucks; crossing protected by watchman, 3 passenger automobiles, 2 motortrucks; crossing protected by gates, 1 passenger automobile, 2 motortrucks.

Ran into side of train.—Crossing unprotected, 6 passenger automobiles, 7 motortrucks; crossing protected by visible signal, 2 motortrucks; crossing protected by audible signal, 1 passenger automobile; crossing protected by audible and visible signal, 1 passenger automobile, 3 motortrucks; crossing protected by watchman, 1 motortruck; crossing protected by gates, 1 motortruck.

Other grade-crossing accident.—Crossing unprotected, 1 obstruction other than a vehicle.

Plaintiffs' Exhibit No. 384
Apr. 29, 1941

TABLE No. 51.—*TRAIN ACCIDENTS and TRAIN-SERVICE ACCIDENTS, and resulting casualties to persons, by States, for the year ended Dec. 31, 1936*

No.	State	Percent of casualties	Train and train-service accidents						Train accidents					Train-service accidents			
			Total		Nontrespassers		Trespassers		Number of accidents	Nontrespassers		Trespassers		Nontrespassers		Trespassers	
			Killed	Injured	Killed	Injured	Killed	Injured		Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
1	Alabama	2.02	121	379	32	274	89	105	97	6	83		1	26	191	89	104
2	Arizona	.60	36	113	11	80	25	33	44		3			11	80	25	33
3	Arkansas	2.02	95	305	32	244	63	61	108	6	70	3	2	26	174	61	59
4	California	4.66	256	867	153	705	103	162	222	9	38	1	7	144	737	102	155
5	Colorado	1.17	51	239	38	213	13	26	108	3	33			33	180	13	26
6	Connecticut	.71	27	148	6	141	21	7	60		13			6	128	19	7
7	Delaware	.21	10	42	5	40	5	2	21		11			5	29	5	2
8	Florida	1.02	71	152	39	130	32	22	68	5	6			34	144	32	22
9	Georgia	2.60	152	443	71	300	81	83	137	15	60			56	239	81	83
10	Idaho	.30	14	61	3	51	11	10	41		3			3	49	11	10
11	Illinois	9.04	496	1,733	268	1,480	189	153	432	29	169	4	1	239	1,440	184	152
12	Indiana	4.30	287	777	150	704	89	73	272	14	67	4	4	136	637	84	67
13	Iowa	2.14	129	601	77	366	52	35	211	6	36	1		71	330	51	35
14	Kansas	2.19	75	617	43	433	32	44	174	4	21	3	3	39	412	29	41
15	Kentucky	2.43	179	622	60	390	130	123	156	5	8			55	291	130	123
16	Louisiana	1.80	83	384	36	332	47	52	94	8	63		1	28	267	47	51
17	Maine	.34	21	64	14	60	7	4	27	7	9			7	51	7	4
18	Maryland	1.21	41	250	8	238	33	23	108	1	30			7	208	33	23
19	Massachusetts	1.52	68	309	24	295	44	23	122	2	17			22	286	44	23
20	Michigan	3.70	196	736	134	650	62	61	147	4	44			134	615	58	61
21	Minnesota	1.99	82	412	55	365	27	27	173	10	14		1	45	371	27	26
22	Mississippi	1.91	95	379	34	318	61	61	85		46	1	2	31	270	60	59
23	Missouri	3.93	170	803	73	727	97	76	246	4	217	6		69	510	80	76
24	Montana	.88	33	136	15	119	18	17	91	4	17	1		11	102	17	17
25	Nebraska	.93	43	187	30	162	13	25	73	2	6	1		28	156	12	25
26	Nevada	.36	18	47	9	36	9	11	55	2	7			7	29	9	11
27	New Hampshire	.17	7	34	4	30	3	4	25	2				3	30	3	4
28	New Jersey	2.79	107	564	50	551	57	33	308	8	43			42	509	57	33
29	New Mexico	.60	29	121	13	97	15	24	37		1	1	3	13	96	14	21
30	New York	5.83	235	1,209	123	1,130	112	79	453	22	60			101	1,080	112	79
31	North Carolina	1.77	120	809	50	251	80	58	105	1	13	1		49	238	79	58
32	North Dakota	.50	20	125	11	113	9	12	41		12			11	101	9	12
33	Ohio	7.10	431	1,327	256	1,196	175	131	666	11	115	3	2	245	1,081	172	129
34	Oklahoma	1.83	105	273	37	231	68	42	87	2	18			35	213	68	42
35	Oregon	.95	46	198	26	165	20	33	88		3		1	26	162	20	32
36	Pennsylvania	7.80	317	1,566	120	1,381	168	185	1,234	19	96		2	110	1,285	168	183
37	Rhode Island	.12	5	25	3	25	2		10	1	3			3	22	3	
38	South Carolina	.36	71	171	28	135	43	36	68	6	14			22	121	43	36
39	South Dakota	.35	12	74	7	65	5	9	30		2			7	63	5	9
40	Tennessee	2.41	132	666	30	357	102	109	156	6	24	1		24	333	101	109
41	Texas	4.64	212	938	84	778	128	160	268	7	40	3	1	77	738	125	159
42	Utah	.48	17	102	7	94	10	8	80		5	1		7	89	9	8
43	Vermont	.26	12	53	6	51	6	2	41	1	3			5	48	6	2
44	Virginia	2.01	118	391	52	302	66	79	166	1	24			51	278	66	79
45	Washington	1.13	52	227	18	196	34	29	109	2	6		1	16	191	34	27
46	West Virginia	2.34	151	428	32	330	119	98	201	3	25			29	305	119	98
47	Wisconsin	2.27	105	456	55	414	50	42	111	3	28	1	2	53	386	49	40
48	Wyoming	.27	17	51	7	37	10	14	47	3	1			6	48	10	14
49	District of Columbia	.24	4	56	1	50	3	6	19		2			1	48	3	6
50	Total	100.00	5,174	19,592	2,508	17,182	2,666	2,410	8,286	243	1,813	35	34	2,280	15,369	2,631	2,376

Defendant's Exhibit No. 386 (Witness J.J. Sullivan)
Apr. 29, 1941

COMPARISONS OF CASUALTIES
TO

EMPLOYES ON DUTY AND NON-TRESPASSERS

ROAD FREIGHT TRAIN OPERATION

SUSTAINED IN TRAIN AND TRAIN-SERVICE ACCIDENTS
REPORTED TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1930 TO 1940, INCLUSIVE

SOUTHERN PACIFIC COMPANY (PACIFIC LINES)
LOS ANGELES DIVISION

YEAR	FREIGHT TRAIN		AVERAGE CARS PER TRAIN	CASUALTY RATE PER MILLION FREIGHT TRAIN MILES							TOTAL ALL PERSONS	CASUALTY RATE PER			
				EMPLOYES				NON-EMPLOYES				EMPLOYES			
	TRAIN MILES (THOUSANDS)	CAR MILES (THOUSANDS)		CONDUCTORS AND BRAKEMEN	ENGINEERS AND FIREMEN	OTHER EMPLOYES	TOTAL ALL EMPLOYES	OCCUPANTS OF MOTOR VEHICLES	OTHER NON-TRESPASSERS	TOTAL NON-TRESPASSERS		CONDUCTORS AND BRAKEMEN	ENGINEERS AND FIREMEN	OTHER EMPLOYES	TO E
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	
1930	1,745	93,678	53.68	10.69	.57	.57	12.03	12.03	1.15	13.18	25.21	20.28	1.07	1.07	
1931	1,440	78,237	54.33	15.28	2.08	.69	18.06	18.06	1.39	19.44	37.50	28.12	3.83	1.28	
1932	1,293	65,094	50.34	17.01	.77	-	17.79	13.92	2.32	16.24	34.03	33.80	1.54	-	
1933	1,223	60,401	49.39	12.26	1.64	-	13.90	11.45	.82	12.26	26.17	24.83	3.31	-	
1934	1,372	71,817	52.34	12.39	.73	-	13.12	10.93	-	10.93	24.05	23.57	1.39	-	
1935	1,526	81,550	53.44	19.66	-	-	19.66	6.55	-	6.55	26.21	56.79	-	-	
6 YEARS 1930-1935	8,599	450,777	52.42	14.54	.93	.23	15.70	12.09	.93	13.02	28.72	27.73	1.77	.44	
1936	1,781	96,184	54.01	19.09	1.12	-	20.21	15.16	-	15.16	35.37	35.35	2.08	-	
1937	1,936	105,111	54.29	20.66	1.03	2.07	23.76	15.50	.52	16.01	39.77	38.06	1.90	3.81	
1938	1,588	92,826	58.45	15.74	1.26	1.89	18.89	24.56	-	24.56	43.45	26.93	2.15	3.23	
1939	1,670	99,525	59.60	10.18	1.80	-	11.98	8.38	2.99	11.38	23.35	17.08	3.01	-	
											34.14	30.15	.91	.91	

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CASUALTY RATE PER 100 MILLION FREIGHT TRAIN CAR MILES								
	EMPLOYES				NON-EMPLOYES			
OTAL ALL RSONS	CONDUCTORS AND BRAKEMEN	ENGINEERS AND FIREMEN	OTHER EMPLOYES	TOTAL ALL EMPLOYES	OCCUPANTS OF MOTOR VEHICLES	OTHER NON-TRESPASSERS	TOTAL NON-TRESPASSERS	TOTAL ALL PERSONS
(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)
5.21	20.28	1.07	1.07	22.42	22.42	2.13	24.55	46.97
7.50	28.12	3.83	1.28	33.23	33.23	2.56	35.79	69.02
4.03	33.80	1.54	-	35.33	27.65	4.61	32.26	67.59
6.17	24.83	3.31	-	28.15	23.18	1.66	24.83	52.98
4.05	23.67	1.39	-	25.06	20.89	-	20.89	45.95
6.21	36.79	-	-	36.79	12.26	-	12.26	49.05
8.72	27.73	1.77	.44	29.95	23.07	1.77	24.85	54.79
5.37	35.35	2.08	-	37.43	28.07	-	28.07	65.50
9.77	38.06	1.90	3.81	43.76	28.54	.95	29.49	73.26
3.45	26.93	2.15	3.23	32.32	42.01	-	42.01	74.33
3.35	17.08	3.01	-	20.10	14.07	5.02	19.09	39.19
4.14	30.15	.91	.91	31.97	20.10	1.83	21.93	53.90

YEARS 1930 TO 1940, INCLUSIVE

SOUTHERN PACIFIC COMPANY (PACIFIC LINES)
LOS ANGELES DIVISION

YEAR	FREIGHT TRAIN TRAIN MILES (THOUSANDS)	FREIGHT TRAIN CAR MILES (THOUSANDS)	AVERAGE CARS PER TRAIN	CASUALTY RATE PER MILLION FREIGHT TRAIN MILES — EMPLOYES — CONDUCTORS AND BRAKEMEN	ENGINEERS AND FIREMEN	OTHER EMPLOYES	TOTAL ALL EMPLOYES	NON-EMPLOYES — OCCUPANTS OF MOTOR VEHICLES	OTHER NON-TRESPASSERS	TOTAL NON-TRESPASSERS	TOTAL ALL PERSONS	CASUALTY R — EMPLOYES — CONDUCTORS AND BRAKEMEN	ENGINEERS AND FIREMEN	OTH EMPL
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o
1930	1,745	93,678	53.68	10.89	.57	.57	12.03	12.03	1.15	13.18	25.21	20.28	1.07	1.
1931	1,440	78,237	54.33	15.28	2.08	.69	18.06	18.06	1.39	19.44	37.50	28.12	3.83	1.
1932	1,293	65,094	50.34	17.01	.77	-	17.79	13.92	2.32	16.24	34.03	33.80	1.54	-
1933	1,223	60,401	49.39	12.26	1.64	-	13.90	11.45	.82	12.26	26.17	24.83	3.31	-
1934	1,372	71,817	52.34	12.39	.73	-	13.12	10.93	-	10.93	24.05	23.67	1.39	-
1935	1,526	81,550	53.44	19.66	-	-	19.66	6.55	-	6.55	26.21	36.79	-	-
6 YEARS 1930-1935	8,599	450,777	52.42	14.54	.93	.23	15.70	12.09	.93	13.02	28.72	27.73	1.77	.4
1936	1,781	96,184	54.01	19.09	1.12	-	20.21	15.16	-	15.16	35.37	35.35	2.08	-
1937	1,936	105,111	54.29	20.66	1.03	2.07	23.76	15.50	.52	16.01	39.77	38.06	1.90	3.
1938	1,588	92,826	58.45	15.74	1.26	1.89	18.89	24.56	-	24.56	43.45	26.93	2.15	3.
1939	1,670	99,525	59.60	10.18	1.80	-	11.98	8.38	2.99	11.38	23.35	17.08	3.01	-
1940	1,728	109,464	63.35	19.10	.58	.58	20.25	12.73	1.16	13.89	34.14	30.15	.91	.9
5 YEARS 36-1940	8,703	503,110	57.81	17.12	1.15	.92	19.19	15.17	.92	16.09	35.28	29.62	1.99	1.
11 YEARS 930-1940	17,302	953,887	55.13	15.84	1.04	.58	17.45	13.64	.92	14.56	32.02	28.72	1.89	1.

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CASUALTY RATE PER 100 MILLION FREIGHT TRAIN CAR MILES								
	EMPLOYES				NON-EMPLOYES			
TAL ALL RSONS	CONDUCTORS AND BRAKEMEN	ENGINEERS AND FIREMEN	OTHER EMPLOYES	TOTAL ALL EMPLOYES	OCCUPANTS OF MOTOR VEHICLES	OTHER NON-TRESPASSERS	TOTAL NON-TRESPASSERS	TOTAL ALL PERSONS
(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)
5.21	20.28	1.07	1.07	22.42	22.42	2.13	24.55	46.97
7.50	28.12	3.83	1.28	33.23	33.23	2.56	35.79	69.02
4.03	33.80	1.54	-	35.33	27.65	4.61	32.26	67.59
6.17	24.83	3.31	-	28.15	23.18	I.66	24.83	52.98
4.05	23.67	1.39	-	25.06	20.89	-	20.89	45.95
6.21	36.79	-	-	36.79	12.26	-	12.26	49.05
8.72	27.73	1.77	.44	29.95	23.07	1.77	24.85	54.79
5.37	35.35	2.08	-	37.43	28.07	-	28.07	65.50
9.77	38.06	1.90	3.81	43.76	28.54	.95	29.49	73.26
3.45	26.93	2.15	3.23	32.32	42.01	-	42.01	74.33
3.35	17.08	3.01	-	20.10	14.07	5.02	19.09	39.19
4.14	30.15	.91	.91	31.97	20.10	1.83	21.93	53.90
5.28	29.62	1.99	1.59	33.19	26.24	1.59	27.83	61.02
2.02	28.72	1.89	1.05	31.66	24.74	1.68	26.42	58.08

CASUALTIES TO ALL PERSONS EXCEPT TRESPASSERS

	EMPLOYES												NON-EMPLOYES							
	CONDUCTORS AND BRAKEMEN			ENGINEERS AND FIREMEN			OTHER EMPLOYES			TOTAL ALL EMPLOYES			OCCUPANTS OF MOTOR VEHICLES			OTHER NON-TRESPASSERS			TOTAL NON-TRESP	
YEAR	KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL	KILLED	INJU
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)
1930	-	19	19	-	1	1	-	1	1	-	21	21	4	17	21	-	2	2	4	1
1931	-	22	22	-	3	3	-	1	1	-	26	26	4	22	26	-	2	2	4	2
1932	1	21	22	-	1	1	-	-	-	1	22	23	1	17	18	-	3	3	1	2
1933	2	13	15	-	2	2	-	-	-	2	15	17	2	12	14	1	-	1	3	1
1934	-	17	17	-	1	1	-	-	-	-	18	18	2	13	15	-	-	-	2	1
1935	1	29	30	-	-	-	-	-	-	1	29	30	-	10	10	-	-	-	-	1
YEARS 1930-1935	4	121	125	-	8	8	-	2	2	4	131	135	13	91	104	1	7	8	14	9
1936	-	34	34	-	2	2	-	-	-	-	36	36	4	23	27	-	-	-	4	2
1937	1	39	40	-	2	2	1	3	4	2	44	46	7	23	30	-	1	1	7	2
1938	1	24	25	-	2	2	-	3	3	1	29	30	9	30	39	-	-	-	9	3
1939	1	16	17	-	3	3	-	-	-	1	19	20	3	11	14	-	5	5	3	4
1940	3	30	33	-	1	1	-	1	1	3	32	35	2	20	22	-	2	2	2	2
YEARS 1936-1940	6	143	149	-	10	10	1	7	8	7	160	167	25	107	132	-	8	8	25	11
YEARS 1930-1940	10	264	274	-	18	18	1	9	10	11	291	302	38	198	236	1	15	16	39	21

SSERS

NON-EMPLOYEES								TOTAL ALL PERSONS EXCEPT TRESPASSERS		
PANTS OF VEHICLES		OTHER NON-TRESPASSERS			TOTAL NON-TRESPASSERS					
NJURED	TOTAL	KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL
(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)
17	21	-	2	2	4	19	23	4	40	44
22	26	-	2	2	4	24	28	4	50	54
17	18	-	3	3	1	20	21	2	42	44
12	14	1	-	1	3	12	15	5	27	32
13	15	-	-	-	2	13	15	2	31	33
10	10	-	-	-	-	10	10	1	39	40
91	104	1	7	8	14	98	112	18	229	247
23	27	-	-	-	4	23	27	4	59	63
23	30	-	1	1	7	24	31	9	68	77
30	39	-	-	-	9	30	39	10	59	69
11	14	-	5	5	3	16	19	4	35	39
20	22	-	2	2	2	22	24	5	54	59
107	132	-	8	8	25	115	140	32	275	307
198	236	1	15	16	39	213	252	50	504	554

NUMBER OF CASUALTIES SEGREGATED AS TO FREIGHT TRAINS OF 70 CARS OR LESS, AND THOSE OVER 70 CARS

YEAR	CONDUCTORS AND BRAKEMEN		ENGINEERS AND FIREMEN		OTHER EMPLOYES		ALL EMPLOYES		OCCUPANTS OF MOTOR VEHICLES		OTHER NON-TRESPASSERS		TOTAL NON-TRESPASSERS		GRAND TOTAL ALL PERSONS	
	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)
1930	13	6	1	-	1	-	15	6	21	-	2	-	23	-	38	6
1931	13	9	1	2	1	-	15	11	20	6	1	1	21	7	36	18
1932	10	12	1	-	-	-	11	12	17	1	1	2	18	3	29	15
1933	7	8	2	-	-	-	9	8	13	1	1	-	14	1	23	9
1934	6	11	-	1	-	-	6	12	15	-	-	-	15	-	21	12
1935	21	9	-	-	-	-	21	9	10	-	-	-	10	-	31	9
6 YEARS 1930-1935	70	55	5	3	2	-	77	58	96	8	5	3	101	11	178	69
1936	20	14	1	1	-	-	21	15	24	3	-	-	24	3	45	18
1937	26	14	1	1	4	-	31	15	26	4	1	-	27	4	58	19
1938	17	8	2	-	3	-	22	8	37	2		-	37	2	59	10
1939	14	3	3	-	-	-	17	3	13	1	5	-	18	1	35	4
1940	19	14	1	-	1	-	21	14	19	3	2	-	21	3	42	17
5 YEARS 1936-1940	96	53	8	2	8	-	112	55	119	13	8	-	127	13	239	68
11 YEARS 1930-1940	166	108	13	5	10	-	189	113	215	21	13	3	228	24	417	137

DETAIL OF CASUALTIES
ALL CLASSES OF PERSONS, EXCEPT TRESPASSERS,
TRAIN AND TRAIN SERVICE ACCIDENTS,
ROAD FREIGHT TRAIN OPERATION
REPORTED TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1930 TO 1941 INCLUSIVE.

SOUTHERN PACIFIC COMPANY
LOS ANGELES DIVISION

	DATE (a)	LOCATION (b)	MAIN LINE (ML) OR BRANCH (BR) (c)	I.C.C. CLASS (d)	TRAIN NUMBER (e)	NO. CARS IN TRAIN (f)	SPEED (M.P.H.) (g)	PERSON INJURED NAME (h)	PERSON INJURED OCCUPATION (i)	ESTIMATED DISABILITY (DAYS) (j)	DESCRIPTION OF ACCIDENT (k)
	1930							YEAR 1930			
1	1-4	North Los Angeles	ML	S-h	X-2820-W	1	4	1 occupant of automobile		90	Automobile collided with side of car which was being backed to balance of train.
2	1-4	Niland	ML	S-j	X-2788-E	15	Standing	V.D.Richards	Brakeman	45	Brass fell on foot.
3	1-7	Beticoy	BR	S-i	X-2747-W	5	3	F. Garcia	Sec.Foreman	24	While riding on caboose step was struck by tie unloaded from car ahead.
4	1-27	Niland	ML	S-c	X-2451-E	55	Standing	J.Howe	Fireman	21	Lost balance and fell off tender of engine.
5	1-28	Aurant	ML	S-j	X-3737-W	57	10	L.N.Davis	Brakeman	21	Caboose door closed on hand when slack action occurred.
6	2-10	Ventura	ML	S-j	X-2713-W	55	Standing	F.J.Koenig	Brakeman	24	Stumbled and fell while running from exploding gasoline.
7	3-1	Mecca	ML	S-j	X-5020-W	42	8	F.M.Collins	Conductor	8	Stepped on rock while running alongside of train.
8	3-3	El Centro	ML	S-j	X-1619-E	3	Standing	G.T.Knox	Brakeman	21	Strained ligaments in arm while disconnecting brake rigging from derailed car, bar which he was using slipped.
9	3-10	Heber	ML	S-j	X-3757-E	1	Standing	R.K.Meydre	Brakeman	6	Ice chopper fell from car striking brakeman on head.
10	3-12	Vinvale	BR	S-a	142	24	5	A.C.Haney	Brakeman	45	Slipped on damp grass while running alongside train to cut off car.
11	3-23	Los Angeles	ML	S-h	1-96	56	6	2 occupants of automobile		7	Automobile drove off crossing into open tracks and struck by train.
12	3-26	Redlands, 2nd St.	BR	S-d	X-1815-W	5 1	5	F.E.Lillis	Brakeman	30	Thrown off balance when cut he was riding coupled on to cars on main track.
13	4-26	Aurant	ML	S-h	X-2813-W	55	6	R.B.Cooper	Conductor	45	Emergency stop of train injured employe in caboose when driverless truck and trailer rolled foul of track.
14	5-13	Flowing Well	ML	S-j	X-5046-W	98	40	E.T.Camutson M.S.JanDell	Brakeman Conductor	45 8	Rough stop account undesired emergency application of brakes caused injury to employes in caboose.
15	5-15	San Fernando	ML	S-h	252	1	6	2 pedestrians		4 and 30	Walked into pilot beam of engine on crossing, which was handling one car on siding.
16	5-31	Tustin	BR	S-b	X-1809-E	8	Standing	A.J.Bierman	Brakeman	21	Struck by flying air hose while uncoupling air hose.
17	6-6	Downey	BR	S-h	142	20	Standing	Driver of motorcycle		2	Motorcycle collided with side of standing train.
18	7-8	Chatsworth	ML	S-h	X-2820-W	25	6	2 occupants of automobile 1 occupant of automobile		Killed 3	Automobile collided with side of train.
19	7-19	Indio	ML	S-g	X-5002-E	123	3	E.H.Rives	Brakeman	6	Stepped on rock while getting off moving car, 24 cars being handled at the time.
20	7-26	Miraflores	BR	S-j	X-1768-E	7	2	W.F.Clark	Brakeman	5	Stepped on rock while walking alongside of cut of cars to make coupling.
21	8-11	San Gabriel	ML	S-h	X-3693-W	60	18	Driver of motorcycle		21	Motorcycle collided with side of engine.
22	8-14	Selvia	ML	S-j	128	89	25	F.Soutar	Conductor	24	Thrown off balance in caboose by slack action on rear end.
23	8-19	Monrovia	BR	S-h	X-1828-E	2	3	Driver of motorcycle		7	Motorcycle collided with train.
24	9-8	Alhambra	BR	S-h	X-1761-E	8	18	1 occupant of automobile		21	Automobile struck by train.
25	9-16	Heber	ML	S-h	X-1639-E	2	30	2 occupants of automobile		14 and 21	Automobile struck by train
26	9-27	Tustin Jct.	BR	S-h	140	7	15	1 occupant of auto-truck		7	Auto-truck struck by train.
27	9-28	Beciez	ML	D-c	X-5000-W	86	6	J.W.Stephens	Brakeman	21	Fifty-sixth car in train buckled and it and car ahead derailed, sudden stop injured employe in caboose.
28	10-10	Indio	ML	S-h	X-5004-E	120					

	1	1-4	North Los Angeles	ML	S-h	X-2820-W	1	4	1 occupant of automobile		.90	Automobile collided with side of car which was being backed to balance of train.
	2	1-4	Niland	ML	S-j	X-2788-E	15	Standing	V.D.Richards	Brakeman	45	Brace fell on foot.
	3	1-7	Setliff	BR	S-j	X-2747-E	5	3	F. Garcia	Sec.Foreman	24	While riding on caboose step was struck by tie unloaded from car ahead.
	4	1-27	Niland	ML	S-c	X-2451-E	55	Standing	J.Howe	Fireman	21	Lost balance and fell off tender of engine.
	5	1-28	Aurant	ML	#S-j	X-3737-E	57	10	L.H.Davis	Brakeman	21	Caboose door closed on hand when slack action occurred.
	6	2-10	Ventura	ML	S-j	X-2713-W	55	Standing	F.J.Koenig	Brakeman	24	Stumbled and fell while running from exploding gasoline.
	7	3-1	Mecca	ML	S-j	X-5020-W	42	8	F.M.Collins	Conductor	8	Stepped on rock while running alongside of train.
	8	3-3	El Centro	ML	S-j	X-1619-E	3	Standing	C.T.Knox	Brakeman	21	Strained ligaments in arm while disconnecting brake rigging from derailed car, bar which he was using slipped.
	9	3-10	Heber	ML	S-j	X-3757-E	1	Standing	R.K.Meyers	Brakeman	6	Ice chopper fell from car striking brakeman on head.
	10	3-12	Vinvale	BR	S-a	142	24	5	A.C.Haney	Brakeman	45	Slipped on damp grass while running alongside train to cut off car.
	11	3-23	Los Angeles	ML	S-h	1-96	56	6	2 occupants of automobile		7	Automobile drove off crossing into open tracks and struck by train.
	12	3-26	Redlands, 2nd St.	BR	S-d	X-1815-E	5	5	F.E.Lillis	Brakeman	30	Thrown off balance when cut he was riding coupled on to cars on main track.
	13	4-26	Aurant	ML	#S-h	X-3813-E	55	6	R.B.Cooper	Conductor	45	Emergency stop of train injured employe in caboose when driverless truck and trailer rolled foul of track.
	14	5-13	Flowing Well	ML	#S-j	X-5046-W	98	40	E.T.Camuteon M.S.Jandall	Brakeman Conductor	45 8	Rough stop account undesired emergency application of brakes caused injury to employes in caboose.
	15	5-15	San Fernando	ML	S-h	252	1	6	2 pedestrians		4 and 30	Walked into pilot beam of engine on crossing, which was handling one car on siding.
	16	5-31	Tustin	BR	S-h	X-1809-E	8	Standing	A.J.Bierman	Brakeman	21	Struck by flying air hose while uncoupling air hose.
	17	6-6	Downey	BR	S-h	142	20	Standing	Driver of motorcycle		2	Motorcycle collided with side of standing train.
	18	7-8	Chatsworth	ML	S-h	X-2820-W	25	6	2 occupants of automobile 1 occupant of automobile		Killed 3	Automobile collided with side of train.
	19	7-19	Indio	ML	S-c	X-5002-E	123	3	E.H.Rives	Brakeman	6	Stepped on rock while getting off moving car. 24 cars being handled at the time.
	20	7-26	Miraflores	BR	S-j	X-1768-E	7	2	W.F.Clark	Brakeman	5	Stepped on rock while walking alongside of cut of cars to make coupling.
	21	8-11	San Gabriel	ML	S-h	X-3693-E	60	18	Driver of motorcycle		21	Motorcycle collided with side of engine.
	22	8-14	Salvia	ML	#S-j	128	89	25	F.Soutar	Conductor	24	Thrown off balance in caboose by slack action on rear end.
	23	8-19	Monrovia	BR	S-h	X-1826-E	2	3	Driver of motorcycle		7	Motorcycle collided with train.
	24	9-8	Alhambra	BR	S-h	X-1761-E	8	18	1 occupant of automobile		21	Automobile struck by train.
	25	9-16	Heber	ML	S-h	X-1639-E	2	30	2 occupants of automobile		14 and 21	Automobile struck by train
	26	9-27	Tustin Jct.	BR	S-h	140	7	15	1 occupant of auto-truck		7	Auto-truck struck by train.
	27	9-28	Beclez	ML	#D-c	X-5000-W	86	6	J.W.Stephens	Brakeman	21	Fifty-sixth car in train buckled and it and car ahead derailed; sudden stop injured employe in caboose.
	28	10-10	Indio	ML	#S-j	X-5024-E	100	6	C.E.Butler	Brakeman	7	Undesired emergency application of air brakes caused severe slack on rear end of train and injured employe on top of caboose.
	29	10-18	Ontario	ML	S-h	2-98	50	18	Occupant of automobile		14	Automobile struck by train.
	30	10-29	El Monte	ML	S-h	X-5039-W	47	18	1 occupant of auto-truck 1 occupant of auto-truck		Killed 7	Auto-truck struck by train.
	31	11-17	Verdant	BR	S-h	X-1803-E	14	3	H.F.Thompson	Brakeman	30	Knocked down and run over by speeding auto which he attempted to flag.

- Caused by sudden stopping, starting, lurch or jerk of car or train

	DATE	LOCATION	MAIN LINE (ML) OR BRANCH (BR)	I.C.C. CLASS	TRAIN NUMBER	NO. CARS IN TRAIN	SPEED (M.P.H.)	PERSON INJURED NAME	PERSON INJURED OCCUPATION	ESTIMATED DISABILITY (DAYS)	DESCRIPTION OF ACCIDENT
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
	1930					YEAR 1930 (Continued)					
32	11-21	Savoy	BR	S-h	X-2664-E	3	15	2 occupants of automobile		7 and 21	Automobile collided with engine.
33	11-29	Van Buys	BR	S-h	X-2640-E	10	15	2 occupants of automobile		7 and 60	Automobile struck by train.
34	12-2	Roscoe	ML	S-h	266	66	30	1 occupant of automobile		Killed	Automobile struck by train.
35	12-11	Ortega	ML	S-d	X-2704-E	64	Standing	H.J.Wallin	Brakeman	30	Left arm fractured when hand brake suddenly released after being set.
	1931					YEAR 1931					
36	1-10	Bryn Mawr	ML	SS-j	X-5006-W	99	18	H.F.Blake	Brakeman	14	Thrown off balance while stepping down on flat car 32nd from engine when sudden stop occurred due to trespasser stepping on cutting lever.
37	1-13	Panama	ML	S-h	X-2544-E	16	Standing	H.C.Johnson	Conductor	7	Struck by automobile while crossing street.
38	1-20	Spadra	ML	S-h	96	46	10	Occupant of automobile		2	Automobile struck by train.
39	1-24	Niland	ML	SS-j	X-5026-W	97	10	C.W.Jones I.B.Allen	Brakeman Livestock caretaker	30 3	Brakeman on top of caboose and livestock caretaker in caboose injured by sudden stop caused by emergency application of air brakes due to trespasser stepping on cutting lever.
40	1-26	Ventura	ML	S-d	X-2719-E	16	Standing	L.M.Miller	Brakeman	10	Struck by brake club when hand brake suddenly released.
41	2-12	Santa Paula	BR	S-d	X-2655-E	16	Standing	D.J.Hynes	Brakeman	45	Lost balance and fell from brake platform of car.
42	2-15	Weber	ML	S-h	X-1788-E	5	30	3 occupants of automobile		Killed	Automobile struck by train.
43	2-24	Imperial	ML	S-c	X-5002-E	43	12	F.B.Volgamot	Fireman	6	Burned by hot water from squirt hose.
44	3-17	Marlboro	BR	S-h	X-1678-E	3	15	Occupant of automobile		14	Automobile collided with side of engine.
45	4-11	Chatsworth	ML	S-h	X-2806-E	22	Standing	Occupant of automobile		15	Automobile collided with side of train.
46	4-19	Fleming Hall	ML	SS-j	X-5002-W	125	20	W.H.Hausman	Brakeman	30	Thrown off balance in caboose due to undesired emergency application of air brakes.
47	4-22	Imperial	ML	S-j	X-3678-W	27	Standing	A.J.Murphy	Conductor	30	Stepped on rock fracturing bone in foot.
48	4-25	Whittier	BR	S-h	X-1768-W	3	8	Occupant of automobile		7	Automobile skidded foul of track and struck by train.
49	5-18	Rayner	ML	S-c	X-2708-W	97	Standing	E.B.Caddy	Fireman	60	Stepped backward while working on main pin, and fell into culvert.
50	5-24	Ontario	ML	S-h	X-2564-W	6	2	2 occupants of automobile		3 and 7	Automobile collided with side of train.
51	5-24	Roscoe	ML	S-h	258	75	30	1 occupant of automobile 5 occupants of automobile		Killed 14 to 30	Automobile struck by train.
52	5-25	Niland	ML	SS-c	X-5020-W	123	8	J.P.McLaughlin G.B.Woodward J.B.Brown	Conductor Brakeman Brakeman	30 30 11	Brakeman threw switch under engine and derailed engine; emergency action of brakes damaged equipment and caused injury to conductor and one brakeman in caboose and one brakeman on top of train.
53	6-5	Tarzana	BR	S-h	X-2771-E	26	20	2 occupants of automobile		21	Automobile collided with side of train.
54	6-13	Imperial	ML	SS-j	X-5007-W	86	4	S.J.Rice	Brakeman	6	Thrown off balance in caboose due to slack action account train parting when trespasser stepped on cutting lever.
55	6-19	Iris	ML	S-c	X-5000-W	118	15	C.A.Hunt	Fireman	30	Hot water from squirt hose burned ankle.
56	6-20	Los Angeles	ML	SS-j	X-3676-W	99	10	M.P.Godbold	Brakeman	30	Thrown off balance on top of caboose due to slack action of train.
57	6-20	Roscoe	ML	SS-j	264	85	15	G.M.Brundage	Brakeman	30	Thrown off balance into ice bunker of 40th car from caboose by slack action while adjusting ventilator on car.
58	7-17	Tunnel	ML	S-[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

36	1-16	Bryn Mawr		ML	β-j	E-5006-E	99	18	H.F.Blake	Brakeman	14	Thrown off balance while stepping down on flat car 32nd from engine when sudden stop occurred due to trespasser stepping on cutting lever.
37	1-13	Fenoom		ML	S-h	E-2544-E	16	Standing	H.C.Johnson	Conductor	7	Struck by automobile while crossing street.
38	1-20	Spadra		ML	S-h	96	46	10	Occupant of automobile		2	Automobile struck by train.
39	1-24	Niland		ML	β-j	E-5026-E	97	10	C.W.Jones I.B.Allen	Brakeman Livestock caretaker	30 3	Brakeman on top of caboose and livestock caretaker in caboose injured by sudden stop caused by emergency application of air brakes due to trespasser stepping on cutting lever.
40	1-26	Vestern		ML	S-d	E-2719-E	16	Standing	L.E.Miller	Brakeman	10	Struck by brake club when hand brake suddenly released.
41	2-12	Santa Fe		ML	S-d	E-2655-E	16	Standing	D.J.Hynes	Brakeman	45	Lost balance and fell from brake platform of car.
42	2-15	Ember		ML	S-h	E-1788-E	5	30	3 occupants of automobile		Killed	Automobile struck by train.
43	2-26	Imperial		ML	S-e	E-5002-E	43	12	F.E.Walgamot	Fireman	6	Burned by hot water from squirt hose.
44	3-17	Marlboro		ML	S-h	E-1678-E	3	15	Occupant of automobile		14	Automobile collided with side of engine.
45	4-11	Chatsworth		ML	S-h	E-2806-E	22	Standing	Occupant of automobile		15	Automobile collided with side of train.
46	4-19	Flowing Well		ML	β-j	E-5002-E	125	20	W.H.Hausman	Brakeman	30	Thrown off balance in caboose due to undesired emergency application of air brakes.
47	4-22	Imperial		ML	S-j	E-3678-E	27	Standing	A.J.Murphy	Conductor	30	Stepped on rock fracturing bone in foot.
48	4-25	Whittier		MR	S-h	E-1768-E	3	8	Occupant of automobile		7	Automobile skidded foul of track and struck by train.
49	5-18	Rayner		ML	S-e	E-2708-E	97	Standing	E.B.Caddy	Fireman	60	Stepped backward while working on main pin, and fell into culvert.
50	5-24	Ontario		ML	S-h	E-2564-E	6	2	2 occupants of automobile		3 and 7	Automobile collided with side of train.
51	5-24	Roscoe		ML	S-h	258	75	30	1 occupant of automobile 5 occupants of automobile		Killed 14 to 30	Automobile struck by train.
52	5-25	Niland		ML	β-g	E-5020-E	123	8	J.F.McLaughlin G.B.Woodward J.B.Brown	Conductor Brakeman Brakeman	30 30 11	Brakeman threw switch under engine and derailed engine; emergency action of brakes damaged equipment and caused injury to conductor and one brakeman in caboose and one brakeman on top of train.
53	6-5	Tarsman		MR	S-h	E-2791-E	26	20	2 occupants of automobile		21	Automobile collided with side of train.
54	6-13	Imperial		ML	β-j	E-5001-E	86	4	S.J.Rice	Brakeman	6	Thrown off balance in caboose due to slack action account train parting when trespasser stepped on cutting lever.
55	6-19	Iris		ML	S-e	E-5000-E	118	35	C.A.Hunt	Fireman	30	Hot water from squirt hose burned ankle.
56	6-20	Los Angeles		ML	β-j	E-3676-E	99	10	M.B.Godbold	Brakeman	30	Thrown off balance on top of caboose due to slack action of train.
57	6-26	Roscoe		ML	β-j	264	85	15	G.H.Brundage	Brakeman	30	Thrown off balance into ice bunker of 40th car from caboose by slack action while adjusting ventilator on car.
58	7-17	Tunnel		ML	S-j	265	64	8	J.D.Cummins	Brakeman	30	Hands and feet burned from heat in tunnel.
59	7-26	Ontario		ML	S-h	E-2691-E	1	8	Occupant of automobile		14	Automobile collided with side of car.
60	8-1	Stine		ML	S-j	E-2655-E	1	8	Non-trespasser		3	Knocked down in car in which he was working when car coupled into by engine.
61	8-5	North Alhambra		MR	S-h	E-1768-E	2	15	Occupant of auto-truck		10	Auto-truck struck by engine handling 2 cars.
62	8-13	Los Angeles		ML	β-d	E-2777-E	61	6	J.H.Hooks	Conductor	45	Three passenger cars rolled out of adjoining track and collided with side of train, derailing 3 cars; sudden stop injured conductor in caboose.
63	9-7	Wilmington		MR	S-h	165	9	10	Occupant of automobile		7	Automobile collided with side of engine.
64	9-30	Chino		MR	S-d	E-1810-E	18	4	B.F.Rose	Brakeman	21	Struck by brake club account hand brake suddenly releasing.
65	10-1	Vinvale		MR	S-g	E-1625-E	20	6	C.Self	Brakeman	45	Fell while boarding car and sprained and bruised right foot.

β - Caused by sudden stopping, starting, lurch or jerk of car or train

	DATE (a)	LOCATION (b)	MAIN LINE (ML) OR BRANCH (BR) (c)	I.C.C. CLASS (d)	TRAIN NUMBER (e)	NO. CARS IN TRAIN (f)	SPEED (M.P.H.) (g)	PERSON INJURED NAME (h)	PERSON INJURED OCCUPATION (i)	ESTIMATED DISABILITY (DAYS) (j)	DESCRIPTION OF ACCIDENT (k)
	1931							YEAR 1931 (Continued)			
66	10-7	Marlboro	BR	S-h	X-1787-W	6	Standing	Occupant of automobile		5	Automobile collided with car on crossing.
67	10-9	Aurant	ML	S-h	X-5024-W	56	8	Occupant of automobile		21	Automobile struck by train.
68	11-6	Santa Paula	BR	S-j	X-2809-W	2	Standing	J.E.Highley	Brakeman	7	Cut by piece of wire which he attempted to remove from hand hold of car.
69	11-17	El Rio	ML	S-h	X-3757-W	48	20	2 occupants of automobile		45 and 90	Automobile collided with side of train.
70	11-18	Ontario	ML	S-j	X-2547-W	52	4	D.R.Stipp	Brakeman	5	Lost hand hold and fell off steps of caboose due to slack action on rear end of train.
71	11-20	Pomona	ML	S-h	X-2691-W	3	8	2 occupants of auto-truck		7	Auto-truck collided with cut of cars.
72	11-21	Garnet	ML	S-j	270	52	8	G.G.Hall	Brakeman	11	Struck by rock thrown by trespasser.
73	11-27	Redlands 2nd St.	BR	S-h	X-1810-E	3	4	H.C.Shackford	Brakeman	9	Automobile collided with car on which brakeman was riding.
74	12-15	Los Angeles	ML	S-j	X-3681-W	65	Standing	R.Kerrebrock	Car Inspr.	30	Slipped and fell to ground while jumping from one car to another on adjoining track.
75	12-29	Brawley	ML	S-j	X-2557-E	6	8	G.R.Powers	Brakeman	30	Struck by open door of car on adjoining track.
								YEAR 1932			
76	1-7	Fulton Wells	BR	S-h	X-1639-E	13	10	Occupant of automobile		Killed	Automobile collided with tender of engine.
77	2-6	Los Angeles	ML	S-j	X-2747-W	74	6	W.W.Lockwood	Brakeman	7	Particle of sand lodged in eye.
78	2-16	Los Angeles	ML	S-e	X-1678-W	58	Standing	J.E.Conner	Engineer	19	Slipped and fell as he stepped down from sand box to apron of engine.
79	2-17	Long Beach	BR	S-h	X-2820-E	3	4	2 occupants of automobile		30	Automobile collided with side of train.
80	2-24	Vinvale	BR	S-j	X-1619-E	4	12	A.H.Davison	Brakeman	Killed	Apparently fell from engine of moving train.
81	3-3	Indio	ML	S-j	X-5006-E	100	5	2 livestock caretakers		30 and 90	Trespasser stepped on cut lever, 19th car from head end, causing train to part and undesired emergency application of air brakes injuring men in caboose.
82	3-13	Wynn	ML	S-j	X-5006-W	62	30	R.H.Hayes F.L.Combs	Brakeman Brakeman	Died 15	Knocked off moving train by trespassers.
83	3-19	El Centro	ML	S-j	X-5022-W	125	6	W.W.Cox	Brakeman, off duty	12	Trespasser stepped on cut lever causing train to part and slack action on rear injuring deadhead brakeman in caboose.
84	3-25	Fulton Wells	BR	S-h	X-1630-E	2	7	Occupant of automobile		90	Automobile collided with tender of engine.
85	3-26	Brawley	ML	S-h	819	7	10	Pedestrian		Died	Struck by train on crossing.
86	4-4	Whyte	ML	S-d	X-2704-W	34	Standing	C.C.Burwell	Brakeman	6	Sprained arm setting hand brake.
87	4-7	South Fontana	ML	S-e	X-3737-W	82	Standing	J.R.Coleman	Brakeman	21	Thumb caught in coupler while coupling cars.
88	5-8	Bassett	ML	S-g	X-3737-W	79	Standing	B.E.Wheeler	Brakeman	11	Stepped on board while getting off train, turning ankle.
89	5-19	Agnew	ML	S-j	822	111	8	F. Soutar	Conductor	21	Undesired emergency application of air brakes due to train parting caused injury to employe in caboose.
90	5-31	Flyn	ML	S-h	X-2759-E	28	Standing	Occupant of automobile		30	Automobile collided with side of standing train.
91	6-12	Agnew	ML	S-j	X-5035-W	112	8	C.G.Shaw	Conductor	21	Undesired emergency application of air brakes due to train parting caused by draw bar key falling out of 42nd car, injured employe in caboose.
92	6-30	Colton	ML	S-j	X-5004-W	101	8	D A Wooster	Brakeman	6	[illegible] to derailment of engine account engineer overrunning

70	11-18	Ontario	ML	#S-j	X-2547-W	52	4	D.R.Stipp	Brakeman	5	Lost hand hold and fell off steps of caboose due to slack action on rear end of train.
71	11-20	Pomona	ML	S-h	X-2691-W	3	8	2 occupants of auto-truck		7	Auto-truck collided with cut of cars.
72	11-21	Garnet	ML	S-j	270	52	8	G.G.Hall	Brakeman	11	Struck by rock thrown by trespasser.
73	11-27	Redlands 2nd St.	BR	S-h	X-1810-E	3	4	H.C.Shackford	Brakeman	9	Automobile collided with car on which brakeman was riding.
74	12-16	Los Angeles	ML	S-j	X-3681-W	65	Standing	R.Kerrebrock	Car Inspr.	30	Slipped and fell to ground while jumping from one car to another on adjoining track.
75	12-29	Brawley	ML	S-j	X-2557-E	6	8	G.R.Powers	Brakeman	30	Struck by open door of car on adjoining track.
	1932							YEAR 1932			
76	1-7	Fulton Wells	BR	S-h	X-1639-E	13	10	Occupant of automobile		Killed	Automobile collided with tender of engine.
77	2-6	Los Angeles	ML	S-j	X-2747-W	74	6	W.W.Lockwood	Brakeman	7	Particle of sand lodged in eye.
78	2-16	Los Angeles	ML	S-e	X-1678-W	58	Standing	J.E.Conner	Engineer	19	Slipped and fell as he stepped down from sand box to apron of engine.
79	2-19	Long Beach	BR	S-h	X-2820-E	3	4	2 occupants of automobile		30	Automobile collided with side of train.
80	2-24	Vinvale	BR	S-j	X-1619-E	4	12	A.H.Davison	Brakeman	Killed	Apparently fell from engine of moving train.
81	3-3	Indio	ML	#S-j	X-5006-W	100	5	2 livestock caretakers		30 and 90	Trespasser stepped on cut lever, 19th car from head end, causing train to part and undesired emergency application of air brakes injuring men in caboose.
82	3-18	Wyman	ML	S-j	X-5006-W	62	30	R.H.Hayes F.L.Combs	Brakeman Brakeman	Died 15	Knocked off moving train by trespassers.
83	3-19	El Centro	ML	S-j	X-5022-W	125	6	W.W.Cox	Brakeman off duty	12	Trespasser stepped on cut lever causing train to part and slack action on rear injuring deadhead brakeman in caboose.
84	3-25	Fulton Wells	BR	S-h	X-1680-E	2	7	Occupant of automobile		90	Automobile collided with tender of engine.
85	4-26	Brawley	ML	S-h	819	7	10	Pedestrian		Died	Struck by train on crossing.
86	5-4	Mecca	ML	S-d	X-2704-W	34	Standing	C.C.Burwell	Brakeman	6	Sprained arm setting hand brake.
87	5-7	South Fontana	ML	S-a	X-3737-W	82	Standing	J.R.Coleman	Brakeman	21	Thumb caught in coupler while coupling cars.
88	5-8	Bassett	ML	S-g	X-3737-W	79	Standing	B.K.Weeden	Brakeman	11	Stepped on board while getting off train, turning ankle.
89	5-17	Amrad	ML	#S-j	822	111	8	F. Soutar	Conductor	21	Undesired emergency application of air brakes due to train parting caused injury to employe in caboose.
90	5-31	Flra	ML	S-h	X-2759-E	28	Standing	Occupant of automobile		30	Automobile collided with side of standing train.
91	6-22	Amrad	ML	#S-j	X-5035-W	112	8	C.G.Shaw	Conductor	21	Undesired emergency application of air brakes due to train parting caused by draw bar key falling out of 42nd car, injured employe in caboose.
92	6-24	Colton	ML	#S-j	X-5044-W	101	8	D.A.Wooster	Brakeman	6	Sudden stop due to derailment of engine account engineer overrunning derailer in interlocking plant, injured employe who was knocked down on top of 32nd car from caboose.
93	7-6	Euclid Ave.	BR	S-d	X-1761-E	3	Standing	A.J.Murphy	Brakeman	120	Fell off brake platform while releasing hand brake.
94	7-6	West Anaheim	BR	S-j	X-1750-W	38	10	R.Politte	Brakeman	60	Knocked off car to ground by rough coupling during switching.
95	7-8	Indio	ML	#S-j	X-5026-W	99	10	W.Q.Orr H.Jones	Brakeman Brakeman	90 14	Sudden stop due to airhose blowing off 30th car from engine injured employes in caboose.
96	7-14	Pomona	BR	S-h	X-2691-W	6	13	Occupant of automobile		3	Automobile struck by train.
97	7-21	Van Buys	BR	S-h	X-2712-W	60	Standing	Occupant of automobile		14	Automobile collided with side of standing train.
98	7-29	Alhambra	BR	S-h	X-2747-W	1	15	Occupant of automobile		7	Automobile struck by train.
99	7-31	Montalvo	ML	S-h	X-2759-E	11	6	2 occupants of automobile		2 and 45	Automobile collided with side of train.
100	8-24	Colton	ML	S-j	X-5017-W	86	20	J.A.Sutton	Brakeman	4	Particle of sand in eye.

- Caused by sudden stopping, starting, lurch or jerk of car or train

	DATE (a)	LOCATION (b)	MAIN LINE (ML) OR BRANCH (BR) (c)	I.C.C. CLASS (d)	TRAIN NUMBER (e)	NO. CARS IN TRAIN (f)	SPEED (M.P.H.) (g)	PERSON INJURED NAME (h)	PERSON INJURED OCCUPATION (i)	ESTIMATED DISABILITY (DAYS) (j)	DESCRIPTION OF ACCIDENT (k)
	1932							YEAR 1932 (Cont'd)			
101	9-2	Oxnard	ML	S-j	X-1831-E	23	4	F. W. Lee	Brakeman	13	Lost hand hold and thrown against dump lever of car due to slack action while switching.
102	9-7	Cabazon	ML	S-j	826	97	12	A. Wing	Brakeman	7	Thrown off balance on top of rear car in train due to slack action account undesired emergency application of air brakes.
103	9-29	Fillmore	BR	S-h	X-2796-E	30	20	Occupant of automobile		15	Automobile collided with side of train.
104	10-9	Camarillo	ML	S-h	X-2777-E	36	Standing	2 occupants of automobile		14 and 21	Automobile collided with side of standing train.
105	10-22	Santa Susana	ML	S-j	X-3725-E	72	2	K. Stanson	Brakeman	30	Thrown off balance on rear step of caboose due to rough stop.
106	10-25	Fuente	ML	S-h	824	61	35	Occupant of automobile		7	Automobile struck by train.
107	11-4	Moorpark	ML	S-h	X-1703-E	57	Standing	Occupant of automobile		5	Automobile collided with side of standing train.
108	11-10	Heber	ML	S-h	820	4	30	Occupant of automobile		2	Automobile struck by train.
109	11-14	Wahop	ML	S-j	X-2665-E	43	Standing	J. O'Reilly	Brakeman	21	Finger caught between rerailing frog and bracket on engine.
110	11-15	Calexico	ML	S-j	357	5	Standing	J.H.Pritchard	Brakeman	21	Stepped on rock and sprained ankle.
111	11-20	[illegible]	ML	S-b	X-1720-E	1	Standing	R.C.Newton	Brakeman	10	Struck by air hose while uncoupling hose.
112	11-20	San Marino	ML	S-h	X-5007-E	79	Standing	Occupant of automobile		60	Automobile collided with side of standing train.
113	11-12	Gaspur	BR	S-h	X-2762-E	3	8	Occupant of automobile		3	Automobile struck by train.
	1933							YEAR 1933			
114	1-17	Fairfax	ML	S-j	X-2746-E	18	1	T.C.Kline	Brakeman	30	While adjusting chain between two cars, hand caught between chain and bottom of car as train moved forward.
115	1-20	Burbank	ML	S-d	X-3703-E	64	Standing	D.J.Purcell	Engineer	30	Stepped backward and fell off bridge.
116	1-27	Walnut	ML	S-j	X-5026-E	79	30	R.H.Allen	Brakeman	30	Thrown off balance in caboose due to slack action on rear of train.
117	2-1	Dry Camp	ML	S-h	828	97	36	Occupant of automobile		Killed	Automobile struck by train.
118	2-16	Elftman	BR	S-h	X-1831-E	9	12	Occupant of auto-truck		14	Auto-truck and trailer struck by train.
119	2-23	El Casco	ML	S-j	X-5048-E	98	1	T.S.Powell	Brakeman	4	Thrown off balance on 20th car from engine and fell to ground as slack was taken to start train.
120	3-25	Ontario	ML	S-j	828	27	Standing	H.H.Hartley	Brakeman	21	Slipped or stumbled and fell while crossing track.
121	4-2	Burbank	ML	S-h	X-3674-E	53	20	Occupant of automobile		Killed	Automobile collided with side of train.
122	4-7	Redlands, 2nd St.	BR	S-h	X-2746-E	None at time	8	Occupant of automobile		4	Automobile struck by engine detached from train at time.
123	4-9	Beaumont	ML	S-b	828	99	10	J.H.Peak E.A.Fowler	Conductor Brakeman	30 30	Branch pipe broke on 4th car from engine, emergency application of brakes causing damage to equipment and injury to employes on caboose.
124	4-19	Brawley	ML	S-d	X-2820-E	12	2	[illegible]	Brakeman	21	Fell off car to ground while setting hand brake as coupling made.
125	4-21	Talbot	ML	S-j	824	84	3	A.B.Talbot	Brakeman	15	Foreign substance in eye.
126	4-23	Brawley	ML	S-d	X-1701-E	4	Standing	W.T.Sanders	Conductor	11	Stepped on rock while getting off car.
127	4-27	San Marino	ML	S-h	X-1662-E	10	25	2 occupants of automobile		14 and 21	Automobile collided with side of engine tender.
128	5-3	Ryerson	BR	S-f	X-1662-E	9	10	J.W.Higley	Brakeman	14	Struck by overhead wire while riding on top of train.
129	5-17	Sunny Slope	ML	S-h	X-1734-E	1	20	2 occupants of automobile		7 and 45	Automobile collided with engine tender.
130	5-22	Glendora	ML	S-j	824	72	2	[illegible]	Brakeman	30	Thrown off balance on rear step of caboose due to rough stop.

104	10-9	Camarillo		ML	S-h	X-2777-E	36	Standing	2 occupants of automobile		14 and 21	Automobile collided with side of standing train.
105	10-22	Santa Susana		ML	#S-j	X-3725-E	72	2	E. Stinson	Brakeman	30	Thrown off balance on rear step of caboose due to rough stop.
106	10-25	Puente		ML	S-h	824	61	35	Occupant of automobile		7	Automobile struck by train.
107	11-4	Moorpark		ML	S-h	X-3703-E	57	Standing	Occupant of automobile		5	Automobile collided with side of standing train.
108	11-10	Heber		ML	S-h	820	4	30	Occupant of automobile		2	Automobile struck by train.
109	11-14	Wahoo		ML	S-j	X-2665-E	43	Standing	J. O'Reilly	Brakeman	21	Finger caught between rerailing frog and bracket on engine.
110	11-15	Oleside		ML	S-j	357	5	Standing	J.H.Pritchard	Brakeman	21	Stepped on rock and sprained ankle.
111				ML	S-h	X-1720-E	1	Standing	R.C.Newton	Brakeman	10	Struck by air hose while uncoupling hose.
112	11-28	San Marcial		ML	S-h	X-5007-E	79	Standing	Occupant of automobile		60	Automobile collided with side of standing train.
113	12-12	Jasper		BR	S-h	X-1762-E	3	8	Occupant of automobile		3	Automobile struck by train.

YEAR 1933

114	1-17	Hartman		ML	S-j	X-2746-E	18	1	T.C.Kline	Brakeman	30	While adjusting chain between two cars, hand caught between chain and bottom of car as train moved forward.
115	1-20	Watsonarm		ML	S-c	X-3703-E	62	Standing	D.J.Purcell	Engineer	30	Stepped backward and fell off bridge.
116	1-27	Walnut		ML	#S-j	X-5026-E	79	30	R.H.Allen	Brakeman	30	Thrown off balance in caboose due to slack action on rear of train.
117	2-1	Dry Cany		ML	S-h	826	97	38	Occupant of automobile		Killed	Automobile struck by train.
118	2-14	Elftman		MR	S-h	X-1831-E	9	12	Occupant of auto-truck		14	Auto-truck and trailer struck by train.
119	2-15	K. Cascc		ML	#S-j	X-5048-E	98	2	T.S.Powell	Brakeman	4	Thrown off balance on 20th car from engine and fell to ground as slack was taken to start train.
120	3-25	Ontario		ML	S-j	828	27	Standing	H.H.Hartley	Brakeman	21	Slipped or stumbled and fell while crossing track.
121	4-2	Burbank		ML	S-h	X-3674-E	53	20	Occupant of automobile		Killed	Automobile collided with side of train.
122	4-7	Redlands, 2nd St.		BR	S-h	X-2746-E	None at time	8	Occupant of automobile		4	Automobile struck by engine detached from train at time.
123	4-10	Beaumont		ML	#S-b	828	99	10	[illegible] Beach W.A.Wheeler	Conductor Brakeman	30 30	Branch pipe broke on 4th car from engine, emergency application of brakes causing damage to equipment and injury to employes on caboose.
124	4-18	Brewer		ML	S-d	X-2820-E	12	2	[illegible]ates	Brakeman	21	Fell off car to ground while setting hand brake as coupling made.
125	4-21	[illegible]		ML	S-j	824	84	3	R.J.Faust	Brakeman	15	Foreign substance in eye.
126	4-25	Arlington		ML	S-h	X-1701-E	4	Standing	W.T.Sanders	Conductor	11	Stepped on rock while getting off car.
127	5-1	San Gabriel		ML	S-h	X-1662-E	10	25	2 occupants of automobile		14 and 21	Automobile collided with side of engine tender.
128	5-15	Gridley		BR	S-f	X-1662-E	9	10	J.W.Higley	Brakeman	14	Struck by overhead wire while riding on top of train.
129	5-17	Sandy Slope		MR	S-h	X-2734-E	4	20	2 occupants of automobile		7 and 45	Automobile collided with engine tender.
130	5-22	Glendale		ML	S-h	X-1811-E	38	30	Pedestrian		Killed	Apparently fell under passing train at street crossing.
131	5-30	West Anaheim		MR	S-h	X-2419-E	10	8	4 occupants of automobile		15 to 45	Automobile collided with train.
132	12-27	Lytle		BR	S-h	X-2578-E	30	Standing	Occupant of automobile		?	Automobile collided with side of standing train.
133	12-28	Chester		ML	#S-j	X-5030-E	57	15	F Soutar@	Brakeman	15	Thrown off balance in caboose due to severe slack action when train parted account knuckles slipping by between 2nd and 3rd car from engine
134	12-31	Pimento		ML	S-j	826	97	15	V.L.Flaherty	Brakeman	Killed	Apparently fell between cars of moving train while stepping from one car to the other.
135	11-11	San Bernardino		BR	S-e	X-746-E	3	Standing	W.T.Justice	Brakeman	11	Dropped switch box cover on foot.
136	11-12	Ontario		BR	S-b	X-1732-E	5	15	Driver of motorcycle		4	Motorcycle ran into side of passing train.
137	11-12	Barnard Jct		MP	#S-j	1-814	71	7	F.A.Vedder	Conductor	21	Thrown off balance in caboose due to sudden stop of train account broken train line.

- Caused by sudden stopping, starting, lurch or jerk of car or train

	DATE (a)	LOCATION (b)	MAIN LINE (ML) OR BRANCH (BR) (c)	I.C.C. CLASS (d)	TRAIN NUMBER (e)	NO. CARS IN TRAIN (f)	SPEED (M.P.H.) (g)	PERSON INJURED NAME (h)	PERSON INJURED OCCUPATION (i)	ESTIMATED DISABILITY (DAYS) (j)	DESCRIPTION OF ACCIDENT (k)
	1933							YEAR 1933 (Cont'd)			
138	12-24	Niland	ML	S-j	822	74	12	E. F. Love	Brakeman	Killed	Apparently fell while stepping from top of car to brake platform while making a cutout of 11 cars.
139	12-30	Moorpark	ML	S-c	X-3673-E	48	Standing	A.D.Glin	Fireman	15	Fell to ground from engine tender when tank hook slipped off water spout while pulling spout into position.
	1934							YEAR 1934			
140	1-5	Montalvo	BR	S-h	X-1678-E	11	4	2 occupants of automobile		21 and 60	Automobile collided with side of train.
141	1-14	San Bernardino	BR	S-h	X-1788-W	5	Standing	Occupant of automobile		90	Automobile collided with standing car.
142	1-24	Stoneman	ML	S-h	X-1784-E	14	20	Occupant of automobile		5	Automobile struck by train.
143	2-10	Calipatria	ML	S-h	X-1228-E	10	5	Occupant of automobile		7	Automobile collided with side of train.
144	3-15	Indio	ML	S-g	X-5024-E	8	2	C.N.Lacey	Brakeman	10	Stepped on rock while getting off car while switching.
145	4-20	Pomona	ML	S-h	X-3697-W	58	3	Occupant of automobile J.W.Higley	Brakeman	30 21	Automobile collided with side of engine, uncoupling air hose between engine and tender applying air brakes in emergency, the run-in of slack injuring employe in caboose.
146	5-1	Calipatria	ML	S-j	X-2746-W	19	Standing	J.C.Turner	Brakeman	21	Finger caught and crushed while closing car door.
147	5-28	Westminster	BR	S-h	X-1775-E	2	20	Occupant of automobile Occupant of automobile		Killed 30	Automobile struck by train.
148	5-29	Downey	BR	S-j	X-1632-W	16	Standing	W.E.Breibelbis	Brakeman	7	Strained stomach muscles while lifting heavy box of freight.
149	6-3	Oxnard	ML	S-h	2-812	49	30	Occupant of automobile		Killed	Automobile struck by train.
150	6-23	Santa Barbara	ML	S-h	X-3696-W	5	2	Occupant of automobile		2	Automobile collided with cars being switched.
151	7-4	Loma Linda	ML	S-g	1-832	99	12	J.Sears	Fireman	4	Hand slipped off grab iron while boarding engine, bruising shin.
152	7-4	San Fernando	ML	S-h	810	58	20	Occupant of automobile		30	Automobile struck by train.
153	7-4	Santa Susana	ML	S-j	X-3681-W	72	Standing	J.Cowser	Brakeman	30	Slipped and fell off bridge while inspecting train.
154	7-7	El Casco	ML	S-j	X-5032-E	101	15	W.F.Thompson	Brakeman	30	Thrown off balance in caboose by slack action and sudden stop of train.
155	7-7	Calipatria	ML	S-j	X-5004-E	79	12	D.F.Morgan	Brakeman	7	Thrown off balance in caboose due to accidental emergency application of air brakes.
156	8-5	Moorpark	ML	S-j	X-3696-W	48	6	E. Stinson	Brakeman	14	Tripped and fell while running to close switch.
157	8-16	South Fontana	ML	S-h	X-4318-W	18	Standing	Occupant of automobile		14	Automobile collided with side of standing train.
158	8-20	Elsmington	ML	S-j	826	86	30	V.L.Rippey	Brakeman	26	Burned by hot water from squirt hose.
159	8-25	Pomona	ML	S-j	X-5021-E	110	6	W.A.Franks H.F.Faust C.Self	Conductor Brakeman Brakeman	45 45 30	Trespasser stepping on cutting lever 20 cars from engine after train had pulled out of siding, caused sudden stop injuring two employes in caboose and one on top of 32nd car from caboose.
160	8-6	Beaumont	ML	S-j	X-3742-E	124	4	T.S.Powell	Conductor	10	Thrown off balance in caboose by slack action on rear end of train.
161	10-9	Spadra	ML	S-h	X-5039-W	48	35	Occupant of automobile		Died	Automobile collided with side of train.
162	10-25	Saugus	ML	S-j	815	71	Standing	R.E.Williams	Brakeman	28	Stepped in hole while walking alongside of standing train.
163	10-31	Burbank	ML	S-j	X-2520-E	19	10	N.J.Donovan	Brakeman	11	Ran into side of moving automobile while crossing highway.
164	11-25	Anaheim	ML	S-g	X-5008-W	124	10	W.F.Church	Brakeman	14	Stepped on rock while boarding moving train.
165	12-2	Olinda	ML	S-j	X-5040-E	117	2	W.H.Cromwell	Conductor	21	Thrown off balance in caboose as train was being started.
166	12-8	Stanton Jct.	BR	S-h	X-1619-E	4	15	Occupant of automobile		2	Automobile struck by train.
167	12-										

140	1-5	Montalvo		BR	S-h	X-1678-E	11	4	2 occupants of automobile		21 and 60	Automobile collided with side of train.
141	1-14	San Bernardino		BR	S-h	X-1788-W	5	Standing	Occupant of automobile		90	Automobile collided with standing car.
142	1-24	Stoneman		ML	S-h	X-1784-E	14	20	Occupant of automobile		5	Automobile struck by train.
143	2-10	Calipatria		ML	S-h	X-1228-E	10	5	Occupant of automobile		7	Automobile collided with side of train.
144	3-15	Indio		ML	S-g	X-5024-E	8	2	G.N.Lacey	Brakeman	10	Stepped on rock while getting off car while switching.
145	3-20	Pomona		ML	∅S-h	X-3697-W	58	3	Occupant of automobile J.W.Higley	Brakeman	30 21	Automobile collided with side of engine, uncoupling air hose between engine and tender, applying air brakes in emergency, the run-in of slack injuring employe in caboose.
146	5-1	Calipatria		ML	S-j	X-2746-W	19	Standing	J.C.Turner	Brakeman	21	Finger caught and crushed while closing car door.
147	5-28	Westminster		BR	S-h	X-1775-E	2	20	Occupant of automobile Occupant of automobile		Killed 30	Automobile struck by train.
148	5-29	Downey		BR	S-j	X-1632-W	16	Standing	W.H.Breibelbis	Brakeman	7	Strained stomach muscles while lifting heavy box of freight.
149	6-3	Oxnard		ML	S-h	2-812	49	30	Occupant of automobile		Killed	Automobile struck by train.
150	6-23	Santa Barbara		ML	S-h	X-3696-W	5	2	Occupant of automobile		2	Automobile collided with cars being switched.
151	7-4	Loma Linda		ML	S-g	1-832	99	12	J.Sears	Fireman	4	Hand slipped off grab iron while boarding engine, bruising shin.
152	7-4	San Fernando		ML	S-h	810	58	20	Occupant of automobile		30	Automobile struck by train.
153	7-4	Santa Susana		ML	S-j	X-3681-W	72	Standing	J.Corser	Brakeman	30	Slipped and fell off bridge while inspecting train.
154	7-7	El Casco		ML	∅S-j	X-9032-W	101	15	W.F.Thompson	Brakeman	30	Thrown off balance in caboose by slack action and sudden stop of train.
155	7-7	Calipatria		ML	∅S-j	X-5004-E	79	12	D.F.Morgan	Brakeman	7	Thrown off balance in caboose due to undesired emergency application of air brakes.
156	8-5	Moorpark		ML	S-j	X-3696-W	48	6	E. Stinson	Brakeman	14	Tripped and fell while running to close switch.
157	8-16	South Fontana		ML	S-h	X-4318-W	18	Standing	Occupant of automobile		14	Automobile collided with side of standing train.
158	8-20	Bloomington		ML	S-j	826	86	30	V.L.Rippey	Brakeman	26	Burned by hot water from squirt hose.
159	8-25	Pomona		ML	∅S-j	X-5021-W	110	6	W.A.Franks N.F.Faust C.Self	Conductor Brakeman Brakeman	45 45 30	Trespasser stepping on cutting lever 20 cars from engine after train had pulled out of siding, caused sudden stop injuring two employes in caboose and one on top of 32nd car from caboose.
160	9-6	Seacliff		ML	∅S-j	X-3742-W	124	4	T.S.Powell	Conductor	10	Thrown off balance in caboose by slack action on rear end of train.
161	10-9	Spadra		ML	S-h	X-5039-W	48	35	Occupant of automobile		Died	Automobile collided with side of train.
162	10-25	Saugus		ML	S-j	815	71	Standing	R.E.Williams	Brakeman	28	Stepped in hole while walking alongside of standing train.
163	10-31	Burbank		ML	S-j	X-2520-W	19	10	M.J.Donovan	Brakeman	11	Ran into side of moving automobile while crossing highway.
164	11-25	Ames		ML	S-g	X-5008-W	124	10	W.F.Church	Brakeman	14	Stepped on rock while boarding moving train.
165	12-2	Glamis		ML	∅S-j	X-5040-E	117	2	W.H.Cromwell	Conductor	21	Thrown off balance in caboose as train was being started.
166	12-8	Stanton Jct.		BR	S-h	X-1619-E	4	15	Occupant of automobile		2	Automobile struck by train.
167	12-23	El Monte		ML	S-h	628	18	20	Occupant of automobile		14	Automobile collided with engine.
	1935								YEAR 1935			
168	1-1	Mecca		ML	S-j	X-5000-E	74	40	E.M.Byrd	Brakeman	21	Lost balance and fell against brake wheel on tank car account broken hand rail on car.
169	1-7	Mesquite		ML	∅S-j	X-5024-W	99	12	M.M.Murphy	Brakeman off duty	21	Deadhead brakeman in caboose thrown off balance by sudden stop of train due to undesired emergency application of brakes.
170	1-10	Los Angeles		ML	S-j	X-5004-W	61	15	J.W.Higley	Brakeman	6	Particle of hot sand lodged in eye.
171	2-9	Pascima		ML	S-j	814	74	26	C.H.Mathews	Brakeman	6	Foreign particles lodged in eye.
172	3-20	Glamis		ML	∅S-j	X-5022-W	124	30	G.N.Lacey	Brakeman	30	Thrown off balance in caboose by sudden stop of train due to undesired emergency application of air brakes.

∅ - Caused by sudden stopping, starting, lurch or jerk of car or train.

	DATE (a)	LOCATION (b)	MAIN LINE (ML) OR BRANCH (BR) (c)	I.C.C. CLASS (d)	TRAIN NUMBER (e)	NO. CARS IN TRAIN (f)	SPEED (M.P.H.) (g)	PERSON INJURED NAME (h)	PERSON INJURED OCCUPATION (i)	ESTIMATED DISABILITY (DAYS) (j)	DESCRIPTION OF ACCIDENT (k)
	1935					YEAR 1935 (Cont'd)					
173	3-22	Van Nuys	BR	S-g	X-2544-E	10	6	M.A.Nugent	Brakeman	9	Slipped in wet weeds and grass while getting off moving car.
174	4-13	Hewitt	ML	S-h	X-3680-E	51	30	Occupant of automobile		90	Automobile struck by train
175	5-8	Stanton Jct.	BR	M-a	X-1632-E	1	12	2 occupants of auto-truck		7 and 21	Auto-truck and trailer struck by train.
176	5-13	Firestone Park	BR	S-j	X-2520-W	34	Standing	D.W.McIntyre	Conductor	21	Attached and beaten by unknown assailant.
177	5-28	El Centro	ML	S-g	X-1828-E	Name at time	4	D. Morgan	Brakeman	14	Claims stepped on end of tie while getting off pilot of engine.
178	5-29	Chatsworth	ML	S-j	X-2544-E	35	Standing	B.M.Proctor	Brakeman	14	Dropped metal running board on foot.
179	6-7	Whittier	BR	S-j	X-1639-W	2	Standing	W.W.Whitney	Brakeman	30	Dropped running board on foot.
180	6-17	West Anaheim	BR	S-h	X-1760-W	11	2	E.E.Witten	Brakeman	Killed	Struck by automobile while flagging crossing.
181	6-21	Keene	ML	S-j	X-3708-E	46	Unknown	E.M.Rives	Brakeman	21	Tripped over tie wire on car.
182	6-24	Stanmore	ML	S-j	826	96	30	W.H.Newman	Brakeman	21	Thrown off balance in caboose by slack action of train.
183	6-30	Brylyn	ML	S-g	822	76	10	R.A.Groves	Brakeman	60	Fell while getting off moving train.
184	6-30	Pomona	ML	S-h	X-5024-W	58	20	Occupant of auto-truck		90	Auto-truck struck by train.
185	7-2	Glendale	ML	S-h	812	32	25	Occupant of auto-truck		2	Auto-truck and trailer struck by train.
186	7-3	Fillmore	BR	S-g	X-1787-E	Name at time	1	J.P.Fowler	Brakeman	21	Foot caught between footboard of engine and ground getting off engine.
187	7-9	Camarillo	ML	S-j	X-3669-W	97	30	J.A.Sutton	Brakeman	90	Thrown off balance in caboose by slack action of train.
188	7-13	Keene	ML	S-e	X-1660-E	4	Standing	J.R.Blankenship	Brakeman	21	Dropped switch lever weight on foot.
189	7-14	Indio	ML	S-i	2-832	76	8	C.L.Kuhney	Brakeman	60	Struck and run over by engine detached from train in back-up movement.
190	7-22	Keber	ML	S-j	X-1810-W	12	Standing	C.Bookman	Brakeman	21	Struck on leg by air hose as engine was cut off from cars.
191	8-1	Bloomington	ML	S-d	X-1842-W	30	4	G.A.McCoy	Brakeman	Died	Fell off top of one of 7 cars when collided with balance of train.
192	8-1	South Pasadena	ML	S-d	X-2578-W	7	Standing	I.D.Street	Brakeman	15	Fell from car to ground while releasing hand brake.
193	9-11	Anaheim	BR	S-d	X-1746-E	12	2	C.W.Jones	Brakeman	7	While releasing hand brake, struck by brake club.
194	9-17	Niland	ML	S-e	X-1726-E	12	Standing	H.E.Jordan	Brakeman	14	Dropped switch lever ball on foot.
195	9-19	Mesquite	ML	S-j	824	97	Stopping	S.J.Rice	Brakeman	30	Thrown off balance in caboose cupola as stop made account train flagged by section crew patrolling track due to heavy rain fall.
196	9-30	Los Angeles	ML	S-j	X-2621-E	21	Standing	W.H.Newman	Brakeman	21	Fell against cupola step while walking through caboose of standing train.
197	10-3	Indio	ML	S-j	X-5036-W	64	6	J.A.Sutton	Brakeman	45	Thrown off balance while riding rear of caboose as stop made.
198	10-9	Tustin Jct.	BR	S-h	X-1789-E	26	20	Occupant of automobile		7	Automobile collided with side of engine.
199	10-16	Pomona	ML	S-h	X-2520-E	14	4	Occupant of automobile		15	Automobile collided with engine.
200	10-22	Rayner	ML	S-h	X-2644-E	26	35	2 occupants of auto-truck		7	Auto-truck struck by train.
201	11-17	Glendale	ML	S-j	811	54	25	G.B.Burch	Brakeman	60	Shot by unknown person while riding on top of caboose.
202	12-12	North Hollywood	BR	S-h	X-1746-E	9	20	Occupant of auto-truck		90	Auto-truck collided with side of train moving over crossing.
203	12-23	Los Angeles	ML	S-j	X-4307-W	43	6	L.E.Richardson	Brakeman	21	Knocked off top of caboose by sudden stop of train.
204	12-26	Oasis	ML	S-j	X-1788-E	13	Standing	C.Plummer	Brakeman	6	Struck by rerailing frog which he was handling.
205	12-29	El Chaco	ML	S-j	830	19	Standing	B.B.Reeves	Brakeman	21	Sprained back unloading freight from car.

								D.W.McIntyre	Conductor	21	Attached and beaten by unknown assailant.
177	5-28	El Centro	SL	S-g	X-1828-E	None at time	4	B. Morgan	Brakeman	14	Claims stepped on end of tie while getting off pilot of engine.
178	5-29	Chatsworth	SL	S-j	X-2544-E	35	Standing	B.M.Proctor	Brakeman	14	Dropped metal running board on foot.
179	6-7	Whittier	SP	S-j	X-1639-E	2	Standing	W.W.Whitney	Brakeman	30	Dropped running board on foot.
180	6-17	West Anaheim	SP	S-h	X-1760-E	11	2	E.E.Witten	Brakeman	Killed	Struck by automobile while flagging crossing.
181	6-23	Hooca	SL	S-j	X-3708-E	46	Unknown	E.H.Rives	Brakeman	21	Tripped over tie wire on car.
182	6-24	Stevenson	SL	S-j	826	96	30	W.H.Hausman	Brakeman	21	Thrown off balance in caboose by slack action of train.
183	6-30	Brylyn	SL	S-g	822	76	10	R.A.Groves	Brakeman	60	Fell while getting off moving train.
184	6-30	Fenson	SL	S-h	X-5024-E	58	20	Occupant of auto-truck		90	Auto-truck struck by train.
185	7-2	Glendale	SL	S-h	812	32	25	Occupant of auto-truck		2	Auto-truck and trailer struck by train.
186	7-3	Fillmore	SP	S-g	X-1787-E	None at time	1	J.P.Fowler	Brakeman	21	Foot caught between footboard of engine and ground getting off engine.
187	7-3	Camarillo	SL	S-j	X-3669-W	97	30	J.A.Sutton	Brakeman	90	Thrown off balance in caboose by slack action of train.
188	7-13	Hooca	SL	S-c	X-1660-E	4	Standing	J.R.Blankenship	Brakeman	21	Dropped switch lever weight on foot.
189	7-14	Indio	SL	S-i	2-832	76	8	C.L.Kuhney	Brakeman	60	Struck and run over by engine detached from train in back-up movement.
190	7-22	Hobar	SL	S-j	X-1810-W	12	Standing	C.Bookman	Brakeman	21	Struck on leg by air hose as engine was cut off from cars.
191	8-1	Bloomington	SL	S-d	X-1842-W	30	4	G.A.McCoy	Brakeman	Died	Fell off top of one of 7 cars when collided with balance of train.
192	8-2	South Fontana	SL	S-d	X-2578-W	2	Standing	I.D.Street	Brakeman	15	Fell from car to ground while releasing hand brake.
193	9-11	Anaheim	SP	S-d	X-1746-E	12	2	C.W.Jones	Brakeman	7	While releasing hand brake, struck by brake club.
194	9-17	Niland	SL	S-c	X-1721-E	12	Standing	H.E.Jordan	Brakeman	14	Dropped switch lever ball on foot.
195	9-19	Mesquite	SL	S-j	824	97	Stopping	S.J.Rice	Brakeman	30	Thrown off balance in caboose cupola as stop made account train flagged by section crew patrolling track due to heavy rain fall.
196	9-30	Los Angeles	SL	S-j	X-2651-E	21	Standing	W.H.Hausman	Brakeman	21	Fell against cupola step while walking through caboose of standing train.
197	10-1	Indio	SL	S-j	X-5036-E	64	6	J.A.Sutton	Brakeman	45	Thrown off balance while riding rear of caboose as stop made.
198	10-9	Martin Jct.	SP	S-h	X-1789-E	26	20	Occupant of automobile		7	Automobile collided with side of engine.
199	10-15	Fenson	SL	S-h	X-2570-E	14	4	Occupant of automobile		15	Automobile collided with engine.
200	10-27	Rayner	SL	S-h	X-2646-E	26	35	2 occupants of auto-truck		7	Auto-truck struck by train.
201	11-17	Glendale	SL	S-j	811	54	25	G.B.Burch	Brakeman	60	Shot by unknown person while riding on top of caboose.
202	12-12	North Hollywood	SP	S-h	X-1746-E	9	20	Occupant of auto-truck		90	Auto-truck collided with side of train moving over crossing.
203	12-23	Los Angeles	SL	S-j	X-4307-W	43	6	L.E.Richardson	Brakeman	21	Knocked off top of caboose by sudden stop of train.
204	12-25	Oxnard	SL	S-j	X-2788-E	13	Standing	C.Plummer	Brakeman	6	Struck by rerailing frog which he was handling.
205	12-27	El Chase	SL	S-j	830	19	Standing	B.B.Reeves	Brakeman	21	Sprained back unloading freight from car.
	1936							YEAR 1936			
206	1-8	Indio	SL	S-g	2-830	99	8	C.A.McCullum	Brakeman	10	Stepped on rock while getting off car.
207	1-14	Bloomington	SL	S-h	824	78	30	Occupant of automobile		Killed	Automobile struck by train.
208	2-16	Los Angeles	SL	S-j	826	108	6	L.Y.Pirani	Brakeman	21	Thrown off balance on top of caboose by sudden stop when train parted due to trespasser stepping on cutting lever.
209	2-25	Santa Barbara	SL	S-d	X-3669-W	4	Standing	W.J.Shorer	Brakeman	14	Fell between cars when brake staff broke while setting hand brake.
210	4-8	Indio	SL	S-g	834	86	8	F.W.Lee	Brakeman	8	While detraining from moving caboose collided with man riding on side of moving car on adjoining track.
211	4-17	Oxnard	SL	S-j	X-5033-E	61	15	V.E.Holland	Brakeman	60	Slack action on rear of train caused him to lose balance on top of car just ahead of caboose and fall to ground.

Caused by sudden stopping, starting, lurch or jerk of car or train

	DATE (a)	LOCATION (b)	MAIN LINE (ML) OR BRANCH (BR) (c)	I.C.C. CLASS (d)	TRAIN NUMBER (e)	NO. CARS IN TRAIN (f)	SPEED (M.P.H.) (g)	PERSON INJURED NAME (h)	PERSON INJURED OCCUPATION (i)	ESTIMATED DISABILITY (DAYS) (j)	DESCRIPTION OF ACCIDENT (k)
	1936							YEAR 1936 (Cont'd)			
212	4-22	Carmenita	BR	S-h	X-1701-W	28	25	3 occupants of automobile		21 and 60	Automobile collided with side of train
213	4-24	Arcadia	BR	S-h	X-1782-E	3	18	2 occupants of automobile 1 occupant of automobile 2 occupants of automobile		Killed Died 60	Automobile struck by train
214	4-30	Burbank	ML	S-h	X-2859-E	15	25	Occupant of automobile		60	Automobile collided with engine.
215	5-1	Ontario	ML	S-h	X-5042-E	84	20	Occupant of automobile		10	Automobile struck by train.
216	5-1	Tweedy	BR	S-j	X-2423-E	8	2	A.J.Murphy	Brakeman	28	Stepped on block of wood lying on ground while walking alongside cars.
217	5-2	Indio	ML	S-j	X-5013-W	64	Standing	M.M.Murphy	Brakeman	4	Sprained hand while prodding livestock in car.
218	5-28	Colton	ML	S-d	X-5007-W	58	Standing	L.Y.Pironi	Brakeman	7	Struck by brake club while releasing hand brake.
219	5-29	Colton	ML	S-j	2-832	96	Standing	M.S.Jan Dell	Brakeman	21	Stepped on rock while running to board helper engine.
220	6-16	Edom	ML	S-g	3-832	49	Standing	L.T.Sullivan	Brakeman	10	Fell from side ladder while getting off car in standing train.
221	6-25	Keber	ML	S-g	X-1809-E	2	Standing	W.F.Clark	Brakeman	14	Stepped in depression of ground while getting off standing car.
222	6-29	Keith	BR	S-g	X-2559-E	32	6	M.P.Hards	Brakeman	14	Stepped on rock while running to board moving cars.
223	6-30	Van Nuys	BR	S-c	X-1772-E	54	8	M.J.Crowley	Fireman	6	Thrown off balance in cab of engine as coupling made.
224	7-7	Indio	ML	S-g	X-5041-W	99	Standing	W.McCubbin	Brakeman	90	Fell from side ladder while getting off standing car.
225	7-12	Banning	ML	S-j	830	23	Standing	A.D.Lane	Brakeman	28	Slipped on ladder and fell off standing car.
226	7-28	Knob	ML	S-j	X-5043-W	60	20	L.C.Hart	Brakeman	4	Piece of hot sand lodged in right eye.
227	8-28	Los Angeles	ML	S-j	2-812	74	3	R.Pollitte	Brakeman	21	Thrown off balance on top of caboose account sudden stop of train to avoid collision with standing cut of cars.
228	9-2	South Fontana	ML	S-j	X-5018-W	74	20	A.C.Haney	Brakeman	20	Fell on top of car due to running board breaking.
229	9-3	Los Angeles	ML	S-i	3-1	5	Standing	Occupant of automobile		21	Automobile ran into standing cars.
230	9-5	Los Nietos	BR	S-h	X-1658-E	2	8	2 occupants of automobile		30	Automobile ran into side of engine.
231	9-6	Espadra	ML	S-j	X-5042-W	111	3	C.A.McCullum	Brakeman	28	Thrown from cupola to floor of caboose when undesired emergency application of air brakes occurred.
232	9-27	Oxnard	ML	S-j	X-1784-E	5	8	F.R.Cowlishaw	Brakeman	21	Thrown off balance and against car as coupling made during switching.
233	10-2	Colton	ML	S-d	X-2451-W	34	Standing	G.J.Abel	Brakeman	5	Fell from car to ground while releasing hand brake.
234	10-8	Los Angeles	ML	S-d	826	83	Standing	W.J.Greene	Brakeman	14	Struck by brake lever while releasing hand brake.
235	10-10	Iris	ML	S-g	822	88	Standing	V.W.VonSeidlets	Brakeman	5	Stepped on rock while getting off standing train.
236	10-11	Niland	ML	S-g	824	86	12	R.R.Robinson	Brakeman	21	Fell while detraining from moving train.
237	10-19	Niland	ML	S-j	X-5048-W	100	4	R.E.Tolbert	Brakeman	30	Running to board caboose after lining switch, stepped on rock wrenching knee.
238	11-1	West Anaheim	BR	S-h	X-1701-W	6	18	Occupant of automobile		60	Automobile struck by train.
239	11-5	Burbank	ML	S-h	811	68	Standing	Occupant of automobile		21	Automobile ran into side of standing train.
240	11-8	Rayner	ML	S-h	1-812	65	15	Occupant of automobile		45	Automobile ran into side of moving train.
241	11-17	El Casco	ML	S-g	X-5024-W	47	10	H.F.Faust	Brakeman	18	Stepped on rock while getting off moving train to close switch.
242	11-19	Iris	ML	S-g	1-822	68	5	L.E.Allen	Brakeman	14	Stepped on rock or uneven ground while getting off moving engine to open switch.

214	4-30	Burbank	ML	S-h	X-2859-E	15	25	Occupant of automobile		60	Automobile collided with engine.
215	5-1	Ontario	ML	S-h	X-5042-E	84	20	Occupant of automobile		10	Automobile struck by train.
216	5-1	Tweedy	BR	S-j	X-2423-E	8	2	A.J.Murphy	Brakeman	28	Stepped on block of wood lying on ground while walking alongside cars.
217	5-2	Indio	ML	S-j	X-5013-W	64	Standing	M.M Murphy	Brakeman	4	Sprained hand while prodding livestock in car.
218	5-28	Colton	ML	S-d	X-5007-W	58	Standing	L.Y.Pironi	Brakeman	7	Struck by brake club while releasing hand brake.
219	5-29	Colton	ML	S-j	2-832	96	Standing	M.S.Jan Dell	Brakeman	21	Stepped on rock while running to board helper engine.
220	6-16	Edom	ML	S-g	3-832	49	Standing	L.T.Sullivan	Brakeman	10	Fell from side ladder while getting off car in standing train.
221	6-25	Heber	ML	S-g	X-1809-E	2	Standing	W.F.Clark	Brakeman	14	Stepped in depression of ground while getting off standing car.
222	6-29	Keith	BR	S-g	X-2559-E	32	6	M.P.Hards	Brakeman	14	Stepped on rock while running to board moving cars.
223	6-30	Van Nuys	BR	S-c	X-1772-E	54	8	M.J.Crowley	Fireman	6	Thrown off balance in cab of engine as coupling made.
224	7-7	Indio	ML	S-g	X-5041-W	99	Standing	W.McCubbin	Brakeman	90	Fell from side ladder while getting off standing car.
225	7-12	Banning	ML	S-j	830	23	Standing	A.D.Lane	Brakeman	28	Slipped on ladder and fell off standing car.
226	7-28	Knob	ML	S-j	X-5043-W	60	20	L.C.Hart	Brakeman	4	Piece of hot sand lodged in right eye.
227	8-28	Los Angeles	ML	#S-j	2-812	74	3	R.Pollitte	Brakeman	21	Thrown off balance on top of caboose account sudden stop of train to avoid collision with standing cut of cars.
228	9-2	South Fontana	ML	S-j	X-5018-W	74	20	A.C.Haney	Brakeman	20	Fell on top of car due to running board breaking.
229	9-3	Los Angeles	ML	S-i	3-1	5	Standing	Occupant of automobile		21	Automobile ran into standing cars.
230	9-5	Los Nietos	BR	S-h	X-1658-E	2	8	2 occupants of automobile		30	Automobile ran into side of engine.
231	9-6	Spadra	ML	#S-j	X-5042-W	111	30	C.A.McCullum	Brakeman	28	Thrown from cupola to floor of caboose when undesired emergency application of air brakes occurred.
232	9-27	Oxnard	ML	S-j	X-1784-E	5	8	F.R.Cowlishaw	Brakeman	21	Thrown off balance and against car as coupling made during switching.
233	10-2	Colton	ML	S-d	X-2451-W	34	Standing	G.J.Abel	Brakeman	5	Fell from car to ground while releasing hand brake.
234	10-8	Los Angeles	ML	S-d	826	83	Standing	W.J.Greene	Brakeman	14	Struck by brake lever while releasing hand brake.
235	10-10	Iris	ML	S-g	822	88	Standing	V.W.VonSeidlotz	Brakeman	5	Stepped on rock while getting off standing train.
236	10-11	Niland	ML	S-g	824	86	12	R.R.Robinson	Brakeman	21	Fell while detraining from moving train.
237	10-19	Niland	ML	S-j	X-5048-W	100	4	R.E.Tolbert	Brakeman	30	Running to board caboose after lining switch, stepped on rock wrenching knee.
238	11-1	West Anaheim	BR	S-h	X-1701-W	6	18	Occupant of automobile		60	Automobile struck by train.
239	11-5	Burbank	ML	S-h	811	68	Standing	Occupant of automobile		21	Automobile ran into side of standing train.
240	11-8	Rayner	ML	S-h	1-812	65	15	Occupant of automobile		45	Automobile ran into side of moving train.
241	11-17	El Casco	ML	S-g	X-5024-W	47	10	H.F.Faust	Brakeman	18	Stepped on rock while getting off moving train to close switch.
242	11-19	Iris	ML	S-g	1-822	68	5	L.E.Allen	Brakeman	14	Stepped on rock or uneven ground while getting off moving engine to open switch.
243	11-19	Colton	ML	#S-j	X-5036-W	52	15	J.J.Brean J.T.Curley	Conductor Brakeman	4 19	Sudden stop of train while sp ing for water caused injury to employes in caboose.
244	11-24	Oxnard	ML	S-d	X-2557-E	3	4	J.E.Harmon	Brakeman	30	While setting hand brake, cla fell off car as coupling made.
245	11-24	Indio	ML	S-g	X-5020-W	59	20	W.A.Boyd	Conductor	21	Fell to ground while boarding boose of moving train.
246	11-25	Santa Paula	BR	S-d	X-2711-W	7	4	L.Foster	Brakeman	21	Knocked off car by rock load conveyor while releasing hand brake.
247	11-26	San Fabrial	ML	S-h	X-5046-E	67	30	Occupant of automobile		10	Automobile struck by train.
248	12-4	Alhambra	ML	S-h	X-1734-W	49	15	Occupant of automobile		4	Automobile ran into side of e e.
249	12-9	Alhambra	ML	S-h	828	33	30	Occupant of automobile		60	Automobile ran into side of m ng train.
250	12-9	South Fontana	ML	#S-j	X-5005-W	77	30	E.Jennings	Brakeman	14	Train parted 35 cars ahead of caboose due to yoke strap failing, emergency application of brakes ca ing injury to employe in caboose.

- Caused by sudden stopping, starting, lurch or jerk of car or train

	DATE (a)	LOCATION (b)	MAIN LINE (ML) OR BRANCH (BR) (c)	I.C.C. CLASS (d)	TRAIN NUMBER (e)	NO. CARS IN TRAIN (f)	SPEED (M.P.H.) (g)	PERSON INJURED NAME (h)	PERSON INJURED OCCUPATION (i)	ESTIMATED DISABILITY (DAYS) (j)	DESCRIPTION OF ACCIDENT (k)
	1936							YEAR 1936 (Cont'd)			
251	12-10	Hazmell	ML	S-h	X-2452-W	2	20	1 occupant of Automobile 2 occupants of automobile		Killed 21 and 60	Automobile struck by train
252	12-14	Fenoma	ML	S-h	828	24	8	2 occupants of automobile		4 and 28	Automobile struck by train.
253	12-14	Colton	ML	S-i	1-832	77	1	L.H.White	Engineer	60	Left foot severed above ankle, run over by engine detached from train when he fell running to board engine which was being moved by fireman.
254	12-17	Kovet	BR	S-h	X-2557-E	7	18	Occupant of auto-truck		Died	Auto-truck struck by train.
255	12-25	Ventura	ML	S-g	1-812	74	10	L.T.Sullivan	Brakeman	6	Fell while attempting to board caboose of moving train.
256	12-28	Fenoma	ML	S-h	X-5012-E	90	20	Occupant of auto-truck		7	Auto-truck struck by train.
257	12-28	Cabazon	ML	S-j	830	51	Standing	J.W.Clark	Brakeman	14	Slipped on side ladder and fell from car to ground.
	1937							YEAR 1937			
258	1-4	Palm Wells	BR	S-h	X-1736-E	2	Standing	2 occupants of auto-truck		90	Truck and trailer ran into side of train.
259	1-5	Rockell	ML	S-h	X-1761-E	1	20	Occupant of automobile		Killed	Automobile struck by train.
260	1-7	Redlands	ML	S-j	819	9	Standing	H.L.St.Clair	Brakeman	7	Slipped on damp car roof and fell off top of car of standing train.
261	1-14	Hewitt	ML	S-h	3-1	23	Standing	J.Herndon	Brakeman	5	Burned by hot water and steam while opening steam hose valve.
262	1-15	El Centro	ML	S-h	X-1830-W	9	6	Occupant of automobile		14	Automobile struck by train.
263	1-20	Ontario	ML	S-h	X-2746-E	3	3	Occupant of automobile		14	Automobile ran into side of train.
264	1-25	Saugus	ML	S-g	X-3306-E	14	1	H.Oswald	Brakeman	5	Stepped in hole while getting off train.
265	1-25	Caleb	ML	S-j	X-5036-W	62	Standing	J.A.Sutton	Conductor	12	Foreign particle lodged in eye.
266	1-28	Arbadia	BR	S-h	X-1835-E	4	15	Occupant of automobile		14	Automobile struck by train
267	2-2	Colonias	ML	S-h	X-1828-W	30	10	Occupant of automobile		Killed	Automobile ran into side of engine.
268	2-26	Oxnard	ML	S-g	X-2551-E	25	3	R.F.Bugg	Brakeman	4	Turned ankle getting off moving car while switching.
269	3-4	Los Angeles	ML	S-h	3-1	24	Standing	W.H.Black	Car Inspr.	Killed	Caught between cars as slack bunched.
270	3-13	Ailem	ML	S-h	X-3707-W	111	25	R.T.Aird	Conductor	4	Failure of barrier iron allowed drawbar to drop from 10th car from engine, part train and derailed 2 cars, sudden stop injured employe in caboose.
271	3-23	Ville Park	BR	S-h	X-1814-E	1	18	Occupant of automobile		7	Automobile ran into side of engine.
272	3-24	Brawley	ML	S-h	X-1707-E	3	4	W.Sullivan	Conductor	28	Automobile struck by train injuring conductor who was riding front end of engine.
273	4-4	Cabazon	ML	S-g	3-836	63	15	E.Wittfeldt	Brakeman	9	Fell attempting board moving train account losing hand hold due to speed accelerating quickly account run out of slack.
274	4-6	Firestone Park	BR	S-h	X-2813-E	3	15	Occupant of automobile		Died	Automobile struck by train.
275	4-7	Fenoma	ML	S-j	X-2799-W	24	Standing	O.M.Preece	Brakeman	45	Struck by missile thrown by unknown person.
276	4-13	Calipatria	ML	S-h	X-1760-E	7	4	Occupant of automobile		30	Automobile ran into engine.
277	4-16	Southgate	BR	S-j	X-1798-E	5	9	R.Pellitte	Brakeman	60	Fell from top of car to ground when cars coupled while switching.
278	4-17	Hazed	ML	S-i	824	68	20	C.E.Smith	Brakeman	Killed	Apparently fell against side of train passing on parallel track.
279	4-24	Niland	ML	S-j	X-5012-E	70	4	J.Gebhart	Carpenter off duty	21	Thrown off balance in outfit car by sudden stop of train.
280	4-29	El Centro	ML	S-j	X-1794-W	None at time	Standing	R.L.Kruger	Brakeman	21	Burned by hot water and steam from [illegible]
281	5-1	[illegible]									

254	12-17	Kovet	ML	S-h	X-5031-W	3	[illegible]	[illegible]			
255	12-25	Ventura	ML	S-g	1-812	74	10	L.T.Sullivan	Brakeman	6	Fell while attempting to board caboose of moving train.
256	12-28	Fremont	ML	S-h	X-5012-W	90	20	Occupant of auto-truck		7	Auto-truck struck by train.
257	12-28	Cabazon	ML	S-j	830	51	Standing	J.W.Clark	Brakeman	14	Slipped on side ladder and fell from car to ground.
	1937						YEAR 1937				
258	1-4	Fulton Wells	BR	S-h	X-1736-E	2	Standing	2 occupants of auto-truck		90	Truck and trailer ran into side of train.
259	1-5	Newhall	ML	S-h	X-1761-E	1	20	Occupant of automobile		Killed	Automobile struck by train.
260	1-7	Redlands	ML	S-j	819	9	Standing	H.L.St.Clair	Brakeman	7	Slipped on damp car roof and fell off top of car of standing train.
261	1-14	Hewitt	ML	S-b	3-1	23	Standing	J.Herndon	Brakeman	5	Burned by hot water and steam while opening steam hose valve.
262	1-18	El Centro	ML	S-h	X-1830-W	9	6	Occupant of automobile		14	Automobile struck by train.
263	1-20	Ontario	ML	S-h	X-2746-E	3	3	Occupant of automobile		14	Automobile ran into side of train.
264	1-25	Saugus	ML	S-g	X-3308-E	14	1	H.Oswald	Brakeman	5	Stepped in hole while getting off train.
265	1-25	Chlob	ML	S-j	X-5036-W	62	Standing	J.A.Sutton	Conductor	12	Foreign particle lodged in eye.
266	1-28	Arcadia	BR	S-h	X-1835-E	4	15	Occupant of automobile		14	Automobile struck by train
267	2-8	Calexico	ML	S-h	X-1828-W	30	10	Occupant of automobile		Killed	Automobile ran into side of engine.
268	2-26	Oxnard	ML	S-g	X-2551-E	25	3	R.F.Sugg	Brakeman	4	Turned ankle getting off moving car while switching.
269	3-4	Los Angeles	ML	S-b	3-1	24	Standing	W.H.Black	Car Inspr.	Killed	Caught between cars as slack bunched.
270	3-12	Ailen	ML	S-b	X-3707-W	111	25	R.T.Aird	Conductor	4	Failure of carrier iron allowed drawbar to drop from 10th car from engine, part train and derailed 2 cars, sudden stop injured employe in caboose.
271	3-13	Villa Park	BR	S-h	X-1814-E	1	18	Occupant of automobile		7	Automobile ran into side of engine.
272	3-24	Brawley	ML	S-h	X-1707-E	3	4	W.Sullivan	Conductor	28	Automobile struck by train injuring conductor who was riding front end of engine.
273	4-4	Cabazon	ML	S-g	3-836	63	15	E.Wittfeldt	Brakeman	9	Fell attempting board moving train account losing hand hold due to speed accelerating quickly account run out of slack.
274	4-6	Riverside Park	BR	S-h	X-2813-E	3	15	Occupant of automobile		Died	Automobile struck by train.
275	4-7	Fremont	ML	S-j	X-2799-E	24	Standing	O.M.Preese	Brakeman	45	Struck by missile thrown by unknown person.
276	4-13	Calipatria	ML	S-h	X-1760-E	7	4	Occupant of automobile		30	Automobile ran into engine.
277	4-16	Northgate	BR	S-j	X-1798-E	5	9	R.Pellitte	Brakeman	60	Fell from top of car to ground when cars coupled while switching.
278	4-17	Elwood	ML	S-i	824	68	20	C.E.Smith	Brakeman	Killed	Apparently fell against side of train passing on parallel track.
279	4-24	Niland	ML	S-j	X-5013-E	70	4	J.Gebhart	Carpenter off duty	21	Thrown off balance in outfit car by sudden stop of train.
280	4-27	El Centro	ML	S-j	X-1794-E	Home at time	Standing	R.L.Kruger	Brakeman	21	Burned by hot water and steam from injector while remailing engine.
281	5-4	Tenaby	BR	S-j	X-1798-W	16	3	C.R.Fussino	Brakeman	13	Caught between and knocked off side-swiped car.
282	5-8	Redlands 2nd St.	BR	S-d	X-1879-E	4	Standing	W.G.Gates	Brakeman	21	Strained back while releasing hand brake on car.
283	5-8	Linco	BR	S-d	X-2711-E	11	2	H.W.Morgan	Brakeman	8	Struck by brake club while releasing hand brake.
284	5-8	Chatsworth	ML	S-i	2-812	59	12	C.B.Cortes J.C.Samaniego	Sec.Laborer " "	28 21	Struck by engine of train.
285	5-23	Knob	ML	S-j	X-5032-W	123	2	W.A.Jordan	Conductor	21	Thrown off balance in caboose by slack action rear of train.
286	5-26	Moore	ML	S-e	X-2804-E	44	Standing	B.W.Biedermann	Brakeman	21	Dropped switch lever ball on foot.
287	5-27	Ontario	ML	S-g	X-2559-W	14	2	B.A.Reeves	Brakeman	21	Foot slipped getting off footboard of engine.
288	5-31	Los Angeles	BR	S-h	X-1810-W	4	3	Occupant of automobile		21	Automobile ran into side of train.

- Caused by sudden stopping, starting, lurch or jerk of car or train

	DATE (a)	LOCATION (b)	MAIN LINE (ML) OR BRANCH (BR) (c)	I.C.C. CLASS (d)	TRAIN NUMBER (e)	NO. CARS IN TRAIN (f)	SPEED (M.P.H.) (g)	PERSON INJURED NAME (h)	PERSON INJURED OCCUPATION (i)	ESTIMATED DISABILITY (DAYS) (j)	DESCRIPTION OF ACCIDENT (k)
	1937							YEAR 1937 (Cont'd)			
289	6-10	Brawley	ML	S-j	X-1721-W	3	2	L. O. Laughrin	PFE Iceman	30	Thrown off balance on top of car as coupling made switching.
290	6-17	El Centro	ML	S-j	X-1736-E	None at time	Unknown	H.R.Bowles	Brakeman	11	Foreign particle lodged in eye.
291	6-17	Rosco	ML	S-j	X-2849-E	55	7	F.L.Combs	Brakeman	5	Thrown off balance as coupling made while switching.
292	6-22	Indio	ML	S-j	X-2746-E	1	8	J.M.Kelly	Brakeman	4	Sprained ankle while stepping on cut lever to uncouple caboose from engine.
293	6-28	El Centro	ML	#S-j	X-2713-E	21	8	G.F.Frey	Brakeman	14	Sudden stop when engineer applied brakes in emergency caused brakeman to be thrown off balance on caboose and to ground.
294	7-8	Drylyn	ML	S-g	X-5025-W	122	8	E.F.Donahue	Brakeman	90	Foot caught under wheel while boarding head end of caboose of moving train.
295	7-9	Ontario	ML	S-h	X-2727-W	2	2	2 occupants of automobile		14 and 90	Automobile ran into side of train.
296	7-12	Indio	ML	S-d	X-1739-W	2	Standing	J.E.Harmon	Brakeman	21	Lost balance and fell from car when brake staff bent while setting hand brake.
297	7-13	Bertram	ML	#S-j	X-5018-W	119	20	G.L.Oswald	Brakeman	7	Thrown off balance in caboose due to sudden stop when train parted account drawbar pulling out car behind engine.
298	7-14	Brawley	ML	S-j	X-1736-W	8	4	F.F.George	Brakeman	45	Lost balance and fell off car as coupling made.
299	7-14	Niland	ML	S-j	X-5039-W	124	5	J.E.Finley	Brakeman	21	Foot slipped off end of tie while running to board caboose.
300	7-16	North Los Angeles	ML	S-g	X-2559-W	73	6	L.E.Richardson	Brakeman	16	Slipped on ballast shoulder while getting off train.
301	7-17	Los Angeles	BR	#S-j	X-1801-W	72	8	H.E.Miller	Brakeman	60	Sudden stop of train to avoid striking automobile, caused brakeman who was on top of train about 20 cars ahead of caboose to fall to the ground.
302	7-18	Chatsworth	ML	S-h	X-3734-W	58	Standing	Occupant of automobile		2	Automobile ran into side of standing train.
303	7-20	Pomona	ML	S-h	X-2540-E	37	3	Occupant of automobile		3	Automobile struck by train.
304	8-6	Rayner	ML	W-a	X-3680-W	49	30	Occupant of automobile		6	Automobile ran into side of train.
305	8-14	Indio	ML	#S-j	X-5032-W	123	6	J.F.Eshelman	Brakeman	10	Thrown off balance in caboose when train parted due to trespasser stepping on cutting lever.
306	8-17	Aurant	ML	S-j	X-3734-W	86	20	J.E.Patterson	Engineer	6	Foreign particle lodged in eye.
307	8-25	Firestone Park	BR	S-h	X-1810-E	40	15	Occupant of auto-truck		7	Auto-truck and trailer struck by train.
308	8-30	Pacoima	ML	S-h	811	70	25	Occupant of automobile Occupant of automobile		Killed 21	Automobile struck by train.
309	9-3	Alhambra	BR	S-h	X-1773-E	3	12	2 occupants of automobile		7	Automobile struck by train.
310	9-4	Chatsworth	ML	S-j	1-812	84	20	J.F.Fahey	Brakeman	14	Fell to ground from flat car in moving train.
311	9-11	Norwalk	BR	S-h	X-1678-W	27	15	Occupant of automobile Occupant of automobile		Killed 30	Automobile ran into side of train.
312	10-3	North Hollywood	BR	S-h	X-1707-E	7	3	Occupant of automobile		Killed	Automobile ran into side of engine.
313	10-7	Dry Camp	ML	S-j	1-836	67	25	D.L.Dillon	Brakeman	20	Missed monkey (horizontal) bar and fell to floor while crossing from one side of caboose cupola to other.
314	10-15	Oxnard	ML	S-e	2-2	45	Standing	C.A.Kelsey	Fireman	28	Finger caught between water spout and edge of tender manhole.
315	10-17	Moorpark	ML	S-g	X-3724-E	58	8	H.H.Bradshaw	Brakeman	21	While boarding train, slipped on ballast and fell.
316	10-17	Firestone Park	BR	S-h	X-1810-E	73	Standing	2 occupants of automobile		4 and 7	Automobile ran into side of standing train.
317	10-21	Wilson									

293	6-25	El Centro	ML	#S-j	X-2713-E	21	8	G.F.Frey	Brakeman	14	Sudden stop when engineer applied brakes in emergency caused brakeman to be thrown off balance on caboose and to ground.
294	7-8	Drylyn	ML	S-g	X-5025-W	122	8	E.F.Donahue	Brakeman	90	Foot caught under wheel while boarding head end of caboose of moving train.
295	7-9	Ontario	ML	S-h	X-2727-W	2	7	2 occupants of automobile		14 and 90	Automobile ran into side of train.
296	7-12	Indio	ML	S-d	X-1739-W	2	Standing	J.E.Hanson	Brakeman	21	Lost balance and fell from car when brake staff bent while setting hand brake.
297	7-13	Bertram	ML	#S-j	X-5018-W	119	20	G.L.Oswald	Brakeman	7	Thrown off balance in caboose due to sudden stop when train parted account drawbar pulling out car behind engine.
298	7-14	Brawley	ML	S-j	X-1736-W	8	4	F.F.George	Brakeman	45	Lost balance and fell off car as coupling made.
299	7-14	Niland	ML	S-j	X-5039-W	124	5	J.E.Finley	Brakeman	21	Foot slipped off end of tie while running to board caboose.
300	7-16	North Los Angeles	ML	S-g	X-2559-E	73	6	L.E.Richardson	Brakeman	16	Slipped on ballast shoulder while getting off train.
301	7-17	Los Angeles	BR	#S-j	X-1801-E	72	8	H.E.Miller	Brakeman	60	Sudden stop of train to avoid striking automobile, caused brakeman who was on top of train about 20 cars ahead of caboose to fall to the ground.
302	7-18	Chatsworth	ML	S-h	X-3734-W	56	Standing	Occupant of automobile		2	Automobile ran into side of standing train.
303	7-20	Pomona	ML	S-h	X-2540-E	37	3	Occupant of automobile		3	Automobile struck by train.
304	8-6	Raymer	ML	M-a	X-3680-W	49	30	Occupant of automobile		6	Automobile ran into side of train.
305	8-16	Indio	ML	#S-j	X-5032-W	123	6	J.F.Kahenower	Brakeman	10	Thrown off balance in caboose when train parted due to trespasser stepping on cutting lever.
306	8-17	Aurant	ML	S-j	X-3734-W	86	20	J.E.Patterson	Engineer	6	Foreign particle lodged in eye.
307	9-25	Firestone Park	BR	S-h	X-1810-E	40	15	Occupant of auto-truck		7	Auto-truck and trailer struck by train.
308	9-30	Pascima	ML	S-h	811	70	25	Occupant of automobile Occupant of automobile		Killed 21	Automobile struck by train.
309	9-3	Alhambra	BR	S-h	X-1773-E	3	12	2 occupants of automobile		7	Automobile struck by train.
310	9-4	Chatsworth	ML	S-j	1-812	84	20	J.F.Fahey	Brakeman	14	Fell to ground from flat car in moving train.
311	9-11	Norwalk	BR	S-h	X-1678-W	27	15	Occupant of automobile Occupant of automobile		Killed 30	Automobile ran into side of train.
312	10-3	North Hollywood	BR	S-h	X-1707-E	7	3	Occupant of automobile		Killed	Automobile ran into side of engine.
313	10-7	Dry Camp	ML	S-j	1-836	67	25	D.L.Dillon	Brakeman	20	Missed monkey (horizontal) bar and fell to floor while crossing from one side of caboose cupola to other.
314	10-15	Oxnard	ML	S-c	2-2	25	Standing	C.A.Kelsey	Fireman	28	Finger caught between water spout and edge of tender manhole.
315	10-17	Moorpark	ML	S-g	X-3724-E	58	8	H.H.Bradshaw	Brakeman	21	While boarding train, slipped on ballst and fell.
316	10-17	Firestone Park	BR	S-h	X-1810-E	73	Standing	2 occupants of automobile		4 and 7	Automobile ran into side of standing train.
317	10-21	Niland	ML	#S-j	X-5025-W	124	8	A.B.Mason	Conductor	21	Knocked off balance on rear platform of caboose by sudden stop due to trespasser stepping on cut lever, parting train.
318	10-22	Calexico	ML	S-d	X-1828-W	11	4	W.A.Franks	Conductor	60	Fell to ground from brake platform while setting hand brake on car.
319	10-31	Los Angeles	ML	S-g	811	66	15	J.A.McGee	Conductor	60	Missed footing and fell while boarding caboose of moving train.
320	11-3	Camarillo	ML	S-i	X-3690-E	74	25	2 occupants of automobile		Killed	Automobile struck by train on private crossing.
321	11-8	Santa Ana	BR	S-h	X-1656-W	12	20	Occupant of automobile		60	Automobile struck by train.
322	11-10	Ares	ML	S-d	X-5005-W	81	4	W.E.Allbright	Brakeman	21	Brake chain slipped while setting hand brakes on car.
323	11-19	Ventura	ML	S-h	X-1760-W	10	15	Occupant of automobile		30	Automobile struck by train.
324	11-23	Bloomington	ML	#S-j	826	77	25	C.C.Koontz	Brakeman	14	Lost balance due to motion of train and fell while getting out of caboose cupola.
325	12-28	South Fontana	ML	#S-j	X-5017-W	106	10	G.N.Lacey H.S.Bolster	Brakeman Brakeman	14 14	Thrown off balance on platform against rear of caboose by slack action when train parted due to trespasser stepping on cut lever.

- Caused by sudden stopping, starting, lurch or jerk of car or train

	DATE (a)	LOCATION (b)	MAIN LINE (ML) OR BRANCH (BR) (c)	I.C.C. CLASS (d)	TRAIN NUMBER (e)	NO. CARS IN TRAIN (f)	SPEED (M.P.H.) (g)	PERSON INJURED NAME (h)	PERSON INJURED OCCUPATION (i)	ESTIMATED DISABILITY (DAYS) (j)	DESCRIPTION OF ACCIDENT (k)
	1938							YEAR 1938			
336	1-4	North Los Angeles	ML	S-h	2-2	19	50	Occupant of automobile Occupant of automobile		Killed 60	Automobile ran into side of train
337	1-15	Alhambra	ML	S-h	X-2746-E	4	15	Occupant of automobile		21	Automobile struck by train.
338	1-26	Roscoe	ML	S-g	813	66	3	R.A.Williams	Brakeman	21	Ladder rung came loose while climbing up side of car.
339	1-31	Moorpark	ML	S-h	1-812	52	25	Occupant of automobile		30	Automobile ran into side of train.
340	2-9	North Alhambra	BR	S-h	X-2577-E	2	10	Occupant of automobile		7	Automobile ran into side of engine.
341	2-10	Saugus	ML	S-e	815	67	Standing	W.S.Brown	Brakeman	4	Strain while operating switch lever.
342	2-16	Spadra	ML	S-j	X-5025-E	58	2	W.E.Dreibelbis B.B.Reeves	Conductor Brakeman	18 60	Thrown off balance in caboose when engineer made emergency stop to avoid running through switch.
343	2-18	Van Nuys	BR	S-h	X-2446-W	14	20	Occupant of automobile Occupant of automobile		Killed 7	Automobile ran into side of engine.
344	2-23	Banning	ML	S-g	X-2842-E	20	5	J.E.Harris	Brakeman	45	Stepped on rock while getting off moving car.
345	2-24	Redlands, 2nd St.	BR	S-h	X-2559-E	9	10	Occupant of automobile		21	Automobile ran into side of engine.
346	2-25	Monrovia	BR	S-h	X-2746-E	2	15	Occupant of automobile Occupant of automobile		Killed 30	Automobile ran into side of engine.
347	3-20	Lagel	ML	S-j	X-3723-W	74	35	D.M.Payne	Brakeman	14	Struck by water box falling from engine tender while standing in gangway.
348	3-24	Rayner	ML	S-h	X-2580-W	75	35	Occupant of auto-truck		6	Auto-truck ran into side of train.
349	3-26	Hazed	ML	S-g	X-4307-W	56	10	M.S.Jan Dell	Brakeman	21	Twisted foot while getting off moving train to close switch.
340	4-8	Indio	ML	S-d	X-5037-W	123	Standing	C.W.White	Brakeman	6	Strained back setting hand brake on car.
341	4-24	Sepulveda	ML	S-h	X-4103-E	53	25	Occupant of automobile		Killed	Automobile struck by train.
342	5-19	Pomona	ML	S-h	830	21	3	Occupant of motorcycle		30	Motorcycle ran into car.
343	5-20	Glenio	ML	S-g	X-5044-W	99	6	R.J.Mourning	Brakeman	4	Stepped on rock while getting off moving train.
344	6-10	Colton	ML	S-g	828	94	Standing	J.L.Todd	Brakeman	14	Foot slipped off stirrup while getting off standing car.
345	6-12	Hugo	ML	S-j	836	94	20	H.O.Davidson	Brakeman	21	Tripped on nail protruding from floor of flat car and fell forward on car.
346	6-17	El Casco	ML	S-i	832	56	12	E.A.Singleton	Signal Maintainer	5	Struck by caboose of train in back-up movement while removing motor car from track.
347	6-25	Pomona	ML	S-g	X-2746-W	33	10	F.O.Walton	Brakeman	6	Strained side while getting off moving car during switching.
348	6-25	Brawley	ML	S-h	X-1755-W	4	6	5 occupants of automobile		3 to 30	Automobile ran into side of train.
349	6-30	Brawley	ML	S-d	X-1809-W	1	3	J.E.Harmon	Brakeman	14	Strained back while setting hand brake on car.
350	6-30	Santa Barbara	ML	S-j	X-3657-W	67	5	W.W.Lockwood	Brakeman	14	Thrown off balance in caboose by slack action as train was stopping.
351	7-12	Saugus	ML	S-e	815	70	Standing	R.T.Townsend	Fireman	12	Struck by water spout chain while raising spout after taking water.
352	8-6	Santa Ana	BR	S-h	X-1801-W	7	20	Occupant of automobile		Killed	Automobile struck by train.
353	8-6	Friah	ML	S-j	X-5025-W	121	40	H.V.Crank	Brakeman	Killed	Fell from moving train and run over.
354	8-9	Indio	ML	C-b	X-5024-W	63	Standing	C.M.Bowney F.B.Kingston	Engine Foreman Yardman	14 21	Yard engine 2719 backing, shoving water car and caboose behind engine, collided with Extra 5024-West, which had just been stopped by emergency application of brakes, the extra west having been misrouted in-

330	2-9	Monta Alhambra	SR	S-h	X-2577-E	2	10	Occupant of automobile		7	Automobile ran into side of engine.
331	2-10	Saugus	ML	S-e	815	69	Standing	W.S.Brown	Brakeman	4	Strain while operating switch lever.
332	2-16	Spadra	ML	∮S-j	X-5025-E	58	2	W.E.Braibelbis B.B.Reeves	Conductor Brakeman	18 60	Thrown off balance in caboose when engineer made emergency stop to avoid running through switch.
333	2-18	Van Nuys	SR	S-h	X-2446-W	14	20	Occupant of automobile Occupant of automobile		Killed 7	Automobile ran into side of engine.
334	2-23	Banning	ML	S-g	X-2842-E	20	5	J.E.Harris	Brakeman	45	Stepped on rock while getting off moving car.
335	2-24	Redlands, 2nd St.	SR	S-h	X-2559-E	9	10	Occupant of automobile		21	Automobile ran into side of engine.
336	2-25	Monrovia	SR	S-h	X-2746-E	2	15	Occupant of automobile Occupant of automobile		Killed 30	Automobile ran into side of engine.
337	3-20	Lagal	ML	S-j	X-3723-W	74	35	D.M.Payne	Brakeman	14	Struck by water box falling from engine tender while standing in gangway.
338	3-24	Raymar	ML	S-h	X-2580-E	75	35	Occupant of auto-truck		6	Auto-truck ran into side of train.
339	3-26	Hared	ML	S-g	X-4307-E	56	10	M.S.Jas Dell	Brakeman	21	Twisted foot while getting off moving train to close switch.
340	4-8	Indio	ML	S-d	X-5032-E	123	Standing	C.W.White	Brakeman	6	Strained back setting hand brake on car.
341	4-24	Sepulveda	ML	S-h	X-4103-E	53	25	Occupant of automobile		Killed	Automobile struck by train.
342	5-19	Pomona	ML	S-h	830	21	3	Occupant of motorcycle		30	Motorcycle ran into car.
343	5-20	Olemia	ML	S-g	X-5044-E	99	6	R.J.Mourning	Brakeman	4	Stepped on rock while getting off moving train.
344	6-10	Colton	ML	S-g	828	94	Standing	J.L.Todd	Brakeman	14	Foot slipped off stirrup while getting off standing car.
345	6-12	Hago	ML	S-j	836	94	20	H.O.Davidson	Brakeman	21	Tripped on nail protruding from floor of flat car and fell forward on car.
346	6-17	El Casco	ML	S-i	832	56	12	E.A.Singleton	Signal Maintainer	5	Struck by caboose of train in back-up movement while removing motor car from track.
347	6-23	Pomona	ML	S-g	X-2746-W	33	10	P.G.Walton	Brakeman	6	Strained side while getting off moving car during switching.
348	6-25	Brawley	ML	S-h	X-1755-E	4	6	5 occupants of automobile		3 to 30	Automobile ran into side of train.
349	6-30	Brawley	ML	S-d	X-1809-W	1	3	J.E.Harmon	Brakeman	14	Strained back while setting hand brake on car.
350	6-30	Santa Barbara	ML	∮S-j	X-3657-E	67	5	W.W.Lockwood	Brakeman	14	Thrown off balance in caboose by slack action as train was stopping.
351	7-12	Saugus	ML	S-e	815	70	Standing	R.T.Townsend	Fireman	12	Struck by water spout chain while raising spout after taking water.
352	8-6	Santa Ana	SR	S-h	X-1801-W	7	20	Occupant of automobile		Killed	Automobile struck by train.
353	8-6	Prink	ML	S-j	X-5025-E	121	40	H.V.Crank	Brakeman	Killed	Fell from moving train and run over.
354	8-9	Indio	ML	C-b	X-5024-E	63	Standing	C.M.Downey F.B.Kingston B.T.Heffernan	Engine Foreman Yardman Brakeman	14 21 14	Yard engine 2719 backing, shoving water car and caboose behind engine, collided with Extra 5024-West, which had just been stopped by emergency application of brakes, the extra west having been misrouted into track account switch improperly lined.
355	8-10	Hobbs	SR	S-d	X-2813-E	6	Standing	C.C.Stephens	Brakeman	30	Fell from standing car while releasing hand brake.
356	9-1	Saugus	ML	S-g	X-2842-E	4	Standing	P.B.Robinson	Brakeman	24	While getting off standing car stepped on sugar beet lying on ground.
357	9-15	North Los Angeles	ML	S-h	X-4417-E	61	35	2 occupants of automobile		7	Automobile ran into side of train.
358	9-17	El Monte	ML	S-h	X-5018-E	44	25	2 occupants of automobile		14 and 21	Automobile ran into side of train.
359	9-25	Burbank	ML	S-h	X-1768-W	13	12	Occupant of automobile		7	Automobile struck by train.
360	9-29	Los Angeles	ML	S-j	X-2788-E	55	Standing	O.W.Ballinger	Brakeman	21	Righ hand cut when contacted exposed screw head on caboose door.
361	10-3	Santa Paula	SR	S-d	X-2713-E	12	Standing	W.F.Church	Brakeman	13	Struck by spoke of brake wheel while releasing hand brake on car.
362	10-3	Norwalk	SR	S-h	X-1809-E	24	25	Occupant of automobile Occupant of automobile		Killed 30	Automobile struck by train.
363	10-6	Ventura	ML	∮S-j	X-3675-E	51	20	E.S.Northrup	Brakeman	5	Unbalanced by slack action on rear end and struck head against caboose ladder.

∮ - Caused by sudden stopping, starting, lurch or jerk of car or train.

	DATE	LOCATION	MAIN LINE (ML) OR BRANCH (BR)	I.C.C. CLASS	TRAIN NUMBER	NO. CARS IN TRAIN	SPEED (M.P.H.)	PERSON INJURED NAME	PERSON INJURED OCCUPATION	ESTIMATED DISABILITY (DAYS)	DESCRIPTION OF ACCIDENT
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
	1938					YEAR 1938 (Cont'd)					
364	10-7	Spadra	ML	S-h	828	97	20	Occupant of automobile		21	Automobile ran into side of train.
365	10-12	Colton	ML	S-d	X-3671-E	66	Standing	G.N.Lacey	Brakeman	30	Fell off car while releasing hand brake.
366	10-20	Firestone Park	BR	S-h	X-1801-E	58	20	2 occupants of automobile		7 and 30	Automobile struck by train.
367	10-21	Indio-Beaumont	ML	S-e	X-5025-E	64	Standing	A.L.Deutenberg	Fireman	28	Injured wrist operating injector water valve on engine.
368	10-29	Santa Ana	BR	S-h	X-1801-E	7	18	2 occupants of automobile Occupant of automobile		Killed 60	Automobile struck by train.
369	11-6	Ontario	ML	S-h	820	8	35	Occupant of automobile		Killed	Automobile struck by train.
370	11-8	San Fernando	ML	S-h	2-815	65	25	Occupant of automobile		7	Automobile ran into side of engine.
371	11-10	Pomona	ML	S-h	819	7	12	Occupant of automobile		60	Automobile ran into side of train.
372	11-21	Kester	BR	S-h	X-2736-E	40	4	Occupant of automobile		14	Automobile ran into side of train.
373	11-28	El Centro	ML	S-g	X-1739-E	1	2	R.Frain	Conductor	14	Fell to ground while stepping from ladder to brake platform of car.
374	12-14	Van Nuys	BR	S-h	X-2360-E	35	Standing	Occupant of motorcycle		14	Motorcycle ran into side of standing train.
375	12-18	Thehard	BR	S-h	X-2580-E	3	Standing	2 occupants of automobile		7	Automobile ran into side of train.
376	12-20	Newhall	ML	S-g	815	59	Standing	E.F.Donahue	Brakeman	4	Foot slipped off rung of gangway ladder while boarding engine of standing train.
377	12-25	Indio	ML	S-j	X-5039-E	86	6	J.T.Curley	Brakeman	21	Sprained knee while running to board caboose of moving train after closing switch.
	1939					YEAR 1939					
378	1-5	Van Nuys	BR	S-h	X-2747-E	31	18	Occupant of automobile		14	Automobile ran into train.
379	1-16	Indio	ML	S-j	834	12	3	D.A.Randolph	Brakeman	120	Lost balance and fell from car while engine handling 11 cars and caboose.
380	1-19	Oxnard	ML	S-j	X-3689-E	85	8	N.J.Personne	Brakeman	8	While stepping from one car to another missed footing and fell to top of car.
381	2-8	Pomona	ML	S-d	X-2741-E	17	5	G.W.Rugg	Brakeman	60	Fell from car to ground while setting hand brake.
382	2-22	Tweedy	BR	S-d	X-1736-E	7	2	D.M.Payne	Brakeman	30	Fell from car to ground when brake wheel came off while setting hand brake.
383	3-3	Burbank	ML	S-h	X-2935-E	5	18	Occupant of automobile Occupant of automobile		Killed 30	Automobile ran into side of engine.
384	4-16	Cabezon	ML	S-d	836	96	Standing	A.C.Reeves	Brakeman	Killed	Fell to ground from 32nd car from engine while releasing hand brake.
385	4-23	Heber	ML	S-h	X-1755-E	2	30	Occupant of automobile Occupant of automobile		Killed Died	Automobile struck by train.
386	5-4	El Monte	ML	S-j	X-5024-E	64	20	K.F.Carrington	Brakeman	4	Struck by rock thrown at passing train.
387	5-20	Pomona	ML	S-h	X-2842-E	51	10	2 occupants of automobile		7	Automobile ran into side of moving train.
388	6-8	El Centro	ML	S-h	X-5046-E	99	15	Occupant of auto-truck		21	Auto-truck ran into train.
389	6-13	Estelle	ML	S-j	X-4302-E	6	1	M.S.Jandell	Conductor	60	Became unbalanced and fell against stove in caboose when engine and 2 cars coupled to train.
390	6-18	Colton	ML	S-j	2-820	66	3	[illegible]	Brakeman	30	[illegible]

369	11-6	Ontario	ML	S-h	820	8	35	Occupant of automobile		Killed	Automobile struck by train.
370	11-8	San Fernando	ML	S-h	2-815	65	25	Occupant of automobile		7	Automobile ran into side of engine.
371	11-10	Pomona	ML	S-h	819	7	12	Occupant of automobile		60	Automobile ran into side of train.
372	11-21	Kester	BR	S-h	X-2736-E	40	4	Occupant of automobile		14	Automobile ran into side of train.
373	11-28	El Centro	ML	S-g	X-1734-E	1	2	R.Train	Conductor	14	Fell to ground while stepping from ladder to brake platform of car.
374	12-14	Van Nuys	BR	S-h	X-2360-E	35	Standing	Occupant of motorcycle		14	Motorcycle ran into side of standing train.
375	12-15	Thenard	BR	S-h	X-2580-E	3	Standing	2 occupants of automobile		7	Automobile ran into side of train.
376	12-20	Newhall	ML	S-g	815	59	Standing	E.F.Donohue	Brakeman	4	Foot slipped off rung of gangway ladder while boarding engine of standing train.
377	12-25	Indio	ML	S-j	X-5039-E	86	6	J.T.Curley	Brakeman	21	Sprained knee while running to board caboose of moving train after closing switch.
	1939					YEAR 1939					
378	1-5	Van Nuys	BR	S-h	X-2747-E	31	18	Occupant of automobile		14	Automobile ran into train.
379	1-16	Indio	ML	S-j	834	12	3	D.A.Randolph	Brakeman	120	Lost balance and fell from car while engine handling 11 cars and caboose.
380	1-19	Oxnard	ML	S-j	X-2689-E	85	8	N.J.Personne	Brakeman	8	While stepping from one car to another missed footing and fell to top of car.
381	2-8	Pomona	ML	S-d	X-2741-E	17	5	G.W.Rugg	Brakeman	60	Fell from car to ground while setting hand brake.
382	2-22	Tweedy	BR	S-d	X-1736-E	7	2	D.M.Payne	Brakeman	30	Fell from car to ground when brake wheel came off while setting hand brake.
383	3-3	Burbank	ML	S-h	X-2935-E	5	18	Occupant of automobile Occupant of automobile		Killed 30	Automobile ran into side of engine.
384	4-16	Cabezon	ML	S-d	836	96	Standing	A.C.Reeves	Brakeman	Killed	Fell to ground from 32nd car from engine while releasing hand brake.
385	4-23	Haber	ML	S-h	X-1755-E	2	30	Occupant of automobile Occupant of automobile		Killed Died	Automobile struck by train.
386	5-4	El Monte	ML	S-j	X-5024-E	64	20	A.F.Carrington	Brakeman	4	Struck by rock thrown by passing train.
387	5-20	Pomona	ML	S-h	X-2842-E	51	10	2 occupants of automobile		7	Automobile ran into side of moving train.
388	6-8	El Centro	ML	S-h	X-5046-E	99	15	Occupant of auto-truck		21	Auto-truck ran into train.
389	6-13	Estelle	ML	S-j	X-4302-E	6	1	M.S.Jandell	Conductor	60	Became unbalanced and fell against stove in caboose when engine and 2 cars coupled to train.
390	6-18	Colton	ML	S-j	2-820	66	3	F.E.Cushing	Brakeman	30	Thrown off balance in caboose by undesired emergency application of air brakes.
391	7-12	Alhambra	ML	S-H	X-2546-E	3	15	Occupant of automobile		21	Automobile struck by train.
392	8-3	Edom	ML	S-g	2-834	99	5	M.J.Russell	Brakeman	45	Fell from side ladder 18th car from engine, claiming slack action caused him to lose hand hold.
393	8-10	San Fernando	ML	S-s	X-2747-E	28	Standing	E.Niday	Fireman	10	Fell on engine tank while taking water.
394	8-19	Fillmore	BR	S-c	X-2577-E	32	Standing	D.W.Pillsbury	Engineer	28	Strained side while operating reverse lever on engine.
395	8-22	Newhall	ML	S-j	816	55	20	E.B.Harris	Brakeman	6	Piece of hot sand lodged in eye.
396	8-26	Ontario	ML	S-s	X-2711-E	16	Standing	L.R.Sickler	Brakeman	7	Fell from car to ground while releasing hand brake.
397	9-11	Bassett	ML	S-j	2-824	31	5	R.E.Wing	Brakeman	20	Struck knee on ladder rung while boarding car in moving train.
398	9-15	Hasson	ML	S-s	373 Passn.72	33 9	15 3	J.M.Burns 5 passengers	Fireman	9 7 to 21	No. 373 collided head-on with No. 72 account No. 373 overrunning switch at which it was to take siding.
399	9-23	Glendale	ML	S-h	374	28	43	Occupant of automobile		Killed	Automobile struck by train.

*Caused by a train stopping, starting, lurch or jerk of car or train.

	DATE (a)	LOCATION (b)	MAIN LINE (ML) OR BRANCH (BR) (c)	I.C.C. CLASS (d)	TRAIN NUMBER (e)	NO. CARS IN TRAIN (f)	SPEED (M.P.H.) (g)	PERSON INJURED NAME (h)	PERSON INJURED OCCUPATION (i)	ESTIMATED DISABILITY (DAYS) (j)	DESCRIPTION OF ACCIDENT (k)
	1939							YEAR 1939 (Cont'd)			
400	10-17	Northridge	ML	S-h	X-2820-W	34	35	3 occupants of automobile		7 to 30	Automobile ran into train.
401	11-4	Ontario	ML	S-g	X-2711-W	10	10	M Burt	Brakeman	15	Stepped on rock while getting off moving car.
402	11-4	Hugo	ML	S-j	X-4197-W	58	Standing	W.H.Rose	Brakeman	45	End door of car dropped on hand.
403	11-9	Tweedy	BR	S-j	X-1760-W	42	Standing	S.A.Huff	Brakeman	9	Tripped over tie and fell against low switch stand.
404	11-9	Bassett	ML	S-j	X-4319-W	46	2	G.C.Sutton	Conductor	14	Unbalanced on rear platform of caboose by slack action as stop made.
405	11-13	Colton	ML	S-j	X-5048-W	63	20	H.R.Bowles	Brakeman	13	Foreign particle lodged in eye.
406	11-23	Kester	BR	S-h	X-1828-W	5	30	Occupant of automobile		2	Automobile ran into side of moving train.
	1940							YEAR 1940			
407	1-20	Tweedy	BR	S-j	X-1760-E	22	Standing	B.G.Turner	Brakeman	60	Stepped on main track and was struck by gasoline track motor car.
408	1-26	Los Angeles	ML	S-i	830	34	8	C.G.Burwell	Conductor	14	While checking his train as it pulled by him, was struck by cut of 5 cars handled by yard engine 2704 on adjacent track.
409	1-28	Niland	ML	S-j	822	97	Standing	A.B.Gibson	Brakeman	21	Caught finger while lifting broken drawbar onto end sill of car.
410	1-29	West Anaheim	BR	S-e	X-1813-E	17	Standing	G.O.Hilts	Fireman	28	Lost balance while moving water spout back in place and fell from engine tender to ground.
411	2-1	Vinvale	BR	S-d	X-1760-E	2	Standing	R.E.Hall	Brakeman	28	Struck by brake club while releasing hand brake on standing car.
412	2-3	Ville Park	BR	S-h	X-2334-E	1	12	Occupant of automobile 3 occupants of automobile		Killed 7	Automobile struck by train.
413	3-8	Fenoam	ML	S-d	X-2842-E	2	Standing	M.S.JamDell	Brakeman	19	Struck by brake wheel while releasing hand brake on car.
414	3-24	North Hollywood	BR	S-h	X-2842-E	16	15	Occupant of automobile		7	Automobile ran into side of train.
415	3-26	Ontario	ML	S-h	X-2727-W	52	Standing	Occupant of automobile		7	Automobile ran into side of standing train.
416	4-17	Riverside	BR	S-d	X-1736-E	1	Standing	L. Creller	Brakeman	5	Thumb struck by brake wheel spoke while releasing hand brake on car.
417	4-24	Keane	ML	S-e	X-4192-W	98	40	L.T.Jones	Brakeman	12	Derailed 13th car from engine account burst off journal, sudden stop injured employe in caboose.
418	4-24	West Anaheim	BR	S-h	X-1813-W	15	5	Occupant of automobile		7	Auto ran into side of train.
419	5-2	Fulton Wells	BR	S-h	X-1813-E	3	6	Occupant of auto-truck		7	Auto-truck ran into train.
420	5-3	Burbank	ML	S-h	X-2559-W	7	25	Occupant of auto-truck		30	Auto-truck struck by train.
421	5-13	Firestone Park	BR	S-h	X-1739-E	17	15	Pedestrian		30	Struck by train.
422	5-15	Coachella	ML	S-j	X-4187-W	87	8	W.C.DeuPree	Brakeman	19	Fell to top of car when unbalanced by engine recoupling to a cut of 4 cars which employe was riding.
423	5-16	Fenoam	ML	S-h	X-5021-W	84	30	Operator of scooter		60	Motor scooter ran into side of engine.
424	5-21	Edom	ML	S-j	X-4200-W	99	8	C.G.Burwell	Conductor	5	Unbalanced in caboose by undesired emergency application of air brakes.
425	5-25	West Glendale	ML	S-h	812	69	34	Occupant of auto truck		30	Auto-truck struck by train.
426	5-28	Banning	ML	S-d	X-5008-W	40	Standing	J.E.Harris	Brakeman	14	Struck by brake club while releasing hand brake on standing car.
427	6-3	Tweedy	BR	S-d	X-1736-E	5	Standing	B.[illegible]atiser	Brakeman	[illegible]	Fell against end of car when brake suddenly released while setting the brake.
428	6-13	San Gabriel	ML	S-j	X-2851-E	10	Standing	L.R.Sickler	Brakeman	6	Stepped on piece of ballast while running to board moving cars.
429	7-3	Marlboro	BR	S-h	X-2749-E	1	15	2 occupants of automobile		7 and 21	Automobile ran into side of train.
430	7-12	Los Angeles	ML	S-j	2-824	86	15	R.B.Cooper	Conductor	10	Unbalanced in caboose by slack action of train.

425	11-13	Orton	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
426	11-23	Exeter	BR	S-2	X-1828-E	5	30	Occupant of automobile		2	Automobile ran into side of moving train.
	1940						YEAR 1940				
427	1-20	Tracy	BR	S-j	X-1760-E	22	Standing	B.G.Turner	Brakeman	60	Stepped on main track and was struck by gasoline track motor car.
428	1-26	Los Angeles	ML	S-i	830	34	8	C.G.Burwell	Conductor	14	While checking his train as it pulled by him, was struck by out of 5 cars handled by yard engine 2704 on adjacent track.
429	1-28	Milan	ML	S-j	822	97	Standing	A.B.Gibson	Brakeman	21	Caught finger while lifting broken drawbar onto end sill of car.
430	1-29	West Anaheim	BR	S-c	X-1813-E	17	Standing	G.O.Hilts	Fireman	28	Lost balance while moving water spout back in place and fell from engine tender to ground.
431	2-1	Visalia	BR	S-d	X-1760-E	2	Standing	R.E.Hall	Brakeman	28	Struck by brake club while releasing hand brake on standing car.
432	2-3	Villa Park	BR	S-h	X-2334-E	1	12	Occupant of automobile 3 occupants of automobile		Killed 7	Automobile struck by train.
433	3-8	Fremont	ML	S-d	X-2842-E	2	Sta.. ng	M.S.JamDell	Brakeman	19	Struck by brake wheel while releasing hand brake on car.
434	3-26	North Hollywood	BR	S-h	X-2842-E	16	15	Occupant of automobile		7	Automobile ran into side of train.
435	3-26	Ontario	ML	S-h	X-2727-E	52	Standing	Occupant of automobile		7	Automobile ran into side of standing train.
436	4-17	Riverside	BR	S-d	X-1736-E	1	Standing	L. Creller	Brakeman	5	Thumb struck by brake wheel spoke while releasing hand brake on car.
437	4-24	Keeco	ML	S-c	X-4192-E	98	40	L.T.Jones	Brakeman	12	Derailed 13th car from engine account burnt off journal, sudden stop injured employe in caboose.
438	4-24	West Anaheim	BR	S-h	X-1813-E	15	5	Occupant of automobile		7	Auto ran into side of train.
439	5-2	Fulton Wells	BR	S-h	X-1813-E	3	6	Occupant of auto-truck		7	Auto-truck ran into train.
440	5-3	Burbank	ML	S-h	X-2559-E	7	25	Occupant of auto-truck		30	Auto-truck struck by train.
441	5-13	Firestone Park	BR	S-h	X-1739-E	17	15	Pedestrian		30	Struck by train.
442	5-15	Coachella	ML	S-j	X-4187-E	87	8	W.C.DuPree	Brakeman	19	Fell to top of car when unbalanced by engine recoupling to a cut of 4 cars which employe was riding.
443	5-16	Fremont	ML	S-h	X-5021-E	84	30	Operator of scooter		60	Motor scooter ran into side of engine.
444	5-21	Edom	ML	S-j	X-4200-E	99	8	C.G.Burwell	Conductor	5	Unbalanced in caboose by undesired emergency application of air brakes.
445	5-25	West Glendale	ML	S-h	812	69	34	Occupant of auto truck		30	Auto-truck struck by train.
446	5-28	Banning	ML	S-d	X-5008-E	40	Standing	J.E.Harris	Brakeman	14	Struck by brake club while releasing hand brake on standing car.
447	6-3	Tracy	BR	S-d	X-1736-E	5	Standing	B.Altiser	Brakeman	21	Fell against end of car when brake suddenly released while setting the brake.
448	6-13	San Gabriel	ML	S-j	X-2851-E	10	Standing	I.N.Sickler	Brakeman	6	Stepped on piece of ballast while running to board moving cars.
449	7-3	Marlboro	BR	S-h	X-2749-E	1	15	2 occupants of automobile		7 and 21	Automobile ran into side of train.
450	7-12	Los Angeles	ML	S-j	2-824	86	35	R.B.Cooper	Conductor	12	Unbalanced in caboose by slack [illegible]on of train.
451	7-23	Salton	ML	S-j	X-4200-E	85	35	F.E.Fry	Brakeman	28	Strained shoulder and back when [illegible]d hold gave way while hanging on side of car.
452	7-25	South Pontana	ML	S-d	2-824	94	Standing	F.S.Thomas	Conductor	4	Strained ligament of arm while [illegible]ing hand brake on car in standing train.
453	7-26	Calexico	ML	S-g	358	9	5	R.H.Ray	Conductor	90	Severed left leg when fell from [illegible] run over by car while switching
454	7-31	Chino	BR	S-j	X-2820-E	5	3	J.A.Galloway	Conductor	4	Boot rack shifted and caught f[illegible] car as coupling made.
455	8-6	Allen	ML	S-j	X-2820-E	57	30	K.M.Beal	Brakeman	28	Foreign particle in eye.
456	8-17	Oxnard	ML	S-j	X-1742-E	4	4	W.W.Hirt	Conductor	21	Car door closed on hand.
457	9-2	Indio	ML	S-i	X-5024-E	93	25	L.G.Hart	Brakeman	Killed	Walked into side of engine of mov[illegible]ing train.

- Caused by sudden stopping, starting, lurch or jerk of car or train.

	DATE (a)	LOCATION (b)	MAIN LINE (ML) OR BRANCH (BR) (c)	I.C.C. CLASS (d)	TRAIN NUMBER (e)	NO. CARS IN TRAIN (f)	SPEED (M.P.H.) (g)	PERSON INJURED NAME (h)	PERSON INJURED OCCUPATION (i)	ESTIMATED DISABILITY (DAYS) (j)	DESCRIPTION OF ACCIDENT (k)
	1940						YEAR 1940 (Cont'd)				
438	9-5	El Centro	ML	S-i	X-1721-W	16	3	G.Smith	Conductor	Killed	Run over by train
439	9-6	Indio	ML	S-d	X-5001-E	94	Standing	F.J.Costello	Brakeman	60	Fell from car to ground while setting hand brake.
440	9-10	Hewitt	ML	S-h	X-4188-E	95	2	Occupant of automobile		7	Automobile ran into side of moving train.
441	9-15	Oxnard	ML	S-g	X-1793-E	6	5	R.E.Hall	Brakeman	60	Fell from car to ground as coupling made while climbing down ladder.
442	9-17	Los Angeles	ML	S-h	X-1794-E	31	10	Occupant of automobile		7	Automobile struck by train.
443	9-24	Colton	ML	S-g	X-4201-W	65	6	W.E.Ulbright	Brakeman	21	Fell while attempting to board caboose of moving train.
444	9-28	Mecca	ML	S-j	X-1809-E	23	Standing	H.J.Saizan	Brakeman	9	Foreign particle in eye.
445	10-7	Ventura	ML	S-d	X-4200-E	91	Standing	H.F.Faust	Brakeman	28	Brake club slipped while releasing hand brake on standing car.
446	10-13	Imperial	ML	S-h	X-1734-E	15	35	2 occupants of automobile		30 and 60	Automobile struck by train.
447	10-18	Burbank	ML	S-h	X-2820-E	8	5	Occupant of auto-truck		14	Auto-truck struck by train.
448	10-22	Amos	ML	S-i	X-4195-W	66	40	V.D.Richards	Brakeman	Killed	Train parted account knuckle breaking 4th car from engine due to undesired emergency action of air brakes; head brakeman fell from train and run over.
449	11-1	Vernon	BR	S-a	X-2749-W	40	12	Street car passenger		90	Street car struck by train.
450	11-17	Beaumont	ML	S-g	X-5044-E	101	8	B.W.Biedermann	Brakeman	21	Slipped or missed footing and fell while boarding moving train.
451	11-20	Stoneman	ML	S-h	X-1678-W	23	30	Occupant of automobile		30	Automobile struck by train.
452	11-22	Wahoo	ML	S-h	3-813	70	35	Occupant of automobile		Killed	Automobile struck by train.
453	11-22	South Fontana	ML	S-h	X-5024-E	86	Standing	Occupant of automobile		7	Automobile ran into side of standing train.
454	12-4	Indio	ML	S-i	X-5043-W	100	12	L.R.Sickler	Brakeman	60	Right foot severed when 6th brakeman fell from 37th car from caboose and run over.
455	12-9	Compton	BR	S-h	X-1742-E	3	15	Occupant of automobile		7	Automobile struck by train.
456	12-10	Tweedy	BR	S-j	X-1809-E	1	4	W.O.Williams	Brakeman	21	Fell from car as coupling made.
457	12-17	Los Angeles	ML	S-d	822	84	Standing	H.H.Cheminitser	Brakeman	21	Struck by brake club while releasing hand brake on car in standing train.
458	12-21	Tweedy	BR	S-j	X-1729-E	11	5	L.T.A.Cockrell	CarInspr.	28	Fell from ladder inside of car on which he was standing when coupling made.
459	12-26	Ventura	ML	S-g	X-4187-W	58	15	C.E.Murphy	Brakeman	10	Fell while attempting to board caboose of moving train.
460	12-28	Mecca	ML	S-j	X-5005-E	123	35	J.A.Sutton	Conductor	14	Unbalanced in caboose by sudden stop due to undesired emergency application of air brakes.

Defendant's Exhibit No. 387 (Wit[illegible]s J.J. Sullivan)
Apr. 29, 1941

COMPARISONS OF CASUALTIES
TO

EMPLOYES AND NON-TRESPASSERS
ROAD FREIGHT TRAIN OPERATION

SUSTAINED IN TRAIN AND TRAIN-SERVICE ACCIDENTS
REPORTED TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1930 TO 1940, INCLUSIVE

SOUTHERN PACIFIC COMPANY PACIFIC LINES
STATE OF NEW MEXICO

YEAR	FREIGHT TRAIN		AVERAGE CARS PER TRAIN	CASUALTY RATE PER MILLION FREIGHT TRAIN MILES							TOTAL ALL PERSONS	CASUALTY RATE PER 100 MIL			
				EMPLOYES				NON-EMPLOYES				EMPLOYES			
	TRAIN MILES (THOUSANDS)	CAR MILES (THOUSANDS)		CONDUCTORS AND BRAKEMEN	ENGINEERS AND FIREMEN	OTHER EMPLOYES	TOTAL ALL EMPLOYES	OCCUPANTS OF MOTOR VEHICLES	OTHER NON-TRESPASSERS	TOTAL NON-TRESPASSERS		CONDUCTORS AND BRAKEMEN	ENGINEERS AND FIREMEN	OTHER EMPLOYES	TOTAL ALL EMPLOYES
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)
1930	2,028	105,579	52.11	3.95	.99	.49	5.43	-	.99	.99	6.42	7.58	1.89	.95	10.42
1931	1,693	90,098	53.21	4.13	2.36	-	6.50	-	-	-	6.50	7.77	4.44	-	12.21
1932	1,425	74,887	52.55	4.21	2.11	.70	7.02	1.40	-	1.40	8.42	8.01	4.01	1.34	13.35
1933	1,234	68,157	55.23	3.24	.81	2.43	6.48	1.62	-	1.62	8.10	5.87	1.47	4.40	11.74
1934	1,375	76,168	55.39	8.73	2.18	.73	11.64	-	.73	.73	12.36	15.75	3.94	1.31	21.01
1935	1,569	86,706	55.26	3.82	2.55	1.27	7.65	-	-	-	7.65	6.92	4.61	2.31	13.84
6 YEARS 1930-1935	9,322	501,589	53.81	4.61	1.82	.86	7.29	.43	.32	.75	8.05	8.57	3.39	1.59	13.56
1936	1,757	91,880	52.26	6.26	1.71	.57	8.54	2.85	-	2.85	11.38	11.98	3.27	1.09	16.34
1937	1,916	99,557	51.96	4.70	.52	-	5.22	-	1.04	1.04	6.26	9.04	1.00	-	10.04
1938	1,747	97,543	55.83	4.01	.57	.57	5.15	.57	-	.57	5.72	7.18	1.05	1.05	9.23
1939	1,784	104,419	58.53	2.24	1.68	-	3.92	-	-	-	3.92	3.83	2.87	-	6.70
1940	1,676	109,583	65.38	10.74	-	1.19	11.93	.60	-	.60	12.53	16.43	-	1.83	18.25

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	CASUALTY RATE PER 100 MILLION FREIGHT TRAIN CAR MILES							
	EMPLOYES				NON-EMPLOYES			
TOTAL ALL PERSONS	CONDUCTORS AND BRAKEMEN	ENGINEERS AND FIREMEN	OTHER EMPLOYES	TOTAL ALL EMPLOYES	OCCUPANTS OF MOTOR VEHICLES	OTHER NON-TRESPASSERS	TOTAL NON-TRESPASSERS	TOTAL ALL PERSONS
(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)
6.42	7.58	1.89	.95	10.42	-	1.89	1.89	12.31
6.50	7.77	4.44	-	12.21	-	-	-	12.21
8.42	8.01	4.01	1.34	13.35	2.67	-	2.67	16.02
8.10	5.87	1.47	4.40	11.74	2.93	-	2.93	14.67
12.36	15.75	3.94	1.31	21.01	-	1.31	1.31	22.32
7.85	6.92	4.61	2.31	13.84	-	-	-	13.84
8.05	8.57	3.39	1.59	13.56	.80	.60	1.40	14.95
11.38	11.98	3.27	1.09	16.34	5.45	-	5.45	21.78
6.26	9.04	1.00	-	10.04	-	2.01	2.01	12.05
5.72	7.18	1.03	1.03	9.22	1.03	-	1.03	10.25
3.92	3.83	2.87	-	6.70	-	-	-	6.70
12.53	16.43	-	1.83	18.25	.91	-	.91	19.16

OPERATION

SUSTAINED IN TRAIN AND TRAIN-SERVICE ACCIDENTS
REPORTED TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1930 TO 1940, INCLUSIVE

SOUTHERN PACIFIC COMPANY PACIFIC LINES
STATE OF NEW MEXICO

YEAR	FREIGHT TRAIN		AVERAGE CARS PER TRAIN	CASUALTY RATE PER MILLION FREIGHT TRAIN MILES								CASUALTY RATE PE		
				EMPLOYE				NON-EMPLOYES				EMPLOYES		
	TRAIN MILES (THOUSANDS)	CAR MILES (THOUSANDS)		CONDUCTORS AND BRAKEMEN	ENGINEERS AND FIREMEN	OTHER EMPLOYES	TOTAL ALL EMPLOYES	OCCUPANTS OF MOTOR VEHICLES	OTHER NON-TRESPASSERS	TOTAL NON-TRESPASSERS	TOTAL ALL PERSONS	CONDUCTORS AND BRAKEMEN	ENGINEERS AND FIREMEN	OTHER EMPLOYES
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)
1930	2,026	105,679	52.11	3.95	.99	.49	5.43	-	.99	.99	6.42	7.58	1.89	.95
1931	1,693	90,092	53.21	4.13	2.36	-	6.50	-	-	-	6.50	7.77	4.44	-
1932	1,425	74,887	52.55	4.21	2.11	.70	7.02	1.40	-	1.40	8.42	8.01	4.01	1.34
1933	1,234	68,157	55.23	3.24	.81	2.43	6.48	1.62	-	1.62	8.10	5.67	1.47	4.40
1934	1,375	76,168	55.39	8.73	2.18	.73	11.64	-	.73	.73	12.36	15.75	3.94	1.31
1935	1,569	86,706	55.26	3.82	2.55	1.27	7.65	-	-	-	7.65	6.92	4.61	2.31
6 YEARS 1930-1935	9,322	501,589	53.61	4.61	1.82	.86	7.29	.43	.38	.75	8.05	8.57	3.39	1.59
1936	1,757	91,880	52.26	6.26	1.71	.57	8.54	2.85	-	2.85	11.38	11.98	3.27	1.09
1937	1,916	99,557	51.96	4.70	.52	-	5.22	-	1.04	1.04	6.26	9.04	1.00	-
1938	1,747	97,543	55.83	4.01	.57	.57	5.15	.57	-	.57	5.72	7.18	1.03	1.03
1939	1,784	104,419	58.53	2.24	1.68	-	3.92	-	-	-	3.92	3.83	2.87	-
1940	1,676	109,583	65.38	10.74	-	1.19	11.93	.60	-	.60	12.53	16.43	-	1.83
5 YEARS 1936-1940	8,880	502,922	56.64	5.52	.90	.45	6.87	.79	.23	1.01	7.88	9.74	1.59	.80
11 YEARS 1930-1940	18,202	1,004,511	55.19	5.05	1.37	.66	7.09	.60	.27	.88	7.97	9,16	2.49	1.19

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	CASUALTY RATE PER 100 MILLION FREIGHT TRAIN CAR MILES							
	EMPLOYEES				NON-EMPLOYEES			
TOTAL ALL PERSONS	CONDUCTORS AND BRAKEMEN	ENGINEERS AND FIREMEN	OTHER EMPLOYEES	TOTAL ALL EMPLOYEES	OCCUPANTS OF MOTOR VEHICLES	OTHER NON-TRESPASSERS	TOTAL NON-TRESPASSERS	TOTAL ALL PERSONS
(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)
6.42	7.58	1.89	.95	10.42	-	1.89	1.89	12.31
6.50	7.77	4.44	-	12.21	-	-	-	12.21
8.42	8.01	4.01	1.34	13.35	2.67	-	2.67	16.02
8.10	5.87	1.47	4.40	11.74	2.93	-	2.93	14.67
12.36	15.75	3.94	1.31	21.01	-	1.31	1.31	22.32
7.65	6.92	4.61	2.31	13.84	-	-	-	13.84
8.05	8.57	3.39	1.59	13.56	.80	.60	1.40	14.96
11.38	11.98	3.27	1.09	16.34	5.45	-	5.45	21.78
6.26	9.04	1.00	-	10.04	-	2.01	2.01	12.06
8.72	7.18	1.03	1.03	9.23	1.03	-	1.03	10.25
3.92	3.83	2.87	-	6.70	-	-	-	6.70
12.53	16.43	-	1.83	18.25	.91	-	.91	19.16
7.88	9.74	1.59	.80	12.13	1.39	.40	1.79	13.92
7.97	9.16	2.49	1.19	12.84	1.10	.50	1.59	14.43

CASUALTIES TO ALL PERSONS EXCEPT TRESPASSERS

YEAR	EMPLOYES												NON-EMPLOYES					
	CONDUCTORS AND BRAKEMAN			ENGINEERS AND FIREMEN			OTHER EMPLOYES			TOTAL ALL EMPLOYES			OCCUPANTS OF MOTOR VEHICLES			OTHER NON-TRESPASSERS		
	KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)
1930	-	8	8	-	2	2	-	1	1	-	11	11	-	-	-	-	2	2
1931	-	7	7	-	4	4	-	-	-	-	11	11	-	-	-	-	-	-
1932	-	6	6	-	3	3	-	1	1	-	10	10	-	2	2	-	-	-
1933	-	4	4	-	1	1	-	3	3	-	8	8	-	2	2	-	-	-
1934	-	12	12	-	3	3	-	1	1	-	16	16	-	-	-	-	1	1
1935	-	6	6	-	4	4	-	2	2	-	12	12	-	-	-	-	-	-
6 YEARS 1930-1935	-	45	45	-	17	17	-	8	8	-	68	68	-	4	4	-	3	3
1936	-	11	11	-	3	3	-	1	1	-	15	15	1	4	5	-	-	-
1937	-	9	9	-	1	1	-	-	-	-	10	10	-	-	-	-	2	2
1938	-	7	7	-	1	1	-	1	1	-	9	9	-	1	1	-	-	-
1939	-	4	4	-	3	3	-	-	-	-	7	7	-	-	-	-	-	-
1940	-	18	18	-	-	-	-	2	2	-	20	20	-	1	1	-	-	-
5 YEARS 1936-1940	-	49	49	-	8	8	-	4	4	-	61	61	1	6	7	-	2	2
11 YEARS 1930-1940	-	92	92	-	25	25	-	12	12	-	129	129	1	10	11	-	5	5

SSERS

NON-EMPLOYEES										
PARTS OF VEHICLES		OTHER NON-TRESPASSERS			TOTAL NON-TRESPASSERS			TOTAL ALL PERSONS EXCEPT TRESPASSERS		
INJURED	TOTAL	KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL	KILLED	INJURED	TOTAL
(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)
-	-	-	2	2	-	2	2	-	13	13
-	-	-	-	-	-	-	-	-	11	11
2	2	-	-	-	-	2	2	-	12	12
2	2	-	-	-	-	2	2	-	10	10
-	-	-	1	1	-	1	1	-	17	17
-	-	-	-	-	-	-	-	-	12	12
4	4	-	3	3	-	7	7	-	75	75
4	5	-	-	-	1	4	5	1	19	20
-	-	-	2	2	-	2	2	-	12	12
1	1	-	-	-	-	1	1	-	10	10
-	-	-	-	-	-	-	-	-	7	7
1	1	-	-	-	-	1	1	-	21	21
6	7	-	2	2	1	8	9	1	69	70
10	11	-	5	5	1	15	16	1	144	145

NUMBER OF CASUALTIES SEGREGATED AS TO FREIGHT TRAINS OF 70 CARS OR LESS, AND THOSE OVER 70 CARS

YEAR	CONDUCTORS AND BRAKEMEN		ENGINEERS AND FIREMEN		OTHER EMPLOYES		ALL EMPLOYES		OCCUPANTS OF MOTOR VEHICLES		OTHER NON-TRESPASSERS		TOTAL NON-TRESPASSER	
	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVE 70 C
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o
1930	7	1	1	1	1	-	9	2	-	-	2	-	2	-
1931	5	2	2	2	-	-	7	4	-	-	-	-	-	-
1932	3	3	3	-	1	-	7	3	2	-	-	-	2	-
1933	2	2	1	-	3	-	6	2	2	-	-	-	2	-
1934	9	3	2	1	1	-	12	4	-	-	1	-	1	-
1935	3	3	3	1	2	-	8	4	-	-	-	-	-	-
6 YEARS 1930-1935	29	14	12	5	8	-	49	19	4	-	3	-	7	-
1936	9	2	3	-	1	-	13	2	2	3	-	-	2	3
1937	8	1	1	-	-	-	9	1	-	-	2	-	2	-
1938	7	-	1	-	1	-	9	-	1	-	-	-	1	-
1939	4	-	3	-	-	-	7	-	-	-	-	-	-	-
1940	10	8	-	-	1	1	11	9	1	-	-	-	1	-
5 YEARS 1936-1940	38	11	8	-	3	1	49	12	4	3	2	-	6	3
11 YEARS 1930-1940	67	25	20	5	11	1	98	31	8	3	5	-	13	3

SE OVER 70 CARS

OTHER -TRESPASSERS		TOTAL NON-TRESPASSERS		GRAND TOTAL ALL PERSONS	
ARS ESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS
	(m)	(n)	(o)	(p)	(q)
	-	2	-	11	2
	-	-	-	7	4
	-	2	-	9	3
	-	2	-	8	2
	-	1	-	13	4
	-	-	-	8	4
	-	7	-	56	19
	-	2	3	15	5
	-	2	-	11	1
	-	1	-	10	-
	-	-	-	7	-
	-	1	-	12	9
	-	6	3	55	15
	-	13	3	111	34

CASUALTIES TO
ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN
CAUSED FROM SUDDEN STOPPING, STARTING, LURCH AND JERK OF TRAIN
OCCURRING ON TRAINS OF 70 CARS AND LESS, AND ON TRAINS OF OVER 70 CARS

YEAR (a)	70 CARS AND LESS (b)	OVER 70 CARS (c)	TOTAL (d)	NUMBER OF SUCH CASUALTIES PER: MILLION TRAIN MILES (e)	100 MILLION CAR MILES (f)
1930	3	1	4	1.77	3.79
1931	2	2	4	2.36	4.44
1932	-	1	1	.70	1.34
1933	-	2	2	1.62	2.93
1934	-	2	2	1.45	2.63
1935	1	3	4	2.55	4.61
TOTAL 1930 - 1935	6	11	17	1.82	3.39
1936	-	1	1	.57	1.09
1937	2	1	3	1.57	3.01
1938	-	-	-	-	-
1939	1	-	1	.56	.96
1940	2	5	7	4.18	6.39
TOTAL 1936 - 1940	5	7	12	1.35	2.39
GRAND TOTAL 1930 - 1940	11	18	29	1.59	2.89
DECREASE PERIOD 1936 - 1940 COMPARED WITH 1930 - 1935				25.82%	29.50%
DECREASE PERIOD 1936 - 1940 COMPARED WITH 1930 - 1940				15.09%	17.30%

6043

DETAIL OF CASUALTIES
ALL CLASSES OF PERSONS, EXCEPT TRESPASSERS
TRAIN AND TRAIN SERVICE ACCIDENTS
ROAD FREIGHT TRAIN OPERATION
REPORTED TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1930 TO 1940, INCLUSIVE

SOUTHERN PACIFIC COMPANY
LINES IN
STATE OF NEW MEXICO

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (DAYS) (i)	DESCRIPTION OF ACCIDENT (j)
	1930						YEAR 1930			
1	1-7	Corona	FS-j	3-227	59	4	R.E.Russell	Conductor	11	Abrupt stop and slack action of train
2	2-1	Escondida	S-d	232	47	Standing	C.E.Roe	Brakeman	40	Fell to ground while setting hand brake account ratchet wheel key missing on hand brake.
3	2-19	Mongola	FS-j	X-3318-E	70	30	R.C.East	Brakeman	7	Sudden stop due to emergency application of brakes caused by nipple in train line branch pipe on engine rusting out of entrance to distributing valve resulting in nipple breaking off.
4	3-27	Palomas	S-g	2-226	18	20	H.W.Beasley	Fireman	7	Jumped from engine and fell after superheater flue had broken.
5	3-27	Desert	S-j	1-229	70	Standing	S.W.VanStone	Brakeman	5	Stepped on piece of slag while walking alongside train.
6	3-29	Luna	S-j	203	51	Standing	T.Sedillo	Sec.Laborer	45	Fractured leg when thrown from car with tie while unloading ties.
7	4-28	Vaway	FS-j	X-3334-E	99	25	H.F.Provence	Brakeman	7	Airhose burst, 29th car from engine, causing emergency stop.
8	5-6	Corona	S-j	203	57	Standing	W.E.Grumbles	Brakeman	8	Foot fell on foot while handling L.C.L. freight.
9	5-16	Alamogordo	S-j	218	9	2	Non-trespasser		45	Employe of lumber company caught hand between steel running board and end of building when car was moved.
10	6-13	Alamogordo	S-e	201	89	Standing	W.G.Boswell	Fireman	5	Hand scalded when poppet valve on stoker opened.
11	8-9	High Rolls	S-g	213	18	8	S.Gates	Brakeman	30	Fell to ground when slipped getting off engine.
12	11-24	Vaughn	S-j	205	3	5	Non-trespasser		18	Occupant of outfit car injured when car was struck by cars being handled by engine due to switches being improperly lined.
13	12-26	Luna	FS-j	X-3657-E	70	7	R.R.Sole	Conductor	20	Engine derailed by hatch cover of car on track caused rough stop and injured employe in caboose.
	1931						YEAR 1931			
14	1-14	Deming	S-e	X-3666-E	100	10	M.F.Schemeley	Engineer	14	Struck back of finger against some object opening blow-off cock.
15	2-21	Hargis	S-g	2-226	60	12	W.Gebo	Brakeman	20	Claims stepped in hole getting off train.
16	4-5	Vaughn	FS-j	X-3655-W	70	6	S.W.VanStone	Brakeman	45	Sudden stop injured employe in caboose when engineer made emergency application of train brakes.
17	5-23	Icehouse Crossover	FS-j	2-410	100	15	H.F.Provence	Brakeman	18	Slack ran in when engineer made service application of brakes injuring employe in caboose.
18	6-7	Alamogordo	S-e	X-3653-E	91	Standing	W.G.Boswell	Fireman	15	Particles of cinders and foreign matter penetrated eye.
19	6-16	Carne	S-e	2-426	68	40	A.F.Emifeste	Engineer	9	Hot cinder in left eye.
20	6-25	Rodeo	FS-j	X-5003-E	70	15	H.E.Gilvin	Conductor	30	Service application train brakes caused run-in on rear of train injured employe in caboose.
21	7-5	Elwood	S-j	X-3655-E	70	6	C.E.Roe	Brakeman	4	Slipped on piece of slag while running for caboose after closing switch.

	Date (a)	Location (b)	Class (c)	Number (d)	No. on Train (e)	(M.P.H.) (f)	Name (g)	Occupation (h)	(DAYS) (i)	DESCRIPTION OF ACCIDENT (j)
1930						YEAR 1930				
1	1-7	Corona	#S-1	3-227	59	4	R.K.Russell	Conductor	11	Abrupt stop and slack action of train
2	2-1	Escondido	S-d	232	47	Standing	C.E.Roe	Brakeman	40	Fell to ground while setting hand brake account ratchet wheel key missing on hand brake.
3	2-19	Mongola	#S-1	X-3318-E	70	30	R.C.East	Brakeman	7	Sudden stop due to emergency application of brakes caused by nipple in train line branch pipe on engine rusting out of entrance to distributing valve resulting in nipple breaking off.
4	3-27	Palomas	S-g	2-226	18	20	H.W.Beasley	Fireman	7	Jumped from engine and fell after superheater flue had broken.
5	3-27	Desert	S-1	1-229	70	Standing	S.W.VanStone	Brakeman	5	Stepped on piece of slag while walking alongside train.
6	3-29	Luna	S-1	203	51	Standing	T.Sedille	Sec.Laborer	45	Fractured leg when thrown from car with tie while unloading ties.
7	4-28	Vesey	#S-1	X-3324-W	99	25	H.F.Provence	Brakeman	7	Airhose burst, 29th car from engine, causing emergency stop.
8	5-6	Corona	S-1	203	57	Standing	W.E.Grumbles	Brakeman	8	Foot fell on foot while handling L.C.L. freight.
9	5-16	Alamogordo	S-1	218	9	2	Non-trespasser		45	Employe of lumber company caught hand between steel running board and end of building when car was moved.
10	6-13	Alamogordo	S-e	201	89	Standing	W.G.Boswell	Fireman	5	Hand scalded when poppet valve on stoker opened.
11	8-9	High Rolls	S-g	213	18	8	S.Cates	Brakeman	30	Fell to ground when slipped getting off engine.
12	11-24	Vaughn	S-1	205	3	5	Non-trespasser		18	Occupant of outfit car injured when car was struck by cars being handled by engine due to switches being improperly lined.
13	12-24	Luna	#S-1	X-3657-E	70	7	H.R.Sale	Conductor	20	Engine derailed by hatch cover of car on track caused rough stop and injured employe in caboose.
1931						YEAR 1931				
14	1-14	Deming	S-e	X-3666-W	100	10	M.E.Schemeley	Engineer	14	Struck back of finger against some object opening blow-off cock.
15	2-21	Hargis	S-	2-220	60	12	W.Gebo	Brakeman	20	Claims stepped in hole getting off train.
16	4-5	Vaughn	#S-1	X-3655-W	70	6	S.W.VanStone	Brakeman	45	Sudden stop injured employe in caboose when engineer made emergency application of train brakes.
17	5-23	Icehouse Crossover	#S-1	2-410	100	15	H.F.Provence	Brakeman	18	Slack ran in when engineer made service application of brakes injuring employe in caboose.
18	6-7	Alamogordo	S-e	X-3653-W	91	Standing	W.G.Boswell	Fireman	15	Particles of cinders and foreign matter penetrated eye.
19	6-16	Carne	S-e	2-426	68	40	A.F.Laifeste	Engineer	9	Hot cinder in left eye.
20	6-26	Rodeo	#S-1	X-5003-W	70	15	H.E.Gilvin	Conductor	30	Service application train brakes caused run-in on rear of train injured employe in caboose.
21	7-5	Elwood	S-1	X-3655-W	70	6	C.E.Roe	Brakeman	4	Slipped on piece of slag while running for caboose after closing switch.
22	7-14	Lordsburg	S-f	412	None at time	6	F.C.Ollerton	Fireman	10	Struck hand on stock chute gate.
23	9-4	Animas	S-1	8	21	Standing	W.C.Archer	Brakeman	16	Piece of ice slipped and struck ankle.
24	12-12	Gage	#S-1	X-3317-W	102	10	R.C.Carden	Brakeman	21	Airhose burst 10th car from engine, causing emergency application of brakes and injured employe in caboose.
1932						YEAR 1932				
25	1-26	Mills	S-1	X-3415-E	2	3	B.G.Haire	Conductor	90	Fell from car to ground when brakeman cut cars, moving head out just as conductor stepped from one car to another.
26	3-25	Three Rivers	S-1	2-228	58	Standing	I.W.Sampson	Fireman	30	Fell to ground when stepped off running board of engine.
27	5-19	Arena	S-1	X-5029-W	58	Standing	S.B.Warner	Fireman	15	Foot slipped on head rod of switch, lost balance and fell to ground.

- Caused by sudden stopping, starting, lurch or jerk of car or train

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (DAYS) (i)	DESCRIPTION OF ACCIDENT (j)
	1932						YEAR 1932 (CONTINUED)			
28	5-31	Temporal	S-j	X-3307-W	100	25	R.E.Hoffman	Brakeman	30	Airhose blew off 14th car from engine, causing brakes to apply in emergency and injured employe in caboose.
29	7-6	Cacura	S-j	X-3657-E	70	5	C.C.Whittington	Conductor	24	Fell between two cars when stubbed foot against obstruction on top of car.
30	8-28	Alamogordo	S-j	X-3304-W	88	15	F.E.Hedrick	Brakeman	10	Particle of hot cinder blew in right eye.
31	10-4	Lordsburg	S-j	980	62	6	W.H.Trickett	D.H.Conductor	30	Thrown in caboose when engine coupled cabooses to train.
32	11-19	Pintado	S-f	X-3665-W	53	15	C.E.Tillery	Roadway machine oper.	30	Boom of burro-crane swung out from car in train, contacting block signal alongside track, causing crane to raise up and when settled back on car injured the employe.
33	11-26	Carrizozo	S-h	994	70	25	2 occupants of automobile		30	Automobile ran into side of train.
34	12-22	Afton	S-e	1-982	69	40	C.B.Hilton	Fireman	7	Cinder in eye account cinders on track struck by engine.
35	12-28	Deming	S-g	X-3655-E	100	Standing	F.R.Hughes	Brakeman	15	Struck knee against ladder when slipped on ice covered ladder on water car.
	1933						YEAR 1933			
36	4-10	North	S-j	X-3695-E	4	Standing	Y.Ortiz	Ex.gang L.b.	15	Rail dislodged on car being unloaded and turned over on employes foot.
37	5-26	North	S-j	X-3702-E	7	2	D.Wooten	Sec. Laborer	12	Finger caught between rail and burro crane boom as rail being loaded on car.
38	7-25	Alamogordo	S-j	X-3304-W	3	10	J.Gomez	Gen.Laborer	8	Thrown out of car by rough coupling during switching operation.
39	10-30	Desert	S-j	994	47	40	J.Moussier	Brakeman	6	Cinder blew in eye.
40	12-6	Polly	S-j	X-3694-E	100	20	A.M.Hardin	Conductor	21	Drawbar pulled out car behind engine causing emergency application of brakes and injury to employe in caboose.
41	12-12	Toboggan	S-j	971	24	12	J.E.Tompkins	Engineer	12	Grain of sand in eye.
42	12-17	Hachita	S-j	X-3019-E	96	15	J.S.McCranie	Brakeman	60	Presumably fell from top of caboose to ground when slack ran in as stop was being made in response to his fusee signal when brakeman was being left.
43	12-22	Carrizozo	S-g	X-2507-E	2	Standing	W.P.Loughrey	Brakeman	8	Fell to ground while descending from top of water car.
44	12-25	Tularosa	S-h	X-3686-E	62	Standing	2 occupants of auto truck		7 and 30	Auto truck ran into side of cars.
	1934						YEAR 1934			
45	3-22	Unknown	S-e	X-3714-E	100	20	V.T.Springer	Fireman	8	Grain of sand in eye.
46	4-19	Kenzin	S-j	X-3664-E	10	4	D.Ramirez	Ex.gang Lab.	10	Struck on side of face by piece of lumber rebounding while unloading rail from train.
47	5-9	Wooten	S-j	970	14	3	Passenger		180	Fell to floor of coach as mixed train was making water stop.
48	5-22	Paxton	S-j	X-3659-E	104	38	S.Gates F.J.Ashe	Conductor Brakeman	10 25	Airhose separated 5th car from engine causing emergency application of brakes and injury to employes in caboose.
49	6-24	Afton	S-g	1-982	70	10	J.W.Raley	Brakeman	14	Stepped on piece of ballast detraining from side ladder of car.
50	7-1	Newman	S-j	994	58	35	J.D.Richardson	Engineer	7	Cinders in eye.
51	8-12	Cuervo	S-j	X-3716-E	17	Standing	C.N.Lemmon	Brakeman	14	Fell to ground from top of between two standing cars.
52	9-3	Crogrande	S-j	970	1	5	O.L.Pruitt	Brakeman	20	Stepped on square edge of tie with toes of right foot and sprained foot.
53	9-3	Hawkins	S-j	X-3655-E	66	4	[illegible]	Brakeman	13	[illegible]

32	11-10	Pintado	S-f	X-3665-E	53	15	C.K.Tillery	Roadway Machine oper.	30	Boom of burro-crane swung out from car in train, contacting block signal alongside track, causing crane to raise up and when settled back on car injured the employe.
33	11-26	Carrizozo	S-h	994	70	25	2 occupants of automobile		30	Automobile ran into side of train.
34	12-21	Afton	S-e	1-982	69	40	C.B.Hilton	Fireman	7	Cinder in eye account cinders on track struck by engine.
35	12-26	Deming	S-g	X-3655-A	100	Standing	F.R.Hughes	Brakeman	15	Struck knee against ladder when slipped on ice covered ladder on water car.
	1933					YEAR 1933				
36	4-10	North	S-j	X-3695-B	4	Standing	Y.Ortiz	Ex.gang Lab.	15	Rail dislodged on car being unloaded and turned over on employes foot.
37	5-26	North	S-j	X-3702-E	7	2	D.Wooten	Sec. Laborer	12	Finger caught between rail and burro crane boom as rail being loaded on car.
38	7-25	Alamogordo	S-j	X-3304-B	3	10	J.Gomez	Gen.Laborer	8	Thrown out of car by rough coupling during switching operation.
39	10-30	Desert	S-j	994	47	40	J.Moussier	Brakeman	6	Cinder blew in eye.
40	12-6	Polly	S-j	X-3694-B	100	20	A.M.Hardin	Conductor	21	Drawbar pulled out car behind engine causing emergency application of brakes and injury to employe in caboose.
41	12-12	Toboggan	S-j	971	24	12	J.E.Tompkins	Engineer	12	Grain of sand in eye.
42	12-17	Hachita	S-j	X-5019-E	96	15	J.S.McCranie	Brakeman	60	Presumably fell from top of caboose to ground when slack ran in as stop was being made in response to his fusee signal when brakeman was being left.
43	12-22	Carrizozo	S-g	X-2507-E	2	Standing	W.F.Loughrey	Brakeman	8	Fell to ground while descending from top of water car.
44	12-25	Tularosa	S-h	X-3686-E	62	Standing	2 occupants of auto truck		7 and 30	Auto truck ran into side of cars.
	1934					YEAR 1934				
45	3-22	Unknown	S-c	X-3714-E	100	20	V.T.Springer	Fireman	8	Grain of sand in eye.
46	4-19	Kenzie	S-f	X-3664-E	10	4	D.Ramirez	Ex.gang Lab.	10	Struck on side of face by piece of lumber rebounding while unloading rail from train.
47	5-9	Wooten	S-j	970	14	3	Passenger		180	Fell to floor of coach as mixed train was making water stop.
48	5-22	Paxton	S-j	X-3659-E	104	18	S.Gates F.J.Ashe	Conductor Brakeman	10 25	Airhose separated 5th car from engine causing emergency application of brakes and injury to employes in caboose.
49	6-26	Afton	S-g	1-982	70	10	J.W.Raley	Brakeman	14	Stepped on piece of ballast detraining from side ladder of car.
50	7-1	Newman	S-j	994	58	35	J.D.Richardson	Engineer	7	Cinders in eye.
51	8-12	Cuervo	S-j	X-3716-E	17	Standing	C.N.Lemmon	Brakeman	14	Fell to ground from top of between two standing cars.
52	9-3	Orogrande	S-j	970	1	5	O.L.Truitt	Brakeman	20	Stepped on square edge of tie with toes of right foot and sprained foot.
53	9-3	Hawkins	S-j	X-3655-E	66	4	A.A.Dean	Brakeman	13	Lost footing and fell running to board moving caboose after closing main track switch.
54	9-6	Vaughn	S-j	994	55	8	E.G.Allen	Conductor	180	Fell to ground when lost hand hold from near top of side ladder of box car when coupled into with locomotive.
55	10-3	Alamogordo	S-j	992	47	5	G.J.Dingwall	Brakeman	5	Foreign object in eye.
56	10-13	Cuervo	S-e	X-3655-E	32	Standing	J.M.Justus	Conductor	7	Fell to ground when lost hand hold on brake wheel while letting off hand brake.
57	10-17	Alamogordo	S-j	970	2	6	C.B.McNeil	Brakeman	5	Hot sand from locomotive in eye.
58	10-21	Deming	S-j	1-980	92	4	R.C.Carden	Conductor	14	Lost hand hold on side of car of a cut of 18 cars as slack ran out of cuts as speed was reduced just prior to coupling being made.
59	12-1	Carrizozo	S-j	X-3657-E	48	2	J.Adams	Fireman	14	Hot cinder lodged in right eye.
60	12-28	Tularosa	S-j	992	36	Standing	A.L.Walker	Conductor	4	Lost footing on side ladder of car and fell about five feet to ground.
	1935					YEAR 1935				
61	3-12	Afton	S-j	X-5047-E	100	30	C.Lewis	Conductor	4	Air hose burst 2nd car from engine, causing emergency application of train brakes and injury to employe in caboose.

- Caused by sudden stopping, starting, lurch or jerk of car or train

DATE (a)	LOCATION (b)	T.&O.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (DAYS) (i)	DESCRIPTION OF ACCIDENT (j)
1935						YEAR 1935 (CONTINUED)			
62 3-20	Carrizozo	S-e	X-3656-E	None at time	1	J.W.Vickery	Brakeman	45	Hand slipped while attempting to adjust coupler on caboose preparatory to coupling engine to caboose.
63 3-30	Carrizozo	S-j	994	1	4	A.Baldonado	Sta.Laborer	12	Working inside car trying to get horse on feet, lost balance and fell when locomotive coupled into car.
64 4-1	Nestar	S-c	990	57	Standing	H.C.Bargenholt	Fireman	4	Fell to ground when hook slipped off water column spout while attempting move spout over intake opening on top of locomotive tender.
65 4-1	Tularosa	S-j	X-3699-E	40	Standing	A.G.Newell	Road Foreman of Engines	5	Fell to ground when foot slipped out of coupler carrier of dead engine.
66 4-11	Vesta	#S-j	X-5010-E	100	35	C.E.Hudson	Brakeman	21	Union in brake pipe of car became disconnected, causing emergency stop of train and injury to employe in caboose.
67 4-14	Salinas	S-j	X-3698-E	42	40	T.J.Gorman	Fireman	4	Opened blow-off cock on locomotive and foreign object struck left eye.
68 4-14	Separ	#S-j	X-5023-E	100	8	G.O.Brockmiller	Brakeman	5	Action of train when making station stop caused jar of caboose and injury to employe in caboose.
69 4-25	Orogrande	#S-j	X-3718-E	48	5	L.J.Niebig	Brakeman	15	Action of train making station stop resulted in injured employe losing balance and falling against and breaking window of caboose.
70 7-4	North	S-c	1-992	48	Standing	T.F.Gorman	Fireman	10	Placed hand in stoker mechanism.
71 8-15	Vesey	S-c	X-3695-E	101	30	E.H.Layman	Engineer	30	Scalded ankles and feet when boiler flue burst.
72 11-13	Deming	S-j	X-3687-W	67	Standing	J.Folkers	Brakeman	7	Misjudged distance to edge of stock corral platform on which standing and stepped backward off platform, falling to ground.
1936						YEAR 1936			
73 1-5	Deming	S-h	1-980	65	Standing	Occupant of automobile		90	Automobile ran into side of engine of standing train.
74 1-13	Lordsburg	S-a	X-5030-E	66	8	C.W.Adams	Brakeman	7	Lost footing and fell while detraining from pilot of locomotive.
75 2-1	Coyote	S-j	X-3692-E	67	6	R.J.Woods	Brakeman	9	Claims stepped on rock or in hole while running to line switch.
76 2-23	Alamogordo	S-e	X-3691-E	36	Standing	J.B.Perkins	Engineer	14	Finger caught in moving parts of locomotive coal stoker conveyer.
77 3-7	Deming	S-g	X-5003-E	102	4	J.D.Gomillion	Brakeman	10	Stepped on piece of rock or slag ballast while detraining from moving car.
78 4-17	Vaughn	S-g	992	54	Standing	C.H.Strauss	Brakeman	30	Slipped and fell to ground from side ladder of car.
79 4-18	Cacura	S-j	X-3699-E	41	25	J.L.Thompson	Brakeman	45	Fell from gangway of locomotive to ground.
80 4-26	Deming	S-h	X-3717-E	89	4	1 occupant of automobile 2 occupants of automobile		Killed 30	Automobile ran into side of train.
81 5-28	Booten	S-c	X-2511-E	28	Standing	R.G.Skinner	Fireman	30	Caught between water column spout and brakeman's cab on top of tender, due to failure of engineer to properly control slack action in train.
82 --4	Vaughn	S-c	X-3655-E	65	Standing	L.W.Rollans	Fireman	20	First degree burns when lost balance and fell while handling bucket hot boiler compound.
83 6-16	Ancho	S-g	X-3714-E	69	12	G.Ramsdale	Conductor	30	Lost hand hold and fell to ground attempting to board rear steps of caboose.
84 6-17	Alamogordo	#S-j	X-3692-E	100	15	P.M.Welch	Brakeman	30	Lost balance and fell from train.
85 7-18	Hachita	S-d	X-3653-E	50	2	L.L.Barker	Brakeman	20	Lost hand hold and fell from top of car to ground when coupling made during switching.

								of Engines		
66	5-17	Vevay	#S-j	X-5010-E	100	35	C.E.Hudson	Brakeman	21	Union in brake pipe of car became disconnected, causing emergency stop of train and injury to employe in caboose.
67	6-7	Salinas	S-j	X-3694-E	42	40	T.J.Gorman	Fireman	4	Opened blow-off cock on locomotive and foreign object struck left eye.
68	6-14	Sayar	#S-j	X-5023-E	100	8	G.O.Brookmiller	Brakeman	5	Action of train when making station stop caused jar of caboose and injury to employe in caboose.
69	6-25	Orogrande	#S-j	X-3716-E	48	5	L.J.Fiebig	Brakeman	15	Action of train making station stop resulted in injured employe losing balance and falling against and breaking window of caboose.
70	7-1	North	S-c	1-992	48	Standing	T.J.Gorman	Fireman	10	Placed hand in stoker mechanism.
71	8-15	Vevay	S-c	X-3695-E	101	10	E.R.Layman	Engineer	30	Scalded ankles and feet when boiler flue burst.
72	11-13	Deming	S-j	X-3687-E	67	Standing	J.Folkers	Brakeman	7	Misjudged distance to edge of stock corral platform on which standing and stepped backward off platform, falling to ground.
	1936.						YEAR 1936			
73	1-5	Deming	S-h	1-980	65	Standing	Occupant of automobile		90	Automobile ran into side of engine of standing train.
74	1-13	Lordsburg	S-h	X-5030-E	66	8	C.W.Adams	Brakeman	7	Lost footing and fell while detraining from pilot of locomotive.
75	2-1	Coyote	S-j	X-3692-E	67	6	H.F.Woods	Brakeman	9	Claims stepped on rock or in hole while running to line switch.
76	2-23	Alamogordo	S-c	X-3691-E	36	Standing	J.B.Perkins	Engineer	14	Finger caught in moving parts of locomotive coal stoker conveyer.
77	3-9	Deming	S-g	X-5003-E	102	4	J.D.Gomillion	Brakeman	10	Stepped on piece of rock or slag ballast while detraining from moving car.
78	4-17	Vaughn	S-g	992	54	Standing	C.M.Strauss	Brakeman	30	Slipped and fell to ground from side ladder of car.
79	4-18	Oscura	S-j	X-3699-E	41	25	J.L.Thompson	Brakeman	45	Fell from gangway of locomotive to ground.
80	4-26	Deming	S-h	X-3717-E	89	4	1 occupant of automobile 2 occupants of automobile		Killed 30	Automobile ran into side of train.
81	5-28	Wooten	S-c	X-2511-E	28	Standing	R.G.Skinner	Fireman	30	Caught between water column spout and brakeman's cab on top of tender, due to failure of engineer to properly control slack action in train.
82	6-10	Vaughn	S-c	X-3655-E	65	Standing	L.W.Rolland	Fireman	20	First degree burns when lost balance and fell while handling bucket hot boiler compound.
83	6-16	Ancho	S-g	X-3714-E	69	12	G.Ramsdale	Conductor	30	Lost hand hold and fell to ground attempting to board rear steps of caboose.
84	6-17	Alamogordo	#S-j	X-3692-E	100	15	P.M.Welch	Brakeman	30	Lost balance and fell from train.
85	7-18	Hachita	S-d	X-3653-E	50	2	L.L.Barker	Brakeman	20	Lost hand hold and fell from top of car to ground when coupling made during switching.
86	7-22	Orogrande-Alamogordo	S-g	992	61	Unknown	H.W.Brown	B&B helper	15	Foreign object lodged in eye while riding in outfit car.
87	8-2	Alamogordo	S-g	2-992	57	10	A.M.Hardin	Conductor	7	Stepped on some obstruction when detraining from moving car in switching movement.
[illegible]	[illegible]	Anapra	S-j	X-5011-E	19	Standing	E.L.Crowe	Brakeman	9	Tie plates falling from car struck leg when car door opened.
89	10-25	Aden	S-j	3-980	70	4	F.S.Felrce	Brakeman	5	Foreign object in eye.
90	11-14	Carrizozo	S-h	X-3700-E	28	10	1 occupant of automobile		10	Automobile ran into side of train.
	1937						YEAR 1937			
91	1-29	Simmons	S-j	990	53	12	R.R.Griggs	Brakeman	15	Lost balance and jumped from running board of engine.
92	3-1	Montoya	S-j	X-3665-E	40	Standing	C.R.Carter	Student Bkman	7	Strain while assisting in handling L.C.L. freight.
93	3-19	Lordsburg	S-g	X-5004-E	65	10	J.J.McMahon	Conductor	5	Foot slipped on rock ballast covered with oil.
94	4-17	Ancho	S-j	996	48	Standing	J.W.Walters	Student Bkman	2	Caught finger between car door and flangeway while opening car door.
95	4-29	Ancho	S-j	1-992	46	Standing	W.Cebo	Conductor	10	Finger caught between hatch cover and plug of refrigerator car.
96	5-24	Lordsburg	S-d	2-980	70	6	R.B.Miller	Brakeman	26	Lost balance and fell from top of car to ground while operating hand brake when coupling made.

- Caused by sudden stopping, starting, lurch or jerk of car or train

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (DAYS) (i)	DESCRIPTION OF ACCIDENT (j)
1937							YEAR 1937 (CONTINUED)			
97	6-30	Mongola	S-j	X-4360-E	100	25	C.E.Hudson	Brakeman	21	Sudden stop due to undesired emergency injured employe in caboose.
98	7-4	Gallinas	S-j	X-3655-E	70	5	F.B.Potts	Conductor	14	Reduction of speed of train made more quickly than anticipated, injured employe in caboose.
99	7-7	Anapra	S-j	X-5000-E	65	10	C.L.Matthews	Brakeman	13	Standing in caboose and lost balance when train reduced speed.
100	7-15	Lordsburg	S-j	2-984	58	Standing	L.F.Abbott	Conductor	9	Foreign object lodged in eye.
101	8-6	Polly	S-j	996	44	15	J.A.Handy	Fireman	4	Foreign object striking eye.
102	12-6	Hotel	S-j	970	4	7	O.L.Pruitt	Brakeman	7	Jarred from side running board of tank car to ground when car derailed during switching move.
1938							YEAR 1938			
103	5-1	Santa Rosa	S-c	990	41	Standing	C.A.Heath	Fireman	7	Slipped and fell on locomotive tender.
104	5-2	Three Rivers	S-j	X-3691-E	66	35	C.C.Word	Brakeman	5	Foreign object lodged in right eye.
105	6-9	Lordsburg	S-g	2-984	66	2	R.E.Harmon	Brakeman	4	Stepped on piece of slag ballast detraining from car.
106	6-22	Deming	S-j	2-980	60	Standing	L.A.Fail	Conductor	30	Hernia right groin when vent plug stuck.
107	6-25	Mongola	S-g	1-982	69	4	R.S.New	Brakeman	4	Stepped on rock while running to throw switch.
108	8-26	Roy	S-j	974	16	Standing	B.W.Higginbotham	Brakeman	42	Lost balance and fell from stock loading platform while assisting in closing stock car door.
109	10-12	Victorio	S-j	X-5001-E	29	35	G.M.Donegan	Brakeman	4	Foreign object lodged in eye.
110	11-12	Rodeo	S-j	X-5009-E	46	Standing	C.E.Robinson	Brakeman	7	Box of freight slipped from hands.
111	11-18	Alamogordo Jct.	S-k	971	22	Standing	1 occupant of auto-truck		30	Auto-truck ran into side of caboose of train.
112	12-1	Afton	S-g	X-4387-E	66	5	J.Jackson	Water Service helper off duty	45	Fell while detraining from car in moving train.
1939							YEAR 1939			
113	1-19	Deming	S-g	980	70	Standing	E.R.Layman	Engineer	10	Slipped and fell descending from cab of locomotive.
114	2-2	Montoya	S-j	X-3707-E	70	Standing	R.J.Woods	Brakeman	6	Stepped on rock while enroute to caboose after throwing switch.
115	2-12	Steins	S-j	X-5003-E	66	4	S.M.Stinson	Brakeman	7	Slipped on ice when running ahead to throw switch.
116	6-7	Vaughn	S-j	1-996	47	15	W.P.Dolan	Conductor	10	Lost balance and fell while descending from cupola of caboose.
117	6-15	Alamogordo	S-c	990	58	Standing	A.S.Peterson	Fireman	4	Strained shoulder account ash pan hopper door on engine sticking.
118	9-26	Chapped	S-c	4-980	59	35	J.M.Clack	Fireman	5	Foreign object lodged in eye.
119	10-18	Tularosa	S-j	X-3656-E	67	3	L.J.Benson	Conductor	13	Lost balance and fell in caboose as train being brought to a stop.
1940							YEAR 1940			
120	1-13	Carrizozo	S-j	X-3704-E	93	-	A.R.Taylor	Brakeman	6	Foreign object in eye.
121	2-13	Santa Rosa	S-j	X-3811-E	98	8	A.R.Jones J.W.Hunt	Conductor Brakeman	10 10	Cutting lever 37th car from engine lifted by some unknown person causing air to apply in emergency and injured employes in caboose
122	2-20									

101	8-6	Polly	S-j	996	44	15	J.A.Handy	Fireman	4	Foreign object striking eye.
102	12-6	Hotel	S-j	970	4	7	O.L.Pruitt	Brakeman	7	Jarred from side running board of tank car to ground when car derailed during switching move.
	1938						YEAR 1938			
103	5-1	Santa Rosa	S-c	990	41	Standing	C.A.Heath	Fireman	7	Slipped and fell on locomotive tender.
104	5-2	THree Rivers	S-j	X-3691-E	66	35	C.C.Word	Brakeman	5	Foreign object lodged in right eye.
105	6-9	Lordsburg	S-g	2-984	66	2	R.E.Harmon	Brakeman	4	Stepped on piece of slag ballast detraining from car.
106	6-22	Deming	S-j	2-980	60	Standing	L.A.[illegible]il	Conductor	30	Hernia right groin when vent plug stuck.
107	6-25	Mongola	S-g	1-982	69	4	R.S.New	Brakeman	4	Stepped on rock while running to throw switch.
108	8-26	Roy	S-j	974	16	Standing	B.W.Higginbotham	Brakeman	42	Lost balance and fell from stock loading platform while assisting in closing stock car door.
109	10-12	Victorio	S-j	X-5001-E	29	35	G.M.Donegan	Brakeman	4	Foreign object lodged in eye.
110	11-12	Rodeo	S-j	X-5009-E	46	Standing	T.E.Robinson	Brakeman	7	Box of freight slipped from hands.
111	11-18	Alamogordo Jct.	S-h	971	22	Standing	1 occupant of auto-truck		30	Auto-truck ran into side of caboose of train.
112	12-1	Afton	S-g	X-4387-E	66	5	J.Jackson	Water Service helper off duty	45	Fell while detraining from car in moving train.
	1939						YEAR 1939			
113	1-19	Deming	S-g	980	70	Standing	E.R.Layman	Engineer	10	Slipped and fell descending from cab of locomotive.
114	2-2	Montoya	S-j	X-3702-E	70	Standing	R.J.Woods	Brakeman	6	Stepped on rock while enroute to caboose after throwing switch.
115	2-12	Steins	S-j	X-5003-E	56	4	S.M.Stinson	Brakeman	7	Slipped on ice when running ahead to throw switch.
116	6-7	Vaughn	S-j	1-996	47	15	E.P.Dolan	Conductor	10	Lost balance and fell while descending from cupola of caboose.
117	6-15	Alamogordo	S-c	990	58	Standing	R.S.Peterson	Fireman	4	Strained shoulder account ash pan hopper door on engine sticking.
118	9-26	Chapman	S-c	4-980	59	35	[illegible].M.Clack	Fireman	5	Foreign object lodged in eye.
119	10-18	Tularosa	S-j	X-3656-E	67	3	L.J.Benson	Conductor	13	Lost balance and fell in caboose as train being brought to a stop.
	1940						YEAR 1940			
120	1-13	Carrizozo	S-j	X-3734-E	93	-	A.R.Taylor	Brakeman	6	Foreign object in eye.
121	2-13	Santa Rosa	S-j	X-3811-E	98	8	A.R.James J.W.Hunt	Conductor Brakeman	10 10	Cutting lever 37th car from engine lifted by some unknown person causing air to apply in emergency and injured employes in caboose.
122	2-20	Vaughn	S-j	X-3805-E	100	Standing	J.L.Chavez	Coal chute foreman	10	Fell on top of engine tender when block on tender turned over when stepped on.
123	3-13	Alamogordo	S-h	970	16	7	1 occupant of automobile		10	Automobile struck by cut of 18 cars being shoved by engine
124	3-26	Steins	S-j	2-866	61	3	J.E.Pence	Brakeman	20	Foot slipped and turned ankle walking over cattle guard.
125	3-29	Alamogordo	S-j	996	76	6	R.P.Clayton	Brakeman	6	Thrown against hand rail of caboose by adjustment of slack as train was being brought to a stop.
126	4-10	Lordsburg	S-j	X-5023-E	100	8	W.A.Kidd	Brakeman	25	Emergency application of brakes to avoid collision with another engine injured employe in caboose.
127	4-29	Kenzin	S-j	1-981	62	Standing	M.E.Huff	Brakeman	7	Foreign object lodged in eye.
128	5-23	Aden	S-g	3-980	59	6	S.R.Montoya	Extra gang laborer off duty	30	Slipped and fell from outfit car and under wheels of car in train moving on siding.
129	6-7	Cavot (M.P.@1127)	D-c	1-845	60	20	H.D.Wester	Brakeman	180	Broken flange 13th car from engine derailed it and 7 following cars. Brakeman Wester, riding on 17th car and as it started to turn over, he fell off car opposite side.

J - Caused by sudden stopping, starting, lurch or jerk of car or train

	DATE (a)	LOCATION (b)	I.C.C. CLASS (c)	TRAIN NUMBER (d)	NO. CARS IN TRAIN (e)	SPEED (M.P.H.) (f)	PERSON INJURED NAME (g)	PERSON INJURED OCCUPATION (h)	ESTIMATED DISABILITY (DAYS) (i)	DESCRIPTION OF ACCIDENT (j)
	1940						YEAR 1940 (CONTINUED)			
130	6-24	Lisbon	#S-j	X-5023-W	100	40	H.W.Bridges	Brakeman	12	Undesired application of air brakes, threw employe against some portion of caboose cupola.
131	6-28	Akela-Cambray	S-j	X-5033-W	67	10	J.P.Hendrix	Conductor	7	Foreign object lodged in eye.
132	8-5	Gallinas	S-g	996	39	6	R.L.Butler	Brakeman	15	Sprain account hand hold on engine broke off at top.
133	8-18	Nyndus	#S-j	X-3320-W	66	10	G.J.Gullander	Brakeman	10	Thrown against end of caboose when emergency application of brakes made to avoid derailment when wrong switch lined.
134	9-1	Gallinas	S-j	994	76	Standing	O.J.Bradley	Brakeman	60	Foot slipped and fell into manhole of engine tender.
135	10-26	Mosquero	S-j	975	27	Standing	R.Whitlock	Brakeman	9	Finger smashed between crate of machinery and floor of truck.
136	11-6	Lordsburg	S-j	2-980	80	Unknown	R.C.East	Brakeman	5	Foreign object entered eye.
137	11-10	Animas	S-j	962	24	Standing	J.S.McCranie	Conductor	4	Cattle loading board fell on instep.
138	11-18	Carrizozo	#S-j	X-3801-W	68	8	L.J.Benson	Conductor	7	Lost balance and fell to floor of caboose due to adjustment of slack.
139	11-26	Lordsburg	S-j	X-5013-W	70	Standing	H.F.Muse	Brakeman	30	Attacked by trespasser.

- Caused by sudden stopping, starting, lurch or jerk of car or train.

Defendant's Exhibit No. 388 (Witness J.J. Sullivan)
Apr. 29, 1941

TRAIN ACCIDENTS

REPORTED TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1930 TO 1940 INCLUSIVE

SOUTHERN PACIFIC COMPANY PACIFIC LINES
STATE OF NEW MEXICO

YEAR	FREIGHT TRAIN		COLLISIONS			DERAILMENTS			OTHER LOCOMOTIVE ACCIDENTS			MISCELLANEOUS TRAIN ACCIDENTS			
				NUMBER PER			NUMBER PER			NUMBER PER			NUMBER PER		
	TRAIN MILES (THOUSANDS)	CAR MILES (THOUSANDS)	NUMBER OF ACCIDENTS	MILLION TRAIN MILES	100 MILLION CAR MILES	NUMBER OF ACCIDENTS	MILLION TRAIN MILES	100 MILLION CAR MILES	NUMBER OF ACCIDENTS	MILLION TRAIN MILES	100 MILLION CAR MILES	NUMBER OF ACCIDENTS	MILLION TRAIN MILES	100 MILLION CAR MILES	NUM ACC
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	
1930	2,026	105,579	4	1.97	3.79	8	3.95	7.58	-	-	-	2	.99	1.89	
1931	1,693	90,092	1	.59	1.11	4	2.37	4.44	3	1.77	3.33	-	-	-	
1932	1,425	74,887	-	-	-	4	2.81	5.34	8	5.61	10.68	1	.70	1.34	
1933	1,234	68,157	1	.81	1.47	-	-	-	5	4.05	7.33	1	.81	1.47	
1934	1,375	76,168	2	1.45	2.63	2	1.45	2.63	4	2.91	5.25	2	1.46	2.62	
1935	1,569	86,706	-	-	-	2	1.27	2.31	3	1.91	3.46	2	1.28	2.30	
TOTAL 1930-1935	9,322	501,589	8	.86	1.59	20	2.14	3.99	23	2.47	4.59	8	.86	1.59	
1936	1,757	91,820	1	.57	1.09	4	2.28	4.36	5	2.84	5.44	1	.57	1.09	
1937	1,916	99,557	1	.52	1.00	6	3.13	6.03	7	3.65	7.03	3	1.57	3.02	
1938	1,749	97,543	-	-	-	5	2.86	5.13	2	1.15	2.05	-	-	-	
1939	1,784	104,419	1	.56	.96	1	.56	.96	4	2.24	3.83	-	-	-	
1940	1,676	109,583	1	.60	.91	10	5.96	9.12	7	4.18	6.39	2	1.19	1.83	
TOTAL 1936-1940	8,880	502,922	4	.45	.80	26	2.93	5.17	25	2.82	4.97	6	.67	1.19	
GRAND TOTAL 1930-1940	18,202	1,004,511	12	.66	1.20	46	2.52	4.58	48	2.64	4.78	14	.77	1.39	

SOURCE: Columns (b) and (c) - Annual Reports of Southern Pacific Company to State Corporation Commission of New Mexico.

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VE ACCIDENTS		MISCELLANEOUS TRAIN ACCIDENTS			ALL TRAIN ACCIDENTS		
NUMBER PER			NUMBER PER			NUMBER PER	
ON MILES	100 MILLION CAR MILES	NUMBER OF ACCIDENTS	MILLION TRAIN MILES	100 MILLION CAR MILES	NUMBER OF ACCIDENTS	MILLION TRAIN MILES	100 MILLION CAR MILES
	(l)	(m)	(n)	(o)	(p)	(q)	(r)
	-	2	.99	1.89	14	6.91	13.26
7	3.38	-	-	-	8	4.73	8.68
1	10.68	1	.70	1.34	13	9.12	17.36
6	7.33	1	.81	1.47	7	5.67	10.27
1	5.25	2	1.46	2.62	10	7.27	13.13
1	3.46	2	1.28	2.30	7	4.46	8.01
7	4.59	8	.86	1.59	59	6.35	11.76
4	5.44	1	.57	1.09	11	6.26	11.98
5	7.03	3	1.57	3.02	17	8.87	17.08
5	2.05	-	-	-	7	4.01	7.18
4	3.83	-	-	-	6	3.36	5.75
8	6.39	2	1.19	1.85	20	11.93	18.25
2	4.97	6	.67	1.19	61	6.87	12.13
4	4.78	14	.77	1.39	120	6.59	11.96

Commission of New Mexico.

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TOTAL TRAIN ACCIDENTS BY CLASSES AND LENGTHS OF TRAINS

	YEAR	COLLISIONS		DERAILMENTS		OTHER LOCOMOTIVE ACCIDENTS		MISCELLANEOUS TRAIN ACCIDENTS		ALL TRAIN ACCIDENTS		
		TRAINS 70 CARS AND LESS	OVER 70 CARS	TRAINS 70 CARS AND LESS	OVER 70 CARS	TRAINS 70 CARS AND LESS	OVER 70 CARS	TRAINS 70 CARS AND LESS	OVER 70 CARS	TRAINS 70 CARS AND LESS	OVER 70 CARS	TOTAL
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
(1)	1930	4	-	7	1	-	-	1	1	12	2	14
(2)	1931	1	-	4	-	3	-	-	-	8	-	8
(3)	1932	-	-	3	1	8	-	-	1	11	2	13
(4)	1933	1	-	-	-	5	-	1	-	7	-	7
(5)	1934	2	-	2	-	3	1	-	2	7	3	10
(6)	1935	-	-	2	-	2	1	1	1	5	2	7
(7)	TOTAL 1930-1935	8	-	18	2	21	2	3	5	50	9	59
(8)	1936	1	-	4	-	4	1	1	-	10	1	11
(9)	1937	1	-	5	1	7	-	2	1	15	2	17
(10)	1938	-	-	4	1	1	1	-	-	5	2	7
(11)	1939	1	-	1	-	3	1	-	-	5	1	6
(12)	1940	1	-	7	3	5	2	-	2	13	7	20
(13)	TOTAL 1936-1940	4	-	21	5	20	5	3	3	48	13	61
(14)	GRAND TOTAL 1930-1940	12	-	39	7	41	7	6	8	98	22	120

SUMMARY OF ABOVE TRAIN ACCIDENTS AS TO CAUSES AND TRAIN LENGTHS

COLLISIONS		DERAILMENTS		OTHER LOCOMOTIVE ACCIDENTS		MISCELLANEOUS TRAIN ACCIDENTS		ALL TRAIN ACCIDENTS	
70 CARS	OVER	70 CARS	OVER	70 CARS	OVER	70 CARS	OVER	70 CARS	OVER

(1)	1930	4	-	7	1	-	-	1	1	12	2	14
(2)	1931	1	-	4	-	3	-	-	-	8	-	8
(3)	1932	-	-	3	1	8	-	-	1	11	2	13
(4)	1933	1	-	-	-	5	-	1	-	7	-	7
(5)	1934	2	-	2	-	3	1	-	2	7	3	10
(6)	1935	-	-	2	-	2	1	1	1	5	2	7
(7)	TOTAL 1930-1935.	8	-	18	2	21	2	3	5	50	9	59
(8)	1936	1	-	4	-	4	1	1	-	10	1	11
(9)	1937	1	-	5	1	7	-	2	1	15	2	17
(10)	1938	-	-	4	1	1	1	-	-	5	2	7
(11)	1939	1	-	1	-	3	1	-	-	5	1	6
(12)	1940	1	-	7	3	5	2	-	2	13	7	20
(13)	TOTAL 1936-1940	4	-	21	5	20	5	3	3	48	13	61
(14)	GRAND TOTAL 1930-1940	12	-	39	7	41	7	6	8	98	22	120

SUMMARY OF ABOVE TRAIN ACCIDENTS AS TO CAUSES AND TRAIN LENGTHS

CAUSE (m)	COLLISIONS		DERAILMENTS		OTHER LOCOMOTIVE ACCIDENTS		MISCELLANEOUS TRAIN ACCIDENTS		ALL TRAIN ACCIDENTS		
	70 CARS AND LESS (n)	OVER 70 CARS (o)	70 CARS AND LESS (p)	OVER 70 CARS (q)	70 CARS AND LESS (r)	OVER 70 CARS (s)	70 CARS AND LESS (t)	OVER 70 CARS (u)	70 CARS AND LESS (v)	OVER 70 CARS (w)	TOTAL (x)
(15) Negligence of Employes	12	-	1	-	-	-	1	-	14	-	14
(16) Defects in or failures of equipment - cars	-	-	23	6	-	-	3	7	26	13	39
(17) Defects in or failures of equipment - locomotives	-	-	1	-	41	7	1	-	43	7	50
(18) Defects in or improper maintenance of way	-	-	11	1	-	-	-	-	11	1	12
(19) Miscellaneous causes	-	-	3	-	-	-	1	1	4	1	5
(20) TOTAL	12	-	39	7	41	7	6	8	98	22	120

NUMBER OF DERAILMENTS CAUSED BY DEFECTS IN OR FAILURES OF FREIGHT CAR EQUIPMENT
SEGREGATED AS TO TRAINS OF 70 CARS OR LESS AND TRAINS OF OVER 70 CARS
DESCRIPTION OR NATURE OF DEFECT OR FAILURE OF CAR EQUIPMENT AND LENGTH OF TRAIN INVOLVED

YEAR	TRUCKS		WHEELS & AXLES		AIR BRAKES AND APPURTENANCES		HAND BRAKES AND BRAKE RIGGING		COUPLERS		DRAFT RIGGING		CAR BODIES AND OTHER PARTS OF EQUIPMENT		TOTAL		G T
	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	
1930	2	-	2	1	-	-	-	-	-	-	-	-	-	-	4	1	
1931	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	
1932	-	-	1	-	-	-	-	-	-	-	-	-	1	-	2	-	
1933	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1934	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	
1935	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	
TOTAL 1930-1935	4	-	4	1	-	-	-	-	-	-	1	-	1	-	10	1	
1936	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	
1937	2	1	2	-	-	-	-	-	-	-	-	-	-	-	4	1	
1938	-	-	4	1	-	-	-	-	-	-	-	-	-	-	4	1	
1939	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1940	1	1	3	2	-	-	-	-	-	-	-	-	-	-	4	3	
TOTAL 1936-1940	3	2	10	3	-	-	-	-	-	-	-	-	-	-	13	5	
GRAND TOTAL 1930-1940	7	2	14	4	-	-	-	-	-	-	1	-	1	-	23	6	

F FREIGHT CAR EQUIPMENT
INS OF OVER 70 CARS
AND LENGTH OF TRAIN INVOLVED

RIGGING		CAR BODIES AND OTHER PARTS OF EQUIPMENT		TOTAL		GRAND	NUMBER OF DERAILMENTS PER	
	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	70 CARS OR LESS	OVER 70 CARS	TOTAL	MILLION TRAIN MILES	100 MILLION CAR MILES
	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)
	-	-	-	4	1	5	2.47	4.74
	-	-	-	2	-	2	1.18	2.22
	-	1	-	2	-	2	1.40	2.67
	-	-	-	-	-	-	-	-
	-	-	-	1	-	1	.73	1.31
	-	-	-	1	-	1	.64	1.15
	-	1	-	10	1	11	1.18	2.19
	-	-	-	1	-	1	.57	1.09
	-	-	-	4	1	5	2.61	5.02
	-	-	-	4	1	5	2.86	5.13
	-	-	-	-	-	-	-	-
	-	-	-	4	3	7	4.18	6.39
	-	-	-	13	5	18	2.03	3.58
	-	1	-	23	6	29	1.59	2.89

DETAIL OF TRAIN ACCIDENTS
WITH OR WITHOUT CASUALTIES, EXCLUDING TRESPASSERS
ROAD FREIGHT TRAIN OPERATION
REPORTED TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1930 TO 1940 INCLUSIVE

SOUTHERN PACIFIC COMPANY
LINES IN
STATE OF NEW MEXICO

	DATE (a)	LOCATION (b)	KIND OF ACCIDENT (c)	I.C.C. CLASS (d)	TRAIN NUMBER (e)	NO. CARS IN TRAIN (f)	SPEED (M.P.H.) (g)	PERSONS INJURED NAME (h)	PERSONS INJURED OCCUPATION (i)	ESTIMATED DISABILITY (DAYS) (j)	AMOUNT OF DAMAGE (k)	BRIEF DESCRIPTION OF ACCIDENT. (l)
	1930							YEAR 1930				
1	1-5	North	Derailment	D-e	229	100	30	None	-	-	$ 270	Broken cast iron wheel 42nd car from caboose, previously overheated, derailed 1 car, damaged 2 others.
2	3-10	Elida	Derailment	D-e	2-228	52	35	None	-	-	990	Loose wheel on 9th car ahead of caboose derailed one car.
3	5-12	Hachita	Miscl. Train	M-b	312	54	2	None	-	-	200	Center sill broke on 9th car from engine starting train.
4	6-1	Myndus	Derailment	D-e	2-426	68	40	None	-	-	207	Broken arch bar 34th car from caboose derailed one car.
5	6-21	Lordsburg	Collision	C-h	X-3312-E	6	15	None	-	-	880	Detached cars collided with standing cabooses during switching move by road crew.
6	6-21	Deming	Derailment	D-d	414	11	6	None	-	-	202	Cocked switch derailed 1 car during switching operation.
7	6-23	Lordsburg	Collision	C-h	3-412	70	4	None	-	-	400	Engine with caboose struck standing train too hard.
8	6-23	Tunis	Miscl. Train	M-b	X-3310-E	101	6	None	-	-	750	4th car from engine buckled due to emergency application of brakes due to train parting between 11th and 12th cars from caboose account defective lock block.
9	8-18	Continental	Derailment	D-c	X-5029-W	62	25	None	-	-	1,481	Burned off journal 24th car from engine derailed it and following two cars.
10	9-19	Hargis	Derailment	D-d	228	52	30	None	-	-	19,801	Broken rail derailed 15th to 31st cars from engine.
11	10-18	Apan	Derailment	D-e	2-312	55	35	None	-	-	20,740	Broken truck side on 28th car from engine derailed it and 14 following cars.
12	11-22	Lordsburg	Collision	C-b	X-3686-A	3	4	None	-	-	500	Engine with three cars collided with standing engine during switching move.
13	12-21	Lordsburg	Collision	C-h	X-3302-E	6	4	None	-	-	550	Engine and cars collided with standing engine during switching move.
14	12-[illegible]	Anapra	Derailment	D-e	312	60	3	None	-	-	221	Open switch point derailed engine.
	1931							YEAR 1931				
15	4-6	Switch Back	Collision	C-i	X-2506-E	4	10	None	-	-	350	Engine and head portion of train collided with standing rear portion due to engineer failing to properly control speed.
16	4-20	Arena	Derailment	D-c	X-5033-W	67	25	None	-	-	300	Engine derailed account broken spring hunger pin.
17	5-29	Rodeo	Derailment	D-d	125	46	5	None	-	-	300	Derailed 5 cars during switching move when rail turned over under car.
18	6-6	Coyote	Other Loco.	L-c	X-226	60	25	None	-	-	350	Main axle broke due to progressive fracture.
19	6-8	Bellaja	Derailment	D-i	213	21	12	None	-	-	350	Derailed 6 cars behind engine, apparently caused by rail on truck on car just behind engine.
20	7-10	Taylor	Derailment	D-c	209	21	30	None	-	-	314	One car derailed due to journal box bolts shearing off.
21	7-30	Deluna	Other Loco.	L-b	232	40	30	None	-	-	350	Left main pin failed due to progressive fracture.
22	9-1	Hachita	Other Loco.	L-b	312	55	15	None	-	-	300	Middle main rod strap broke due to flaw.

1	1-5	North	Derailment	D-c	229	100	30	None	-	-	270	Broken cast iron wheel 42nd car from caboose, previously overheated, derailed 1 car, damaged 2 others.
2	3-10	Elda	Derailment	D-c	2-228	52	35	None	-	-	990	Loose wheel on 9th car ahead of caboose derailed one car.
3	5-12	Hachita	Miscl. Train	M-b	312	54	2	None	-	-	200	Center sill broke on 9th car from engine starting train.
4	6-1	Kyndus	Derailment	D-c	2-426	68	40	None	-	-	207	Broken arch bar 34th car from caboose derailed one car.
5	6-21	Lordsburg	Collision	C-h	X-3312-E	6	15	None	-	-	880	Detached cars collided with standing cabooses during switching move by road crew.
6	6-21	Deming	Derailment	D-d	414	12	6	None	-	-	202	Cocked switch derailed 1 car during switching operation.
7	6-23	Lordsburg	Collision	C-h	3-412	70	4	None	-	-	400	Engine with caboose struck standing train too hard.
8	6-23	Tunis	Miscl. Train	M-b	X-3310-E	101	6	None	-	-	750	4th car from engine buckled due to emergency application of brakes due to train parting between 11th and 12th cars from caboose account defective lock block.
9	8-16	Continental	Derailment	D-c	X-3[illegible]-E	62	25	None	-	-	1,481	Burned off journal 24th car from engine derailed it and following two cars.
10	9-15	Hargis	Derailment	D-d	228	52	35	None	-	-	19,801	Broken rail derailed 15th to 31st cars from engine.
11	10-18	Alpan	Derailment	D-c	2-312	55	35	None	-	-	20,740	Broken truck side on 28th car from engine derailed it and 14 following cars.
12	11-22	Lordsburg	Collision	C-h	X-3680-E	3	4	None	-	-	500	Engine with three cars collided with standing engine during switching move.
13	12-21	Lordsburg	Collision	C-h	X-3302-E	6	4	None	-	-	550	Engine and cars collided with standing engine during switching move.
14	12-31	Ancapra	Derailment	D-e	312	60	3	None	-	-	221	Open switch point derailed engine.
	1931						YEAR 1931					
15	4-6	Delton Back	Collision	C-i	X-2506-E		10	None	-	-	850	Engine and head portion of train collided with standing rear portion due to engineer failing to properly control speed.
16	4-20	Arena	Derailment	D-c	X-3033-E	67	25	None	-	-	300	Engine derailed account broken spring hanger pin.
17	5-25	Rodeo	Derailment	D-d	225	46	3	None	-	-	300	Derailed 5 cars during switching move when rail turned over under car.
18	6-6	Coyote	Other Loco.	L-c	1-226	60	25	None	-	-	350	Main axle broke due to progressive fracture.
19	6-8	Dallas	Derailment	D-i	312	22	12	None	-	-	350	Derailed 6 cars behind engine, apparently caused by rigid truck on car just behind engine.
20	7-4	Taylor	Derailment	D-c	209	21	20	None	-	-	314	One car derailed due to journal the bolts shearing off.
21	7-10	Lazare [illegible]	Other Loco.	L-b	232	40	30	None	-	-	350	Left main pin failed due to progressive fracture.
22	9-7	Hachita	Other Loco.	L-b	312	55	15	None	-	-	300	Middle main rod strap broke due to flaw.
	1932						YEAR 1932					
23	1-4	Alamogordo	Derailment	D-g	X-3016-E	46	12	None	-	-	575	Derailed 25th, 30th, 38th, 43rd and 44th cars from engine account section foreman closing switch rods for inspection spiked right switch point against rail, leaving left point free.
24	1-23	Duran	Other Loco.	L-c	X-3660-E	44	Standing	None	-	-	300	Main driving axle broken account progressive fracture 93%.
25	2-23	Hensin	Derailment	D-d	2-410	71	5	None	-	-	215	Engine derailed in siding account broken rail.
26	3-13	Gamble	Other Loco.	L-c	2-228	52	15	None	-	-	500	Driving wheel tires slid flat due to engineer holding speed of train with independent brake.
27	3-17	Trail Spur	Derailment	D-c	X-3413-E	18	10	None	-	-	190	Derailed 3 cars due to middle cone end of car switching in switch.
28	3-26	Three Rivers	Derailment	D-c	X-3687-E	70	30	None	-	-	1,077	Broken wheel 43rd car from caboose derailed the one car.

	DATE (a)	LOCATION (b)	KIND OF ACCIDENT (c)	I.C.C. CLASS (d)	TRAIN NUMBER (e)	NO. CARS IN TRAIN (f)	SPEED (M.P.H.) (g)	PERSONS INJURED NAME (h)	PERSONS INJURED OCCUPATION (i)	ESTIMATED DISABILITY (DAYS) (j)	AMOUNT OF DAMAGE (k)	BRIEF DESCRIPTION OF ACCIDENT (l)
	1932							YEAR 1932 (CONTINUED)				
29	6-23	Monument	Other Loco.	L-e	960	61	20	None	-	-	300	Broken main axle due to progressive fracture.
30	7-12	Miriam	Other Loco.	L-e	X-5027-W	48	20	None	-	-	180	Broken main axle due to progressive fracture.
31	7-18	Anapra	Miscl.Train	M-b	982	91	5	None	-	-	250	End of 26th car from engine pulled out due to emergency application of brakes account broken train line.
32	8-8	Orade	Other Loco.	L-b	X-5012-W	70	25	None	-	-	2,422	Loose cross-head key, shearing rivet in key, allowed cross-head key to come out.
33	9-22	Noria	Other Loco.	L-e	X-5004-W	45	25	None	-	-	250	Main axle broken account progressive fracture.
34	10-6	Vaughn	Other Loco.	L-e	933	None at time	2	None	-	-	250	Broken main axle.
35	11-29	Duran	Other Loco.	L-b	X-3665-W	62	30	None	-	-	300	Left main rod broken account old progressive fracture.
	1933							YEAR 1933				
36	1-14	Varney	Miscl.Train	M-b	X-3682-W	67	12	None	-	-	710	Two cars damaged when emergency application of brakes occurred to train becoming uncoupled by engine due to low coupler on engine tender.
37	1-25	Gallinas	Other Loco.	L-e	X-3654-W	70	10	None	-	-	225	Main axle on locomotive broke account progressive fracture.
38	3-20	Alamogordo	Other Loco.	L-e	X-3714-W	78	Standing	None	-	-	250	Broken main driving journal account progressive fracture.
39	4-26	Vaughn	Collision	C-h	994	52	2	None	-	-	250	Rear 36 cars standing train started to move account insufficient hand brakes set, and collided with standing 16 cars attached to engine which had moved ahead.
40	6-2	Steins	Other Loco.	L-b	1-868	40	20	None	-	-	400	Piston broke on engine and knocked front cylinder head out of middle cylinder.
41	7-18	Orogrande	Other Loco.	L-e	X-3713-W	63	25	None	-	-	300	Main axle on engine broke.
42	10-22	Ford	Other Loco.	L-b	X-5027-W	65	30	None	-	-	300	Middle crank pin broke account progressive fracture.
	1934							YEAR 1934				
43	1-26	Deming	Miscl.Train	M-b	1-982	100	6	None	-	-	550	Empty stock car 29th from engine buckled as train being brought to a stop.
44	2-7	Alamogordo	Other Loco.	L-b	X-3700-W	61	30	None	-	-	300	Driving journal cut due to ineffective lubrication.
45	4-9	Carrizozo	Collision	C-h	X-3699-W	3	4	None	-	-	450	Engine and 3 cars collided with other cars during switching move by road crew.
46	4-22	Anapra	Miscl.Train	M-b	X-3667-W	101	20	None	-	-	892	Five cars damaged when emergency application of brakes occurred due to train parting account coupler shank breaking on 10th car from engine.
47	5-29	Tucumcari	Derailment	D-d	975	25	5	None	-	-	176	Derailed 2 cars account defective frog.
48	5-25	Folly	Other Loco.	L-e	992	50	30	None	-	-	300	Main axle broke account progressive failure.
49	6-15	Hargis	Other Loco.	L-b	X-3716-W	90	10	None	-	-	200	Left main crank pin worked loose in wheel fit.
50	7-20	Columbus	Other Loco.	L-e	X-5034-W	63	5	None	-	-	250	Main driving axle broken account progressive fracture.
51	8-29	Leoncita	Derailment	D-e	2-994	52	30	None	-	-	660	Coupler pulled out 3rd car from engine and dropped on track derailing three cars, due to failure of engineer to control slack action in train.

35	11-29	Duran	Other Loco.	L-b	X-3665-W	62	30	None	-	-	300	Left main rod broken account old progressive fracture.
	1933							YEAR 1933				
36	1-14	Varney	Miscl.Train	M-b	X-3682-W	67	12	None	-	-	710	Two cars damaged when emergency application of brakes occurred to train becoming uncoupled by engine due to low coupler on engine tender.
37	1-25	Gallinas	Other Loco.	L-c	X-3654-W	70	10	None	-	-	225	Main axle on locomotive broke account progressive fracture.
38	3-20	Alamogordo	Other Loco.	L-c	X-3714-W	70	Standing	None	-	-	250	Broken main driving journal account progressive fracture.
39	4-26	Vaughn	Collision	C-h	994	52	2	None	-	-	250	Rear 36 cars standing train started to move account insufficient hand brakes set, and collided with standing 16 cars attached to engine which had moved ahead.
40	6-2	Steins	Other Loco.	L-b	1-868	40	20	None	-	-	400	Piston broke on engine and knocked front cylinder head out of middle cylinder.
41	7-18	Oregrande	Other Loco.	L-c	X-3713-W	63	25	None	-	-	300	Main axle on engine broke.
42	10-27	Ford	Other Loco.	L-b.	X-5027-W	65	30	None	-	-	300	Middle crank pin broke account progressive fracture.
	1934							YEAR 1934				
43	1-26	Deming	Miscl.Train	M-b	1-982	100	6	None	-	-	550	Empty stock car 29th from engine buckled as train being brought to a stop.
44	2-7	Alamogordo	Other Loco.	L-b	X-3700-W	61	30	None	-	-	300	Driving journal cut due to ineffective lubrication.
45	4-9	Carrizoso	Collision	C-h	X-3699-W	3	4	None	-	-	450	Engine and 3 cars collided with other cars during switching move by road crew.
46	4-22	Anapra	Miscl.Train	M-b	X-3667-W	101	20	None	-	-	892	Five cars damaged when emergency application of brakes occurred due to train parting account coupler shank breaking on 10th car from engine.
47	5-29	Tucumcari	Derailment	D-d	975	25	5	None	-	-	176	Derailed 2 cars account defective frog.
48	5-25	Pelly	Other Loco.	L-c	992	50	30	None	-	-	300	Main axle broke account progressive failure.
49	6-15	Hargis	Other Loco.	L-b	X-3716-W	90	10	None	-	-	200	Left main crank pin worked loose in wheel fit.
50	7-20	Columbus	Other Loco.	L-c	X-5034-W	63	5	None	-	-	250	Main driving axle broken account progressive fracture.
51	8-29	Leoncita	Derailment	D-c	2-994	52	30	None	-	-	660	Coupler pulled out 3rd car from engine and dropped on track derailing three cars, due to failure of engineer to control slack action in train.
52	10-15	Mastodon	Collision	C-h	X-5033-W	48	6	None	-	-	511	Collision between cars of train during switching move due to failure of engineer to promptly and properly act on stop signals.
	1935							YEAR 1935				
53	1-27	Bowen	Derailment	D-h	3-980	65	10	None	-	-	3,123	Engine and 2 cars derailed due to rocks placed on rails by two boys.
54	2-20	Fronto	Other Loco.	L-c	1-982	97	30	None	-	-	500	Driving axle on engine broke account progressive fracture.
55	5-12	Afton	Derailment	D-c	4-980	70	35	None	-	-	470	Broken axle on 17th car from caboose derailed the car.
56	6-13	Hachita	Miscl.Train	M-b	X-5009-W	65	4	None	-	-	200	Water column damaged due to failure to move spout to proper clearance away from track.
57	7-23	Winkle	Other Loco.	L-b	990	55	30	None	-	-	250	Broken guide bolts on locomotive.
58	9-21	Walnut	Other Loco.	L-b	X-2505-E	4	5	None	-	-	200	Broken main rod strap account progressive failure.
59	11-25	Lanark	Miscl.Train	M-b	984	108	35	None	-	-	166	Knuckles slipped by 81st and 82nd cars from engine due to worn knuckle pin holes, causing emergency application of train brakes resulting in draw bars being pulled out 9th and 18th cars from engine.

	DATE (a)	LOCATION (b)	KIND OF ACCIDENT (c)	I.C.C. CLASS (d)	TRAIN NUMBER (e)	NO. CARS IN TRAIN (f)	SPEED (M.P.H.) (g)	PERSONS INJURED NAME (h)	PERSONS INJURED OCCUPATION (i)	ESTIMATED DISABILITY (DAYS) (j)	AMOUNT OF DAMAGE. (k)	BRIEF DESCRIPTION OF ACCIDENT (l)
	1936							YEAR 1936				
60	3-10	Dona	Other Loco.	L-b	1-980	98	25	None	-	-	$ 465	Middle rod strap broke account 40% progressive fracture.
61	3-22	Cloudcroft	Derailment	D-d	X-2511-W	24	10	None	-	-	756	Car derailed as result of low spot in track and slightly curve worn rail, causing rocking motion of car while moving off 12° to 4° curve on 3.6% descending grade.
62	4-3	Paloma	Other Loco.	L-b	994	49	12	None	-	-	400	Front and middle side rods broke caused by knuckle pin working out due to excessive wear, shearing nut and key.
63	6-7	Aden	Other Loco.	L-c	X-3300-W	61	Standing	None	-	-	350	Main driving axle broken.
64	6-19	Pastura	Other Loco.	L-b	990	53	40	None	-	-	300	Main rod and piston rod bent when guide bolts broke.
65	8-5	Hawks	Derailment	D-g	X-3717-W	38	2	None	-	-	389	Four cars derailed while switching account switch having been previously run through.
66	8-31	Lanark	Miscl.Train	M-b	3-980	64	40	None	-	-	350	Car in train damaged by fire from undetermined origin.
67	9-2	Carrizozo	Derailment	D-d	992	2	4	None	-	-	812	Locomotive derailed account defective condition of rail in track.
68	10-19	Winkle	Other Loco.	L-b	1-994	50	35	None	-	-	450	Guide bolts broke account progressive fracture.
69	11-8	Cavot (MP 1126)	Derailment	D-c	X-5019-W	40	18	None	-	-	520	Broken axle - 13th car ahead of caboose, derailed the car.
70	11-8	Lordsburg	Collision	C-d	X-5021-E	2	2	None	-	-	350	Light engine being moved by roundhouse employes from coal chute to delivery track struck engine and two cars being handled by road crew.
	1937							YEAR 1937				
71	1-13	Ladin	Other Loco.	L-b	1-980	67	35	None	-	-	350	Middle main rod broke account old fracture.
72	2-7	Ulmerria	Derailment	D-c	X-5028-W	61	35	None	-	-	17,955	Car derailed account car journal burned off due to overheating and ran on ties for about ¼ miles.
73	2-16	Coyote	Other Loco.	L-b	X-3686-W	70	35	None	-	-	2,651	Guide bolts failed account progressive fracture.
74	2-24	Hargis	Derailment	D-c	1-992	51	35	None	-	-	1,179	Journal broke on 11th car ahead of caboose derailing car.
75	3-13	Columbus	Derailment	D-c	964	42	25	None	-	-	214	One car derailed account failure of truck side.
76	3-23	Hermanas	Miscl.Train	M-b	X-3304-W	35	30	None	-	-	1,908	Journal failed on car
77	4-27	Kemin	Miscl.Train	M-b	X-5031-W	100	40	None	-	-	175	Train parted, damaging equipment, due to conductor stopping train by use of conductor's valve in caboose.
78	5-19	Santa Rosa	Other Loco.	L-c	X-3699-W	70	15	None	-	-	443	Broken main driving axle due to progressive fracture.
79	6-5	Grade	Collision	C-b	X-5028-W	59	4	None	-	-	600	Engine shoving caboose collided with cut of cars that were to be picked up in train.
80	7-1	Cuervo	Miscl.Train	M-b	X-3716-W	70	12	None	-	-	250	M.of W. car in train damaged when air applied from caboose to stop train.
81	7-3	Lizard	Derailment	D-c	X-5019-W	100	25	None	-	-	868	Four cars derailed account truck bolster and truck frame "locking" on 15th car from caboose.
82	7-8	Paloma	Other Loco.	L-b	990	52	20	None	-	-	250	Left main pin bent account breaking or shearing of tapered pin of combination lever.
83	7-9	Potrillo	Other Loco.	L-c	X-5027-W	32	6	None	-	-	300	Main driving axle broken while switching.
84	8-18	Mongola	Other Loco.	L-c	1-980	69	35	None	-	-	220	Main driving tire broke.
85	8-22	Mongola	Derailment	D-c	3-980	70	35	None	-	-	234	Broken truck side frame derailed 22nd car from caboose.

65	8-5	Hawks	Derailment	D-g	X-3717-W	38	2	None	-	-	389	Four cars derailed while switching account switch having been previously run through
66	8-31	Lamar	Misel.Train	M-b	3-980	64	40	None	-	-	350	Car in train damaged by fire from undetermined origin.
67	9-2	Carrizozo	Derailment	D-d	.992	2	4	None	-	-	812	Locomotive derailed account defective condition of rail in track
68	10-19	Winkle	Other Loco.	L-b	1-994	50	35	None	-	-	450	Guide bolts broke account progressive fracture.
69	11-8	Cavot (MP 1126)	Derailment	D-c	X-5019-W	40	18	None	-	-	520	Broken axle - 13th car ahead of caboose, derailed the car.
70	11-8	Lordsburg	Collision	C-d	X-5021-E	2	2	None	-	-	350	Light engine being moved by roundhouse employes from coal chute to delivery track struck engine and two cars being handled by road crew.
	1937							YEAR 1937				
71	1-13	Ladim	Other Loco.	L-b	1-980	67	35	None	-	-	350	Middle main rod broke account old fracture.
72	2-7	Ulmorris	Derailment	D-c	X-5028-W	61	35	None	-	-	17,955	Car derailed account car journal burned off due to overheating and ran on ties for about 4 miles.
73	2-16	Coyote	Other Loco.	L-b	X-3686-W	70	35	None	-	-	2,651	Guide bolts failed account progressive fracture.
74	2-24	Hargis	Derailment	D-c	1-992	51	35	None	-	-	1,179	Journal broke on 11th car ahead of caboose derailing car.
75	3-13	Columbus	Derailment	D-c	964	42	25	None	-	-	214	One car derailed account failure of truck side.
76	3-23	Hermanas	Misel.Train	M-b	X-3304-W	35	30	None	-	-	1,908	Journal failed on car
77	4-27	Kemsin	Misel.Train	M-b	X-5031-W	100	40	None	-	-	175	Train parted, damaging equipment, due to conductor stopping train by use of conductor's valve in caboose.
78	5-19	Santa Rosa	Other Loco.	L-c	X-3699-W	70	15	None	-	-	443	Broken main driving axle due to progressive fracture.
79	6-5	Grade	Collision	C-h	X-5028-W	59	4	None	-	-	600	Engine shoving caboose collided with cut of cars that were to be picked up in train.
80	7-1	Cuervo	Misel.Train	M-b	X-3716-W	70	12	None	-	-	250	M.of W. car in train damaged when air applied from caboose to stop train.
81	7-3	Lizard	Derailment	D-c	X-5019-W	100	25	None	-	-	868	Four cars derailed account truck bolster and truck frame "locking" on 15th car from caboose.
82	7-9	Palomas	Other Loco.	L-b	990	52	20	None	-	-	250	Left main pin bent account breaking or shearing of tapered pin of combination lever.
83	7-9	Potrillo	Other Loco.	L-c	X-5027-W	32	6	None	-	-	300	Main driving axle broken while switching.
84	8-18	Mongola	Other Loco.	L-c	1-980	69	35	None	-	-	220	Main driving tire broke.
85	8-22	Mongola	Derailment	D-c	3-980	70	35	None	-	-	234	Broken truck side frame derailed 22nd car from caboose.
86	10-21	Oregrande	Other Loco.	L-b	994	70	Standing	None	-	-	250	Cross-head and driving journal damaged.
87	10-31	Strauss	Derailment	D-d	X-3702-W	45	10	None	-	-	250	Derailed 13th car from engine, due to improper elevation in track on turn-out.
	1938							YEAR 1938				
88	3-9	Nondal	Derailment	D-c	X-5031-W	63	35	None	-	-	16,599	Loose wheel 23rd car from engine derailed car and damaged track.
89	4-2	Aden	Derailment	D-c	2-984	69	20	None	-	-	2,703	Car derailed account overheated journal burning off.
90	5-6	Deem	Other Loco.	L-c	2-984	85	35	None	-	-	155	Main driving tire broke account flaw.
91	6-9	Lordsburg	Derailment	D-c	1-984	68	6	None	-	-	478	Broken flange 25th car from caboose derailed it and 2 other cars
92	6-23	Largo	Other Loco.	L-b	X-3717-W	50	30	None	-	-	2,000	Engine damaged account knuckle and main rod wedge breaking.
93	12-6	Wilna	Derailment	D-c	X-3687-W	95	35	None	-	-	5,249	Broken overheated wheel derailed one car.
94	12-14	Lizard	Derailment	D-c	1-980	68	30	None	-	-	2,780	Loose wheel 7th car from engine derailed the car.

	DATE (a)	LOCATION (b)	KIND OF ACCIDENT (c)	I.C.C. CLASS (d)	TRAIN NUMBER (e)	NO. CARS IN TRAIN (f)	SPEED (M.P.H.) (g)	PERSONS INJURED NAME (h)	PERSONS INJURED OCCUPATION (i)	ESTIMATED DISABILITY (DAYS) (j)	AMOUNT OF DAMAGE (k)	BRIEF DESCRIPTION OF ACCIDENT (l)
	1939							YEAR 1939				
95	2-10	Vaughn	Derailment	D-e	X-3699-E	70	5	None	-	-	$ 236	Engine pony truck derailed account frozen cinders and snow o on rails.
96	7-16	Tecolote	Other Loco.	L-b	X-3700-W	47	35	None	-	-	200	Left piston became loose in cross-head.
97	9-5	Steins	Other Loco.	L-c	2-866	70	15	None	-	-	500	Axle broke on engine.
98	9-23	El Paso-Lordsburg	Other Loco.	L-c	3-981	55	-	None	-	-	500	Driving tires slid flat account failure of engineer to pr ope handle air brakes on engine.
99	11-29	Santa Rosa	Collision	C-h	996 X-3806-E	105 67	8 Standing	None	-	-	936	Engine of No. 996 backing on main track with 35 cars behind gine collided with caboose of Extra 3806 West standing on ma track.
100	12-3	Lamark	Other Loco.	L-c	X-3700-W	89	20	None	-	-	175	Cut journal on main driver of engine.
	1940							YEAR 1940				
101	1-5	Mongola	Miscl.Train	M-b	X-5023-W	99	40	None	-	-	225	Equipment damaged account of emergency application of brake from caboose.
102	1-22	Santa Rosa	Miscl.Train	M-b	X-3802-W	89	3	None	-	-	203	Unknown person stepped on cutting lever 14th car from caboos causing emergency application of brakes and damaged 1st car 16th car from engine.
103	2-7	Russia	Derailment	D-d	971	18	15	None	-	-	418	Six cars derailed account wide gage of track.
104	2-25	Desert	Derailment	D-c	994	70	40	None	-	-	398	Broken truck side derailed one car.
105	2-28	Mongola	Other Loco.	L-b	X-3704-W	61	35	None	-	-	350	Broken main pin on locomotive.
106	3-12	Akela	Derailment	D-g	X-5020-W	65	40	None	-	-	5,005	Broken overheated wheel derailed 4 cars.
107	3-21	Vevay	Derailment	D-c	1-980	100	40	None	-	-	200	Broken truck side derailed one car.
108	4-26	Cox Canon	Derailment	D-i	971	17	12	None	-	-	225	Two cars derailed account improperly balanced load of logs o
109	5-15	Torrance	Other Loco.	L-e	X-3808-E	100	18-20	None	-	-	1,890	Undesired emergency application of brakes due to some object striking branch pipe on car, slid drivers on engine.
110	5-31	Deming	Other Loco.	L-c	3-981	61	10	None	-	-	265	Driving axle broke.
111	6-7	Cavot (MP 1127)	Derailment	D-c	1-845	60	20	H.D.Wester	Brakeman	180	6,320	Broken flange 18th car from engine, derailed it and 7 follow cars. Injured brakeman was riding on 19th car from engine.
112	7-21	Anapra	Derailment	D-c	962	38	4	None	-	-	1,047	During back-up movement of 12 cars, wheel on rear truck split

		Lordsburg										handle air brakes on engine.
99	11-29	Santa Rosa	Collision	C-h	996 X-3806-W	105 67	8 Standing	None	-	-	936	Engine of No. 996 backing on main track with 35 cars behin gine collided with caboose of Extra 3806 West standing on m track.
100	12-3	Lanark	Other Loco.	L-c	X-3700-W	89	20	None	-	-	175	Cut journal on main driver of engine.
	1940						YEAR 1940					
101	1-5	Mongola	Miscl.Train	M-b	X-5023-W	99	40	None	-	-	225	Equipment damaged account of emergency application of brak from caboose.
102	1-22	Santa Rosa	Miscl.Train	M-b	X-3802-W	89	3	None	-	-	203	Unknown person stepped on cutting lever 14th car from caboo causing emergency application of brakes and damaged 1st car 16th car from engine.
103	2-7	Russia	Derailment	D-d	971	18	15	None	-	-	418	Six cars derailed account wide gage of track.
104	2-25	Desert	Derailment	D-c	994	70	40	None	-	-	398	Broken truck side derailed one car.
105	2-28	Mongola	Other Loco.	L-b	X-3704-W	61	35	None	-	-	350	Broken main pin on locomotive.
106	3-12	Akela	Derailment	D-g	X-5020-W	65	40	None	-	-	5,005	Broken overheated wheel derailed 4 cars.
107	3-21	Vevay	Derailment	D-c	1-980	100	40	None	-	-	200	Broken truck side derailed one car.
108	4-26	Cox Canon	Derailment	D-i	971	17	12	None	-	-	225	Two cars derailed account improperly balanced load of logs
109	5-15	Torrance	Other Loco.	L-e	X-3808-W	100	18-20	None	-	-	1,890	Undesired emergency application of brakes due to some objec striking branch pipe on car, slid drivers on engine.
110	5-31	Deming	Other Loco.	L-c	3-981	61	10	None	-	-	265	Driving axle broke.
111	6-7	Cavot (MP 1127)	Derailment	D-c	1-845	60	20	H.D.Wester	Brakeman	180	6,320	Broken flange 18th car from engine, derailed it and 7 follo cars. Injured brakeman was riding on 19th car from engine.
112	7-21	Anapra	Derailment	D-c	962	38	4	None	-	-	1,047	During back-up movement of 12 cars, wheel on rear truck spl switch point due to thin flange.
113	8-4	Carrizozo- Tucumcari	Other Loco.	L-e	2-992	69	-	None	-	-	1,500	Three pair locomotive drivers slid flat due to mishandling air by engineer.
114	9-25	Toboggan	Collision	C-h	970	7	5	None	-	-	200	Engine tender damaged when severe coupling to train was mad
115	10-6	Desert	Derailment	D-g	990	84	40	None	-	-	617	One car derailed account broken overheated journal on car.
116	10-22	Pintado	Derailment	D-g	994	95	35	None	-	-	2,092	Broken overheated wheel derailed the one car.
117	12-1	Hachita	Other Loco.	L-c	962	56	15	None	-	-	350	Loose tire came off engine.
118	12-12	Lordsburg	Other Loco.	L-e	1-862	48	10	None	-	-	3,000	Dri[illegible] slid flat when making stop to avoid collision.
119	12-18	Anapra	Other Loco.	L-e	X-3686-W	100	10	None	-	-	200	D[illegible] slid flat.
120	12-25	Lordsburg	Derailment	D-g	X-5029-W	2	2	None	-	-	221	[illegible] derailed account split switch.

Defendant's Exhibit No. 389 (Witness J.J. Sullivan)

COMPARISON OF
NUMBER, AND ACCIDENT RATE PER MILLION FREIGHT TRAIN MILES AND
PER 100 MILLION FREIGHT TRAIN CAR MILES
DERAILMENTS DUE TO DEFECTS IN OR FAILURES OF FREIGHT CAR EQUIPMENT
NEW MEXICO, ARIZONA AND NEVADA
1930 TO 1940 INCLUSIVE
AS REFLECTED IN EXHIBIT NO. 388 COVERING NEW MEXICO,
EXHIBIT NO. 286 COVERING ARIZONA, AND EXHIBIT NO. 287 COVERING NEVADA

	Exh. 388	Exh. 286	Exh. 287	Exh. 388	Exh. 286	Exh. 287	Exh. 388	Exh. 286	Exh. 287
	NUMBER OF DERAILMENTS			TRAIN MILE BASIS			CAR MILE BASIS		
YEAR	NEW MEXICO	ARIZONA	NEVADA	NEW MEXICO	ARIZONA	NEVADA	NEW MEXICO	ARIZONA	NEVADA
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
1930	5	5	5	2.47	1.94	2.43	4.74	3.53	3.38
1931	2	4	3	1.18	1.81	1.76	2.22	3.33	2.43
1932	2	1	-	1.40	.54		2.67	.99	-
1933	-	3	2	-	1.84	1.47	-	3.29	1.91
1934	1	2	3	.73	1.11	1.98	1.31	1.95	2.46
1935	1	3	-	.64	1.43	-	1.15	2.53	-
TOTAL 1930-1935	11	18	13	1.18	1.48	1.34	2.19	2.67	1.77
1936	1	2	4	.57	.82	2.07	1.09	1.51	2.76
1937	5	12	5	2.61	4.32	2.49	5.02	8.10	3.30
1938	5	4	3	2.86	1.74	1.82	5.13	3.08	2.28
1939	-	2	1		78	.55	-	1.40	.69
1940	7	4	5	4.18	1.44	2.44	6.39	2.57	3.04
TOTAL 1936-1940	18	24	18	2.03	1.87	1.91	3.58	3.38	2.45
GRAND TOTAL 1930-1940	29	42	31	1.59	1.68	1.62	2.89	3.03	2.11

Defendant's Exhibit No. 390 (Witness)
Apr. 29, 1941

TRAIN ACCIDENTS
SHOWING CLASSES AND CAUSES
CLASS I RAILROADS OF THE UNITED STATES
REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

					COLLISIONS					DERAILMENTS					LOCOMOTIVE BOILER ACCIDE		
					CAUSE					CAUSE					CAUSE		
	YEAR	TOTAL LOCOMOTIVE MILES (THOUSANDS)	TOTAL TRAIN MILES (THOUSANDS)	TOTAL CAR MILES (THOUSANDS)	NEGLIGENCE OF EMPLOYES	DEFECTS IN OR FAILURES OF EQUIPMENT	DEFECTS IN OR IMPROPER MAINTENANCE OF WAY AND STRUCTURES	MISCELLANEOUS	TOTAL NUMBER OF COLLISIONS	NEGLIGENCE OF EMPLOYES	DEFECTS IN OR FAILURES OF EQUIPMENT	DEFECTS IN OR IMPROPER MAINTENANCE OF WAY AND STRUCTURES	MISCELLANEOUS	TOTAL NUMBER OF DERAILMENTS	NEGLIGENCE OF EMPLOYES	DEFECTS IN OR FAILURES OF EQUIPMENT	MISCELLANEOUS
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)
(1)	1923	1,756,170	1,245,099	29,432,500	5,982	665	15	319	6,981	1,597	8,356	3,589	2,720	16,262	46	6	15
(2)	1924	1,672,584	1,204,302	28,889,085	4,389	429	9	231	5,068	1,345	6,640	3,501	2,423	13,909	28	7	7
(3)	1925	1,697,798	1,220,846	30,785,543	4,464	354	7	220	5,045	1,386	5,712	3,115	2,191	12,404	18	5	6
(4)	1926	1,776,071	1,248,897	32,666,043	4,597	339	14	218	5,168	1,365	5,514	3,084	2,246	12,209	23	1	2
(5)	1927	1,728,040	1,220,987	32,462,178	4,168	310	14	206	4,698	1,310	5,082	2,561	2,099	11,052	18	2	1
(6)	1928	1,698,744	1,202,678	32,994,940	3,735	266	5	186	4,192	1,254	4,558	2,059	1,753	9,624	23	1	-
(7)	TOTAL 1923-1928	10,331,407	7,342,809	187,230,289	27,325	2,363	64	1,380	31,152	8,257	35,862	17,909	13,432	75,460	156	22	31
(8)	PERCENTAGE OF TOTAL SHOWN IN COLUMN (dd)				21.99	1.92	.05	1.11	25.07	6.64	28.85	14.41	10.81	60.71	.13	.02	.02
(9)	1929	1,731,883	1,214,360	33,828,943	3,917	269	2	145	4,333	1,445	4,463	1,923	1,728	9,557	11	3	2
(10)	1930	1,550,246	1,106,386	30,177,598	2,654	183	7	72	2,916	1,090	3,242	1,277	1,141	6,750	22	-	1
(11)	1931	1,327,487	965,181	25,608,792	1,710	82	-	94	1,886	749	2,024	869	825	4,467	11	3	-
(12)	1932	1,104,953	821,158	20,350,867	1,125	69	-	45	1,239	515	1,467	626	626	3,244	8	-	-
(13)	1933	1,080,916	786,720	20,597,254	1,088	62	1	37	1,188	457	1,478	615	637	3,187	11	3	1
(14)	1934	1,184,043	818,473	22,179,787	1,185	52	3	51	1,291	457	1,640	412	684	3,293	16	6	1
(15)	TOTAL 1929-1934	7,918,628	5,712,278	152,743,239	11,679	717	13	444	12,853	4,713	14,314	5,932	5,639	30,598	83	15	5
(16)	PERCENTAGE OF TOTAL SHOWN IN COLUMN (dd)				21.75	1.33	.03	.83	23.94	8.78	26.66	11.05	10.50	56.99	.15	.03	.01
(17)	1935	1,149,494	829,198	22,512,343	1,130	55	-	37	1,222	510	1,727	754	836	3,827	7	1	1
(18)	1936	1,285,048	905,749	25,546,220	1,575	83	4	64	1,726	612	2,283	945	950	4,790	13	1	-
(19)	1937	1,310,646	933,219	26,668,096	1,610	76	2	72	1,760	644	2,065	960	1,021	4,690	11	7	-
(20)	1938	1,132,482	825,682	23,241,538	1,027	50	2	44	1,123	457	1,248	654	741	3,100	11	3	-
(21)	1939	1,190,362	853,179	25,258,741	1,326	58	3	40	1,429	573	1,157	652	701	3,083	7	1	1
(22)	TOTAL 1935-1939	6,068,032	4,347,027	123,348,941	6,668	322	13	257	7,260	2,796	8,550	3,965	4,249	19,560	49	13	1
(23)	PERCENTAGE OF TOTAL SHOWN IN COLUMN (dd)				19.80	.96	.04	.76	21.56	8.30	25.39	11.77	12.62	58.07	.14	.04	.01

		MISCELLANEOUS TRAIN ACCIDENTS					ALL TRAIN ACCIDENTS									
		CAUSE					CAUSE					NUMBER OF ACCIDENTS PER			NUMBER OF CASUALTIES TRAINMEN AND ENGINE IN THESE ACCIDEN	
	YEAR	NEGLIGENCE OF EMPLOYES	DEFECTS IN OR FAILURES OF EQUIPMENT	DEFECTS IN OR IMPROPER MAINTENANCE OF WAY AND STRUCTURES	MISCELLANEOUS	TOTAL NUMBER OF MISCELLANEOUS TRAIN ACCIDENTS	NEGLIGENCE OF EMPLOYES	DEFECTS IN OR FAILURES OF EQUIPMENT	DEFECTS IN OR IMPROPER MAINTENANCE OF WAY AND STRUCTURES	MISCELLANEOUS	TOTAL NUMBER OF ALL TRAIN ACCIDENTS	MILLION LOCOMOTIVE MILES	MILLION TRAIN MILES	100 MILLION CAR MILES	KILLED	INJURED
		(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(bb)	(cc)	(dd)	(ee)	(ff)	(gg)	(hh)	(ii)
(24)	1923	351	1,699	7	561	2,618	7,956	11,690	3,611	3,615	26,872	15.30	21.58	91.30	242	1,597
(25)	1924	261	1,359	6	484	2,110	6,633	9,166	3,518	3,145	21,880	13.09	18.17	75.74	168	1,209
(26)	1925	285	1,296	11	507	2,089	6,123	8,098	3,133	2,924	20,276	11.94	16.61	65.87	179	1,157
															156	1,265

AL AR Y ILS	LOCOMOTIVE BOILER ACCIDENTS — CAUSE: NEGLIGENCE OF EMPLOYES (o)	DEFECTS IN OR FAILURES OF EQUIPMENT (p)	MISCELLANEOUS (q)	TOTAL NUMBER OF LOCO. BOILER ACCIDENTS (r)	OTHER LOCOMOTIVE ACCIDENTS — CAUSE: DEFECTS IN OR FAILURES OF EQUIPMENT (s)	TOTAL NUMBER OF OTHER LOCOMOTIVE ACCIDENTS (t)
52	46	6	15	67	964	964
09	28	7	7	42	751	751
04	18	3	8	29	741	741
09	23	1	2	26	721	721
52	16	2	1	21	649	649
24	23	1	-	24	542	542
60	156	.22	31	209	4,368	4,368
71	.13	.02	.02	.17	3.51	3.51
57	11	3	2	18	704	704
50	27	-	1	28	739	739
67	11	3	-	14	631	631
44	8	-	-	8	520	520
69	11	3	1	15	455	455
93	16	6	1	23	530	530
98	83	15	5	104	3,578	3,578
99	15	.03	.01	.19	6.66	6.66
09	7	1	-	8	527	527
86	13	1	-	14	667	667
90	11	7	-	18	614	614
00	11	3	-	14	493	493
03	7	1	1	9	511	511
60	49	13	1	63	2,612	2,612
02	.14	.04	.01	.19	8.35	8.35

CCIDENTS

IDENTS PER ON N S	100 MILLION CAR MILES (ii)	NUMBER OF CASUALTIES TO TRAINMEN AND ENGINEMEN IN THESE ACCIDENTS — KILLED (hh)	INJURED (ii)	TOTAL (jj)	NUMBER OF CASUALTIES TO TRAINMEN AND ENGINEMEN PER MILLION LOCOMOTIVE MILES (kk)	MILLION TRAIN MILES (ll)	100 MILLION CAR MILES (mm)
9	91.30	242	1,597	1,839	1.05	1.48	6.25
7	75.74	166	1,209	1,377	.82	1.14	4.77
1	65.87	179	1,157	1,336	.79	1.09	4.34
2	61.99	156	1,265	1,421	.80	1.14	4.35
8	57.05	148	921	1,069	.62	.88	3.29
2	49.98	116	917	1,033	.61	.86	3.13
03	AVERAGE				AVERAGE	AVERAGE	AVERAGE
3	66.39	1,009	7,056	8,075	.78	1.10	4.31

	YEAR	NEGLIGENCE OF EMPLOYES (u)	IN OR FAILURES OF EQUIPMENT (v)	MAINTENANCE OF WAY AND STRUCTURES (w)	MISCELLANEOUS (x)	MISCELLANEOUS TRAIN ACCIDENTS (y)	NEGLIGENCE OF EMPLOYES (z)	IN OR FAILURES OF EQUIPMENT (aa)	MAINTENANCE OF WAY AND STRUCTURES (bb)	MISCELLANEOUS (cc)	TOTAL NUMBER OF ALL TRAIN ACCIDENTS (dd)	MILLION LOCOMOTIVE MILES (ee)	MILLION TRAIN MILES (ff)	100 MILLION CAR MILES (gg)	TRAINMEN AN IN THESE A KILLED (hh)	INJ
(24)	1923	351	1,699	7	551	2,618	7,956	11,690	3,611	3,615	26,872	15.30	21.58	91.30	242	1,5
(25)	1924	261	1,359	6	484	2,110	6,053	9,186	3,516	3,145	21,880	13.08	18.17	75.74	166	1,3
(26)	1925	255	1,286	11	507	2,089	6,123	8,098	3,133	2,924	20,278	11.94	16.61	65.87	179	1,1
(27)	1926	286	1,233	10	578	2,107	6,271	7,828	3,108	3,044	20,251	11.39	16.22	61.99	156	1,2
(28)	1927	279	1,282	4	529	2,092	5,775	7,325	2,579	2,833	18,512	10.71	15.16	57.05	148	9
(29)	1928	298	1,242	6	563	2,110	5,310	6,610	2,070	2,502	16,492	9.71	13.71	49.98	116	9
(30)	TOTAL 1923-1928	1,730	8,102	44	3,220	13,096	37,468	50,737	18,017	18,063	124,285	AVERAGE 12.03	AVERAGE 16.93	AVERAGE 66.38	1,009	7,0
(31)	PERCENTAGE OF TOTAL SHOWN IN COLUMN (dd)	1.39	6.52	.04	2.59	10.54	30.15	40.82	14.50	14.53	100.00					
(32)	1929	454	1,134	13	526	2,127	5,827	6,573	1,938	2,399	16,737	9.66	13.78	49.48	135	7
(33)	1930	368	816	12	389	1,585	4,139	4,979	1,296	1,603	12,017	7.75	10.86	39.82	111	5
(34)	1931	224	415	9	280	928	2,694	3,155	878	1,199	7,926	5.97	8.21	30.95	85	4
(35)	1932	140	257	4	240	641	1,788	2,313	640	911	5,652	5.12	6.88	27.77	57	2
(36)	1933	114	297	8	211	630	1,670	2,295	624	886	5,475	5.07	6.96	26.59	59	2
(37)	1934	126	263	9	251	649	1,784	2,401	624	987	5,886	5.24	7.19	26.54	88	2
(38)	TOTAL 1929-1934	1,426	3,182	55	1,897	6,560	17,902	21,806	6,000	7,985	53,693	AVERAGE 6.78	AVERAGE 9.40	AVERAGE 35.15	535	2,8
(39)	PERCENTAGE OF TOTAL SHOWN IN COLUMN (dd)	2.66	5.93	.10	3.53	12.22	33.34	40.61	11.18	14.87	100.00					
(40)	1935	152	247	2	313	714	1,799	2,627	756	1,185	6,369	5.34	7.68	28.29	80	
(41)	1936	206	336	7	348	897	2,406	3,370	956	1,362	8,094	6.30	8.98	31.63	107	
(42)	1937	243	300	9	356	908	2,508	3,082	971	1,449	7,990	6.10	8.56	29.76	104	
(43)	1938	166	237	12	267	682	1,661	2,031	668	1,052	5,412	4.78	6.55	23.39	76	
(44)	1939	202	276	10	297	785	2,108	2,003	667	1,039	5,817	4.89	6.82	23.03	75	
(45)	TOTAL 1935-1939	969	1,396	40	1,581	3,986	10,482	13,093	4,018	6,089	33,681	AVERAGE 5.55	AVERAGE 7.70	AVERAGE 27.31	422	2,1
(46)	PERCENTAGE OF TOTAL SHOWN IN COLUMN (dd)	2.88	4.14	.12	4.69	11.83	31.12	38.87	11.93	18.03	100.00					

COMPARISON OF AVERAGE ACCIDENT AND CASUALTY RATES

PERIOD 1929 - 1934 COMPARED WITH PERIOD 1923 - 1928	DECREASE	43.64%	44.49%	47.05%
PERIOD 1935 - 1939 COMPARED WITH PERIOD 1929 - 1934	DECREASE	18.14%	17.85%	22.30%
PERIOD 1935 - 1939 COMPARED WITH PERIOD 1923 - 1928	DECREASE	53.87%	54.23%	58.66%
YEAR 1939 COMPARED WITH YEAR 1923	DECREASE	68.04%	68.40%	74.76%

SOURCE: Interstate Commerce Commission, Bureau of Statistics, publications.

Column (b) - Annual Accident Bulletins, Table No. 101 for years 1923 and 1924; Table No. 97 for subsequent years.
Columns (c) and (d) - Statistics of Railways, Statements Nos. 30 and 31, issue of 1928 for years 1923 to 1928, inclusive; Tables No. 53 and 55 issue of 1939 for years 1929 to 1939 inclusive.
Columns (e) to (y) - Annual Accident Bulletins, Table No. 101.
Columns (hh) and (ii) - Annual Accident Bulletins, Table No. 102.
Columns (z) to (ss) - Computations.

CIDENTS

IDENTS PER		NUMBER OF CASUALTIES TO TRAINMEN AND ENGINEMEN IN THESE ACCIDENTS			NUMBER OF CASUALTIES TO TRAINMEN AND ENGINEMEN PER		
ON N S	100 MILLION CAR MILES	KILLED	INJURED	TOTAL	MILLION LOCOMOTIVE MILES	MILLION TRAIN MILES	100 MILLION CAR MILES
)	(gg)	(hh)	(ii)	(jj)	(kk)	(ll)	(mm)
3	91.30	242	1,597	1,839	1.05	1.48	6.25
7	75.74	166	1,209	1,377	.82	1.14	4.77
1	65.87	179	1,157	1,336	.79	1.09	4.34
2	61.99	156	1,265	1,421	.80	1.14	4.35
6	57.05	148	921	1,069	.62	.88	3.29
1	49.98	116	917	1,033	.61	.86	3.13
OR 5	AVERAGE 86.38	1,009	7,056	8,075	AVERAGE .78	AVERAGE 1.10	AVERAGE 4.31
3	49.48	135	791	926	.53	.76	2.74
6	39.82	111	516	627	.40	.57	2.08
1	30.95	85	343	428	.32	.44	1.67
8	27.77	57	282	339	.31	.41	1.67
6	26.58	59	291	350	.32	.44	1.70
9	26.54	88	296	384	.34	.47	1.73
OR 0	AVERAGE 35.15	535	2,519	3,054	AVERAGE .39	AVERAGE .53	AVERAGE 2.00
9	28.29	60	293	353	.31	.43	1.57
4	31.63	107	409	516	.40	.57	2.02
5	29.76	104	395	499	.38	.53	1.86
5	23.89	76	274	350	.31	.42	1.51
2	23.03	75	298	373	.31	.44	1.48
'S 5	AVERAGE 29.31	422	1,669	2,091	AVERAGE .34	AVERAGE .48	AVERAGE 1.70
3%	47.05%				50.00%	51.82%	53.60%
5%	22.30%				12.82%	9.43%	15.00%
2%	58.86%				56.41%	56.36%	60.56%
0%	74.76%				70.48%	70.27%	72.32%

ious years.
to 1928, inclusive.

Defendant's Exhibit No. 391 (Witness J.J. Sullivan)
Apr. 29, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

ALL TRAIN ACCIDENTS
COLLISIONS, DERAILMENTS, LOCOMOTIVE BOILER ACCIDENTS, OTHER LOCOMOTIVE ACCIDENTS, AND MISCELLANEOUS TRAIN ACCIDENTS AND CASUALTIES TO ALL PERSONS EXCEPT TRESPASSERS SUSTAINED THEREBY,
ROAD FREIGHT TRAIN OPERATION, INCLUDING MIXED
REPORTED TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

STATE OF ARIZONA

	YEAR	TOTAL FREIGHT TRAIN LOCO. MILES (THOUSANDS)	TOTAL FREIGHT TRAIN MILES (THOUSANDS)	TOTAL FREIGHT TRAIN CAR MILES (THOUSANDS)	COLLISIONS: NUMBER CHARGEABLE TO – NEGLIGENCE OF EMPLOYES	COLLISIONS: NUMBER CHARGEABLE TO – DEFECTS IN OR FAILURES OF EQUIPMENT	COLLISIONS: NUMBER CHARGEABLE TO – DEFECTS OR IMPROPER MAINTENANCE OF WAY & STRUCTURES	COLLISIONS: NUMBER CHARGEABLE TO – MISCELLANEOUS	TOTAL NUMBER OF COLLISIONS	COLLISIONS: NUMBER OF COLLISIONS PER MILLION FREIGHT LOCO. MILES	COLLISIONS: NUMBER OF COLLISIONS PER MILLION FREIGHT TRAIN MILES	COLLISIONS: NUMBER OF COLLISIONS PER 100 MILLION FREIGHT TRAIN CAR MILES	DERAILMENTS: NUMBER CHARGEABLE TO – NEGLIGENCE OF EMPLOYES	DERAILMENTS: NUMBER CHARGEABLE TO – DEFECTS IN OR FAILURES OF EQUIPMENT	DERAILMENTS: NUMBER CHARGEABLE TO – DEFECTS OR IMPROPER MAINTENANCE OF WAY AND STRUCTURES	DERAILMENTS: NUMBER CHARGEABLE TO – MISCELLANEOUS	TOTAL NUMBER OF DERAILMENTS	DERAILMENTS: NUMBER OF DERAILMENTS PER MILLION FREIGHT LOCO. MILES	DERAILMENTS: NUMBER OF DERAILMENTS PER MILLION FREIGHT TRAIN MILES
(a)		(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)
(1)	1923	1,927	1,622	91,565	2	-	-	-	2	1.09	1.23	2.18	1	6	1	1	9	4.93	5.54
(2)	1924	1,944	1,779	99,490	8	1	1	-	10	5.00	5.63	10.15	2	8	1	-	11	5.50	6.19
(3)	1925	2,715	2,448	124,954	6	-	2	-	8	2.95	3.27	6.40	-	19	1	2	22	8.10	8.99
(4)	1926	2,970	2,704	137,640	7	-	1	-	8	2.69	2.96	5.81	3	13	5	1	22	7.41	8.14
(5)	1927	3,071	2,796	140,957	6	-	1	-	7	2.36	2.59	5.08	2	5	1	1	9	2.93	3.22
(6)	1928	3,118	2,856	145,287	2	1	-	-	3	1.05	1.15	4.26	-	6	1	-	7	2.25	2.46
(7)	TOTAL 6 YEARS 1923-1928	15,700	14,127	738,913	33	1	5	1	35	2.13	2.47	4.74	8	56	10	6	80	5.10	5.84
(8)	1929	3,390	3,083	160,238	6	-	2	-	8	1.77	1.96	3.74	1	6	4	1	12	3.54	3.89
(9)	1930	2,843	2,574	141,512	3	1	-	-	4	1.06	1.17	2.12	4	5	1	-	10	3.52	3.89
(10)	1931	2,449	2,205	120,015	-	1	-	-	1	.41	.45	.83	2	5	1	2	10	4.09	4.54
(11)	1932	2,028	1,849	101,195	-	-	-	-	-	-	-	-	1	2	-	-	3	1.48	1.62
(12)	1933	1,779	1,632	91,142	1	-	-	-	1	.56	.61	1.10	1	3	-	-	4	2.25	2.45
(13)	1934	1,977	1,809	102,302	1	-	-	-	1	.51	.56	.98	-	3	-	-	3	1.52	1.67
(14)	TOTAL 6 YEARS 1929-1934	14,466	13,152	716,409	11	1	-	-	12	.83	.91	1.67	9	24	6	3	42	2.90	3.20
(15)	1935	2,305	2,106	119,599	3	-	-	-	3	1.30	1.43	2.53	-	3	-	-	3	1.30	1.43
(16)	1936	2,713	2,452	132,505	4	1	-	-	5	1.84	2.06	3.77	-	3	1	2	6	2.21	2.45
(17)	1937	3,117	2,776	148,232	5	-	-	-	5	1.60	1.80	3.37	2	14	3	1	20	6.42	7.20
(18)	1938	2,409	2,301	130,054	4	-	-	-	4	1.66	1.74	3.08	1	6	1	3	11	4.22	4.78
(19)	1939	2,895	2,569	142,754	4	-	-	-	4	1.38	1.56	2.80	1	2	4	1	8	2.76	3.13
(20)	TOTAL 5 YEARS 1935-1939	13,439	12,187	672,142	20	1	-	-	21	1.54	1.72	3.12	4	28	9	7	48	3.52	3.94
(21)	TOTAL 15 YRS. 1925-1939	43,729	39,527	2,127,464	64	3	8	1	76	1.55	1.72	3.20	21	108	25	16	170	3.89	4.30
(22)	AVERAGE RATE YEARS 1935 - 1939 COMPARED WITH YEARS 1929 - 1934 - INCREASE									85.54%	89.01%	86.83%						21.38%	23.13%
(23)	AVERAGE RATE YEARS 1935 - 1939 COMPARED WITH YEARS 1923 - 1928 - DECREASE									30.94%	30.36%	34.18%						30.98%	30.14%

OTHER LOCOMOTIVE ACCIDENTS		MISCELLANEOUS TRAIN ACCIDENTS		TOTAL TRAIN ACCIDENTS
NUMBER CHARGEABLE	NUMBER OF OTHER LOCOMOTIVE ACCIDENTS PER		NUMBER OF MISCELLANEOUS	

ss F.J. Sullivan)

IDENTS, AND MISCELLANEOUS TRAIN ACCIDENTS),
SUSTAINED THEREBY,
NG MIXED
OMMISSION

DERAILMENTS						LOCOMOTIVE BOILER ACCIDENTS						
BLE TO			NUMBER OF DERAILMENTS PER			NUMBER CHARGEABLE TO				NUMBER OF LOCOMOTIVE BOILER ACCIDENTS PER		
EFECTS IMPROPER INTENANCE WAY AND UCTURES	MISCEL-LANEOUS	TOTAL NUMBER OF DERAIL-MENTS	MILLION FREIGHT LOCO. MILES	MILLION FREIGHT TRAIN MILES	100 MILLION FREIGHT TRAIN CAR MILES	NEGLI-GENCE OF EMPLOYES	DEFECTS IN OR FAILURES OF EQUIPMENT	MISCEL-LANEOUS	TOTAL NUMBER OF LOCOMOTIVE BOILER ACCIDENTS	MILLION FREIGHT LOCO. MILES	MILLION FREIGHT TRAIN MILES	100 MILLION FREIGHT TRAIN CAR MILES
(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)	(aa)
1	1	9	4.93	5.55	9.83	-	-	-	-	-	-	-
1	-	11	5.50	6.19	11.17	-	-	-	-	-	-	-
1	2	22	8.10	8.99	17.61	-	-	-	-	-	-	-
5	2	22	7.41	8.14	15.98	-	-	-	-	-	-	-
1	1	9	2.93	3.22	6.36	-	-	-	-	-	-	-
1	-	2	1.25	2.46	4.62	-	-	-	-	-	-	-
10	6	80	5.10	5.64	10.83	-	-	-	-	-	-	-
4	1	12	3.54	3.89	7.48	-	-	-	-	-	-	-
1	-	10	3.53	3.89	7.07	-	-	-	-	-	-	-
1	2	10	4.09	4.54	8.33	-	-	-	-	-	-	-
-	-	3	1.48	1.62	2.96	-	-	-	-	-	-	-
-	-	4	2.25	2.45	4.39	-	-	-	-	-	-	-
-	-	3	1.52	1.67	2.93	-	-	-	-	-	-	-
6	3	42	2.90	3.20	5.86	-	-	-	-	-	-	-
-	-	7	1.30	1.43	2.53	-	-	-	-	-	-	-
1	2	9	2.21	2.45	4.53	-	-	-	-	-	-	-
3	1	20	6.42	7.20	13.49	-	-	-	-	-	-	-
1	3	11	4.22	4.78	8.46	-	-	-	-	-	-	-
4	1	8	2.76	3.13	5.60	-	-	-	-	-	-	-
9	7	48	3.52	3.94	7.14	-	-	-	-	-	-	-
25	16	170	3.88	4.30	7.99	-	-	-	-	-	-	-
			21.36%	23.13%	21.89%							
			30.99%	30.14%	34.07%							

TOTAL TRAIN ACCIDENTS

CASUALTIES TO PERSONS EXCEPT TRESPASSERS

	1923-1939	43,799	39,527	2,127,554	84	3	-	1	88	1.56	1.72	3.20	21 A	108	25	16	170	- 3
(42)	AVERAGE RATE YEARS 1935 - 1939 COMPARED WITH YEARS 1929 - 1934 - INCREASE									65.54%	89.61%	86.83%						21
(43)	AVERAGE RATE YEARS 1935 - 1939 COMPARED WITH YEARS 1923 - 1928 - INCREASE									30.94%	30.36%	34.18%						30

		OTHER LOCOMOTIVE ACCIDENTS					MISCELLANEOUS TRAIN ACCIDENTS										TOTAL TR
				NUMBER OF OTHER LOCOMOTIVE ACCIDENTS PER			NUMBER CHARGEABLE TO					NUMBER OF MISCELLANEOUS TRAIN ACCIDENTS PER			NUMBER CHARGEABLE TO			
	YEAR [bb]	NUMBER CHARGEABLE TO DEFECTS IN OR FAILURES OF EQUIPMENT [cc]	TOTAL NUMBER OTHER LOCO. ACCIDENTS [dd]	MILLION FREIGHT LOCO. MILES [ee]	MILLION FREIGHT TRAIN MILES [ff]	100 MILLION FREIGHT TRAIN CAR MILES [gg]	NEGLIGENCE OF EMPLOYEES [hh]	DEFECTS IN OR FAILURES OF EQUIPMENT [ii]	DEFECTS OR IMPROPER MAINTENANCE OF WAY & STRUCTURES [jj]	MISCELLANEOUS [kk]	TOTAL NUMBER OF MISCELLANEOUS TRAIN ACCIDENTS [ll]	MILLION FREIGHT LOCO. MILES [mm]	MILLION FREIGHT TRAIN MILES [nn]	100 MILLION FREIGHT TRAIN CAR MILES [oo]	NEGLIGENCE OF EMPLOYEES [pp]	DEFECTS IN OR FAILURES OF EQUIPMENT [qq]	DEFECTS OR IMPROPER MAINTENANCE OF WAY & STRUCTURES [rr]	
(34)	1923	-	-	-	-	-	-	1	-	2	3	1.64	1.85	3.26	3	7	-	
(35)	1924	-	-	-	-	-	1	-	-	3	4	3.60	2.25	4.06	11	9	1	
(36)	1925	4	4	1.47	1.63	3.20	2	2	-	3	7	2.58	2.86	5.60	10	25	1	
(37)	1926	-	-	-	-	-	1	3	-	2	6	2.02	2.22	4.36	11	15	5	
(38)	1927	1	1	.33	.36	.71	2	3	-	4	9	1.83	1.79	3.55	10	6	1	
(39)	1928	1	1	.32	.35	.69	-	1	-	1	2	.64	.70	1.38	2	8	1	
(30)	TOTAL 6 YEARS 1923-1928	6	6	.36	.42	.81	6	7	-	14	27	1.72	1.90	3.65	47	70	10	
(31)	1929	1	1	.29	.38	.62	1	-	-	-	1	.29	.38	.62	8	7	4	
(32)	1930	-	-	-	-	-	-	2	-	1	3	1.06	1.17	2.12	7	7	1	
(33)	1931	6	6	2.45	2.72	5.00	1	1	-	1	3	1.23	1.36	2.50	3	13	1	
(34)	1932	16	16	7.89	8.65	15.81	-	3	-	1	4	1.97	2.16	3.95	1	21	-	
(35)	1933	7	7	3.91	4.29	7.68	-	-	-	2	2	1.13	1.23	2.19	2	10	-	
(36)	1934	3	3	1.52	1.67	2.93	-	1	-	1	2	1.01	1.11	1.95	1	6	-	
(37)	TOTAL 6 YEARS 1929-1934	33	33	2.28	2.51	4.61	2	7	-	6	15	1.04	1.14	2.09	22	64	6	
(38)	1935	12	12	5.21	5.71	10.12	-	5	-	3	8	2.17	2.38	4.22	3	10	-	
(39)	1936	7	7	2.58	2.85	5.28	-	1	-	1	2	.74	.82	1.51	4	12	1	
(40)	1937	8	8	2.57	2.80	5.40	3	1	-	2	6	1.92	2.16	4.05	10	23	3	
(41)	1938	2	2	2.69	3.06	5.30	1	-	-	3	4	1.53	1.74	3.08	6	13	1	
(42)	1939	3	3	1.04	1.19	2.10	-	1	-	-	1	.35	.39	.70	5	6	4	
(43)	TOTAL 6 YEARS 1935-1939	37	37	2.71	3.04	5.30	4	8	-	8	18	1.32	1.48	2.68	28	74	9	
(44)	TOTAL 17 YRS. 1923-1939	76	76	1.74	1.92	3.37	12	20	-	22	60	1.39	1.52	2.82	99	206	20	
(45)	AVERAGE RATE YEARS 1935-1939 COMPARED WITH YEARS 1929-1934 DECREASE INCREASE			10.86%	21.18%	12.31%						28.92%	29.82%	28.23%				
(46)	AVERAGE RATE YEARS 1935-1939 COMPARED WITH YEARS 1923-1928 DECREASE INCREASE			613.16%	553.41%	579.01%						63.76%	28.11%	26.58%				

NOTE: Figures in columns (xx) to (eee) exclude trespassers and represents casualties to Road Freight Conductors And Brakemen on duty, with the following exceptions:
Year 1923 includes one fireman, Operator Repairer, Bay one express messenger injured.
Year 1925 includes one engineer injured.
Year 1927 includes one passenger fireman, two passenger brakemen, four [illegible] injured and one fireman killed.
Year 1931 includes one engineer and one fireman injured.

NOTE:

25	16	170	3.8%	9.0%								
			2 . 3%	23.13%	21.8%							
			30.98%	30.14%	34.07%							

TOTAL TRAIN ACCIDENTS								CASUALTIES TO PERSONS EXCEPT TRESPASSERS IN THESE ACCIDENTS					
NUMBER CHARGEABLE TO				TOTAL NUMBER OF TRAIN ACCIDENTS PER							TOTAL CASUALTIES PER		
DEFECTS IN OR FAILURE OF EQUIPMENT	DEFECTS OR IMPROPER MAINTENANCE OF WAY & STRUCTURES	MISCELLANEOUS	TOTAL NUMBER OF TRAIN ACCIDENTS	MILLION FREIGHT LOCO. MILES	MILLION FREIGHT TRAIN MILES	100 MILLION FREIGHT TRAIN CAR MILES	KILLED	INJURED	TOTAL	MILLION FREIGHT LOCO. MILES	MILLION FREIGHT TRAIN MILES	100 MILLION FREIGHT TRAIN CAR MILES
(qq)	(rr)	(ss)	(tt)	(uu)	(vv)	(ww)	(xx)	(yy)	(zz)	(aaa)	(bbb)	(ccc)
7	1	3	14	7.66	8.63	15.29	-	3	3	1.64	1.85	3.28
9	1	4	25	12.51	14.07	25.38	-	-	-	-	-	-
28	1	5	9 41	15.10	16.75	32.81	-	3	3	1.10	1.23	3.40
15	5	4	9 35	11.78	12.94	25.42	-	-	-	-	-	-
6	1	4	99 21	6.84	7.51	14.90	1	8	9	2.93	3.22	6.38
8	1	1	12	3.86	4.21	8.26	-	-	-	-	-	-
70	10	21	999 148	9.43	10.42	20.03	1	14	15	.96	1.06	2.03
7	4	1	9 20	5.90	6.49	12.47	-	-	-	-	-	-
7	1	1	16	5.63	6.22	11.31	-	-	-	-	-	-
13	1	3	9 20	8.18	9.07	16.66	-	3	3	1.23	1.36	2.50
21	-	1	23	11.34	12.44	22.73	-	2	2	-	-	-
10	-	2	14	7.88	8.58	15.36	-	-	-	-	-	-
8	-	2	9	4.55	5.00	8.88	-	-	-	-	-	-
	6	10	99 102	7.05	7.76	14.24	-	5	5	.35	.38	.70
18	-	2	23	9.98	10.95	19.39	-	-	-	-	-	-
12	1	3	20	7.37	8.16	15.09	-	-	-	-	-	-
24	3	3	9 39	12.51	14.05	26.31	-	2	2	.77	.87	1.64
12	1	6	26	9.97	11.30	19.99	-	-	-	-	-	-
9	1	1	16	5.53	6.25	11.21	-	-	-	-	-	-
77	9	15	9 124	9.09	10.17	18.45	-	2	2	.15	.16	.30
205	25	45	4 374	8.54	9.46	17.58	1	21	22	.50	.56	1.05
				28.94%	31.06%	59.56%				59.14%	37.89%	59.14%
				3.61%	2.40%	7.89%				86.37%	84.91%	85.82%

NOTE: 9 - Includes one accident, track motor car struck by train.
99 - Includes two accidents, track motor cars struck by trains.
9999 - Includes four accidents, track motor cars struck by trains.
7 - Includes seven accidents, track motor cars struck by trains.

Defendant's Exhibit No. 392 (Witness J.J. Sullivan)
Apr. 29, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

ALL TRAIN ACCIDENTS
(COLLISIONS, DERAILMENTS, LOCOMOTIVE BOILER ACCIDENTS, OTHER LOCOMOTIVE ACCIDENTS, AND MISCELLANEOUS TRAIN ACCIDE
AND CASUALTIES TO ALL PERSONS EXCEPT TRESPASSERS SUSTAINED THEREIN,
ROAD FREIGHT TRAIN OPERATION, INCLUDING MIXED
REPORTED TO THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

STATE OF NEVADA

					COLLISIONS								DERAILMENTS						
					NUMBER CHARGEABLE TO					NUMBER OF COLLISIONS PER			NUMBER CHARGEABLE TO					NUMBER OF	
	YEAR	TOTAL FREIGHT TRAIN LOCO. MILES (THOUSANDS)	TOTAL FREIGHT TRAIN MILES (THOUSANDS)	TOTAL FREIGHT TRAIN CAR MILES (THOUSANDS)	NEGLIGENCE OF EMPLOYES	DEFECTS IN OR FAILURES OF EQUIPMENT	DEFECTS OR IMPROPER MAINTENANCE OF WAY & STRUCTURES	MISCELLANEOUS	TOTAL NUMBER OF COLLISIONS	MILLION FREIGHT LOCO. MILES	MILLION FREIGHT TRAIN MILES	100 MILLION FREIGHT TRAIN CAR MILES	NEGLIGENCE OF EMPLOYES	DEFECTS IN OR FAILURES OF EQUIPMENT	DEFECTS OR IMPROPER MAINTENANCE OF WAY AND STRUCTURES	MISCELLANEOUS	TOTAL NUMBER OF DERAILMENTS	MILLION FREIGHT LOCO. MILES	MIL FRE TRA MI
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s
(1)	1923	2,411	2,259	111,847	7	-	-	-	7	2.90	3.10	6.26	3	8	3	2	16	6.64	7.
(2)	1924	2,193	2,035	106,707	5	-	-	-	5	2.28	2.46	4.69	4	4	-	-	8	3.65	3.
(3)	1925	2,438	2,262	127,118	2	-	-	-	2	.82	.88	1.57	1	11	-	1	13	5.33	5
(4)	1926	2,247	2,077	129,622	2	-	-	-	2	.89	.96	1.54	1	1	-	-	2	.89	
(5)	1927	2,337	2,146	139,959	4	-	-	-	4	1.71	1.86	2.86	-	8	1	-	9	3.85	4.
(6)	1928	2,344	2,418	156,869	1	-	-	-	1	.38	.41	.64	2	6	-	-	8	3.03	3.
(7)	TOTAL 6 YEARS 1923-1928	14,270	13,197	772,122	21	-	-	-	21	1.47	1.59	2.72	11	38	4	3	56	3.92	4.
(8)	1929	2,537	2,320	150,671	1	-	-	-	1	.39	.43	.66	2	2	2	-	6	2.36	2.
(9)	1930	2,259	2,057	147,802	1	-	-	-	1	.44	.48	.68	-	5	-	3	8	3.54	3.
(10)	1931	1,861	1,688	123,433	1	-	-	-	1	.54	.59	.81	-	3	-	1	4	2.15	2.
(11)	1932	1,655	1,514	111,024	-	-	-	-	-	-	-	-	-	-	1	1	2	1.21	1.
(12)	1933	1,478	1,364	104,663	1	-	-	-	1	.68	.73	.96	1	2	-	2	5	3.38	3.
(13)	1934	1,632	1,512	122,026	2	-	-	-	2	1.23	1.32	1.64	-	3	-	1	4	2.45	2.
(14)	TOTAL 6 YEARS 1929-1934	11,422	10,455	759,619	6	-	-	-	6	.53	.57	.79	3	15	3	8	29	2.54	2.
(15)	1935	1,713	1,596	123,508	-	-	-	-	-	-	-	-	2	-	1	-	3	1.75	1.
(16)	1936	2,072	1,929	144,689	3	1	-	-	4	1.93	2.07	2.76	1	5	-	1	7	3.38	3.
(17)	1937	2,153	2,007	151,385	1	-	-	-	1	.46	.50	.66	1	7	-	-	8	3.72	3.
(18)	1938	1,752	1,647	131,331	-	-	-	-	-	-	-	-	-	3	-	1	4	2.28	2.
(19)	1939	1,926	1,814	144,106	-	-	-	-	-	-	-	-	1	1	-	1	3	1.56	1.
(20)	TOTAL 5 YEARS 1935-1939	9,616	8,993	695,019	4	1	-	-	5	.52	.56	.72	5	16	1	3	25	2.60	2.
(21)	TOTAL 17 YRS. 1923-1939	35,308	32,645	2,226,760	31	1	-	-	32	.91	.98	1.44	19	69	8	14	110	3.12	3.
(22)	AVERAGE RATE YEARS 1935 - 1939 COMPARED WITH YEARS 1929 - 1934							-	DECREASE INCREASE	1.89% -	1.75% -	8.86% -						-	
(23)	AVERAGE RATE YEARS 1935 - 1939 COMPARED WITH YEARS 1923 - 1928								DECREASE	64.63%	64.78%	73.53%						2.36% 33.67%	34.

:s J.J. Sullivan)

:IDENTS, AND MISCELLANEOUS TRAIN ACCIDENTS),
SUSTAINED THEREIN,
MIXED
MMISSION

DERAILMENTS						LOCOMOTIVE BOILER ACCIDENTS						
LE TO		TOTAL NUMBER OF DERAIL-MENTS	NUMBER OF DERAILMENTS PER			NUMBER CHARGEABLE TO			TOTAL NUMBER OF LOCOMOTIVE BOILER ACCIDENTS	NUMBER OF LOCOMOTIVE BOILER ACCIDENTS PER		
FECTS MPROPER TENANCE AY AND CTURES	MISCEL-LANEOUS		MILLION FREIGHT LOCO. MILES	MILLION FREIGHT TRAIN MILES	100 MILLION FREIGHT TRAIN CAR MILES	NEGLI-GENCE OF EMPLOYES	DEFECTS IN OR FAILURES OF EQUIPMENT	MISCEL-LANEOUS		MILLION FREIGHT LOCO. MILES	MILLION FREIGHT TRAIN MILES	100 MILLION FREIGHT TRAIN CAR MILES
(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)	(aa)
3	2	16	6.64	7.08	14.31	-	-	-	-	-	-	-
-	-	8	3.65	3.93	7.50	-	-	-	-	-	-	-
-	1	13	5.33	5.75	10.23	-	-	-	-	-	-	-
-	-	2	.89	.96	1.54	-	-	-	-	-	-	-
1	-	9	3.85	4.19	6.43	-	-	-	-	-	-	-
-	-	8	3.03	3.31	5.10	-	-	-	-	-	-	-
4	3	56	3.92	4.24	7.25	-	-	-	-	-	-	-
2	-	6	2.36	2.59	3.98	-	-	-	-	-	-	-
-	3	8	3.54	3.89	5.41	-	-	-	-	-	-	-
-	1	4	2.15	2.37	3.24	-	-	-	-	-	-	-
1	1	2	1.21	1.32	1.80	-	-	-	-	-	-	-
-	2	5	3.38	3.67	4.78	-	-	-	-	-	-	-
-	1	4	2.45	2.65	3.28	-	-	-	-	-	-	-
3	8	29	2.54	2.77	3.82	-	-	-	-	-	-	-
1	-	3	1.75	1.88	2.43	-	-	-	-	-	-	-
-	1	7	3.38	3.63	4.84	-	-	-	-	-	-	-
-	-	8	3.72	3.99	5.28	-	-	-	-	-	-	-
-	1	4	2.28	2.43	3.05	-	-	-	-	-	-	-
-	1	3	1.56	1.65	2.08	-	-	-	-	-	-	-
1	3	25	2.60	2.78	3.60	-	-	-	-	-	-	-
8	14	110	3.12	3.37	4.94	-	-	-	-	-	-	-
			- 2.36%	- .36%	5.76% -							
			33.67%	34.43%	50.34%							

(22)	AVERAGE RATE YEARS 1935 - 1939 COMPARED WITH YEARS 1929 - 1934		DECREASE INCREASE	1.89% -	1.75% -	8.86% -															
(23)	AVERAGE RATE YEARS 1935 - 1939 COMPARED WITH YEARS 1923 - 1928		DECREASE	64.63%	64.78%	73.53%															

		OTHER LOCOMOTIVE ACCIDENTS					MISCELLANEOUS TRAIN ACCIDENTS												
		NUMBER CHARGEABLE TO DEFECTS IN OR FAILURES OF EQUIPMENT	TOTAL NUMBER OTHER LOCO. ACCIDENTS	NUMBER OF OTHER LOCOMOTIVE ACCIDENTS PER			NUMBER CHARGEABLE TO				TOTAL NUMBER OF MISCELLANEOUS TRAIN ACCIDENTS	NUMBER OF MISCELLANEOUS TRAIN ACCIDENTS PER			NUMBER CHARGEABLE T		
	YEAR			MILLION FREIGHT LOCO. MILES	MILLION FREIGHT TRAIN MILES	100 MILLION FREIGHT TRAIN CAR MILES	NEGLIGENCE OF EMPLOYES	DEFECTS IN OR FAILURES OF EQUIPMENT	DEFECTS OR IMPROPER MAINTENANCE OF WAY & STRUCTURES	MISCELLANEOUS		MILLION FREIGHT LOCO. MILES	MILLION FREIGHT TRAIN MILES	100 MILLION FREIGHT TRAIN CAR MILES	NEGLIGENCE OF EMPLOYES	DEFECTS IN OR FAILURES OF EQUIPMENT	DEFI OR IM MAINTD OF WA STRUC
	(bb)	(cc)	(dd)	(ee)	(ff)	(gg)	(hh)	(ii)	(jj)	(kk)	(ll)	(mm)	(nn)	(oo)	(pp)	(qq)	(r
(24)	1923	-	-	-	-	-	-	3	-	1	4	1.66	1.77	3.58	10	11	
(25)	1924	1	1	.46	.49	.94	2	1	-	-	(p) 3	1.37	1.47	2.81	11	6	
(26)	1925	1	1	.41	.44	.79	2	3	-	1	(p) 6	2.46	2.66	4.72	5	15	
(27)	1926	1	1	.45	.48	.77	2	1	-	1	(p) 4	1.78	1.93	3.09	5	3	
(28)	1927	-	-	-	-	-	-	5	-	1	6	2.57	2.80	4.29	4	13	
(29)	1928	1	1	.38	.42	.64	1	3	-	-	4	1.51	1.65	2.55	4	10	
(30)	TOTAL 6 YEARS 1923-1928	4	4	.28	.30	.52	7	16	-	4	(pp) 27	1.89	2.05	3.50	39	58	
(31)	1929	1	1	.39	.43	.66	-	1	-	-	1	.39	.43	.66	3	4	
(32)	1930	-	-	-	-	-	-	5	-	2	7	3.10	3.41	4.74	1	10	
(33)	1931	1	1	.54	.59	.81	-	3	-	1	4	2.15	2.37	3.24	1	7	
(34)	1932	11	11	6.65	7.27	9.91	-	1	-	1	1	.60	.66	.90	-	11	
(35)	1933	2	2	1.35	1.46	1.91	-	2	-	-	2	1.35	1.47	1.91	2	6	
(36)	1934	1	1	.61	.66	.82	-	1	-	-	1	.61	.66	.82	2	5	
(37)	TOTAL 6 YEARS 1929-1934	16	16	1.40	1.53	2.11	-	12	-	4	16	1.40	1.53	2.11	9	43	
(38)	1935	2	2	1.17	1.25	1.62	-	2	-	-	2	1.17	1.25	1.62	2	4	
(39)	1936	2	2	.97	1.04	1.38	-	1	-	2	3	1.45	1.56	2.07	4	9	
(40)	1937	5	5	2.32	2.49	3.30	-	-	-	-	-	-	-	-	1	12	
(41)	1938	5	5	2.85	3.04	3.81	2	1	-	1	(p) 4	2.28	2.43	3.05	2	9	
(42)	1939	2	2	1.04	1.10	1.39	-	1	-	-	1	.52	.55	.69	-	4	
(43)	TOTAL 5 YEARS 1935-1939	16	16	1.66	1.78	2.30	2	5	-	3	(p) 10	1.04	1.11	1.44	1	38	
(44)	TOTAL 17 YRS. 1923-1939	36	36	1.02	1.10	1.42	9	33	-	11	(pp) 53	1.30	1.42	2.38	39	139	
(45)	AVERAGE RATE YEARS 1935-1939 COMPARED WITH YEARS 1929-1934 DECREASE INCREASE			- 18.87%	- 16.34%	- 9.00%						25.71% -	27.43% -	31.78% -			
(46)	AVERAGE RATE YEARS 1935-1939 COMPARED WITH YEARS 1923-1939 DECREASE INCREASE			- 498.86%	- 493.33%	- 342.31%						44.97% -	45.85% -	56.66% -			

NOTE: Figures in columns (xx) to (ccc) inclusive, exclude trespassers, and represents casualties to Road Freight Conductors and Brakemen on duty, with the following exceptions:

Year 1924 - includes 1 contract cook injured;
Year 1925 - includes 1 passenger engineer and 1 passenger fireman killed;
Year 1928 - includes 1 deadhead freight brakeman injured;
Year 1930 - includes 1 mixed train engineer killed.

	14	110	3.12	3.31	4.94	-	-	-	-	-	-	-
			- 2.36%	- .36%	5.76% -							
			35.67%	34.43%	50.34%							

TOTAL TRAIN ACCIDENTS

NUMBER CHARGEABLE TO				TOTAL NUMBER OF TRAIN ACCIDENTS	TOTAL NUMBER OF TRAIN ACCIDENTS PER			CASUALTIES TO PERSONS EXCEPT TRESPASSERS IN THESE ACCIDENTS					
											TOTAL CASUALTIES PER		
LI-CE / OYES	DEFECTS IN OR FAILURES OF EQUIPMENT	DEFECTS OR IMPROPER MAINTENANCE OF WAY & STRUCTURES	MISCELLANEOUS		MILLION FREIGHT LOCO. MILES	MILLION FREIGHT TRAIN MILES	100 MILLION FREIGHT TRAIN CAR MILES	KILLED	INJURED	TOTAL	MILLION FREIGHT LOCO. MILES	MILLION FREIGHT TRAIN MILES	100 MILLION FREIGHT TRAIN CAR MILES
	(qq)	(rr)	(ss)	(tt)	(uu)	(vv)	(ww)	(xx)	(yy)	(zz)	(aaa)	(bbb)	(ccc)
)	11	3	3	27	12.20	11.95	24.14	-	6	6	2.49	2.66	5.36
1	6	-	-	17	7.75	8.35	15.93	-	2	2	.91	.98	1.87
5	15	-	2	22	9.02	9.73	17.31	2	1	3	1.23	1.33	2.36
1	3	-	1	9	4.01	4.33	6.94	-	-	-	-	-	-
6	13	1	1	19	8.13	8.86	13.88	-	2	2	.86	.93	1.43
	10	-	-	14	5.30	5.79	8.92	-	1	1	.38	.41	.64
9	58	4	7	108	7.57	8.18	13.99	2	12	14	.98	1.06	1.81
3	4	2	-	9	3.55	3.86	5.97	1	-	1	.39	.43	.66
1	10	-	5	16	7.08	7.78	10.83	1	2	3	1.33	1.66	2.03
1	7	-	2	10	5.37	5.92	8.10	-	-	-	-	-	-
-	11	1	2	14	8.46	9.25	12.61	-	-	-	-	-	-
2	6	-	2	10	6.77	7.33	9.55	-	1	1	.68	.72	.96
2	5	-	1	8	4.90	5.29	6.86	-	2	2	1.23	1.32	.64
9	43	3	12	67	5.87	6.41	8.82	2	5	7	.61	.67	.92
2	4	1	-	7	4.09	4.36	5.67	-	-	-	-	-	-
4	9	-	3	16	7.72	8.29	11.06	-	2	2	.97	1.04	1.38
2	18	-	-	14	6.50	6.98	9.25	-	-	-	-	-	-
2	9	-	2	13	7.42	7.89	9.90	-	5	5	2.86	3.04	3.81
	4	-	1	6	3.12	3.31	4.16	-	-	-	-	-	-
1	38	1	6	56	5.82	6.23	8.06	-	7	7	.73	.78	1.01
9	139	8	25	231	6.54	7.08	10.37	4	24	28	.79	.86	1.26
					.85% -	2.81% -	8.32% -				-	-	-
											19.67%	16.42%	9.72%
					23.12% -	23.84% -	42.39% -				23.51% -	26.42% -	44.20% -

NOTE: Column (11) (g) - Includes 2 accidents, track motorcars struck by trains.
(hh) - Includes 6 accidents, track motorcars struck by trains.
(iii) - Includes 8 accidents, track motorcars struck by trains.

Defendant's Exhibit No. 393 (Witness B.S. Sines)
Apr. 30,-1941

CONSIST TRAIN NO. 3
DEPARTING TUCSON, APRIL 12, 1940
CONDUCTOR G. SHAW, ENGINEER B. CHEEK

4-37-115M APR 30 1941 C. S. 1213

PASSENGER CONDUCTOR'S CAR REPORT

19 40

Train 3 Conductor G. Shaw
Ar. Empire 2:00 PM 4-11
Lv. Empire 9:50 PM 4-11
Train 3 Conductor B.A. Bleyer
Lv. Empire 10:09 PM 4-11
Ar. Tucson 6:50 PM 4-12
Train 3 Conductor B.S. Sines
Lv. Tucson 6:20 AM 4-12
Ar. Phoenix 12:20 PM 4-12
Train 3 Conductor B.J. Dahlgren
Lv. Phoenix 1:45 PM 4-12
Ar. Los Angeles 7:25 PM 4-12

ENGINES	INITIAL	NUMBER	ENGINEER	FROM	TO	MILES
	SP	4390	E.V. Kelly	1627	1429	174
	"	4390	E.V. Kelly	1430	1216	166
	-	4312	F. Reynolds	1296	1107	217
	-	4312	F. Slaton	1187	982	124
	-	4357	B.C. Cheek	984	933	294
	HELPER					
	SP	4334	E. Dayton	905	733	174
	-	4357	S.C. Mason	731	493	251

INITIAL	CLASS	NUMBER	FROM	TO	MILES
SP	Mail	5138	1627	1296	332
"	Bag	6185	"	483	1143
"	"	6461	"	"	-
"	Exp	2325	"	"	-
SP	Tour	4167	"	"	-
SP	Tourist	10003	"	"	-

CONDUCTOR'S REPORT OF SPECIAL CARS

C. S. 1213

NUMBER	TO	DESTINATION	CONTENTS	STENCILED WEIGHT OF FREIGHT CARS	WEIGHT OF CONTENTS OF FREIGHT CARS	Kind of Transportation No. Pass By Whom Issued Pay B.J. From What Station	NAME OF PARTY IN CHARGE
SP 5138	Tucson	Los Angeles	Fruit			Pass	Shaw
SP 6185	"	"	Empty			Pass	Shaw
SP 6461	"	"	"			Pass	Shaw
SP 2325	"	"	"			Pass	Shaw
SP 4167	"	"	"			Pass	Shaw
SP 10003	"	"	"			Pass	Shaw

All cars belonging to regular train.
Loaded Cars, Special Cars, Cars loaded with fruit, Horse Cars and other cars not a part of regular train, with full information.
Empty Cars to Auditor Equipt. Service Accts. immediately after completing run.
Duplicate of this report by conductors on through trains.
Report shall show party or organization for whose account operated.

Train — Conductor —

Lv. [illegible] 200 M 4-11

Arr. Eagle 950 M 4-11

Train 3 Conductor A.A. Blum

Lv. Eagle 1049 M 4-11

Arr. Tucson 600 M 4-12

Train 3 Conductor [illegible]

Lv. Tucson 630 AM 4-12

Arr. Phoenix 1200 PM 4-12

Train 3 Conductor [illegible]

Lv. Phoenix 1245 PM 4-12

Arr. Barstow 725 PM 4-12

	INITIAL	NUMBER	ENGINEER	FROM	TO	MILES
ENGINES	DO	4390	[illegible]	1627	1439	188
	L	4390	E Healy	1430	1214	184
	—	4312	F Reynolds	1296	1167	217
	—	4312	F Slyter	1167	984	124
	—	4357	B Chaddock	984	733	294
	HELPER					
	SP	4334	E Downing	908	733	174
	—	4357	SC Mason	733	492	251

	INITIAL	CLASS	NUMBER	FROM	TO	MILES
CARS	DO	Mail	5138	1627	1295	332
	L	Bag	6185	L	492	1143
	L	L	6461	L	—	—
	L	Bg	23254	L	—	—
	DO	Tour	4167	L	—	—
	L	Dyner	10003	L	—	—
	L	Lge Dy Grant	L	—	—	—
	DO	Chair	Kilauea	L	—	—
	L	L	Bowers	L	733	766
	L	L	Rock Rapids	L	984	678
	L	L	Galesburg	L	492	1143
	L	Observation	Talequah	L	—	—
	BR	Bl	51327	984	—	500
	BP	Bbg	2026	984	—	
	DO	CC	2723	1295	733	774

CONDUCTOR'S REPORT OF SPECIAL CARS

INITIAL	NAME OF NUMBER	FROM	TO	DESTINATION	CONTENTS	STENCILED WEIGHT OF FREIGHT CARS	WEIGHT OF CONTENTS OF FREIGHT CARS	Kind of Transportation No. Pass By Whom Raised No. of B.F.reet Platform	P&U
L	2031	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	
—	2127	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	
—	2303	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	
—	2144	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	

Conductors will show on face of report all cars belonging to regular train.
Report above all Officers' Cars, Dead Head Cars, Special Cars, Cafe loaded with Milk, Horse Cars and other cars not a part of regular train, with full information.
Report must be made out and forwarded to Auditor Equip't. Service Accts. immediately after completing run.
See special instructions regarding use of this report by conductors on through trains.
Report covering movement of special trains shall show party or organization for whose account operated.

	NUMBER OF CARS IN	OUT
El Paso	—	11
Tucson	11	16
Phoenix	16	15
Arlington	15	13
Yuma	13	11
Los Angeles	11	—

6060

Defendant's Exhibit No. 394 (Witness B.S. Sines)
Apr. 30, 1941

Arizona
1087

Witness B S Sines

24

CONSIST TRAIN NO. 44
DEPARTING YUMA, APRIL 13, 1940
CONDUCTOR C. H. DAVIS, ENGINEER B. CHEEK

Belle D. Hall, Clerk
L. D. Dawson, Deputy

Clerk
D.C.

APR 30 1941

C. S. 1213

PASSENGER CONDUCTOR'S CAR REPORT

1934

Train 44 Conductor Gofreda.
Lv. La 8 PM 4-12
Arr. Yuma 235 AM 4-13
Train 14 Conductor Ontaros
Lv. Yuma 350 PM 4-12
Arr. Tucson 1040 PM 4-12
Train 44 Conductor J. J. MORRISSEY
Lv. TUCSON 1104 PM 4-12
Arr. EL PASO 710 AM 4-13
Train 44 Conductor W W Rogers
Lv. El Paso 735 PM 4-13
Arr. Alexander 32 AM 4-14

	INITIAL	NUMBER	ENGINEER	FROM	TO	MILES
	AT	4311	[illegible]	483	733	251
	—	—	Cheek	733	984	251
	AT	4321	[illegible]	984	1107	123
	AT	4321	[illegible]	1107	1254	147
	PD	4315	[illegible]	1296	1439	143
	PD	4315	[illegible]	1439	1627	188
		5046	Lucas	379	562	

	INITIAL	CLASS	NUMBER	FROM	TO	MILES
	[illegible]		4270	483	984	501
	—		4172	4	1627	1144
	—		4183	—	—	—
	[illegible]		2944	—	—	—
	[illegible]		4241	—	—	—
	—		3069	—	—	—
	PD	D	10134	—	1439	956
	PD	D	3116	—	1627	1144
	—	—	206	—	—	—
	—	—	207	—	—	—

CONDUCTOR'S REPORT OF SPECIAL CARS.

C. S. 1213

ORDER	FROM	TO	DESTINATION	CONTENTS	STENCILED WEIGHT OF FREIGHT CARS	WEIGHT OF CONTENTS OF FREIGHT CARS	Kind of Transportation No. Pass By Whom Issued No. W. B. From What Station	NAME OF PARTY IN CHARGE
3	[illegible]	[illegible]	Eyano	Dry				
	—	—	—	—				
	—	[illegible]	Lucas	Milk				
	[illegible]	[illegible]	[illegible]					

Face of report all cars belonging to regular train.
Cars, Dead Head Cars, Special Cars, Cars loaded with fruit, Horse Cars and other cars not a part of regular train, with full information.
It and forwarded to Auditor Equip't. Service Accts. immediately after completing run.
garding use of this report by conductors on through trains.
al of special trains shall show party or organization for whose account operated.

Arr. Yuma 235 AM 4-13

Train 44 Conductor Ontaros

Lv. Yuma 350 AM 4-13

Arr. Tucson 1040 AM 4-13

Train 44 Conductor J. J. MORRISSEY

Lv. TUCSON 1109 AM 4-13

Arr. EL PASO 740 PM 4-13

Train 44 Conductor W W Rogers

Lv. El Paso 735 AM 4-13

Arr. Pullman 345 AM 4-14

ENGINES

INITIAL	NUMBER	ENGINEER	FROM	TO	MILES
AC	4311	[illegible]	483	733	251
—	—	[illegible]	733	984	251
SP	4376	[illegible]	[illegible]	[illegible]	123
SP	4324	[illegible]	[illegible]	[illegible]	217
SP	4345	[illegible]	1296	1439	143
SP	4355	[illegible]	1839	1627	188
	5046	Lucas	379	562	

CARS

INITIAL	CLASS	NUMBER	FROM	TO	MILES
SP Loms		4270	483	984	501
	—	4172	1	1627	1144
	—	4183	—	—	—
SP	I	2944	—	—	—
SP Loms		4241	—	—	—
	—	30694	—	—	—
SP	D	101344	—	1439	956
SP	C	3116	—	1627	1144
—	—	206	—	—	—
—	—	207	—	—	—
SP	D	64791	—	—	—
—	—	64033	—	906	475
—	CC	2321	783	—	273
—	C	1552	906	1296	467
SP	D	60444	1296	1627	331

CONDUCTOR'S REPORT OF SPECIAL CARS

INITIAL	NAME OR NUMBER	FROM	TO	DESTINATION	CONTENTS	STENCILED WEIGHT OF FREIGHT CARS	WEIGHT OF CONTENTS OF FREIGHT CARS	Kind of Transportation No. F'ms By Whom Issued *No. W. B. From What Station
SP	23032	906	Bisbee	Empty	Empty			
	21447	—	984	—	—			
SP	1357	—	1296	Tucson	Empty			Empty Loco
SP	60521	1627	1746	El Paso	Empty			

Conductors will show on face of report all cars belonging to regular train.
Report above all Officers' Cars, Dead Head Cars, Special Cars, Cars loaded with Fruit, Stove Cars and other cars not a part of regular train, with full information.
Report must be made out and forwarded to Auditor Equip't. Service Accts. immediately after completing run.
See special instructions regarding use of this report by Conductors on through trains.
Report covering movement of special trains shall show party or organization for whose account operated.

	NUMBER OF CARS IN	OUT
Los Angeles	-	12
Yuma	12	13
Phoenix	11	15
Tucson	15	14
El Paso	14	-

6061

Defendant's Exhibit No. 395 (Witness B.S. Sines)
Apr. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

1940 SERVICE RECORDS OF
CONDUCTORS A. T. ASH,
L. A. FAIL AND E. V. SHAW

		A. T. ASH		L. A. FAIL		E. V. SHAW	
	YEAR 1940 MONTH	TRIPS OR DAYS	MILES OR EQUIVALENT MILES	TRIPS OR DAYS	MILES OR EQUIVALENT MILES	TRIPS OR DAYS	MILES OR EQUIVALENT MILES
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
(1)	January	18	5,676	29	4,702	19	3,173
(2)	February	4	937	27	4,615	19	3,352
(3)	March	11	2,474	28	4,740	22	3,767
(4)	April	24	4,445	27	4,517	20	3,335
(5)	May	23	3,898	20	3,456	21	3,574
(6)	June	18	3,316	29	4,938	19	3,220
(7)	July	21	4,010	25	4,365	10	1,682
(8)	August	23	4,698	21	3,505	20	3,519
(9)	September	17	3,321	24	4,403	16	2,738
(10)	October	25	4,343	28	4,766	34	4,380
(11)	November	21	3,528	26	4,367	19	3,889
(12)	December	26	4,558	26	4,639	28	3,530
(13)	TOTAL	231	45,204	310	53,013	257	40,159

6062

Defendant's Exhibit No. 396 (Witness B.S. Sines)
Apr. 30, 1941

AMERICAN RAILWAY ASSOCIATION
MECHANICAL DIVISION
Master Car Builders Master Mechanics .

SPECIFICATIONS FOR FREIGHT BRAKES

Standard

ADOPTED, 1933

Supersedes Test Requirements for Triple Valves for Freight Service adopted 1895, last revised 1911.

Purpose

The purpose of this specification is to define and prescribe requirements for power brakes and appliances for operating power brake systems.

Definitions

For purposes of this specification, terms used herein are defined as follows:

Power Brake.—A combination of parts operated by compressed air and controlled manually, pneumatically or electrically, by means of which the motion of a car or locomotive is retarded or arrested.

Power Brake System.—The power brakes on locomotives and cars of a train so interconnected that they can be operated together and by means of which the motion of the train is retarded or arrested.

Brake Valve.—The valve of the locomotive equipment by means of which operation of the power brake system is controlled.

Equalizing Reservoir.—The small reservoir connected to the brake

Operating Valve.—Device on each car, the operation of which results in:

(a) Admission of air to brake cylinder,
(b) Release of air from brake cylinder, and
(c) Charging of one or more reservoirs.

Service Reduction.—A decrease in brake pipe pressure, usually of from 5 to 25 pounds, at a rate sufficiently rapid to move the operating valve to service position, but at a rate not rapid enough to operate the valve to emergency position.

Service Application.—A brake application which results from one or more service reductions.

Full Service Reduction.—A service reduction sufficient in amount to cause equalization of pressure in brake cylinder with pressure in the reservoir from which compressed air is supplied to brake cylinder.

Full Service Application.—A brake application which results from one or more brake pipe reductions sufficient in amount to cause a full service reduction.

Emergency Reduction.—A depletion of brake pipe pressure at a rate sufficiently rapid to move the operating valve to emergency position.

Emergency Application.—A brake application which results from an emergency reduction.

Emergency Brake Cylinder Pressure.—The force per square inch exerted upon piston in brake cylinder by compressed air which is admitted to brake cylinder as a result of an emergency reduction. Effective emergency brake cylinder pressure is a pressure not less than 15 per cent nor more than 20 per cent greater than the brake cylinder pressure obtained from a full service reduction on the same car and from the same initial pressures.

Test Requirements

Car brake equipment for freight service shall conform to the following requirements when tested on the test rack shown on drawing, Plate No. ___ representing the power brake equipment of a 150-car train. Tests will be made from an initial brake pipe pressure of 70 lbs. at the brake valve and main reservoir pressure of 100 lbs. The brake system leakage will be limited to that which will cause the pressure in the 150th car to be within one pound of the pressure on car 1. Unless otherwise specified, brake cylinder piston travel will be 8 in. and brake cylinder leakage not to exceed 2 lbs. per minute from 50 lbs. pressure.

Charging; Individual Car Test

TR-1. With operating valve in retarded recharge position and with 90 lbs. brake pipe pressure maintained, the auxiliary reservoir should be charged from 0 to 70 lbs. pressure in not more than 340 seconds and not less than 260 seconds, and the emergency reservoir from 0 to 70 lbs. in not more than 340 seconds and not less than 260 seconds.

TR-2. With operating valve blocked in normal charging position and with 90 lbs. brake pipe pressure maintained, the auxiliary reservoir should be charged from 0 to 70 lbs. pressure in not more than 195 seconds and not less than 130 seconds, and the emergency reservoir from 0 to 70 lbs. in not more than 255 seconds and not less than 170 seconds.

Service Application

TR-3. With a service reduction of 5 lbs. in the equalizing reservoir at the brake valve all brakes must apply.

TR-4. An initial 5 lb. equalizing reservoir reduction at the brake valve shall produce substantially 10 lb. brake cylinder pressure throughout the train, including brakes having piston travel in excess of 8 inches.

TR-5. With an equalizing reservoir reduction of 10 lbs., the difference in the time of obtaining substantially 10 lbs. pressure in the brake cylinder of the 1st and 150th brakes shall be nominally 20 seconds or less.

TR-6. A brake pipe reduction of 10 lbs. must result in pressure in each brake cylinder of not less than 15 lbs. nor more than 25 lbs.

TR-7. Quick service activity of the train brakes must cease when the initial quick service action has been completed.

TR-8. A total brake pipe reduction of 28 lbs. must result in equalization of brake cylinder pressure with pressure in the reservoir from which compressed air is supplied to the brake cylinder, and brake cylinder pressure of not less than 48 lbs. nor more than 52 lbs. must be obtained.

Emergency Application

TR-9. When the operating valve acts in emergency it shall so function as to develop nominally 15 lbs. brake cylinder pressure in not more than 1½ seconds and the maximum pressure in nominally 10 seconds.

TR-10. The operating valve shall so function that, when an emergency application is made subsequent to a service application which has

produced not less than 30 lbs. brake cylinder pressure, the maximum brake cylinder pressure shall be attained in nominally 4 seconds from the beginning of emergency action of the valve.

TR-11. With an emergency reduction of brake pipe pressure all brakes, including the 150th, shall start to apply within 8.2 seconds and develop not less than 15 per cent or more than 20 per cent in excess of 50 lbs. brake cylinder pressure within 18.2 seconds from the movement of the brake valve to emergency position.

TR-12. Emergency application shall produce from a charged system between 15 and 20 per cent increase in brake cylinder pressure over that which results from a full service application and irrespective of any degree of prior service application.

TR-13. With brakes Nos. 1, 2 and 3, or any group of three consecutive brakes cut out, an emergency reduction made with the brake valve should cause the remainder of the brakes to operate in emergency and produce normal emergency pressures in the same time as when the brakes are all cut in.

TR-14. Using the piping of the locomotive tender and car 1 of the train rack, with the double heading cock under the brake valve closed and the tender vent valve cut out, the operating valve must give a quick action application when brake pipe pressure is reduced by direct discharge to the atmosphere through a disc—with a ⅛ in. orifice and must not with a 9/32 in. orifice.

Release Operation

TR-15. Both service and emergency brake applications shall be released when the brake pipe pressure is increased to not more than 1¼ lbs. above that of the auxiliary reservoir and irrespective of the increased frictional resistance to release movement of the piston and slide valves after a period of operation in train service.

TR-16. With 15 lbs. service reduction and brake valve exhaust closed, all valves, including the 150th shall move to release within 40 seconds after the brake valve is placed in release position [illegible]

brake cylinder pressure shall be attained in nominally 4 seconds from the beginning of emergency action of the valve.

TR-11. With an emergency reduction of brake pipe pressure all brakes, including the 150th, shall start to apply within 8.2 seconds and develop not less than 15 per cent or more than 20 per cent in excess of 50 lbs. brake cylinder pressure within 18.2 seconds from the movement of the brake valve to emergency position.

TR-12. Emergency application shall produce from a charged system between 15 and 20 per cent increase in brake cylinder pressure over that which results from a full service application and irrespective of any degree of prior service application.

TR-13. With brakes Nos. 1, 2 and 3, or any group of three consecutive brakes cut out, an emergency reduction made with the brake valve should cause the remainder of the brakes to operate in emergency and produce normal emergency pressures in the same time as when the brakes are all cut in.

TR-14. Using the piping of the locomotive tender and car 1 of the train rack, with the double heading cock under the brake valve closed and the tender vent valve cut out, the operating valve must give a quick action application when brake pipe pressure is reduced by direct discharge to the atmosphere through a disc with a $\frac{1}{4}$ in. orifice and must not with a $\frac{5}{32}$ in. orifice.

Release Operation

TR-15. Both service and emergency brake applications shall be released when the brake pipe pressure is increased to not more than $1\frac{1}{4}$ lbs. above that of the auxiliary reservoir and irrespective of the increased frictional resistance to release movement of the piston and slide valves after a period of operation in train service.

TR-16. With 15 lbs. service reduction and brake valve exhaust closed, all valves, including the 150th shall move to release within 40 seconds after the brake valve is placed in release position where it will remain 15 seconds and then be placed in running position.

TR-17. With 15 lbs. service reduction and brake valve exhaust closed, the brake pipe pressure shall be increased 5 lbs. at car 150 within $1\frac{1}{2}$ minutes after the brake valve is placed in release position where it will remain 15 seconds, then placed in running position.

TR-18. The rate of release of pressure from the brake cylinders will be nominally 23 seconds from 50 to 5 lbs.

TR-19. The release valve capacity shall be sufficient to reduce the pressure of both the auxiliary and emergency reservoirs from 70 lbs. to 5 lbs. within 7 seconds.

General Requirements

The following requirements for power brakes and appliances for operating power brake systems for freight trains are specified and prescribed:

Service Application

GR-1. The quick service feature of the brake must produce a substantially uniform time of quick service transmission regardless of the unavoidable variations in frictional resistance of the parts.

GR-2. The brake shall so function as to prevent a degree of wave action in brake pipe pressure sufficient to cause undesired release of any brakes while the brakes are being applied.

GR-3. The degree of stability shall be sufficient to prevent undesired service applications occurring with unavoidable minor fluctuations of brake pipe pressure.

GR-4. The quick service action shall be such as to improve the quick service functioning of the "K" triple valves associated with them.

GR-5. The brake cylinder pressure increase resulting from quick service operation shall be less when the brake is reapplied with pressure retained in the brake cylinder than with applications made when the brake cylinder pressure is zero.

Emergency Application

GR-6. Undesired quick action shall not result with any rate of change in brake pipe pressure which may occur during service application or release of the brakes.

GR-7. Emergency application operation shall always be available irrespective of the existing state or stage of brake application or release.

GR-8. Emergency applications initiated during a release of a previous brake application shall produce a material increase in brake cylinder pressure over that which would result from a full service application made under the same conditions.

Release of Service Applications

GR-9. The brake shall so function as to provide a more rapid rise in brake pipe pressure in the rear portion of the train during release of train brakes than obtains with the "K" equipment.

GR-10. In the normal release of train brakes, individual car brakes shall not start recharging from the brake pipe until its pressure has increased sufficiently to have accomplished the release of adjacent valves.

GR-11. The recharge of auxiliary reservoirs in the forward portion of the train shall be automatically retarded while full release position of the brake valve is being used to initiate the release of train brakes.

Release of Emergency Applications

GR-12. The brake shall so function as to accomplish the release of an emergency application with the same degree of certainty secured in the release of service applications.

GR-13. When releasing brakes following an emergency application, each brake shall so function as to decrease the auxiliary reservoir pressure prior to the actual release.

GR-14. The brake shall function as specified in GR-13 when mixed in trains with present standard "K" equipment.

GR-15. That apparatus conforming to the foregoing requirements shall be so constructed, installed and maintained as to be safe and suitable for service.

General Features Relating to Installation and Maintenance

GR-16. The portions of the car brake which control the brake application and release, and also the brake cylinder, shall be so protected against the entrance of dirt, water and floating dust that the time interval between cleaning and repairs may be extended as compared with standard "K" equipment.

GR-17. Reinforced flanged fittings will be used on the brake pipe tee and for all pipes connecting the operating valve with the brake pipe, brake cylinder and reservoirs.

GR-18. The brake branch pipe tee shall be provided with a lug for rigidly anchoring it to the car underframe to prevent shifting of the brake pipe and avoid strains on the branch pipe.

GR-19. The design of the service and emergency valves shall be such as to permit their removal for cleaning and repair without disturbing pipe joints.

GR-20. The release valve shall permit the release of air from the auxiliary reservoir only or from both the auxiliary and emergency reservoirs by extended movement of the same handle.

GR-21. The operating valve shall be so constructed that by inexpensive adjustment the rate of brake cylinder pressure development may be changed to meet such change in train operating conditions as may develop in the future.

Defendant's Exhibit No. 387 (Witness D.E. Sines)
Apr. 30, 1941

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

DELAYS TO FREIGHT AND PASSENGER TRAINS ASSOCIATED WITH EQUIPMENT OR DEFECTS THEREIN, AS REPORTED BY CONDUCTORS ON TIME RETURNS AND DELAY REPORTS, JANUARY 1 - JUNE 30, 1940 (#)
LORDSBURG, NEW MEXICO TO EL PASO, TEXAS

	FREIGHT TRAINS		PASSENGER TRAINS	
	70 CARS AND LESS (a)	OVER 70 CARS (b)	14 CARS AND LESS (c)	OVER 14 CARS (d)
1- Trespasser stepping on cutting lever	9	3	-	-
2- Undesired emergency	1	1	-	-
3- Hot boxes	17	6	1	-
4- Truck frame broken, bent, twisted (out of line)	-	1	-	-
5- Broken wheels	1	-	-	-
6- Hose failures	6	2	-	-
7- Sticking brakes	3	4	-	-
8- Broken branch pipes	2	1	-	-
9- Hot wheels	4	-	-	-
10- Angle cocks broken or otherwise defective	1	-	-	-
11- Train line broken or otherwise defective	5	-	-	-
12- Some one set air on train	-	-	1	-
13- Whistle signal sounded	-	-	1	-
14- Brake beam down	5	2	-	-
15- Brake rigging coming down - other failure, etc.	5	1	-	-
16- Wire up brake beam	2	-	-	-
17- Repair brake rigging	4	2	-	-
18- Hand brake set	1	-	-	-
19- Couplers, knuckles	5	1	-	-
20- Drawbar, draft gear, carrier iron	4	1	-	-
21- Switch bad order to rear	1	2	-	-
22- Break-in-two	3	2	-	-
23- Train parted and uncoupled	2	1	-	-
24- Brass car	7	5	-	-

	70 CARS AND LESS (a)	OVER 70 CARS (b)	14 CARS AND LESS (c)	OVER 14 CARS (d)
1- Trespasser stepping on cutting lever	9	3	-	-
2- Undesired emergency	1	1	-	-
3- Hot boxes	17	6	1	-
4- Truck frame broken, bent, twisted (out of line)	-	1	-	-
5- Broken wheels	1	-	-	-
6- Hose failures	6	2	-	-
7- Sticking brakes	3	4	-	-
8- Broken branch pipes	2	1	-	-
9- Hot wheels	4	-	-	-
10- Angle cocks broken or otherwise defective	1	-	-	-
11- Train line broken or otherwise defective	5	-	-	-
12- Some one set air on train	-	-	1	-
13- Whistle signal sounded	-	-	1	-
14- Brake beam down	5	2	-	-
15- Brake rigging coming down - other failure, etc.	5	1	-	-
16- Wire up brake beam	2	-	-	-
17- Repair brake rigging	4	2	-	-
18- Hand brake set	1	-	-	-
19- Couplers, knuckles	5	1	-	-
20- Drawbar, draft gear, carrier iron	4	1	-	-
21- Switch bad order to rear	1	2	-	-
22- Break-in-two	3	2	-	-
23- Train parted and uncoupled	2	1	-	-
24- Brass car	7	5	-	-
25- T O T A L S	88	35	3	None

	FREIGHT TRAINS		PASSENGER TRAINS	
	70 CARS AND LESS (e)	OVER 70 CARS (f)	14 CARS AND LESS (g)	OVER 14 CARS (h)
26- Trains	1,900	652	741	18
27- Train miles	282,172	96,766	109,326	2,627
28- Car miles	17,851,722	9,100,005	1,270,376	42,443
29- Car miles per delay	202,860	260,000	423,459	-
30- Cars per train	63.3	94.0	11.6	16.1

(#) Does not include delays reported due to failure of locomotive parts or machinery.

[fol. 6070] [File endorsement omitted]

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA IN AND FOR THE COUNTY OF PIMA

No. 20087

STATE OF ARIZONA, EX REL JOE CONWAY, Attorney General of the State of Arizona, Plaintiff,

vs.

SOUTHERN PACIFIC COMPANY, a corporation, Defendant

Court's Finding of Fact and Conclusions of Law—Filed February 11, 1942

Submitted in Accordance with the Provisions of Section 21-1027 Arizona Code Annotated, 1939

[fol. 6071]

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NOTE: The following findings are supported by the evidence referred to in the annotations to each finding, oral testimony being referred to by the name of the witness and page number of the reporter's transcript, and exhibits by reference to their respective numbers.

[fol. 6078] *Findings of Fact and Conclusions of Law*

Preamble

This cause came on regularly for trial on November 19, 1940, before the above-entitled Court; Honorable Levi S. Udall, Judge of the Superior Court of the State of Arizona, to whom the cause had been duly assigned, presiding and sitting without a jury, a trial by jury having been duly waived by the parties.

Thereafter said trial proceeded from day to day with certain intermissions until and including May 1, 1941. In the course of said trial evidence, both oral and documentary, was offered by each of the parties to the cause.

The parties were represented by counsel, Honorable Joe Conway, Attorney General of the State of Arizona, Wesley E. Polley, Esq., Assistant Attorney General, and Charles L. Strouss, Esq., appearing for the plaintiff, and Knapp, Boyle and Thompson, Henley C. Booth, Esq., and Burton Mason, Esq., for the defendant.

At the conclusion of the trial on said May 1, 1941, it was stipulated and agreed in open Court, by and between said parties, that proposed findings of fact and conclusions of law, together with briefs of argument might be filed with the Court by the parties, or by either party, prior to the final submission of the cause to the Court for its decision; and the Court was then and there duly requested to make and enter written special findings of fact and conclusions of law before rendering judgment. Thereafter, and in due course, such proposed special findings of fact and conclusions of law, and said briefs of argument, were duly filed with the Court by the parties.

[fol. 6079] Now, therefore, having duly considered said proposed findings and conclusions and briefs of argument, together with all the evidence, both oral and documentary, of record herein, and all of the other records, papers, files, and proceedings in this cause, and being now fully advised

in the premises, the Court hereby makes, adopts and enters the following as its special findings of fact and conclusions of law herein:

[fol. 6080] SPECIAL FINDINGS OF FACT

I

Definition of Terms

For the sake of brevity the words "train-limit law", and "the law" (without other separate designation), as used in these findings mean, unless the context otherwise requires, that certain statute of the State of Arizona, enacted in 1912, entitled "An act limiting the number of cars in a train" (being Section 69-119 of the Arizona Annotated Code, 1939), hereinafter set forth at length; which statute prohibits the operation in Arizona of trains of more than 70 freight or other cars, exclusive of caboose, and passenger trains of more than 14 cars.

Trains containing cars in excess of the maxima permitted by said Train-Limit Law are referred to in these findings as "long trains"; and trains coming within the limits fixed by said statute are referred to as "short trains".

The term "interstate trains" means all trains carrying any interstate traffic or commerce, or engaged in interstate transportation.

By the expression "standard long-train operation" is meant the practice of handling freight traffic in freight trains containing substantially more than 70 cars, and passenger traffic in passenger trains of more than 14 cars, whenever the volume, destination, and character of the traffic to go forward by train is such that a long train can be more efficiently and economically operated than a short train; and to handle in short trains such traffic as cannot be conveniently or economically handled in long trains.

By the expression 'the affected territory" is meant the districts, including the lines of the defendant within Arizona [fol. 6081] and in the adjacent portions of California, Texas, and New Mexico, wherein the Train-Limit Law affects or may affect the railroad operations of defendant.

The present tense, as used herein, means all times since and including January 1, 1938.

II

Nature of the Case: The Parties Involved

(a) The Parties.

The plaintiff in this action is the State of Arizona. The suit is brought on behalf of the state, by and at the direction of the Attorney General of Arizona, acting in his official capacity.

Defendant is a corporation duly organized and existing under and by virtue of laws of the State of Kentucky, and a citizen and resident of that state. Defendant is engaged in the operation, as a common carrier in interstate commerce, of lines of railroad in the States of Oregon, California, Nevada, Utah, Arizona, Texas, and New Mexico, and in the transportation of passengers and property from, to, and between points in each and all of said states. Defendant, as such interstate common carrier by railroad, is subject to the provisions of the Act of Congress approved February 4, 1887, and acts amendatory thereof and supplementary thereto, known as Part I of the Interstate Commerce Act.

(b) The Issues.

This suit is a civil action at law, brought for the purpose of recovering from the defendant penalties as provided by said Train-Limit Law; it being alleged in the complaint that defendant operated, on March 2, 1940, a passenger train of [fol. 6082] more than 14 cars, and on April 4, 1940, a freight train of more than 70 cars, and that both such long-train operations were in violation of said law, and subject to the penalties therein prescribed.

Defendant, by its answer, admitted the operation of the aforesaid long trains, though denying that said operations were wilful or otherwise in violation of the law. Said defendant, in and by said answer, further alleged that said law was and is invalid and unconstitutional, as applied to its interstate trains and the interstate traffic carried therein, because in conflict with the Commerce Clause of, and the Due-Process Clause of the XIV Amendment to, the Constitution of the United States, and the corresponding Due-Process Clause (Section 4 of Article II) of the Constitution of Arizona, and also because in conflict with and an infringe-

ment upon certain federal statutes; to-wit, the Boiler Inspection Act, the Safety Appliance Acts, and Section 2 (now Section 25) of Part I of the Interstate Commerce Act.

III

Description of Defendant's Lines of Railroad

(a) General Description of the System.

Defendant's main lines of railroad extend from San Francisco, California, to Portland, Oregon, and from San Francisco, across Nevada, to Ogden, Utah, and also from San Francisco, southeasterly to Los Angeles, California, and thence via Yuma and Tucson, Arizona, to El Paso, Texas, and thence to Tucumcari, New Mexico. At each of said points (other than Tucson and Yuma), as well as at numerous other points, defendant's lines connect with the lines of other interstate rail carriers, and thus enter into and become part of through routes for the transportation of freight between all parts of the United States, and to and from adjacent foreign countries.

[fol. 6083] Defendant's operations extend over 5,148 miles of main lines, and 3,500 miles of branch lines, producing a total system mileage of 8,648 miles of line. Including the miles of second (i. e., alternate or double) tracks, there are 9,524 main-track miles, 6,012 miles of said track miles being on main lines, and 3,512 miles of said track miles on branch lines. Defendant's sidings and yard tracks total 4,145 track miles, thus producing a grand total, for all tracks, of 13,669 track miles.

The above-described lines, generally known as the defendant's Pacific Lines, represent a total investment in roadbed and other fixed properties (not including rolling equipment), as of December 31, 1939, of $729,056,899. The portion of said lines within Arizona, which consists of 1,208 road miles and 1,273 main-track miles, represents a total investment in road and fixed properties only (not including movable equipment), as of December 31, 1939, of $68,876,025.

The total mileage of the main lines between Yuma, Arizona, and El Paso, including the alternate main lines via Phoenix and Douglas, hereinafter more fully described, is 1,069 road miles, representing a total investment, in roadbed

and fixed property only, as of December 31, 1939, of $71,870,183.

Answer, par. III (2).

Sines, R. 46-52; *Wright*, R. 229-239; *Kirk*, R. 406-414; *Young*, R. 493-494; *Fertig*, R. 860-861, 866-868, 881; *Green*, R. 931; *Kraemer*, R. 973-978; *Randall*, R. 1029; *Triem*, R. 1108; *Hammond*, R. 1172-1173; *Warfel*, R. 1216; *Peckenpaugh*, R. 1336; *Mahoney*, R. 1844, 1870-1872; *Masson*, R. 1936-1938; *F. P. McDonald*, R. 2971; *Judson*, R. 2988.

Exhibits 1, 110, 111, 115, 145, 175.

[fol. 6084] (b) The Line in the Affected Territory.

(1) Location; principal stations; double track:

Defendant's aforesaid main line between Los Angeles and Tucumcari extends easterly from Los Angeles via Colton, Beaumont and Indio, California, and crosses the westerly boundary of Arizona immediately west of Yuma, 250 miles east of Los Angeles. Yuma is a division point at which an extensive freight terminal is maintained, where freight trains originate and terminate, and are made up and broken up. The main line principally used for the handling of freight traffic extends easterly and southeasterly through the cities and stations of Wellton, Gila, Picacho, Tucson, Mescal, Benson, Dragoon, Bowie, and San Simon to the station of Cavot, Arizona, at which point said line crosses the Arizona-New Mexico boundary line. Said line then continues easterly through the cities and stations of Steins, Lordsburg, Deming and Anapra, New Mexico, to El Paso, Texas, and thence northeasterly to Tucumcari, New Mexico. The distance from Cavot to Lordsburg is approximately 23 miles; from Cavot to El Paso, approximately 171 miles. The total length within Arizona of defendant's said main line from Yuma via Gila, Tucson and Bowie, last described, is approximately 392 miles.

In addition to the aforesaid main line, defendant also has an alternate main line in Arizona which departs from the Yuma-Gila-Lordsburg line at Wellton, 37 miles east of Yuma, and runs thence northeasterly to Phoenix, and thence easterly and southeasterly via Mesa, Chandler, and Coolidge to Picacho, a point 46 miles northwest of Tucson, where it joins the Yuma-Gila-Lordsburg line. The distance from Wellton via Phoenix to Picacho is 211 miles.

A second alternate line of defendant leaves the Yuma-Gila-Lordsburg line at Mescal, approximately 40 miles easterly [fol. 6085] from Tucson, and extends via Douglas, Arizona, to Anapra, New Mexico, where it rejoins the Yuma-Gila-Lordsburg line. The distance from Mescal via Douglas to Anapra is 295 miles.

The three main lines just described, considered together, afford to the defendant practically two lines for the entire distance between Yuma and El Paso; but, except for the double-track districts hereinafter mentioned, these lines are all operated as single track.

Defendant's Yuma-Gila-Lordsburg line, as above described, is double-track from Yuma to East Yard, a distance of 4.7 miles; thence single-track for a distance of 16 miles to Dome; thence double-track for a distance of 16.5 miles to a point near Wellton; thence single-track for a distance of 211.2 miles to Stockham; thence double-track for a distance of 42.4 miles to Mescal; thence single-track for a distance of 101.5 miles to Cavot, at which point said line crosses the Arizona-New Mexico boundary, as aforesaid; thence continues as single-track for a distance of 164.8 miles to Anapra; and thence is double-track for a distance of 7.1 miles to El Paso.

The alternate main line via Phoenix consists entirely of single-track, except for about two miles of double-track immediately east and west of the station at Phoenix. The second alternate main line via Douglas consists entirely of single track.

Defendant also has certain branch lines in Arizona, the more important of which are as follows: the Christmas Branch, extending easterly from McQueen on the Phoenix main line, a distance of 87 miles to Christmas; the Nogales Branch, extending southerly from Tucson a distance of 66 miles to Nogales, where it connects with the main line [fol. 6086] of the Southern Pacific Railway Company of Mexico, and thus affords a through route for the transportation of all kinds of traffic to and from points in Mexico; and the Globe Branch, which extends northwesterly 136 miles from Bowie, via Safford, Globe and Miami to Live Oak.

Answer, par. III (2).
Sines, R. 46-50, 61-63, 2512, 4223-4224; *Masson*, R. 1536-1540, 1935-1938; *Kirkbride*, R. 2034-2037.

2046-2047, 4053; *G. C. Baker*, R. 2352, 2358-2360, 2380-2384.

Exhibits 1, 115, 145, 154, 155, 175, 176.

(2) Ruling grades and curvatures:

The term "ruling grade," when employed hereafter in these findings, means that ascending grade, within a particular district or territory, which is of such length and location as to limit the amount of tonnage which a train may handle over such district or territory. Ruling grades are not usually continuous over any district or territory, and in fact are limited in length by topography to comparatively short stretches in any given district. Ruling grades are ordinarily short grades, and are not continuous; and long stretches of level or lesser grades generally prevail on each side of each ruling grade.

Kirk, R. 396-397; *Warfel*, R. 1355-1357.

The above-described main lines, both within and without Arizona, and particularly those portions thereof between Indio, California, and El Paso, Texas, are located for the most part in level territory where the grades are of comparatively little consequence. From Indio eastward to Yuma there is no ruling grade in excess of one per cent in either direction. From Yuma eastward to Gila the grade is generally slightly ascending; and ruling grades opposed [fol. 6087] to either eastward or westward traffic do not exceed .6 per cent: except that from Pembroke to Mohawk eastward, a distance of 4.0 miles, and from Kim to Mohawk westward, a distance of 3.3 miles, the ruling grade is one per cent; and except also that from Lava to Sentinel eastward, a distance of 4.1 miles, the ruling grade is 1.02 per cent. From Gila to Estrella, a distance of 18.9 miles, the line ascends eastward, the ruling grade being 1.02 per cent; and then descends eastward, a distance of 23.2 miles from Estrella to Maricopa, the ruling grade being .83 per cent opposed to westward movement. From Maricopa to Picacho, a distance of 39.7 miles, the line ascends with a maximum ruling grade of .5 per cent, and from Picacho to Tucson, a distance of 46.4 miles, the maximum ruling grade is 0.96 per cent.

From Tucson to Mescal, a distance of 39.7 miles, the line ascends eastward with a maximum ruling grade opposed to

eastward traffic of 1.06 per cent; and thence descends for a distance of 9.0 miles to Benson, with a ruling grade (opposed to westward traffic) of 1.4 per cent. From Benson to Dragoon, 21.3 miles, the line again ascends eastward, the maximum ruling grade opposed to eastward traffic being 1.4 per cent. The line then descends eastward for about 12 miles to a point east of Cochise, the ruling grade (opposed to westward traffic) being 1.1 per cent. At Cochise the grade becomes level, and further east ascends with slight gradient to Willcox, a distance of 8 miles. Between Willcox and San Simon, a distance of 38.5 miles, the maximum ruling grade opposed to eastward traffic is 0.91 per cent, and to westward traffic is 1.0 per cent, these grades controlling for short distances easterly and westerly from a summit at Raso. From San Simon the line ascends eastward for a distance of 14.7 miles to Steins, with maximum ruling grades of 1.4 per cent; the Arizona-New Mexico boundary is crossed during this ascent at the station of Cavot, elevation 4,092 feet, 10.9 miles east of San Simon. [fol. 6088]

From Steins to Lordsburg, 19.4 miles, the line descends for a short distance with a ruling grade of 1.4 per cent opposed to westward traffic, the rest of the distance to Lordsburg being traversed with ruling grades of 1.0 per cent in each direction. From Lordsburg to El Paso, 148 miles, the ruling grades opposed to traffic in either direction are comparatively light and do not exceed one per cent.

On the line from Wellton to Picacho via Phoenix the ruling grades do not exceed one per cent in either direction and in general do not exceed .6 per cent.

On the line from Mescal via Douglas to Anapra the ruling grades are likewise one per cent or less, and for substantial distances do not exceed .8 per cent in either direction.

In general, throughout the territory above-described, curvatures are light, and curves are comparatively infrequent. On the main line from Yuma via Gila and Lordsburg to El Paso, a total distance of approximately 563 miles, only 84.3 miles, or about 15 per cent, consist of curved track; and only about 5.5 miles, or less than one per cent, consist of curves of more than six degrees. On that portion of said Yuma-Gila-Lordsburg line within Arizona, a total distance, as aforesaid, of 392 miles, 84 per cent of the total mileage is straight track, and only 16 per cent curved

track, and only about one per cent of the total mileage consists of curves of more than six degrees. On the Wellton-Phoenix-Picacho line, only 18.5 miles, or less than 9 per cent of the total of 211 miles, consist of curved track. [fol. 6089] On the Mescal-Douglas-Anapra line 51.7 miles, or 17.5 per cent of the total of 295 miles, consist of curves.

Where curved track exists in grade territory upon the lines above described, or elsewhere upon any of defendant's main lines, each of such curves is "compensated"; i. e., the grade is reduced around the curve to an extent such that the effect of the combined resistance to movement of tonnage afforded by the curve itself and by the grade upon the curve, is not greater than the corresponding resistance afforded by grade alone upon an adjacent stretch of "tangent" (straight) track. The compensated grade upon the curve is thus capable of being stated, and in common railroad practice is stated, in terms of the equivalent of rise expressed in per cent of distance along tangent track.

Grades, including ruling grades (as heretofore defined), are usually expressed in per cent of distance, or in feet of rise per mile of distance, and when so expressed in these findings are the "compensated" grades; i. e., they take into account such resistance to tonnage movement as is contributed by curvature as well as actual grade.

Answer, par III (2).

Kirkbride, R. 2038-2040, 2046-2056, 2064-2065, 4044-4050, 4053-4056.

Exhibits 155, 175, 301, 302, 303, 309, 310.

(3) Helper districts:

Those sections of the line where the grade and other physical conditions are such as to require the use of one or more additional locomotives in order to handle trains which elsewhere are normally handled by one locomotive, are customarily referred to as "helper districts." There are four regular freight helper districts for eastward trains [fol. 6090] on defendant's main lines in Arizona, as follows: From Gila to Estrella, 18.9 miles; from Tucson to Mescal, 39.7 miles; from Benson to Dragoon, 21.3 miles; from San Simon to Steins, New Mexico, 14.7 miles. The two freight helper districts from Tucson to Mescal, 39.7 miles, and from Benson to Dragoon, 21.3 miles, are operated as one freight-helper district in actual practice, in that the

additional helper locomotives and the employes operating them run through from Tucson to Dragoon, without detaching from the trains they are helping, during the nine-mile descent from Mescal to Benson.

Helper locomotives are not regularly required or normally used by defendant's westbound freight trains between Lordsburg and Gila, or by freight trains moving in either direction between Yuma and Gila, or Lordsburg and El Paso, or upon the two alternate main lines via Phoenix and Douglas.

Helper locomotives are usually required by westward freight trains and by many westward passenger trains ascending the grade from Indio to Beaumont, California, and by eastward freight trains, and many eastward passenger trains moving from Colton, California, to Beaumont. Helper locomotives are not used or required by trains descending the grades above described in any of the aforementioned territories.

Masson, R. 270; *Dyer*, R. 2022-2024; *Sines*, R. 2589-2590, 2595-2601, 4226, 4427.
Exhibits 155, 175.

(4) The affected lines well constructed:

Defendant's main lines in the affected territory are well constructed and carefully maintained, and fully capable of [fol. 6091] sustaining the heaviest and most powerful locomotives and cars owned or operated by defendant. Said main lines are equipped throughout with approved modern block signals and other numerous safety devices of modern type promoting the safety of operation.

J. B. Baker, R. 1466-1478, 1491-1495, 1509-1528; *Dyer*, R. 2017, 2021, 2022; *Kirkbride*, R. 2065-2131.
Exhibits 110 to 114, 157 to 159.

(c) Defendant's Lines in Nevada and Utah: Description: Comparison with Arizona Lines.

The operating conditions upon defendant's main lines across Nevada and Utah (briefly referred to in sub-paragraph (a) of this finding) are very similar to those upon the above-described lines between Yuma, Arizona and El Paso, Texas. The ruling grades in the Nevada-Utah territory are generally less than one per cent, and the lines

lie for the most part in desert and valley territory, where operating conditions are substantially as favorable as in Arizona and New Mexico; the only notable difference being that the climatic conditions in the winter are much more severe in northern Nevada and Utah. The maximum ruling grade encountered on defendant's main lines in Nevada and Utah, in either direction, is 1.5 per cent. The curvatures on said lines are, as in Arizona, light and relatively infrequent, in that there are long stretches of tangent track and flat curves; however, the percentage of curved track to the total main-line mileage is greater in Nevada than in Arizona, in that about 24.5 per cent of the main line mileage in Nevada consists of curved track.

Said Nevada-Utah lines are well constructed and maintained, in accordance with the same standards which prevail [fol, 6092] in Arizona, and are equipped with the same types of block signals and other modern safety devices in use in Arizona.

Answer, III (2).

Dyer, R. 2009-2010; *Kirkbride*, R. 2056-2064, 2105-2108, 2116-2132, 2134-2136, 2144-2146, 3876-3882, 4034-4064.

Exhibits 110, 156, 157, 158, 159, 301, 302, 303, 306, 307, 308, 309, 310.

IV

Character of Freight and Passenger Traffic Handled upon Defendant's Lines in Arizona and Adjacent Territory; Comparison with Nevada Traffic.

(a) Predominant Interstate Character of Arizona Freight and Passenger Traffic.

A substantial volume of traffic is handled in both the eastward and westward directions, over defendant's main lines in the territory affected by the law. This traffic is predominantly interstate in character.

92.74 per cent of the total revenue freight ton miles carried by all of the defendant's lines in Arizona during the five-year period, 1935-1939, inclusive, related to interstate freight, and only 7.26 per cent of said total related to intrastate freight. In the same five-year period 95.49 per cent of all the revenue passenger miles accumulated

on all of the defendant's lines in Arizona were interstate in character, and only 4.51 per cent were intrastate.

In the years 1938 and 1939, more than 68.5 per cent of all the revenue freight ton miles, and more than 74.0 per cent of all the revenue passenger miles, accumulated upon [fol. 6093] defendant's said Arizona lines, related to "overhead" or "bridge" freight and passenger traffic: that is, traffic originating outside the state, and crossing the state to destinations beyond.

A study of the total freight revenues earned by the defendant's lines in Arizona, such revenues being allocated to the State of Arizona in accordance with the formula prescribed by the Arizona Corporation Commission, developed that the revenues from handling interstate freight were, during said five-year period, 1935-1939, inclusive, 93.07 per cent of the total thus allocated, while the corresponding revenues from Arizona intrastate freight were but 6.93 per cent of said total. A similar study of passenger revenues earned by defendant's lines in Arizona, such earnings being also allocated in accordance with the formula prescribed by the Arizona Corporation Commission, developed that interstate passenger revenues were, during said five-year period, 1935-1939, inclusive, 95.25 per cent of the total thus allocated, and Arizona intrastate passenger revenues were but 4.75 per cent of said total.

64.77 per cent of said total of freight revenues allocated to Arizona for said five-year period accrued to defendant for the handling of bridge or overhead freight traffic, as above defined.

Masson, R. 1911-1947, 2225-2227, 2233, 2246-2252; *Sines*, R. 2500-2509.

Exhibits 141, 142, 143, 144, 145, 146, 147, 148, 167, 170, 189, 190.

(b) Character of Commodities Transported: Need for Expedition.

The interstate traffic handled in defendant's freight trains in the affected territory consists principally of per- [fol. 6094] ishable agricultural products (fresh fruits, vegetables, melons, etc.), livestock, and manufactured products of relatively high intrinsic value. All of these classes of freight must be handled and delivered with the least possible delay.

During the year 1939 defendant handled 261,755 carloads of all kinds of freight, both interstate and intrastate, on its lines in Arizona, of which 104,739 carloads consisted of products of agriculture. 88,658 of said carloads consisted of fruits and vegetables and other perishable agricultural products; and there were 16,001 carloads of livestock, fresh meats, and other animal products. During 1939 defendant handled 190,828 carloads of freight on its lines in New Mexico, of which 96,250 were products of agriculture. 87,126 of said carloads consisted of perishable agricultural products; and there were also 13,273 carloads of livestock, fresh meats, and other animal products.

Approximately 59 per cent of the eastbound cars forwarded to El Paso by defendant during the five years, 1935-1939, inclusive, were loaded refrigerator cars; and about 53 per cent of the westward cars forwarded by defendant from El Paso during the same period were empty refrigerator cars. Such refrigerator cars are designed to be, and in nearly all cases are used for the transportation of various kinds of perishable freight, other than livestock.

Practically all of the traffic handled by defendant eastward into El Paso or westward from that point did, during the period stated, and as a general rule does move over defendant's main lines in Arizona, and by far the greater portion thereof did, and as a general course does originate or terminate at points beyond (west of) Arizona. A substantial proportion of the traffic, other than that handled in refrigerator cars moving across Arizona, and received [fol. 6095] at or forwarded from El Paso by defendant, consists of either livestock or so-called manifest freight. 4278 per cent of all the loaded freight-car mileage accumulated in Arizona in the five years, 1935-1939, inclusive, was accumulated by loaded Pacific Fruit Express refrigerator cars; while 56.21 per cent of all the empty freight-car miles accumulated in Arizona during the same five-year period were accumulated by empty Pacific Fruit Express refrigerator cars.

Such perishable and livestock traffic, as well as the so-called manifest freight, must be handled promptly, in order to avoid damage and shrinkage and permit of orderly marketing, and also, in the case of livestock, to comply with the requirements of the Federal Twenty-eight-Hour Law. Empty westbound refrigerator cars must be handled by

defendant over its lines, particularly the main lines in the affected territory, as speedily as practicable in order to insure a dependable supply of such cars for the loading of the highly perishable agricultural traffic originating in the California and Arizona producing areas.

Kirk, R. 410-414; *Fertig*, R. 870-872; *Cartmill*, R. 1768-1769, 1775-1776; *Mahoney*, R. 1841-1844; *Sines*, R. 63-64, 2500-2509; *Dyer*, R. 2008-2009; *Masson*, R. 2225-2230, 2233, 2246-2252, 3177-3184; *G. C. Baker*, R. 2340-2344, 2670,
Exhibits 167, 168, 170, 175, 189, 190, 216, 217, 218.

(c) Arizona Traffic Compared with Traffic Across Nevada.

The freight traffic handled upon defendant's main lines crossing Nevada and Utah is similar to that handled in and across Arizona; in that it is predominantly interstate in character, and the loaded movement consists principally of perishable agricultural products, livestock and the prod- [fol. 6096] ucts thereof, and manufactured articles of relatively high value, while the empty car movement consists, in large part, of refrigerator cars being returned from eastern markets for further loading in the California and Oregon producing areas. Moreover, the total volume of the freight traffic across Nevada is approximately the same (on the average, about 5 per cent greater) as the corresponding volume of freight traffic in Arizona. About 50 per cent of the cars moved eastward by defendant during the year 1939 over said lines across Nevada and Utah, and to Ogden, Utah, were refrigerator cars carrying perishable freight, while similarly 55 per cent of the cars moving eastward to El Paso during 1939 were loaded refrigerator cars. About 47 per cent of the cars moved westward during the said year from Ogden over said lines were empty refrigerator cars being moved to the producing areas of California and Oregon for further loading, while 49 per cent of the cars moving westward through El Paso were empty refrigerator cars. 38.59 per cent of all the loaded freight-car miles accumulated in Nevada during the five years, 1935-1939, inclusive, were accumulated by loaded refrigerator cars of the Pacific Fruit Express Company. 55.01 per cent of all of the empty freight-car miles accumulated in Nevada during the same five-year period was

accumulated by empty Pacific Fruit Express Company refrigerator cars.

Dyer, R. 2008-2009; *Masson*, R. 2232-2252, 3179-3184; *Sines*, R. 2500-2508, 2535-2537.

Exhibits 149, 150, 167, 169, 170, 189, 190, 217, 219, 277, 279, 280.

[fol. 6097]

V

The Train Limit Law: History and Text

On May 16, 1912, the Governor of the State of Arizona approved an act of the Legislature of that State entitled "An Act limiting the number of cars in a train", which act was afterwards, on referendum at a general State election held November 5, 1912, approved by a majority of the voters of said State voting at said election (Laws, 1913, Referendum, p. 15; Sections 2166-2168, Revised Statutes of Arizona, 1913; Civil Code of Arizona, Section 647, Arizona Revised Statutes, 1928; Section 69-119, Arizona Annotated Code, 1939), and ever since has been and now is in full force and effect. Said act has no preamble, and reads as follows:

"Section 1. It shall be unlawful for any person, firm, association, company or corporation, operating any railroad in the State of Arizona, to run, or permit to be run, over his, their, or its line of road, or any portion thereof, any train consisting of more than seventy freight, or other cars, exclusive of caboose.

"Section 2. It shall be unlawful for any person, firm, association, company or corporation, operating any railroad in the State of Arizona, to run, or permit to be run, over his, their, or its line of road, or any portion thereof, any passenger train consisting of more than fourteen cars.

"Section 3. Any person, firm, association, company or corporation, operating any railroad in the State of Arizona, who shall willfully violate any of the provisions of this act, shall be liable to the State of Arizona for a penalty of not less than one hundred dollars, nor more than one thousand dollars, for each offense; and such penalty shall be recovered, and suits therefore brought by the attorney general, or under his direction, in the name of the State of Arizona, in any county

[fol. 6098] through which such railroad may be run or operated, provided, however, that this act shall not apply in cases of engine failures between terminals.

"Section 4. All acts and part of acts in conflict with the provisions of this act are hereby repealed."

Said act is generally known, and throughout these findings is referred to, as the Arizona Train-Limit Law.

Complaint, par. I.

Answer, par. I (1); par. II (1).

VI

Recent Improvements in Defendant's Transportation Plant, Both Generally, and in the Territory Affected By the Law:

(a) Improvements In Track, Roadbed, Bridges and Other Fixed Structures.

In the years since the enactment of the Train-Limit Law in 1912, and especially since 1923, defendant has made numerous, substantial, permanent improvements in the track, roadbed, bridges and other fixed structures upon its lines of railroad heretofore generally described in paragraph III of these findings, and particularly upon its main lines in the affected territory.

Said improvements have included the following, among other things: The replacement of lighter weights of rail, in main tracks and sidings, by heavier rail, including, particularly in Arizona, replacement of lighter rail in main lines by rail weighing 90 pounds or more per lineal yard; replacement of gravel ballast, in the roadbed, by crushed rock and slag ballast, and the placement of such [fol. 6099] ballast at greater depths under the track than was previously the practice; constant and thorough renewal and replacement of ties, and the use of more ties per mile, of better and more costly types; constant repair and renewal of bridges, trestles and culverts; and replacement, where needed, of wooden bridges, trestles, and culverts by steel or concrete structures; separation of grades at numerous rail-and-highway crossings, and installation of automatic warning signals at numerous other grade

crossings; construction of additional double track; construction of additional yard and terminal facilities at various points; installation of improved types of block signals, and replacement of older types by more modern types; construction, where needed, of interlocking signal plants; and the acquisition in 1924 of the lines of the former Arizona Eastern and El Paso and Southwestern Railroad Companies, following which, in 1924-1926, defendant constructed and reconstructed the lines between Wellton and Picacho via Phoenix, so as to provide the alternate main line via Phoenix heretofore refered to.

The aforesaid improvments have been accomplished only by the expenditure of large sums of money.

During the years 1924 to 1939, inclusive, defendant expended more than $162,000,000 for net additions and betterments (after allowance made for retirements) to the roadbed and fixed structures (not including rolling stock or other movable equipment) upon its railroad system in the states of California, Nevada, Utah, Oregon, Arizona, New Mexico and Texas, known as its "Pacific Lines", and heretofore described in paragraph III of these findings.

In the same period the net investment by defendant (over and above retirements) for permanent improvements made [fol. 6100] to its roadbed and fixed structures in the territory between Yuma and El Paso was more than $21,000,000; which figure does not include any amounts expended by defendant in acquiring the properties formerly owned and operated by the El Paso and Southwestern and Arizona Eastern Railroad companies, as above mentioned.

This net additional expenditure, over and above retirements, made in Arizona alone by defendant for permanent improvements to roadbed and fixed structures, during said period 1924-1939, was more than $18,400,000. None of the above figures includes any sums of money spent by defendant in the acquisition and improvement of rolling stock, or other movable equipment.

In 1912 the sidings and passing tracks on defendant's main line in Arizona were not generally of sufficient capacity to hold freight trains of substantially more than 70 cars, including engine and caboose. While said sidings have been greatly improved, as aforesaid, since 1912, and particularly since 1920, by being relaid with heavier rail, and by

having ties, ballast, and embankments renewed, they have not in general been extended beyond their former capacities.

J. B. Baker, R. 1466-1478, 1491-1495, 1509-1528; *Dyer*, R. 1998; *Kirkbride*, R. 2050, 2093-2131; *Herbert*, R. 2830-2839, 2857-2858.

Exhibits 110, 111, 112, 113, 114, 157, 158, 159, 197, 200, 201.

(b) Improvements in Locomotives, Cars and Equipment.

The locomotives, cars and equipment used on defendant's lines generally, including the lines affected by the law, have been substantially improved during the years since 1912, and notably since 1923.

[fol. 6101] As to the locomotives, such improvements have included the building, purchase, or acquisition by other means, of newer and heavier types of locomotives, capable of rendering speedier and more efficient service and of withstanding more severe service conditions, and having substantially greater hauling capacity, than the locomotives previously in service; and the retirement of the older, smaller, and less efficient types, which have been largely replaced by the newer locomotives. Such newer and heavier locomotives are equipped with the latest and most modern devices, designed to promote safety, efficiency and economy of operation; which devices include, among others, the following: super-heaters, feed-water heaters, air pumps of newer design, air reservoirs of increased capacity, heavier frames and running gears, improved and strengthened brake equipment, back-pressure indicators, automatic stokers for coal-burning locomotives, and power-reverse gears. Many of the older locomotives, where retained in service, have been improved and brought to a higher state of efficiency by placing upon them certain of the devices above enumerated, as well as other devices not herein specifically mentioned.

The locomotives and cars presently in use in freight and passenger service on the lines in Arizona are, in most instances, the same kinds and types as those heretofore or presently in similar service in Nevada and Utah, and include the most modern types owned by defendant. Such locomotives were acquired expressly for the purpose of handling, and in several years of actual operation have demonstrated that they are fully capable of handling in

the Nevada-Utah territory, freight trains consisting of substantially more than 70 cars, either loaded or empty, and passenger trains of more than 14 cars; and, except to the extent that helper locomotives are or may be required on [fol. 6102] certain helper districts in Nevada, the handling of such long trains in said states, by single locomotives of the same types as are now used by defendant in Arizona, is the ordinary, customary, and standard practice. Locomotives of the types now in use in Arizona have recently been, and likewise presently are, in use on those portions of defendant's lines in California and New Mexico, adjacent to the Arizona boundary line, in service similar to that for which they are employed in Arizona; and in such service said locomotives have demonstrated that they are fully capable of handling long freight and passenger trains, as a regular, customary, and standard practice.

Defendant has expended large sums of money in recent years in the building and purchase of said newer and more powerful locomotives. The total so expended by defendant during the period 1922-1939, inclusive, was $46,216,000, which expenditure enabled defendant to acquire during that period 409 new locomotives, having a total tractive power of 34,244,070 pounds. These expenditures were in all instances made pursuant to express authority to that end, granted by the Interstate Commerce Commission under the provisions of Section 20a of the Interstate Commerce Act.

The improvements made since 1912 in the cars in service upon defendant's aforesaid lines of railroad have included the purchase or building of newer cars equipped with the latest and most modern devices and appliances and of stronger construction than the cars previously in service, and the retirement and withdrawal from service of the older, weaker cars, which have been largely replaced by the cars of later types.

All cars now in use for the handling of freight in through and interchange service (i. e., in service involving move-
[fol. 6103] ment over more than one railroad) upon defendant's lines are built of steel or with steel underframes; cars having wooden underframes, largely in use in 1912 and previously, have been entirely withdrawn from such service. Refrigerator cars constitute approximately 50 per cent of the freight cars handled in defendant's freight

trains in the affected territory; and almost all of the refrigerator cars handled by defendant are owned by the Pacific Fruit Express Company, a corporation affiliated with defendant. All such refrigerator cars, and all of the other freight cars owned or used by defendant, are equipped with trucks having cast-steel side frames. The use of the older arch-bar type of truck has been entirely discontinued.

The draft gears and draft rigging on all such cars have been greatly improved. All of the refrigerator cars, and more than 80 per cent of the freight cars of other types owned by defendant and used in through or interchange service, are equipped with modern friction draft gears and modern draft appliances.

Modern, single-plate cast iron wheels are in universal use upon both the freight and refrigerator cars aforesaid, the older, double-plate type of wheel having been replaced.

Numerous improvements have been made in the air-brake mechanism of said cars; examples of such improvements being (1) the installation of heavier graduating springs in the triple valves, as a result of which so-called unintended (undesired) emergency action by the air brakes has been practically eliminated; (2) the development and subsequent adoption (in 1933) of an improved type of freight-brake valve known as the "AB"; which type is now standard upon all new cars built since 1933, and also required (by the interchange code) to be applied on all older cars not later than January 1, 1945. Numerous other improve- [fol. 6104] ments, not herein separately mentioned, have also been made in said freight cars, operated in defendant's trains in the affected territory, and upon its railroad lines generally.

All passenger cars now in use on defendant's main lines, including sleeping and other cars owned by the Pullman Company, are now built entirely of steel, the use in passenger trains of cars having wooden bodies, which was common in 1912 and previously, having been entirely discontinued. The braking appliances, couplers, draft gears and draft rigging, wheels, and other features of said cars have been greatly strengthened and improved, and numerous other devices and improvements, not herein separately mentioned, have been added to such passenger cars, all with the purpose and result of providing greater safety and comfort for the traveling public and employes riding

in such cars, and greater ease, safety and economy of operation of the trains in which such cars are run.

Leriche, R. 72-83, 86-112, 145-146; *Russell*, R. 118-144; *Parke*, R. 1397-1418, 1431-1465; *Cartmill*, R. 1779-1821; *Dyer*, R. 1998-2000, 2004-2005, 2016; *Masson*, R. 2295-2299; *Sines*, R. 2467-2473; 3148-3149, 4226-4227; *Browning*, R. 2863-2894; *Burke*, R. 2959-2962; *F. P. McDonald*, R. 2964-2967; *Bohnstengel*, R. 3078 3142; *Barker*, R. 3436-3441; *Durnil*, R. 4390-4391, 4448, 4462-4265; *Kennedy*, R. 4505-4507, 4516; *Cooper*, R. 4264-4265, 4532-4535; *Shaw*, R. 4910, 4935-4936; *Fifield*, R. 5194, 5208, 5210-5211, 5222; *Menzies*, R. 5240.

Exhibits 2, 3, 4, 5, 6, 7, 107, 108, 109, 135, 136, 137, 174, 183, 189, 204, 210, 212, 247, 396.

[fol. 6105] (c) Purpose of the Improvements Made By Defendant: Adequacy of Defendant's Present Track, Structures, and Equipment To Permit Operation of Long Trains

The expenditures above referred to, and the improvements and enlargements of defenadnt's transportation plant thereby effected, and the improvements, additions and betterments otherwise made by defendant, both upon its lines generally and particularly in the territory affected by the law, as hereinbefore set forth, were made and undertaken by defendant for the primary purpose of enabling greatest possible safety, efficiency, and economy and to discharge its public duty as a common carrier.

Said expenditures, particularly those made during and since the year 1923, were undertaken by defendant concurrently with and as a part of the general program of betterment of the railroad transportation plant of the said defendant to operate its railroad lines with the United States formulated and agreed upon in 1923 by the United States railroads, including defendant, and hereinafter more fully referred to.

Defendant's track, roadbed, bridges, and other structures upon its main lines in the territory affected by the law are given regular and exacting inspections, and are thoroughly and carefully maintained, and have been at all times herein mentioned and now are in excellent physical condition. They are fully capable of sustaining safely the

weight of the heaviest equipment, whether locomotives, loaded cars, or other movable equipment, owned or operated by the defendant. The locomotives presently in use or available for use in the affected territory are, as before stated, fully capable of handling freight trains consisting of substantially more than 70 cars, either loaded or empty, or both, exclusive of caboose, and passenger trains of more [fol. 6106] than 14 cars, over the main lines in that territory; and the cars operated in said trains are of adequate strength and construction, and equipped with adequate appliances and devices to permit of their being safely operated, in train units of substantially more than 14 or 70 cars, as the case may be. There is no reason, whether from the standpoint of climatic conditions, or track, grades, curvatures, or other operating conditions, or the strength or capacity of road, structures, and equipment now being used and available, why defendant cannot operate and continue to operate upon its main lines in the affected territory, as elsewhere upon its system in comparable or more difficult territory, a very substantial number of freight-train units of many more than 70 cars, exclusive of caboose, and passenger-train units of more than 14 cars. If defendant were relieved of the restrictions of the train-limit law, it would at once undertake, and thereafter continue and expand such long-train operations in the affected territory.

As hereinafter more fully set forth, defendant operated long passenger trains in the affected territory on 62 occasions during the months of March and April, 1940, and also operated some 302 or more long freight trains in said territory during the month of April, 1940; and thereby demonstrated that such long-train operation is wholly practicable in said territory, and results in greater safety, efficiency, and economy.

Parmelee, R. 282-374; 475-478; *Dyer*, R. 2021-2022; *Kirkbride*, R. 2068-2093, 2105-2107; *Sines*, R. 3357-3362, 3427-3432.

Exhibits 15 to 22, inclusive, 234, 246, 294, 295.

[fol. 6107]

VII.

Defendant's Methods of Operation, Past and Present

(a) Operating Subdivisions: Runs of Crews and Locomotives: Operating Rules: Inspections.

(1) Operating divisions and subdivisions:

In the operation of its lines generally, defendant has subdivided its system into nine operating divisions; and each of the said divisions is further subdivided into operating subdivisions. The stations at the termini of said subdivisions are usually designated as freight-train terminals, and the through freight trains operated by defendant generally originate at such terminals, moving over the subdivisions to the next succeeding terminals, where their runs terminate.

That portion of defendant's main lines hereinbefore described, which extends between Los Angeles and Yuma, Arizona, forms a part of defendant's Los Angeles Division. The lines between Yuma and Tucson, together with the eastbound main track in the double-track territory between Tucson and Mescal, and the line from Mescal via Bowie to Lordsburg, as well as the Nogales, Christmas and Globe branches have, since July, 1930, constituted the Tucson Division. The westbound main track between Tucson and Mescal, together with the line from Mescal via Douglas to Anapra, and from Lordsburg to Tucumcari via El Paso have, since July, 1930, constituted the Rio Grande Division. Prior to July, 1930, the line between Tucson and Lordsburg, including the Globe branch, was part of the Rio Grande Division, which division then included also the line between Tucson and El Paso via Douglas, but not the line between El Paso and Tucumcari. Said line last mentioned formed a separate division called the New Mexico Division. In July, 1930, the present divisional bound-
[fol. 6108] aries, above described, were established, and the New Mexico and Rio Grande divisions were merged.

All of the lines in Nevada east of the station of Lawton, Nevada, including also the lines in Utah, as well as certain lines in northeastern California, and a portion of the narrow-gauge branch line in Owens Valley of California, are now, and since November, 1929, have been operated as defendant's Salt Lake Division.

That portion of the Salt Lake Division north of Wendel, California, was added to the division in November, 1929, at which time the line from Fernley, Nevada, to Wendel, formerly classed as branch line, was reclassified as main line. The portion of the main line in Nevada between the Nevada-California boundary line and Lawton, Nevada, is a part of defendant's Sacramento Division.

The following stations upon the main lines in the affected territory are designated as freight-train terminals: Los Angeles, Indio, Yuma, Gila, Tucson, Lordsburg, El Paso; upon the Phoenix line, Phoenix; and upon the Douglas line, Douglas. At those points freight trains originate and terminate, and the runs of freight-train and engine crews, and in some instances of the locomotives of such freight trains, begin and end.

Through freight trains arriving at El Paso are largely broken up and reswitched before the cars handled therein receive further movement. Through freight trains arriving at Yuma are also generally, although not always, switched and reconsisted to a substantial extent before further movement takes place; and in particular, locomotives and cabooses are invariably changed at that point. At Gila through freight trains arriving from either direction receive little, if any, substantially reconsisting, other [fol. 6109] than the changing of cabooses and locomotives; and in some instances locomotives are not changed. At Lordsburg, in those instances where schedule and other requirements permit, through freight trains of less than 70 cars arriving from the west are reconsisted into the longer trains permitted by the New Mexico law; and all westbound long freight trains arriving at Lordsburg are reconsisted into short trains in order to conform to the Arizona law. When not thus shortened or lengthened, trains generally pass through the Lordsburg terminal without substantial reconsisting other than the changing of cabooses, and in some instances, of locomotives. All through or local freight trains moving in either direction terminate at Tucson. The locomotives, crews and cabooses on all such trains are changed at that point, and in many instances the trains are substantially reconsisted.

Freight trains operating eastward over the alternate main line between Wellton and Picacho generally originate at Yuma, and move through to Phoenix, where they are largely reconsisted, crews and locomotives being changed;

such trains then move from Phoenix to Picacho, and thence to Tucson, where they terminate. The westward operation over the Phoenix line is similar. Freight trains operating over the alternate main line via Douglas generally originate at either Tucson or El Paso, and run to Douglas, where crews and locomotives change, and said trains then continue to the terminals at El Paso or Tucson, where they terminate.

Defendant's eastbound main-line passenger trains in the affected territory originate at Los Angeles, with the exception of one train operated on alternate days during the winter season, which originates at Phoenix. Such trains carry the same names and numerical identifications throughout their movement over defendant's lines. De-
[fol. 6110] fendant's westbound main-line passenger trains in said territory likewise carry the same names and numerical identifications throughout their movement over defendant's lines. All said westbound trains originate at or east of El Paso, and except for one train operated on alternate days during the winter season, which terminates at Phoenix, all said trains run across Arizona and terminate at Los Angeles. Neither the eastbound nor westbound passenger trains are generally reswitched while enroute, except where necessary to adjust their consists to the 14-car restriction, or to pick up or set out individual cars at intermediate points.

Sines, R. 61-66, 2485-2491, 2531-2533, 2792-2805, 3163, 3169-3170, 3309-3313, 4222-4224; *Kirkbride*, R. 2034-2036; *G. C. Baker*, R. 2340-2342, 2669-2697, 2380-2382; *Herrell*, R. 2732, 2742-2749; *Garverick*, R. 3024; *Herbert*, R. 3069.

Exhibits 154, 155, 185, 186, 199, 214.

(2) Runs of crews and locomotives:

The district between the terminals at Los Angeles and Yuma constitutes a through run for passenger-train and engine crews. Freight-train crews operating on said district are ordinarily changed at Indio. The district between Yuma and Tucson, via either Gila or Phoenix, constitutes a through run for passenger-train crews, but the through runs for freight-train crews are between Yuma and Gila, and Gila and Tucson on the main freight line, and

between Yuma and Phoenix, and Phoenix and Tucson, on the alternate main line via Phoenix. The district between Tucson and Lordsburg constitutes a through freight run for both engine crews and train crews. Engine crews on [fol. 6111] passenger trains also run between Tucson and Lordsburg, changing at the latter point; but train crews on passenger trains run through between Tucson and El Paso. The district between Lordsburg and El Paso constitutes a through freight run for both engine crews and train crews, and also for engine crews of passenger trains. The district between Tucson and Douglas, and likewise the district between Douglas and El Paso, constitute through runs for freight crews, and also for engine crews on passenger trains. Train crews on passenger trains operating via Douglas run through between Tucson and El Paso, without changing at Douglas.

Passenger locomotives generally run through between Los Angeles and El Paso without change, although occasionally such locomotives are "dropped back" (as hereinafter described) at Tucson. Freight locomotives generally run through between Yuma and Tucson, and between Tucson and El Paso, usually "dropping back" at Gila and Lordsburg; i. e., the locomotive, upon arrival, is detached from its train and used on the next succeeding train, being replaced by (and in turn replacing) another locomotive of the same general class and type, assigned to the same character of service. Such "dropping back" permits the locomotives to be inspected, refueled and otherwise serviced between trains, and at the same time avoids any incidental delay to the movement of the trains concerned.

Sines, R. 61-66, 2583-2601, 2606-2607, 3169-3170, 3257, 4223-4224; *Baker*, R. 2670-2684; *Herrell*, R. 2736-2737.

(3) Operating rules:

The operation of defendant's freight and passenger, and other trains, in the affected territory and also upon its [fol. 6112] system generally (including the lines in Nevada and Utah) is governed by written rules, embodied in two books of rules, issued to all employes in train service, and called (1) "Rules and Regulations of the Transportation Department", and (2) "Rules and Regulations Gov-

erning Care and Operation of Air Brake and Air Signal Apparatus". Said Rules and Regulations provide general instructions governing such operation, which are required to be observed by all employes concerned, except where deviations are permitted by written rule or bulletin, to meet special local conditions; and said Rules and Regulations constitute a complete and adequate code, sufficient, if fully complied with and observed by said employes, to insure the safe operation of defendant's trains under all circumstances. Responsibility for the enforcement and observance of said rules rests upon defendant's operating officers.

Dyer, R. 2006-2007; *Cheek*, R. 4608-4609; *Durnil*, R. 4419-4420; *Stevenson*, R. 4621-4624; *Fifield*, R. 5225-5231; *Menzies*, R. 5249-5256.
Exhibits 319, 320.

(4) Inspections:

The operation of defendant's trains, in the affected territory and also upon its system generally (including the lines in Nevada and Utah), is accompanied by systematic inspections of the equipment, in order to make certain that said equipment is in safe operating condition, and free of defects requiring repair or replacement; and such equipment is thoroughly and carefully maintained.

Cars received by defendant from its connections, at interchange points (such as El Paso), are subjected to thorough [fol. 6113] inspections, before being accepted for handling; such inspections being in accord with the code promulgated by the American Railway Association (now the Association of American Railroads). Cars receive further inspections where they pass through terminals, either by car-inspection forces there maintained for that purpose, or by the crews of the trains in which the cars are placed. Cars also receive frequent inspection by train crews while on the road between terminals, and in particular are required to be inspected at designated inspection stops, as well as at all other stops as far as practicable. Refrigerator cars of the Pacific Fruit Express Company, which as before stated comprise a large proportion of the cars handled in the affected territory, undergo a separate, thorough inspection and reconditioning prior to each movement, under load, away from the principal producing areas.

Such inspection and maintenance are for the purpose of insuring that the equipment handled in defendant's trains shall be in the best possible condition, so as to permit said cars to be handled safely, whether in long-train or short-train units; and, as hereinafter shown, said inspection and maintenance are fully adequate to, and do, accomplish that purpose.

Cartmill, R. 1798-1806; *Sines*, R. 2607-2610, 3239; *Browning*, R. 2880, 2863-2884; *Reid*, R. 2936-2942, 2947-2950; *Burke*, R. 2955-2958, 2962-2963; *F. P. McDonald*, R. 2968-2972. See also Finding XIII (d).

Exhibits 137, 203, 204.

(5) Similarity of operating methods, rules, records, etc., on defendant's lines in Nevada and Utah to those in the affected territory:

Defendant's train operations upon its lines in Nevada and Utah are subject to the same code and system of operating [fol. 6114] rules, and are carried on in accordance with the same standards and methods of operating practice, which prevail upon its system generally, and particularly upon its lines in the affected territory.

The same officials who have jurisdiction over defendant's system supervise all said operations. A number of officials of defendant have at different times served as division officers, in immediate charge of operations and maintenance, on the lines in both Arizona and Nevada.

The laws of Nevada and Arizona relating to the numbers and classes of employes required upon trains of various kinds are substantially similar, and their effects, in so far as concerns defendant's train operations in the two states, are practically identical.

The same equipment, including both locomotives and cars, is used interchangeably in both the affected territory and on the lines in Nevada and Utah. As heretofore more fully set forth, traffic in these two territories, as to volume, density, predominate interstate character, distribution between loads and empties, and generally in all other essential characteristics, is closely and substantially similar.

Operating conditions, from the standpoint of those physical characteristics such as grades, curvatures, and the like, are, as previously stated, also shown to be very similar in

the two territories; the only point of difference being that the weather conditions in Nevada and Utah, in the winter months, are much severer than in the affected territory.

The records maintained by defendant, and the numerous statistical and other reports required to be rendered and made by defendant to the Interstate Commerce Commission [fol. 6115] and other public authorities, relating to defendant's operations and the results thereof, are developed, maintained and rendered, in accordance with and pursuant to systems and methods of accounting and reporting which are applicable alike, and without material difference, to both the affected territory and the lines in Nevada and Utah.

Except for the train-limit law, and the modifications of railroad operating practice made necessary in the affected territory by the restrictions of said law, there is no substantial difference in operating methods, or equipment, or the character of the railroad plant and structures generally, or in the nature of the business carried on, as between the lines in the affected territory on the one hand, and the lines in Nevada and Utah on the other. Comprehensive comparisons between Arizona and Nevada, and between the Tucson and Salt Lake Divisions, as to the results and incidents of operations, therefore afford a reliable and highly accurate method of testing and determining the effects and results of the law.

Dyer, R. 2005-2025; *Masson*, R. 2246-2252; *Sines*, R. 52-53, 2474-2475, 3145-3149, 3844-3845, 4221-4222; *Sullivan*, R. 3723; see also annotations to Findings III (c) and IV (c).

Exhibits 8, 9, 170, 184, 191, 195, 212, 260, 305.

(b) Lengths of Defendant's Trains

(1) Train lengths on the system generally:

Prior to about the year 1925 defendant operated comparatively few long freight or passenger trains over any of its lines. Commencing in 1926, and continuing thereafter down to the present time, defendant has followed and now follows, [fol. 6116] upon its entire system (except in the affected territory), the practice of operating a substantial number of long trains, when and where operating and traffic conditions permit or render such practice desirable; and both the average lengths of defendant's trains, expressed in the number of cars contained therein, and the proportion

borne by the number of long trains to the total number of those operated have tended (except in the affected territory aforesaid) to increase from year to year, throughout that period.

In 1922, the average length of all freight trains operated by defendant upon its entire system, including its lines in Arizona, was 42.4 cars, exclusive of caboose. The corresponding figures for later years were as follows: for 1926, 47.7 cars; for 1930, 51.5 cars; for 1934, 51.7 cars; for 1936, 50.8 cars; for 1938, 52.0 cars; for 1939, 53.6 cars.

A study of the lengths of freight trains operated on substantially all of defendant's main lines in the several states (other than Arizona) where it operates, covering some 61,943 trains, operated during four representative months of 1939, shows that long freight trains were in proportion to the total number of trains operated, as follows: In Oregon, 38.16 per cent; in California, 21.74 per cent; in Nevada, 66.20 per cent; in Utah, 85.85 per cent; in Texas, 1.34 per cent; in New Mexico, 9.06 per cent. For the system as a whole, excluding Arizona, long trains constituted 27.03 per cent of the total number operated.

A similar study of system passenger-train operations over the principal main routes, during the year 1939, shows that the percentages of long passenger trains, in relation to the total of through passenger trains operated, were as follows: on the main route from San Francisco across Nevada to Ogden, 43.79 per cent; on the main route from San Fran- [fol. 6117] cisco to Portland, Oregon, 19.76 per cent; on the "Valley Route" from San Francisco, via Fresno, California, to Los Angeles, 15.35 per cent; on the "Coast Route" from San Francisco, via Santa Barbara, California, to Los Angeles, 34.39 per cent; on the route from Los Angeles across Arizona to Tucumcari, for the portion between Los Angeles and Yuma, 7.64 per cent, and for the portion between El Paso and Tucumcari, 3.57 per cent. No longer passenger trains were operated in Arizona by defendant in 1939.

Dyer, R. 2001-2003, 2017, 2026-2027; *Masson*, R. 1947-1954; *Herbert*, R. 2399-2401, 2416-2418, 2429-2430, 2442-2445; *Sines*, R. 2483-2495, 3142-3144; *Fifield*, R. 5180-5183, 5220.

Exhibits, 149, 150, 162, 177, 178, 179, 180, 185, 186, 187, 188, 211.

(2) Train lengths in Arizona, past and present: Comparison with other portions of the system, and with the system as a whole.

In 1912, and prior thereto, defendant operated very few long freight or passenger trains in Arizona. The average main-line freight train in Arizona in 1912 consisted of about 47 cars; the average passenger train of 9 or 10 cars. During the first six months of 1912, only 16, or 0.38 per cent, out of a total of 4187 main-line freight trains operated in Arizona, consisted of 71 cars or more; the longest of said trains (two in number) contained 75 cars each. During the same period, defendant operated no regular passenger trains in Arizona of more than 14 cars, but did on 14 accasions (out of a total of 3118 passenger trains operated) run special trains having 15 or more passenger-train cars each.

In the years between 1912 and 1922, the average lengths of defendant's freight trains in Arizona increased about [fol. 6118] 15 per cent; but since 1922 there has been no improvement. Thus the average number of cars per freight train in 1912 was 48.39; in 1917, 40.82; in 1922, 55.79; in 1927, 51.44; in 1932, 56.76; in 1937, 52.37; in 1938, 55.5; and in 1939, 54.82. For the four-year period 1922-1925, the average was 54.42; for the four-year period 1936-1939, 53.85. The largest annual average of number of cars per train achieved in Arizona was 57.13, for the year 1934.

In Nevada, on the other hand, freight-train lengths have increased substantially since 1912, and more notably since 1922. The average number of cars per freight train in Nevada in 1912 was 40.58; in 1917, 41.07; in 1922, 48.92; in 1927, 69.17; in 1932, 81.06; in 1937, 74.43; in 1938, 78.77; and in 1939, 78.46. For the four-year period 1922-1925 the average in Nevada was 53.09; for the four-year period 1936-1939, 76.28. The largest annual average number of cars per train achieved in Nevada was 86.67, also for the year 1934.

Average freight-train lengths on defendant's system as a whole, even though affected to some extent by the restrictions of the Arizona law, have also increased in recent years, and particularly since 1920. Comparing the Tucson Division main line (which is representative of and includes the greater part of the territory subject to the 70-car restriction) with the Salt Lake Division main line (which is rep-

resentative of and includes substantially all of the Nevada and Utah operations), and also with main-line operations upon the system as a whole, it appears that the system average train length, expressed in number of cars per train, including caboose, increased from 43.2 in 1920 to 52.8 in 1925, and thereafter to 58.5 in 1930, continuing thereafter without substantial variation either upward or downward until and including 1939, when the average was 60.1. On the Tucson Division, the corresponding figure in 1920 was [fol. 6119] 48.1, increasing to 57.9 in 1922, to 59.6 in 1925, and to 61.0 in 1930, and continuing thereafter without substantial variation until 1939, when the average was 59.8. On the Salt Lake Division the corresponding figures were: 1920, 45.0; 1922, 52.0; 1925, 62.4; 1930, 78.1; and 1939, 85.4.

It appears from the foregoing that during the years since 1925, defendant has followed, and now follows the practice of operating a substantial number of long trains upon its lines in Nevada and Utah, the proportion of such trains to all trains operated for the year 1939 having been stated in subparagraph VII (b) (1) of these findings. The continuance of said practice of long-train operation is shown by the upward trend in the average number of cars per freight train in said territory; and said practice has caused the number of freight-train units operated by defendant in the same territory to be relatively reduced in proportion to the total amount of freight traffic handled. Thus, in Nevada during the four years 1922-1925, inclusive, defendant produced 420,672,972 car miles (excluding caboose car miles), and in so doing operated a total of 7,923,768 train miles; whereas in the four years 1936-1939, defendant produced in said state 564,256,341 car miles (excluding caboose car miles), but in so doing operated only 7,397,062 train miles. By comparison, in the years 1922-1925, inclusive, defendant produced in the state of Arizona 378,372,269 car miles (excluding caboose car miles), and operated 6,952,701 train miles in so doing; and in the four years 1936-1939 produced 543,210,212 car miles (excluding caboose car miles), and operated 10,086,237 train miles in so doing.

By reason of the initiation and continuance of the long-train program in Nevada and Utah, defendant has been enabled, during recent years, and particularly since 1930, to handle the interstate freight traffic moving over its lines [fol. 6120] in said territory with a substantially less number of trains, both in aggregate total and as related to the volume

of traffic so handled, than in the years prior to the development and commencement of said program.

The restriction of the law has prevented any similar improvement in the affected territory; on the contrary it has compelled defendant to produce a substantially greater number of train miles than would have been required if long-train operation had been developed there to the same or a similar extent as in Nevada and Utah. Thus, in the years 1925-1939, inclusive, defendant actually produced on the Tucson Division 25,661,903 train miles; whereas, if defendant had disregarded the train limit law, and had obtained thereby the same average train lengths as prevailed on the Salt Lake Division in the same fifteen-year period; it could and would have handled the same volume of traffic, measured in car miles, with 19,337,070 train miles. Defendant was thus compelled by the law to produce in said fifteen-year period 6,324,833 excess train miles, or 32.7 per cent more, than were or would have been necessary if the law had not been observed. In 1938, 564,717 excess train miles, or 37.7 per cent, were thus produced.

Long-train operation of the same character and extent as in Nevada and Utah is entirely feasible upon defendant's lines in Arizona, subject only to the construction (as hereinafter described in detail) of certain additional facilities, and the assignment of more powerful locomotives designed to haul heavier and longer trains. Defendant is fully able and intends at once, if the law's restrictions are removed, to make such changes and provided such locomotives, and thereupon and thereafter to operate long trains in the affected territory, in the same manner as in Nevada, and elsewhere upon its system generally.

[fol. 6121] In 1912, as heretofore stated, comparatively few of the sidings or passing tracks on defendant's lines in Arizona had a capacity of more than about 70 cars, inclusive of engine and caboose; so that the enactment of the train-limit law in that year did not cause defendant to reduce the lengths of its freight and passenger trains then being operated in Arizona to any substantial extent, or otherwise compel changes in defendant's operating methods. Rather, said law then imposed upon defendant, and upon its operations, a continuing and permanent restraint, which ever since 1912 has been effective, against further progress and development in the direction of the increased safety,

efficiency, and economy which, as stated at various places in these findings, are and have been realized through the adoption and continuance of the long-train program upon other portions of defendant's system, and by the United States railroads generally.

Masson, R. 1947-1954; *Dyer*, R. 2000-2003, 2016-2017, 2021-2022; *Herbert*, R. 2442-2445, 2454-2457; *Sines*, R. 2459-2474, 3149-3154, 3375-3376.

Exhibits 5, 6, 7, 149, 150, 180, 181, 182, 183, 212.

(c) Reductions in Schedules of Freight Trains.

In handling the through freight traffic, both eastbound and westbound, which moves over its lines in the affected territory, defendant, in conjunction with its connections at El Paso and Tucumcari, and beyond, maintains and for many years last past has maintained time schedules covering the handling and delivery of such freight.

The eastbound perishable and other freight from California points (other than from the Imperial Valley) is concentrated at Colton, and there placed in the trains for eastward movement. At that point the cars containing perishable and similar freight are usually segregated into [fol. 6122] so-called "Fruit Blocks", which contain from 10 to 100 cars; such blocks are identified by letter and number, and each carries its identification throughout its eastward movement. An eastward train operated in the affected territory, if it includes a fruit block or a part thereof in its consist, is usually identified by the block number.

Perishable freight from the Imperial Valley, and from Yuma and vicinity is concentrated at Yuma, and there made up into blocks and trains; such freight when originating in the Salt River Valley, Arizona, is concentrated at Phoenix. The handling of the Yuma (Y) and Phoenix (A) blocks is in all respects similar to that accorded to the Colton (C) blocks as hereinafter described, except that the overall schedules to eastern destinations are shorter, because of the shorter distances, and also that the departure and "run-off" times for Yuma and Phoenix blocks are somewhat different.

The schedules governing the handling of eastbound perishable blocks are and have been based upon a specified basic departure time at Colton (at present, 3:00 a. m. of the day following loading), from which is computed a specified maximum time en route to Chicago, Illinois, and corre-

sponding times to other large eastern markets; but since several such eastward trains oridinarily leave Colton in the course of a day, and all such trains cannot leave at precisely the same time, the times en route of the fruit blocks which leave after the basic departure hour are shortened, and all such blocks are so handled as to arrive at the Chicago market (or other eastern markets) upon an equality; i. e., trains leaving after 3:00 a. m. (and up to 7:00 p. m.) are operated so as to make up, or "run off", the interval prior to their departure, such interval (up to a present maximum of 16 hours) being known as "run-off time".

[fol. 6123] The schedules participated in by defendant and its connections obligate those carriers to make delivery of the freight handled thereunder at the specified schedule times, under penalty of loss-and-damage claim payments for spoilage or loss of market; and by agreements between the participating carriers, such schedules further obligate defendant to make delivery of freight handled thereunder, to its connections at El Paso and Tucumcari, at definite times determined according to the departure hour at Colton.

The schedules governing the handling of westward traffic over the lines in the affected territory, also maintained by defendant in conjunction with said connections, provide and have provided for definite maximum times en route from Chicago to Los Angeles, with corresponding times from and to other related points. A certain specified proportion of said total time is and has been assigned to the district between El Paso and Yuma. Westward trains handling freight moving under such schedules are usually identified by letter symbols: e. g., the SSW trains (Sunset West), and the GBW trains (Gold Ball West).

Schedules similar to the foregoing are and have been maintained covering the eastward and westward transportation of freight moving to and from points in Arizona.

Contemporaneously with the adoption and development of the long-train program, upon its lines generally, other than the lines in the affected territory, and largely as a result of said long-train program (in that the reduction in the relative number of train units has caused the number of train meets and passings, and other interferences with operation, to be reduced in even greater proportion, and has greatly simplified operations in other ways), defendant and its connections have made several successive reductions [fol. 6124] in the time schedules above referred to; and

in connection therewith defendant has materially shortened the average time, both in intermediate terminals and en route, of the identified trains handling freight under said schedules. Prior to the year 1921 the over-all schedule time for perishable freight, from departure time at Colton to delivery at Chicago, was 189 hours; and there was no provision for run-off time; i. e., the schedule merely contemplated not more than 189 hours' total time in transit. In 1921, the over-all time was reduced to 154 hours, with no provision for run-off. In 1924 said over-all time was reduced, in effect, by including a provision for run-off time not exceeding 3 hours. The result was to reduce the actual elapsed time from Colton departure to arrival at Chicago, to not more than 151 hours. In 1927 the run-off time was increased to 7 hours, thus reducing the net elapsed time to 147 hours.

In 1929 a further reduction was made to 146 hours, the basic departure hour at Colton being 3:00 a. m., but the schedule also continued to provide for 7 hours run-off. Thus the actual scheduled elapsed time to Chicago, based upon 10:00 a. m. departure at Colton, became 139 hours. In 1932, the run-off time was increased to 16 hours, thus reducing the elapsed time to 130 hours. In 1940 a further reduction was made, to the present over-all schedule of 139 hours and 30 minutes, with 16 hours run-off, or a net elapsed time of 123 hours and 30 minutes from departure at Colton.

Each of these reductions in over-all time has been accompanied by a corresponding reduction in the proportion of the time assigned between Yuma and El Paso.

In 1932 the producing area in California, to which defendant and its connections apply and have throughout the period [fol. 6125] since 1926 applied the eastbound schedules above referred to, was substantially enlarged; the effect of such enlargement was to reduce, as to the additional points included, the actual times in transit from points of production to points of final delivery in the east. Recently a further reduction in elapsed time has been made, in that shippers who pre-cool their perishable shipments are not required to release such shipments until 5:00 a. m. on the day following loading, in order to obtain movement on the schedule of that day.

The schedule times applying to the handling of perishable freight originating in the Imperial Valley of California and in Arizona, and handled in the "Y" blocks from Yuma and

the "A" blocks from Phoenix, have also been reduced, in the same degree and at or about the same dates as the schedules from Colton.

The aforesaid westbound schedules applying from Chicago and other related points, to Los Angeles and other Pacific Coast points, over the lines in the affected territory, have also been reduced from time to time; and defendant's proportion of such schedule times, allotted to the El Paso-Yuma district, has been correspondingly reduced, as follows:

From 226 hours, in 1920, to 198 hours and 25 minutes, in 1926; 162 hours, in 1928; 137 hours and 45 minutes, in 1929; 134 hours and 15 minutes, in 1934; 134 hours in April, 1935; 110 hours, in November, 1935; and finally to the present schedule, established in 1939, which provides for 109 hours en route from Chicago, or sixth-morning delivery at Los Angeles.

Perishable shipments from northern California, moving over the Nevada-Utah lines of defendant, are concentrated at Roseville, California; and defendant, with its connections, maintains, and in the past has maintained, both eastbound schedules from Roseville to Chicago and [fol. 6126] related points, and westbound schedules from such points to San Francisco, via said Utah-Nevada line, equivalent to the east- and westbound schedules from and to California points via the Arizona lines, as above set forth.

Such schedules have also been reduced in the past, upon dates and to an extent corresponding to reductions made in the schedules applying via the Arizona lines.

Despite the aforesaid schedule reductions, with the consequent higher speeds and greater difficulty in maintaining on-time performance, such performance has, in the main, been highly satisfactory. In 1939, 1261 out of 1528 identified Colton fruit blocks, or 82.5 per cent, arrived at El Paso upon or ahead of schedule, and 758 out of 800, or 94.8 per cent, of the Colton fruit blocks operated into Tucumcari in said year arrived upon or ahead of schedule. On the Nevada route, in the same year, 1428 out of 1608 Roseville fruit blocks, or 88.8 per cent, arrived in Ogden upon or ahead of schedule. In the same year, 1078 out of 1189 manifest sections operated westward over the Arizona lines, into Los Angeles, or 90.7 per cent, made their schedule arrival times; while 668 out of 700 identified manifest sections operated as the "CS" (California Special) out of Ogden westward

to San Francisco, or 95.4 per cent, made their schedule arrival times at San Francisco.

Sines, R. 63-64; *Parmelee*, R. 287; *Kirk*, R. 406-414; *Young*, R. 493-494; *Fertig*, R. 866-883; *Green*, R. 930-947; *Kraemer*, R. 974-978, 987-989; *Randall*, R. 1029-1040; *Hammond*, R. 1173-1175, 1191-1196; *Warfel*, R. 1235-1236, 1239-1242, 1372; *Peckenpaugh*, R. 1334-1337; *Mahoney*, R. 1858-1871, 1841-1844, 1977-1981, 1990-1992; *G. C. Baker*, R. 2340-2377, 2386-2393, 2715-2722.

Exhibits 175, 176.

[fol. 6127] (d) Effect of the Long-Train Program Upon the Efficiency and Economy of Defendant's Train Operations

(1) As to the system generally.

During the aforesaid period of steadily increasing long-train operations upon defendant's system (other than in Arizona and adjoining territory) there has also occurred, as a direct result of said long-train program (and in spite of defendant's inability to carry out said program fully, because of the restrictions of the Arizona Train-Limit Law), a substantial and continuous improvement in the efficiency and economy of defendant's freight-train operations. This improvement was particularly marked during the period between 1924 and 1932, the period of most intensive development of the long-train program. Such improvement has been and is evidenced by a number of important and generally recognized indices of efficiency and economy of operation, which include, among others, the following: Average speeds of freight trains, measured in miles per hour; average gross-ton miles made, per freight-train hour; average net-ton miles made, per freight-train hour; average gross-ton miles per ton of fuel consumed, in operation of freight trains; average cost per thousand revenue-ton miles, for all operating expenses, and for transportation expenses only; average freight revenue per freight-train mile; average cost per thousand gross-ton miles, for certain selected direct operating expenses; average pounds of fuel consumed per thousand gross-ton miles.

The average train speed (meaning the average speed, measured in miles per hour, of the trains, while on the road between terminals, the times at stops between terminals being included, but not the times consumed at terminals) of

all main-line freight trains operated on defendant's system increased from 11.2 miles per hour in 1922, a year of pre-
[fol. 6128] dominating short-train operation, to 16.5 miles per hour in 1932, and to 17.8 miles per hour in 1939; an improvement, contrasting 1939 with 1922, of 58.9 per cent.

The average gross-ton miles made per freight-train hour (meaning the total weight of the cars and their contents, not including any of the weights of locomotives, multiplied by the miles over which such weight was moved, the latter figure being then divided by the number of hours during which the freight trains handling the traffic were in operation), made by main-line freight trains on the system, increased from 20,727 in 1923, to 34,005 in 1932, and to 41,886 in 1939; an improvement, contrasting 1939 with 1923, of 102.1 per cent.

The average net-ton miles per freight-train hour (meaning the total weight of the contents of the cars only, not including any of the weights of the locomotives or of the cars themselves, multiplied by the miles over which such weight was moved, the latter figure being then divided by the number of hours during which the freight trains handling such traffic were in operation) made by all freight trains, both main and branch lines, on the system, increased from 7,258 in 1922 to 8,775 in 1932 and to 12,490 in 1939; an improvement, contrasting 1939 with 1922, of 72.1 per cent.

The average gross-ton miles per ton of fuel (meaning the quotient obtained by dividing the total amount of fuel consumed by locomotives handling freight trains, measured in units equivalent to pounds of coal, into the figure obtained by multiplying the total gross weight, including the weight of locomotives, handled in such trains, measured in thousands of tons, by the total number of miles over which the tonnage was moved), for all freight trains (both main and branch line) on the system, increased from 11,405 [fol. 6129] in 1922, to 15,395 in 1932, and to 17,318 in 1939; an improvement, contrasting 1939 with 1922, of 51.8 per cent.

The average cost per thousand revenue-ton miles, for all operating expenses, for freight-train operations on the system (meaning the figure in cents obtained by dividing, into the total operating expense of freight-train operations, the figure obtained by multiplying the total number of revenue tons of freight handled by defendant, by the miles over which such freight was moved), declined from $11.10 in

1922, to $8.45 in 1932, and to $7.05 in 1939; an improvement contrasting 1939 with 1922, of 36.5 per cent; and from an average of $9.94 for the four years 1922-1925 (all of which were years of predominant short-train operation) to an average of $7.15 for the four years 1936-1939 (which were years of general long-train operation): an improvement of 28.1 per cent.

The average cost per thousand revenue-ton miles, for transportation expenses only, for freight-train operations on the system (said expenses including no costs incurred for maintenance of way, or general overhead, but only those expenses directly incurred in operation of trains), declined from $5.47 in 1922, to $4.34 in 1932, and to $3.82 in 1939; an improvement, contrasting 1939 with 1922, of 43.2 per cent; and from an average of $5.03 for the four years 1922-1925, to an average of $3.95 for the four years 1936-1939: an improvement of 21.5 per cent.

In making comparisons of the direct cost of operations for different periods, for the system, or as between different portions of the system, defendant regularly compiles certain selected direct operating expenses, covering costs of fuel, wages of trainmen and enginemen, engine house expenses, [fol. 6130] other locomotive supplies, and train supplies and expenses. The average cost per thousand gross-ton miles for said expenses (being the quotient obtained by dividing the total weight of the cars and the contents, not including the weight of the locomotives, multiplied by the distance moved, into the total of the freight-train costs covering said selected direct expenses) for all freight trains operated on the system, decreased from 93.4 cents in 1925, to 60.3 cents in 1932, thereafter increasing slightly to 63.6 cents in 1939: an inprovement (reduction) of 31.9 per cent, contrasting 1939 with 1924. For the two-year period 1924-1925, the system average cost per thousand gross-ton miles for said expenses was 92.46 cents; for the two-year period 1928-1929, 70.14 cents: an improvement of 24.14 per cent; for the two-year period 1930-1931, the corresponding average cost was 66.6 cents, and for the two-year period 1938-1939, 65.76 cents: an improvement of 1.26 per cent. The combined total improvement for the two series of two-year periods was 25.4 per cent.

The average pounds of fuel consumed per thousand gross-ton miles (being the quotient obtained by dividing the total amount of the fuel consumed by locomotives handling freight

trains measured in units converted to equivalent pounds of coal, by the figure obtained by multiplying the weight of the cars and contents, not including the weight of the locomotives, by the distance over which such weights were moved) for all freight trains, both main and branch lines, on the system, declined from 158 in 1924 to 115 in 1939. The corresponding average figure for the two-year period 1924-1925 was 154.3, which declined to 136.3 for the two-year period 1928-1929: an improvement of 11.67 per cent. For the two-year period 1930-1931, the corresponding average figure was 131.7, which declined to an average of 117.6 for the two-year period 1938-1939: an improvement of 10.71 per cent. [fol. 6131] The combined total improvement for the two series of two-year periods was 22.38 per cent.

Masson, R. 1957-1965, 2185-2195, 2213-2222; *Herbert* R. 2412-2428, 2438-2442, 2449-2452; *Sines*, R. 2528-2540, 3455-3464.

Exhibits 151, 162, 165, 178, 179, 180, 193, 249.

(2) In the Nevada-Utah Territory:

There has been a similar and, in many cases, somewhat greater, improvement in the efficiency and economy of defendant's freight-train operations in Nevada and Utah, as compared to the system generally; and such improvement has likewise taken place coincident with, and as a result of, the development of the long-train program. This improvement is shown by statistics reflecting the results of defendant's operations in Nevada, and upon the Salt Lake Division.

The average speed, in miles per hour, of all main-line freight trains on the Salt Lake Division, increased from 14.7 in 1922, to 19.7 in 1932, and to 21.4 in 1939; an improvement, contrasting 1939 with 1922, of 45.5 per cent.

The average gross-ton miles per freight-train hour made by main-line freight trains on the Salt Lake Division increased from 29,628 in 1923, to 58,669 in 1932, and to 72,955 in 1939; an improvement, contrasting 1939 with 1922, of 146.4 per cent.

The average net tons of freight, per main-line freight train upon the Salt Lake Division, increased from 784 tons in 1923, to 1161 tons in 1939, an improvement of 48.1 per cent.

The average cost per thousand revenue ton-miles, for all operating expenses, for all freight train operations (both main and branch line) within Nevada, declined from $7.02 [fol. 6132] in 1922 to $4.37 in 1939, an improvement (reduction) of 37.8 per cent; and from an average of $6.18 for the four-year period 1922-1925, to an average of $4.28 for the four-year period 1936-1939; an improvement of 30.7 per cent.

The average cost per thousand revenue ton-miles, for transportation expenses only (i. e., those expenses directly associated with train operation) for all freight train operation within Nevada, declined from $3.45 in 1922 to $2.36 in 1939, an improvement of 31.6 per cent; and from an average of $3.12 for the four-year period 1922-1925, to an average of $2.36 for the four-year period 1936-1939; an improvement of 24.4 per cent.

The average freight revenue per train mile, for all freight trains on defendant's lines within Nevada, increased from $8.33 in 1923, to $10.10 in 1939, an increase of 21.2 per cent, despite a concurrent decrease from $0.238 to $0.204, or 14.3 per cent, in freight revenue per loaded freight-car mile, and a similar concurrent decrease from $12.82 to $9.68, or 24.5 per cent, in freight revenue per thousand ton miles of freight.

The average cost per thousand gross ton miles for certain selected direct expenses, for all freight trains operated on the Salt Lake Division, decreased from 56.0 cents in 1924, to 35.4 cents in 1939; an improvement of 36.7 per cent. The corresponding figure for the two-year period 1924-1925 was 53.85 cents, which declined to 39.91 cents for the two-year period 1928-1929; an improvement of 25.89 per cent. For the two-year period 1930-1931, the corresponding figure was 37.66 cents, which declined to 36.97 cents for the two-year period 1938-1939; an improvement of 1.83 per cent. The combined total improvement for the two series of two-year periods thus analyzed was 27.72 per cent.

The average pounds of fuel consumed per thousand gross-ton miles, for all freight trains operating on the Salt Lake [fol. 6133] Division, declined from 100 pounds in 1924 to 73 pounds in 1939; an improvement of 27.00 per cent. The corresponding figure for the two-year period 1924-1925 was 96.2, which declined to 83.0 for the two-year period 1928-1929; an improvement of 13.72 per cent. For the two-year period 1330-1931, the average was 84.3 pounds, which

declined to 73.9 pounds for the two-year period 1938-1939; an improvement of 12.34 per cent. The combined total improvement for the two series of two-year periods thus analyzed was 26.06 per cent.

Masson, R. 2213-2222; *Herbert*, R. 2406-2428, 2438-2442, 2449-2458; *Sines*, R. 2528-2540, 3455-3464.
Exhibits 161, 165, 177, 178, 179, 180, 181, 193, 249.

(3) Defendant's inability to achieve comparable efficiency and economy in the territory affected by the Arizona Train-Limit Law.

As heretofore stated, and solely because of the restrictions imposed by said train-limit law, defendant has never been able to undertake or carry forward any substantial program or practice of long-train operation in Arizona or in the adjacent territory where said law has extra-territorial effect. In consequence of such inability, and notwithstanding (1) the substantial improvements in its road and equipment, heretofore set forth in Findings VI (a) and VI (b), which improvements were comparable to and proportionately as extensive as those made in Nevada and Utah; (2) the employment of identical operating rules and methods, in both Nevada and Arizona, the only essential differences being those necessarily brought about by compliance with the train-limit law; and (3) substantial similarity in the traffic handled, as to both volume and character, and in operating conditions, in both Arizona and Nevada: defendant has not been able to bring about the [fol. 6134] same improvements in the efficiency and economy (or as hereafter shown, the safety) of its train operations in Arizona, or any improvement comparable to that achieved in Nevada and the adjacent territory.

As set forth at length in subparagraph (b) (2) of this finding, the years following 1925, and until and including 1932, were those in which the long-train program had its most rapid development; and therefore comparisons between the indices of efficiency and economy herein mentioned, over that span of years, give the most definite indications of the effects of the adoption of the long-train program, in the Nevada-Utah territory, and upon the system generally, and likewise reflect the results of defendant's inability to adapt and carry out said program in the affected territory.

The average speed, in miles per hour, of all main-line freight trains on the Tucson Division increased from 14.7 in 1922, to 17.8 in 1932, and to 20.7 in 1939. The improvement, as between 1923 and 1939, was 40.8 per cent; whereas the corresponding improvement on the system generally was 58.9 per cent, and on the Salt Lake Division 45.5 per cent. As between 1922 and 1932, the improvement on the Tucson Division was 21.1 per cent; as compared with an improvement of 34.0 per cent, over the same span of years, on the Salt Lake Division, and of 47.3 per cent on the system generally.

The average gross-ton miles per freight-train hour, made by main-line freight trains on the Tucson Division, increased from 30,665, in 1923, to 38,787 in 1932, and 47,680 in 1939. The improvement, as between 1923 and 1939, was 55.5 per cent; whereas over the same span of years, the corresponding improvement on the system was 102.1 per cent, and on the Salt Lake Division, 146.4 per cent. Comparing 1932 with 1923, the improvement on the Tucson [fol. 6135] Division was 26.7 per cent, whereas the corresponding improvement on the system was 15.8 per cent, and on the Salt Lake Division 98.0 per cent. Comparing 1939 with 1930, the average gross-ton miles per freight-train hour, for all trains, both main and branch line, on the Tucson Division, increased from 36,175, in 1930, to 45,026, in 1939, an improvement of 24.5 per cent. The corresponding improvement on the system was 32.2 per cent, and on the Salt Lake Division, 41.8 per cent.

The average net tons of freight per main-line freight train on the Tucson Division decreased from 758 in 1923, to 575 in 1932, and then increased to 712 in 1939. There was a decrease of 6.1 per cent, comparing 1939 with 1923; whereas the corresponding figures over the same span of years showed, for the system, an improvement (increase) of 10.6 per cent, and for the Salt Lake Division, an improvement of 48.1 per cent. Comparing 1932 with 1923, the decrease on the Tucson Division was 24.1 per cent; there was a decrease of 13.9 per cent on the system generally, but an increase of 9.9 per cent on the Salt Lake Division, in the corresponding figures, over the same span of years. Comparing 1939 with 1932, the corresponding figures show an increase, on the Tucson Division, amounting to 23.8 per cent, whereas on the system generally, the

improvement was 28.4 per cent, and on the Salt Lake Division, 33.4 per cent.

The average cost per thousand revenue ton-miles, for all operating expenses, for all freight-train operations within Arizona, declined from $8.24 in 1922 to $7.26 in 1932, an improvement of 11.9 per cent, and to $6.12 in 1939, an improvement of 25.7 per cent, comparing 1939 with 1922. The corresponding improvement on the system, as between 1922 and 1932, was 30.0 per cent, and as between 1922 and 1939, 36.5 per cent; in Nevada, between 1922 and [fol. 6136] 1932, the corresponding improvement was 36.5 per cent, and between 1922 and 1939, 37.8 per cent. For the four-year period 1922-1925, the corresponding average cost per thousand revenue ton-miles in Arizona was $7.42, which declined to $5.97 for the four-year period 1936-1939, an improvement of 19.5 per cent. The corresponding improvement, over the same span of years, for the system generally, was 28.1 per cent, and for defendant's lines in Nevada, 30.7 per cent.

The average cost per thousand revenue ton miles, for transportation expenses only, for all freight-train operations in Arizona, both main and branch line, increased from $3.23 in 1922 to $3.40 in 1932, and then declined to $2.95 in 1939, an increase of 5.3 per cent, comparing 1932 with 1922, and an improvement of 8.7 per cent, comparing 1939 with 1922. The corresponding improvement on the system, comparing 1932 with 1922, was 20.7 per cent, and comparing 1939 with 1922, 30.2 per cent. In Nevada the corresponding improvement, comparing 1932 with 1922, was 34.5 per cent, and comparing 1939 with 1922, was 31.6 per cent. For the fouryear period 1922-1925, the same index for Arizona showed an average of $3.22, which declined to an average of $3.00 for the four-year period 1936-1939, an improvement of 6.8 per cent. The corresponding improvement on the system generally was 21.5, and for Nevada, 24.4 per cent.

As heretofore found, the boundaries of the Tucson Division were changed in July, 1930, by the addition of the main line between Tucson and Lordsburg, and the branch line between Bowie and Live Oak via Globe and Miami; and in November, 1929, the boundaries of the Salt Lake Division were changed by the addition of the main line between Wendel and Alturas, California, at which time the

former branch line between Fernley, Nevada, and Wendel, was reclassified as main line. These changes of divisional [fol. 6137] limits do not affect any of the comparisons herein set forth, as between the States of Nevada and Arizona, or for the system. In so far as direct comparisons between the two divisions are concerned, the effects of the changes are largely inconsequential, and can be and are entirely eliminated by making comparisons between the divisions by groups and series of years, in the manner hereinafter set forth.

Thus, the average cost per thousand gross-ton miles for certain "selected" direct expenses (as heretofore specified) for all freight trains on the Tucson Division, declined from 62.88 cents for the two-year period 1924-1925, to 50.80 cents for the two-year period 1928-1929: an improvement of 19.21 per cent. The corresponding figure for the two-year period 1930-1931 was 53.63 cents, which increased to 55.39 cents, for the two-year period 1938-1939: an increase of 3.28 per cent. The combined net improvement (decrease) for the two series of two-year periods thus analyzed was 15.93 per cent. The corresponding improvement, over the same spans and groupings of years, was 25.4 per cent for the system, and 27.72 per cent for the Salt Lake Division. The years 1924-1925, thus grouped together for the purposes of this and similar comparisons, are immediately prior to the general adoption of the long-train program; and the comparison with the two years 1928-1929 produces the percentage of change taking place up to but not including the years in which the changes in the divisional boundaries were fully effective. The two years 1930 and 1931 (the figures for 1930 having been restated, so as to reflect for the entire year the operations on the Tucson Division, as if the altered divisional boundaries had prevailed throughout that year) includes the first years after the changes; and a comparison of those two years (1930 and 1931) with the years 1938 and 1939, taken together, [fol. 6138] develops the percentage of change down to the latest years for which complete statistics are available. By adding the percentage of change in the first series to the combined total improvement for the two series of percentage of change in the second series, there is produced a two-year periods. As before stated, this method of comparison automatically eliminates any effect which might follow from the fact that the territorial boundaries of the

two divisions, in the first series of years, are not exactly identical with said divisional boundaries in the later series of years.

The average pounds of fuel consumed per thousand gross-ton miles, for all freight trains, both main and branch, on the Tucson Division, declined from 104.1 pounds, for the two years 1924-1925, to 99.9 pounds for the two-year period 1928-1929, an improvement of 4.03 per cent. The corresponding average, for the two-year period 1930-1931, was 118.7 pounds and for the two-year period 1938-1939, 108.5 pounds, an improvement of 8.59 per cent. The combined total improvement for the two series of two-year periods on the Tucson Division was 12.62 per cent; as compared with an improvement of 22.38 per cent for the system, and of 26.06 per cent for the Salt Lake Division, for the same index, and over the same span and groupings of years.

The gross-ton miles (exclusive of locomotives and tenders) per ton of fuel, for all freight trains, both main and branch, on the Tucson Division, decreased from 18,675 for the year 1930, to 18,590 for the year 1939, a decrease of 0.5 per cent. The corresponding improvement (increase) on the system was 14.2 per cent, and on the Salt Lake Division 15.3 per cent.

Defendant's inability to effect improvements in the efficiency and economy of freight-train operations upon its lines in Arizona, comparable to those achieved upon its [fol. 6139] lines in Nevada and upon its system generally, has been and is largely and directly due to the restrictions upon its operations imposed by the law. The extent of the improvements available, through the adoption of long-train operation in Arizona, is indicated by the analyses and comparisons set forth in subparagraph (d) of this finding. The comparisons made between the results in the years immediately prior to or at the beginning of the adoption of the long-train program on defendant's lines generally, and the results of operations in recent years (i.e., between the results in the years 1922, 1923, 1924 and 1925, on the one hand, and 1938 and 1939, on the other) measure the long-time trends which demonstrate the growth and continuing advantages of such long-train operation. The comparisons between the results of the years immediately following the changes of limits of the Tucson and Salt Lake Divisions, and the results of the operations of more recent years (i.e., of the years 1930 and 1931, on the one hand, and 1938 and

1939, on the other) measure the more recent trends which demonstrate the present and prospective advantages of such long-train operation, and demonstrate as well that the changes in limits of the Tucson and Salt Lake Divisions have not operated and do not operate to impair the propriety of conclusions predicated upon comparisons between the Tucson Division and the system as a whole or other portions thereof, for the years subsequent to 1930. Finally, said comparisons between the results of operation in years immediately prior to or at the beginning of long-train operations on defendant's lines and results for the years at the close of the period of major development of the long-train program (i.e., comparisons between 1922, 1923, 1924 and 1925, on the one hand, and 1930, 1931 and 1932, on the other) show clearly that in the space of a few years the long-train program resulted in substantially greater effi- [fol. 6140] ciency and economy upon the system generally, and particularly the lines in Nevada and Utah, whereas no corresponding improvements were possible of achievement in the affected territory.

Masson, R. 1957-1965, 2156-2166, 2182-2222; *Herbert*, R. 2406-2428, 2438-2442, 2449-2459; *Sines*, R. 2528-2540, 3455-3464, 4222-4223.

Exhibits 151, 160, 161, 162, 163, 164, 165, 177, 178, 179, 180, 181, 193, 249.

VIII

Comparison of Defendant's Methods of Operation with Those Followed on United States Railroads Generally

(a) Improvements in Road and Equipment.

The policy undertaken by defendant, since about the year 1922, as heretofore described, of making and continuing to make improvements in its roadway, structures, and equipment, and of maintaining its transportation plant and facilities in the best possible condition of repair, and of expending large sums of money for such purposes, has been and is typical and representative of the policy generally followed by the major railroads of the United States, considered either as units forming a general national transportation system, or as individual and separate carriers.

The Class I railroads of the United States (a Class I railroad being one having annual gross revenue of at least

$1,000,000; which class thus includes defendant, and its principal connections and competitors) operated 232,026 miles of railroad in 1939, and received total operating revenues in that year amounting to almost four billion dollars. Said Class I railroads have, during said period [fol. 6141] since 1922, built and acquired a great number of new locomotives, of larger sizes than those previously in service, having greater average tractive power per unit, and to a large extent equipped with new and modern devices of the character mentioned in paragraph VI (b) of these findings, designed generally for the safe, efficient, and speedy handling of long trains, both freight and passenger; and said Class I railroads have also, during said period, largely retired and replaced the smaller, older, and less efficient locomotives.

The result is that average tractive power per locomotive, for the locomotives presently in service upon the railroads of the United States, greatly exceeds the average for earlier years. Thus, the average tractive effort per locomotive, for all locomotives in service on the railroads of the United States, was in 1922, 37,441 pounds; in 1939, 50,395 pounds: an improvement of about 34.6 per cent. Between 1924 and 1938 the average tractive power per freight locomotive, for locomotives of Class I railroads only, increased from 46,060 pounds to 55,943 pounds: an improvement of about 21.5 per cent.

Said Class I railroads have also, during said period since 1922, greatly improved their passenger-car and freight-car equipment, both by buying and building or rebuilding new, larger, and stronger cars, and by retiring and replacing the older, smaller, and less efficient cars. In 1922, 68.8 per cent of all of the freight cars in service on the Class I railroads were of steel or steel-underframe construction. In 1938 such cars constituted 95.5 per cent of the total. Those not having steel underframes (i. e., of wooden construction) are no longer used in interchange service. In 1922 the average capacity of the freight cars in service on United States railroads was 43.1 tons; in 1939, 49.7 tons: an improvement of 15.3 per cent.

[fol. 6142] The devices and appliances used upon such passenger and freight cars, including the draft gears and rigging, wheels, brakes and brake appliances, and the other matters referred to in paragraph VI (b) hereof, have been improved, and newer and more modern types of such de-

vices have, to a large and increasing extent, been installed and applied on such cars.

The Association of American Railroads, acting for the carriers as a group, has promulgated a code of rules, which it from time to time amends, specifying the details of the construction and equipment of cars used or usable in interchange service. Observance of these rules is enforced by careful inspections of cars at points of interchange between railroads.

The principal main lines of the United States railroads have been brought to and now are upon substantially the same high standard of construction, maintenance and repair, and adequacy to meet the national transportation demands, which prevail upon the defendant's lines generally and particularly in the affected territory.

Such improvements in road, equipment and plant generally, thus accomplished by the railroad systems of the United States, have been brought about only through the expenditure of enormous sums of money, such expenditures having been made, in many instances, upon express authority of the Interstate Commerce Commission, pursuant to Section 20a of the Interstate Commerce Act.

Said improvements, and the expenditures therefor, were undertaken pursuant to the general program of betterment of the railroad transportation plant of the United States, heretofore referred to, which was formulated and agreed upon in 1923 by the railroads of the United States (includ- [fol. 6143] ing defendant), as members of and constituting the American Railway Association (now succeeded by the Association of American Railroads). Said program, as agreed upon and thereafter carried out, had for its essential purpose the betteerment of railroad service, through improvements in the railroad plant designed to promote and permit speedier, safer, more efficient and more economical railroad transportation.

Wright, R. 223-229, 231-237; *Parmelee*, 282-298, 342-374; *Kirk*, R. 418-427, 434-441; *Young*, R. 505-511, 551-552; *Otterback*, R. 575-605, 608-616; *La Fountaine*, R. 652-656, 682, 695-697, 700-702, 712; *Fertig*, R. 858-864; *Green*, R. 919-922, 924-927, 928-930; *Kraemer*, R. 966-973, 985-987; *Randall*, R. 1023-1026, 1028; *Triem*, R. 1095-1097; *Hammond*, R. 1147-1149, 1162-1165; *Warfel*, R. 1211-1212, 1217-1218, 1223-1231, 1245, 1253, 1263, 1359-1362; *Kiley*,

R. 1293-1300, 1302; *Peckenpaugh*, R. 1323-1332; *Parke*, R. 1397-1417, 1418, 1431-1465; *Beale*, R. 1551-1556, 1560-1580; *Blanchard*, R. 1675-1694, 1698-1702; *Thomas*, R. 1713-1715, 1722-1735; *Cartmill*, R. 1769-1776, 1779-1821; *Mahoney*, R. 1847-1856, 1871-1874, 1889-1890; *Browning*, R. 2863-2884; *Judson*, R. 2979-2989, 2998; *Bohastengel*, R. 3078-3142.

Exhibits, 19, 22, 33, 34, 35, 36, 37, 38, 107, 108, 109, 127, 128, 129, 135, 136, 137, 203, 204, 210, 248.

(b) Increased Train Lengths

Various improved methods of operation which were instituted by the United States railroads contemporaneously with the aforesaid 1923 program of betterment, and were largely made possible thereby, included the adoption and development of the practice of "standard long-train operation", heretofore defined. In consequence thereof, the [fol. 6144] average lengths of freight trains on the railroads of the United States have tended to increase continually; thus, the average number of cars per freight train was, in 1922, 38.4; in 1926, 45.2; in 1930, 48.9; in 1934, 46.2; in 1938, 47.7; and in 1939, 49.1. The recession following 1930 was due largely to a substantial falling off in the total traffic volume in the years after 1930.

The practice of standard long-freight and passenger-train operation is today followed, as the customary and ordinary method of operation, upon substantially every major railroad system throughout the United States. Detailed testimony appears in the record covering the methods followed upon railroad systems which reach into every section of the country; which systems, in 1939, operated a total of 125,885 miles of line, or about 54.25 per cent of the mileage of Class I railroads in the United States, and produced, in said year, more than thirteen billion freight train miles, or about 59 per cent of the total produced by all Class I carriers, and more than thirteen and one-half billion revenue passenger miles, or about sixty per cent of the total produced by all Class I carriers.

With respect to freight-train operation, said detailed testimony shows that freight trains ranging in length from 125 cars up to 160 cars are commonly and regularly operated; that on some systems the standard length of through

freight trains is in excess of 100 cars; that on many main-line districts substantially more than half of all the freight trains run, including the local and turn-around or branch-line trains running only short distances on the main line, are longer than 70 cars; that the operation of long freight trains is a regular and daily practice on each and every railroad covered by said testimony, and over practically every section of the main line of each such railroad.

[fol. 6145] With respect to passenger-train operation, said detailed testimony shows that passenger trains containing 17 cars or more are commonly operated by many railroads; that on many main-line districts substantially more than one-third of all the through passenger trains operated consist of more than 14 cars; that the operation of long pasenger trains is a regular, common, and daily practice on each and every railroad whose passenger operations were discussed, and on practically every section of the main line of each such railroad.

Upon all of the several railroads to which said detailed showing refers, as well as various others whose methods of operation were the subject of more general testimony, said standard long-train method of freight and passenger-train operation is and for at least ten years last past has been the common, standard, and regular practice. The railroads mentioned include substantially all of defendant's principal competitors, and all or nearly all of its principal connections, and many other lines which participate with defendant in joint through routes between points on the Pacific Coast, on the one hand, and the states and cities upon and east of the Missouri and Mississippi Rivers, on the other.

Wright, R. 245-251, 253-255, 258-259, 263; *Parmelee*, R. 350-352; *Kirk*, R. 383-384, 386-396, 430-432, 435; *Young*, R. 497-504, 514-517, 544-547, 553-554; *La-Fountaine*, R. 679, 682-684, 688-689, 703-709, 848-852; *Fertig*, R. 901-905, 1069-1070, 1072-1075; *Green*, R. 918-919, 938-948; *Kraemer*, R. 948, 987-989; *Randall*, R. 1017-1018, 1051-1052, 1055-1058, 1102; *Triem*, R. 1111, 1120-1121, 1130-1131; *Hammond*, R. 1183-1185, 1189-1195; *Warfel*, R. 1210, 1250, 1251, 1254-1255; *Kiley*, R. 1315, 1541; *Peckenpaugh*, R. 1350-1354, 1366; *Parke*, R. 1415, 1435, [fol. 6146] 1436, 1454; *Beale*, R. 1561-1581, 1585.

1639-1642, 1650; *Wilbur*, R. 1601-1606; *Mahoney*, R. 1846, 1874-1887, 1890-1902, 1906-1907, 1966-1974, 1989-1990, 2525; *G. C. Baker*, R. 2358-2360, 2380-2386; *Judson*, R. 2978, 2998, 3001-3008; *Sines*, R. 3450-3454.

Exhibits 12, 13, 22, 25, 29, 31, 43, 44, 45, 47, 49, 52, 56, 60, 64, 68, 73, 74, 75, 76, 79, 81, 82, 83, 84, 87, 89, 90, 91, 92, 95, 97, 98, 100, 101, 103, 117, 118, 119, 121, 131, 138, 139, 192, 248.

(c) Improved Schedules and Performance

The handling of through freight traffic upon published and agreed time schedules, conforming in general character to the schedules maintained by defendant and its connections, described at length in paragraph VII (c) of these findings, is a general practice of the major railroads of the United States. Freight is transported between all parts of the nation under said schedules, which frequently are participated in by three or more carriers. The institution and maintenance of such schedules has been and is an essential part of an organized and coordinated effort of the country's railroads, directed toward the continuing improvement of service, which had its inception in the aforesaid 1923 program of betterment; and a direct result of the improved operating methods, including particularly the operation of standard long trains, made possible thereby. As improvements in road, equipment, and operating methods became more widespread upon the railroads of the United States during the years following 1923, improvements in and reductions of schedules became possible, and were made. Illustrative of such schedules, and said reductions and improvements therein, are those participated in by defendant and its connections, covering the transporta-[fol. 6147] tion of through freight eastward and westward between Pacific Coast points, on the one hand, and Chicago, Illinois, and related points, on the other.

The record indicates that freight handled under schedules is transported in accordance therewith, and delivered at destination, upon or in advance of schedule time, in more than 95 per cent of all cases.

Wright, R. 229-230; *Parmelee*, R. 348-354; *Kirk*, R. 406-414, 433-434, 439-440; *Young*, R. 493-499, 502-503; *LaFountaine*, R. 656-658, 840-848; *Fertig*, R.

866-884; *Green*, R. 930-946; *Kraemer*, R. 974-978, 987-989; *Randall*, R. 1029-1040; *Triem*, R. 1108; *Hammond*, R. 1172-1175, 1191-1196; *Warfel*, R. 1235-1236, 1239-1242, 1362, 1374; *Kiley*, R. 1304-1305; *Peckenpaugh*, R. 1334-1337; *Mahoney*, R. 1841-1844, 1858-1863, 1866-1871, 1977-1981, 1990-1992; *Judson*, R. 2991-2992; *F. P. McDonald*, R. 2971; *Sines*, R. 63-64; *G. C. Baker*, R. 2340-2377, 2386-2393, 2715-2722.

Exhibits 22, 175, 176.

(d) Increased Efficiency and Economy

During the period since 1923, and coincident with the substantial increase in train lengths during that period, there has been a marked improvement in the efficiency and economy of operations upon the railroads of the United States generally. This improvement is comparable to that achieved upon defendant's system, other than upon the lines in the affected territory, and particularly the increased efficiency and economy achieved in Nevada and Utah, as more fully set forth in paragraph VII (d) of these findings. Such improvement, as to the railroads of the United States [fol. 6148] as a whole, has been and is a direct result of the aforesaid 1923 program of betterment, and the development and accomplishment thereof in the succeeding years, and of the improved operating methods, particularly the practice of standard long-train operation, which were adopted and developed throughout the years following 1923.

Said improvement in efficiency and economy is particularly shown by both (1) national statistics, relating to efficiency and economy of operations upon the railroads of the United States as a whole, which statistics present certain of the indices heretofore mentioned; and (2) corresponding statistics, relating to the operations of individual typical railroads.

Thus, referring first to national statistics, the average speed of all freight trains, on all Class I railroads, was, in 1922, 11.1 miles per hour; and said average speed increased steadily through the succeeding years to 16.7 miles per hour in 1939: an improvement of 50.5 per cent. The average amount of freight-train service produced per ton of fuel consumed on freight trains of Class I railroads increased during the same period as follows: from 10,750

gross ton miles per ton of fuel consumed for the year 1922, to 15,528 gross ton miles in 1939. The improvement, contrasting 1939 with 1922, was 44.4 per cent.

The average gross ton miles per train hour, for all freight trains of Class I carriers was, in 1922, 16,188; and said average increased rather steadily year by year to 32,808 in 1939: an improvement of 102.7 per cent.

The average expense, per thousand revenue ton miles, for all freight operating expenses, for all Class I rail roads, was, during the four-year period 1922-1925, $8.71; [fol. 6149] and said average declined rather steadily from year to year, to $6.49 for the four-year period 1936-1939: an improvement of 25.5 per cent.

The average expense, per thousand revenue ton miles, for freight transportation expenses only (as heretofore defined), for all Class I railroads, was, for the four-year period 1922-1925, $4.16; and declined progressively to $3.18 for the four-year period 1936-1939: an improvement of 23.6 per cent.

The average expense per passenger-train car mile, for passenger operating expenses, for all Class I railroads, was, for the four-year period 1922-1925, 32.80 cents; and declined to 25.67 cents for the four-year period 1936-1939: an improvement of 21.74 per cent.

The average expense per passenger-train car mile, for passenger transportation expenses, was, for the four-year period 1922-1925, 15.40 cents; and declined to 12.31 cents for the four-year period 1936-1939: an improvement of 20.06 per cent.

The greatly increased efficiency and economy of the operation of the Class I railroads, as a group, is further shown by the fact that in the four-year period 1922-1925 their revenue freight traffic, amounting to 1,554 billion revenue ton miles, was handled with an average annual ownership of 64,792 locomotives and 2,328,741 freight cars; whereas in the four-year period 1936-1939 their revenue freight traffic, amounting to 1,323 billion revenue ton miles was handled with an average annual ownership of 42,885 locomotives and 1,712,936 freight cars; in other words, though the traffic volume was only 15 per cent lighter, it was handled more cheaply, at higher speeds and on faster schedules, and with 34 per cent fewer locomotives and 26 per cent fewer cars.

[fol. 6150] The statistics of record, showing the efficiency and economy achieved by individual carriers (other than defendant) as a result of the long-train practice, relate directly to operations of sixteen important systems: namely, the Chesapeake & Ohio, Boston & Maine, Chicago, Milwaukee, St. Paul & Pacific, Northern Pacific, Missouri Pacific, Erie, Atchison, Topeka & Santa Fe, New York Central, Pennsylvania, Chicago, Burlington & Quincy, Great Northern, Union Pacific, Chicago & Northwestern, Illinois Central, St. Louis Southwestern, and Chicago, Rock Island & Pacific railroads. The lines of these carriers extend into every major territorial subdivision of the country; five of said systems extend from the Pacific Coast to the Mississippi or Missouri Rivers, and each of these transcontinental carriers extends, either with its own lines or those of direct connections, to Chicago, Illinois. Certain of the other lines enumerated are important trunk-line carriers extending from Chicago, or Mississippi River crossings, to the Atlantic Seaboard. The principal north-and-south lines of the Mississippi Valley are likewise represented.

Each of said carriers follows, and for many years last past has followed the practice of standard long-train operation, except to the extent that the Arizona Train-Limit Law prevents and has prevented the Atchison, Topeka & Santa Fe from so doing, upon that part of its lines located in Arizona and adjacent territory where the law has extra-territorial effect. The improvements in the efficiency and economy of operation achieved by these systems, coincident with and as the result (in part, at least) of the long-train practice adopted by them, are typical of the achievement of efficiency and economy of operation, by the rail-[fol. 6151] roads of the United States generally, and particularly by defendant, as heretofore shown.

Porter, R. 152-155, 189-198, 210-214; *Wright*, R. 215-216, 260-263; *Parmelee*, R. 298-374, 475-478; *Kirk*, R. 378-379, 439-440; *Young*, R. 486-488; *Otterback*, R. 567-572, 581-610, 619-624; *LaFountaine*, R. 636-638; *Burn*, R. 731-733; *Fertig*, R. 856-857; *Green*, R. 915-916; *Kraemer*, R. 955-958; *Callin*, R. 997; *Randall*, R. 1015-1016; *Triem*, R. 1078-1083; *Hammond*, R. 1139-1140, 1145-1148; *Kiley*, R. 1281-1282; *Peckenpaugh*, R. 1318-1321; *Beale*, R. 1545-1548; *Wilbur*, R. 1593-1600; *Blanchard*, R. 1657; *J. P.*

McDonald, R. 1739-1746, 1762-1765; *Judson*, R. 2975-2977.

Exhibits 10, 11, 12, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29, 32, 33, 37, 39, 42, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 58, 59, 60, 62, 63, 64, 66, 67, 68, 77, 78, 79, 85, 86, 87, 93, 94, 95, 99, 102, 103, 116, 120, 121, 124, 130, 131, 248.

(e) Results of the Long-train Program from the Standpoint of the Public, the Employes, and the Railroad Owners.

(1) Reduction in Average Transportation Charges Paid by the Public.

Concurrently with the aforesaid improvements in schedules and performance, and as a direct result of the increased efficiency and economy brought about by the aforesaid 1923 betterment program, including the development and continuation of long-train operations, the rates for freight and passenger transportation paid by the railroad patrons have shown continuously decreasing trends. Thus the average revenue per ton-mile, received by all Class I railways of the United States (which average revenue directly reflects the average level of the freight rates charged to and paid by the public for freight transporta-[fol. 6152] tion) was in 1922, 1.177 cents, and in 1939, .973 cents: a decrease of 17.4 per cent. Similarly, the average revenue per passenger-mile, received by all Class I railways of the United States (which average figure directly reflects the average levels of fares paid by the public for railroad passenger transportation) was in 1922, 3.027 cents, and in 1939, 1.840 cents: a decrease of 39.2 per cent.

Parmelee, R. 298-304, 332, 336, 339.

Exhibit 16.

(2) Increases in average wages paid to employes.

Except for a temporary recession in the levels of wages, commencing in 1932 and extending until and including 1934 (the wage levels having been entirely restored in 1935), the average rates per hour for wages paid to all railroad employes of Class I railroads in the United States have shown a generally increasing trend since 1922. In that year

the average hourly rate was 6[illegible]3 cents; in 1939, said rate was 74.9 cents: a percentage increase of 22.1 per cent. Dealing particularly with the wage rates of train and engine-service employes (which are the classes of employes who man the trains to which the train-limit law applies), the average wage-rate per hour for such employes was, in 1922, 79.1 cents, and generally tended to increase, except for the aforesaid temporary recession of 1932-1935, up to 92.2 cents per hour for the year 1939: a percentage increase, comparing 1939 with 1922, of 16.5 per cent.

Parmelee, R. 304-316, 332-336, 339-342.
Exhibits 17-18.

(3) Effect on returns to owners of the railroads.

While the aforesaid 1923 betterment program, as developed and continued through the succeeding years, has [fol. 6153] been accomplished by increasing efficiency and economy (and also, as hereinafter shown, safety) of operations, and likewise by benefits to the shipping and traveling public (through the aforesaid reductions in rates and fares) and to the railroad employes (by reason of the aforesaid increases in wages and wage rates, and the improvement in safety), the owners of the railroads have failed to realize any corresponding benefits, in the shape of returns upon the moneys invested in the properties, particularly during the period since 1929.

During the period following the year 1922, and to and including the year 1929, the Class I railroads of the United States, considered as a group, enjoyed a period of relative prosperity, in that the net income from their operations, available for the betterment of the properties and for the payment of dividends upon the capital stock, represented substantial amounts, culminating in a net income of approximately $897,000,000 for the year 1929. Following the year 1929, said Class I railroads of the United States entered upon a period of severe and continued depression; and the net income declined from said figure of $897,000,000 for the year 1929, to an actual deficit of $139,000,000 in the year 1932. The years 1933, 1934 and 1938 were also years in which substantial deficits were experienced. In the year 1935 there was a net income of $7,500,000; in 1936, $164,000,000; in 1937, $98,000,000; and in 1939, $93,000,000. The rate of return on the prop-

erty investment devoted to carrier purposes, for all Class I railroads as a group, has not in any year since and including 1931 exceeded 2.57 per cent; in the year 1939, such rate of return was 2.25 per cent.

Parmelee, R. 316-325.
Exhibit 19.

[fol. 6154] (f) Similarity of Operating Conditions and Operating Rules on Other Railroads to Those Prevailing upon Defendant's Lines in the Affected Territory.

The operating rules which cover the operations of United States railroads generally, and particularly of those railroads, typical examples of whose operations are separately set forth in the record, are largely modeled upon and in conformity with a standard code of operating rules prepared and promulgated by the Association of American Railroads, and generally used, subject to minor variations because of peculiar or local conditions. The code of operating rules in force on defendant's lines, heretofore mentioned in paragraph VII (a) of these findings, likewise conforms generally to said standard code.

The operating conditions, particularly from the standpoint of maximum and ruling grades, curvature, and distribution of traffic as between through (interstate) and purely local, upon the districts and subdivisions covered by said typical examples of long-train operation are generally similar and, in many instances, closely comparable, to those encountered upon defendant's lines in the affected territory. Said examples include districts where there are single-track, and double-track operations; districts where helper service is used, both regularly and occasionally; districts where the cars moved in one direction are generally loaded, and those in the other direction generally empty; districts where there is a more even balancing of loaded and empty movement in opposite directions; districts where local traffic is negligible, and through traffic is relatively heavy; districts where perishable traffic is handled, in multiple-car units, in heavy volume; districts where operations, and particularly the handling of cars in long trains, must be so conducted as to insure that trains and cars will [fol. 6155] arrive at interchange and gateway points at agreed times; in short, said typical examples cover operations under varied conditions; but each one presents a

situation, the counterpart of which is found, to a greater or less degree, throughout, or at least in some part of, the affected territory.

A further similarity between the operations of the several railroads particularly mentioned in subparagraph (d) of this finding, and those of defendant, both on its system generally and in the affected territory, is found in the fact that perishable commodities, including also livestock and livestock products, form a substantial proportion of the traffic carried by each such railroad, and likewise, as aforesaid, of the traffic handled by defendant, particularly in interstate commerce in and across the affected territory.

Sines, R. 53-54, 2474-2475; *Porter*, R. 193-195; *Wright*, R. 215-222, 229-230, 238-245, 251-252, 256-259, 264-270; *Kirk*, R. 378-379, 390-397, 399-414, 426, 427-430, 442-445, 450-453; *Young*, R. 487-494, 511-513, 540; *LaFountaine*, R. 635-645, 648-651, 661-662, 671-672, 675-682, 685, 688-690, 692-700, 702, 709-714, 840-848; *Burn*, R. 733-736, 751-752; *Gregory*, R. 747-751; *Oakley*, R. 775-777; *Millard*, R. 789-794; *Snell*, R. 813-815; *Albert*, R. 824-826; *Fertig*, R. 855-857, 881-883, 887-889, 895-905, 1068-1070; *Green*, R. 919, 922-924, 938-940, 942-943, 953, 1154; *Kraemer*, R. 958-966, 968-969, 983, 992-994; *Randall*, R. 1018-1022, 1032-1034, 1036, 1051-1055; *Triem*, R. 1081-1086, 1107-1111, 1116-1120, 1129-1130, 1157; *Hammond*, R. 1139-1140, 1165-1173, 1175-1176, 1185, 1189-1191, 1202-1204; *Warfel*, R. 1205, 1210-1216, 1231-1239, 1243-1249, 1256-1263, 1361-1366, 1368-1370; *Kiley*, R. 1292-1294, 1300-1306, 1313-1314, 1485-1486; *Peckenpaugh*, R. 1319-[fol. 6156] 1322, 1324, 1332-1334, 1342-1343, 1349-1354, 1419-1430; *Beale*, R. 1545, 1548-1550, 1560-1580, 1582-1586, 1639-1651; *Wilbur*, R. 1606-1617; *Blanchard*, R. 1657-1677, 1700-1705; *Thomas*, R. 1713-1715, 1722-1735; *McDonald*, R. 1747-1759, 1760-1761, 1765; *Mahoney*, R. 1856-1858, 1863-1865, 1874-1885, 1887-1888, 1903-1909, 1981-1985; *Browning*, R. 2863-2884; *Judson*, R. 2979, 2989-2991, 2996, 3005-3007, 3052-3056.

Exhibits 10, 23, 26, 27, 30, 42, 43, 50, 53, 55, 57, 58 61, 62, 65, 66, 69, 71, 73, 77, 80, 85, 88, 93, 96, 99,

104, 105, 106, 116, 124, 125, 126, 132, 133, 134, 140, 152, 184, 203, 204.

IX

Recent Long-train Operations of Defendant in Arizona: Intention to Undertake Future Long-train Operations.

(a) Long-train Operations of Defendant in Arizona in 1940.

During the period between March 2nd and April 30th, 1940, both dates inclusive, defendant operated in Arizona 62 long passenger trains, including the passenger train particularly referred to in the complaint herein. During the period April 4th to April 30th, 1940, both dates inclusive, defendant also operated in Arizona some 302 or more long freight trains, including the freight train particularly referred to in the complaint. Each of such long trains was operated at the direction, and with the knowledge, of the responsible officers of defendant having immediate supervision over its train operations in Arizona.

The long passenger trains thus operated accumulated 15,857 passenger-train miles and 243,749 passenger-car miles within Arizona. The long freight trains thus operated [fol. 6157] accumulated 37,257 freight-train miles, and 3,180,278 freight-train car miles within Arizona. The average number of freight cars per freight train, for such long trains, was 85.36. The average length of all of the freight trains, including short trains, operated in Arizona during the month of April, 1940, was 57.85 cars.

The long freight-train operation thus undertaken by defendant during April, 1940, was necessarily upon a limited scale; primarily because the defendant did not undertake, for the purposes of such operation, to make any changes in the assignments of locomotives to its lines in the affected territory, or to transfer to said lines, for use in said long-train operation, the larger and more powerful locomotives which are and would be more appropriate thereto; and also because the great majority of the passing sidings and yard tracks in the affected territory, particularly in the districts west of Lordsburg, do not readily accommodate trains of substantially more than 70 cars, including engine and caboose. For these reasons the aforesaid long freight-train operation was largely confined to the handling

of long trains in the westward direction only; although at different times, during said period, long trains were also operated eastward.

Stipulation of Counsel, R. 30.
Sines, R. 3356-3380, 3427-3431.
Exhibits 234, 235, 246, 295.

(b) Future Long-train Operations Contemplated by Defendant: Changes in Plant and Equipment.

As heretofore stated, defendant plans and intends, when and if the restrictions of the train-limit law are removed, to begin at once the operation of a substantial number of long freight and passenger trains in the affected territory. Initially, and primarily because of the limited lengths of [fol. 6158] many of the sidings in the affected territory, such long freight-train operation will be generally confined to the handling of trains of more than 70 cars in one direction only, at one time. Eventually, and as rapidly as the necessary extensions of siding lengths and other changes in plant and equipment hereinafter mentioned can be made, such long-train operation would and will be expanded and extended until, upon substantially the same scale as presently followed in Nevada and other portions of defendant's system where, as elsewhere stated in these findings, long-train operations prevail.

In order to operate long freight trains freely in both directions in the affected territory, it will be necessary for defendant, and defendant now plans and intends, to build, or extend, yard tracks and sidings at 49 stations (including terminals) in said territory, so as to provide trackage permitting the operation of trains of 100 cars eastward and 125 cars westward as a general practice. The capital cost of such track construction and extensions is $685,985; the annual interest and maintenance charge thereon amounts to $40,009. Defendant also plans and intends, in order to provide the necessary servicing and repair facilities for the larger locomotives (as hereinafter mentioned) to be employed in such long freight-train operation, to reconstruct certain of its present roundhouse and turntable facilities at Tucson and Yuma, and to provide additional repair facilities at El Paso, and additional water-supply facilities at Benson. The aggregate capital expenditure for these purposes amounts to $453,832, involving an annual interest and maintenance charge of $28,137.

In order to conduct long freight-train operations in the affected territory with greater efficiency and economy, and [fol. 6159] with due regard for schedule requirements, and to realize thereby a larger degree of use and usefulness of its entire railroad plant in said territory, defendant plans and intends to provide and assign to such freight-train operation an adequate number of locomotives having sufficient tractive power more readily to handle long freight trains in both directions in said territory. Such locomotives, when so assigned, will replace certain of the other locomotives now in use in said territory. Of all of the types of locomotives owned and operated by defendant, the Articulated-Consolidation type is most suitable to such long-train operation. Locomotives of class 8 of the Articulated-Consolidation type, for brevity known as AC-8 locomotives, have been in service on various portions of defendant's lines since 1939. An earlier class of the same type, known as the AC-6 locomotive, which closely resembles the AC-8 in all essential features, has also been used by defendant on various portions of the system since about the year 1930. In order to handle, in long-train operation, the same volume of freight traffic actually handled in the affected territory in 1938, defendant will be required to assign some thirty AC-8 locomotives to said service. Fifty-one of the various types and classes of locomotives presently assigned to the affected territory will thereby be displaced, and made available for use elsewhere upon defendant's system. The net increase in the gross weight of the locomotives assigned to the affected territory brought about by such replacement, amounts to 1,141,160 pounds; so that the net capital cost to defendant of such locomotive reassignment, based upon the current price of 24.9 cents per pound for locomotives purchased by defendant in 1939, amounts to $284,149. The annual interest and depreciation charge associated with said capital cost is $19,606.

[fol. 6160] Long freight-train operation in the affected territory would and will bring about a reduction in the number of such trains operated, in relation to the traffic moved; as a result of which defendant would and will be able to conduct freight-train operations in the affected territory (if the total volume of such freight traffic were no greater than in 1938) with 21 fewer cabooses. These 21 surplus cabooses represent a capital investment of $71,694;

and an annual charge for interest, depreciation, and maintenance, amounting to $8747. Defendant would and will be relieved of said capital investment, and the corresponding annual charge thereon, as represented by said surplus cabooses, if and when the restrictions of the law are removed.

Dyer, R. 2021-2022; *Sines*, R. 2569-2572, 3259-3280, 4129-4137, 4161-4163, 4226-4227; *Herbert*, R. 2839-2856, 2886-2893; *Russell*, R. 120.

Exhibits 197, 202, 205, 222, 223, 224, 225.

X

Effect of the Train-limit Law upon Defendant's Operations.

(a) The Redispatching Studies.

In order to determine as precisely as possible the effect of the train-limit law upon its operations, defendant conducted a series of detailed studies of the trains and the traffic handled over its lines in the affected territory, during various recent periods, as follows:

1. The freight trains and traffic handled between Yuma and El Paso during the months of June and August, 1938;

2. The passenger trains and traffic handled between Los Angeles and El Paso during the entire year 1938;

[fol. 6161] 3. The freight trains and traffic handled over the lines between Phoenix and Picacho, including the movement of such traffic between Picacho and Tucson, during the month of December, 1938;

4. The freight trains and traffic handled between Yuma and El Paso during the period April 4th to April 30th, 1940, both dates inclusive.

These several studies are hereinafter referred to for convenience as the "redispatching studies".

The redispatching study of June and August 1938, first above referred to, involved a close and detailed analysis of each of the freight trains actually operated by defendant over the lines between Yuma and Tucson, via Gila, and between Tucson and El Paso, via both Lordsburg and Douglas, as to consist, speed, and other essential features

of operation; and the complete rearrangement, into "redispatched" trains, of the cars and traffic thus actually moved, so as to conform the operations, for the purposes of the study, to the conditions which would prevail if the law were wholly set aside. Said months of June and August, 1938, were and are representative of the entire year, in that June was the month of heaviest traffic volume, and August the month of lightest traffic volume; while the volume of the traffic handled over the lines studied, in the two months taken together, constituted slightly more than one-sixth (17.89 per cent) of the total so handled for the entire year.

In the conduct of said study it was contemplated, for the purposes thereof, that all of the conditions which actually prevailed on said lines during the two months mentioned would have continued to prevail; except to the extent [fol. 6762] that the removal of the limitations imposed by the law would have permitted modifications in defendant's operating methods, and would have warranted certain changes in its equipment and facilities (substantially as set forth in finding IX-b, supra), particularly: (i) the substitution of more powerful locomotives for those actually in use, (ii) necessary changes in and additions to locomotive roundhouse and shop facilities, and (iii) increases in the capacities, measured in numbers of cars, of sidings at certain specified meeting and passing points upon the lines involved.

Said 1938 redispatching study was carefully conducted, expressly for the purposes of the present case, under the direct, personal, supervision of experienced and fully qualified operating and executive officers of defendant, by the chief train dispatchers, who now and for many years last past have supervised the operation and movement of defendant's trains in the affected territory. The results thereof present as precise and accurate a determination as possible of the effects of the law: (1) in requiring additional train service to be operated by defendant in the affected territory; (2) in creating or aggravating delays to and interference with defendant's trains and cars, and the traffic transported therein; and (3) in imposing additional expenses upon defendant's operations in said affected territory.

The passenger redispatching study for the year 1938, second above referred to, was conducted in substantially

the same manner, and by the same persons, as the freight redispatching study for the months of June and August, 1938; however, it was unnecessary for the purposes of said study to assume any such changes in locomotive assignments, or in locomotive roundhouse or shop facilities, or in siding capacities, as in the case of the freight-train redispatching study.

[fol. 6163] The redispatching study covering the Phoenix-Tucson operations, for the month of December, 1938, third above referred to, was conducted in the same manner and with the same care as the other studies, all of the work being personally performed by the chief train dispatcher of the Tucson Division. The month of December, 1938, was selected for said study, because that month represents the period of maximum traffic upon the Phoenix-Picacho portion of the line.

Two separate but closely coordinated redispatching studies were actually undertaken in connection with freight-train movements in the affected territory during the period April 4th to April 30th, 1940. During said 27-day period, defendant conducted long-train operations on a limited scale in certain portions of the affected territory, and as stated in finding IX (a), actually operated in Arizona some 302 freight trains containing more than 70 cars, exclusive of caboose. Such operations, though undertaken without regard to the 70-car restriction, were limited in scope, in that they were carried on with the same locomotive theretofore and thereafter in service in the same territory, and without the benefit of any extensions of sidings, as contemplated in the event the law's restrictions should be removed.

The first of the said 1940 redispatching studies contrasted the limited long-train operations thus actually conducted during April, 1940, with operations as they would have been conducted if the 70-car restriction had been fully observed. Defendant was thus able to and did determine the savings in additional train service, in interferences with operations, and in additional and unnecessary expenses, realized as a result of such limited long-train operation.

[fol. 6164] The second of said 1940 redispatching studies contrasted said limited long-train operations with long-train operations as they would have been conducted with the extended sidings, the enlarged roundhouse and shop facilities, and the more powerful locomotives, as contemplated

in connection with said 1938 redispatching study. The two 1940 redispatching studies, taken together, therefore afford a ready and accurate determination of both the economies and advantages immediately available to defendant, if the restriction be removed, and even though defendant might not at once undertake substantial alterations of its present plant and equipment in the affected territory, and also of those economies and advantages capable of being ultimately realized, if and when the law is no longer effective. In those respects said 1940 studies serve to check and confirm the results presented by the 1938 studies.

Sines, R. 2555-2582, 2594-2632, 2654-2669, 2788-2806, 4161-4163, 4224-4226; *Baker*, R. 2697-2705, 2723-2729, 2780-2786, 2894-2918; *Herrell*, R. 2732-2772, 4065-4072; *Cassady*, R. 2812-2830, 4090-4092, 4096-4099; *Reid*, R. 2942-2947, 2950-2952; *Burke*, R. 2958-2959; *F. P. McDonald*, R. 2964-2967, 2972-2974.

Exhibits 196, 197, 198, 199, 226, 315, 316, 317.

(b) Interference With and Delays To Interstate Traffic.

The enforcement of the train-limit law against defendant results and will continue to result in delay to and interference with the handling and movement of defendant's interstate trains, both freight and passenger, operated in the affected territory, and with the transportation and movement of the interstate passengers, cars and commerce contained therein, both within and without the boundaries of Arizona.

[fol. 6165] Such delays and interferences arise and will continue to arise in the following ways: (1) interferences with and delays to cars and trains at terminals, (2) delays to individual cars, as distinguished from trains, at terminals and other stations, and (3) interferences with and delays to trains while on the line between terminals.

(1) Terminal delays.

The terminal delays occasioned by enforcement of the law, and which are directly and solely due thereto, are usually caused by the necessity of: (i) reducing defendant's long trains, as they approach or arrive at the Arizona state boundary lines, to lengths not exceeding 70 cars; (ii) building up said trains, as they are about to leave or after they

have left Arizona, to the normal lengths prevailing in the adjoining states. Such delays occur in part outside of Arizona, and in that respect the law operates with extra-territorial effect.

About 46.6 per cent of the freight trains moving between Indio and Yuma are long trains; the average length of the eastward trains entering Yuma from California being about 87.3 cars, and of the trains moving westward from Yuma into California about 89.7 cars. As the result of observance of the law in connection with all operations east of Yuma, all of defendant's freight trains moving eastward to and through Yuma must either be made up as short trains at points of origin in California, or reconsisted at Yuma or some point west thereof, so that the operation east of Yuma shall conform to the law; and all said trains, when moving westward as short trains into Yuma, must either be reconsisted at Yuma, so as to avoid running them as short trains in California, with resulting added and unnecessary expense, or else operated out of Yuma westward [fol. 6166] as short trains, to be stopped at some point west of Yuma, and there built up into the longer trains permitted in California.

Some 22.34 per cent of defendant's freight trains moving between Lordsburg and El Paso are long trains; and by reason of the observance of said law, said long trains, when moving westward, must be stopped at Lordsburg and there cut down to the length permitted by the law, being then operated as short trains for a distance of some 23 miles in New Mexico before entering Arizona at Cavot. Eastward long trains operating between Lordsburg and El Paso represent short trains which have moved eastward from Arizona and have been stopped at Lordsburg and there built up into long trains as permitted in New Mexico. In many instances, however, and as indicated by the fact that more than 77 per cent of the freight trains between Lordsburg and El Paso are short trains, schedule requirements prevent the stopping of eastward trains or blocks of cars at Lordsburg, or at any other point west of El Paso, for the period necessary for consolidation into longer trains. The law thus operates to control completely the length of defendant's freight trains between Lordsburg and the Arizona-New Mexico boundary line at Cavot; and, as to a large proportion of defendant's eastward trains, the law affects and largely controls their lengths, not only west of Lords-

burg, but also east thereof, upon defendant's lines in New Mexico and Texas as far east as El Paso. The total distance east of the Arizona boundary where the law thus directly affects train lengths of defendant's freight trains is 171 miles, the distance from Cavot to El Paso.

There are no terminal or other facilities at the exact point where defendant's line crosses the California-Arizona boundary, or at any station immediately west of or closely [fol. 6167] adjacent to said boundary in California, sufficient for the making and breaking up of trains, and storage of cars, all of which operations are necessary if the law is to be complied with literally. Such facilities exist at Yuma, immediately east of the boundary line; but since they are wholly within Arizona, they cannot be used for the purpose of changing from long-train to short-train operation, or the reverse, unless long trains are actually operated into and out of Arizona. In practice, defendant daily operates many long trains into and out of the Yuma terminal, and performs the reconsisting operations with the facilities at said terminal. Plaintiff, through its counsel, has in effect conceded that defendant can, as a practical matter, avoid such operations within Arizona only by causing all its trains between Yuma and the terminals next west of Yuma to be operated as short trains.

There are likewise no terminal or other facilities at or near Cavot (the Arizona-New Mexico boundary), and such facilities could not be constructed at said point except at great expense. The nearest point to said boundary at which the reconsisting and car-storage operations necessary in order to conform to the law can practicably be conducted is Lordsburg, which is 23 miles east of the boundary, and about 148 miles from El Paso. The siding facilities at Lordsburg are fairly adequate for the purpose, and are presently so used. The topography at Cavot is such that even if terminal and storage facilities were constructed there, the operations of changing from long-train to short-train operation, and the reverse, and of storing and setting out cars as required incidental thereto, would be difficult and impracticable, besides involving considerably greater operating expenses, and substantially more delays to trains and cars, than are incurred in the performance of such [fol. 6168] operations at Lordsburg. Moreover, such facilities would be useless for the purpose of reconsisting those eastward freight trains (about 75 per cent of all now oper-

ated) which because of schedule requirements cannot be and are not presently stopped and held for consolidation at Lordsburg.

G. C. Baker, R. 2358-2360, 2380-2382; *Herrell*, R. 2743-2749; *Sines*, R. 3169-3173, 3530-3536, 3828-3839, 4151-4153; *Herbert*, R. 3820-3827.

Exhibits 1, 175, 185, 215, 297.

Yuma delays: All eastward freight trains of defendant entering Arizona stop at Yuma to change crews and cabooses. Such trains, when consisting of more than 70 cars, are also reswitched, the excess cars being cut off, to be stored until sent forward either in trains originating at Yuma, or in later trains arriving at Yuma from the west with less than 70 cars. If it were not for the law, by far the greater proportion of defendant's said eastward long trains could and would move through Yuma without substantial change of consist, or any switching other than that incidental to the changing of locomotives and cabooses, or possibly the addition of cars originating at Yuma. The eastbound trains thus required to be switched in order to conform to the law are delayed at Yuma for varying periods; and the cars set out from said trains and thereafter moved on later trains also suffer substantial delays. All of said delays are solely due to the law, and could and would be avoided and eliminated if the law were set aside.

All westward freight trains of defendant arriving at Yuma are stopped there, and cabooses and locomotives are changed. Such trains are likewise generally consolidated into the longer trains permitted in California, in or- [fol. 6169] der to avoid and, as far as possible, minimize the extra expense of operating additional and unnecessary trains, and to confine such train operations to the State of Arizona. Such reconsisting and consolidation involve delays to the trains and cars affected thereby; and each and all of said delays are created by and are solely due to the law, and likewise could and would be eliminated and avoided if the law were not in effect.

Sines, R. 61-66, 2582, 3169-3170, 3309-3313; *G. C. Baker*, R. 2358, 2380-2382.

Exhibit 215.

Delays at Lordsburg and points east thereof: Defendant's westward freight trains arriving at Lordsburg are

stopped at that point to change cabooses, and also frequently locomotives. If the trains consist of more than 70 cars, the excess cars must be cut off and stored, and moved forward on later trains. These reconsisting operations cause delays to the trains involved, and also to the cars thus shut off and stored for later movement. All of said delays are solely due to the necessity of complying with the law, and could and would be avoided if the law were set aside.

Defendant's eastward freight trains arriving at Lordsburg from Arizona also change cabooses and frequently locomotives at that point. For various reasons, and particularly because of being operated close to definitely scheduled times, about 75 per cent of said eastward trains cannot be stopped at Lordsburg to be consolidated into the longer trains permitted in New Mexico, and they are therefore operated through to El Paso as short trains. The remainder are held at Lordsburg for consolidation, and are operated east of that point as long trains. Such consolidations involve varying delays to the trains and cars in question, which delays are likewise solely due to the law, and [fol. 6170] can and could be avoided only by conforming to the law's restrictions in the territory east of Lordsburg, and between that point and El Paso, a distance of 148 miles, as aforesaid.

Frequently westbound empty freight cars available and due for movement from El Paso via Lordsburg into and across Arizona are required to be held and stored at Lordsburg, because of the impossibility of handling such cars out at once in short trains operating west of that point, or of operating immediately any special trains for the purpose; and in such cases, and whenever the available storage space at Lordsburg is filled, such cars must also be stored at Deming or Strauss, New Mexico, or even at El Paso, until such times as movement to and through Lordsburg is again possible. These delays are wholly extra-territorial in character, and are also due entirely to the restrictions of the law.

Herrell, R. 2742-2749; *Sines*, R. 3168.
Exhibits 1, 175, 185, 215.

(2) Delays to trains en route: Meets and passes.

In the operation of freight and passenger trains over defendant's lines in the affected territory, as well as over

railroads generally, it is frequently necessary for trains to meet and pass each other. The term "meet" is generally understood to refer to the operation whereby two trains proceeding in opposite directions on the same track go by each other. The term "pass" is generally understood to refer to the operation whereby one train, having overtaken one or more preceding trains going in the same direction on the same track, runs around and thereafter precedes the train or trains overtaken. Train meets normally occur only in single-track territory; passes may occur on either single or double track. Whenever a meet or pass occurs, at least one of the trains involved is normally required to [fol. 6171] take siding and stop, and is thus delayed to a certain extent. The greater the number of meets and passes required in the operation of trains over a particular district or subdivision, the greater in the aggregate are the delays to and interferences between the trains affected thereby.

The 1938 redispatching study showed that in that year defendant was compelled to operate 4,304 additional freight trains over its principal main line between Yuma and El Paso via Gila and Lordsburg, which said additional trains were run solely because of the restrictions of the law and would not have been run if it were not for the law; and further, that 16,512 additional meets and passes occurred in said territory in said year, over and above those which would have occurred if long freight-train operation had prevailed; all of which additional meets and passes were therefore solely due to the operation of the aforesaid additional trains, and thus solely due to and occasioned by the law. Expressed in percentages, the law thus compelled an increase in the total number of trains run (both freight and passenger) in said territory, over the number that would otherwise have been necessary, of about 28.4 per cent; whereas the number of meets and passes between all the trains run (both freight and passenger) in said territory was thereby increased about 63.0 per cent.

Herbert, R. 2449-2452; *G. C. Baker*, R. 2683-2684; *Sines*, R. 3186-3213, 3846-3854, 4122-4128, 4218-4220; *Darnil*, R. 4402-4405; *Ash*, R. 4823-4825; *Menzies*, R. 5246-5247.

Exhibts 220, 226, 298.

(3) Delays to and interferences with passenger trains and traffic.

In general, the restrictions of the law create delays to and interference with the movement of passenger trains [fol. 6172] and traffic, in the affected territory, similar to those imposed upon freight traffic; however, because of the nature and character of passenger traffic, and more especially because of the 14-car limit on passenger trains, the law affects such trains at points and over portions of defendant's lines outside as well as within Arizona; and the extra-territorial effects are even greater, relatively, than in the case of freight trains.

Thus, passenger trains approaching Arizona from the east must often be reduced in length, both at points near the Arizona boundary such as Lordsburg and Rodeo, New Mexico, and also frequently at El Paso, the excess cars being either transferred to other scheduled trains operating over the same or alternate routes, or left behind to be picked up by later trains, or in some cases, made into special and extra sections and operated either ahead of or following the regular trains from which such cars were taken. Each train from which cars are taken under such circumstances is frequently further delayed at Tucson, or Yuma, or some point further west, in order to return to it cars which have been separately run across or partly across the state of Arizona.

Eastbound passenger trains moving or intended to move across Arizona also suffer delays and interferences, largely similar to those above described as being imposed upon westbound trains; such delays and interferences taking place both at Yuma and, frequently, at Los Angeles as well.

Cars originating at points en route such as Yuma, Phoenix, Tucson or El Paso, or coming to defendant's line at those or other points in the affected territory for movement in passenger trains across or within Arizona, frequently must be set out, or left behind, or otherwise delayed [fol. 6173] because of being handled in trains or over routes other than those upon which they were intended and scheduled to be moved, solely because their movement in the proper and intended trains would cause the latter to exceed the 14-car limit.

A detailed study and analysis of the passenger trains and traffic handled in the affected territory during the year 1938

developed that on 222 separate occasions, involving 359 different passenger trains, passenger cars had to be switched from their trains, and set out to be picked up by other trains, or moved as extra sections at or from various points in the territory between and including El Paso and Los Angeles; that 315 such cars were set out and 338 such cars picked up (the difference being principally accounted for by head-end cars which were added as "buffers" on extra sections); and that such interferences caused 63 trains to be delayed, an average of 15 mintes each. 19 of the delays or interferences referred to, involving 30 trains, occurred at points outside of Arizona.

Included in the instances enumerated above were various kinds of annoyances and interferences developed by analysis of individual cases, as follows:

Deadhead equipment was delayed at various stations between and including Yuma, Arizona, and El Paso, Texas, in 45 instances, involving 89 trains and 51 cars. The total delay to such deadhead cars was 499 hours 29 minutes, or an average of 9 hours and 47 minutes per car. In 56 instances, involving 112 trains, 67 cars were adversely routed, that is, they were moved by trains or routes other than those originally assigned. In 44 instances, involving 48 trains, 47 car movements were canceled outright, that is, the advertised movement was permanently canceled because prevented by the car limit. In 21 instances, involving 21 trains, helper service was incurred on the Los Angeles Division, [fol. 6174] and there was developed thereby, 1,142 locomotive helper miles which would have been unnecessary were it not for the extra-territorial effects of the law. 200 occupied or loaded cars were delayed at various stations between and including Yuma, Arizona, and El Paso, Texas, by being set out and later picked up, or by failing to be picked up in accordance with schedule, and suffered a total delay of 165 hours, 50 minutes, or an average delay of 50 minutes per car.

The movement of cars over routes or by trains other than those intended compelled defendant to produce, in 1938, 2,203 excess passenger car miles, which excess car-mileage was created by and solely due to the restrictions of the law.

Sines, R. 2492-2499, 2656-2657, 2788-2804, 3327-3340, 4114-4120; *G. C. Baker*, R. 2382-2386.

Exhibits 187, 188, 199, 230.

(4) Summary of effect of delay and interferences.

The effect of the aforesaid delays and interferences occasioned by the law are and will continue to be directly, substantially and seriously to impede the prompt and efficient handling of the interstate freight and passenger traffic carried in the trains operating over defendant's lines in the affected territory, and to hamper seriously, and in many cases to prevent, the on-time delivery of said traffic at destinations and/or points of interchange with defendant's connections.

Detailed studies were made by defendant of the traffic handled over the affected lines during the month of June and August, 1938, and April, 1940; contrasts and comparisons being made between:

(i) The handling over the line, and the times of delivery at El Paso (of eastbound traffic) and Yuma (of [fol. 6175] westbound traffic), of fruit blocks and manifest sections, or parts thereof, and of individual cars, as the same actually took place; and

(ii) The handling en route and at intermediate terminals and the times of delivery at the same points, of the same traffic, as performed by the redispatched trains.

Said studies showed that, if the law were not in effect, the arrival times at El Paso and Yuma of identified blocks and sections, and individual cars, would on the average be substantially earlier than if the law were in effect, and that the times en route over the lines in the affected territory would, on the average, be correspondingly less; that under the law, fewer of the identified blocks and sections arrived at El Paso or Yuma at or ahead of scheduled times, and that many more were late on schedule; that those arriving ahead of schedule did so by smaller time margins, while those arriving late on schedule did so by greater margins, on the average, than if the law were not in effect.

Each and all of the aforesaid delays and interferences, and each and all of the results thereof, whereby freight or passenger traffic is or will or would be delayed or caused to arrive at terminals, interchange points, or other stations, later than such traffic will or would arrive free of the law,

will and would be occasioned by and solely due to the restrictions and impositions of said Train-Limit Law.

Sines, R. 3300-3318, 3384-3390, 3413-3422, 3442-3446.
Exhibits 227, 228, 237, 238, 243, 244.

[fol. 6176] (c) Reduction in train lengths: Increase in number of trains operated.

(1) Freight train operations.

The enforcement of the law causes and will continue to cause the average and the maximum lengths of defendant's freight trains operated in the affected territory to be greatly reduced, below the average and maximum lengths which would obtain if it were not for the law, and also compels and will continue to compel defendant to operate a substantially larger number of such trains, and correspondingly to produce a substantially greater number of train miles and locomotive miles than would be necessary, if it were not for the law, for the handling of the same traffic volume (expressed in cars or car miles).

Such effects of the law are not confined to Arizona; for the law does and will continue to regulate and control completely the lengths of defendant's freight trains, and the number thereof, operated upon defendant's lines in New Mexico at least as far east as Lordsburg and Rodeo. The law also affects and will continue to affect said train lengths, and the number of trains, as far east as El Paso, Texas.

In the two months (June and August) covered by the 1938 redispatching study, the average lengths of the eastward trains operated over the several freight-train districts between Yuma and El Paso were as follows: from Yuma to Gila, 64.3 cars; from Gila to Tucson, 63.7 cars; from Tucson to Lordsburg, 64.2 cars; from Lordsburg to El Paso, 68.0 cars. If the law had not been in effect, said average train lengths would have been as follows: from Yuma to Gila, 85.2 cars; from Gila to Tucson, 85.9 cars; from Tucson to Lordsburg, 89.1 cars; from Lordsburg to El Paso, 88.7 cars.

[fol. 6177] The average lengths of the westward trains operated in said two-months' period, between terminals, were comparable to but slightly greater than the average lengths of the eastward trains between said points; and if

the law had not been in effect, such average lengths would have increased, to averages comparable to and slightly greater than those of the corresponding eastward trains. The average lengths of the eastward and westward trains operated between Tucson and El Paso via Douglas in said two months was 48.5 cars; if the law had not been effect, the average length of said trains would have been 55.9 cars.

Summarizing, the average length of the trains operated in both directions during the months of June and August, 1938, in the entire district between Yuma and El Paso via Gila and Lordsburg, and between Tucson and El Paso via Douglas, was 64.7 cars; whereas if the law had not been in effect, the average length of said trains would have been 86.6 cars; a percentage increase of 33.8 per cent.

The average length of the trains operated between Tucson and Phoenix in both directions, in December, 1938, was 57.7 cars; if the law had not been in effect, that average would have been 70.2 cars.

The extent of the long freight-train operation, which would have prevailed in the affected territory in 1938, if the law had not been in effect, is as follows: For the Yuma-Gila district, the percentage of short trains would have been 18.23; of long trains, 81.77. For the Gila-Tucson district, the percentage of short trains would have been 17.82; of long trains, 82.18. For the Tucson-Lordsburg district, the percentage of short trains would have been 17.47; of long trains, 82.53. For the Lordsburg-El Paso district, the percentage of short trains would have de-
[fol. 6178] creased from 69.32 to 25.82; the percentage of long trains would have increased from 30.68 to 74.18. The percentage of long trains on the alternate main line, from Tucson to El Paso via Douglas, would have increased from 0.68 to 17.23.

That such an extent of long-train operations in the affected territory would and will be readily achieved is shown by reference to operations in Nevada and Utah for a typical four-months' period of 1939. Between Sparks and Carlin, Nevada, in said period, the percentage of short trains was 27.60; of long trains, 72.40. Between Carlin and the Nevada-Utah line, the percentage of short trains was 11.59; of long trains, 88.41. Between the Ne-

vada-Utah line and Ogden, Utah, the percentage of short trains was 14.14, and of long trains, 85.86.

Coincident with the foregoing increases in train lengths, defendant could, in 1938, have handled the same freight traffic which actually moved over the lines between Yuma and El Paso via Gila and Lordsburg, and between Tucson and El Paso via Douglas, with 4304 fewer freight trains, producing 638,569 fewer freight-train miles, and 798,424 fewer locomotive miles; that is to say, the law, by restricting freight-train lengths and thus causing more trains to be run, compelled defendant to operate 30.8 per cent more freight trains, and to produce 33.1 per cent more freight-train miles, and 35.9 per cent more freight-locomotive miles, than would otherwise have been required: though without any increase in the number of cars handled or car miles produced. Of said 638,569 additional freight-train miles, 151,789, or 23.8 per cent, were produced in the states of New Mexico and Texas, and were caused by and solely due to the extra-territorial effects of the law upon defendant's operations.

On the Phoenix line, the law's restrictions caused defendant, during the month of December, 1938, to operate [fol. 6179] 17 additional freight trains, and to accumulate 2,266 additional freight-train miles, and 2,506 additional locomotive miles; or 17.0 per cent more trains, 19.0 per cent more train miles, and 21.0 per cent more locomotive miles, than were necessary except for the law.

The results of the April, 1940, redispatching studies confirm very closely the results obtained from the 1938 study. Thus, said studies show that with unrestricted freight-train operations (i.e., with AC-type locomotives, and siding extensions and other improved facilities as contemplated in the event the law's restrictions are removed, all as heretofore set forth in detail), defendant would have been able to handle the freight traffic which, during the period April 4 to 27, inclusive, 1940, moved over the lines between Yuma and El Paso via Gila and Lordsburg, and between Tucson and El Paso via Douglas, with 378 fewer freight trains, producing 56,182 fewer freight-train miles, and 74,329 fewer locomotive miles, than would have been necessary if the law had been fully observed. Otherwise stated, compliance with the law during said period would have compelled defendant to operate 26.8 per cent more

freight trains, and to produce 29.0 per cent more freight-train miles, and 33.4 per cent more locomotive miles, than would otherwise have been required. 12,023, or approximately 21.4 per cent of said 56,182 additional freight-train miles, were or would have been produced extra-territorially: i.e., in the states of New Mexico and Texas.

Sines, R. 3169-3172, 3199, 3350-3355, 3402-3413.
Exhibits 186, 214, 215, 220, 226, 233, 234, 235, 236, 240, 242, 245, 259, 299, 315, 316.

(2) Passenger train operations.

The law is completely restrictive in holding the lengths of defendant's passenger trains in the districts between [fol. 6180] Yuma and Lordsburg and Tucson and Rodeo to a maximum of 14 cars, and is generally restrictive, extra-territorially, as far west as Los Angeles, and as far east as El Paso. Thus in 1939, no long passenger trains were operated in either direction between Yuma and Lordsburg or Rodeo; while only 12.19 per cent of the eastward passenger trains from Los Angeles to Yuma, and only 3.08 per cent of the westward passenger trains from Yuma to Los Angeles were long trains. Between Lordsburg and El Paso only 1.30 per cent of the trains were long trains.

Solely because the law thus restricts its passenger trains to the 14-car maximum, defendant is compelled to operate many more such trains than would otherwise be required, and as a result to produce a substantial volume of additional and unnecessary passenger-train miles and locomotive miles. In 1938, as shown by the passenger redispatching study, 33 additional and unnecessary sections of passenger trains were operated in the affected territory, involving the production of 14,218 additional train miles and 18,860 additional locomotive miles. 3,902 of said additional passenger train miles and 5,042 of said additional locomotive miles were produced outside of Arizona.

If it were not for the law, defendant could and would operate many more long passenger trains in the affected territory, corresponding in lengths to the trains operated on other portions of its system. The operation of such long passenger trains in Arizona, and in the affected territory generally, is entirely practicable; as is shown, *first*, by the fact that in 1940 defendant actually operated long passenger trains in Arizona on 62 occasions, producing

within the state 15,857 long-train miles, and 243,749 car miles (the average length of the long trains thus operated having been 15.37 cars, and a considerable number of said [fol. 6181] trains having contained 16 or more cars each); *second*, by the fact that on defendant's principal main lines, other than those across Arizona, passenger trains of more than 14 cars, and in fact frequently containing 17 cars or more, are commonly and regularly operated. The operation of long passenger trains on the main lines of defendant's system generally has heretofore been found to be the usual and ordinary practice. On the line across Nevada and Utah, for example, in the year 1939, long passenger trains constituted 43.79 per cent, and trains of 17 cars or more 18.24 per cent, of the entire number operated.

Sines, R. 2495-2499, 3327-3340, 3346-3349, 3426-3432.
Exhibits 187, 188, 230, 231, 232, 246.

(d) Increased annual expense of operation, etc., imposed by the law:

The enforcement of the law against defendant, and defendant's consequent compulsory compliance therewith, causes and will continue to cause additional operating and other expenses to be imposed upon and incurred by defendant, solely by reason of said law, amounting to not less than $394,900 per year; all of which expense is and will continue to be recurring, and irreparable, and could and would be saved and avoided if defendant were relieved of the law's restrictions.

Said sum of $394,900 per year represents the difference between the operating and other expenses, based upon operations during the year 1938, actually incurred by defendant in the affected territory, under the short-train method of freight and passenger train operation heretofore and presently followed; and the corresponding expenses which would be incurred, also based upon the handling of the 1938 traffic volume, in said affected territory, [fol. 6182] if the law were repealed or set aside, and defendant were thereby enabled to adopt and follow the long-train method of operation.

The following are the items as to which the amounts of the potential savings have been definitely determined and shown of record:

(1) Savings in operating expenses in freight service, said expenses including only those incurred for

locomotive fuel, and trainmen's and enginemen's wages, amounting to $397,515 per year.

(2) Savings in passenger-train operating expenses (said expenses including those incurred for locomotive fuel, trainmen's and enginemen's wages, enginehouse expenses, other locomotive supplies, and locomotive repairs), amounting to $10,884 per year.

(3) Annual interest, maintenance, and depreciation charges, amounting to $8747 per year, upon the additional investment in twenty-one cabooses, which said cabooses are required in the affected territory solely because of the additional freight trains compelled to be run because of the law, and as heretofore found, would not be required if the law were set aside.

These itemized savings in current expenses and charges, totaling $417,146, would be partially offset by increases in annual interest and maintenance charges upon certain equipment and facilities which, as stated in finding IX (b), defendant would construct or acquire in order to conduct long freight-train operations readily, efficiently, and economically; such increased annual charges being as follows:

[fol. 6183] (1) Interest and maintenance charge upon extensions of various yard tracks and sidings in the affected territory, amounting to $40,009 per year.

(2) Interest and depreciation charges upon the increased investment in larger locomotives, which defendant would use in freight service in the affected territory, in lieu of the locomotives presently in use, amounting to $19,606 per year.

(3) Interest and maintenance charges upon the expanded roundhouse, water service, and shop facilities necessary to provide for the proper servicing and maintenance of such larger locomotives, amounting to $28,137 per year.

The total of such offsetting charges amounts to $87,752 per year, which figure, subtracted from the foregoing total of itemized annual savings, amounting to $417,146, leaves a net annual saving in expenses, which defendant could realize by adopting long-train operation in the affected territory, amounting to $329,394.

In addition to said sum of $329,394, defendant also presently incurs further annual expenses, by reason of the law, not included in said sum, over and above those which would be incurred if it were not for the law, on account of repairs to locomotives used in freight service in the affected territory. The record indicates that the added expense for such freight locomotive repairs, which is therefore an additional amount which would be saved by the adoption of long-train operation in said territory, is not less than $65,500 per year. The total amount of the added annual expense which the law thus imposes upon defendant is therefore not less than $394,900.

[fol. 6184] *Extra-territorial portion of the added expense imposed by the law:* A substantial portion of said additional annual expense imposed by the law is and will continue to be incurred outside of Arizona, because associated with or occasioned by the aforesaid changes in or additions to defendant's operations, in those portions of the affected territory lying wholly within California, New Mexico, and Texas, which are brought about or necessitated solely by the restrictions of the law. This extra-territorial expense can be and has been accurately computed, by determining the amount and proportion of the total additional train service (measured in train miles) compelled by the law, which is performed outside of Arizona. The extra-territorial portion of the aforesaid net additional annual expense of $394,900 includes particularly the following:

(1) Additional freight operating expenses, associated 151,789 additional extra-territorial freight-train miles, amounting to $75,712 per year.

(2) Additional passenger operating expenses, associated with 3902 additional extra-territorial passenger-train miles, amounting to $3,319 per year.

The aggregate of said additional extra-territorial expense amounts to $79,031 per year, to which is to be added the additional expense of repairs to freight locomotives incident to the additional freight-train service outside of Arizona compelled by the law; which expense, as indicated by the record, is not less than $15,569 per year.

The total of the compelled additional extra-territorial expense is therefore $94,600.

The redispatching studies for the month of April, 1940, heretofore mentioned, confirm closely the foregoing figures [fol. 6185] of compelled additional annual expense, both in the aggregate, and as incurred outside of Arizona.

Garverick, R. 3012-3034; *Sines,* R. 3266-3280, 3318-3327, 3346-3349, 3491-3496, 3855-3857, 4210-4216.

Exhibits 209, 224, 225, 229, 231, 232, 250, 251, 252, 253, 254, 256, 257, 258, 259, 299, 317, 318.

XI

Slack and Slack-Action in Trains: Nature, Cause and Effects

(a) Description of draft rigging.

Freight and passenger cars and trains are coupled together by means of devices known as couplers, a coupler being located at each end of each car. Each coupler is attached to a draft gear, the latter being in turn attached to the underframe, which carries the body of the car. The couplers provide non-rigid connections between the several units (the locomotive and cars) which comprise the train. The purpose of the draft gear, as hereinafter more fully explained, is to afford a controlled resistance, effective when required to cushion and absorb the striking and pulling shocks of coupling, starting, stopping, and train movement generally, and thereby to protect the car structure and the lading within the car from injury and damage. The coupler and draft gear, with necessary connections and attachments, are collectively termed the draft rigging.

When freight cars are coupled together, there exists at the coupler faces a small amount of play or free motion (varying from 7/8 inch to 1 1/8 inches), as between each pair of coupled cars. This is provided for in the construction [fol. 6186] of the couplers themselves, and is necessary to the proper operation of freight trains, in that it permits the lateral and vertical movements occurring when trains round curves, pass over dips and humps in track, and, in starting, assists in enabling cars to be moved successively instead of simultaneously, which would be required if couplings were solid.

In addition to the free motion at the coupler faces, there is the controlled motion (heretofore also referred to as "controlled resistance") which exists in the draft gears themselves, and is controlled by the spring-actuated friction members, or by springs alone, which form the essential working parts of the draft gears.

Leriche, R. 74-77; *Parke*, R. 1449-1450; *Cartmill*, R. 1792-1794; *Bohnstengel*, R. 3078-3079, 3089-3099, 3109-3110, 3119, 3122-3124; *Durnil*, R. 4391-4397; *Cooper*, R. 4541-4543; *Stevenson*, R. 4629-4633, 4639-4644; *Ash*, R. 4826-4831.
Exhibit 210.

(b) Action of Draft Gears.

Draft gears presently in use on freight cars are of two general types: (1) the friction type, which uses both springs and friction members; (2) the tandem-spring type, which employs heavy springs, but has no friction members. All of defendant's freight cars (including, for this purpose, refrigerator cars owned by Pacific Fruit Express Company) used in interchange service are equipped either with approved types of friction draft gears, or with tandem-spring draft gears; and, as heretofore found, by far the greater proportion of such cars are equipped with friction gears.

Whenever a push or impact, as, for example, in the coupling of cars, or a pull, as for example, in the starting [fol. 6187] of a train, is given to an individual car, that push or pull is transmitted first to the coupler itself, and then through the coupler shank to the draft gear, and thereby causes the draft gear to be compressed. Because of the construction of the draft gear, compression takes place in the case of pull as well as upon push, or so-called "buff". When force is applied to the coupler with sufficient rapidity to produce shock, the draft gear absorbs the shock to the limit of its capacity, and dissipates this shock energy, through the absorptive power of the springs and the heat created by the operation of the friction members. The standard type of friction draft gear required the application of from 300,000 to 500,000 pounds of "buffing" or pulling force at the coupler face, in order to produce complete closure of the draft gear; i.e., in order to produce the maximum amount of motion or "controlled resistance" of which the draft gear is capable. The

total amount of motion of which a standard friction type of draft gear is capable, in the event of the application of force sufficient to cause complete closure, is 2¾ inches from the mean or normal position. The potential motion of a tendem-spring draft gear is about 2 inches, from normal position to complete closure; and this may be developed by application of from 60,000 to 65,000 pounds pressure.

Leriche, R. 74-77, 87; *Cartmill*, R. 1781-1792; *Bohnstengel*, R. 3090-3108, 3111-3113, 3115-3116, 3139-3142; *Barker*, R. 3440-3441.

Exhibits 2, 210, 247.

(c) Slack and Slack-Action Defined.

By the term "slack", as used herein, is meant the amount of the movement, including both the free motion at the coupler faces and the "controlled resistance" in the draft [fol. 6188] gears, which may take place, between the coupled cars of a moving train. By the term "slack-action", as used herein, is meant the accumulated effect of such motion, as it may be created or brought into play as the result of train operations. Slack and slack-action exist and occur in trains of all lengths.

(d) Factors Affecting Slack-action: Amount Developed in Operation.

There are a number of factors affecting the amount and severity of the slack action which may take place in a freight train, at any particular time while the train is in motion. Thus, for example, when a train is in motion, immediately after starting from a standstill, the draft riggings in the head portion of the train will be extended, so as to increase the distance between cars somewhat more than if the cars were standing free. In the center and rear portion of such train, however, the draft gears would be but slightly extended, if at all, although the free slack at the coupler faces would be completely stretched. If an emergency application should take place, even though at or near the head end of the train, the potential slack-action which might be developed could not exceed the amount of the increased distance between cars, created by the compression of the draft gears due to the starting effort of the locomotive, plus the amount by which the draft gears might be compressed in the opposite direction upon stopping, plus whatever free slack might

be developed at the coupler faces. The total amount o slack thus created normally would not exceed, on the aver age, more than about 6 or 7 inches per car throughout th train.

In general, more slack, and consequently greater slack action in the event of an emergency, may be developed whe a train is at low speed, accelerating from a stop, than woul [fol. 6189] be developed in the same train while proceedin at normal road speed between stations; both because o the momentum developed at higher speeds; and furthe because when trains are in motion, the draft gears tend b their action to adjust the slack.

The grade upon which a train is proceeding has a susbtan tial effect upon the slack, and consequently upon the slack action; if a train is proceeding against an adverse grade the tendency is for the slack to be somewhat more stretche than if the train were on level track; whereas if a train i proceeding down-grade, the slack will be bunched or com pressed to a much greater extent than on level track.

Whether a train is accelerating or decelerating likewis has a substantial effect upon the slack, and the consequen slack-action. As above stated, if a train is moving from stop, or is attaining a higher speed, the tendency is for th slack to become somewhat more stretched than if the trai is slowing down, or preparing to stop, or is about to stop.

The speed of the train, the extent to which the slack i extended or bunched, the consist of the train whether al loads or empties, and if partly loads and partly empties, th position of the loads and empties, and the action taken b the engineer, have a very definite effect upon the slack action. It appears that normally the slack-action at th rear of a freight train is more severe, at speeds of 10 mile per hour or less, than at ordinary road speeds of 30 to 4 miles per hour, other conditions as to consist of train, grade and length of train being equal. If a train consists of loads slack-action will be less severe than if the train consists o all empties, because the braking power upon the loaded car is much less, in proportion to the weight thereof, and th momentum of the loads is greater, than in the case o [fol. 6190] empties. If the train consists partly of load and partly of empties, and the loads are at the head end o the train, the slack-action at the rear will be less severe tha if the empties were at the head end of the train and the load behind.

The extent and amount of the slack-action in a freight train in operation, and whether the slack is extended or bunched, are to a large degree within the control of the engineer, who is able, by manipulation of the air brakes, and the power of the engine, and by taking into account the grades upon the track over which the train is running, so to handle the train as to avoid any severe shock or slack-action at the rear of the train, in ordinary operation.

It is not true, as apparently contended by plaintiff, that the amount and severity of slack-action occurring in a freight train depend solely upon the number of cars in the train. Said contention takes into account only the number of cars comprising the train, but fails to take account of any of the other factors affecting slack-action shocks and the severity thereof, heretofore mentioned; namely, grades, speed of trains, consist of trains, whether the cars therein are loaded or empty, and if loaded, the weight of the loads, and the control exercised and exercisable by the engineer.

It is likewise not true that the Train-Limit Law, by restricting the lengths of freight trains, either eliminates or substantially reduces the number or severity of the casualties attributable to slack-action shocks in cabooses or other cars at or near the rear end of trains. The evidence indicates that in the operation of long trains, there have been many instances of severe jerks and jolts occurring at the rear end of the train because of slack-action, and that in-[fol. 6191] juries have been suffered by brakemen and conductors as a result thereof. The record contains many similar instances occurring in connection with the operation of short trains. It is also shown that emergency stops of long trains have taken place, without causing any severe slack-action shocks to the caboose or injuries to the occupants thereof. Emergency stops of short trains have occurred, accompanied by severe slack-action shocks to the caboose and injury to the occupants thereof. The evidence shows that these different results, as herein indicated, on long and short trains arise because of the presence or absence, in the particular operation of the factors directly contributing to and controlling the severity of the slack-action.

Bohnstengel, R. 3115-3123, 3131-3133; *Durnil*, R. 4432-4435; *Kennedy*, R. 4482, 4507-4509, 4516-4523; *Cooper*, R. 4536-4540; *Stevenson*, R. 4621-4624, 4629, 4634-4635, 4639-4644; *Ash*, R. 4787-4788,

4792-4795, 4826-4839; *Fail*, R. 4854-4857; *Shaw*, R. 4928-4930, 4933-4935; *Fifield*, R. 5184-5208, 5211-5217, 5219-5222; *Menzies*, R. 5240-5244.

Exhibits 210, 266, 270, 274, 275, 280, 295, 386, 387.

(e) Slack-action in Passenger-train Operation.

The couplers and draft gears on passenger cars generally resemble those on freight cars, and perform similar functions. While slack and slack-action therefore also exist and occur upon passenger trains of all lengths, it does not appear from the testimony that the emergency stops or other circumstances by reason of which such slack-action may be developed are more frequent or the resulting shocks any more severe, on long than on short passenger trains; nor does it appear that the slack-action occurring in passenger-train operations, whatever the train length, is of sufficient severity to cause serious injury or damage.

[fol. 6192] From the standpoint of the safety of persons and property, slack and slack-action on passenger trains are of no significance whatever.

Leriche, R. 96; *Parke*, R. 1449-1450; *Bohnstengel*, R. 3093, 3104-3105; *Cheek*, R. 4581-4588, 4600-4604, 4610-4616; *Hardwicke*, R. 5079-5080; *Fifield*, R. 5209-5210, 5222.

Exhibits 4, 107, 271, 292, 294.

XII

Safety of Operation as Affected by Train Lengths: Accident and Casualty Statistics

(a) Accident Reports to Interstate Commerce Commission.

Pursuant to the Accidents Reports Act (36 Stat. 350; U. S. Code, Title 45, Secs. 38 et seq.) the Interstate Commerce Commission has for many years required monthly reports of railway accidents, in considerable detail, on forms prescribed by the Commission and filed under oath by the carrier. Those reports are annually summarized in accident bulletins published by the Commission in statistical form, wherein the accidents so reported are tabulated and segregated in great detail by classes and causes, and in

accordance with the classification of accidents contained in the Commission's rules for reporting accidents.

Reportable railway accidents are divided into three primary groups: train accidents, train-service accidents, and non-train accidents. Reportable train accidents are those—with or without casualties—that arise in connection with the operation or movement of trains, locomotives or cars, and result in damage to the equipment or other railway property in excess of $150, including cost of clearing the [fol. 6193] wreck and local expense of transferring lading (but not damage to lading). Reportable train-service accidents are those that arise in connection with the operation or movement of trains, locomotives or cars, and result in casualties to persons, but not damage to equipment or other railway property in excess of $150 as just defined. Reportable non-train accidents are those that do not result directly from the operation or movement of trains, locomotives or cars.

A casualty is not reportable unless it results in the death of a person, or injury to an employe, either on or off duty sufficient to incapacitate him from performing his ordinary duties for more than three days in the aggregate during the ten days immediately following the accident, or injury to a person other than an employe (which includes passengers) if the injury is sufficient, in the opinion of the reporting officer, to incapacitate the injured person from following his customary vocation or mode of life for a period of more than one day. Train accidents and train-service accidents are reported on a form prescribed by the Commission and designated as Form T, a separate sheet being used for each reportable train accident or train-service accident.

All of the statistical showings of train and train-service accidents received in evidence were based on the statistics of accidents actually reported to that Commission or reportable to that Commission. The Nevada statistics of accidents and casualties on defendant's lines included with those reported to the Commission a few that were reportable under the rules of the Commision, but through inadvertence had not been reported, although a record thereof was in the defendant's files.

Sullivan, R. 3559-3571, 3582, 3611, 3883-3886.
Exhibits 9, 260, 261.

[fol. 6194] (b) Bases for Computing Accident and Casualty Rates:

Train accidents with or without casualties, or casualties alone, may be measured, as to their frequency, on the basis of locomotive miles, train miles, or car miles operated; casualty frequency may also be measured against man hours worked, or man miles traveled. In its published accident statistics the Interstate Commerce Commission measured train accidents against locomotive miles, and casualties against locomotive miles and man hours; in addition to those bases the railroads of the United States, including defendant, use both the train mile and the car-mile basis. Man hours and train miles are commonly used as bases for measuring casualty frequency in relation to the exposure of employes to injury. The car-mile basis is used and is appropriate to determine casualty frequency in relation to the volume of traffic moved. The locomotive mile is also a satisfactory basis for comparing the frequency of casualties sustained in train and train-service accidents in all classes of service, because all classes of train service accumulate locomotive miles; whereas certain classes of service, such as yard service, and light-engine movements, do not accumulate train miles or car miles.

A train mile is the movement of a train a distance of one mile. A locomotive mile is the movement of a locomotive a distance of one mile, under its own power. A car mile is a movement of a unit of car equipment a distance of one mile. Man hours represent the period, expresed in hours of time, that employes are on duty. A man mile represents a mile that an employe actually travels on duty. The term "casualty" as used in these findings includes both deaths and personal injuries, and, unless otherwise specified, means a casualty reportable to the Interstate Commerce [fol. 6195] Commission under its Rules for Reporting Accidents.

Sullivan, R. 3574-3579, 3612-3614, 3659-3661, 3663-3664, 3693, 3720-3723.

(c) National Accident and Casualty Statistics:

Tables are in evidence which were compiled from the published statistics of the Interstate Commerce Commission for the years 1923-1939, inclusive, and which relate to the frequency of reported accidents and casualties on all of the

Class I railroads of the United States. The increase in the length of trains on Class I railroads of the United States during that seventeen-year period has been dealt with in Finding VIII (b) ante.

Exhibits 262 to 271 inclusive, 312.

(1) All Employes:

The tables referred to show that accompanying the increase in the length of trains on Class I railroads from 1923 to 1939, there has been a continuous and marked downward trend in the frequency of casualties to all classes of railroad employes on duty sustained in train and train service accidents; casualty rates being for 1923, 8.24 per million man hours, 22.79 per million locomotive miles, 32.15 per million train miles, and 136.0 per 100 million car miles; and for 1939, 2.87 per million man hours, 5.64 per million locomotive miles, 7.87 per million train miles, and 26.58 per 100 million car miles. For the six year period 1923-1928 the average casualty rates were 7.08 per million man hours, 18.49 per million locomotive miles, 26.02 per million train miles, and 102.04 per 100 million car miles; and these rates declined to the following during the five-year period 1935-1939: 3.12 per million man hours, an improvement of 55.93 [fol. 6196] per cent as compared with the earlier period; 6.15 per million locomotive miles, a corresponding improvement of 66.74 per cent; 8.59 per million train miles, a corresponding improvement of 66.99 per cent; and 30.28 per 100 million car miles, a corresponding improvement of 70.33 per cent.

Sullivan, R. 3571-3574, 3886-3889.
Exhibit 262.

(2) Road Trainmen and Enginemen on Duty, All Classes:

Considering casualties sustained only by road trainmen and enginemen on duty in train and train-service accidents in all classes of service on Class I railroads during the same 17-year period, the 1923 rates were 43.34 casualties per million man hours, 17.38 per million train miles, and 73.52 per 100 million car miles; in 1939, the corresponding rates were 12.87 per million man hours, 4.13 per million train miles, and 13.94 per 100 million car miles. Comparing the rates for the 6-year period 1923-1928 for these casualties with the corresponding rates for the 5-year period 1935-

1939, there were the following improvements: in the rate per million man hours from 32.12, for the earlier period, to 14.16 for the later period, or 55.92 per cent; in the rate per million train miles from 13.54 to 4.64, an improvement of 65.73 per cent; and in the rate per 100 million car miles from 53.11 to 16.35, an improvement of 69.21 per cent. The term "road trainmen and enginemen" includes conductors, brakemen, flagmen, train baggagemen, engineers and firemen, engaged in passenger, freight or work service, but does not include engine hostlers.

Sullivan, R. 3585-3589.
Exhibit 263.

[fol. 6197] (3) Road Freight Trainmen and Enginemen on Duty:

Considering casualties sustained only by road freight trainmen and enginemen on duty in train and train-service accidents on Class I railroads of the United States during the same 17-year period, the casualty rates declined as follows: from 39.55 per million man hours in 1923, to 14.68 in 1939; from 26.83 per million train miles to 6.51; from 70.60 per 100 million car miles to 13.44. Comparing the six-year period 1923-1928 with the five-year period 1935-1939, the improvements in the average casualty rates were as follows: from 34.42 per million man hours in the earlier period, to 15.91 in the later period, or 53.78 per cent; from 21.30 per million train miles to 7.21, or 66.15 per cent; and from 50.68 per 100 million car miles to 15.55, or 69.32 per cent.

Sullivan, R. 3589-3592, 3891.
Exhibit 264.

(4) Road Freight Conductors, Brakemen and Flagmen:

Considering only those casualties sustained by road freight conductors, brakemen and flagmen on duty on Class I railroads of the United States, occurring in train and train-service accidents, it is shown that over the period of 17 years above mentioned there has also been a general downward trend from year to year in the number of such employes killed as well as those injured, whether considered in the absolute number or in the casualty rates measured against either man hours worked or train miles or car miles accumulated. Thus in 1923 there were 12,232 such casual-

ties, 322 being fatal; in 1939 there were 2,380 such casualties, 86 being fatal. In 1923 the casualty rates were: 45.33 per million man hours, 18.02 per million train miles, 47.42 per 100 million car miles; and in 1939 those rates were 20.33 per million man hours, 5.15 per million train miles, and [fol. 6198] 10.64 per 100 million car miles. Comparing the average casualty rates for the five years 1935-1939 with the earlier six years 1923-1928, the improvement or decrease in the casualty rate per million man hours is 48.15 per cent; in the rate per million train miles, 62.72 per cent; and in the rate per 100 million car miles, 66.21 per cent.

Sullivan, R. 3593-3595.
Exhibit 265.

(5) Conductors, Brakemen and Flagmen—Slack Action:

Casualties due to sudden stop, start, lurch or jerk of train or car sustained by road freight conductors, brakemen and flagmen on duty in train-service accidents on all railroads of the United States, when related to the number of freight train miles or freight train car miles accumulated, show a similar substantial and generally continuous downward trend. Thus the casualty rate per million train miles for the six-year period 1923-1928, for this type of accident, was 2.75, and for the five-year period 1935-39, it was 1.05, an improvement or decrease of 61.82 per cent. The corresponding casualty rates per 100 million car miles were for 1923-1928, 6.54; for 1935-1939, 2.27, an improvement of 65.29 per cent. The decrease in the absolute number of the casualties of this type is equally marked. Thus, in 1923, approximately 25,800,000,000 freight-car miles were accumulated, and there were 1,957 casualties to road freight conductors, brakemen and flagmen occurring in train-service accidents caused by sudden stop, start, lurch or jerk of train or car; in 1939 there were approximately 22,400,000,000 freight-train car miles accumulated, but the casualties of the type just described had declined to 399, only three of which were fatal.

The relative unimportance of the type of casualty particularly referred to in this sub-finding is shown by the com- [fol. 6199] parison of the total number of such casualties to the total number of casualties to all classes of employes on duty. In the five-year period 1935-1939 there were 37,346 casualties to all classes of employes on duty, sus-

tained in train and train-service accidents on Class I railroads of the United States. In the same period there were but 2,473 casualties of the so-called "slack-action" type sustained by road freight conductors, brakemen and flagmen, on all railroads (including other than Class I) of the United States. In the year 1939 there were 6,713 casualties to all classes of employes on duty on Class I railroads sustained in train and train-service accidents; but only 399 so-called "slack-action" casualties to road freight conductors, brakemen and flagmen on all United States railroads. The fatalities in train and train-service accidents in 1939 numbered 353; but there were only three "slack-action" fatalities.

Exhibits 262, 266.

(6) Passengers on Trains:

Casualties to pasengers on trains, sustained in train and train-service accidents on Class I railroads of the United States, have likewise shown a generally downward trend during the 17-year period 1923-1939. In the six-year period 1923-1928 the average casualty rate per million passengers carried was 5.16; the average per 100 million passenger miles accumulated was 12.91. In the five-year period 1935-1939 the average casualty rate per million passengers carried was 5.00, an improvement of 3.10 per cent as compared with the earlier period; and per 100 million passenger miles, 1063, an improvement of 17.66 per cent, as compared with the earlier period.

Sullivan, R. 3611-3615.

Exhibit 267.

[fol. 6200] (d) Train Accidents—National:

These acidents involving property damage in excess of $150, with or without reportable casualties, are classified as collisions, derailments, locomotive-boiler accidents, other locomotive accidents, and miscellaneous train accidents. The total number of all types of train accidents in all classes of service, per million train miles, decreased from 17.38 in 1923-1928, to 8.05 in 1935-1939: an improvement of 53.68 per cent; and the number of head-on and rear-end collisions per million train-miles, has been reduced from .50 in 1923-1928 to .19 in 1935-1939: an improvement of 62.00 per cent.

The downward trend from year to year has been fairly

uniform. Fewer trains running on the road provide fewer opportunities for head and rear-end collisions and the number of locomotive boiler and other locomotive accidents necessarily is directly related to the number of locomotive miles run.

Train accidents caused by defects in or failure of equipment on all railroads of the United States, and the casualties to trainmen sustained in such accidents, greatly decreased during the 17 years 1923 to 1939. The total number of train accidents caused by defects in or failures of equipment has been steadily reduced from 11,822 in 1923 to 2,039 in 1939, or 82.75 per cent. Relating the totals by periods of years to the number of train miles operated, produces rates of 6.69 accidents per million train miles in 1923-1928, and of 3.06 in 1935-1939—an improvement or decrease of 54.26 per cent. Trainmen's casualties in these accidents did not exceed in any one of the years one casualty in five million train miles; the rate per million train miles in 1923 being .19, and in 1939, .05—an improvement or decrease of 74 per cent. Illustrating how few casualties [fol. 6201] are sustained in any year by trainmen in all reportable train accidents due to defects in or failures of equipment along with the generally continuous decrease from 1923 to 1939, it appears that in the year 1939, only 5 trainmen were killed, and only 41 trainmen were injured, or at the rate of but one such casualty for each 18,177,800 train miles operated.

Although during the period 1923-1939, covered by the National statistics in evidence, there have been substantial improvements in the road-bed and equipment of American railroads, it is clear from a consideration of all of the evidence in the case that a considerable part of the improvement in casualty rates on those railroads during the same period is directly attributable to the adoption and growth of the standard long-train method of handling freight and passenger traffic, because thereby a substantially less number of train units was operated than would have been operated for the same volume of traffic had not the long-train policy been followed.

Sullivan, R. 3626-3632, 5132-5138.
Exhibits 269, 390.

(e) Commission's Investigation of Train Accidents—National:

The Interstate Commerce Commission has a Bureau of Safety through which it conducts the investigations authorized by Section 3 of the Accident Reports Act. The Bureau summons and examines witnesses, investigates at the scene of the accident and elsewhere, and makes a detailed report and conclusions to the Commission, which officially publishes summaries of those reports quarterly and has done so at least since the year 1927. Such investigations have been held as to more than 90 per cent of col- [fol. 6202] lisions, derailments or other accidents which resulted in fatalities to passengers or employes.

Sullivan, R. 3634-3635.
Exhibits 270, 312.

(1) Freight train accidents:

During the twelve-year period, 1928-1939, the Bureau investigated 1,002 train accidents, all of which are summarized in the Commission's said quarterly reports; of that number 561 involved freight trains, of which 298 were collisions, 206 were derailments and 7 were miscellaneous train accidents. Those accidents involved 728 freight trains, of which 574, or 78.8 per cent, consisted of 70 cars or less; of that 574 trains, 344 or 60 per cent, contained 40 cars or less.

Negligence of employes was the cause assigned by the Bureau for 349 of the accidents investigated involving freight trains, or 62.2 per cent of the 561 freight train accidents investigated. Of the number charged to negligence of employes 409 of the trains involved, or 82.0 per cent, consisted of 70 cars or less. Defects in or failures of equipment were charged with 79 freight-train accidents, an average of sligthly over 6.5 accidents per year, or 14.1 per cent.

Although under Section 3 of the Accident Reports Act the Commission is empowered to make and has frequently made such recommendations as it may deem proper, it did not on any of the quarterly reports for the twelve years 1928-1939, above referred to, find that the length of a train had any bearing on the accident, or that the accident might [fol. 6203] have been avoided had a train been shorter, or

make any recommendations respecting train length. It made recommendations in many other respects.

Sullivan, R. 3636-3646.

Exhibits 270, 312.

(2) Passenger train accidents:

During the six-year period 1934-1939, the Bureau investigated 520 accidents; of that number, 232 involved passenger trains, of which 96 were collisions, 120 were derailments, and 16 were miscellaneous train accidents. Those 232 accidents involved 267 passenger trains, of which 261, or 97.8 per cent, consisted of 14 cars or less; of those 261 trains, 224, or 85.8 per cent, consisted of 11 cars or less.

Negligence of employes was the cause assigned by the Bureau for 112 of said 232 accidents involving passenger trains, or 48.3 per cent thereof. In the accidents charged to negligence of employes, 142 trains were involved; 139 of these trains, 97.7 per cent, consisted of 14 cars or less. Defects in or failures of equipment were charged with 7 passenger-train accidents, or 3 per cent of the total, all of them occurring on short trains. Collisions with vehicles at grade crossings were charged with 42, or 18.1 per cent, of said accidents, involving 43 trains; 42 of these trains, or 97.7 per cent, were short trains.

Six of said passenger train accidents investigated by the Bureau occurred on defendant's lines. In five of said accidents the trains involved, six in number, were short trains. The train involved in the other accident consisted of 16 cars; the accident was caused by a collision with a motor truck which was driven on the track directly in front of the approaching train. Of the five short-train accidents, two [fol. 6204] were charged to negligence of employes, two to collisions with motor vehicles driven on the tracks, and one to malicious tampering with the track.

Sullivan, R. 3646-3654.

Exhibits 271, 312.

(f) Accident Statistics—Defendant's Pacific Lines:

As hereinbefore found, defendant's railway system operations are in seven states, and except in Arizona it has carried forward the standard long freight and passenger train method of operation since its adoption as a policy in 1923.

(1) Employes on duty—all classes of service—train and train service accidents:

The annual totals of locomotive miles in all classes of service on defendant's lines has varied from a low figure of 32,851,000 in 1933 to a high figure of 58,090,000 in 1926. In the six years 1923-1928 the average number of locomotive miles per year was 53,279,000; and in the five years 1935-1939, the corresponding average was 46,305,000.

During the seventeen-year period 1923-1939 the number of casualties to all classes of employes on duty in all classes of service sustained in train and train-service accidents on defendant's lines has shown a generally and substantially declining tendency. Thus, in the year 1923 there were 806 such casualties, 36 of which were fatal; in the year 1939 there were 344 such casualties, 29 of which were fatal. The casualty rate, per million locomotive miles, during the six-year period 1923-1928 was 11.58; during the five-year period 1935-1939, 8.47; an improvement or decrease of 26.86 per cent.

Exhibit 272.

[fol. 6205] (2) Trainmen on duty—all classes of service:

The frequency of casualties to trainmen on duty in all classes of service on defendant's lines sustained in train and train service accidents has also substantially declined since 1923; the absolute number of such casualties has likewise shown a generally and substantially declining tendency. Thus in the year 1923 there were 659 such casualties, 16 of which were fatal; in the year 1939 there were 260, 11 of which were fatal. In the six-year period 1923-1928 the casualty frequency rates for this class of casualties were as follows: per million locomotive miles, 9.47; per million man hours worked, 2061; per 100 million car miles, 49.84. In the five-year period 1935-1939 the corresponding casualty frequency rates were: 7.01 per million locomotive miles, an improvement of 25.98 per cent as compared to the earlier six-year period; 17.61 per million man hours worked, an improvement of 14.56 per cent; and 30.82 per 100 million car miles, an improvement of 38.16 per cent. In 1939 the casualty rates per million man hours and per 100 million car miles (14.21 and 23.34, respectively) were lower than for any prior year of the 17-year period; the rate per million locomotive miles (5.74) was also lower

than for any prior year except 1932, when the rate was almost exactly the same (5.72).

Exhibit 273.

(g) Nevada and Arizona Casualty Statistics:

Tables were received in evidence which included statistics of train and train-service accidents in Arizona reported to the Interstate Commerce Commission. Other exhibits list and furnish the details of each reportable train and train-service accident in Arizona for the 18 years, 1923-1940, inclusive. By the exhibits and the oral testimony explana- [fol. 6206] tory thereof, as well as oral testimony relating to occurrences not resulting in train or train-service accidents, a clear and complete showing has been made of the defendant's operations in Arizona for 18 years, in so far as they have involved accidents or casualties.

The same showing has been made of train and train-service accidents on defendant's lines in Nevada, for the same period, by statistical tables and a detailed showing of all of those accidents reported by defendant to the Interstate Commerce Commission, including also a few such accidents which were reportable but through inadvertence were not reported. There were no reportable accidents in Arizona that were not reported.

In the sub-findings that follow as well as in those that have preceded it will be understood that when an accident or casualty is referred to, an accident or casualty reportable to the Interstate Commerce Commission is meant, unless otherwise stated.

Sullivan, R. 3675, 3681, 3683.
Exhibit 184.

(1) Propriety and significance of comparison of Nevada-Arizona casualty statistics on defendant's lines:

The physical characteristics of defendant's operations in Nevada, and the volume and character of traffic handled, are described in preceding Findings IIIc and IVc. The operating rules are, and in general have been, the same in both Nevada and Arizona, and operating methods differ only in the respect that since 1912 the defendant has generally observed in Arizona the restrictions of the train-limit law; while in Nevada it has operated its freight and passenger trains without such restrictions, and for some

years (Finding VI-b) has followed the "standard long train method of operation" defined in Finding I(c). The [fol. 6207] requirements of the Nevada Full Crew Law and the Arizona Full Crew Law are substantially the same as to the number of trainmen to be employed on trains in the two states.

See annotations to Proposed Findings III (c), IV (c) VII (a) (5).

The defendant's statistical showing of its operations in Nevada, particularly as related to train accidents and train service accidents, is uncontradicted and, when considered with the evidence as to Arizona train and train-service accidents, affords a fair and reliable basis of comparison between operations as a whole, as well as between a passenger-train operation limited to 14 cars, and a freight-train operation limited to 70 cars, exclusive of caboose, and a standard long-train operation, as to the hazard of accident (1) to passengers; (2) to all employes; (3) to freight-train employes; and (4) to freight-train employes from so-called slack action. It clearly appears that the enforcement of the Arizona Train-Limit Law has not been accompanied by any measurable decrease in so-called slack-action casualties, as compared with the standard long-train method of operation, but has been accompanied by a greater proportion or ratio of casualties to passengers, and to all employes, as well as to freight-train employes, from all causes that lead to train and train-service accidents.

From 1929 to 1940 the operation of long freight trains in and through Nevada has greatly predominated. The year 1923 showed a partial beginning of increase in the length of trains in that State, and it assumed greater proportions each year until 1928. Prior to 1926, the operation of short trains greatly predominated.

[fol. 6208] (2) All classes of employes—all classes of service:

Comparing Nevada and Arizona, as to all casualties to all classes of employes on duty, in all classes of service, sustained in train and train-service accidents over the 16-year period from 1923 to 1938, inclusive, the showing is considerably more favorable to Nevada in each of the years when the casualties in absolute number are considered, as well as when they are related to a common basis of measure

ment—the locomotive mile. That is particularly true during the 11 years, 1929 to 1938, inclusive, and 1940. The comparison for the year 1939 would lead to the same result, except that the Nevada casualty rates and totals are greatly distorted because of a derailment of a 14-car passenger train at Harney, Nevada, on August 12, 1939, which was found by the Bureau of Safety of the Interstate Commerce Commission to have been due to malicious tampering with the track, and caused the death of 13 and the injury of 12 employes. During the period 1923 to 1939, all freight trains in Arizona have been restricted by law to 70 cars exclusive of caboose; in Nevada, freight trains of substantially more than 70 cars have greatly predominated since 1929.

Arizona operations show casualty rates, based on the number of train and train-service casualties, to all classes of employes, per million locomotive miles, ranging from 1.2 times higher in 1923, to 4.0 times higher in 1935, and 1.9 times higher in 1940 than the corresponding rates in Nevada. The Arizona rate has been higher in each of the 17 years, 1923-1938, inclusive, and 1940. For the six years 1929-1934 in Nevada, when train lengths were steadily increasing and long trains predominated, the average casualty rate was twice as favorable as in Arizona, where the length of trains, both freight and passenger was restricted by law. For the six years 1935-1940, and despite the distortion due [fol. 6209] to the casualties occurring in the Harney derailment, the Arizona casualty rate was still almost twice (1.86 times) the Nevada rate. The rate of improvement over that period of years has also been more rapid in Nevada than Arizona, the casualty rate on a locomotive-mile basis having improved 46.7 per cent in Nevada, against 38.7 per cent in Arizona, comparing the six-year period 1935-1940 with the six-year period 1923-1928. There were no fatalities to employes on duty in Nevada during 1933, 1934, 1935, or 1938, and only one in 1940; while in Arizona there were: one in 1933, two in 1934, one in 1935, one in 1938, and none in 1940. Considering the 18 years, 1923-1940, inclusive, there were 43 employes on duty killed in Nevada (including 13 killed in the Harney derailment on August 12, 1939), and 33 killed in Arizona; there were 406 employes on duty injured in Nevada, and 968 in Arizona—or 2.4 times as many in Arizona as Nevada; although the locomotive miles during that period were 70,678,000 in Nevada, and 90,734,000 in Arizona. During the six years, 1935 to 1940, inclusive,

there were more than three times as many injured in Arizona as there were in Nevada, although the locomotive miles during that six years were 21,757,000 in Nevada, and 30,970,000 in Arizona.

Sullivan, R. 3688-3691,
Exhibits 274, 275, 276, 289, 290, 391, 392.

(3) All classes of employes—road freight trains:

A comparison between Nevada and Arizona of casualties to all classes of employes on duty, sustained in train and train-service accidents in road freight-train operation for the years 1923 to 1940, inclusive, shows more favorably for Nevada in every year (1) when considered in their absolute number, except in the year 1923, (2) when related to freight-[fol. 6210] train miles, one of the measures of exposure of employes to injury, or (3) when related to freight-train car miles, a satisfactory and accepted basis for relating casualties to the movement of a given amount of traffic. During that eighteen-year period, there were 17 such employes on duty killed in Nevada, and 20 killed in Arizona. There were 291 such employes on duty injured in Nevada, and 526 in Arizona, or 1.8 times as many in Arizona as in Nevada. During the six years, 1929 to 1934, when the average length of freight trains was continually increasing in Nevada, and trains of substantially more than 70 cars predominated, and with practically no change in Arizona, only four such employes (one of them a conductor on a 67-car train struck by a passenger train) were killed in Nevada, against 5 in Arizona; there were 74 injured in Nevada, and 148 in Arizona—or exactly twice as many in Arizona as in Nevada. During the six years 1935-1940, when long-train operation continued to prevail in Nevada, only three such employes (one a conductor on a 57-car train, killed while on the engine detached from the train; the second a brakeman on a 70-car train; and the third a section foreman, killed by being struck by a 63-car train) were killed in Nevada, against 5 in Arizona; there were 53 injured in Nevada, and 132 in Arizona, or nearly 2.5 times as many in Arizona as in Nevada.

When these casualties are related to the number of freight-train miles operated, it is found that the casualty rate is higher in Arizona than in Nevada in every year, and reaches a figure three times as great in the year 1931, 2.4 times as great in 1935, and 1.8 times as great in the six years

1935-1940. The comparison is still more favorable to Nevada in every year, when the casualties are related to the freight-train car miles operated. The difference is not so marked in the years 1923 and 1924, when trains of less than [fol. 6211] 70 cars predominated in Nevada and when the average length of trains was less than in Arizona (1923, Nevada 49.47 cars, Arizona 56.45; 1924, Nevada 52.23 cars, Arizona, 55.49; but in the later years, the casualty rate on a freight-train car-mile basis ranged from 1.5 times as great in the year 1933 to 4.1 times as great in 1931; the rate in 1940 being 2.38 times as great in Arizona as in Nevada. The average rate for the six years 1923-1928 was 1.5 times as high; for the 6 years, 1929-1934, 2.1 times as high; and for the 6 years 1935-1940, 2.5 times as high, in Arizona as it was in Nevada. In both states there has been a downward trend in the casualty rate year after year, with some variations in certain years; but the percentage rate of improvement in the casualty rate in later years as against earlier years, both on a train-mile and on a freight-train car-mile basis, is more favorable in Nevada than in Arizona. Comparing the 6 years, 1929-1934, with the 6 years, 1923-1928, the casualty rate per million train miles decreased 43.4 per cent in Nevada against 35.4 per cent in Arizona, and on the basis of 100 million freight-train car miles, the decrease in Nevada was 54.4 per cent, against 38.4 per cent in Arizona. Comparing 1935-1940 with 1923-1938, the improvement on the train-mile basis was, Nevada 61.5 per cent, Arizona 49.2 per cent; on the car-mile basis, Nevada 71.1 per cent, Arizona 52. per cent.

Exhibits 274, 275, 277, 278.

(4) Road freight conductors, brakemen and flagmen:

As to the relative safety in Nevada and Arizona of Road Freight Conductors, Brakemen and Flagmen on duty, the decrease in casualties years after year, in absolute number as well as when related to the freight-train miles and freight-train car miles operated, has been slightly better [fol. 6212] than when all classes of employes on duty killed and injured in road freight-train operation is considered. During the 18-year period 1923 to 1940, inclusive, 11 Road Freight Conductors, Brakemen and Flagmen on duty have been killed in Nevada, and 15 in Arizona, and 257 have been injured in Nevada and 434 in Arizona—or 1.69 times as

many in Arizona as in Nevada; although the freight traffic, measured in freight-train car miles, was almost five per cent greater in Nevada than in Arizona. In every year except 1923, there were more casualties of this type in Arizona than in Nevada. An analysis of the comparisons between Nevada and Arizona for the last 6 years, 1935 to 1940, years of predominant long-train operation in Nevada, shows 2 killed in Nevada, both on short trains, and 5 killed in Arizona, or more than twice as many in Arizona as in Nevada, although the freight-train car miles were 3.8 per cent greater in Nevada than in Arizona. The casualty rate on a train-mile basis is more favorable in Nevada than in Arizona in every year except 1934, where the difference is only .61 (less than one casualty) per million freight-train miles. For the 6 years 1923-1928, the casualty rate on the freight-train mile basis was 1.3 times as high; for the 6 years 1929-1934, it was 1.5 times as high, and for the 6 years 1935-1940 it was 1.6 times as high in Arizona as in Nevada. The comparison between the two states of the casualty rates on the car-mile basis is more favorable to Nevada for every year except 1923, when the average length of trains was greater in Arizona than in Nevada. For the 6 years 1923-1928, the casualty rate on the freight-train car-mile basis was 1.5 times as high; for the 6 years 1929-1934 it was twice as high; and for the 6 years 1935-1940, it was 2.2 times as high in Arizona as in Nevada. The percentage rate of improvement in the casualty rates has been considerably higher in [fol. 6213] Nevada than in Arizona. Comparing the latest 6 years 1935-1940 with the earliest 6 years 1923-1928, the improvement or decrease in the casualty rate on a train-mile basis in Nevada was 58.8 per cent, against 50.3 per cent in Arizona; and on a car-mile basis in Nevada 69.1 per cent, against 53.3 per cent in Arizona.

Exhibits 278, 279.

(5) Slack-action casualties to trainmen, Nevada-Arizona:

Plaintiff bases its contention that the train-limit law is a safety statute almost entirely on the theory that it will minimize or greatly lessen the so-called "slack-action" or "slack-surge" accident—a form of accident classified by the Interstate Commerce Commission as being caused by a shock incident to a sudden starting, stopping, lurch or jerk of the train. Casualties resulting from this type of accident

are confined almost entirely to road freight conductors, brakemen and flagmen on duty, occur most frequently when they are in the caboose, occasionally when on top of the train, and infrequently when they are on the side of a car or caboose, or attempting to board or leave a car or caboose. The train-limit law has been observed long enough, and under such circumstances, as to afford a fair basis for judging whether a law limiting the length of a freight train to 70 cars, exclusive of caboose, can be said to be reasonably effective in the prevention or minimization of slack accidents and incident casualties. It clearly appears, and it is hereby found, that said law has not had that effect in Arizona, as to the defendant's freight-train operations in that state, either when they alone are considered, or when they are compared with defendant's freight-train operations in Nevada.

There is in evidence a reliable statistical comparison of defendant's freight-train operations as between the states [fol. 6214] of Nevada and Arizona, and as to the occurrence of "slack-action" casualties, for the 18-year period, 1923-1940, inclusive.

Considering the casualties in their absolute number during that period, there were more on short trains, in Arizona, than there were on long trains in Nevada; there being 101 such casualties, including one killed, on short trains, in Arizona, and 94 casualties, none of whom were killed, on long trains in Nevada. Analyzing the combined total number of this particular type of casualty occurring in both states, it is shown that there were 125 such short-train casualties; 101 in Arizona and 24 in Nevada (including 2 killed, one in Arizona and one in Nevada); against 96 such long-train casualties (none fatal), 94 in Nevada and 2 in Arizona; or 31 per cent more casualties on short trains than on long trains. During the 12 years 1929-1940, inclusive, there were 61 casualties of this type in Nevada and 62 in Arizona, although the traffic measured in freight-train car miles was 5 per cent greater in Nevada.

This type of casualty is of comparatively infrequent occurrence. There were no reportable casualties from "slack" and "slack-surge" accidents in Nevada during the eleven months, October 13, 1930, to September 20, 1931; none during the six months December 18, 1932, to June 22, 1933; none during the five months, March 1, 1935 to August

12, 1935; none during the five months January 11 to June 21, 1937; none during the 11 months, December 6, 1937 to November 17, 1938; none during the eight months February 14 to October 10, 1939. There was but one reportable slack or slack-surge accident to a conductor, brakeman, or flagman on Defendant's lines in Nevada during the period of almost two years from October 13, 1930, to July 13, 1932. In Arizona there were no such casualties during the seven months from May 29 to December 28, 1932; none during the [fol. 6215] thirteen months from October 29, 1933, to November 26, 1934; none during the twelve months from July 20, 1935, to July 5, 1936; none during the six months from December 25, 1937, to June 16, 1938; and none during the ten months from August 6, 1938, to June 1, 1939. There was only one such casualty in Arizona during the period of sixteen and one-half months from October 29, 1933 to March 9, 1935.

Another index of infrequency is the high percentage of days in the year when no accidents of this type causing casualties have occurred. In Nevada there were 359 such days in 1929; 358 in 1930; 364 in 1931; 361 in each of 1932, 1933, 1934, 1936 and 1937; 362 in each of 1935, 1939, and 1940; and 363 in 1938. Reduced to a percentage basis, it thus appears that on about 98.9 per cent of the days of the twelve-year period 1929-1940, no casualties of this class occurred in Nevada. In Arizona there were 360 such days in 1929; 354 in 1930; 357 in 1931; 362 in 1932; 361 in 1933, 1935 and 1939; 364 in 1934; 363 in 1936 and 1938; 358 in 1937, and 365 in 1940. On a percentage basis, there were about 98.8 per cent of the days during the twelve-year period, upon which no casualties of this class occurred in Arizona.

The casualty rate for said type of accident, on either a train-mile basis or car-mile basis for any one year, fluctuates greatly on account of the relatively small number of such accidents, and the infrequency with which they occur: for example, the casualty rate, on a train-mile basis, for the year 1939, was 1.65 in Nevada, and 1.56 in Arizona, a difference of only .09 casualty per million train miles in favor of Arizona. However, on a car-mile basis of comparison, the difference of .72 casualty per 100 million freight-train car miles (Nevada, 2.08, and Arizona, 2.80) is more favorable to Nevada.

[fol. 6216] Comparing the six years, 1935-1940, inclusive, with the earlier six years, 1923-1928, inclusive, there has

been a decrease of 30 casualties of this type in Nevada, and a decrease of 17 casualties in Arizona. On a train-mile basis, previously described as one of the commonly used measures of exposure of employes to injury, the casualty rates show a 43.3 per cent improvement in Nevada, and 44.6 per cent improvement in Arizona. On a freight-train car-mile basis, a recognized and proper measure of the casualty frequency against volume of traffic moved, the decrease in Nevada was 57.5 per cent, and in Arizona 47.7 per cent. For the 12 years, 1923-1934, inclusive, when short-train operations predominated for the earlier years, and the length of trains was steadily increasing until the operation of long trains became predominant in the later 6 years in Nevada, the average casualty rate, per million train miles was only slightly higher: .91 casualty (less than one) more, in Nevada than in Arizona; and per hundred million car miles the Nevada rate was .47 casualty less. When the comparison between Nevada and Arizona is confined to the 6 years, 1935-1940, inclusive, the casualty rate, based on the number of freight-train car miles operated, is less favorable in Nevada than Arizona, by but .24 (less than one-fourth casualty) per 100 million car miles.

The findings in this paragraph as well as the other evidence on the subject support the conclusion of fact, which is hereby adopted, that the "slack" or "slack-surge" accident is clearly shown to be a minor factor in determining whether the train-limit law here considered is a reasonable exercise of the state's police power.

Sullivan, R. 4023-4024.
Exhibits 274, 275, 280.

[fol. 6217] (6) Caretakers in cabooses—Nevada-Arizona:

Persons carried under contract in freight-train cabooses are usually livestock caretakers and messengers accompanying banana and other perishable shipments. In Nevada, during the 17-year period 1923-1939, there was one such casualty—a caretaker was injured in 1925, while walking over the top of a 54-car train; but no one was injured from slack action. During the same period there were 11 of such persons injured in Arizona on short trains, six of them by slack action on trains of 70 cars or less.

Sullivan, R. 3738-3743.
Exhibit 285.

(7) Serious casualties—Nevada-Arizona:

Comparing the freight-train operations in the two states for the period 1923-1939, as to their production of fatalities or amputation of limbs of freight conductors, brakemen and flagmen in train and train-service operations, it is found that there were, in Nevada, eleven deaths and four amputations, none of which occurred on a long train, except one amputation; while during the same period in Arizona there were nineteen deaths and four amputations, all of which occurred on short freight trains. Slack action was assigned as the cause of one death in Nevada, on a 60-car train, and one amputation. That cause was assigned for one death in Arizona on a 64-car train, and one subsequent fatality on a 66-car train; no amputation.

Exhibits 274, 275, 281.

(8) Casualties classified—Nevada-Arizona:

In further confirmation of the creation of additional hazard to road freight conductors, brakemen and flagmen [fol. 6218] by operating more train units than are necessary to carry a given amount of freight traffic the evidence shows:

Road Freight-train Operation

Casualties to Road Freight Conductors, Brakemen and Flagmen

Period	Total casualties		Operating hand brakes		Getting on or off cars or locomotives		Miscellaneous train accidents and miscellaneous train-service accidents	
	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1923-1928	151	214	5	24	30	47	98	130
1929-1934	65	123	1	12	6	26	49	79
1935-1940	52	112	4	16	9	27	35	61
Totals, 18 years	268	449	10	52	45	100	182	270

The classifications of causes are those used by the Interstate Commerce Commission in its Rules for Reporting Accidents. "Operating hand brakes" and "Getting on or off cars or locomotives" are directly related to the number of train units operated. "Miscellaneous train acci-

dents" and "Miscellaneous Train Service Accidents" include practically all of the so-called "slack-action" accidents. The "casualties" shown in cols. (4) to (9) inclusive, included 5 deaths in Nevada in the first period, none in the second, and one in the third; and 4 deaths in Arizona in the first period, 2 in the second, and 3 in the third; in Nevada one death on a 60-car train, and in Arizona one death on a 66-car train and one on a 64-car train resulted from slack-action accidents.

Sullivan, R. 3695-3697, 3596.
Exhibits 274, 275, 278, 279.

[fol. 6219] (9) Derailments reportable as train accidents—Nevada-Arizona.

The claim is made by plaintiff that the law under review tends to minimize derailments caused by defects in or failure of equipment, and consequent damage to equipment and hazard to life and limb. By comparing the derailments in Arizona and Nevada, during the 18-year period 1923-1940, reported to the Interstate Commerce Commission as having been caused by defects in or failures of freight-car equipment, it is found that the following appears:

Derailments Caused by Defects in or Failures of Freight-Car Equipment

A Period	B Number		C Damage to property	
	Nevada	Arizona	Nevada	Arizona
1923-1928	37	58	$40,096	$120,839
1929-1934	15	21	10,879	38,946
1935-1940	18	27	51,036	42,616
Total, 18 years 1923-1940	70	106	102,011	202,401
	D Per million train miles			
1923-1928	2.80	4.09	$3,038	$8,513
1929-1934	1.43	1.69	1,041	2,963
1935-1940	1.63	1.81	4,623	3,849
Total, 18 years 1923-1940	2.02	2.51	2,941	4,785
	E Per 100 million car miles			
1923-1928	4.79	7.85	$5,193	$16,354
1929-1934	1.97	2.93	1,432	5,436
1935-1940	2.09	3.26	5,938	5,147
Total, 18 years 1923-1940	2.93	4.64	4,266	8,864

[fol. 6220] Whatever effect improvements in track, roadbed, cars and appurtenances may have had during those years in lessening the hazard of derailment has been experienced equally in both states.

Of the 70 derailments in Nevada, 35 occurred on long trains and 35 on short trains—which results in there having been 141 of the 176 derailments in both states—1923-1940—chargeable to defects in or failure of freight-car equipment on short trains, as against 35 on long trains.

In 1935 there were no reportable derailments in Nevada from these causes, although 1,596,000 freight-train miles and 123,508,000 freight-train car miles were operated. In Arizona there were 3 reportable derailments with an aggregate damage of $12,274, but with no casualties; the accident rate and amount of damage being 1.43 ($5,845) and 2.53 ($10,353) on the basis of one million freight-train miles and one hundred million freight-train car miles respectively.

Sullivan, R. 5129-5132.

Exhibits 286, 287, 288, 389.

(h) Comparison of Short and Long-Train Periods in Nevada with Each Other.

From the evidence it clearly appears that there has been a marked improvement during the 18 years, 1923-1940, inclusive, in the rate of casualties of employes engaged in road freight-train operation in Nevada, coincident with the increase in the length of freight trains hereinbefore found.

An exhibit was received based on reportable casualties to all classes of employes on duty in train and train-service accidents resulting from the operation of road freight trains, and covering two periods: (a) The three years, 1923, [fol. 6221] 1924 and 1925, when short freight-train operation was predominant, the average during those years being 52.73 cars per train, and (b) the years 1937, 1938 and 1939, when long-train operation was predominant, the freight trains averaging 78.06 cars per train. In the first period, while 6,556,000 freight-train miles were operated, 345,672,000 freight-car miles were made by cars in those trains. In the second period, due to the increase in the length of trains, the total freight-train miles dropped to 5,468,000, while the freight-train car miles increased to 426,822,000, a lesser number of trains handling a greater

number of cars. During the first period there were five deaths, four of them of brakemen while working on trains of less than 55 cars, and one of them a railroad police officer who fell from a 60-car train. In the first period there were 106 reportable injuries to train and enginemen, 96 of which were to freight conductors, brakemen and flagmen; there were also three other employes injured. In the second period there was one death where a conductor of a 57-car train fell from the gangway of the moving engine, which was detached from the train; there were 31 train and enginemen injured, of whom 28 were freight conductors, brakemen and flagmen, and there was one other employe injured. The total casualties for the two periods were 114 in the first period, and 33 in the second; as stated, in the second period a lesser number of train miles produced a greater number of car miles than in the first period.

On recognized bases for measuring frequency of casualties: the first period produced 16.71 per million locomotive miles, or 2.88 times as many as the 5.81 that were produced during the second period; in the first period there were 17.39 casualties per million train miles, or 2.88 times as many as the 6.04 in the second period. In the first period, per hundred million freight-car miles, there were 32.98 casualties, or 4.27 times as many as the 7.73 produced in [fol. 6222] the second period. On a percentage basis, the improvement in the second period over the first was, per million locomotive miles, 65.23 per cent; per million train miles, 65.27 per cent; and per hundred million freight-car miles, 76.56 per cent.

Sullivan, R. 3730-3731.
Exhibits 275, 277, 282.

(1) Comparison, Nevada with Arizona—three-year periods.

It is also contended by plaintiff that decreases in casualty rates are to be credited to improvements in roadbed, bridges, equipment, etc. hereinbefore described. As hereinbefore found those improvements, as well as operating rules, operating conditions, and character of traffic, during the years 1923-1940, were practically the same on defendant's lines in both Nevada and Arizona, the only fundamental difference between the two states being that created by the restrictions of the Arizona Train-Limit Law. While

the factors claimed by plaintiff to account for improvement in casualty rates have, no doubt, increased the safety of operation of all classes of trains, the evidence clearly shows —comparing defendant's Nevada and Arizona operations— that the improvement in casualty rates is only partly due to improvements in road and equipment. Comparing total casualties and casualty rates for the two states, for the three-year periods 1923-1925 and 1938-1940, the following comparisons are established:

[fol. 6223] Casualties—Road Freight Trains—All Employes on Duty—Train and Train Service Accidents

	A. Period	B. Average length freight trains		C. Casualties		D. Per million train miles		E. Per 100 million car miles	
		Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona
(1)	1923-1925	52.73	53.88	114	133	17.39	22.75	32.98	42.22
(2)	1938-1940	79.88	56.19	27	58	4.90	7.60	6.14	13.53
	Ratio					3.55	2.99	5.37	3.12
	Improvement %, comparing line (1) with line (2)					71.82	66.59	81.38	67.96

The table next above clearly shows that the standard long-train operation on Defendant's lines in Nevada is a safer operation, when all classes of employes employed in or subject to injury by road freight-train service are considered, than the restricted operation in Arizona.

That conclusion is borne out by a comparison of the statistics of train and train-service accidents occurring on the defendant's line in the states of Nevada, New Mexico, and on the Los Angeles Division, California, as well as by the experience of the Atchison, Topeka & Santa Fe Railway, as summarized in Finding XII(k) hereof, and that of the Chesapeake & Ohio Railway summarized in Finding XII(l) hereof.

The act under review purports to be in the interest of safety of all employes, not of the protection of one class of employes from the hazard of one class of accidents.

Exhibits 277-282.

(See, also, proposed Findings III(c), IV(c), VII(a)(5).)

[fol. 6224] (i) Casualty Statistics — Defendant's Los Angeles Division.

Defendant introduced in evidence an exhibit listing all of the reportable casualties sustained by employes on duty and by non-trespassers (i.e., all persons other than trespassers) in train and train-service accidents occurring upon or in connection with the operation of road freight trains upon defendant's Los Angeles Division, during the 11-year period 1930-1940; said exhibit showing also the number and rate of occurrence of such casualties, both by classes of persons and by years.

Plaintiff introduced a list of freight-train accidents occurring on the Los Angeles Division, but made certain errors in its compilation, and failed to offer any other related statistical showing in connection therewith. Except for said errors, plaintiff's said showing confirms substantially the testimony submitted by defendant.

During the 11 years 1930-1940, there were 460 accidents on the Los Angeles Division, which occurred in connection with the operation of road freight trains and involved reportable casualties to employes and other non-trespassers. Fifty persons were killed in these accidents, 11 of whom were employes; and 504 persons were injured, 291 of whom were employes; or a total of 302 casualties to employes and 252 casualties to non-trespassers; 236 of said non-trespasser casualties were sustained by occupants of motor vehicles, 38 of such persons being killed and 198 injured.

The average length of all freight trains, both main and branch line, operated on the Los Angeles Division during the 11-year period 1930-1940 was 55.13 cars. The corresponding figure for Arizona for the same period was 55.33 cars; for Nevada 76.58 cars. The record does not show [fol. 6225] the proportion of long trains to all trains run on the Los Angeles Division, during the 11-year period 1930-1940. It does appear, however, that approximately 25.8 per cent of the trains run on certain main lines of that division, during four typical months of 1939, were long trains.

Of the total of 302 employe casualties above referred to, 189 (or 62.6 per cent) occurred on short trains, and 113 (or 37.4 per cent) on long trains. Of the total of 252 non-employe casualties above referred to, 228 (or 90.5 per cent) occurred on or in connection with the operation of short

trains, and only 24, or 9.5 per cent, on long trains. During the 5-year period 1936-1940 there were 167 employe casualties, of which 112, or 67.1 per cent, occurred on short trains; and there were 140 non-employe casualties, of which 127, or 90.7 per cent, occurred on short trains. Of the total of 554 casualties which were sustained during the 11 years 1930-1940 by persons other than trespassers, as aforesaid, 417, or 75.3 per cent, occurred upon or in connection with short trains, and only 137, or 24.7 per cent, on long trains; while during the 5 years 1936-1940, out of a total of 307 such casualties, 239, or 77.8 per cent, were on or in connection with short trains, and only 68, or 22.2 per cent, on long trains.

Of the 236 casualties sustained by occupants of motor vehicles during said 11-year period, 215 or 91.1 per cent, were sustained in connection with the operation of short trains, and only 21, or 8.9 per cent, in connection with the operation of long trains.

There is no sufficient showing to enable direct comparisons to be made between the Los Angeles Division, on the one hand, and either Arizona or Nevada, on the other, as to either the total number or the frequency rates of accidents and casualties occurring in freight-train operation. Any such comparisons, in so far as they involve casualties [fol. 6226] to employes, and particularly those sustained by conductors and brakemen on duty, are further disturbed and rendered inaccurate by reason of the fact that the requirements of the Full-Crew Law of California compel the employment of substantially more brakemen, particularly on long trains, than in Arizona or Nevada, and thus cause many more employes to be exposed to the hazard of injury in the event of accidents to such trains.

It appears, from the accident and casualty showing for the Los Angeles Division, and it is hereby found, that from the standpoint of the safety of persons, including employes on duty and the general public (other than trespassers), there is no especial or unusual hazard produced by or associated with the operation of long freight trains on that division, that is not also produced by or associated with the operation of short trains thereon, or that such hazards as do exist would be in any degree or to any extent reduced or eliminated if all trains were short.

Sullivan, R. 3998-3999.

Exhibits 185, 277, 351 to 361, 365, 386.

(j) Accident and Casualty Statistics—Defendant's Lines in New Mexico.

(1) Casualties to Persons—Freight-train operation.

Defendant introduced an exhibit containing a list of all of the accidents occurring in road freight-train operation on its lines in New Mexico, during the 11 years 1930-1940, in which reportable casualties were sustained by employes, or other persons not including trespassers. This exhibit also shows both the absolute number, and the frequency rates of such casualties, by years and groups of years, and by classes of persons involved, and also the casualties occurring upon or in connection with short-train and long-train operations, respectively.

[fol. 6227] Plaintiff introduced certain exhibits listing and describing in detail the reportable freight-train accidents and casualties occurring on defendant's New Mexico lines during the period above referred to; but plaintiff's compilation contains certain errors, and moreover was not accompanied by or related to any statistical showing. Plaintiff's evidence relative to New Mexico freight-train casualties, except for the errors above mentioned, tends to confirm and corroborate the showing made by defendant.

During said 11-year period 1930-1940, there were 139 accidents involving reportable casualties to persons other than trespassers, which occurred on or in connection with the operation of road freight trains on defendant's lines in New Mexico. Said 139 accidents resulted in 145 casualties, one person being killed and 144 injured. 129 employes were injured, but none was killed. 15 non-trespassers were injured and one was killed. 11 of said non-trespasser casualties, including the one fatality, were sustained by occupants of motor vehicles.

Of said total of 145 casualties, 111, or 76.5 per cent, were sustained in connection with the operation of short trains; 34, or 23.5 per cent, in connection with the operation of long trains; of the 70 such casualties which occurred during the 5 years 1936-1940, 55, or 78.6 per cent, were on short trains; and 15, or 21.4 per cent, were on long trains.

The record indicates that during four typical months of the year 1939, long trains constituted 9.06 per cent of all the freight trains operated on defendant's main lines in New Mexico. It also appears that during the first six

months of 1940, 25.5 per cent of the trains operated on the main line between Lordsburg and El Paso were long trains. The average length of all freight trains, both main and branch line, operated in New Mexico during the 11 years [fol. 6228] 1930-1940 was 55.19 cars; as compared to average lengths, during the same period, of 55.03 cars in Arizona and of 76.58 cars in Nevada.

Of the total of 129 employe casualties above referred to, 98, or 75.9 per cent, were on short trains; and during the 5-year period 1936-1940, 49 out of 61 casualties, or 80.3 per cent, were on short trains. Of the 16 casualties to non-trespassers other than employes, which occurred during the 11-year period 1930-1940, 13 occurred in conjunction with short-train operation. The 3 casualties sustained in connection with long-train operation all occurred at one time and in one accident, when an automobile ran into the side of an 89-car train, which at the time was moving at a speed of four miles per hour.

Casualties to employes, occurring in freight-train operation in New Mexico, are and have been substantially less in both number and frequency than in Arizona, although generally somewhat more frequent, in relation to train miles operated or car miles produced, than in Nevada. Thus, in said 11-year period, there were the following numbers and frequency rates of casualties to all classes of employes on duty sustained in train and train-service accidents occurring in road freight-train operation in said three states: in New Mexico, 129, at the rate of 7.97 per million train miles, 12.84 per 100 million car miles; in Arizona, 251, at the rates of 10.03 per million train miles and 18.10 per 100 million car miles; in Nevada, 113, at the rates of 5.89 per million train miles and 7.69 per 100 million car miles.

Considering only casualties to road freight conductors and brakemen on duty, there were, during said 11-year period, in New Mexico, 92 such casualties (67 of which occurred on short trains), at the rates of 5.05 per million train [fol. 6229] miles and 9.16 per 100 million car miles; whereas in Arizona there were 203 such casualties, at the rates of 8.11 per million train miles and 14.66 per 100 million car miles; and in Nevada, 101 such casualties, at the rates of 5.26 per million train miles and 6.87 per 100 million car miles.

Considering only casualties to road freight conductors and brakemen, caused from sudden stopping, starting, lurch, and jerk of train, there were, during said period, 29 such casualties in New Mexico, 11 of which occurred on short trains, the frequency rates being 1.59 per million train miles, and 2.89 per 100 million car miles; whereas there were in Arizona, during said 11 years, 56 such casualties, the rates being 2.24 per million train miles and 4.04 per 100 million car miles; and in Nevada, 52 casualties, the rates being 2.71 per million train miles and 3.54 per 100 million car miles.

Exhibits 185, 277, 279, 280, 338, 364, 387, 397.

(2) Train accidents—Freight-train operation.

Defendant also submitted an exhibit showing, by number and in detail, the reportable train accidents occurring upon or in connection with the operation of road freight trains upon its lines in New Mexico during the 11 years 1930-1940, and showing also the frequency of such accidents in the aggregate and by classes. There were 120 such train accidents occurring during said 11-year period. Only one of said accidents involved a casualty: a brakeman on a 60-car train was injured when 8 cars of the train were derailed by a broken flange on one of the cars.

The frequency rates of such New Mexico train accidents were: 6.59 per million train miles, and 11.95 per 100 million car miles. In Arizona, during the same 11-year period, [fol. 6230] there were 232 such train accidents, and the frequency rates were: 9.24 per million train miles, and 16.72 per 100 million car miles. In Nevada, during the same period, there were 133 such accidents, and the frequency rates were: 6.94 per million train miles and 9.05 per 100 million car miles.

12 of said New Mexico train accidents were collisions, all of them involving short trains, and all being ascribed to the negligence of employes. 46 of said train accidents were derailments; 39 occurred on short trains, and only 7 on long trains. 29 of said derailments were due to defects in or failures of cars or car bodies, 23 occurring on short trains and 6 on long trains. 48 of said train accidents were classed as locomotive accidents, 41 occurring on short trains and 7 on long trains. The remaining 14 accidents were miscellaneous train accidents, 6 occurring on short trains

and 8 on long trains. 98, or 81.7 per cent, of said 120 train accidents occurred on short trains; and only 22, or 18.3 per cent, on long trains.

Exhibits 280, 289, 290, 340 to 349, 388.

(3) Passenger-train accidents and casualties.

Plaintiff introduced in evidence a list of casualties to passengers and passenger employes occurring in train and train-service accidents on defendant's lines in New Mexico, but did not offer any statistical showing in connection therewith. Only two of the accidents thus listed by plaintiff occurred on long passenger trains; in one case a brakeman on a 16-car train sustained eight days' disability because of a foreign object in his eye; and in the other a passenger on a 15-car train suffered a probable 21-day disability, when he lost his hand hold and fell from an upper berth while the train was standing.

[fol. 6231] It does not appear that the length of the train had anything to do with any accident or casualty occurring in passenger-train operation on defendant's lines in New Mexico during the period covered by plaintiff's showing.

Exhibits 362, 368.

(k) Santa Fe Casualty Statistics—Comparing Short-train and Long-train Operations.

As part of its system operations the Atchison, Topeka & Santa Fe Railway Company operates a standard steam railway from Los Angeles, California to Chicago, Illinois, which passes through Needles, California, 12 miles west of the Arizona line, Winslow, Arizona, and Gallup, Belen and Clovis, New Mexico. The distance from Needles to Gallup is 419.7 miles, 385.7 of which are through Arizona, and from Gallup, through Belen, to Clovis, is 383.9 miles. The character of freight traffic and equipment handled through Arizona and New Mexico on that main line is substantially the same as that handled by defendant through Arizona and New Mexico, through interstate freight traffic greatly preponderating. That railroad has observed the train-limit law, the effect of which is to control the length of freight trains in both directions between Needles and Gallup, the nearest freight-train terminal east of Arizona (22 miles from the state line), and to shorten the length of east bound freight trains between Gallup and Belen (a freight-train terminal)

a distance of 144 miles. Between Belen and Clovis (a freight-train terminal), a distance of 240 miles, standard long freight-train operation is predominant, and has been for a number of years. There is no New Mexico state law that limits the length of freight trains. The evidence shows an exclusively short-train operation between Needles and Gallup (419.7 miles), a standard long-train operation between Gallup and Belen (144 miles) somewhat modified as [fol. 6232] to eastbound freight trains by the effect of the Arizona law, and an unrestricted and unmodified standard long-train operation between Belen and Clovis (240 miles).

Casualties on the above portions of the Santa Fe lines, resulting to road freight trainmen and enginemen on duty, from the operation of through, local and mixed road freight trains, and occurring while on, or getting on or off, road freight trains, as such casualties were reported to the Interstate Commerce Commission by the carrier, and their relation to train and car miles are found to be:

Period	Average Number cars per train		Casualties					
			Enginemen		Trainmen		Total	
	Clovis-Gallup	Gallup-Needles	Clovis-Gallup	Gallup-Needles	Clovis-Gallup	Gallup-Needles	Clovis-Gallup	Gallup-Needles
6 yrs. 1923-1928	69 7	52 4	15	9	44	97	59	106
6 yrs. 1929-1934	73 5	56 8	5	11	29	55	34	66
5 yrs. 1935-1939	69 2	55 6	8	5	18	42	26	47
17 years 1923-1939	70 8	54 8	28	25	91	194	119	219

Period	Frequency of Casualties			
	Per million freight-train miles		Per 100 million freight-car miles	
	Clovis-Gallup	Gallup-Needles	Clovis-Gallup	Gallup-Needles
6 yrs. 1923-1928	8 19	10 15	11 75	19 36
6 yrs. 1929-1934	5 85	7 72	7 92	13 60
5 yrs. 1935-1939	4 21	5 40	6 07	9 71
17 years. 1923-1939	6 20	7 91	8 75	14 44

[fol. 6233] There were two deaths (due to a locomotive boiler explosion) on a long train, and 11 deaths from accidents on short trains; none was due to slack action. The character and extent of operation in the two districts is illustrated by a comparison of the traffic movements in the

first year, 1923, with the peak year, 1929, and the last year, 1939, as follows:

Year and Territory	Average cars per train	Freight-train miles (thousands)	Freight-car miles (thousands)
1923			
Gallup-Clovis	64.76	1,175	76,115
Needles-Gallup	44.96	1,961	88,156
1929			
Gallup-Clovis	72.69	1,309	95,156
Needles-Gallup	57.06	1,794	102,366
1939			
Gallup-Clovis	71.7	1,251	89,761
Needles-Gallup	56.2	1,755	98,712

All reportable casualties due to sudden stop, start, lurch or jerk of the trains described in the heading of the table are included in its description of the casualties it covers.

This evidence shows, and it is hereby found, that over a period of 18 years the casualty frequency to road freight trainmen and enginemen on duty, while on or getting on or off road freight trains has been less favorable on the train-mile basis and substantially less favorable on the car-mile basis in Arizona where trains have operated under the restrictions of the law, than in the immediately adjacent territory of New Mexico where train length is unrestricted and where conditions of operation and volume of [fol. 6234] traffic are greatly similar, the only dissimilarity being in the length of trains.

J. P. McDonald, R. 1752-1758, 1760-1761; *Mahoney*, R. 1847-1849, 1851-1852, 1856-1858, 1876-1880.

Exhibits 124, 126, 132, 133, 134, 138, 140, 153, 296, 300.

(1) Chesapeake and Ohio Railway—Casualty Statistics

The Chesapeake and Ohio Railway is a Class I railroad of 3,117 miles of road operating in the states of Virginia, West Virginia, Kentucky, Ohio, Indiana and Illinois, and the District of Columbia. The railroad consists of both heavy or mountainous grade and relatively light or water grade, the heavier grades varying from 1.5% to 2.67%. A large proportion of the mileage consists of double track, and the main lines are equipped with block signals, most of which are automatic signals although there are some manual block signals; a portion of the automatic block signal territory has the additional protection of automatic train control.

Depending upon the character and availability of traffic, facilities, and grade conditions, both long and short trains

are operated. However, long trains greatly preponderate on the main-line subdivisions. During a typical four-week period of the year 1939, out of 3200 freight trains operated on seven main-line subdivisions, 2843, or 88 per cent, were long trains, and 1,722, or 53.8 per cent, consisted of 141 cars or more. The operation of freight trains of 160 cars is a common practice on this railroad.

The system freight operations of the Chesapeake and Ohio were large, and the increase in freight-train lengths progressive and pronounced, from 1924 to 1938, as during the same period the reductions in accidents and casualties [fol. 6235] to employes were also continuous and substantial, as shown by the following tables (the 1938 statistics being the latest available from the published reports of the Interstate Commerce Commission at the time the witnesses from the Chesapeake and Ohio testified):

Year	Freight Revenue Ton miles (millions)	Average Freight Cars Per Train
1924	16,527	53 5
1928	21,183	61 7
1934	17,613	77 9
1938	16,054	77 3

Years	Total Casualties		Casualty Rates Per Million Car miles	
	All Employes	Trainmen & Enginemen	All Employes	Trainmen & Enginemen
1924-27	2281	1974	61	55
1928-31	1250	1070	34	30
1932-35	723	613	24	22
1936-38	495	424	20	18
Improvement, 1936-38, compared with 1924-27			62 21%	67 27%

During the period 1924 to 1938 there was, in particular, a continuous and substantial reduction in the number and frequency of derailments due to various causes, including particularly those due to defects in or failures of equipment, as shown by the following table:

Years	Derailments			Frequency of Derailments	
	All Causes	Due to Negligence of Employes	Due to Defects in or Failures of Equipment	Per 100,000 Train miles	Per 1,000,000 Car miles
1924-27	1,554	200	570	1 68	42
1928-31	723	109	346	87	19
1932-35	316	52	142	55	11
1936-38	209	35	89	47	08
Improvement, 1936-38, compared with 1924-27				72 0%	81 0%

Beale, R. 1548, 1557-1580.
Exhibits 116, 117, 118, 121, 122, 123.

[fol. 6236] (m) Decrease in Casualties — Nevada Compared with Arizona

Coincident with the increase, as hereinbefore found in Finding VII (b), in the percentage of long freight trains operated in Nevada, there has been a continuous and marked decrease in reportable casualties in train and train-service accidents resulting from the operation of road freight trains. The evidence of those casualties in Nevada for the eighteen years 1923-1940 is complete. During the same eighteen-year period in Arizona, which is also fully covered by evidence showing all of the same classes of accidents and casualties in that state, and also showing that the average and maximum train lengths, as hereinbefore found, remained relatively constant, the decrease in the casualties in train and train-service accidents resulting from the operation of road freight trains has been much smaller than in Nevada.

Considering said eighteen years in three periods, the first consisting of the six years 1923-1928, the second of the six years 1929-1934, and the third of the six years 1935-1940, the following is shown by the record:

All Classes of Employes on Duty;

Road Freight Train Operation:

	Rates per million train miles		Rates per 100 million car miles	
	Nevada	Arizona	Nevada	Arizona
1923–1928	13 18	18 03	22 54	34 65
1929–1934	7 46	11 64	10 27	21 35
1935–1940	5 07	9 16	6 52	16 54
Improvement, 1929–34 compared with 1923–28	43 4%	35 4%	54 4%	38 4%
Improvement, 1935–40 compared with 1923–28	61 5%	49 2%	71 1%	52 3%

[fol. 6237]

Road Freight Conductors, Brakemen, and Flagmen on Duty

	Rates per million train miles		Rates per 100 million car miles	
	Nevada	Arizona	Nevada	Arizona
1923–28	11 44	15 07	19 56	28 96
1929–34	6 22	9 36	8 56	17 17
1935–40	4 71	7 49	6 05	13 53
Improvement, 1929–34 compared with 1923–28	45 6%	37 9%	56 2%	40 7%
Improvement, 1935–40 compared with 1923–28	58 8%	50 3%	69 1%	53 3%

Road Freight Conductors, Brakemen and Flagmen on Duty, Caused From Sudden Starting, Stopping, Lurch or Jerk of Train

	Rates per million train miles		Rates per 100 million car miles	
	Nevada	Arizona	Nevada	Arizona
1923–28	4 32	2 89	7 38	5 55
1929–34	3 25	2 89	4 48	5 30
1935–40	2 45	1 60	3 14	2 90
Improvement, 1929–34 compared with 1923–28	24 8%	—	39 3%	4 5%
Improvement, 1935–40 compared with 1923–28	43 3%	44 6%	57 5%	47 7%

Exhibits 277, 279, 280.

(n) Casualties While Train Standing.

Not all casualties in train and train-service accidents occur while trains are in motion. Of the 308 reportable casualties in Nevada sustained by all classes of employes on duty in train and train-service accidents in road freight-train operation during the 18 years 1923-40, 73, or 23.7 per cent, occurred while the trains were standing; and 53 of the 73 occurred on short trains. Of the 546 reportable [fol. 6238] casualties in Arizona, similarly sustained by all classes of defendant's employes on duty in train and train-service accidents in road freight-train operation, 177, or 32.4 per cent, occurred while the trains were standing. All were on short trains.

Of the 109 casualties sustained in train and train-service accidents by all persons (other than trespassers) while on or getting on or off passenger trains on defendant's lines in Nevada during the 17 years 1923-39, 18, or 16.5 per cent, occurred while the trains were standing. Of the 239 corresponding casualties occurring in Arizona during the same 17-year period, 77, or 32.2 per cent, occurred while the trains were standing.

Casualties occurring while trains are standing are closely related to the number of trains operated, but have no relation to the length of the train. An unnecessary increase in the number of trains operated, either freight or passenger or both, increases the hazard of all those classes of casualties which take place while trains are standing. It is hereby found that the train-limit law, by causing such unnecessary increase in the number of trains operated, increases the hazard of casualties occurring while trains are standing, both in absolute number, and in proportion to all

casualties sustained in train and train-service accidents.

Exhibits 274, 275, 277, 291, 292.

(o) Passenger-train Safety:

(1) Passenger Casualties—Class I Railroads of the United States.

Under the rules of the Interstate Commerce Commission governing the reporting of accidents, the death of a passenger in a train or train-service accident is always report-
[fol. 6239] able, and an injury to a passenger is reportable if sufficient to incapacitate the injured person from following his customary vocation or mode of living for a period of more than one day.

The published statistics of the Commission relating to casualties to passengers in train and train-service accidents, Class I railroads of the United States, for the years 1923-1939, inclusive, show that during that period the number of passengers killed decreased from 102 in 1923 to 27 in 1939, and the number of passengers injured, from 5,538 in 1923 to 2,489 in 1939. The number of revenue passengers carried decreased during that period from about 987,000,000 in 1923 to about 451,000,000 in 1939; and the number of passengers carried one mile from about 38,000,000,000 in 1923 to about 22,500,000,000 in 1939. On a frequency basis the rates are exceedingly small. In the six-year period 1923-1928, the frequency of casualties per million passengers carried was 5.16. In the five years 1935-1939, it was 5.0: an improvement of 3.10 per cent. In the first period the frequency of casualties per 100 million passenger miles was 12.91, and in the second period, 10.63, an improvement of 17.66 per cent.

The 1935-1939 casualty rate of 10.63 casualties per hundred million passenger miles was equivalent to a passenger travelling about 9,407,000 miles for each reportable casualty.

Sullivan, R. 3611-3613.

Exhibit 267.

(2) Passenger Casualties—Nevada and Arizona.

During the seventeen-year period 1923-1939 defendant has operated its passenger trains in Arizona in units of not more than 14 cars, as required by the train-limit law. In

Nevada, on the other hand, defendant has operated free of [fol. 6240] any such restriction, and has in fact operated a substantial number of long passenger trains, particularly in more recent years. The volume and character of the passenger traffic in the two states has heretofore been found to be closely comparable; and other conditions are likewise so closely comparable (except for the train-limit law) as to render a comparison between the two states, over said period of seventeen years, a full and sufficient test of the effectiveness of the Arizona limitation upon passenger-train lengths as a regulation in the purported interest of safety of passengers or employes or others upon or affected by the operation of passenger trains.

During the six-year period 1923-1928, defendant carried approximately 2,600,000 revenue passengers in Nevada, and 2,844,000 in Arizona. It accumulated in said six years 630,000,000 revenue-passenger miles, and 9,361,000 passenger-train miles in Nevada; and 765,000,000 revenue-passenger miles, and 10,572,000 passenger-train miles in Arizona. In Nevada, in said period, six passengers were injured, two employes were killed and 14 injured, and three other non-trespassers were injured: a total of 25 casualties to persons, other than trespassers, sustained while on or getting on or off passenger trains. In Arizona, during said period, one passenger was killed, 36 were injured; one employe was killed, and 47 were injured; and five other non-trespassers were injured: a total of 90 casualties to persons, other than trespassers, while on or getting on or off passenger trains in Arizona. The casualty rate for passenger casualties was in Arizona more than five times as great as in Nevada; for employe casualties, on a passenger-train mile basis, 2.65 times as great as in Nevada; for all casualties as described above, except to trespassers, on a passenger-train mile basis, 3.19 times as great in Arizona as in Nevada.

[fol. 6241] During the six-year period 1929-1934 defendant carried approximately 1,592,000 revenue passengers in Nevada, and 2,000,000 in Arizona. It accumulated in said six years 434,000,000 revenue-passenger miles, and 7,649,000 passenger-train miles in Nevada; 602,000,000 revenue-passenger miles and 9,592,000 passenger-train miles in Arizona. In said six-year period, in Nevada, no passengers were killed, but nine were injured; one employe

was killed, and three were injured; and three other non-trespassers were injured: a total of 16 reportable casualties to persons on or while getting on or off passenger trains. The corresponding totals for Arizona were: one passenger killed and 29 injured; 3 employes killed and 24 injured; 5 other non-trespassers injured: a total of 62 such casualties. The casualty rates for passenger casualties were in Arizona, during said period, approximately 2.6 times as great as in Nevada; for employe casualties, on the train-mile basis, 5.4 times as great as in Nevada; and for all casualties as described, on the train-mile basis, three times as great in Arizona as in Nevada.

In the period 1935-1939 there occurred (on August 12, 1939) in Nevada the Harney derailment (involving a 14-car train), previously referred to. Said derailment, which was caused solely by malicious tampering with the track, occasioned the deaths of nine passengers and thirteen employes and one other non-trespasser, and the injury of eighteen passengers and twelve employes. The record indicates that the defendant had no responsibility for this accident, and no means of avoiding or anticipating it; moreover, neither the accident nor the casualties therein appear to have borne any relation to the length of the train. The inclusion of the Harney casualties in the statistics for the period 1935-1939 tends to distort the comparison, and to what extent to present the showing for Nevada less favor-[fol. 6242] ably than would be normal. Nevertheless, and even including said Harney casualties, it appears that in the five-year period 1935-1939, during which defendant carried approximately 1,480,000 revenue passengers, and accumulated 492,000,000 passenger miles, and 6,148,000 passenger-train miles in Nevada, there were in Nevada a total of 9 passengers killed and 24 injured; 13 employes killed and 17 injured; one non-trespasser killed and four injured, or a total of 68 reportable casualties of the classes above described; whereas, in Arizona, in which state defendant during said period carried approximately 1,980,000 passengers and accumulated 621,000,000 revenue passenger miles and 8,000,000 passenger-train miles, one passenger was killed and 45 injured; 39 employes were injured; and two other non-trespassers were injured, or a total of 87 reportable casualties of the classes above described. Despite the distorting influence of the inclusion of the Harney

casualties, the passenger casualty rates in Arizona were slightly greater than in Nevada during the five-year period 1935-1939; the employe casualty rates were practically identical, and the casualty rate for all persons on a passenger-train mile basis was but 2 per cent greater in Nevada than in Arizona.

Considering the entire seventeen-year period, there were 239 casualties to persons (other than trespassers) while on or getting on or off passenger trains in Arizona, and 109 in Nevada. The passenger casualty rate for the seventeen-year period was approximately twice as great in Arizona as in Nevada. The employe casualty rate, on the passenger-train mile basis, was 1.88 times as great in Arizona as in Nevada. The casualty rate to all persons, on the passenger-train mile basis, was 1.8 times as great in Arizona as in Nevada.

It is hereby found, that the Arizona 14-car limitation upon passenger trains bears no reasonable relation nor any [fol. 6243] relation whatever to the safety of travelers or of employes, or of others lawfully upon defendant's passenger trains in Arizona.

Sullivan, R. 3768-3769, 3775-3776.
Exhibits 291, 292.

(p) Grade-crossing Accidents.

It is common knowledge that, with the increase in the number of motor vehicles owned and operated for both private and business purposes, and the improvement of highways permitting greater speed, efficiency and comfort in the operation of motor vehicles and greater practicability of long-distance travel, collisions between vehicles of various types and railroad trains, engines or cars at railroad grade crossings occur with alarming frequency.

On the lines of the defendant in Arizona there were, as of December 31, 1939, 654 crossings at grade on public highways over defendant's track. Eighty-four of these crossings are in or closely adjacent to the various towns and cities upon said lines. None of said 654 crossings at grade is protected by mechanical crossing gates; but 36 are protected by audible and visible signals other than fixed signals, and one by a watchman on duty a part of the 24 hours each day. By comparison, there were in Nevada, as of December 31, 1939, 211 public crossings at grade over defend-

ant's lines. Four of these were protected by watchmen, and 20 by audible and visible signals; the remainder by fixed signs only.

In addition to said public crossings there are, on defendant's lines in Arizona and Nevada, numerous private crossings at grade, the use of which is governed by agreements between the users and the railroad or restricted by gates located in the fence lines.

[fol. 6244] Casualties to all classes of persons, in highway grade-crossing accidents in which automobiles were involved, on all steam railroads of the United States, declined in absolute number and in proportion to the number of automobiles registered, during the period 1923-1939; but the rate of such casualties, as measured against the train miles accumulated, remained almost constant. Thus in the years 1923-1928, there was an average of 7,843 such casualties per year; the rate per 10,000 automobiles registered was 3.85; and per million train miles, 6.41. In the years 1929-1934, the yearly average was 6,093; the rate per 10,000 automobiles registered was 2.41, and per million train miles, 6.40. In the five years, 1935-1939, the yearly average was 5,718; the rate per 10,000 automobiles registered was 1.98, and per million train miles, 6.58. Over the seventeen-year period, the average rate per million train miles was 6.45, and in no year was there any very substantial variation from this average. About 34.6 per cent of the accidents occurring during the five years 1935-1939 were caused by automobiles striking the sides of trains.

Of the 112,207 casualties occurring on all railroads of the United States during said seventeen years, 27,792, or 24.8 per cent were fatal.

Assuming the traffic over a grade crossing, be it either vehicles or persons, to be the same, the hazard of grade-crossing accidents involving trains increases proportionately with the increased number of trains using the crossing.

The statistics of grade-crossing accidents for the states of Arizona, Nevada, and New Mexico, set forth in exhibits introduced by plaintiff, indicate that the frequency rate of such accidents as related to the number of motor vehicles registered, is slightly lower in Arizona than in either of the [fol. 6245] other states, but fail to show the frequency of such accidents, as related to train movements, in any of said states. In the absence of such a showing, plaintiff's said ex-

hibits do not afford a satisfactory basis for any findings upon the question whether the Train-Limit Law reduces or increases the hazard of grade-crossing collisions.

It is found that there exists a hazard of collisions at grade crossings between trains, engines or cars, on the one hand, and vehicles on the other, that, assuming the same use of the crossings by vehicles to continue, will increase somewhat in proportion to the additional number of freight trains, engines or cars operated over the grade crossing, whether in road or in switching movements. Such collisions are a source of casualties not only to the drivers and occupants of vehicles, but also to the train and engine crews and other persons on the train or engine involved in the accident.

The Train-Limit Law, by requiring a greater number of trains to be run than would otherwise be necessary, increases the hazards of casualties to the public, and also to defendant's employes, incident to grade-crossing accidents in Arizona and the adjacent affected territory.

Herbert, R. 2830-2839, 2857-2859, 3816-3820; *Sullivan*, R. 3616-3626, 4002.

Exhibits 200, 201, 268, 293, 334, 335, 336.

(q) Freight Train Derailments—Nevada, Arizona, and New Mexico

There has been a reduction in the frequency rates of derailments caused by defects in or failures of freight-car equipment in road freight trains, including mixed trains, taking place on defendant's lines in both Arizona and [fol. 6246] Nevada; such derailments are substantially less frequent, whether considered from the train-mile or the car-mile basis, in Nevada than in Arizona. Classifying reportable derailments caused by such defects, according to the classifications of accidents prescribed by the Interstate Commerce Commission, they fall into seven general classes: (1) trucks, (2) wheels and axles, (3) air brakes and appurtenances, (4) hand brakes and brake rigging, (5) couplers, (6) draft rigging, and (7) car bodies and other parts of equipment.

During the six years 1923-1928, reportable derailments from such causes were, in Nevada, 37 in number, and at the rates of 2.80 per million train miles and 4.79 per 100 million car miles; in Arizona they were 58 in number, and

at the rates of 4.09 per million train miles and 7.85 per 100 million car miles.

During the six years 1935-1940, such derailments were, in Nevada, 18 in number, and at the rates of 1.63 per million train miles, and 2.09 per 100 million car miles; in Arizona, 27 in number, and at the rates of 1.81 per million train miles, and 3.26 per 100 million car miles.

For the 18-year period 1923-1940, there were, in Nevada, 70 such accidents, the rate being 2.02 per million train miles, and 2.93 per 100 million car miles; in Arizona, 106 such accidents, the rates being 2.51 per million train miles, and 4.64 per 100 million car miles. Of the 70 Nevada derailments, 35 occurred on short trains. All the Arizona derailments were also on short trains. There were no Nevada derailments due to defects in or failures of freight car equipment in the years 1932 and 1935; and only one in the year 1939. In Arizona, there was no year without such a derailment, though only one occurred in 1932.

[fol. 6247] The reportable damage from such derailments was: in Nevada, 1923-1928, $40,096; 1935-1940, $51,036; 1923-1940, $102,011; in Arizona, 1923-1928, $120,839; 1935-1940, $42,616; 1923-1940, $202,401. There were three trainmen casualties in the 70 Nevada derailments, none fatal; there were two employe casualties, both being fatal in the 106 Arizona derailments. Of the total of 176 derailments in the two states, 141 occurred on short trains, and 35 on long trains.

Comparing the totals and frequency rates of such derailments in New Mexico, with the corresponding showing for Arizona and Nevada, the following appears: In the 11-year period 1930-1940, there were in New Mexico 29 such derailments, at the rates of 1.59 per million train miles, and 2.89 per hundred million car miles; in Arizona, 42, at ratio of 1.68 per million train miles; and 3.03 per hundred million car miles; in Nevada, 31, at rates of 1.62 per million train miles, and 2.11 per hundred million car miles. Of the 102 such derailments in the 3 states, only 24 (6 in New Mexico, and 18 in Nevada) were on long trains; and 78, or 76.5% of the total, were on short trains.

Giving full consideration to the substantial improvements in roadbed and equipment as heretofore stated, it is hereby found that the arbitrary limitation of freight trains on defendant's lines in Arizona to 70 cars, exclusive of

caboose, has resulted and continues to result in an increased hazard of train accidents over that resulting from the standard long-train method of operation, and a consequent increase in the hazard of casualties to those who are subject to the hazard of train accidents.

Sullivan, R. 3748.

Exhibits, 286, 287, 288, 289, 290, 388, 389.

[fol. 6248] (r) Emergency Applications of Air by Engineer

It was asserted on behalf of plaintiff that a definite casualty hazard exists on long freight trains because of emergency applications of the air brakes by engineers in the locomotives.

It appears that since October 4, 1936, there has been no reportable casualty to any one of defendant's employes in Nevada attributable in whole or in part to said cause. From January 6, 1923, to October 4, 1936, there were twelve such casualties; five on long trains, and seven on short trains. In Arizona, during the eighteen-year period 1923-1940 there were nine such casualties, all on short trains, the latest occurring Jan. 18, 1933.

The evidence shows that the application of the air brake in emergency by an engineer on a freight train is a comparatively rare occurrence. The necessity for the use of the air brake in emergency by the engineer is directly related to the number of trains operated, and not to the length of the train.

Fifield, R. 5218; *Menzies*, R. 5244-5245.

Exhibits 274, 275.

(s) Heavier Graduating Springs

Out of 53 casualties attributed to slack action, other than incident to break-in-twos, air hose and brake pipe failures, and engineers' emergency applications, on both long and short trains on defendant's lines in Nevada, during 18-year period 1923-1940, 16 such casualties resulted from undesired emergency applications of the air brakes, presumably due, judging by the circumstances and there being no evidence to the contrary, to a light graduating spring in the triple valve, which is part of the air brake mechanism underneath the car. The five of these casualties which occurred on short trains occurred prior to 1926. Eight of the

11 casualties which occurred on long trains occurred prior [fol. 6249] to 1929, the 9th in 1933, the 10th in 1935, and the 11th in 1937.

In Arizona there were 67 such casualties on defendant's lines during said 18-year period, from causes other than break-in-twos, air hose and brake pipe failures, and engineers' emergency applications, all but two of which occurred on short trains. Twenty-five of said 67 casualties resulted from undesired emergency applications of the air brakes, likewise presumably due, as in Nevada, to a light graduating spring in the triple valve of the car where the emergency application initiated. Twenty-one of said 25 casualties occurred prior to May 16, 1930; the remaining four, including two occurring on a long train at Yuma, took place in 1937.

The evidence shows without contradiction that by 1929 the use of a heavier graduating spring, which largely prevents such undesired emergency action, as above described, has become practically universal, and after January 1, 1935, compulsory on cars offered in interchange as well as standard on all defendant's cars and on all cars of the Pacific Fruit Express Company.

The 16 casualties in Nevada above referred to formed 13.5 per cent of the total of 118 casualties attributed to slack action occurring on both long and short trains in said state during the 18-year period 1923-1940. The 25 Arizona casualties above referred to formed 24.3 per cent of the 103 slack-action casualties in said state during said period. It is found that slack-action accidents on either long or short trains, due to this particular cause, are no longer to be considered a factor of material consequence in train operation.

Leriche, R. 78-79; *Cartmill*, R. 1817-1818; *Durnil*, R. 4462-4463; *Cooper*, R. 4533; *Shaw*, R. 4935; *Fifield*, R. 5211.

Exhibits 2, 135, 203, 204, 274, 275, 280.

[fol. 6250] (t) Arizona Long-Train Operations, 1940

During the period March 2-April 30, 1940, as heretofore found, defendant on 62 occasions operated long passenger trains in Arizona, accumulating 15,587 long passenger-train miles, and 243,749 passenger-car miles in such long trains. There were seven accidents, resulting in seven casualties.

on or in connection with the operation of passenger trains during said period. All of the trains involved in said accidents were trains operated in conformity with the train-limit law, and all but one were trains of 14 cars or less. The one such train which exceeded 14 cars consisted of 26 cars, two short trains having been consolidated between terminals, because of an engine failure. There were no accidents or casualties on any of the 62 long trains operated as aforesaid during said period.

During the month of April, 1940, as heretofore found, defendant operated some 302 long freight trains in Arizona. Said long trains accumulated 37,257 train miles, and 3,180,278 car miles; the average length was 85.36 cars. During said month the short trains operated by defendant in Arizona accumulated 199,761 train miles and 10,533,262 car miles, and had an average length of 52.73 cars.

There were seven accidents on or in connection with the operation of defendant's freight trains in Arizona in April, 1940; four resulted in casualties. All but one of these accidents involved short trains. That one accident occurred when a brakeman fell, alighting from the caboose on a 91-car train, said caboose being at the time detached from the train and handled alone by the engine.

It is hereby found that defendant's long freight and passenger train operations in Arizona in 1940 were conducted [fol. 6251] without causing or incurring any accident or casualty which could or would have been prevented or minimized in any degree if the train-limit law had been observed; that all the accidents occurring during said period either occurred on trains operated in full conformity with the law, or (in one case) in circumstances where the length of the train had no bearing whatsoever.

The experience of defendant's said Arizona long-train operations confirms the conclusion, drawn from the other evidence of record herein, that long-train operations can and could and would be conducted and carried on, upon defendant's lines in Arizona, with substantially greater safety than if the limitations of the law were fully observed.

Sullivan, R. 3785-3788, 3793-3796.
Exhibits 246, 294, 295.

(u) Employes Affected by the Train-Limit Law

The defendant's employes in Arizona who are affected, in various aspects of their employment, by the Train-Limit

Law, are largely employes of the Tucson Division. Certain employes of the Rio Grande Division, employed on that portion of the Tucson-Douglas-El Paso line which is within Arizona, are also affected to some extent.

Insofar as concerns the opportunity for employment, said law directly affects only those train and engine service employes who are engaged in main-line freight and passenger train service; in that said law, by compelling a relatively larger number of trains to be run than otherwise would be required, causes a corresponding increase in the number of such employees actually engaged in manning such trains.

There were, as of 1939, some 2,693 employes on the Tucson Division. 644 of said employes, or 23.9 per cent of the [fol. 6252] entire number, are train and engine service employes engaged in main and branch line (as distinguished from yard) service. Said total of 644 employes represents the entire number whose employment or opportunities for employment can be said to be affected by the law.

Insofar as concerns safety of employment, all said train service employes, and as well all employes whose duties require them to be or go upon the tracks, are affected by the law; in that by increasing the relative number of trains run, said law increases the hazards of train and train-service accidents to which such employes are subject, and particularly (among others) the following hazards: (1) of being struck and run down while on or near the tracks in the course of duty, (2) of being involved and injured in head and rear-end collisions; (3) of being involved in locomotive accidents; (4) of being injured in grade-crossing accidents; (5) of slipping or falling while getting on or off trains. The classes of employes whose safety is thus impaired by the law include, in particular: all section men, signal men, road-masters, gang, bridge and section foremen, and bridge builders (numbering some 818 employes, or about 30 per cent of the total number); and all train and engine service employes (numbering, including those in yard as well as in road service, some 834, or about 31 per cent of the total).

The plaintiff's contention that the law promotes safety of employment relates only to potential slack-action injuries to train service employes (not including enginemen) upon main line freight trains. It does not appear to be contended that the law promotes the safety of any employes on passenger trains, or on the engines of freight trains, or any employes on branch line trains. There were, as of 1939, only

[fol. 6253] 299 conductors and brakemen in through freight service, and only 32 such employes in local freight service; or a total of 331 employes whose safety, according to plaintiff, is in any manner enhanced by the law. As contrasted with this number, there are 1652 employes, or approximately five times as many, whose safety of employment is definitely shown to be impaired by the law.

Sines, R. 2544-2549.
Exhibits 194, 313.

(v) Increase in Accident and Casualty Hazard Inherent in Increase of Train Units

The evidence clearly shows that the frequency of train and train service accidents is directly related to the number of train units operated, and that when more train units are run than are necessary to handle a given amount of traffic, the hazard of accident in the handling of such traffic is correspondingly increased.

As found in Finding X(c) hereof, a limitation of freight trains on defendant's lines in Arizona to not more than 70 cars exclusive of caboose, and of passenger trains to not more than 14 cars, results in defendant being compelled to operate substantially more freight and passenger trains to carry a given volume of traffic than it would operate under the standard long-train method of operation. In 1938 the number of freight trains operated on the Yuma-Gila-Lordsburg line alone, under compulsion of the law was, as found in Finding X hereof, 4304 greater, or an increase of 30.8 per cent more, than the number actually necessary if it was not for the law. Such increased number of trains substantially increased the number of starts and stops of freight trains, and the number of meetings and passings of freight and passenger trains. In 1938, as found in Finding X(b) hereof, the additional number of train meets and [fol. 6254] passings required totalled about 16,500. Such additional number of trains also necessitated additional light engine movements in substantial number, and a substantially increased number of switching movements in yards.

Such additional number of trains also required a substantially greater number of telegraphic and telephonic train orders and messages directly relating to the movement of trains, and thereby increased the hazard of train and

train service accidents resulting from misunderstanding or forgetfulness of train orders. Such an additional number of trains increased the number of employes required to move the same amount of freight and passenger traffic, and thereby increased the hazard of casualties due to failure to observe rules or signals, slipping, falling or being run over while getting on or off trains, and other classes of casualties related to the number of train units operated. Additional trains to those necessary to handle the traffic under standard long-train operation also increase accidents and casualties in yards, accidents to employes such as section men and signal maintainers, grade-crossing accidents, and head-end and rear-end collisions. The additional locomotives that are operated to handle the additional trains increase the hazard of every accident or casualty that is related to the number of locomotives operated.

Viewing the evidence in its most favorable aspect for the plaintiff, it clearly appears and is found that, if short-train operation may or should result in any decrease in the number or severity of the "slack" or "slack-surge" type of accidents or casualties, such decrease is substantially more than offset by the increased number of accidents and casualties from other causes that follow the arbitrary limitation [fol. 6255] of freight trains to 70 cars, exclusive of caboose, and passenger trains to 14 cars, to handle the same volume of freight and passenger traffic that can be and is practicably and efficiently handled without such limitation. Thus the Arizona Train-Limit Law not only bears no reasonable relation to safety but, to the contrary does, and if enforced will continue to, impair and lessen substantially the safety of defendant's train operations in Arizona and the adjacent affected territory.

XIII

Analysis of Certain Contentions Advanced by Plaintiff

(a) The Contention that, with Long-Train Operation, Trains Would Be Delayed at Meeting and Passing Points because of Inadequate Siding Capacities

Plaintiff appears to contend that if long-train operation were carried on in the affected territory, trains would be delayed at meeting and passing points because of the fact that long freight trains would, in many instances, exceed

the present capacities of the sidings; so that, according to plaintiff, a meet or pass could be accomplished only by the operation known as "sawing by"; and that such operation causes delays to trains involved and to other following and approaching trains.

The testimony does not sustain or support this contention. The only type of "saw-by" referred to in the testimony is that involving a meet or pass between trains, one of which is longer and the other shorter than the siding at which the meet or pass takes place. The delay to trains incurred by this type of saw-by is negligible, and does not in any event involve more than ten minutes of delay to either train.

[fol. 6256] Moreover, while there are at present comparatively few long-train sidings between Yuma and Lordsburg, sidings exist at seven stations between Lordsburg and El Paso at which trains of more than 100 cars can be accommodated; and as heretofore found, defendant plans and intends if and when long-train operation is undertaken, to extend sidings and increase siding capacities in the affected territory to the extent necessary to permit long trains to meet and pass each other in the same manner as on other portions of defendant's lines where such long-train operations are conducted. Until longer sidings can be provided, defendant contemplates operating long trains in one direction or the other, but not in both directions at the same time.

Such limited long-train operation is entirely practicable with present siding facilities, and does not and would not involve or create any substantial delays to trains or traffic. On the contrary, by reducing the number of trains operated and in consequence the number of meets and passes, it would and does tend to that extent to eliminate delays, and to expedite the trains and the traffic carried therein.

Dyer, R. 2017, 2019, 2021-2022; *Sines*, R. 2468-2572, 3359-3398; *Herrell*, R. 2754-2755, 4068-4072; *Fail*, R. 4745-4746, 4891.

Exhibits 197, 234 to 239, inclusive.

(b) The Contention that Trains Should Be Limited to 70 Cars in Order that the Members of the Crews May See and Interpret Signals more Readily

It was claimed by plaintiff that the distance of the caboose from the engine cab in a long train makes it extremely dif-

ficult and at times impossible for an engineer, fireman or head brakeman in the engine cab to see a signal from the [fol. 6257] caboose. Those signals are given manually in the day time, and by lantern at night. In an emergency the conductor or brakeman in the caboose has the privilege, and is encouraged to, and frequently does, light a red fusee at night, which is a certain and effectual way of conveying a stop signal to the engineer.

Under defendant's operating rules there is but one signal that needs to be used by a conductor or brakeman in a caboose while the train is in motion, and that is the stop signal. Frequently brakemen are at or near the middle of long trains, or some distance from the caboose, and the signal can be relayed. But when any stop signal has not been complied with by the engineer, and it is evident to the conductor that the signal has not been seen, the conductor has, under the rules, the right, and it is his duty, in case of any emergency, to use the conductor's valve in the caboose, which has the effect of applying the air brake in emergency first on the caboose, then on the car next ahead, and so on serially, car by car, toward the head of the train. There can be no severe slack-action shock in the caboose in such a case.

The evidence shows that no reportable casualty has resulted during the 18 years, 1923-1940, on defendant's lines in Nevada or Arizona, or during the 11 years, 1930-1940, in New Mexico or on the Los Angeles Division, California, from the use of the conductor's valve in the caboose, and no witness stated that any such casualty had occurred elsewhere. The application of the conductor's valve may and occasionally does result in break-in-twos of freight trains, but no reportable casualty resulting from such a break-in-two was testified to.

When the train is at a standstill and a "proceed" or "back-up", or other signal is to be given from the ground or the top of the train to the engineer, no accident can result [fol. 6258] if the engineer does not see the signal. The signal is repeated until he does see and acknowledge it, and in extreme cases the brakeman is sent forward to a point where the engineer can see such a signal.

No reportable train or train-service accident, occurring while a train was in motion, has occurred in Arizona or Nevada during the period 1923-1940, due to failure to observe or properly to interpret signals. Only one reportable train

accident assigned to this cause has occurred in said states during the same 18-year period. No casualties were involved in said accident, which involved only the movement of a helper engine, and two cars and a caboose, the remainder of the train being at a standstill at the time.

It is evident, and it is hereby found, that the Arizona Train-Limit Law is not a reasonable regulation, in the interest of greater safety of operation, with respect to the giving and receiving of signals while trains are standing or in motion.

Durnil, R. 4406-4410, 4425-4439, 4459-4462; *Kennedy, R.* 4512-4521; *Cooper*, R. 4540; *Check*, R. 4606-4608; *Stevenson*, R. 4633-4636; *Ash*, R. 4783-4786, 4790-4795, 4831-4839; *Fail*, R. 4869-4876, 4882.
Exhibits 274, 275, 289, 290, 386, 387.

(c) The Contention that Members of the Crews on Long Trains are in Constant fear of Injury, and are thereby Rendered Less Alert and Efficient in the Performance of their Duties.

The plaintiff appears to contend that the trainmen, who in the course of their duties, may be called upon to ride in the cabooses on long trains in Arizona or New Mexico, are in constant fear of injury from "slack-action" accidents, and are consequently rendered less alert and efficient in the performance of their duties, with resulting detriment to [fol. 6259] the safe operation of all trains; that the law, by limiting trains to 70 cars, eliminates such fear, because it tends to prevent slack-action accidents.

While two conductors, employed by defendant and appearing as witnesses for plaintiff, testified that they were at times fearful of slack-action, while riding in cabooses of long trains, the record fails to show that either the witnesses so testifying, or any other employes, were thereby rendered less alert or efficient in the performance of their duties, or that their physical condition or the safety of train operation has been or would be adversely affected thereby.

There is no basis whatever for the claim that the limiting of trains to 70 cars does or will prevent slack-action accidents, and thereby eliminate such alleged fear. As heretofore stated, the record shows that, over the 12-year period, 1929-1940, slack-action accidents, and reportable casu-

alties occasioned thereby, are and have been somewhat more frequent, measured on a car-mile basis, in Arizona, where the 70-car limit prevails, than in Nevada, where long-train operation has predominated throughout said period. This type of casualty was also substantially more frequent in Nevada, during the years of predominant short-train operation, than in the subsequent years of predominant long-train operation (1926-1940). In Arizona during the twelve years (1929-1940) immediately last past, there were 62 reportable slack-action casualties, all but two of which occurred upon short trains.

The alleged fear or apprehension of long trains expressed by plaintiff's said witnesses is wholly unsubstantial and without foundation. These witnesses have by their own choice worked for many years in the long-train territory between Lordsburg and El Paso, though having ample [fol. 6260] seniority to hold equivalent positions and perform equivalent work in the short-train districts between Yuma and Lordsburg.

Kennedy, R. 4501-4504; *Cooper*, R. 4524-4526; *Stevenson*, R. 4619-4621; *Ash*, R. 4767-4778, 4821-4823; *Fail*, R. 4850-4861, 4891-4895; *Shaw*, R. 4915-4917.
Exhibits 274, 275, 280, 395.

(d) The Contention that Long Trains cannot be Properly Inspected or Supervised while in Operation, but that Short Trains can be and that Long-Train Operation Therefore Results in Greater Hazards.

Plaintiff appears to contend that the duty of inspecting trains at stops, and of supervising the same while in motion, for the purpose of detecting and locating defects in or failures of cars and the appliances thereon, cannot be completely or satisfactorily performed by trainmen upon long trains, but can be more adequately performed on short trains; that additional hazards of train operation thus result from the operation of long trains, which do not occur in the operation of short trains. This contention is not sustained or supported by substantial testimony; on the contrary, the evidence shows that the claim is not well founded.

The rules and practices in force in the affected territory afford ample opportunity for the inspection of cars of long freight and passenger trains at terminals, and at other

points en route where stops are made, either for the purpose of inspection alone, or also for the purpose of taking water, cooling wheels, and other incidental purposes, or in the case of passenger trains to receive and discharge passengers, mail, baggage or express; and such inspections can be made and adequate supervision exercised while such [fol. 6261] trains are in operation, both at and when leaving stations, and while running over the road between stations.

In freight-train operation each brakeman in the crew has a particular station on the train where he normally rides, unless some occasion or duty causes him to ride elsewhere. Thus, the head brakeman usually rides upon the locomotive or some car closely adjacent; the swing brakeman frequently rides in the caboose, but may be anywhere upon the train; the rear brakeman (flagman) and, usually, the conductor ride in the caboose. Each brakeman is required to and does maintain careful watch over the running of those cars within the range of his vision. It is the duty of the engineer and fireman likewise to keep watch over those portions of the train which can be seen from the engine.

The duties of observation and inspection of trains in operation can be and are as efficiently performed on long trains as on trains of less than 70 cars. Thus in Nevada, where a conductor and the same number of brakemen are employed as in Arizona upon a freight train of 50 cars or more, and where long-train operation was undertaken on a substantial scale in about 1925, and has predominated since about 1929, the reportable derailments due to defects in or failures of freight-car equipment were 4.79 per 100 million car miles in the 6-year period 1923-1928, 1.97 during the 6-year period 1929-1934, and 2.09 during the 6-year period 1935-1940. For the 11 years 1930-1940 such derailments were at the rate of 2.11 per 100 million car miles. The total number of such derailments during the 6-year period 1935-1940 was only 18, 9 of which were on short trains; during the 11-year period 1930-1940, 31, of which 11 were on short trains.

[fol. 6262] In Arizona, by comparison, and in spite of the asserted greater opportunity to detect such defects in freight-car equipment running in short trains, and thereby to prevent such accidents, the reportable derailments due to defects in or failures of freight-car equipment were at

the rate of 7.85 per 100 million car miles in the 6-year period 1923-1928, 2.93 in the 6-year period 1929-1934, and 3.26 in the 6-year period 1935-1940. The rate during the 11-year period 1930-1940 was 3.03. There were 27 such derailments in Arizona during the 6-year period 1935-1940, and 42 during the 11-year period 1930-1940, all on short trains. Both the actual number, and the frequency rate of such derailments, were about 50 per cent greater in Arizona than in Nevada during the 6-year period ending in 1940.

In New Mexico, during the 11-year period 1930-1940, there were 29 such derailments, and the frequency rate was 2.89 per 100 million car miles. 23 of said derailments in New Mexico occurred on short trains, and only 6 on long trains.

During the first six months of the year 1940, during which period defendant operated 1,900 short freight trains and 652 long freight trains over the district between Lordsburg, New Mexico, and El Paso, Texas, and 741 short passenger trains and 18 long passenger trains over the same district, 123 delays and occurrences having to do with the operation of freight cars in such freight trains, and 3 delays and occurrences having to do with the operation of passenger cars in such passenger trains, were discovered and detected; practically all by members of train crews, either during inspections at terminals, or while standing at stations, or upon observation while the trains were in motion. These defects and occurrences were reported by the train conductors upon their time return and delay reports. 88 of [fol. 6263] said 123 defects and occurrences were on trains of 70 cars and less. The 1,900 short freight trains aforesaid accumulated 17,851,722 car miles, an average of 202,860 car miles for each reported defect of every kind.

35 of the 123 defects and delays thus reported occurred on long freight trains. Said 652 long trains accumulated 96,766 train miles and 9,100,000 car miles: an average of 260,000 car miles for each such reported defect. Only 3 of said reported defects resulted in accidents reportable to the Interstate Commerce Commission: 1, occurring on a 95-car train, resulted in damage of $5,005; 1, on a 99-car train, resulted in damage of $225, and 1, on a 100-car train, resulted in damage of $200. There were no reportable personal injuries associated with any of said defects or occurrences.

The 3 such delays reported by conductors on passenger trains all occurred on short trains. The 741 short passenger trains operated during said 6 months' period, in said territory between Lordsburg and El Paso, accumulated 1,270,376 passenger-car miles, or an average of 423,459 car miles per delay. The 18 long passenger trains, upon which no delays or defects were reported, accumulated 42,448 car miles.

Although plaintiff called a number of witnesses to testify respecting freight and passenger-train operation in the affected territory, none of said witnesses testified or referred to any reportable accident or casualty occurring upon a long train, as to which it was claimed by the witness, or made to appear, that it could have been avoided or the effects minimized, if the train had been operated within the restrictions set forth in the Train-Limit Law. None of said witnesses testified or referred to any derailment or other accident, caused by or attributed to a defect in or failure of [fol. 6264] the equipment or applicances upon a freight or passenger car in a long train, as to which it was claimed or made to appear, either directly or by reasonable inference, that the accident could have been averted, or the effects thereof minimized, through detection of the defect while the train was in motion, or at a standing inspection, or at a rolling inspection leaving a stop, if the train had been within the limits prescribed by the Train-Limit Law, rather than a long train.

The record shows, and it is hereby found, that the inspection of all trains, including long trains, both by car forces at terminals where such forces are provided, and by train crews at terminals and while on the road, and the supervision of such trains while in motion, are adequate and satisfactory; that sufficient time and opportunity for such inspections are provided; and that the alleged additional hazards, claimed to be due to inadequate or incomplete inspections or supervision of long trains, do not exist in any part of the affected territory, and would not exist or be created if long-train operation were adopted in Arizona as the customary and standard practice.

Durnil, R. 4401, 4408-4424, 4440-4443, 4447-4450, 4462-4463; *Cheek*, R. 4619; *Stevenson*, R. 4638-4639; *Ash*, R. 4788-4790, 4805-4813, 4840-4844; *Fail*, R. 4863-4866, 4876-4879, 4880-4882, 4888-4891; *Shaw*,

R. 4918-4922, 4924-4927; *Menzies*, R. 5244-5246; also, annotations to. See, Finding VII (a) (4). *Exhibits* 286, 287, 288, 388, 389, 397.

[fol. 6265] (e) The Contention That the Present Type of Air-Brake Equipment is Inadequate to Control the Speed of and to Stop Long Trains, But is More Efficient and Adequate upon Short Trains.

Plaintiff appears to contend that the type of air-brake equipment now in use, or available for use, upon locomotives and cars comprising defendant's freight trains does not and would not operate efficiently to control the speed of and to stop long trains upon the lines in the affected territory, but that said air-brake equipment is and would be more nearly efficient and adequate for such purposes, if such trains were to continue to be limited to not more than 70 cars, exclusive of caboose, as provided by the law. Plaintiff's said contention is not sustained or supported by substantial evidence, and is indeed clearly and wholly opposed to the great weight of the uncontradicted testimony.

Plaintiff produced, among its witnesses, some nine train-service employes of defendant, seven of whom gave general testimony respecting train operations in various portions of the affected territory, including the lines between Lordsburg and El Paso. Six of said nine witnesses were conductors, and three were engineers. One of said engineers works almost exclusively in passenger service, and gave no testimony respecting freight-train operation. The other two engineers work principally in freight service, one of them between Lordsburg and Tucson (i. e., in a short-train district), and the other between Lordsburg and El Paso (i. e., in a district where long trains are run in substantial numbers).

The engineer working between Lordsburg and El Paso testified that he had handled many long trains, and admitted that the controlling of such trains simply required more care by engineers. He referred to but one instance [fol. 6266] where he had experienced difficulty in controlling or stopping a long train; in that instance, the train was in fact safely brought to a stop at the station, and thereafter handled through to the terminal, without any further difficulty, or any accident or casualty whatsoever.

The engineer working between Lordsburg and Tucson, though engaged principally in handling short trains, also handled certain long trains between those points during April, 1940. He stated that he had used greater care in handling said trains, but admitted that he had handled the same without any greater difficulty, in so far as concerned his ability to control or stop them, than if they had been short trains.

The aforesaid six conductors called by plaintiff failed to refer to any instance where the engineer on any freight train upon which they were employed was unable to control the speed of or to stop the train, no matter what its length. Two of said conductor witnesses were actually in charge of the two long trains specifically mentioned in the complaint in this cause; but neither witness even suggested that any difficulty or unusual circumstance had arisen in the handling of said trains.

Plaintiff also called an engineer employed by the Atchison, Topeka & Santa Fe Railway Company, who, though testifying generally on the subjects of air brakes and brake-appliances in freight trains and the control of such trains by locomotive engineers, failed to refer to any instance when he, or any other engineer within his knowledge, had been unable to control or to stop a long freight train by means of the present type of air brakes. It appears that this engineer, though having sufficient seniority to obtain and hold a regular freight assignment in Arizona (i. e., in short-train territory) has exercised his seniority to obtain and hold a preferred position in freight service in Cali- [fol. 6267] fornia (i. e., in territory where long trains are regularly and frequently operated).

Defendant called as witnesses upon said topic two locomotive engineers of long experience in the handling of both long and short trains. Both of these witnesses are now employed by defendant as road foremen of engines, one on the Coast Division in California, where numerous long trains are operated; the other on the Tucson Division, where short-train operation prevails. Each of these witnesses testified that the handling of long trains by engneers, and particularly the controlling and stopping of said trains with the present types of air brakes, though requiring somewhat more care by the engineers, involved no greater difficulties than in the case of short trains. This testmony

was not challenged or controverted in any way by plaintiff or its witnesses.

As heretofore found, defendant operated some 302 long freight trains in Arizona during April, 1940. There is no evidence that any of the engineers handling said long trains were unable at any time to control or to stop them, or that any substantial difficulties were encountered in their operation. As to many of said trains, the record affirmatively shows that the handling was without any difficulty or other notable incident.

Skinner, R. 27-36; *Odeyard*, R. 37-41; *Kennedy*, R. 4516-4520; *Cooper*, R. 4524-4528, 4536-4538; *Stevenson*, R. 4551, 4570-4572, 4621-4623; *Cheek*, R. 4594; *Shaw*, R. 4917-4918; *Fifield*, R. 5180-5208, 5210-5221; *Menzies*, R. 5237-5245.

[fol. 6268]

XIV

Extent of Penalties Imposed by the law

Section 3 of said Train-Limit Law provides for a penalty of not less than $100.00 nor more than $1,000.00 for each violation thereof; that is to say, for each long train operated in Arizona. If defendant had followed the long-train operating practice in Arizona during the year 1938, it would have operated, upon its main lines in that state, approximately 7800 long freight trains, and approximately 360 long passenger trains. Defendant would thus have been liable, if such long-train operation had been followed, for cumulative penalties ranging from approximately $816,000 to approximately $8,160,000. Said sums last mentioned fairly represent the range and amount of the cumulative annual penalties for which defendant would be liable, under the terms of the law, if it were to disregard and violate the same, and were to adopt and follow the practice of standard long-train operation in Arizona.

Exhibits 214, 246.

XV

The Permissible Number of Cars in an Interstate Train Is a Subject of National and Not Local Concern

The permissible number of cars in an interstate train is a subject of national, and not local, concern; it is a subject which, if any regulation thereof be needed, requires a gen-

eral system of uniformity of regulation; and it is a subject which, if regulated at all, should and must be regulated by Congress, and not by the several states. For it is wholly impracticable to construct and maintain railroad terminals [fol. 6269] exactly on state lines or to split up or consolidate through trains except at terminals. If other states should regulate train lengths in accordance with their respective notions as to what should be proper or desirable within their respective boundaries, all such regulations would necessarily have substantial extra-territorial effect as does the Arizona Train-Limit Law, and to comply with these conflicting provisions would seriously impede, delay, embarrass and interfere with through interstate train operation. If other states should adopt either the Arizona limitations, or different and conflicting limitations based on their several notions as to the proper length of railroad trains, the efficiencies and economies which have resulted, as hereinbefore found, from standard long freight-train operation, would be lost, and much of the enormous investment that made such operation possible would be rendered non-productive.

XVI

Financial Burden Imposed by the Law a Factor in Determining Its Unreasonableness

The additional expense, as hereinbefore found, that defendant is compelled to incur, by reason of compliance with the Train-Limit Law is a factor that may and should be, and has been, taken into consideration as a factor, but not the sole or controlling factor in finding (as is hereby found) that the law, considered as an exercise of the police power of the state in an ostensible attempt to promote public safety, the safety of travelers and the safety of railroad employes is, in so far as defendant is concerned, unreasonable, arbitrary, and without any reasonable relation to its purported objects, or to those claimed by plaintiff. Viewed entirely apart from the effect of the law on interstate com- [fol. 6270] merce, as hereinbefore found, and from the financial burden on such commerce imposed thereby, the law has created, now creates, and as long as it may continue in effect, will perpetuate a financial burden on defendant that is, under any fair and reasonable view of the evidence, entirely out of proportion to and far in excess of any safety

to the public; to travelers upon defendant's railroad, or to employes of defendant, that is or can or will be promoted thereby.

XVII

Further Arbitrary Effect of the Law

As to defendant's operations into, across, and out of Arizona, the Train-Limit Law is further arbitrary and unreasonable in that by its terms it applies and is made to apply to any and all trains in all circumstances, except those described in the proviso in Section 3 of the Act, whether a train be of all loaded cars, or all empty cars, or partly of loaded and partly of empty cars, each car being treated as a unit regardless of its construction, type, length, weight or condition or whether loaded or empty.

XVIII

Impairment of Defendant's Facilities by the Law

The necessary effect of the Train-Limit Law, as applied and enforced against defendant, is, has been and will continue to be substantially and continuously to impair the use and usefulness of the facilities used and usable by defendant in the transportation of interstate commerce, both passengers and property, into, out of, across and through the State of Arizona.

[fol. 6271]

XIX

Financial Burden on Interstate Commerce

The additional and unnecessary expense, as heretofore found, of defendant's compliance with the Train-Limit Law, has been and is and will and would continue to be a substantial, direct and continuing burden upon defendant as an interstate common carrier by railroad, and upon the interstate commerce carried on by defendant into, out of, across, and through the State of Arizona by means of its trains.

XX

Substantial Allegations Sustained

Each and all of the substantial allegations of fact set forth in parts I, II, and III of defendant's answer herein is sustained and established by the evidence.

[fol. 6272] CONCLUSIONS OF LAW

I

Jurisdiction

This is a civil suit in the nature of an action at law, in which the State of Arizona, as plaintiff, is seeking to recover from the defendant, a railroad corporation operating lines of railroad within said state, certain statutory penalties as provided in and by the Arizona Train-Limit Law (Sec. 69-119, Arizona Annotated Code, 1939) with respect to two alleged violations of said statute by defendant. This Court therefore has jurisdiction over the subject matter of the action, and of the parties hereto.

II

The Train-Limit Law Invades an Exclusive Federal Field and Thus Violates the Commerce Clause of the Federal Constitution

Said Train-Limit Law is unconstitutional and void as to interstate trains, which term includes substantially all of the trains operated in both directions over defendant's main lines in Arizona, because regulation of the permissible number of cars in an interstate railroad train passing from one state to another, or passing from one state through another into a third, or passing through a number of states, or passing over lines within a single state, is a subject over which exclusive legislative jurisdiction was and is vested in Congress by the Commerce Clause (Subdivision 3 of Section 8 of Article I) of the Constitution of the United States; the subject of the length and consist of interstate trains being one which requires a general or national system and uniformity of regulation, if such regulation should for any reason be required.

[fol. 6273] III

The Law Operates with Extra-Territorial Effect

Said Train-Limit Law is further unconstitutional and void, and in violation of said Commerce Clause, because its necessary, practical, and inevitable effect is, and will continue to be, to regulate the length of the interstate rail-

road trains operated over defendant's lines, not only within Arizona, but also in adjoining portions of the States of California and New Mexico, and in the State of Texas.

IV

The Law Interferes with and Unduly Regulates the Interstate Commerce Both Within and Without Arizona

Said Train-Limit Law is further unconstitutional and void and in conflict with said Commerce Clause because its necessary, practical and inevitable effect is, and will continue to be, directly, substantially, and unreasonably to interfere with and to regulate the operation of defendant's interstate trains in Arizona, and also in California, New Mexico, and Texas, and to delay and interfere with the continuous movement of said interstate trains between Arizona and other states; and also because its necessary and inevitable effect is, and will continue to be, to impair unreasonably the usefulness of the facilities employed, as well as their use by defendant, in the transportation of interstate commerce from, to and across the State of Arizona.

[fol. 6274]

V

The Law Imposes Undue and Improper Burdens Upon Interstate Commerce

Said Train-Limit Law is further unconstitutional and void, and in conflict with said Commerce Clause, because its necessary and inevitable effect is, and will continue to be to impose direct, substantial and unreasonable financial burdens upon the interstate commerce carried on by defendant, both within Arizona, and also in the adjacent States of California, New Mexico and Texas, and to impair the use and usefulness of the transportation facilities employed by defendant in the carriage of interstate commerce from, to and across the State of Arizona.

VI

The Law Conflicts With Existing Federal Legislation

To the extent to which said Train-Limit Law has, or may have, or is intended, or claimed, to have the effect of limiting the number of cars in a train to the maximum number

which can safely be controlled or stopped in one train, by the use of the types of air brakes and their appurtenances now employed on such trains, or by any other form of train-control or other safety devices, said law is further void and unenforceable against defendant, because it attempts to and does enter a legislative field already entered and therefore occupied by Congress, and thereby conflicts with and infringes upon existing legislation enacted by Congress pursuant to its powers under the Commerce Clause of the Constitution: the Congress having, under the provisions of the Safety Appliance Act, as amended (45 U. S. Code, Sections 1, 9) and the provisions of Sec- [fol. 6275] tion 25 of Part I of the Interstate Commerce Act, (49 U. S. Code 1, Section 25) delegated to the Interstate Commerce Commission full and complete authority to investigate and determine the adequacy of the air brakes, and their appurtenances, and each and all other forms of train control, automatic train-stop, and other safety devices used or proposed to be used on locomotives, cars, and trains operated in interstate commerce, and by order to prescribe the form and type thereof and from time to time to issue such amendatory and supplementary orders as said Commission may deem necessary or desirable in the exercise of the power thus delegated to it, which power and authority said Commission has duly exercised; the Congress having more particularly, in and by such statutes, necessarily empowered said Commission to determine whether the types of air brakes and their appurtenances presently used or proposed to be used upon trains in interstate commerce are or will be adequate and effective, safely and properly to control and to stop trains of the lengths now being operated or proposed to be operated by defendant in interstate commerce, both within and without the State of Arizona.

VII

The Law Operates Unreasonably and Arbitrarily to Deprive Defendant of Its Property, in Violation of Both the Commerce Clause and the Fourteenth Amendment to the Federal Constitution and Also in Violation of the Due-Process Clause of the Arizona Constitution

Said Train-Limit Law is further unconstitutional and void, and in violation of both the aforesaid Commerce

Clause of the Federal Constitution, and the Due-Process [fol. 6276] Clause of the Fourteenth Amendment to said Federal Constitution, and also in violation of the Due-Process Clause set forth in Section 4 of Article II of the Constitution of the State of Arizona, in that it operates, and will continue to operate, arbitrarily and unreasonably to deprive defendant of its property without due process of law, because:

(a) Said law fixes maximum lengths very much lower than those which generally obtain elsewhere throughout the United States, under operating conditions substantially similar to those upon defendant's main lines in Arizona;

(b) Said law makes no allowance for grade or other operating conditions, or for the construction, type, weight, or lengths of the cars composing the trains, or whether such cars are loaded or empty, or if loaded the weights of the loads therein;

(c) Said law imposes a great, substantial, and wholly unreasonable burden of expense upon, interference with, and delay to, interstate commerce, and impairs the use and usefulness of defendant's transportation facilities;

(d) Said law bears no reasonable relation to health or safety, and does not and will not either eliminate or to any substantial extent reduce any existing hazard, but on the contrary does and will create certain hazards which do not now and would not otherwise exist, and increases other hazards and dangers of railroad operation in numerous respects.

[fol. 6277]

VIII

Defendant Entitled to Judgment

Defendant is entitled to judgment in its favor, adjudging and declaring:

(a) That said Train-Limit Law is wholly void, invalid and unenforceable, as to said defendant, and each and all of its trains carrying any interstate commerce or traffic, or engaged in interstate transportation;

(b) That defendant is not liable to plaintiff by reason of any of the matters or circumstances alleged in the complaint herein, or otherwise, either for the amounts de-

manded as penalties in said complaint, or in any other sum or amount whatever;

(c) That said complaint and each count thereof be dismissed; and that said plaintiff take nothing by its action; and

(d) For its costs of suit herein incurred.

Dated and filed this the 11th day of February 1942.

Levi S. Udall, Presiding Judge in the Above Entitled Case.

[fol. 6278] Approved as to form February 11, 1942, Charles L. Strouss.

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA IN AND FOR THE COUNTY OF PIMA

No. 20087

STATE OF ARIZONA, ex rel, Joe Conway, Attorney General of the State of Arizona, Plaintiff,

vs.

SOUTHERN PACIFIC COMPANY, a corporation, Defendant

JUDGMENT—Filed Feb. 11, 1942

This cause having come on regularly for trial on the 19th day of November, 1940, before the Honorable Levi S. Udall, Judge of the Superior Court, to whom said cause had duly been especially assigned; and Honorable Joe Conway, Attorney-General of Arizona, W. E. Polley, Esq., Assistant Attorney General, and Charles L. Strouss, Esq., having appeared for plaintiff; and Cleon T. Knapp, Esq., James P. Boyle, Esq., B. G. Thompson, Esq., Henley C. Booth, Esq., and Burton Mason, Esq., having appeared for defendant; and the case having been duly tried before said Court, sitting without a jury, a trial by jury having been duly waived pursuant to Rule 38 of the Rules of the Superior Court; and the case having been thereafter duly briefed, argued and submitted for decision; and the Court having heretofore, pursuant to Superior Court Rule 52, found the facts herein specially and stated separately its

conclusions of law, and having caused said Special Findings of Fact and Conclusions of Law to be entered of record herein, wherein and whereby, among other things, it was and is hereby found and held:

[fol. 6279] 1. That this Court has jurisdiction over the subject matter of this suit and of the parties hereto;

2. That that certain statute of the State of Arizona, known as the Arizona Train-Limit Law, being Section 69-119 of the Official Arizona Annotated Code, 1939, which statute is set forth in full in the complaint of the plaintiff herein, is unconstitutional and void, because:

First: Said statute invades the exclusive legislative field of Congress, as limited and defined by the Commerce Clause (par. 3, of Sec. 8, Art. 1) of the Constitution of the United States;

Second: Said statute imposes direct, unreasonable and unlawful burdens upon, and interferes with, delays and obstructs interstate commerce, in violation of said Commerce Clause;

Third: Said statute impairs the use and usefulness of the transportation facilities employed by defendant as a common carrier engaged in interstate commerce;

Fourth: Said statute is in conflict with and infringes upon, and amounts to an unlawful attempt to supplement, the power-brake provisions of the Federal Safety Appliance Acts, and the safety-device provisions of Section 25 of the Interstate Commerce Act, which Federal statutes operate upon the same subject matter and are directed to the same objects as said Train-Limit Law and by which said statutes Congress has completely and exclusively occupied the field of regulation of train lengths;

[fol. 6280] Fifth: Said statute operates unreasonably and arbitrarily to deprive defendant of its property, without due process of law, in violation of both the Due-Process Clause of the Fourteenth Amendment to the Constitution of the United States, and

the Due-Process Clause set forth in Section 4 of Article 2 of the Constitution of the State of Arizona;

3. That defendant is entitled to judgment in its favor, adjudging and declaring that said Train-Limit Law is wholly void, invalid and unenforceable; that said defendant is not liable to plaintiff for the amounts demanded as penalties in said complaint, or otherwise; and that said plaintiff take nothing by its action:

Now, therefore, it is hereby ordered, adjudged and decreed:

(a) That said Train-Limit Law is wholly void, invalid and unenforceable, as to said defendant, and each and all of its trains carrying any interstate commerce or traffic, or engaged in interstate transportation, upon each and all of the grounds hereinbefore set forth;

(b) That defendant is not liable to plaintiff by reason of any of the matters or circumstances alleged in the complaint herein, or otherwise, either for the sums demanded as penalties in said complaint, or for any other sum or amount whatever;

(c) That plaintiff take nothing by its action;

(d) That defendant do have and recover from plaintiff its costs of suit herein, in the sum of $

Dated: This 11th day of February, 1942.

Levi S. Udall, Judge of the Superior Court of the State of Arizona.

[fol. 6281] [File endorsement omitted]

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA IN AND FOR THE COUNTY OF PIMA

No. 20087

STATE OF ARIZONA, ex rel, Joe Conway, Attorney General of the State of Arizona, Plaintiff,

vs.

SOUTHERN PACIFIC COMPANY, a corporation, Defendant

MEMORANDUM OPINION—Filed Feb. 11, 1942

This suit, brought by the State of Arizona at the relation of the Attorney General, is a civil action, seeking to recover from the defendant railroad company, which is an interstate carrier, penalties for violations of what is known as the Arizona Train-Limit Law. The complaint contains two causes of action; one charges the operation on March 2, 1940, of a passenger train containing sixteen cars; and the other alleges that on April 4, 1940, a freight train containing ninety-one cars was unlawfully operated. Both trains were operated west out of the Tucson yards. The defendant frankly admitted the operations complained of, but sought to avoid the penalties by asserting that the law in question was and is invalid and unconstitutional as applied to its interstate trains and traffic, because in conflict with various provisions of the State and Federal constitutions, which sections are hereinafter more particularly referred to.

The trial of these issues commenced November 19, 1940, and closed May 1, 1941, there being a number of intervening recesses; in all forty-six court days out of thirteen different weeks were consumed in the trial. Seventy-three different witnesses testified, many of whom came from all [fol. 6282] parts of the United States, and some 402 exhibits were offered in evidence.

The law under attack was enacted by the Legislature of the State of Arizona and approved by the Governor on May 16, 1912. A referendum was invoked and at a general State election, held November 5, 1912, the law was approved by a majority of the voters. It now appears as Section 69-119, Arizona Code Annotated, 1939. Since its adoption in 1912

this law, with but few exceptions and over short periods, has been enforced by the State and its terms complied with by the defendant. A notable exception is that by sufferance of the State the operations from the California-Arizona line into the Yuma yards has never been treated as within the purview of the law.

Briefly, the law provides that it shall be unlawful for a freight train consisting of more than seventy cars, exclusive of caboose, or a passenger train containing more than fourteen cars to be operated in the State of Arizona, and it provides a penalty of not less than $100.00, nor more than $1,000.00 for each violation thereof. The law when passed was entitled, "An Act Limiting the Number of Cars in a Train", without any preamble reciting its basic purpose. This Court will assume, for the purpose of determining this matter, that the law was enacted under the inherent police power of the State to promote and provide greater safety of persons and property, for it is fundamental that the State can only interfere in matters affecting interstate commerce where the health, safety or welfare of its citizens may so require, and then only when the law is reasonably adapted to accomplish the end sought to be attained.

The sole question, then, before the Court is as to the constitutionality of the Arizona Train-Limit Law as applied to defendant's interstate operations under the conditions as they have been shown to exist during the period covered by the record in this case. For, even though the law may have been constitutional when enacted in 1912, it does not prevent the Court from a re-examination to de- [fol. 6283] termine whether conditions may have changed so as to render it arbitrary and unreasonable, considered in the light of the changes. This record discloses that the present conditions, upon which the plaintiff must rely, are vastly and fundamentally different from those existing when the law was passed. Both the rolling equipment and the fixed plant have been practically completely changed, this through the medium of extensive improvement and reconstruction. Operating methods have been substantially modified. The volume and character of the traffic are quite different from that which was carried in 1912. As a matter of fact, the law had no appreciable adverse effect on defendant's operations when enacted, for the reason that freight trains then averaged but forty-seven cars and only 0.38%

of the trains had more than seventy cars. Passenger trains only averaged nine or ten cars. By September of 1913 the entire Southern Pacific system in Arizona had only some two miles of its track protected by block signals.

In determining the constitutional questions raised in this case I have constantly kept in mind the admonition of the present Chief Justice of the United States, wherein he said: "The power of courts to declare a statute unconstitutional is subject to a guiding principle of decision which ought never to be absent from judicial consciousness. This is that the Courts are concerned only *with the power to enact statutes, not with their wisdom.* For the removal of unwise laws from the statute-books appeal lies not only to the courts but to the ballot and to the processes of democratic government."

There can be no question but what the presumption is in favor of every legislative act, and the whole burden of proof lies on him who denies the constitutionality. The defendant here has been required to assume that full burden. The constitutional invalidity must be manifest and if it rests upon disputed questions of fact, the invalidating facts must be proved.

[fol. 6284] Here there is being called in question the validity of a statute which has been upon our books for more than twenty-eight years. It was not only passed by the Legislature, but subsequently approved by the people themselves in a referendum. More recently the Fifteenth Legislature made a special appropriation of a substantial amount to defend and sustain this law. This Court fully appreciates the delicacy of the situation and the great responsibility of rendering a judgment thereon. It is sometimes said that the court assumes a power to overrule or control the action of the people, or their representatives. This is a misconception. Our constitutions are the supreme laws of the land ordained and established by the people. All legislation must conform to the principles they lay down. When an act of a State Legislature is appropriately challenged in the courts as not conforming to the constitutional mandate the judicial branch of the Government has only one duty—to lay the article or articles of the constitution which are invoked beside the statute which is challenged and to decide whether the latter squares with the former. All the court does, or can do, is to announce its considered judgment upon the question. The only

power it has, if such may be called, is the power of judgment. This court neither approves nor condemns any legislative policy. Its delicate and difficult office is to ascertain and declare whether the legislation is in accordance with, or in contravention of, the provisions of the Constitution; and, having done that, its duty ends.

For some five and a half months I listened to the evidence adduced from the witness stand. In the intervening months, to refresh my memory, I have read the eighteen volumes comprising the Reporter's Transcript, which contains more than a million words; the numerous exhibits have been re-examined, the comprehensive briefs submitted by counsel for both parties, the last of which [fol. 6285] reached me on December 20, 1941, have been carefully studied and the hundreds of cases therein cited examined and it is now my matured conclusion that the Arizona Train-Limit Law is unconstitutional and void and I would be unworthy of the position that I hold if I did not have the courage to so declare it, irrespective of the effect of the ruling upon the parties, or those heretofore benefited thereby.

It should be remembered that this case is unique in at least two respects: It is the first train limit case to reach the State courts; second, it is the first time in the United States that the evidence in such a case has been taken before a trial judge. There are only four cases that are squarely in point, they are: The first Arizona case, the Nevada case, the Oklahoma case, and the Louisiana case. In the latter case no opinion was filed and, hence, it does not appear as a reported case. All of the four cases were brought in the Federal Court and determined by a special three-judge court. The evidence was either taken by a special master or the matter submitted on affidavits as in the Oklahoma and Louisiana cases. Admittedly none of the decisions in the four cases above referred to are controlling upon this Court. The Oklahoma law was sustained by a divided Court, while the courts in the other three cases declared the law under attack as unconstitutional. The first Arizona case was appealed to the Supreme Court of the United States and reversed on a jurisdictional ground without passing upon the merits. However, the opinions are of value in their logic and reasoning in passing upon identical questions as those here presented.

As a brief review of this type of legislation, the testimony of Dr. Parmelee, who is the Director of the Bureau of Railway Economics of the Association of American Railroads, shows that though forty-four different bills attempt-
[fol. 6286] ing to regulate the length of trains have been introduced in thirty-five different states, it was only in Arizona (1912), Nevada (1935), Louisiana (1936) and Oklahoma (1937) that such laws were actually passed. Three such measures were defeated in Congress. Only Arizona and more recently Oklahoma have actually operated under such laws. The Nevada and Oklahoma statutes affected only the length of freight trains, no mention being made of passenger-train operations.

As a part of its comparative showing as to costs and methods of operation, casualties, etc., the defendant presented the National picture of railroading by witnesses, who are outstanding in their respective fields, from sixteen of the Class I roads of the United States. The railroads from which these witnesses came, perform fifty-nine per cent of the freight service, sixty per cent of the passenger service, and operate fifty-four per cent of the Class I railroad mileage of America. This evidence clearly establishes that "long-train" operating practice is the customary and ordinary practice throughout the United States and that improvements in efficiency, economy and safety are an accomplishment and necessary result of the adoption of that practice. This type of operation is unquestionably more economical and efficient than "short-train" operations. Freight train expenses vary invers-ly with train length. Furthermore, long-train operations permit improved schedules and performance by elimination of short-train interference. Operating conditions, including grades and curves on defendant's lines, in Arizona were not shown to be essentially different from those in other parts of the United States. As a matter of fact, eighty-four per cent of defendant's main lines in Arizona are tangent (straight) track, and of the sixteen per cent that is curved only one per cent has curves of more than six degrees. Between March 2d and April 30th, 1940, the defendant's operations were carried on without regard to the restrictions of the
[fol. 6287] train-limit law, during which period some sixty-two long passenger trains and some 302 long freight trains were operated without particular incident. This further

indicates that long-train operations can be successfully carried out over the Arizona lines.

I shall not attempt in this opinion, as no good purpose could be served thereby, to make an analysis of the evidence, as that will be covered by the findings of fact filed this day. Nor shall I attempt to review and differentiate the numerous cited cases which lay down the principles of law governing these matters. I shall content myself with stating some of the principal reasons leading to the conclusion announced.

There is a field of regulation of interstate activities which, under the commerce clause, is exclusively reserved to the National Government, and I am firmly convinced that the subject of the length of trains engaged in interstate traffic falls within that class. This for the reason that the subject matter is national in its character, requiring uniformity of regulation by a single authority. If each state was at liberty to regulate the conduct of carriers while within its jurisdiction, the confusion likely to follow could not but be productive of great inconvenience and unnecessary hardship. The very purpose of the commerce clause was to insure uniformity of regulation of interstate commerce against conflicting and discriminating state legislation, such as the law in question. The absence of any act of Congress on the subject of train lengths is equal to its declaration that commerce in that matter shall be free. In other words, the inertia of government should be on the side of freedom of commerce, rather than on the side of restraint of commerce. The determination of this entire case might well be decided upon this exclusive federal field doctrine, which is in effect saying that Arizona never had the right to pass this legislation in the first instance.

[fol. 6288] There is a second so-called "joint" field of regulation, relating to those matters which require diversity of treatment according to local conditions, where the states may act within their respective jurisdictions, unless and until Congress sees fit to exercise its paramount authority. But even if the law in question were found not to fall in the "exclusive Federal field", but rather in the "joint field" of regulation, still the law must be stricken down for the reason that in my opinion Congress has, by the enactment of the Safety Appliance Act, Boiler Inspection Act, etc., coupled with the broad powers delegated to

the Interstate Commerce Commission, fully "occupied" this joint field of regulation. This would automatically oust the State of any power to supplement or expand such regulations any more than it could annul or amend them. Clearly if the law is necessary as a safety measure because "long trains" cannot be properly controlled and stopped with the present types of air brakes, then it gets over into a field already occupied by the Congress through the passage of the safety acts above referred to. Engineer Thrace Cooper of the Santa Fe System called by the State testified: "Your ability to control slack in a train rests solely on your ability to apply and release the brakes throughout the train."

There is still another infirmity to overcome: Any laws enacted by the State in the concurrent field must not be unreasonable or arbitrary and must not *substantially or directly* regulate, obstruct, impede or burden interstate commerce; *incidental or indirect interference* being all that is permitted.

The heavy direct burden cast by the law upon interstate commerce can not be seriously questioned and the impairment of the efficient use of defendant's property is of itself an unlawful taking of that property without due process of law, which is a violation of both the State and Federal con-
[fol. 6289] stitutions. The fact that it costs the defendant in excess of $300,000.00 a year to comply with this law would not or itself, standing alone, warrant invalidating the law, providing it was otherwise valid and bore some reasonable relation to the purpose for which it was enacted. The cost of compliance, however, with a statute of this kind is an element for appropriate consideration in determining whether the statute is arbitrary, capricious or repugnant to due process, and this factor has been so considered in arriving at a decision in this case.

The record here also amply discloses that the law causes real interference with, and delay to, interstate commerce, practically to the extent that Arizona operations create a bottle-neck. Actually ninety-three per cent of the freight traffic and ninety-five of the passenger business of the defendant in Arizona is interstate commerce. Furthermore, the law certainly imposes a great, substantial and wholly unreasonable burden of expense upon this interstate traffic. To hold in this case that interstate commerce was only

incidentally or indirectly involved would be less than realistic, for the interference and regulation is *substantial, continuous, direct and unavoidable*, as is pointed out in detail in the findings of fact. What is even more serious from the standpoint of those who seek to uphold the Act is its extra-territorial effect. The challenged law lays hands upon interstate commerce moving over defendant's lines long before it reaches the physical boundaries of Arizona, and continues directly to affect and regulate that commerce long after it has left Arizona. As a practical matter, it nearly controls the length of passenger trains from Los Angeles to El Paso, and of freight trains from Yuma to Lordsburg, the latter point being twenty-three miles East of the State line, and frequently on to El Paso, 171 miles beyond Arizona's boundary. Under the decided cases it is fatal for any police power statute to operate with extra-[fol. 6290] territorial effect, and under the guise of the police power no state may thus directly interfere with interstate commerce.

Even if the proponents of the law were able to clear all of the other hurdles heretofore discussed, there would then arise the hotly contested question as to whether this train-limit law actually bears any reasonable relation to safety. The Statute was unquestionably enacted under the police power, which is that undefined branch of government which bears the same relation to the State that the principle of self defense bears to the individual. Police power is founded upon public necessity and only public necessity can justify its exercise. If the law in question does not promote the safety of employees and travelers upon the defendant's railroad lines, and others who are affected by said operations, then it must fall.

There need be no speculation as to the effect of the law (as would be the case if this were a recently enacted statute whose prospective effect might be problematical) for the reason that the Interstate Commerce Commission, by its regulations, and the Congress by legislative enactment, have required this defendant and all other railroads to file detailed monthly reports of accidents and casualties occurring in connection with their operations. Furthermore, all of the more serious accidents are investigated by a representative of the Commission.

The defendant established the fact that operating conditions on its lines across the Salt Lake Division, through

the State of Nevada, where "long-train operations" are the rule, are entirely comparable in practically every respect to the operations on the Tucson division, in the State of Arizona. These latter operations being restricted by the law in question.

Detailed exhibits as to accidents and casualties of all types and classes were introduced in evidence. These exhibits covered operations particularly in Nevada and Ari- [fol. 6291] zona, as well as showing the National picture as a whole. From this evidence the Court is able to draw an irrefutable and striking comparison as to casualties under the "long" and "short" train operations.

Considering, first, passenger-train operations, the record shows that the casualty rates in Arizona, on the train-mile or any other recognized basis, are nearly twice what they are in Nevada. The Santa Fe operations in Arizona show the same trend. Surely the ultimate test of increased hazard is to be found in the actual record of casualties covering a twenty-eight year period.

From the standpoint of the safety of persons and property, slack and slack-action casualties on passenger trains are of no significance whatever.

Long-train method of operation prevails in passenger service all over the United States, except in Arizona, and the statistics demonstrate, from the safety angle, that the fourteen-car limit has no logical or reasonable basis. Furthermore, long passenger-train operations in Arizona are entirely practicable and would result in greater efficiency, economy and safety.

Hence, certainly as applied to passenger-train operations, the challenged law bears no reasonable relation to its claimed object of safety, and instead of promoting that object actually increases many hazards, and creates many others which would not exist if the law were not enforced.

In passing it might not be amiss to call attention to the splendid stride that has been made throughout the United States in recent years in reducing casualties. Arizona to a limited extent has shared in these reductions. This record shows that on the Class I roads the casualty rate for the years 1935-1939 was 10.63 per hundred million passenger miles, which is another way of saying that there was a casualty to a passenger for every 9,407,000 miles of traffic.

Considering next freight-train operations: The same [fol. 6292] careful records are kept of these operations as

is required by the I. C. C. of passenger-train operations, which includes reporting all train accidents where the damage exceeds $150.00, of all train service accidents and non-train accidents resulting in casualties to persons. If an employe is injured to the extent that he is incapacitated for work for a three-day period, within ten days after the accident it is classified as a casualty and becomes reportable. If a passenger is incapacitated for one day it is reportable as a casualty. (The term casualty includes fatalities. As a matter of fact ninety per cent of accidents resulting in fatalities to passengers or trainmen are investigated by a representative of the I. C. C., and it is rather significant that they have failed to find or report in any one year that the length of trains had anything to do with the number of casualties.

Furthermore, this record contains exhibits comparing the defendant's freight-train operations in Arizona with its operations in Nevada and New Mexico, as well as the Class I roads of America. The element of speculation, as to the result of long and short-train operations, is therefore largely eliminated. From all of which it appears very definitely that there are more accidents and they occurred more frequently in proportion to trains handled or traffic moved in short-train territory than in long-train territory. Reference is made to the findings of fact for details to support this statement.

The frequency of train and train-service accidents, which includes grade-crossing accidents, appears to be directly related to the number of train units operated and that when more train units are run than are necessary to handle a given amount of traffic, the hazard or accidents in the handling of such traffic is correspondingly increased. When one considers that in the year 1938, for instance, that 30.8% or 4,304 more freight trains were operated between Yuma and El Paso than were actually necessary if it had not been [fol. 6293] for this law, it becomes apparent why the casualty rate is higher in Arizona.

Also it is clear that the reason defendant is unable to effect improvements in the efficiency and economy of its freight-train operations in Arizona comparable to those achieved in neighboring states, or upon its system generally, is primarily due to the restrictions imposed by the Arizona law.

In arriving at a decision in this case I have not overlooked, nor minimized, the type of casualty caused by the sudden start, stop, lurch and jerk of the train or car, commonly known as slack-action casualties, which are so dreaded by every trainman. While slack action cannot be prevented, it must be controlled. A certain amount of slack is absolutely necessary to train operations. It cannot be denied that the addition of each car to a train adds just that much more potential slack, which must be effectively handled by the engineer if serious accidents are to be avoided. To the credit of the locomotive engineers of the United States, be it said that they have, with the improved equipment and devices furnished them, manifested greater skill and exercised more care in handling these longer trains with their heavier locomotives to the extent that over a seventeen-year period (1923-1939) only six per cent of the over-all casualties were caused by this type of accident. It must also be remembered that there are many factors besides length of train causing slack-action casualties, such as: grades, speed of train, consist of train and whether loaded or empty. The record shows many severe casualties of this type on short trains. Limiting trains to the Arizona maxima has had no perceptible limiting effect on even that class of accidents, but if it had, surely it would not be argued that the law was aimed at a definite class of hazards, to-wit: slack-action accidents, which represents but six per cent of the whole, and that the law must stand regardless of its effect on all the other [fol. 6294] classes of accidents representing ninety-four per cent of the casualties, all of which showed material increase due to the effect of the law.

Essentially then the question is not whether a given number of long trains may be operated with fewer casualties than an equal number of short trains, but rather whether the long-train method of moving the entire volume of traffic results in fewer casualties, of all classes, than the movement of the traffic in a larger number of trains of restricted length.

In determining then whether the law bears any reasonable relation to safety, only the over-all result in casualties of the entire operation should be considered and when thus weighed it is clear that the law not only does not in-

crease safety of train operations in Arizona, but that as a matter of cold fact it makes these short-train operations more dangerous.

Thus the Arizona Train-Limit Law not only bears no reasonable relation to safety but, to the contrary, does, and if enforced will continue to, impair and lessen substantially the safety of defendant's train operations in Arizona and the adjacent affected territory.

Defendant established that if the law were invalidated it contemplated the undertaking of an immediate program to build or extend its sidings and yard tracks at forty-nine different stations so as to provide suitable trackage permitting the efficient operation of long trains. Furthermore, larger locomotives of the AC-8 type, having much greater tractive power, would be assigned to the Tucson division. This change in motive power would also necessitate reconstructing certain roundhouses and turntables and providing additional repair facilities. It was estimated that these changes would involve the expenditure of more than a million dollars.

Before closing this opinion, may I say that the arduous [fol. 6295] task of the Court has been made much easier by the very able and comprehensive manner in which the Attorneys for both of the parties have briefed both the law and the facts; I compliment each of you on the skill manifested. This assistance has been appreciated, as has all of the courtesies which were extended throughout the long trial.

At the close of the trial both parties requested the Court to make findings of fact and conclusions of law. Thereupon the Court asked that counsel for the parties submit proposed findings, which request in due time was complied with. Being now of the opinion that the findings of fact submitted by the defendant, consisting of some 200 printed pages, are well supported by the record, the Court therefore adopts in toto these findings of fact and conclusions of law as its own. These have been signed and are now filed with the Clerk as a compliance with Section 21-1027, A. C. A., 1939.

It necessarily follows from what has been said that the Court considers the Train-Limit Law as being wholly void, invalid and unenforceable as to the interstate operations of the defendant, by reason of being in conflict with the

Commerce Clause and the Due Process Clause (Fourteenth Amendment) of the Constitution of the United States, as well as the Due Process Clause of the Constitution of the State of Arizona. The Defendant is, therefore, entitled to judgment, dismissing the Plaintiff's Complaint, and each count thereof, and for its costs of suit herein expended. It is so ordered.

Done in open Court this 11th day of February, 1942.

Levi S. Udall, Presiding Judge in the above Entitled Case.

[fol. 6296] [File endorsement omitted]

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA IN AND FOR THE COUNTY OF PIMA

NOTICE OF APPEAL—Filed April 9, 1942

[Title omitted]

Notice is hereby given that the above named plaintiff, State of Arizona, appeals to the Supreme Court of the State of Arizona from the judgment rendered and entered in the above entitled Court in the above entitled cause on the Eleventh (11th) day of February, 1942, in favor of the above named defendant, Southern Pacific Company, a corporation, and against said plaintiff, State of Arizona, and from the whole thereof.

Dated this 8th day of April, 1942.

Joe Conway, Attorney General, W. E. Polley, Assistant Attorney General; Charles L. Strouss, Of Counsel.

[fol. 6297] IN THE SUPREME COURT OF ARIZONA

No. 4525

STATE OF ARIZONA, ex rel. Joe Conway, Attorney General of the State of Arizona, Appellant,

vs.

SOUTHERN PACIFIC COMPANY, a Corporation, Appellee

Appeal from the Superior Court of Pima County. Honorable Levi S. Udall, Judge. Judgment Reversed.

Joe Conway, Attorney General, Earl Anderson, Assistant Attorney General, Charles L. Strouss, of Counsel, all of Phoenix, Arizona, Attorneys for Appellant.

Cleon T. Knapp, James P. Boyle, B. G. Thompson, all of Tucson, Arizona; Henley C. Booth, Burton Mason, both of San Francisco, California; Attorneys for Appellee.

OPINION—Dec. 23, 1943

STANFORD, J.:

This action is brought under the provisions of Section 69-119, Arizona Code Annotated, 1939, (Laws, 1913, Referendum, p. 15; Sections 2166-2168, Revised Statutes of Arizona, 1913, Civil Code; Section 647 Revised Code of Arizona, 1928), being the act commonly called the Train Limit Law, and was brought for the purpose of recovering from defendant penalties as provided by the act. The charge in the complaint is that on March 12, 1940, the defendant [fol. 6298] operated a passenger train of more than 14 cars, and on April 4, 1940, the defendant operated a freight train of more than 70 cars, in violation of said law.

The aforesaid statute reads as follows:

"Section 1. It shall be unlawful for any person, firm, association, company or corporation, operating any railroad in the state of Arizona, to run, or permit to be run, over his, their, or its line of road, or any portion thereof, any train consisting of more than seventy freight or other cars, exclusive of caboose.

"Section 2. It shall be unlawful for any person, firm, association, company or corporation, operating

any railroad in the state of Arizona, to run, or permit to be run, over his, their, or its line or road, or any portion thereof, any passenger train consisting of more than fourteen cars.

"Section 3. Any person, firm, association, company or corporation, operating any railroad in the state of Arizona, who shall wilfully violate any of the provisions of this act, shall be liable to the state of Arizona for a penalty of not less than one hundred dollars, nor more than one thousand dollars, for each offense; and such penalty shall be recovered and suits therefor brought by the attorney general, or under his direction, in the name of the state of Arizona, in any county through which such railway may be run or operated, provided, however, that this act shall not apply in cases of engine failures between terminals.

"Section 4. All acts and parts of acts in conflict with the provisions of this act are hereby repealed."

The case was tried in Tucson, Pima County, Arizona, before the Honorable Levi S. Udall, Judge of the Superior Court of Apache County, Arizona, to whom it had been assigned.

By the judgment rendered it was held that the Train Limit Law of Arizona, as set forth in the sections above quoted, was unconstitutional and void because:

[fol. 6299] "First: Said statute invades the exclusive legislative field of Congress, as limited and defined by the Commerce Clause (par. 3, of Sec. 8, Art. 1) of the Constitution of the United States;

"Second: Said statute imposes direct, unreasonable and unlawful burdens upon, and interferes with, delays and obstructs interstate commerce, in violation of said Commerce Clause;

"Third: Said statute impairs the use and usefulness of the transportation facilities employed by defendant as a common carrier engaged in interstate commerce;

"Fourth: Said statute is in conflict with and infringes upon, and amounts to an unlawful attempt to supplement, the power-brake provisions of the Federal Safety Appliance Acts, and the safety-device provi-

sions of Section 25 of the Interstate Commerce Act, which Federal statutes operate upon the same subject matter and are directed to the same objects as said Train-Limit Law and by which said statutes Congress has completely and exclusively occupied the field of regulation of train lengths;

"Fifth: Said statute operates unreasonably and arbitrarily to deprive defendant of its property, without due process of law, in violation of both the Due-Process Clause of the Fourteenth Amendment to the Constitution of the United States, and the Due-Process Clause set forth in Section 4 of Article 2 of the Constitution of the State of Arizona;"

Appellee has admitted the operation of the trains as alleged in the complaint, but alleged that each of said trains consisted in a large part of cars moving in Interstate Commerce and carrying interstate traffic, and in further explanation of appellee's case, we quote as follows:

"* * * and denied that either of said operations was a wilful violation of the law. For a further separate and affirmative defense to the complaint, appellee alleged that the law was and is void, invalid and unconstitutional, because in violation of the Commerce Clause (Article I, Section 8, para: 3) of the Constitution of the United States, the Due-Process Clause of Section 1 of the 14th Amendment of the Constitution of the United States, and the corresponding Due-Process Clause set forth in Article II, Section 4, of the Constitution of Arizona, in that: (a) the law undertakes to regulate a subject-matter of national concern which, if required [fol. 6300] to be regulated at all, is subject to regulation only by Congress pursuant to the powers granted by the Commerce Clause; (b) the necessary effect of the law is to regulate appellee's train operations extraterritorially, that is to say, beyond the boundaries of Arizona; (c) the law directly and substantially interferes with, delays, and regulates appellee's interstate train operations in Arizona and the adjacent states; (d) the law imposes direct and substantial burdens upon the appellee's interstate train operations; (e) the law, to the extent that it has, or is intended or claimed to have, the effect of limiting the number of cars in a

train to that number which can be safely and effectively controlled or stopped by the use of air brakes and other appurtenances now in use on such trains, is in conflict with and an infringement upon existing Federal legislation having the same or similar purposes, enacted by Congress pursuant to its powers under the Commerce Clause; (f) the law deprives appellee of its property unreasonably and arbitrarily, in violation of the due-process clauses of the State and Federal Constitutions above referred to, for the reason, among others, that it bears no reasonable relation to health or safety, its ostensible objects, and does not eliminate or reduce any present hazard, but on the contrary creates certain hazards which would not otherwise exist, and increases other hazards of railroad operation in numerous respects."

In 1912, the year Arizona became a state, several measures were referred, under the Constitutional Act of Initiative and Referendum, to the people after their passage by the legislature. Among those measures, besides the one in question, the Train Limit Law, each had to do with the regulation through the police power of the state of railroads in Arizona for the health and safety of its employees and traveling public. That will be observed, first, by the act regulating the number of men to be employed on trains and engines; second, by the act regulating head lights on all locomotives (for example, in this particular act, it was required that locomotive engines used in the transportation of trains over railroads should install electric head lights of a certain power); and third, by the act to require certain tests of service before a person could serve as a locomotive [fol. 6301] engineer or train conductor. It can be easily seen that all of these acts, including the one in question in this action, were made the laws of this state for the purpose of the safety and protection of employees and of the people being transported over the railroads in our state.

Appellee contends in its brief, as it did by a statement before the court in argument that "it is much more probable that the law was advocated and passed as a measure to promote and preserve—make static—the employment of railroad trainmen. Certainly that is its most obvious practical (but extra-legal) purpose and, as experience has shown, one of its principal results." We have just quoted

the title to other acts, as well as this one, enacted in the year 1912 by the State Legislature. All of them have to do with the regulation of the handling of trains in order to protect the employees or traveling public as will be seen by the various acts, and no other reason could possibly be assigned to those acts, including, as stated, the one in question here. The case of State vs. Pate, (N. M.), 138 Pac. (2d) 1006, states: "The courts do not inquire into the motives of the legislature."

16 C. J. S. page 277, Sec. 100, has the following to say in connection with legislative acts:

> "It will be presumed that the legislature, in passing a statute, acted advisedly and with full knowledge of existing facts and conditions on which its legislation is based, and that no general laws are ever passed either through want of information on the part of the legislature or because it was misled by false representations of interested parties. It will also be presumed that the legislature carefully investigated and properly determined that the interests of the public required the enactment of particular legislation. So, the court will presume that the legislature in enacting [fol. 6302] a regulatory measure had adequate knowledge of the evils sought to be corrected and did not act arbitrarily or unreasonably."

In State vs. Wisconsin Telephone Co., 172 N. W. 225, 169 Wis. 198, it is said:

> "The term 'police power' is very elastic and is used to express different meanings at different times. In its broadest sense, it has been said to include 'all legislation and almost every function of civil government.'"

The case of Salem Lodge vs. Swaile, 197 N. E. 837, 209 Ind. 347, expresses the opinion that when a subject lies within the police power of the state, debatable questions as to reasonableness are not for the courts, but for the legislature which is entitled to form its own judgment, and its action within its range of discretion cannot be set aside because compliance is burdensome.

In the case of State vs. Superior Court, 174 Pac. 973, 103 Wash. 409, it is stated:

> "Indeed, it may be said that, where the police power is set in motion in its proper sphere, the courts have no

jurisdiction to stay the arm of the legislative branch of the government, for it is operating in its own particular field, where even the courts are powerless to insist upon a procedure consistent with the forms of the common law."

Dwelling for the present on the contention of the appellee that the law is in conflict with the Fourteenth Amendment, we refer to the case of Barbier vs. Connolly, 113 U. S. 923, reading as follows:

"* * * But neither the Amendment, broad and comprehensive as it is, nor any other amendment was designed to interfere with the power of the State, sometimes termed its 'police power,' to prescribe regulations to promote the health, peace, morals, education and good order of the people, and to legislate so as to increase the industries of the State, develop its resources and add to its wealth and prosperity. From the very necessities of society, legislation of a special character, having these objects in view, must often be [fol. 6303] had in certain districts, such as for draining marshes and irrigating arid plains. Special burdens are often necessary for general benefits, for supplying water, preventing fires, lighting districts, cleaning streets, opening parks, and many other objects. Regulations for these purposes may press with more or less weight upon one than upon another, but they are designed, not to impose unequal or unnecessary restrictions upon anyone, but to promote, with as little individual inconvenience as possible, the general good. Though, in many respects, necessarily special in their character, they do not furnish just ground of complaint if they operate alike upon all persons and property under the same circumstances and conditions. Class legislation, discriminating against some and favoring others, is prohibited; but legislation which, in carrying out a public purpose, is limited in its application, if within the sphere of its operation it affects alike all persons similarly situated, is not within the Amendment."

Appellee has brought to the attention of the court six certain cases in which it places great reliance. The first one is the case of A. T. & S. F. Ry. Co., et al., vs. LaPrade

(1933) 2 Fed. Supp. 855. This case was tried by one Circuit Judge and two District Judges. In this case counsel in their brief have to say:

> "The conclusions expressed by that opinion were given no effect solely because of the holding of the United States Supreme Court in Ex parte LaPrade (1933), 289 U. S. 444; 77 L. ed. 1311, which decided that the suit had abated because of the substitution of the incoming attorney general for the original defendant. The Supreme Court considered no other question."

The second is the Southern Pacific Company vs. Mashburn, (1937), 18 Fed. Supp. 393. This case was tried before one Circuit Judge and two District Judges. That case was decided against the validity of the Nevada law which was patterned after the Arizona law.

The third case was Texas & New Orleans R. Co., vs. Martin, et al., (1936). This is known as the Louisiana case and was heard by one Circuit Judge and two District Judges. It is an unreported case but the court made permanent the interlocutory injunctions issued prohibiting interference of the railroad in that state.

[fol. 6304] The fourth case is the case of M. K. & T. R. Co., vs. Williamson, 36 Fed. Supp. 607, known as the Oklahoma case. That case is like the Nevada Train Limit case except that it has reference to freight trains only. This case was heard and decided by the two Circuit Judges, District Judge Vaught dissenting.

The fifth case is State, etc. vs. A. T. & S. F. Ry. Co. et al., 125 Kans. 586; 264 Pac. 1056, a Kansas case heard by the State Supreme Court. The state, through its Public Service Commission, attempted to compel, by mandamus proceedings, the railroad company to put into effect certain orders prescribed by it relating to manual signals to be used by train crews and relating to the air and power brake system, and in part, the holding of that state court was that such an order could not be enforced by mandamus where no showing was made that a better system had been devised. The unanimous judgment was rendered for the railroad company.

The sixth case is Southern Pacific Company vs. Railroad Commission of California, 10 Fed. Supp. 918. In that case the Railroad Commission of California had ordered that

certain trains moving between certain points during the six winter months be operated with an additional caboose, to be placed midway in the train. The opinion in this case was given by one Circuit and two District Judges upholding the railroad company.

In connection with the foregoing six cases we quote a statement, or contention, of the appellee herein as follows:

> "It will be noted that the four Federal train-limit cases were heard before twelve different Federal judges, five of whom were Circuit judges and seven [fol. 6305] District judges. Three of the Circuit judges and all of the District judges, or ten Federal judges in all, have agreed that state train-limit laws exactly or essentially similar to the challenged law are invalid, upon precisely the same constitutional grounds urged in the present case. Only two of these twelve judges have taken a contrary view.
>
> "Three of the ten Federal judges mentioned have also concurred in reaching the same result with respect to a state regulation not differing in principle from a train-limit law; although, of course, neither the volume of the traffic affected, the character and extent of the interference imposed, nor the financial burden was as severe and widespread as in the train-limit cases."

The State of Oklahoma, one of our latest additions to statehood in the union, no doubt was desirous of enacting laws that would be progressive, that would be for the safety of the traveling public through its state and for the employees on its trains. Regardless of the reasoning of the appellee herein, as above set forth, as to the total number of various judges who have in the aggregate given opinions that would overwhelm the Oklahoma case, nevertheless the Oklahoma case was not tried by state judges and it is the latest case quoted by appellee herein, and while this court is not bound to follow, it is certainly most fitting to do so.

There are something like 325 cases cited by the two parties to this action, and it would be impossible to make reference to all of them. The case of M. K. & T. R. Co., vs. Williamson, supra, is replete with the cases cited by both sides in this case, and Circuit Judge Bratton, who wrote the opinion in that case, gave expression of the court to most all the cases cited in the case. In that case, like the one at bar,

the railroad company was compelled, among other things, to expend great sums of money in order to comply with the restrictions placed by the State of Oklahoma, and by in- [fol. 6306] junction the railroad company sought to be relieved of the necessity of such great additional expense. We quote from said case as follows:

"It is contended with emphasis that the statute, applied to the business of plaintiff, is not a safety measure reasonably enacted in the exertion of the police power of the state, but is merely an attempt to regulate, delay and burden interstate commerce, in violation of the Commerce Clause. The supreme, plenary and complete power of Congress to regulate interstate commerce is without limitation or restriction, except that prescribed in the Constitution; and within the reach of that paramount authority lies the power to protect such commerce against substantial dangers, burdens or obstructions, no matter the source from which the encroachment springs. Gibbons v. Ogden, 9 Wheat. 1, 6 L. Ed. 23; Minnesota Rate Cases (Simpson v. Shepard), 230 U. S. 352, 398, 33 S. Ct. 729, (citing many other cases.) Coming to apply the well-recognized doctrine many state and municipal enactments have been held invalid. (citing cases).

"But every state statute having some relation to interstate commerce is not to be condemned on that ground. A state is free in the exertion of its police power to enact reasonable measures in the interest of the health, safety and welfare of its people, including employees of railroads, passengers on trains, and others, even though interstate commerce may be incidentally or indirectly involved. * * * It is crystal clear that the general principle running through all of these cases is that a state statute, enacted in the exercise of the police power, and bearing some reasonable relation to the health, safety, or well-being of the people of the state, is not to be overturned by judicial decree, even though by its necessary operation it affects interstate commerce in an incidental or indirect manner, but not otherwise. * * *.

"Plaintiff relies upon the due process clause of the Fourteenth Amendment. It is obvious that to comply with the statute plaintiff will be required to expend

additional sums in the operation of its business. The cost of compliance with a statute of this kind is an element for appropriate consideration in determining whether the statute is arbitrary, capricious, or repugnant to due process; but, standing alone, it is not always enough to warrant judicial determination of invalidity. Missouri Pacific Railway Co. v. Kansas, 216 U. S. 262, 30 S. Ct. 330, 54 L. Ed. 472; Lehigh Valley Railroad Co. v. Board of Public Utility Commissioners, 278 U. S. 24, 49 S. Ct. 69, 73 L. Ed. 161, 62 A. L. R. 805; Missouri Pacific Railroad Co. v. Norwood, supra. The facts presented are not sufficient to distinguish or set apart this case from those to which reference has been made in which statutes enacted in the exercise of the police power of the state were sustained, although interstate commerce was incidentally and indirectly affected and the expenditure of additional sums was necessitated.

[fol. 6307] "The remaining contention to be considered is that the statute must fall because Congress has occupied the field; that the act infringes and is in conflict with legislation heretofore enacted by Congress pursuant to its powers under the Commerce Clause. To sustain the contention, plaintiff relies upon paragraphs 10 to 17 and paragraph 21 of section 1, and section 26, of the Interstate Commerce Act, as amended, 49 U. S. C. A. Pars. 1, 26; and sections 1 and 9 of the Safety Appliance Act, as amended, 45 U. S. C. A. Pars. 1, 9. Paragraph 10, section 1, of the Interstate Commerce Act, as amended, defines the term 'car service'; paragraph 11 makes it the duty of a railroad company to furnish safe and adequate car service, and to enforce just and reasonable rules, regulations, and practices in respect of car service; paragraph 12 relates to the distribution of cars for the transportation of coal; paragraph 13 authorizes the Commission to require railroads to file with it their rules and regulations relating to car service, and empowers the Commission to direct that such rules and regulations be incorporated in the schedules showing rates, fares and charges for transportation; paragraph 14 authorizes the Commission to establish rules, regulations, and practices touching car service; paragraph 15 is addressed to the furnishing of car service and the use of facilities in case of short-

age of equipment, congestion of traffic, or other emergency, paragraph 16 empowers the Commission to make just and reasonable directions in respect to the handling, routing, and movement of traffic over other lines; paragraph 17 requires railroad companies to obey orders of the Commission concerning car service, and provides a penalty for disobedience; and paragraph 21 vests in the Commission authority to require any railroad to provide itself with safe and adequate facilities for performing its car service, and fixes a penalty for refusal or neglect to comply with such an order; and section 26 authorizes the Commission to order a railroad to install automatic train-stop or train-control devices or other safety devices, and fixes a penalty for the refusal or neglect to comply with such an order. Section 1 of the Safety Appliance Act, as amended, provides that no railroad company shall use on its line any locomotive in moving interstate traffic not equipped with a power driving-wheel brake and appliances for operating the train-brake system, and that no train shall be run in such traffic that does not have a sufficient number of cars in it equipped with such power and train brakes that the engineer on the locomotive can control its speed without requiring brakemen to use the common hand brake for that purpose; and section 9 provides that whenever a train is operated with power or train brakes not less than fifty per cent of the cars shall have their brakes used and operated by the engineer, that all power-braked cars in the train which are associated together with such fifty per cent shall have their brakes so used and operated that the Interstate Commerce Commission may, from time to time, [fol. 6308] increase the minimum percentage of cars required to be operated with power or train brakes, and that failure to comply with any such requirement shall subject the company to a penalty.

"In respect to the regulatory power of the state and the occasions for its exercise, the general subject of commerce has been divided into three separate and distinct classes. They are those in which the power of the state is exclusive, those in which the state may act in the absence of legislation by Congress, and those in which the action of Congress is exclusive and therefore the state cannot act at all (citing cases). The

reasonable limitation of the length of trains in the interest of public safety falls within the second class. As to that class, the exercise of the paramount power of Congress is necessary to take from the state its subordinate power to legislate. Covington & Cincinnati Bridge Co. v. Kentucky, supra; Western Union Telegraph Co. v. James, supra. And mere congressional delegation of power to the Interstate Commerce Commission to act in respect to that class does not require the state to yield. It is only after action by the Commission that the state is shorn of its power (citing cases). But the intent of Congress to exert its superior authority and thus exclude or supersede state legislation concerning the same matter is not to be lightly inferred. It must be fairly manifested (citing cases). And, it is within the power of Congress to limit its regulation to only part of a given field, thus leaving the remainder open to action by the state (citing cases).

"The acts of Congress relied upon fail to make specific reference to the length of trains as an element of safety, and it is not contended that the Interstate Commerce Commission has acted or asserted its authority to act in respect of the matter under the powers which Congress has delegated to it. True, some if not all of the statutes concern themselves with various aspects of safety in the operation of trains. But, fairly construed, they do not contain any provision from which it can be reasonably implied that Congress intended to exert the paramount character of its authority in relation to the length of trains in such manner as to exclude or supersede state action. And until an intent to exercise such superior authority has been indicated, the state is free to legislate in the exertion of its police power . . . ."

It has come to our attention that the Interstate Commerce Commission in relation to the Transportation Act of 1940 has recently commented on that Act as follows:

"It is unnecessary to decide whether Congress has occupied the field of safety regulation with respect to [fol. 6309] the operation of trains or with respect to the length of trains. In any event, that is a question for the courts. The question before us is whether, in view of the emergency found to exist, we were author-

ized by law to suspend the operation of State laws limiting the number of cars in a train."

The emergency referred to, of course, has reference to the suspension of the Train Limit Law for the duration of the war, and to which this state has unhesitatingly yielded. From the case of People vs. Letford, 79 Pac. (2d) 274, 102 Colo. 284, we quote the following:

> "In approaching the question of the validity and constitutionality of the statute, it is well to keep in mind certain fundamental rules. When an act of the Legislature is attacked on the ground of unconstitutionality, the question presented is not whether it may be voided but whether it is possible to uphold it. Denver v. Knowles, 17 Colo. 204, 30 P. 1041, 17 L. R. A. 135. Every presumption will be indulged in favor of the legislation and only clear and demonstrable usurpation of power will authorize judicial interference with legislative action. Green v. Frazier, 253 U. S. 233, 40 S. Ct. 499, 64 L. Ed. 878. The rule was well stated by the Supreme Court of Massachusetts in Re Wellington et al., Petitioners, 16 Pick. 87, 26 Am. Dec. 631, and quoted with approval by us in Milheim v. Moffat Tunnel District, 72 Colo. 268, 273, 211 P. 649, 651, as follows: 'When called upon to pronounce the invalidity of an act of legislation passed with all the forms and solemnities requisite to give it the force of law, courts will approach the question with great caution, examine it in every possible aspect and ponder upon it as long as deliberation and patient attention can throw any new light on the subject, and never declare a statute void, unless the nullity and invalidity of the act are placed, in their judgment, beyond reasonable doubt.' "

The trial court took from the 19th day of November to the first of the following May in the trial of this cause, excepting some recesses. There were 886 assignments of error and 39 propositions of law presented to us, and of the many scores of cases cited by both appellant and appellee, this court has read as many as possible to be consistent in rendering justice to both sides. The matter has engrossed the attention of this court, as time would permit, [fol. 6310] since its presentation in April, 1943, until this time, but the opinion, condensed as it is in the foregoing

pages, expresses our reason for holding that the findings and judgment of the trial court to the effect that the Train Limit Law is unconstitutional were in error.

We cannot impugn the motives of the legislature of our state, and in this particular case the purpose of the citizenry of our commonwealth by disturbing the enactment of this law made by them until we find that it is in violation of a law to which the state must yield.

The judgment is reversed.

R. C. Stanford, Judge.

Concurring:

A. G. McAlister, Chief Justice.

[fols. 6311-6312] Ross, J.:

I dissent. My reasons will be given later. Illness prevents my doing so at this time.

I think the judgment of the lower court should be affirmed.

Henry D. Ross, Judge.

[fol. 6313] IN THE SUPREME COURT OF ARIZONA

No. 4525

STATE OF ARIZONA, ex Rel. JOE CONWAY, Attorney General of the State of Arizona, Appellant,

vs.

SOUTHERN PACIFIC COMPANY, a Corporation, Appellee

Appeal from the Superior Court of Pima County. Honorable Levi S. Udall, Judge

Judgment reversed in opinion of December 23, 1943.

Joe Conway, Attorney General, Earl Anderson, Assistant Attorney General, Charles L. Strouss, of Counsel, all of Phoenix, Arizona, Attorneys for Appellant.

Cleon T. Knapp, James P. Boyle, B. G. Thompson, all of Tucson, Arizona; Henley C. Booth, Burton Mason, both of San Francisco, California, Attorneys for Appellee.

DISSENTING OPINION—January 13, 1944

Ross, J. (Dissenting):

When the opinion in this case was handed down on December 23, 1943, I was unable, because of illness, to give my reasons for dissenting. I now do so.

The validity of the Arizona Train Limit Law (section 69-119, Arizona Code 1939) as applied to interstate transportation of persons and property is the question for decision. Such law undertakes to penalize any railroad in [fol. 6314] the State of Arizona that runs over its lines, or any part thereof, any train consisting of more than 70 freight, or other cars, exclusive of caboose, or any passenger train of more than 14 cars.

The act is silent as to its purpose. If it was enacted to protect the safety, health and well-being of railroad employees, or the traveling public, it does not so recite, as in the Williamson case (36 Fed. Supp. 607) cited in the majority opinion.

The laws observance until now by the interstate railroads operating in Arizona, as the evidence and findings conclusively show, has not only cost such utilities large sums of money but, also, has delayed and interfered with their business of transportation of goods and persons, at both the east and west boundaries of the state, without any material benefit to the traveling public, in the way of safety or health, or of the employees unless it be that more of them thereby have secured employment, increasing the operating expenses of the roads.

One sure result of a compliance with the law has been to force interstate companies to operate many more trains in the conduct of their business than the safety and well-being of the employees would seem to require, greatly increasing their costs.

Under the law, a fruit or cattle train made up in California for the Kansas City or Chicago Markets, if it consists of more than 70 cars, must, when or before it reaches, Yuma, Arizona, be broken down to the limit of 70 cars before it proceeds through Arizona. When this same train has crossed Arizona it may be rebuilt to the California length and proceed on its course to the point of destination. The traffic from the east to California must also conform [fol. 6315] to this arbitrary rule at the state's boundary. In effect, the law limits length of trains from California and New Mexico to and through Arizona and practically outside of the state.

The regulation of the length of interstate trains, if permissible, is by reason of the state's right under the constitution to pass laws for the protection of its people's lives, safety, health and well-being and to do that the state may

enter the field appropriated under the federal constitution to the federal government, when such field has not been wholly occupied by that government. Powers belonging under the constitution to the federal government but not exercised may in all proper cases be exercised by the state for its use and protection, and a state law to that end will be valid and enforceable.

The Train Limit Law, if an allowable state regulation originally, is no longer allowable for the following reasons:

1. The danger to life and health in the operation of long trains, because of the improvement in the operating services as shown by the evidence and findings, has been greatly minimized, if not wholly done away with.

2. That because of such improvement, if the Train Limit Law was ever a valid police regulation, it now, under the evidence, serves but one purpose, to wit, the employment of more employees and trains, with the expense and hazards incident thereto.

3. It invades the field of regulation occupied by the Congress in its legislation providing for safety appliances in railroad operations (Virginian Ry. v. United States (1915), 223 Fed. 748) and the safety provisions of the Interstate Commerce Act.

[fol. 6316] 3. In ExParte No. 156, November 8, 1943, the Interstate Commerce Commission refused to modify its Service Order No. 85, theretofore entered, suspending during the war the operation of state laws limiting the number of cars in trains, stating, among other things:

> "If state laws limiting the number of cars in trains are to be held valid (a question we do not decide), it would be possible for each state to set a different number of cars as the maximum to be hauled in a train. A state might even limit the length of trains to one car, although such a law would be clearly arbitrary and unreasonable. Higher limits might be set by states and found reasonable, but lack of uniformity would place a serious burden on interstate commerce. • • •
>
> "The fact that freight trains in excess of 70 cars and passenger trains in excess of 14 cars are safely operated in states without train-limit laws 'is convincing evidence of its safety, except where unusual operating conditions exist.' • • •

"We find that these state laws were and are in fact rules and regulations with respect to car service within the meaning of section 1, paragraph (10) and (15); that Service Order No. 85 was and is in accord with the national transportation policy * * * and is fully authorized by section 1 * * * of the Interstate Commerce Act."

The Interstate Commerce Commission refused to modify or change said Service Order No. 85 for the reasons (a) that it was a valid order made pursuant to act of Congress and (b) because as a matter of fact "freight trains in excess of 70 cars and passenger trains in excess of 14 cars are safely operated in states without train-limit laws", which " 'is convincing evidence of its safety, except where unusual operating conditions exist.' " This finding of fact by the Commerce Commission is fully and well supported by the evidence taken in this case and is in accord with the learned trial court's findings.

[fols. 6317-6318] Four states, Arizona, Nevada, Louisiana and Oklahoma, have enacted train limit laws. The laws in the first three named states have been passed upon and declared to be invalid (Atchison, T. & S. F. Ry. Co. v. La Prade, 2 Fed. Supp. 855; Southern Pacific Co. v. Mashburn, 18 Fed. Supp. 393; Texas & New Orleans R. Co. v. Martin et al (1936, unreported), No. 428-Equity), in Oklahoma it was sustained by a divided court (Missouri-Kansas-Texas R. Co. v. Williamson, 36 Fed. Supp. 607). The rulings of these courts is another very cogent reason why the Train Limit Law should not be sustained. These decisions were by three-judge federal courts and were unanimous in holding the law invalid, except in the state of Oklahoma. In other words, of the 12 judges presiding in these cases 10 joined in declaring the law invalid and two (in the Oklahoma case) sustained the law.

I think the judgment of the lower courts should be affirmed.

Henry D. Ross, Judge.

[fol. 6319] IN THE SUPREME COURT OF THE STATE OF ARIZONA

MANDATE—Filed in Superior Court Jan. 15, 1944

To the Honorable the Superior Court of the State of Arizona in and for the County of Pima

Greeting: whereas, lately in the Superior Court of the State of Arizona in and for the County of Pima, before you in a cause between: State of Arizona, ex rel. Joe Conway, Attorney General of the State of Arizona, Plaintiff, vs. Southern Pacific Company, a corporation, Defendant, No. 20087, the said Superior Court made and entered its judgment on February 11, 1942, as follows:

"Now, therefore, it is hereby ordered, adjudged and decreed:

(a) That said Train-Limit Law is wholly void, invalid and unenforceable, as to said defendant, and each and all of its trains carrying any interstate commerce or traffic, or engaged in interstate transportation, upon each and all of the grounds hereinbefore set forth;

(b) That defendant is not liable to plaintiff by reason of any of the matters or circumstances alleged in the complaint herein, or otherwise, either for the sums demanded as penalties in said complaint, or for any other sum or amount whatever;

(c) That plaintiff take nothing by its action;

(d) That defendant do have and recover from plaintiff its costs of suit herein, in the sum of $

Dated: This 11th day of February, 1942.
Levi S. Udall, Judge of the Superior Court of the State of Arizona."

[fol. 6320] as by the inspection of the record of the said Superior Court, which was brought into the Supreme Court of the State of Arizona by virtue of an appeal by plaintiff agreeably to the law in such case made and provided fully and at large appears.

[fol. 6321] And whereas, in April, in the year of our Lord one thousand nine hundred and Forty-three, the said

cause came on to be heard before the said supreme court, and was submitted for decision after argument of counsel.

On consideration whereof, it was on the 23rd day of December in the year of our Lord one thousand nine hundred and forty-three, ordered by this Court that the judgment of the said Superior Court in this cause, entered February 11, 1942, be, and the same is hereby reversed. Costs in this court to said appellant State of Arizona of and from said appellee Southern Pacific Company on cost bill duly filed and allowed.

Whereupon, appellee filed its motion for rehearing, on consideration of which, with the reply and objections of appellant, it was, on January 13, 1944, ordered that the motion for rehearing be denied.

[fol. 6322] You therefore are hereby commanded that such proceedings be had in said cause, as according to right and justice, and to law, ought to be had, the said Appeal notwithstanding.

Witness, the Honorable A. G. McAlister, Chief Justice of the Supreme Court of the State of Arizona, the Fourteenth day of January, in the year of our Lord one thousand nine hundred and Forty-four.

Costs of no cost bill filed.

Eugenia Davis, Clerk of the Supreme Court of the State of Arizona.

[fol. 6323] [File endorsement omitted]

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA IN AND FOR THE COUNTY OF PIMA

No. 20087

STATE OF ARIZONA, ex rel. JOE CONWAY, Attorney General of the State of Arizona, Plaintiff,

vs.

SOUTHERN PACIFIC COMPANY, a corporation, Defendant

JUDGMENT ON MANDATE OF SUPREME COURT—Filed Feb. 5, 1944

The above entitled cause coming on regularly before the Court this 5th day of February, 1944, on the opinion and

mandate of the Supreme Court of the State of Arizona,

It is now ordered, adjudged and decreed:

1. That the Arizona Train Limit Law is constitutional and valid.

2. That plaintiff have and recover judgment against the defendant:

(a) on plaintiff's first cause of action, in the amount of $250.00;

(b) on plaintiff's second cause of action, in the amount of $250.00;

(c) for plaintiff's costs herein in the amount of $ none.

Dated this 5th day of February, 1944.

Levi S. Udall, Judge.

[fol. 6324] [File endorsement omitted]

IN THE SUPREME COURT OF ARIZONA

[Title omitted]

PETITION FOR APPEAL FROM THE SUPREME COURT OF THE STATE OF ARIZONA TO THE SUPREME COURT OF THE UNITED STATES—Filed March 8, 1944

To the Honorable, the Chief Justice of the Supreme Court of the State of Arizona:

Southern Pacific Company, a corporation, your petitioner, respectfully shows:

1. Petitioner is the appellee in the above entitled cause.

2. The above named appellant filed a complaint in the Superior Court of the State of Arizona, in and for the County of Pima, on the 19th day of April, 1940, against your petitioner as defendant, seeking to recover penalties for two asserted violations of Section 69-119, Arizona Revised Code Annotated, 1939, the statute of Arizona known as the Arizona Train Limit Law. After trial of said cause in said Superior Court judgment therein was rendered in favor of your petitioner as defendant, adjudging said Train Limit

Law to be unconstitutional because in violation of the Constitutions of the United States and the State of Arizona. [fol. 6325] 3. An appeal was thereupon taken from said judgment to the Supreme Court of the State of Arizona. Said Supreme Court is the highest court of the State of Arizona and therefore the highest court of said State in which a decision in this suit could be had. Upon said appeal said judgment was reversed, by a decision rendered by said Supreme Court of Arizona on the 23rd day of December, 1943. Thereafter your petitioner filed its motion for rehearing, which was denied by said Supreme Court of Arizona on the 13th day of January, 1944. Thereupon the mandate of said Supreme Court duly issued, addressed to said Superior Court, directing further proceedings to be had in conformity with said decision dated December 23, 1943.

4. In obedience to the decision and mandate of the Supreme Court of Arizona, said Superior Court, on February 5, 1944, rendered and entered its judgment, declaring said Arizona Train Limit Law to be valid and constitutional, and imposing upon your petitioner as defendant penalties in the aggregate sum of $500.00, for and on account of the asserted violations of said Train Limit Law set forth in the complaint in this cause.

5. In said cause there is drawn in question the validity of a statute of the State of Arizona, on the ground of its being repugnant to the Constitution, laws or treaties of the United States, and the decision is in favor of its validity; in that your petitioner, as defendant in the Superior Court, and as appellee in the proceedings before the Supreme Court of Arizona, has at all times maintained, from the outset of the cause, and as a matter of affirmative defense to the complaint in said cause, and now maintains, that the Arizona Train Limit Law, the statute of Arizona aforesaid upon which the prosecution is predicated, infringes upon and violates the Commerce Clause (Article I, Section 8, Paragraph 3) of, and the Due Process Clause of the 14th Amendment (14th Amendment, Section 1) to, the Constitu- [fol. 6326] tion of the United States, and also infringes upon and is in conflict with certain federal statutes enacted by Congress pursuant to its powers under the Commerce Clause, to wit, the Federal Safety Appliance Act (45 U. S. Code, Sections 1, 9), and the Safety Section (Section 25) of

Part I of the Interstate Commerce Act (49 U. S. Code, Part I, Section 25).

6. Petitioner further represents and shows that the decision of the Supreme Court of Arizona, herein dated December 23, 1943, and the judgment of the Superior Court herein dated February 5, 1944, entered in obediencee to said mandate of said Supreme Court of Arizona, were and each of them was erroneous, in that this Court failed to hold and decide that said Arizona Train Limit Law was and is wholly unconstitutional and void, because in violation of each and all of the provisions of the Constitution of the United States hereinbefore referred to, and also an infringement upon and in conflict with the statutes of the United States hereinbefore particularly referred to.

Wherefore, petitioner prays for the allowance of an appeal from the Supreme Court of the State of Arizona (the highest court of said State) to the Supreme Court of the United States, in order that the decision of said Supreme Court of the State of Arizona may be examined and reversed, and also prays that a transcript of the record, proceedings and papers in this case, duly authenticated by the Clerk of the Superior Court of the State of Arizona, in and for the County of Pima (being the clerk of the court possessed of the record), may be sent to the Supreme Court of the United States, as provided by law.

Petitioner, desiring the appeal to be a supersedeas, prays an order touching the security to be required of it, and the approval of such bond as required in the case.

The errors upon which your petitioner claims to be en- [fol. 6327] titled to an appeal are those above indicated, and are fully set forth in the assignment of errors filed herewith.

Dated March 7th, 1944.

Cleon T. Knapp, James P. Boyle, B. G. Thompson, Tucson, Arizona; C. W. Durbrow, Burton Mason, San Francisco, California, Attorneys for Petitioner and Proposed Appellant in the Supreme Court of the United States.

[fol. 6328] [File endorsement omitted]

IN THE SUPREME COURT OF ARIZONA

[Title omitted]

ASSIGNMENTS OF ERROR—Filed March 8, 1944

Southern Pacific Company, a corporation, the above named appellee, assigns the following errors in the record and proceedings in this cause:

1. The Supreme Court of the State of Arizona erred in its decision and opinion herein, dated December 23, 1943, in failing to hold and conclude that that certain statute of the State of Arizona, known as the Arizona Train Limit Law (enacted in 1912, and now codified and republished as Section 69-119, Arizona Annotated Code, 1939), which statute prohibits, under penalty, the operation within the State of Arizona of trains of more than 70 freight or other cars, exclusive of caboose, or passenger trains of more than 14 cars, is wholly void, invalid and unconstitutional, and in violation of the Commerce Clause (Article 1, Section 8, Paragraph 3) of the Constitution of the United States, because said Train Limit Law undertakes to and does regulate a subject matter over which exclusive legislative jurisdiction was and is vested in the Congress of the [fol. 6329] United States by said Commerce Clause and thereby invades the exclusive legislative field of Congress; in that the subject of the length and consist of interstate trains is one which requires a general or national system and uniformity of regulation, if such regulation should for any reason be required.

2. The Supreme Court of the State of Arizona erred further, in its decision and opinion aforesaid, in failing to hold and conclude that said Train Limit Law is invalid and unconstitutional, and in violation of said Commerce Clause, because its necessary and inevitable effect is to regulate and control the length and consist of the interstate railroad trains operated over appellee's lines extraterritorially, that is to say, not only within Arizona, but also in adjoining portions of the States of California and New Mexico, and in the State of Texas.

3. The Supreme Court of the State of Arizona erred further, in its decision and opinion aforesaid, in failing to hold

and conclude that said Train Limit Law is invalid and unconstitutional, and in violation of said Commerce Clause, because its necessary, practical, and inevitable effect is, and continues to be, directly substantially, and unreasonably to interfere with, delay, regulate and obstruct the operation and movement of appellee's interstate trains, both within and without Arizona, and to impair the use and usefulness of the transportation facilities employed by appellee in the transportation of interstate commerce from, to, and across the State of Arizona.

4. Said Supreme Court of the State of Arizona erred further, in its opinion and decision aforesaid, in failing to hold and conclude that said Train Limit Law is invalid and unconstitutional, and in violation of said Commerce Clause, because its necessary and inevitable effect is, and continues to be, to impose direct, substantial, and unreasonable financial burdens upon the interstate commerce carried on by appellee both within and without Arizona, and thus further [fol. 6330] to impair the use and usefulness of the transportation facilities employed by appellee in the transportation of interstate commerce from, to, and across the State of Arizona.

5. Said Supreme Court of the State of Arizona erred further, in its opinion and decision aforesaid, in failing to hold and conclude that said Train Limit Law, to the extent that it has, or may have, or is intended or claimed to have, the effect of limiting the number of cars in a train to the maximum number which can be safely controlled or stopped in one train, by the use of the types of air brakes and their appurtenances now employed on such trains, or by any other form of train-control or other safety devices, is void and unenforceable against appellee, because it attempts to and does enter a legislative field already entered, and therefore occupied by Congress, and thereby conflicts with and infringes upon existing legislation enacted by Congress pursuant to its powers under the Commerce Clause of the Constitution: The Congress having, under the provisions of the Safety Appliance Act, as amended (45 U. S. Code, Sections 1, 9) and the provisions of Section 25 of Part I of the Interstate Commerce Act (49 U. S. Code I, Sec. 25), delegated to the Interstate Commerce Commission full and complete authority to investigate and determine the ade-

quacy of the air brakes and their appurtenances, and each and all other forms of train control, automatic train-stop, and other safety devices used or proposed to be used on locomotives, cars, and trains operated in interstate commerce, and by order to prescribe the form and type thereof and from time to time to issue such amendatory and supplementary orders as said Commission may deem necessary or desirable in the exercise of the power thus delegated to it, which power and authority said Commission has duly exercised; and the Congress having, more particularly, in and by such statutes, necessarily empowered said Commis[fol. 6331] sion to determine whether the types of air brakes and their appurtenances presently used or proposed to be used upon trains in interstate commerce are or will be adequate and effective, safely and properly to control and to stop trains of the lengths now being operated or proposed to be operated by appellee in interstate commerce, both within and without the State of Arizona.

6. Said Supreme Court of the State of Arizona erred further, in its opinion and decision aforesaid, in failing to hold and conclude that said Train Limit Law is invalid and unconstitutional, and in violation of said Commerce Clause, and also in violation of the Due Process Clause of the 14th Amendment to the Constitution of the United States in that said Train Limit Law operates and will continue to operate arbitrarily and unreasonably to deprive appellee of its property without due process of law; because said law fixes maximum lengths very much lower than those which generally obtain elsewhere throughout the United States, under operating conditions substantially similar to those upon appellee's lines in Arizona; makes no allowance for grade or other operating conditions, or for the construction, type, weight, or lengths of the cars composing the trains, or whether such cars are loaded or empty, or if loaded, the weights of the loads therein; imposes a great, substantial, and wholly unreasonable burden of expense upon, interference with, and delay to interstate commerce, and impairs the use and usefulness of appellee's transportation facilities; and bears no reasonable relation to health or safety, and does not and will not either eliminate or to any substantial extent reduce any existing hazard, but on the contrary does and will create new and increases existing hazards and dangers of railroad operation.

7. Said Supreme Court of the State of Arizona erred further, in its opinion and decision aforesaid, in holding and concluding that said Train Limit Law is valid and con-
[fol. 6332] stitutional, and that the "findings and judgment of the trial court to the affect that the Train Limit Law is unconstitutional were in error,"

8. To the extent that the aforesaid opinion and decision of said Supreme Court of the State of Arizona are, or may be, intended or construed to be a disapproval or reversal of the findings of fact (as distinguished from the conclusions of law) made and adopted by the trial court (the Superior Court of the State of Arizona, in and for the County of Pima) in this cause, or of any part or portion of said findings of fact, said Supreme Court of Arizona erred further in its said opinion and decision, in holding and deciding that said findings of fact of the trial court, or any of them, were or are in any respect in error, or that other and inconsistent or opposing findings of fact were or are required and proper upon the basis of the evidence of record in this cause; such holding by said Supreme Court of the State of Arizona, to the extent that its opinion and decision are or may be construed as herein indicated, having constituted a denial to the appellee of due process of law, within the meaning of the Due Process Clause of the 14th Amendment to the Constitution of the United States.

9. Said Supreme Court of the State of Arizona erred further, in and by its opinion and decision aforesaid, in reversing the judgment in favor of appellee duly rendered and entered on February 11, 1942, by said trial court, wherein and whereby said trial court declared that said Train Limit Law is invalid and unconstitutional upon each and all of the grounds of such invalidity specified in the foregoing assignments of error numbers one to six, inclusive; and in issuing its mandate to said trial court, dated January 14, 1944, wherein and whereby it ordered and directed said Superior Court to enter judgment against appellee, and in favor of appellant.

For which errors this petitioner prays that the said opinion and decision of the Supreme Court of the State of
[fol. 6333] Arizona, dated December 23, 1943, and said judgment of the Superior Court of the State of Arizona, in and for the County of Pima, dated February 5, 1944, en-

tered by said Superior Court in obedience to the aforesaid opinion and decision of said Supreme Court of the State of Arizona and the mandate of said Supreme Court issued pursuant thereto, in the above entitled cause, be reversed, and judgment rendered in favor of the said appellee.

Dated: March 7th, 1944.

Cleon T. Knapp, James P. Boyle, B. G. Thompson, Tucson, Arizona; C. W. Durbrow, Burton Mason, San Francisco, California, Attorneys for Southern Pacific Company, a corporation, (petitioner, and proposed appellant in the Supreme Court of the United States).

[fol. 6334] [File endorsement omitted]

IN THE SUPREME COURT OF ARIZONA

[Title omitted]

ORDER ALLOWING APPEAL—Filed March 8, 1944

The petition of Southern Pacific Company, a corporation, the above named appellee, for an appeal in the above cause to the Supreme Court of the United States from the Supreme Court of the State of Arizona, and the assignment of errors filed therewith and the record in said cause having been considered, it is

Ordered that an appeal be and is allowed to the Supreme Court of the United States from the Supreme Court of the State of Arizona, as prayed in said petition, and that the Clerk of the Superior Court of the State of Arizona, in and for the County of Pima, being the Clerk of the Court possessed of the record, shall prepare and certify a transcript of the record and proceedings in the above cause, and transmit the same to the Supreme Court of the United States within sixty (60) days from the date hereof.

It is further ordered that said petitioner, Southern Pacific Company, a corporation, shall give good and sufficient security in the sum of $2,000.00, that said petitioner shall prosecute said appeal to effect, and if said petitioner fail [fol. 6335] to make its plea good, it shall answer for all damages and costs.

The said petitioner now presenting a surety bond, in the sum of $2,000.00, with the Saint Paul-Mercury Indemnity Company, a corporation, named as surety, it is

Ordered that the same be and is hereby approved, and that this appeal shall operate as a supersedeas.

Dated March 7th, 1944.

A. G. McAlister, Chief Justice of the Supreme Court of the State of Arizona.

[fols. 6336-6340] Bond on appeal for $2,000.00, filed March 8, 1944, omitted in printing.

[fols. 6341-6342] Citation in usual form showing service on Joe Conway, et al. omitted in printing.

[fol. 6343] [File endorsement omitted]

IN THE SUPREME COURT OF ARIZONA

[Title omitted]

PRAECIPE FOR TRANSCRIPT OF RECORD—Filed March 2, 1944

To the Clerk of the Superior Court of the State of Arizona, in and for the County of Pima:

As the Clerk of the Court possessed of the record in the above entitled cause, you are hereby requested to prepare and certify a transcript of the record in said cause to be filed in the Supreme Court of the United States, pursuant to an appeal to said Supreme Court of the United States heretofore allowed in said cause on the 7th day of March, 1944, and to include in said transcript of record in the order given below the following and no other papers and exhibits, to-wit:

1. The complaint of the State of Arizona as plaintiff herein.

2. The order of the Superior Court staying the plaintiff from prosecuting any other proceedings to

enforce the provisions of the Arizona Train Limit Law.

[fol. 6344] 3. The answer of Southern Pacific Company as defendant herein.

4. The full and complete reporter's transcript of the proceedings had at the trial of the cause, consisting of typewritten pages numbered from 1 to 5309, inclusive, bound into eighteen volumes.

5. All original exhibits tendered in evidence by either party and received in evidence by the trial court, being 379 exhibits, identified by the following numbers:

1-13, both inclusive; 15-39, both inclusive; 42-202, both inclusive;
204 and 205; 207-220, both inclusive, 222-328, both inclusive;
334-370, both inclusive; 382-397, both inclusive; 399-402, both inclusive;

and excluding therefrom twenty-three exhibits which were marked for identification and not received in evidence, the same being exhibits identified by numbers as follows:

14, 40, 41;
203, 206, 221;
329-333, both inclusive; 371-381, both inclusive; and 398.

6. The findings of fact and conclusions of law made and adopted by the Superior Court, under date of February 11, 1942, and filed on said February 11, 1942, and bearing the style and designation "Court's Findings of Fact and Conclusions of Law".

7. The judgment of the Superior Court, rendered and entered on February 11, 1942.

8. The memorandum opinion of the Superior Court, rendered and filed on February 11, 1942.

9. The notice of appeal from the judgment of the Superior Court, filed on April 9, 1942.

10. The opinion of the Supreme Court of the State of Arizona, dated December 23, 1943.

[fol. 6345] 11. The dissenting opinion of Honorable Henry D. Ross, Judge of the Supreme Court of Arizona, dated January 13, 1944.

12. The mandate of the Supreme Court of Arizona, directed to the Supreme Court, dated January 14, 1944.

13. The judgment of the Superior Court, entered in obedience to said mandate of the Supreme Court, dated February 5, 1944.

14. The petition of Southern Pacific Company for the allowance of an appeal to the Supreme Court of the United States.

15. The assignment of errors filed by Southern Pacific Company as appellant, in connection with said appeal.

16. The statement with respect to jurisdiction filed by Southern Pacific Company in connection with said appeal; and each and every other statement or document filed under authority of Rule 12 of the Rules of the Supreme Court of the United States.

17. The order of the Chief Justice of the Supreme Court of the State of Arizona, allowing the appeal to the Supreme Court of the United States, and fixing the bond upon such appeal.

18. The bond upon appeal to the Supreme Court of the United States.

19. The citation upon appeal to the Supreme Court of the United States.

20. The statement served upon the State of Arizona, as proposed appellee, directing attention to the provisions of paragraph 3 of Rule 12 of the Rules of the Supreme Court of the United States, together with the acknowledgment of service, in the name and on behalf of the State of Arizona, as appellee, of the documents served upon it pursuant to the [fol. 6346] *the* provisions of paragraph 2 of Rule 12 of said Rules of the Supreme Court of the United States.

21. This praecipe for transcript of record.

Dated March 7, 1944.

Cleon T. Knapp, James P. Boyle, B. G. Thompson, Tucson, Arizona. C. W. Durbrow, Burton, Mason, San Francisco, California. Attorneys for petitioner and proposed appellant in the Supreme Court of the United States.

Due service of the foregoing Praecipe for Transcript of Record and receipt of a copy thereof are hereby acknowledged this 7th day of March, 1944.

Joe Conway, Attorney General of the State of Arizona, by Earl Anderson, Assistant Attorney General; Chas. L. Strouss, of Counsel. Attorneys for the State of Arizona (appellant) proposed appellee of the Supreme Court of the United States.

[fol. 6347] [File endorsement omitted]

IN SUPREME COURT OF ARIZONA

[Title omitted]

PROPOSED APPELLEE'S PRAECIPE FOR ADDITIONAL RECORD—Filed March 16, 1944

To the Clerk of the Superior Court of the State of Arizona, in and for the County of Pima:

You are hereby requested to incorporate into the transcript of record, on the appeal herein, in addition to the portions of the record indicated by proposed appellant herein by its praecipe, to be included in the transcript of record on appeal, the following:

Exhibits 371-381, both inclusive, and 398, the same being twelve of the twenty-three exhibits, referred to in item 5 of proposed appellant's praecipe, which were marked for identification and not received in evidence.

Dated March 14, 1944.

Joe Conway, Attorney General of the State of Arizona; By Earl Anderson, Assistant Attorney General; Charles L. Strouss, Of Counsel. Attorneys for the State of Arizona, proposed appellee.

[fol. 6348] Due service of the foregoing Proposed Appellee's Praecipe for Additional Record and receipt of a copy thereof are hereby acknowledged this 16th day of March, 1944.

Cleon T. Knapp, James P. Boyle, B. G. Thompson, C. W. Durbrow, Burton Mason, Attorneys for proposed Appellant.

[fols. 6349-6352] Clerk's Certificate to foregoing transcript omitted in printing.

[fol. 6353] IN THE SUPREME COURT OF THE UNITED STATES

[Title omitted]

STATEMENT OF POINTS TO BE RELIED UPON—Filed April 22, 1944

Now comes Southern Pacific Company, a corporation, the appellant in the above-entitled cause, and adopts its assignments of error as its statement of points to be relied upon, and states that the whole of the record as filed, is necessary for the consideration of the case, and should be printed in its entirety, in accordance with the stipulation of the parties dated April 5, 1944, except for those documents and papers specified in said stipulation as unnecessary to be printed.

Dated April 17, 1944.

Southern Pacific Company, a corporation, Appellant,
Cleon T. Knapp, C. W. Durbrow, Burton Mason,
Attorneys for Appellant.

[fol. 6354] AFFIDAVIT OF SERVICE BY MAIL

STATE OF CALIFORNIA,
City and County of San Francisco, ss:

Burton Mason, of lawful age, being first duly sworn, on his oath deposes and says that he is one of the attorneys of record for Southern Pacific Company, a corporation, the appellant named in the foregoing Statement of Points to be Relied Upon, and as such attorney makes and files this affidavit of service; that on the 17th day of April, 1944, he served upon Joe Conway, Esq., as Attorney General of Arizona, and upon Earl Anderson, Esq., as Assistant Attorney General, and upon Charles L. Strouss, Esq., (each and all of whom reside and have their offices in Phoenix, Maricopa County, State of Arizona), in their capacities as attorneys for the appellee named in said statement, one copy each of the Statement of Points to be Relied Upon by appellant in said cause, as filed with the Clerk of the Supreme Court of the United States pursuant to Paragraph 9 of Rule 13 of the Rules of said Supreme Court, by enclosing said copies of said Statement in sealed envelopes respectively addressed to said attorneys for appellee, and

depositing the same in the United States post office at the City of San Francisco aforesaid, with the postage thereon fully prepaid; that on the 17th day of April, 1944, there was and is a regular and established daily mail service, from the City of San Francisco aforesaid, to the City of Phoenix, Arizona.

/Burton Mason.

Subscribed and sworn to before me this 17th day of April, 1944. A. T. Whittle, Notary Public in and for the City and County of San Francisco, State of California.

[fol. 6355] [File endorsement omitted.]

[fol. 6356] IN THE SUPREME COURT OF THE UNITED STATES

[Title omitted]

STIPULATION AS TO PRINTING OF RECORD—Filed April 22, 1944

It is hereby stipulated, by and between the above-named appellant and its attorneys, and the above-named appellee and its attorneys, that the entire record in the above entitled case is deemed necessary to be printed for the consideration of the Court, except the following documents and papers, which the Clerk is requested to omit from such printing, viz:

Exhibits received in evidence, and identified by number as follows:

8, 9, 152, 153, 175, 300-304, both inclusive, 306-312, both inclusive, 319, 320, 430-349, both inclusive, 352-361, both inclusive, 385, and 399-402, both inclusive.

Exhibits offered but not received in evidence, marked for identification by numbers as follows:

371-381, both inclusive, and 398.

It is further stipulated that the documents and papers above mentioned to be omitted from the printed record shall be preserved by the Clerk and may be referred to by counsel or the Court, if deemed necessary, during the course of the

[fol. 6357] argument, or in brief, or otherwise during the disposition of the cause.

Dated April 5, 1944.

Southern Pacific Company, a corporation, Appellant, Cleon T. Knapp, C. W. Durbrow, Burton Mason, Attorneys for Appellant. State of Arizona, Appellee, Joe Conway, Attorney General; Earl Anderson, Assistant Attorney General; Charles L. Strouss, of Counsel; Attorneys for Appellee.

[fol. 6358] [File endorsement omitted]

SUPREME COURT OF THE UNITED STATES, OCTOBER TERM, 1944

No. 56

[Title omitted]

ORDER NOTING PROBABLE JURISDICTION—May 1, 1944

The statement of jurisdiction in this case having been submitted and considered by the Court, probable jurisdiction is noted.

Endorsed on Cover: File No. 48,371, Arizona, Superior Court, County of Pima. Term No. 561. Southern Pacific Company, Appellant, vs. State of Arizona, ex rel. Joe Conway, Attorney General of the State of Arizona. Filed April 12, 1944. Term No. 56 O. T. 1944.

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1943

No. 578 56

SOUTHERN PACIFIC COMPANY,
Appellant,

vs.

STATE OF ARIZONA, EX REL. JOE CONWAY, ATTORNEY GENERAL OF THE STATE OF ARIZONA.

APPEAL FROM THE SUPREME COURT OF THE STATE OF ARIZONA.

STATEMENT AS TO JURISDICTION.

CLEON T. KNAPP,
C. W. DURBROW,
BURTON MASON,
Counsel for Appellant.

JAMES P. BOYLE,
B. G. THOMPSON,
Of Counsel.

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SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1943

No. 878

SOUTHERN PACIFIC COMPANY, A CORPORATION,
Appellant,

vs.

STATE OF ARIZONA, EX REL. JOE CONWAY, ATTORNEY GENERAL OF THE STATE OF ARIZONA,
Appellee.

UPON APPEAL FROM THE SUPREME COURT OF THE STATE OF ARIZONA.

APPELLANT'S STATEMENT WITH RESPECT TO JURISDICTION.

I. **The statutory provision believed to sustain jurisdiction** is Section 237(a) of the Judicial Code of the United States (28 United States Code, Section 344(a)).

II. **The statute of the State of Arizona, the validity of which is involved,** is commonly known as the Arizona Train Limit Law. It was enacted in 1912 by the Arizona legislature, and approved by the Governor of that State on May 16, 1912 (Sections 2166-2168, Revised Statutes of

Arizona, 1913; Section 647, Revised Code of Arizona, 1928; now codified and republished as Section 69-119, Arizona Code Annotated, 1939). Said statute, as originally enacted, had no preamble or statement of purpose. Its title and text were as follows:

"*An Act limiting the number of cars in a train.*

"Section 1. It shall be unlawful for any person, firm, association, company or corporation, operating any railroad in the State of Arizona, to run, or permit to be run, over his, their, or its line of road, or any portion thereof, any train consisting of more than seventy freight, or other cars, exclusive of caboose.

"Section 2. It shall be unlawful for any person, firm, association, company or corporation, operating any railroad in the State of Arizona, to run, or permit to be run, over his, their, or its line of road, or any portion thereof, any passenger train consisting of more than fourteen cars.

"Section 3. Any person, firm, association, company or corporation, operating any railroad in the State of Arizona, who shall willfully violate any of the provisions of this act, shall be liable to the State of Arizona for a penalty of not less than one hundred dollars, nor more than one thousand dolars, for each offense; and such penalty shall be recovered, and suits therefor brought by the attorney general, or under his direction, in the name of the State of Arizona, in any county through which such railroad may be run or operated, provided, however, that this act shall not apply in cases of engine failures between terminals.

"Section 4. All acts and parts of acts in conflict with the provisions of this act are hereby repealed."

When said statute was codified and republished as Section 69-119 of the Arizona Code Annotated, 1939, the section numbers, together with all of Section 4, were omitted, and Sections 1 and 2 were combined into one sentence.

III. **The Judgment sought to be reviewed upon this appeal** was rendered by the Superior Court of the State of Arizona, in and for the County of Pima, on February 5, 1944, in obedience to the mandate of the Supreme Court of Arizona, dated January 14, 1944; which mandate was issued by said Supreme Court, pursuant to its opinion and decision dated December 23, 1943, and its order, dated January 13, 1944, denying the motion for rehearing duly filed in this cause by the above-named appellant, as appellee before said Supreme Court of Arizona.

The application for the allowance of this appeal was presented to the Chief Justice of the Supreme Court of Arizona on the 7th day of March, 1944.

IV. **The nature of this case is as follows:**

The appeal herein is from a final judgment of the Superior Court of Arizona, in and for the County of Pima, rendered and entered by said Superior Court in obedience to the mandate and direction of the Supreme Court of Arizona, following a final decision by said Supreme Court and its denial of a motion for rehearing filed by the present appellant, in a civil action at law theretofore commenced and continued in said Superior Court, in which action the State of Arizona, the present appellee, was the plaintiff, and Southern Pacific Company, the present appellant, was the defendant; the nature of the case and the proceedings had therein being more fully described as follows:

On April 19, 1940, said State of Arizona, as plaintiff, acting by and through its Attorney-General of Arizona, commenced the aforesaid action against the above-named appellant, as defendant, by filing a complaint in the Superior Court of said State, in and for Pima County, seeking to recover from appellant penalties for two alleged violations of the Arizona Train Limit Law, the state statute

set forth in paragraph II of this statement. In due course appellant, as defendant, filed its answer to said complaint. In said answer, after admitting the operation of a freight train of more than 70 cars, exclusive of caboose, and a passenger train of more than 14 cars, within Arizona, as set forth in said complaint, said appellant further alleged, as a matter of affirmative defense, that said Train Limit Law was and is wholly invalid and unconstitutional, as applied to appellant's railroad operations in Arizona and elsewhere, because in violation of the Commerce Clause (Article I, Section 8, Paragraph 3) of the Constitution of the United States, and the Due Process Clause set forth in Section I of the 14th Amendment to the Constitution of the United States, and the corresponding Due Process Clause (Article II, Section 4) of the Constitution of Arizona.

In its answer appellant also alleged in detail the facts upon which its said affirmative defense was predicated, and included therein a prayer for a judgment declaring the Train Limit Law to be invalid and unconstitutional upon each and all of the grounds therein set forth. Reference is hereby made to Part III of said answer, and likewise to the prayer for relief appended to said answer, and particularly to Paragraphs 10, 11, and 12 of said Part III, which embody the specific allegations of unconstitutionality upon which appellant has relied from the outset of this case, and still relies. A copy of said paragraphs 10, 11, and 12 is attached as Appendix A to this statement.

The case duly came on for trial upon the issues as made by the complaint and the answer, before Hon. Levi S. Udall, Judge of the Superior Court of Arizona, sitting without a jury, a trial by jury having been duly waived by the parties. Forty-six court days were required for said trial. An extensive record of oral and documentary testimony was

compiled. Practically all of said testimony was devoted to the development of the facts relevant and material to the issues of constitutionality presented by the pleadings. No other substantive issues were presented to the trial court.

Following the trial and submission of the case, the trial court on February 11, 1942, made and entered its special findings of fact, and its conclusions of law, which findings and conclusions were separately stated, and pursuant thereto, on the same date, rendered and entered its judgment in favor of appellant as defendant, declaring the Arizona Train Limit Law to be invalid and unconstitutional upon each and all of the grounds asserted by appellant in its answer. On said February 11, 1942, the trial court also delivered and filed its memorandum opinion, a complete copy of which is attached to this statement, as Appendix B, wherein it set forth in some detail the reasons for its findings, conclusions, and judgment.

The grounds of said decision and judgment of the trial court are summarized in the judgment as follows:

> "That that certain statute of the State of Arizona, known as the Arizona Train-Limit Law, being Section 69-119 of the Official Arizona Annotated Code, 1939, which statute is set forth in full in the complaint of the plaintiff herein, is unconstitutional and void, because:
>
> "*First:* Said statute invades the exclusive legislative field of Congress, as limited and defined by the Commerce Clause (par. 3, of Sec. 8, Art. 1) of the Constitution of the United States;
>
> "*Second:* Said statute imposes direct, unreasonable and unlawful burdens upon, and interferes with, delays and obstructs interstate commerce, in violation of said Commerce Clause;
>
> "*Third:* Said statute impairs the use and usefulness of the transportation facilities employed by defendant as a common carrier engaged in interstate commerce;

"*Fourth:* Said statute is in conflict with and infringes upon, and amounts to an unlawful attempt to supplement, the power-brake provisions of the Federal Safety Appliance Acts, and the safety-device provisions of Section 25 of the Interstate Commerce Act, which Federal statutes operate upon the same subject matter and are directed to the same objects as said Train-Limit Law and by which said statutes Congress has completely and exclusively occupied the field of regulation of train lengths;

"*Fifth:* Said statute operates unreasonably and arbitrarily to deprive defendant of its property, without due process of law, in violation of both the Due-Process Clause of the Fourteenth Amendment to the Constitution of the United States, and the Due-Process Clause set forth in Section 4 of Article 2 of the Constitution of the State of Arizona;"

On April 9, 1942, the State of Arizona took an appeal from said judgment of the trial court to the Supreme Court of Arizona. Said Supreme Court of Arizona is the court created by the Constitution of said State, for the purpose, among others, of hearing and deciding appeals from the superior courts of said State, and is the highest court and the only court of said State of Arizona having jurisdiction to hear, determine, and finally decide such appeals, and is the highest court of said State in which a decision of this suit could be had. No other court of said State has any power, under the Constitution and statutes of Arizona, to review, reverse, or modify a decision or judgment rendered by said Supreme Court of Arizona.

Reference is hereby made to Article 6, Section 1, of the Constitution of Arizona, which vests the judicial power of the State in the Supreme Court, the superior courts, and such other courts as may be provided by law; to Section 4 of the same article of said Constitution, which defines the jurisdiction of said Supreme Court, and particularly de-

clares that it shall have appellate jurisdiction in all actions and proceedings; and to Section 21-1702 of the Arizona Code Annotated, 1939, which provides for the review by said Supreme Court of judgments entered by the superior courts of the State.

Following the submission of this case to said Supreme Court of Arizona, upon the above-mentioned appeal, said Court on December 23, 1943, announced and entered its opinion and decision, which was concurred in by two of the three judges comprising said Court, wherein and whereby it reversed the judgment of the trial court dated February 11, 1942. In and by its said opinion and decision, said Supreme Court of Arizona held and declared, as the sole grounds of its decision, that said Arizona Train Limit Law is valid and constitutional, and that the judgment of the trial court to the effect that said Train Limit Law is unconstitutional was in error. A full and complete copy of said opinion is attached to this statement as Appendix C.

On January 7, 1944, the above named appellant (as appellee before said Supreme Court of Arizona) duly filed with said Court a motion for rehearing of the case. Said motion for rehearing was denied by said Court on January 13, 1944; and upon January 14, 1944, said Court issued its mandate to the trial court, ordering and directing further proceedings to be had in the cause in conformity with its decision and opinion of December 23, 1943. A copy of said mandate is included in the record on appeal, and a copy is also attached to this statement as Appendix D.

On said January 13, 1944, there was also rendered and filed the separate dissenting opinion of Honorable Henry D. Ross, one of the members of said Court. A copy of said dissenting opinion is attached to this statement as Appendix E.

On February 5, 1944, the trial court rendered and entered final judgment in this cause, in obedience to the afore-

said mandate and direction of the Supreme Court of Arizona, in favor of the original plaintiff, the State of Arizona, and against the present appellant as the original defendant. In said judgment of February 5, 1944, said trial court declared that the Arizona Train Limit Law is valid and constitutional, and imposed upon appellant a penalty of $250.00 for each of the two violations of said Train Limit Law described in the original complaint, or a total penalty of $500.00. A copy of said judgment dated February 5, 1944, is attached to this statement as Appendix F.

The cause is now brought to this Court, by direct appeal from the final decision of the Supreme Court of Arizona, as rendered on December 23, 1943, and the final judgment of the trial court entered on February 5, 1944, in obedience to said decision and mandate of the Supreme Court of Arizona.

V. **The grounds upon which it is contended that the federal questions involved are substantial** are as follows:

(A) The invalidity, on the ground of violation of the Federal Constitution by the State statute (the Arizona Train Limit Law) upon which the suit is based, has been and is the principal ground of defense presented, urged, and relied upon by appellant.

(B) Such invalidity of the Train Limit Law has been asserted, as the essential basis of said defense, from the outset of the case (namely, in the answer originally filed) and continuously throughout the trial and upon the subsequent appeal to the Supreme Court of Arizona.

(C) In support of its said defense of invalidity, appellant as defendant adduced the testimony of some 60 witnesses, and offered in evidence 316 exhibits, 311 of which were received. Appellee, as plaintiff adduced the testimony of 13 witnesses, and offered in evidence 86 exhibits, 68 of which were received. Substantially all of appellee's evidence was likewise addressed to the basic issue of invalidity.

(D) The trial court found and held that said defense of invalidity of said statute, under the Constitution of the United States, was sustained by the evidence and the law, including the decisions of the Supreme Court of the United States, and on February 11, 1942, rendered judgment for appellant accordingly. As previously stated, one of the three judges comprising the Supreme Court of Arizona agreed with said decision and judgment of the trial court, and upon appeal voted for its affirmance.

(E) There are no decisions of this Court which directly declare that a State statute limiting the lengths of trains operated by railroad common carriers in interstate commerce to a fixed maximum number of cars per train is valid under the Constitution and laws of the United States, or which are otherwise so clearly or directly in point upon the issues arising under the Constitution of the United States, presented in this case and upon this appeal, as to foreclose any further debate upon or discussion of said issues.

There are, on the contrary, many decisions of this Court which sustain appellant's position upon each and all of said issues under the Constitution of the United States: in that this Court has held and decided that State statutes or regulations having effects and results not distinguishable from those flowing from appellant's enforced compliance with the Arizona Train Limit Law were and are unconstitutional and void, because in violation of the Commerce Clause of, or the Due Process Clause of the 14th Amendment to, the Constitution of the United States: the same constitutional provisions upon which appellant relies in the present case:

(1) In particular, this Court has many times held and decided that a state statute cannot be sustained as valid, under said Commerce Clause, if it undertakes (as does the Arizona Train Limit Law) to regulate a subject matter, such as the lengths of railroad trains operating in continuous movement in interstate commerce, which requires

a general or national system and uniformity of regulation, if such regulation should for any reason be required—because such subject is not within the field of regulation permitted to the states, but instead belongs to and falls within the field of regulation exclusively vested in and reserved to Congress under said Commerce Clause:

Hall v. *DeCuir* (1877), 95 U. S. 485;
Minnesota Rate Cases (1912), 230 U. S. 352, 399-400;
Kelly v. *Washington* (1937), 302 U. S. 1, 9, 14-15;
Milk Control Board v. *Eisenberg Farm Products* (1939), 306 U. S. 346, 351;
Edwards v. *California* (1941), 314 U. S. 160, 174, 176.

Compare:

Parker v. *Brown* (1942), 317 U. S. 341, 362-363.

(2) This Court has likewise held that a state cannot validly enact a statute which, by necessary and inevitable effect, substantially and directly regulates (as the Arizona Train Limit Law admittedly does) the conduct of interstate commerce extra-territorially, that is to say, in other states:

Hall v. *DeCuir* (1877), 95 U. S. 485, 488;
Bowman v. *C. & N. W. Ry. Co.* (1888), 125 U. S. 465, 486;
South Covington R. Co. v. *Covington* (1915), 235 U. S. 537, 547-548.

Compare:

Olmsted v. *Olmsted* (1910), 216 U. S. 386, 395;
Home Insurance Co. v. *Dick* (1930), 281 U. S. 397, 410;
Baldwin v. *Seelig* (1935), 294 U. S. 511, 521;
Magnolia Petroleum Co. v. *Hunt* (Dec. 20, 1943), October Term, 1943, No. 29.

(3) This Court has likewise held and decided that a state law or regulation which, even though claimed to have

been enacted in the interest of public safety or convenience or some other object associated with the police power of the state, in fact directly, substantially, and unreasonably obstructs, burdens, and interferes with interstate commerce (as does the Arizona Train Limit Law), is in violation of the Commerce Clause, and therefore invalid.

Kansas City S. R. Co. v. *Kaw Valley District* (1914), 233 U. S. 75, 79;

Seaboard Airline R. Co. v. *Blackwell* (1917), 244 U. S. 310;

M-K & T. R. Co. v. *Texas* (1918), 245 U. S. 484, 488;

St. Louis-San Francisco R. Co. v. *Railroad Commission* (1921), 254 U. S. 535, 537;

La Coste v. *Dept. of Conservation* (1924), 263 U. S. 545, 550;

Foster-Fountain Packing Co. v. *Haydel* (1929) 278 U. S. 1;

Compare:

Minnesota Rate Cases (1912), 230 U. S. 352, 400;

Milk Control Board v. *Eisenberg Farm Products* (1939), 306 U. S. 346, 351;

Edwards v. *California* (1941), 314 U. S. 160, 174, 176.

(4) This Court has further held and decided that when Congress has undertaken to regulate with respect to a particular phase or subject matter of interstate commerce, any state statute purporting to regulate the same subject matter, whether already existing or thereafter enacted, forthwith becomes void and of no effect, because the states are powerless either to annul, augment, or supplement the congressional regulation.

Erie R. Co. v. *New York* (1914), 233 U. S. 671;

New York Central R. Co. v. *Winfield* (1917), 244 U. S. 147;

Pa. R. Co. v. *Public Service Commission* (1919), 250 U. S. 566, 569;

Napier v. *Atlantic Coast Line R. Co.* (1926), 272 U. S. 605, 612;

Chesapeake & Ohio R. Co. v. *Stapleton* (1929), 279 U. S. 587, 592;

Kelly v. *Washington* (1937), 302 U. S. 1, 10-13;

Welch Co. v. *New Hampshire* (1939), 306 U. S. 79, 85.

The challenged Train Limit Law is claimed by the appellee to be necessary as a safety measure, because trains longer than permitted by the law (70 freight, or 14 passenger cars) assertedly cannot be safely controlled while in motion or stopped by the use of the present types of air brakes. The Federal Safety Appliance Act (45 U. S. Code, Sections 1, 9), and the Safety Section of Part I of the Interstate Commerce Act (49 U. S. Code, Part I, Section 25), require that trains of interstate railroads be equipped with air brakes, adequate to control and stop them safely, and that trains longer than can be thus controlled shall not be run. The Interstate Commerce Commission has issued its own regulations covering the subject matter, acting pursuant to the authority conferred by Congress. Compare:

Virginian Railway Co. v. *U. S.* (1915), 233 Fed. 748;

U. S. v. *Great Northern R. Co.* (1916), 229 Fed. 927;

Pa. R. Co. v. *U. S.* (1917), 241 Fed. 824;

New York Central R. Co. v. *U. S.* (1924), 265 U. S. 41, 46.

The Federal Safety Appliance Act has been declared by this Court to have been enacted in order to promote safety of railroad operation.

Johnson v. *Southern Pac. Co.* (1904), 196 U. S. 1, 17;

New York Central R. Co. v. *U. S.* (1924), 265 U. S. 41, 45-46;

Tipton v. *A. T. & S. F. Ry. Co.* (1935), 78 Fed. (2d) 450; (1936), 298 U. S. 141;
U. S. v. *California* (1936), 297 U. S. 175.

(5) This Court has further held and declared that a state law or regulation, although purporting to have been enacted under the police power, must be held invalid, in violation of the Due Process Clause of the 14th Amendment to the Constitution of the United States, if it is shown that said law bears no reasonable relation to its claimed or purported object, but instead is arbitrary and capricious, and the cost of obedience, when considered with other factors of the case, is wholly out of proportion to any possible benefits.

Mugler v. *Kansas* (1887), 123 U. S. 623, 661;
Minnesota v. *Barber* (1890), 136 U. S. 313, 319;
Norfolk & Western R. Co. v. *Public Service Commission* (1924), 265 U. S. 70, 74;
Liggett v. *Baldridge* (1928), 278 U. S. 105;
Lehigh Valley R. Co. v. *Commissioners* (1928), 278 U. S. 24, 33;
A. T. & S. F. R. Co. v. *Railroad Commission* (1931), 283 U. S. 380, 395-396;
Southern Ry. Co. v. *Virginia* (1933), 290 U. S. 190;
Nebbia v. *New York* (1934), 291 U. S. 502, 525;
N. C. & St. L. R. Co. v. *Walters* (1935), 294 U. S. 405.

The trial court's findings demonstrate that the challenged law does not in fact promote safety of railroad train operation, because it does not remove or measurably reduce any hazard associated with such operation, but on the contrary increases certain of the hazards attendant upon such operation, and creates certain other hazards which would not otherwise exist; that it necessarily and inevitably imposes upon appellant, as a result of enforced compliance with its provisions, a great and wholly uncompensated burden of

expense and interference. These findings are based upon evidence received at the trial, the truth and competence of which was not challenged by appellee.

(F) The great weight of authority in the inferior federal courts, in cases where the same or substantially similar state regulations have been assailed as invalid under the Constitution of the United States, directly upholds the contentions of appellant with respect to the Arizona Train Limit Law.

Thus, in

A. T. & S. F. Ry. Co. v. *La Prade* (1933), 2 Fed. Supp. 855, a special three-judge court for the District of Arizona, in suits brought to enjoin the enforcement of the Arizona Train Limit Law, unanimously held said law to be invalid and unconstitutional, upon the precise federal grounds now urged by appellant herein.

The conclusions expressed in that opinion were given no effect, solely because of the holding of this Court (*Ex Parte La Prade* (1933), 289 U. S. 444) that the suit in the district court had abated because of the substitution of the incoming attorney general for the original defendant. No question was presented to or passed upon by this Court, other than the propriety of said substitution.

In *Southern Pacific Co.* v. *Mashburn* (1937), 18 Fed. Supp. 393, a special three-judge Court for the District of Nevada also unanimously held invalid the Nevada Train Limit Law, enacted in 1935, which prohibits the operation in that state of railroad trains of more than 70 cars, exclusive of caboose; again upon precisely the same federal grounds now urged by appellant in the present suit. A permanent injunction was issued accordingly.

A special three-judge court for the Eastern District of Louisiana also unanimously held invalid the Louisiana Train Limit Law, enacted in 1936, prohibiting the operation

of freight trains of more than 70 cars, exclusive of caboose, and passenger trains of more than 16 cars. The case is unreported, but identified upon the records of that court as:

Texas & New Orleans R. Co. v. *Martin, et al.* (1936), No. 428-Equity.

In *M-K-T Ry. Co.* v. *Williamson* (1941), 363 Fed. Supp. 607, a special three-judge court for the District of Oklahoma, with one member dissenting, held the Oklahoma Train Limit Law, enacted in 1937 (which forbids the operation of trains of more than 70 cars), to be valid, against an attack based upon the same grounds urged in the instant case; except that the opinion of that court indicates that it was not contended in the suit that the law should be held invalid because of extra-territorial effect: a point which is here strongly relied upon.

In *Southern Pacific Co.* v. *Railroad Commission of California* (1935), 10 Fed. Supp. 918, a special three-judge court for the Northern District of California held invalid, under the Commerce Clause, and the Due Process Clause of the 14th Amendment, an order of the Railroad Commission of California requiring the plaintiff company to place an additional caboose on each of its freight trains of more than 57 cars operating over its main line between Roseville, California, and the California-Nevada boundary, during the six winter months. The grounds of decision were substantially identical with the grounds of invalidity of the Arizona Train Limit Law here urged; and the court referred with approval to the decision of the special court for the District of Arizona in *A. T. & S. F. Ry. Co.* v. *La Prade*, 2 Fed. Supp. 855.

No appeal was ever taken from the decisions of the several district courts in the cases referred to in this paragraph; and except for the decision of the District Court for Arizona involving the Arizona Train Limit Law, each of

said decisions became final and has ever since been observed.

Summarizing, there have been four cases in the federal district courts involving the validity of state train limit laws, heard before twelve different federal, circuit, and district judges. Ten of said judges have taken the view that state train limit laws, exactly or essentially similar to the Arizona law, are invalid upon precisely the same constitutional grounds urged in the present case. Only two of the twelve judges have taken the contrary view.

(G) The opinion and decision of the Supreme Court of Arizona show that that Court intended to determine, and necessarily determined, the issues in this case which arise under the Constitution of the United States, as well as those arising under the Constitution and laws of Arizona; and further show that the decision does not rest upon an independent state ground adequate to support it.

The trial court's judgment clearly and distinctly held the Train Limit Law invalid, not only under the State Constitution, but also under the Federal Constitution and statutes: the several grounds of invalidity are separately set forth therein. The Supreme Court of Arizona recognized that the trial court's judgment was predicated upon these several grounds, for in the opinion (p. 2) it quoted from the text of that judgment; and thereafter it concluded its opinion by declaring (p. 14) "that the findings and judgment of the trial court to the effect that the Train Limit Law is unconstitutional were in error," and reversed said judgment.

That reversal operated to overturn the trial court's judgment in its entirety; that is to say, the trial court's conclusions upon the issues under the Federal Constitution, as well as under the state constitution, were reversed and set aside. If the reversal had been restricted to the state issue only, with intent not to pass upon the federal issues, the

trial court's conclusions (as expressed in its judgment) that the challenged law is invalid under the Federal Constitution would not have been affected; so that the judgment, to the extent that it constituted a decision of the federal issues, would have remained unimpaired, and the challenged law would have continued to stand adjudged to be invalid. The only way in which the Supreme Court of Arizona could have reversed the trial court's judgment without qualification (as it did) was by holding that that judgment was erroneous in its disposition of the federal issues, as well as the state issue. If the state issue only had been decided, then the conclusion that "the judgment is reversed," set forth in the last sentence of the opinion, would have had no adequate support; it becomes a complete and effective reversal of the trial court's judgment because, and *only* because, it is supported by the court's determination of the federal issues.

The scope of the decision, and the Court's intentions in this behalf, are also shown by its reference to and quotation from the majority opinion in the *Oklahoma Train-Limit Case: M-K-T Ry. Co.* v. *Williamson*, 36 Fed. Supp. 607. These quotations (pp. 10-12 of the opinion) set forth the conclusions of the special district court for Oklahoma, upon the various grounds of attack under the Federal Constitution directed against the Oklahoma Train-Limit Law. Except that the question of extra-territorial effect was not there involved, these are largely the same grounds as urged in the instant case, and are exclusively federal in character.

It is submitted that the decision of the Supreme Court of Arizona constituted a determination of issues arising under the Federal Constitution, which determination was necessary to the decision, and that said decision does not rest upon an independent state ground adequate to support it irrespective of said federal grounds of decision.

VI. *The following decisions of this Court are believed to sustain the jurisdiction of the Court in the premises:*

C. B. & Q. R. R. Co. v. *Drainage Commissioners* (1906), 200 U. S. 561, 580-581;
West Chicago Street Ry. Co. v. *Chicago* (1906), 201 U. S. 506, 519-520;
Second Natl. Bank v. *First Natl. Bank* (1917), 243 U. S. 600;
Whitney v. *California* (1927), 274 U. S. 357, 360-361;
Bryant v. *Zimmerman* (1928), 278 U. S. 63, 68;
Milheim v. *Moffat Tunnel Dist.* (1923), 262 U. S. 710, 716;
Abie State Bank v. *Bryan* (1931), 282 U. S. 765, 773;
Senn v. *Tile Layers Union* (1937), 301 U. S. 468, 476;
Cheseboro v. *Los Angeles County Dist.* (1939), 306 U. S. 459, 462-463;
Tulee v. *Washington* (1942), 315 U. S. 681, 682;
Standard Oil Co. v. *Johnson* (1942), 316 U. S. 481, 483;
Largent v. *Texas* (1943), 318 U. S. 418, 421.

Dated March 7th, 1944.

Respectfully submitted,

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APPENDIX A.

Paragraphs 10, 11 and 12, of Part 3 of Defendant's Answer in State of Arizona, Etc., Plaintiff, v. Southern Pacific Company, Defendant. Superior Court of Arizona, Pima County, No. 20087.

"10. *The Train-Limit Law violates the Commerce Clause of the Federal Constitution.*

Said Train-Limit Law is unconstitutional and void, as to each and all of the interstate trains of the defendant, in that it conflicts with and violates the Commerce Clause (Paragraph 3 of Section 8, Article I) of the Constitution of the United States; because:

(a) The permissible number of cars in an interstate railroad train passing from one state to another, or passing from one state through another into a third, or passing through a number of states, is a subject over which exclusive legislative jurisdiction was and is vested in Congress by said Commerce Clause;

(b) The necessary effect of said law is: (1) to impose a direct and substantial burden upon, and directly and substantially to interfere with, delay, and regulate, the operation of defendant's interstate freight and passenger trains across and within Arizona, as well as in California and New Mexico; (2) to determine the number of interstate trains to be run by defendant, not only within Arizona, but also within adjoining portions of California and New Mexico; and (3) to impair the usefulness of the facilities used, as well as those usuable, by the defendant in the carriage of interstate commerce across, through, into, and out of, the State of Arizona.

11. *The Train-Limit Law violates the Due-Process Clauses of the Fourteenth Amendment to the Federal Constitution and Article II, Section 4, of the State Constitution.*

Said Train-Limit Law is further unconstitutional and void, and in violation of the aforesaid Commerce Clause

of the Constitution, and also operates unreasonably and arbitrarily to deprive defendant of its property without due process of law, in violation of the Due-Process Clause of the Fourteenth Amendment to the Constitution of the United States, and the Due-Process Clause set forth in Section 4 of Article II of the Constitution of the State of Arizona, because:

(a) It fixes maximum train lengths very much lower than those which generally obtain elsewhere throughout the United States, under operating conditions substantially the same as those on defendant's main lines in Arizona;

(b) It makes no allowance for grade or other operating conditions, or for the construction, type, weight, or length of the cars composing the train, or whether such trains are loaded or empty, and if loaded the weight of the load;

(c) It imposes a great and substantial burden of expense upon, interference with, and delay to, interstate commerce and impairs the usefulness of defendant's transportation facilities; and

(d) It bears no reasonable relation to health or safety.

12. *The Train-Limit Law conflicts with Federal Legislation.*

Said Train-Limit Law is further void, invalid, and unenforceable, for the reason that it is in conflict with, and/or an infringement upon, legislation heretofore enacted by Congress, pursuant to its powers under the Commerce Clause of the Constitution, in the following respects:

(a) To the extent that said Train-Limit Law is or may be intended to prevent the use of heavy locomotives in the State of Arizona, and thus to regulate locomotive sizes, it is an infringement upon and in conflict with statutes enacted by Congress pursuant thereto, having the same or a like purpose, to wit, the Boiler Inspection Act of February 17, 1911 (36 Stat. 913), as amended in 1913, (38 Stat. 1192) and in 1924 (43 Stat. 659), being Sections 23 to 35, inclusive, of Title 45 of the United States Code,

wherein and whereby full power over the size, design, weight or construction of locomotives was delegated to and is now vested in the Interstate Commerce Commission;

(b) To the extent to which said Train-Limit Law is intended to or has or may have the effect of limiting the number of cars in a freight or passenger train to the maximum number which properly and with reasonable safety can be controlled in one train by the type of air brakes and their appurtenances now used on such trains, or by any other form of train-control devices or other safety devices, it is void, in that it attempts to and does enter a legislative field already entered and therefore completely occupied by Congress; the Congress having, under the Commerce Clause, by the enactment of the power-brake provisions of the Safety Appliance Act, as amended (Sections 1 and 9 of Chapter 1 of Title 45 of the United States Code), and the provisions of Section 26 of the Interstate Commerce Act (Section 26 of Chapter 1 of Title 49, of the United States Code), delegated to the Interstate Commerce Commission full and complete authority to investigate and determine the adequacy of the air-brakes, and their appurtenances, and other forms of train-control and other safety devices, used or proposed to be used upon locomotives and cars operated in interstate commerce, and by order to prescribe the form and type of such air-brakes, appurtenances and other train-control and safety devices, and from time to time to issue such amendatory and supplementary orders as it may deem necessary or desirable in the exercise of the power and jurisdiction thus conferred by Congress; and the Congress having, in particular, in and by said statutes, necessarily empowered said Interstate Commerce Commission to determine whether the types of air-brakes, and their appurtenances, presently used or proposed to be used upon trains in interstate commerce, are or will be adequate and effective, safely and properly to control and to stop trains of the lengths now being operated in interstate commerce, both in the State of Arizona and elsewhere, by the defendant and by other railroad common carriers throughout the United States."

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APPENDIX B.

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA IN AND FOR THE COUNTY OF PIMA

No. 20087.

STATE OF ARIZONA, ex rel., Joe Conway, Attorney General of the State of Arizona, *Plaintiff*,

vs.

SOUTHERN PACIFIC COMPANY, a corporation, *Defendant*.

Memorandum Opinion.

This suit, brought by the State of Arizona at the relation of the Attorney General, is a civil action, seeking to recover from the defendant railroad company, which is an interstate carrier, penalties for violations of what is known as the Arizona Train-Limit Law. The complaint contains two causes of action; one charges the operation on March 2, 1940, of a passenger train containing sixteen cars; and the other alleges that on April 4, 1940, a freight train containing ninety-one cars was unlawfully operated. Both trains were operated west out of the Tucson yards. The defendant frankly admitted the operations complained of, but sought to avoid the penalties by asserting that the law in question was and is invalid and unconstitutional as applied to its interstate trains and traffic, because in conflict with various provisions of the State and Federal constitutions, which sections are hereinafter more particularly referred to.

The trial of these issues commenced November 19, 1940, and closed May 1, 1941, there being a number of intervening recesses; in all forty-six court days out of thirteen different weeks were consumed in the trial. Seventy-three different witnesses testified, many of whom came from all parts of the United States, and some 402 exhibits were offered in evidence.

The law under attack was enacted by the Legislature of the State of Arizona and approved by the Governor on May 16, 1912. A referendum was invoked and at a general State election, held November 5, 1912, the law was approved by a

majority of the voters. It now appears as Section 69-119, Arizona Code Annotated, 1939. Since its adoption in 1912 this law, with but few exceptions and over short periods, has been enforced by the State and its terms complied with by the defendant. A notable exception is that by sufferance of the State the operations from the California-Arizona line into the Yuma yards has never been treated as within the purview of the law.

Briefly, the law provides that it shall be unlawful for a freight train consisting of more than seventy cars, exclusive of caboose, or a passenger train containing more than fourteen cars to be operated in the State of Arizona, and it provides a penalty of not less than $100.00, nor more than $1,000.00 for each violation thereof. The law when passed was entitled, "An Act Limiting the Number of Cars in a Train", without any preamble reciting its basic purpose. This Court will assume, for the purpose of determining this matter, that the law was enacted under the inherent police power of the State to promote and provide greater safety of persons and property, for it is fundamental that the State can only interfere in matters affecting interstate commerce where the health, safety or welfare of its citizens may so require, and then only when the law is reasonably adapted to accomplish the end sought to be attained.

The sole question, then, before the Court is as to the constitutionality of the Arizona Train-Limit Law as applied to defendant's interstate operations under the conditions as they have been shown to exist during the period covered by the record in this case. For, even though the law may have been constitutional when enacted in 1912, it does not prevent the Court from a re-examination to determine whether conditions may have changed so as to render it arbitrary and unreasonable, considered in the light of the changes. This record discloses that the present conditions, upon which the plaintiff must rely, are vastly and fundamentally different from those existing when the law was passed. Both the rolling equipment and the fixed plant have been practically completely changed, this through the medium of extensive improvement and reconstruction. Operating methods have been substantially modified. The volume and character of the traffic are quite different from that which

was carried in 1912. As a matter of fact, the law had no appreciable adverse effect on defendant's operations when enacted, for the reason that freight trains then averaged but forty-seven cars and only 0.38% of the trains had more than seventy cars. Passenger trains only averaged nine or ten cars. By September of 1913 the entire Southern Pacific System in Arizona had only some two miles of its track protected by block signals.

In determining the constitutional questions raised in this case I have constantly kept in mind the admonition of the present Chief Justice of the United States, wherein he said: "The power of courts to declare a statute unconstitutional is subject to a guiding principle of decision which ought never to be absent from judicial consciousness. This is that the Courts are concerned only *with the power to enact statutes, not with their wisdom.* For the removal of unwise laws from the statute books appeal lies not only to the courts but to the ballot and to the processes of democratic government."

There can be no question but what the presumption is in favor of every legislative act, and the whole burden of proof lies on him who denies the constitutionality. The defendant here has been required to assume that full burden. The constitutional invalidity must be manifest and if it rests upon disputed questions of fact, the invalidating facts must be proved.

Here there is being called in question the validity of a statute which has been upon our books for more than twenty-eight years. It was not only passed by the Legislature, but subsequently approved by the people themselves in a referendum. More recently the Fifteenth Legislature made a special appropriation of a substantial amount to defend and sustain this law. This Court fully appreciates the delicacy of the situation and the great responsibility of rendering a judgment thereon. It is sometimes said that the court assumes a power to overrule or control the action of the people, or their representatives. This is a misconception. Our constitutions are the supreme laws of the land ordained and established by the people. All legislation must conform to the principles they lay down. When an act of a State Legislature is appropriately challenged in the

courts as not conforming to the constitutional mandate the judicial branch of the Government has only one duty—to lay the article or articles of the constitution which are invoked beside the statute which is challenged and to decide whether the latter squares with the former. All the court does, or can do, is to announce its considered judgment upon the question. The only power it has, if such may be called, is the power of judgment. This court neither approves nor condemns any legislative policy. Its delicate and difficult office is to ascertain and declare whether the legislation is in accordance with, or in contravention of, the provisions of the Constitution; and, having done that, its duty ends.

For some five and a half months I listened to the evidence adduced from the witness stand. In the intervening months, to refresh my memory, I have read the eighteen volumes comprising the Reporter's Transcript, which contains more than a million words; the numerous exhibits have been re-examined, the comprehensive briefs submitted by counsel for both parties, the last of which reached me on December 20, 1941, have been carefully studied and the hundreds of cases therein cited examined and it is now my matured conclusion that the Arizona Train-Limit Law is unconstitutional and void and I would be unworthy of the position that I hold if I did not have the courage to so declare it, irrespective of the effect of the ruling upon the parties, or those heretofore benefited thereby.

It should be remembered that this case is unique in at least two respects: It is the first train limit case to reach the State courts; second, it is the first time in the United States that the evidence in such a case has been taken before a trial judge. There are only four cases that are squarely in point, they are: The first Arizona case, the Nevada case, the Oklahoma case, and the Louisiana case. In the latter case no opinion was filed and, hence, it does not appear as a reported case. All of the four cases were brought in the Federal Court and determined by a special three-judge court. The evidence was either taken by a special master or the matter submitted on affidavits as in the Oklahoma and Louisiana cases. Admittedly none of the decisions in the four cases above referred to are controlling upon this Court. The Oklahoma law was sustained by a divided Court, while

the courts in the other three cases declared the law under attack as unconstitutional. The first Arizona case was appealed to the Supreme Court of the United States and reversed on a jurisdictional ground without passing upon the merits. However, the opinions are of value in their logic and reasoning in passing upon identical questions as those here presented.

As a brief review of this type of legislation, the testimony of Dr. Parmelee, who is the Director of the Bureau of Railway Economics of the Association of American Railroads, shows that though forty-four different bills attempting to regulate the length of trains have been introduced in thirty-five different states, it was only in Arizona (1912), Nevada (1935), Louisiana (1936) and Oklahoma (1937) that such laws were actually passed. Three such measures were defeated in Congress. Only Arizona and more recently Oklahoma have actually operated under such laws. The Nevada and Oklahoma statutes affected only the length of freight trains, no mention being made of passenger-train operations.

As a part of its comparative showing as to costs and methods of operation, casualties, etc., the defendant presented the National picture of railroading by witnesses, who are outstanding in their respective fields, from sixteen of the Class I roads of the United States. The railroads from which these witnesses came perform fifty-nine per cent of the freight service, sixty per cent of the passenger service, and operate fifty-four per cent of the Class I railroad mileage of America. This evidence clearly establishes that "long-train" operating practice is the customary and ordinary practice throughout the United States and that improvements in efficiency, economy and safety are an accomplishment and necessary result of the adoption of that practice. This type of operation is unquestionably more economical and efficient than "short-train" operations. Freight train expenses vary inversely with train length. Furthermore, long-train operations permit improved schedules and performance by elimination of short-train interference. Operating conditions, including grades and curves on defendant's lines, in Arizona were not shown to be essentially different from those in other parts of the

United States. As a matter of fact, eighty-four per cent of defendant's main lines in Arizona are tangent (straight) track, and of the sixteen per cent that is curved only one per cent has curves of more than six degrees. Between March 2d and April 30th, 1940, the defendant's operations were carried on without regard to the restrictions of the train-limit law, during which period some sixty-two long passenger trains and some 302 long freight trains were operated without particular incident. This further indicates that long-train operations can be successfully carried out over the Arizona lines.

I shall not attempt in this opinion, as no good purpose could be served thereby, to make an analysis of the evidence, as that will be covered by the findings of fact filed this day. Nor shall I attempt to review and differentiate the numerous cited cases which lay down the principles of law governing these matters. I shall content myself with stating some of the principal reasons leading to the conclusion announced.

There is a field of regulation of interstate activities which, under the commerce clause, is exclusively reserved to the National Government, and I am firmly convinced that the subject of the length of trains engaged in interstate traffic falls within that class. This for the reason that the subject matter is national in its character, requiring uniformity of regulation by a single authority. If each state was at liberty to regulate the conduct of carriers while within its jurisdiction, the confusion likely to follow could not but be productive of great inconvenience and unnecessary hardship. The very purpose of the commerce clause was to insure uniformity of regulation of interstate commerce against conflicting and discriminating state legislation, such as the law in question. The absence of any act of Congress on the subject of train lengths is equal to its declaration that commerce in that matter shall be free. In other words, the inertia of government should be on the side of freedom of commerce, rather than on the side of restraint of commerce. The determination of this entire case might well be decided upon this exclusive federal field doctrine, which is in effect saying that Arizona never had the right to pass this legislation in the first instance.

There is a second so-called "joint" field of regulation, relating to those matters which require diversity of treatment according to local conditions, where the states may act within their respective jurisdictions, unless and until Congress sees fit to exercise its paramount authority. But even if the law in question were found not to fall in the "exclusive Federal field," but rather in the "joint field" of regulation, still the law must be stricken down for the reason that in my opinion Congress has, by the enactment of the Safety Appliance Act, Boiler Inspection Act, etc., coupled with the broad powers delegated to the Interstate Commerce Commission, fully "occupied" this joint field of regulation. This would automatically oust the State of any power to supplement or expand such regulations any more than it could annul or amend them. Clearly if the law is necessary as a safety measure because "long trains" cannot be properly controlled and stopped with the present types of air brakes, then it gets over into a field already occupied by the Congress through the passage of the safety acts above referred to. Engineer Thrace Cooper of the Santa Fe System called by the State testified: "Your ability to control slack in a train rests solely on your ability to apply and release the brakes throughout the train."

There is still another infirmity to overcome: Any laws enacted by the State in the concurrent field must not be unreasonable or arbitrary and must not *substantially or directly* regulate, obstruct, impede or burden interstate commerce, *incidental or indirect interference* being all that is permitted.

The heavy direct burden cast by the law upon interstate commerce can not be seriously questioned and the impairment of the efficient use of defendant's property is of itself an unlawful taking of that property without due process of law, which is a violation of both the State and Federal constitutions. The fact that it costs the defendant in excess of $300,000.00 a year to comply with this law would not of itself, standing alone, warrant invalidating the law, providing it was otherwise valid and bore some reasonable relation to the purpose for which it was enacted. The cost of compliance, however, with a statute of this kind is an element for appropriate consideration in determining whether

the statute is arbitrary, capricious or repugnant to due process, and this factor has been so considered in arriving at a decision in this case.

The record here also amply discloses that the law causes real interference with, and delay to, interstate commerce, practically to the extent that Arizona operations create a bottle-neck. Actually ninety-three per cent of the freight traffic and ninety-five of the passenger business of the defendant in Arizona is interstate commerce. Furthermore, the law certainly imposes a great, substantial and wholly unreasonable burden of expense upon this interstate traffic. To hold in this case that interstate commerce was only incidentally or indirectly involved would be less than realistic, for the interference and regulation is *substantial, continuous, direct and unavoidable*, as is pointed out in detail in the findings of fact. What is even more serious from the standpoint of those who seek to uphold the Act is its extra-territorial effect. The challenged law lays hands upon interstate commerce moving over defendant's lines long before it reaches the physical boundaries of Arizona, and continues directly to affect and regulate that commerce long after it has left Arizona. As a practical matter, it nearly controls the length of passenger trains from Los Angeles to El Paso, and of freight trains from Yuma to Lordsburg, the latter point being twenty-three miles East of the State line, and frequently on to El Paso, 171 miles beyond Arizona's boundary. Under the decided cases it is fatal for any police power statute to operate with extra-territorial effect, and under the guise of the police power no state may thus directly interfere with interstate commerce.

Even if the proponents of the law were able to clear all of the other hurdles heretofore discussed, there would then arise the hotly contested question as to whether this train-limit-law actually bears any reasonable relation to safety. The Statute was unquestionably enacted under the police power, which is that undefined branch of government which bears the same relation to the State that the principle of self defense bears to the individual. Police power is founded upon public necessity and only public necessity can justify its exercise. If the law in question

does not promote the safety of employees and travelers upon the defendant's railroad lines, and others who are affected by said operations, then it must fall.

There need be no speculation as to the effect of the law (as would be the case if this were a recently enacted statute whose prospective effect might be problematical) for the reason that the Interstate Commerce Commission, by its regulations, and the Congress by legislative enactment, have required this defendant and all other railroads to file detailed monthly reports of accidents and casualties occurring in connection with their operations. Furthermore, all of the more serious accidents are investigated by a representative of the Commission.

The defendant established the fact that operating conditions on its lines across the Salt Lake Division, through the State of Nevada, where "long-train operations" are the rule, are entirely comparable in practically every respect to the operations on the Tucson division, in the State of Arizona. These latter operations being restricted by the law in question.

Detailed exhibits as to accidents and casualties of all types and classes were introduced in evidence. These exhibits covered operations particularly in Nevada and Arizona, as well as showing the National picture as a whole. From this evidence the Court is able to draw an irrefutable and striking comparison as to casualties under the "long" and "short" train operations.

Considering, first, passenger-train operations, the record shows that the casualty rates in Arizona, on the train-mile or any other recognized basis, are nearly twice what they are in Nevada. The Santa Fe operations in Arizona show the same trend. Surely the ultimate test of increased hazard is to be found in the actual record of casualties covering a twenty-eight year period.

From the standpoint of the safety of persons and property, slack and slack-action casualties on passenger trains are of no significance whatever.

Long-train method of operation prevails in passenger service all over the United States, except in Arizona, and the statistics demonstrate, from the safety angle, that the fourteen-car limit has no logical or reasonable basis. Fur-

thermore, long passenger-train operations in Arizona are entirely practicable and would result in greater efficiency, economy and safety.

Hence, certainly as applied to passenger-train operations, the challenged law bears no reasonable relation to its claimed object of safety, and instead of promoting that object actually increases many hazards, and creates many others which would not exist if the law were not enforced.

In passing it might not be amiss to call attention to the splendid stride that has been made throughout the United States in recent years in reducing casualties. Arizona to a limited extent has shared in these reductions. This record shows that on the Class I roads the casualty rate for the years 1935-1939 was 10.63 per hundred million passenger miles, which is another way of saying that there was a casualty to a passenger for every 9,407,000 miles of traffic.

Considering next freight-train operations: The same careful records are kept of these operations as is required by the I. C. C. of passenger-train operations, which includes reporting all train accidents where the damage exceeds $150.00, of all train service accidents and non-train accidents resulting in casualties to persons. If an employe is injured to the extent that he is incapacitated for work for a three-day period, within ten days after the accident it is classified as a casualty and becomes reportable. If a passenger is incapacitated for one day it is reportable as a casualty. (The term casualty includes fatalities.) As a matter of fact ninety per cent of accidents resulting in fatalities to passengers or trainmen are investigated by a representative of the I. C. C., and it is rather significant that they have failed to find or report in any one year that the length of trains had anything to do with the number of casualties.

Furthermore, this record contains exhibits comparing the defendant's freight-train operations in Arizona with its operations in Nevada and New Mexico, as well as the Class I roads of America. The element of speculation as to the result of long and short-train operations, is therefore largely eliminated. From all of which it appears very definitely that there are more accidents and they occurred more frequently in proportion to trains handled or traffic

moved in short-train territory than in long-train territory. Reference is made to the findings of fact for details to support this statement.

The frequency of train and train-service accidents, which includes grade-crossing accidents, appears to be directly related to the number of train units operated and that when more train units are run than are necessary to handle a given amount of traffic, the hazard or accidents in the handling of such traffic is correspondingly increased. When one considers that in the year 1938, for instance, that 30.8% or 4,304 more freight trains were operated between Yuma and El Paso than were actually necessary if it had not been for this law, it becomes apparent why the casualty rate is higher in Arizona.

Also it is clear that the reason defendant is unable to effect improvements in the efficiency and economy of its freight-train operations in Arizona comparable to those achieved in neighboring states, or upon its system generally, is primarily due to the restrictions imposed by the Arizona law.

In arriving at a decision in this case I have not overlooked, nor minimized, the type of casualty caused by the sudden start, stop, lurch and jerk of the train or car, commonly known as slack action casualties, which are so dreaded by every trainman. While slack action cannot be prevented, it must be controlled. A certain amount of slack is absolutely necessary to train operations. It cannot be denied that the addition of each car to a train adds just that much more potential slack, which must be effectively handled by the engineer if serious accidents are to be avoided. To the credit of the locomotive engineers of the United States, be it said that they have, with the improved equipment and devices furnished them, manifested greater skill and exercised more care in handling these longer trains with their heavier locomotives to the extent that over a seventeen-year period (1923-1939) only six per cent of the over-all casualties were caused by this type of accident. It must also be remembered that there are many factors besides length of train causing slack-action casualties, such as: grades, speed of train, consist of train and whether loaded or empty. The record shows many severe casualties of

this type on short trains. Limiting trains to the Arizona maxima has had no perceptible limiting effect on even that class of accidents, but if it had, surely it would not be argued that the law was aimed at a definite class of hazards, to-wit: slack-action accidents, which represents but six per cent of the whole, and that the law must stand regardless of its effect on all the other classes of accidents representing ninety-four per cent of the casualties, all of which showed material increase due to the effect of the law.

Essentially then the question is not whether a given number of long trains may be operated with fewer casualties than an equal number of short trains, but rather whether the long-train method of moving the entire volume of traffic results in fewer casualties, of all classes, than the movement of the traffic in a larger number of trains of restricted length.

In determining then whether the law bears any reasonable relation to safety, only the over-all result in casualties of the entire operation should be considered and when thus weighed it is clear that the law not only does not increase safety of train operations in Arizona, but that as a matter of cold fact it makes these short-train operations more dangerous.

Thus the Arizona Train-Limit Law not only bears no reasonable relation to safety but, to the contrary, does, and if enforced will continue to, impair and lessen substantially the safety of defendant's train operations in Arizona and the adjacent affected territory.

Defendant established that if the law were invalidated it contemplated the undertaking of an immediate program to build or extend its sidings and yard tracks at forty-nine different stations so as to provide suitable trackage permitting the efficient operation of long trains. Furthermore, larger locomotives of the AC-8 type, having much greater tractive power, would be assigned to the Tucson division. This change in motive power would also necessitate reconstructing certain roundhouses and turntables and providing additional repair facilities. It was estimated that these changes would involve the expenditure of more than a million dollars.

Before closing this opinion, may I say that the arduous task of the Court has been made much easier by the very able and comprehensive manner in which the Attorneys for both of the parties have briefed both the law and the facts; I compliment each of you on the skill manifested. This assistance has been appreciated, as has all of the courtesies which were extended throughout the long trial.

At the close of the trial both parties requested the Court to make findings of fact and conclusions of law. Thereupon the Court asked that counsel for the parties submit proposed findings, which request in due time was complied with. Being now of the opinion that the findings of fact submitted by the defendant, consisting of some 200 printed pages, are well supported by the record, the Court therefore adopts in toto these findings of fact and conclusions of law as its own. These have been signed and are now filed with the Clerk as a compliance with Section 21-1027, A. C. A., 1939.

It necessarily follows from what has been said that the Court considers the Train-Limit Law as being wholly void, invalid and unenforceable as to the interstate operations of the defendant, by reason of being in conflict with the Commerce Clause and the Due Process Clause (Fourteenth Amendment) of the Constitution of the United States, as well as the Due Process Clause of the Constitution of the State of Arizona. The Defendant is, therefore, entitled to judgment dismissing the Plaintiff's Complaint, and each count thereof, and for its costs of suit herein expended. IT IS SO ORDERED.

Done in open Court this 11th day of February, 1942.

LEVI S. UDALL,
Presiding Judge in the Above Entitled Case.

APPENDIX C.

December 23, 1943.

IN THE SUPREME COURT OF THE STATE OF ARIZONA.

No. 4525

STATE OF ARIZONA ex Rel. JOE CONWAY, Attorney General of the State of Arizona, *Appellant*,

vs.

SOUTHERN PACIFIC COMPANY, a Corporation, *Appellee*.

Appeal from the Superior Court of Pima County. Honorable Levi S. Udall, Judge. Judgment Reversed.

Joe Conway, Attorney General; Earl Anderson, Assistant Attorney General; Charles L. Strouss, of Counsel, all of Phoenix, Arizona, Attorneys for Appellant.

Cleon T. Knapp, James P. Boyle, B. G. Thompson, all of Tucson, Arizona; Henley C. Booth, Burton Mason, both of San Francisco, California, Attorneys for Appellee.

STANFORD, *J.*:

This action is brought under the provisions of Section 69-119, Arizona Code Annotated, 1939, (Laws, 1913, Referendum, p. 15; Sections 2166-2168, Revised Statutes of Arizona, 1913; Civil Code; Section 647 Revised Code of Arizona, 1928), being the act commonly called the Train Limit Law, and was brought for the purpose of recovering from defendant penalties as provided by the act. The charge in the complaint is that on March 12, 1940, the defendant operated a passenger train of more than 14 cars, and on April 4, 1940, the defendant operated a freight train of more than 70 cars, in violation of said law.

The aforesaid statute reads as follows:

> "Section 1. It shall be unlawful for any person, firm, association, company or corporation, operating any railroad in the state of Arizona, to run, or permit to be

run, over his, their, or its line of road, or any portion thereof, any train consisting of more than seventy freight, or other cars, exclusive of caboose.

"Section 2. It shall be unlawful for any person, firm, association, company or corporation, operating any railroad in the state of Arizona, to run, or permit to be run, over his, their, or its line or road, or any portion thereof, any passenger train consisting of more than fourteen cars.

"Section 3. Any person, firm, association, company or corporation, operating any railroad in the state of Arizona, who shall wilfully violate any of the provisions of this act, shall be liable to the state of Arizona for a penalty of not less than one hundred dollars, nor more than one thousand dollars, for each offense; and such penalty shall be recovered and suits therefor brought by the attorney general, or under his direction, in the name of the state of Arizona, in any county through which such railway may be run or operated; provided, however, that this act shall not apply in cases of engine failures between terminals.

"Section 4. All acts and parts of acts in conflict with the provisions of this act are hereby repealed."

The case was tried in Tucson, Pima County, Arizona, before the Honorable Levi S. Udall, Judge of the Superior Court of Apache County, Arizona, to whom it had been assigned.

By the judgment rendered it was held that the Train Limit Law of Arizona, as set forth in the sections above quoted, was unconstitutional and void because:

"First: Said statute invades the exclusive legislative field of Congress, as limited and defined by the Commerce Clause (par. 3, of Sec. 8, Art. 1) of the Constitution of the United States;

"Second: Said statute imposes direct, unreasonable and unlawful burdens upon, and interferes with, delays and obstructs interstate commerce, in violation of said Commerce Clause;

"Third: Said statute impairs the use and usefulness of the transportation facilities employed by defendant as a common carrier engaged in interstate commerce;

"Fourth: Said statute is in conflict with and infringes upon, and amounts to an unlawful attempt to supplement, the power-brake provisions of the Federal Safety Appliance Acts, and the safety-device provisions of Section 25 of the Interstate Commerce Act, which Federal statutes operate upon the same subject matter and are directed to the same objects as said Train-Limit Law and by which said statutes Congress has completely and exclusively occupied the field of regulation of train lengths;

"Fifth: Said statute operates unreasonably and arbitrarily to deprive defendant of its property, without due process of law, in violation of both the Due-Process Clause of the Fourteenth Amendment to the Constitution of the United States, and the Due-Process Clause set forth in Section 4 of Article 2 of the Constitution of the State of Arizona:"

Appellee has admitted the operation of the trains as alleged in the complaint, but alleged that each of said trains consisted in a large part of cars moving in Interstate Commerce and carrying interstate traffic, and in further explanation of appellee's case, we quote as follows:

"* * * and denied that either of said operations was a wilful violation of the law. For a further separate and affirmative defense to the complaint, appellee alleged that the law was and is void, invalid and unconstitutional, because in violation of the Commerce Clause (Article I, Section 8, para. 3) of the Constitution of the United States, the Due-Process Clause of Section 1 of the 14th Amendment of the Constitution of the United States, and the corresponding Due-Process Clause set forth in Article II, Section 4, of the Constitution of Arizona, in that: (a) the law undertakes to regulate a subject-matter of national concern which, if required to be regulated at all, is subject to regulation

only by Congress pursuant to the powers granted by the Commerce Clause; (b) the necessary effect of the law is to regulate appellee's train operations extra-territorially, that is to say, beyond the boundaries of Arizona; (c) the law directly and substantially interferes with, delays, and regulates appellee's interstate train operations in Arizona and the adjacent states; (d) the law imposes direct and substantial burdens upon the appellee's interstate train operations; (e) the law, to the extent that it has, or is intended or claimed to have, the effect of limiting the number of cars in a train to that number which can be safely and effectively controlled or stopped by the use of air brakes and other appurtenances now in use on such trains, is in conflict with and an infringement upon existing Federal legislation having the same or similar purposes, enacted by Congress pursuant to its powers under the Commerce Clause; (f) the law deprives appellee of its property unreasonably and arbitrarily, in violation of the due-process clauses of the State and Federal Constitutions above referred to, for the reason, among others, that it bears no reasonable relation to health or safety, its ostensible objects and does not eliminate or reduce any present hazard, but on the contrary creates certain hazards which would not otherwise exist, and increases other hazards of railroad operation in numerous respects."

In 1912, the year Arizona became a state, several measures were referred, under the Constitutional Act of Initiative and Referendum, to the people after their passage by the legislature. Among those measures, besides the one in question, the Train Limit Law, each had to do with the regulation through the police power of the state of railroads in Arizona for the health and safety of its employees and traveling public. That will be observed, first, by the act regulating the number of men to be employed on trains and engines; second, by the act regulating head lights on all locomotives (for example, in this particular act, it was required that locomotive engines used in the transportation

of trains over railroads should install electric head lights of a certain power); and third, by the act to require certain tests of service before a person could serve as a locomotive engineer or train conductor. It can be easily seen that all of these acts, including the one in question in this action, were made the laws of this state for the purpose of the safety and protection of employees and of the people being transported over the railroads in our state.

Appellee contends in its brief, as it did by a statement before the court in argument that "it is much more probable that the law was advocated and passed as a measure to promote and preserve—make static—the employment of railroad trainmen. Certainly that is its most obvious practical (but extra-legal) purpose and, as experience has shown, one of its principal results." We have just quoted the title to other acts, as well as this one, enacted in the year 1912 by the State Legislature. All of them have to do with the regulation of the handling of trains in order to protect the employees or traveling public as will be seen by the various acts, and no other reason could possibly be assigned to those acts, including, as stated, the one in question here. The case of *State* vs. *Pate*, (N. M.), 138 Pac. (2d) 1006, states: "The courts do not inquire into the motives of the legislature."

16 C. J. S. page 277, Sec. 100, has the following to say in connection with legislative acts:

> "It will be presumed that the legislature, in passing a statute, acted advisedly and with full knowledge of existing facts and conditions on which its legislation is based, and that no general laws are ever passed either through want of information on the part of the legislature or because it was misled by false representations of interested parties. It will also be presumed that the legislature carefully investigated and properly determined that the interests of the public required the enactment of particular legislation. So, the court will presume that the legislature in enacting a regulatory measure had adequate knowledge of the evils sought to be corrected and did not act arbitrarily or unreasonably."

In State vs. Wisconsin Telephone Co., 172 N. W. 225, 169 Wis. 198, it is said:

> "The term 'police power' is very elastic and is used to express different meanings at different times. In its broadest sense, it has been said to include 'all legislation and almost every function of civil government.'"

The case of Salem Lodge vs. Swaile, 197 N. W. 837, 209 Ind. 347, expresses the opinion that when a subject lies within the police power of the state, debatable questions as to reasonableness are not for the courts, but for the legislature which is entitled to form its own judgment, and its action within its range of discretion cannot be set aside because compliance is burdensome.

In the case of State vs. Superior Court, 174 Pac. 973, 103 Wash. 409, it is stated:

> "Indeed, it may be said that, where the police power is set in motion in its proper sphere, the courts have no jurisdiction to stay the arm of the legislative branch of the government, for it is operating in its own particular field, where even the courts are powerless to insist upon a procedure consistent with the forms of the common law."

Dwelling for the present on the contention of the appellee that the law is in conflict with the Fourteenth Amendment, we refer to the case of Barbier vs. Connelly, 113 U. S. 923, reading as follows:

> . . . . But neither the Amendment, broad and comprehensive as it is, nor any other amendment was designed to interfere with the power of the State, sometimes termed its 'police power,' to prescribe regulations to promote the health, peace, morals, education and good order of the people, and to legislate so as to increase the industries of the State, develop its resources and add to its wealth and prosperity. From the very necessities of society, legislation of a special character, having these objects in view, must often be had in certain districts, such as for draining marshes and ir-

rigating arid plains. Special burdens are often necessary for general benefits, for supplying water, preventing fires, lighting districts, cleaning streets, opening parks, and many other objects. Regulations for these purposes may press with more or less weight upon one then upon another, but they are designed, not to impose unequal or unnecessary restrictions upon anyone, but to promote, with as little individual inconvenience as possible, the general good. Though, in many respects, necessarily special in their character, they do not furnish just ground of complaint if they operate alike upon all persons and property under the same circumstances and conditions. Class legislation, discriminating against some and favoring others, is prohibited; but legislation which, in carrying out a public purpose, is limited in its application, if within the sphere of its operation it affects alike all persons similarly situated, is not within the Amendment."

Appellee has brought to the attenion of the court six certain cases in which it places great reliance. The first one is the case of A. T. & S. F. Ry. Co., et al., vs. LaPrade (1933) 2 Fed. Supp. 855. This case was tried by one Circuit Judge and two District Judges. In this case counsel in their brief have to say:

"The conclusions expressed by that opinion were given no effect solely because of the holding of the United States Supreme Court in Ex parte LaPrade (1933), 289 U. S. 444; 77 L. Ed. 1311, which decided that the suit had abated because of the substitution of the incoming attorney general for the original defendant. The Supreme Court considered no other question."

The second is the Southern Pacific Company vs. Mashburn, (1937), 18 Fed. Supp. 393. This case was tried before one Circuit Judge and two District Judges. That case was decided against the validity of the Nevada law which was patterned after the Arizona law.

The third case was Texas & New Orleans R. Co. vs. Martin, et al. (1936). This is known as the Louisiana case

and was heard by one Circuit Judge and two District Judges. It is an unreported case but the court made permanent the interlocutory injunctions issued prohibiting interference of the railroad in that state.

The fourth case is the case of M. K. & T. R. Co. vs. Williamson, 36 Fed. Supp. 607, known as the Oklahoma case. That case is like the Nevada Train Limit case except that it has reference to freight trains only. This case was heard and decided by the two Circuit Judges, District Judge Vaught dissenting.

The fifth case is State, etc. vs. A. T. & S. F. Ry. Co. et al., 125 Kans. 586; 264 Pac. 1056, a Kansas case heard by the State Supreme Court. The state, through its Public Service Commission, attempted to compel, by mandamus proceedings, the railroad company to put into effect certain orders prescribed by its relating to manual signals to be used by train crews and relating to the air and power brake system, and in part, the holding of that state court was that such an order could not be enforced by mandamus where no showing was made that a better system had been devised. The unanimous judgment was rendered for the railroad company.

The sixth case is Southern Pacific Company vs. Railroad Commission of California, 10 Fed. Supp. 918. In that case the Railroad Commission of California had ordered that certain trains moving between certain points during the six winter months be operated with an additional caboose, to be placed midway in the train. The opinion in this case was given by one Circuit and two District Judges upholding the railroad company.

In connection with the foregoing six cases we quote a statement, or contention, of the appellee herein as follows:

> "It will be noted that the four Federal train-limit cases were heard before twelve different Federal judges, five of whom were Circuit judges and seven District judges. Three of the Circuit judges and all of the District judges, or ten Federal judges in all, have agreed that state train-limit laws exactly or essentially similar to the challenged law are invalid, upon precisely the same constitutional grounds urged in the present

case. Only two of these twelve judges have taken a contrary view.

"Three of the ten Federal judges mentioned have also concurred in reaching the same result with respect to a state regulation not differing in principle from a train-limit law; although, of course, neither the volume of the traffic affected, the character and extent of the interference imposed, nor the financial burden was as severe and widespread as in the train-limit cases."

The State of Oklahoma, one of our latest additions to statehood in the union, no doubt was desirous of enacting laws that would be progressive, that would be for the safety of the traveling public through its state and for the employees on its trains. Regardless of the reasoning of the appellee herein, as above set forth, as to the total number of various judges who have in the aggregate given opinions that would overwhelm the Oklahoma case, nevertheless the Oklahoma case was not tried by state judges and it is the latest case quoted by appellee herein, and while this court is not bound to follow, it is certainly most fitting to do so.

There are something like 325 cases cited by the two parties to this action, and it would be impossible to make reference to all of them. The case of M. K. & T. R. Co. vs. Williamson, supra, is replete with the cases cited by both sides in this case, and Circuit Judge Bratton, who wrote the opinion in that case, gave expression of the court to most all the cases cited in the case. In that case, like the one at bar, the railroad company was compelled, among other things, to expend great sums of money in order to comply with the restrictions placed by the State of Oklahoma, and by injunction the railroad company sought to be relieved of the necessity of such great additional expense. We quote from said case as follows:

"It is contended with emphasis that the statute, applied to the business of plaintiff, is not a safety measure reasonably enacted in the exertion of the police power of the state, but is merely an attempt to regulate, delay and burden interstate commerce, in violation of the

Commerce Clause. The supreme, plenary and complete power of Congress to regulate interstate commerce is without limitation or restriction, except that prescribed in the Constitution; and within the reach of that paramount authority lies the power to protect such commerce against substantial dangers, burdens or obstructions, no matter the source from which the encroachment springs. Gibbons v. Ogden, 9 Wheat. 1, 6 L. Ed. 23; Minnesota Rate Cases (Simpson v. Shepard), 230 U. S. 3252, 398, 33 S. Ct. 729, (citing many other cases). Coming to apply the well-recognized doctrine many state and municipal enactments have been held invalid (citing cases).

"But every state statute having some relation to interstate commerce is not to be condemned on that ground. A state is free in the exertion of its police power to enact reasonable measures in the interest of the health, safety and welfare of its people, including employees of railroads, passengers on trains, and others, even though interstate commerce may be incidentally or indirectly involved. * * * It is crystal clear that the general principle running through all of these cases is that a state statute, enacted in the exercise of the police power, and bearing some reasonable relation to the health, safety, or well-being of the people of the state, is not to be overturned by judicial decree, even though by its necessary operation it affects interstate commerce in an incidental or indirect manner, but not otherwise. * * *.

"Plaintiff relies upon the due process clause of the Fourteenth Amendment. It is obvious that to comply with the statute plaintiff will be required to expend additional sums in the operation of its business. The cost of compliance with a statute of this kind is an element for appropriate consideration in determining whether the statute is arbitrary, capricious, or repugnant to due process; but, standing alone, it is not always enough to warrant judicial determination of invalidity. Missouri Pacific Railway Co. v. Kansas, 216 U. S. 262, 30 S. Ct. 330, 54 L. Ed. 472; Lehigh Valley Railroad Co. v. Board of Public Utility Commis-

sioners, 278 U. S. 24, 49, S. Ct. 69, 73 L. Ed. 161, 62 A. L. R. 805; Missouri Pacific Railroad Co. v. Norwood, supra. The facts presented are not sufficient to distinguish or set apart this case from those to which reference has been made in which statutes enacted in the exercise of the police power of the state were sustained, although interstate commerce was incidentally and indirectly affected and the expenditure of additional sums was necessitated.

"The remaining contention to be considered is that the statute must fall because Congress has occupied the field; that the act infringes and is in conflict with legislation heretofore enacted by Congress pursuant to its powers under the Commerce Clause. To sustain the contention, plaintiff relies upon paragraphs 10 to 17 and paragraph 21 of section 1 and section 26, of the Interstate Commerce Act, as amended, 49 U. S. C. A. Pars. 1, 26; and sections 1 and 9 of the Safety Appliance Act, as amended, 45 U. S. C. A. Pars. 1, 9. Paragraph 10, section 1, of the Interstate Commerce Act, as amended, defines the term 'car service'; paragraph 11 makes it the duty of a railroad company to furnish safe and adequate car service, and to enforce just and reasonable rules, regulations, and practices in respect of car service; paragraph 12 relates to the distribution of cars for the transportation of coal; paragraph 13 authorizes the Commission to require railroads to file with it their rules and regulations relating to car service, and empowers the Commission to direct that such rules and regulations be incorporated in the schedules showing rates, fares and charges for transportation; paragraph 14 authorizes the Commission to establish rules, regulations, and practices touching car service; paragraph 15 is addressed to the furnishing of car service and the use of facilities in case of shortage of equipment, congestion of traffic, or other emergency; paragraph 16 empowers the Commission to make just and reasonable directions in respect to the handling, routing, and movement of traffic over other lines; paragraph 17 requires railroad companies to obey orders of the Commission concerning car service, and

provides a penalty for disobedience; and paragraph 21 vests in the Commission authority to reqire any railroad to provide itself with safe and adequate facilities for performing its car service, and fixes a penalty for refusal or neglect to comply with such an order; and section 26 authorizes the Commission to order a railroad to install automatic train-stop or train-control devices or other safety devices, and fixes a penalty for the refusal or neglect to comply with such an order. Section 1 of the Safety Appliance Act, as amended, provides that no railroad company shall use on its line any locomotive in moving interstate traffic not equipped with a power driving-wheel brake and appliances for operating the train-brake system, and that no train shall be run in such traffic that does not have a sufficient number of cars in it equipped with such power and train brakes that the engineer on the locomotive can control its speed without requiring brakemen to use the common hand brake for that purpose; and section 9 provides that whenever a train is operated with power or train brakes not less than fifty per cent of the cars shall have their brakes used and operated by the engineer, that all power-braked cars in the train which are associated together with such fifty per cent shall have their brakes so used and operated that the Interstate Commerce Commission may, from time to time, increase the minimum percentage of cars required to be operated with power or train brakes, and that failure to comply with any such requirement shall subject the company to a penalty.

"In respect to the regulatory power of the state and the occasions for its exercise, the general subject of commerce has been divided into three separate and distinct classes. They are those in which the power of the state is exclusive, those in which the state may act in the absence of legislation by Congress, and those in which the action of Congress is exclusive and therefore the state cannot act at all (citing cases). The reasonable limitation of the length of trains in the interest of public safety falls within the second class. As to that class, the exercise of the paramount power of Congress

is necessary to take from the state its subordinate power to legislate. Covington & Cincinnati Bridge Co. v. Kentucky, supra; Western Union Telegraph Co. v. James, supra. And mere congressional delegation of power to the Interstate Commerce Commission to act in respect to that class does not require the state to yield. It is only after action by the Commission that the state is shorn of its power (citing cases). But the intent of Congress to exert its superior authority and thus exclude or supersede state legislation concerning the same matter is not to be lightly inferred. It must be fairly manifested (citing cases). And, it is within the power of Congress to limit its regulation to only part of a given field, thus leaving the remainder open to action by the state (citing cases).

"The acts of Congress relied upon fail to make specific reference to the length of trains as an element of safety, and it is not contended that the Interstate Commerce Commission has acted or asserted its authority to act in respect of the matter under the powers which Congress has delegated to it. True, some if not all of the statutes concern themselves with various aspects of safety in the operation of trains. But, fairly construed, they do not contain any provision from which it can be reasonably implied that Congress intended to exert the paramount character of its authority in relation to the length of trains in such manner as to exclude or supersede state action. And until an intent to exercise such superior authority has been indicated, the state is free to legislate in the exertion of its police power . . . ."

It has come to our attention that the Interstate Commerce Commission in relation to the Transportation Act of 1940 has recently commented on that Act as follows:

"It is unnecessary to decide whether Congress has occupied the field of safety regulation with respect to the operation of trains or with respect to the length of trains. In any event, that is a question for the courts. The question before us is whether, in view of the

emergency found to exist, we were authorized by law to suspend the operation of State laws limiting the number of cars in a train."

The emergency referred to, of course, has reference to the suspension of the Train Limit Law for the duration of the war, and to which this state has unhesitatingly yielded. From the case of People vs. Letford, 79 Pac. (2d) 274, 102 Colo. 284, we quote the following:

"In approaching the question of the validity and constitutionality of the statute, it is well to keep in mind certain fundamental rules. When an act of the Legislature is attacked on the ground of unconstitutionality, the question presented is not whether it may be voided but whether it is possible to uphold it. Denver v. Knowles, 17 Colo. 204, 30 P. 1041, 17 L. R. A. 135. Every presumption will be indulged in favor of the legislation and only clear and demonstrable usurpation of power will authorize judicial interference with legislative action. Green v. Frazier, 253 U. S. 233, 40 S. Ct. 499, 64 L. Ed. 878. The rule was well stated by the Supreme Court of Massachusetts in Re Wellington et al., Petitioners, 16 Pick. 87, 26 Am. Dec. 631, and quoted with approval by us in Milheim v. Moffat Tunnel District 72 Colo. 268, 273, 211 P. 649, 651, as follows: 'When called upon to pronounce the invalidity of an act of legislation passed with all the forms and solemnities requisite to give it the force of law, courts will approach the question with great caution, examine it in every possible aspect and ponder upon it as long as deliberation and patient attention can throw any new light on the subject, and never declare a statute void, unless the nullity and invalidity of the act are placed, in their judgment, beyond reasonable doubt.'"

The trial court took from the 19th day of November to the first of the following May in the trial of this cause, excepting some recesses. There were 886 assignments of error and 39 propositions of law presented to us, and of the many scores of cases cited by both appellant and appellee, this court has read as many as possible to be consistent in

rendering justice to both sides. The matter has engrossed the attention of this court, as time would permit, since its presentation in April, 1943, until this time, but the opinion, condensed as it is in the foregoing pages, expresses our reason for holding that the findings and judgment of the trial court to the effect that the Train Limit Law is unconstitutional were in error.

We cannot impugn the motives of the legislature of our state, and in this particular case the purpose of the citizenry of our commonwealth by disturbing the enactment of this law made by them until we find that it is in violation of a law to which the state must yield.

The judgment is reversed.

R. C. STANFORD,
Judge.

Concurring:
A. G. MCALISTER,
Chief Justice.

ROSS, J.:

I dissent. My reasons will be given later. Illness prevents my doing so at this time.

I think the judgment of the lower court should be affirmed.

HENRY D. ROSS,
Judge.

APPENDIX D.

IN THE SUPREME COURT OF THE STATE OF ARIZONA.

To the Honorable the Superior Court of the State of Arizona in and for the County of Pima. (SEAL.)

GREETING:

Whereas, lately in the Superior Court of the State of Arizona in and for the County of Pima, before you in a cause between State of Arizona, ex rel. Joe Conway, Attorney General of the State of Arizona, Plaintiff, vs. Southern Pacific Company, a corporation, Defendant, No. 20087, the

said Superior Court made and entered its judgment on February 11, 1942, as follows:

"Now, Therefore, It Is Hereby Ordered, Adjudged And Decreed:

(a) That said Train-Limit Law is wholly void, invalid and unenforceable, as to said defendant, and each and all of its trains carrying any interstate commerce or traffic, or engaged in interstate transportation, upon each and all of the grounds hereinbefore set forth;

(b) That defendant is not liable to plaintiff by reason of any of the matters or circumstances alleged in the complaint herein, or otherwise, either for the sums demanded as penalties in said complaint, or for any other sum or amount whatever;

(c) That plaintiff take nothing by its action;

(d) That defendant do have and recover from plaintiff its costs of suit herein, in the sum of $_____.

Dated: This 11th day of February, 1942.

LEVI S. UDALL,
Judge of the Superior Court of the State of Arizona."

as by the inspection of the record of the said Superior Court, which was brought into the Supreme Court of the State of Arizona by virtue of an appeal by plaintiff agreeably to the law in such case made and provided fully and at large appears.

And Whereas, in April, in the year of our Lord one thousand nine hundred and forty-three, the said cause came on to be heard before the said Supreme Court and was submitted for decision after argument of counsel.

On Consideration Whereof, it was on the 23rd day of December in the year of our Lord one thousand nine hundred and forty-three, ordered by this Court that the judgment of the said Superior Court in this cause, entered February 11, 1942, be, and the same is hereby reversed. Costs in this court to said appellant State of Arizona of and from said appellee Southern Pacific Company on cost bill duly filed and allowed.

WHEREUPON, appellee filed its motion for rehearing, on consideration of which, with the reply and objections of appellant, it was, on January 13, 1944, Ordered that the motion for rehearing be denied.

You therefore are hereby commanded that such proceedings be had in said cause, as according to right and justice, and to law, ought to be had, the said appeal notwithstanding.

Witness, the Honorable A. G. McAlister, Chief Justice of the Supreme Court of the State of Arizona, the Fourteenth day of January, in the year of our Lord one thousand nine hundred and Forty-four.

Costs of No cost bill filed.

EUGENIA DAVIS,
Clerk of the Supreme Court
of the State of Arizona.

[Endorsed:] No. 4525. Supreme Court of the State of Arizona. State of Arizona ex Rel. Joe Conway, Attorney General of the State of Arizona, Appellant, vs. Southern Pacific Company, a Corporation, Appellee. Mandate. Issued January 14, 1944.

APPENDIX E.

Jan. 13, 1944.

IN THE SUPREME COURT OF THE STATE OF ARIZONA.

No. 4523.

STATE OF ARIZONA ex Rel. JOE CONWAY, Attorney General of the State of Arizona, *Appellant*,

vs.

SOUTHERN PACIFIC COMPANY, a Corporation, *Appellee*.

Appeal from the Superior Court of Pima County. Honorable Levi S. Udall, Judge. Judgment Reversed in Opinion of December 23, 1943.

Joe Conway, Attorney General; Earl Anderson, Assistant Attorney General; Charles L. Strouss, of Counsel, all of Phoenix, Arizona, Attorneys for Appellant.

Cleon T. Knapp, James P. Boyle, B. G. Thompson, all of Tucson, Arizona; Henley C. Booth, Burton Mason, both of San Francisco, California, Attorneys for Appellee.

Ross, J. (Dissenting):

When the opinion in this case was handed down on December 23, 1943, I was unable, because of illness, to give my reasons for dissenting. I now do so.

The validity of the Arizona Train Limit Law (section 69-119, Arizona Code 1939) as applied to interstate transportation of persons and property is the question for decision. Such law undertakes to penalize any railroad in the State of Arizona that runs over its lines, or any part thereof, any train consisting of more than 70 freight, or other cars, exclusive of caboose, or any passenger train of more than 14 cars.

The act is silent as to its purpose. If it was enacted to protect the safety, health and well-being of railroad employees, or the traveling public, it does not so recite, as in

the Williamson case (36 Fed. Supp. 607) cited in the majority opinion.

The law's observance until now by the interstate railroads operating in Arizona, as the evidence and findings conclusively show, has not only cost such utilities large sums of money, but, also, has delayed and interfered with their business of transportation of goods and persons, at both the east and west boundaries of the state, without any material benefit to the traveling public, in the way of safety or health, or of the employees unless it be that more of them thereby have secured employment, increasing the operating expenses of the roads.

One sure result of a compliance with the law has been to force interstate companies to operate many more trains in the conduct of their business than the safety and well-being of the employees would seem to require, greatly increasing their costs.

Under the law, a fruit or cattle train made up in California for the Kansas City or Chicago Markets, if it consists of more than 70 cars, must, when or before it reaches, Yuma, Arizona, be broken down to the limit of 70 cars before it proceeds through Arizona. When this same train has crossed Arizona it may be rebuilt to the California length and proceed on its course to the point of destination. The traffic from the east to California must also conform to this arbitrary rule at the state's boundary. In effect, the law limits length of trains from California and New Mexico to and through Arizona and practically outside of the state.

The regulation of the length of interstate trains, if permissible, is by reason of the state's right under the constitution to pass laws for the profection of its people's lives, safety, health and well-being and to do that the state may enter the field appropriated under the federal constitution to the federal government, when such field has not been wholly occupied by that government. Powers belonging under the constitution to the federal government but not exercised may in all proper cases be exercised by the state for its use and protection, and a state law to that end will be valid and enforceable.

The Train Limit Law, if an allowable state regulation originally, is no longer allowable for the following reasons:

1. The danger to life and health in the operation of long trains, because of the improvement in the operating services as shown by the evidence and findings, has been greatly minimized, if not wholly done away with.

2. That because of such improvement, if the Train Limit Law was ever a valid police regulation, it now, under the evidence, serves but one purpose, to wit, the employment of more employees and trains, with the expense and hazards incident thereto.

3. It invades the field of regulation occupied by the Congress in its legislation providing for safety appliances in railroad operations (Virginian Ry. Co. v. United States (1915), 223 Fed. 748) and the safety provisions of the Interstate Commerce Act.

3. In Ex Parte No. 156, November 8, 1943, the Interstate Commerce Commission refused to modify its Service Order No. 85, theretofore entered, suspending during the war the operation of state laws limiting the number of cars in trains, stating, among other things:

> "If state laws limiting the number of cars in trains are to be held valid (a question we do not decide), it would be possible for each state to set a different number of cars as the maximum to be hauled in a train. State might even limit the length of trains to one car, although such a law would be clearly arbitrary and unreasonable. Higher limits might be set by states and found reasonable, but lack of uniformity would place a serious burden on interstate commerce. * * *
>
> "The fact that freight trains in excess of 70 cars and passenger trains in excess of 14 cars are safely operated in states without train-limit laws 'is convincing evidence of its safety, except where unusual operating conditions exist.' * * *
>
> "We find that these state laws were and are in fact rules and regulations with respect to car service within

the meaning of section 1, paragraph (10) and (15); that Service Order No. 85 was and is in accord with the national transportation policy * * * and is fully authorized by section 1 * * * of the Interstate Commerce Act.''

The Interstate Commerce Commission refused to modify or change said Service Order No. 85 for the reasons (a) that it was a valid order made pursuant to act of Congress and (b) because as a matter of fact ''freight trains in excess of 70 cars and passenger trains in excess of 14 cars are safely operated in states without train-limit laws'', which '' 'is convincing evidence of its safety, except where unusual operating conditions exist.' '' This finding of fact by the Commerce Commission is fully and well supported by the evidence taken in this case and is in accord with the learned trial court's findings.

Four states, Arizona, Nevada, Louisiana and Oklahoma, have enacted train limit laws. The laws in the first three named states have been passed upon and declared to be invalid (Atchison, T. & S. F. Ry. Co. *v.* La Prade, 2 Fed. Supp. 855; Southern Pacific Co. *v.* Mashburn, 18 Fed. Supp. 393; Texas & New Orleans R. Co. *v.* Martin et al. (1936, unreported), No. 428 Equity), in Oklahoma it was sustained by a divided court (Missouri-Kansas-Texas R. Co. *v.* Williamson, 36 Fed. Supp. 607). The rulings of these courts is another very cogent reason why the Train Limit Law should not be sustained. These decisions were by three-judge federal courts and were unanimous in holding the law invalid, except in the state of Oklahoma. In other words, of the 12 judges presiding in these cases 10 joined in declaring the law invalid and two (in the Oklahoma case) sustained the law.

I think the judgment of the lower court should be affirmed.

HENRY D. ROSS,
Judge.

APPENDIX F.

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA IN AND FOR THE COUNTY OF PIMA.

No. 20087.

STATE OF ARIZONA, ex rel. JOE CONWAY, Attorney General of the State of Arizona, *Plaintiff*,

vs.

SOUTHERN PACIFIC COMPANY, a corporation, *Defendant*.

Judgment On Mandate of Supreme Court.

The above entitled cause coming on regularly before the Court this 5th day of February, 1944, on the opinion and mandate of the Supreme Court of the State of Arizona,

It Is Now Ordered, Adjudged And Decreed:

1. That the Arizona Train Limit Law is constitutional and valid.

2. That plaintiff have and recover judgment against the defendant:

(a) on plaintiff's first cause of action, in the amount of $250.00;

(b) on plaintiff's second cause of action, in the amount of $250.00;

(c) for plaintiff's costs herein in the amount of $_____.

Dated this 5th day of February, 1944.

(S.) LEVI S. UDALL,
Judge.

FILE COPY

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY,
a corporation,

Appellant,

vs.

STATE OF ARIZONA ex rel. JOE CONWAY,
Attorney General of the State of
Arizona,

Appellee.

BRIEF FOR APPELLANT

VOLUME I: THE LAW

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SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY,
a corporation,
Appellant,

vs.

STATE OF ARIZONA ex rel. JOE CONWAY,
Attorney General of the State of Arizona,
Appellee.

BRIEF FOR APPELLANT

VOLUME I: THE LAW[1]

I.

OPINIONS BELOW

The opinion of the Supreme Court of Arizona (R. 4055-4068 is reported in 145 Pac.(2d) 530; the separate dissent-

[1] In a separately bound volume, styled "Volume II: The Facts," appellant presents a discussion of the evidence in this case in its relation to the findings of fact made by the trial court. (The State Supreme Court made no findings, nor did it revise the findings of the trial court.) For reasons more fully explained hereafter, Volume II need not be reviewed in the study of the case, unless the Court should conclude that, by reason of an expression in the opinion of the State Supreme Court, issues of fact are open upon this appeal.

ing opinion of Honorable Henry D. Ross, a judge of that court (R. 4068-4071), is reported in 145 Pac.(2d) 536. The official (Arizona State) report is not yet in print.

The Memorandum Opinion of the trial court (the Superior Court of Arizona, in and for the County of Pima) is reproduced in the printed record (R. 4042-4054), but is not officially reported.

II.

JURISDICTION

Issues under the Constitution and laws of the United States (viz., the Commerce Clause, and the Due-Process Clause of the 14th Amendment; and the Safety Appliance and Interstate Commerce Acts) were duly presented to the Superior Court of Arizona, in a suit brought in that court by the State of Arizona (the present appellee) for the recovery of penalties for alleged violations of the Arizona Train Limit Law, the statute hereinafter quoted in full. That court ruled in favor of appellant upon such issues, holding that the Train Limit Law is invalid because in violation of said constitutional provisions and statutes, and rendered its judgment for appellant accordingly, February 11, 1942 (R. 4039-4041).

Upon appeal by the State to the Supreme Court of Arizona (the highest court of that state), the judgment of the Superior Court was reversed, the State Supreme Court (one judge dissenting) holding, on December 23, 1943, that the challenged statute is valid under the Federal Constitu-

tion and laws. Final judgment upon the mandate (R. 4072-4073) of the State Supreme Court was thereupon entered February 5, 1944 (R. 4073-4074). The present appeal from said judgment was duly presented and allowed March 7, 1944 (R. 4081-4082). Jurisdiction of this Court is invoked under Section 237(a) of the Judicial Code (28 U.S.C. 344(a)).

The order of this Court noting probable jurisdiction herein was entered May 1, 1944 (R. 4088).

III.

STATEMENT OF THE CASE

(a) THE STATUTE INVOLVED.

The Arizona Train Limit Law,* the above mentioned statute the validity of which presents the essential question in the case, was enacted by the Arizona Legislature in 1912, and subsequently approved by the electors of that State at a referendum election on November 5, 1912. As enacted the statute had no preamble or statement of purpose, its full title and text having been as follows:

"An Act limiting the number of cars in a train.

"Section 1. It shall be unlawful for any person, firm, association, company or corporation, operating

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*For convenience, throughout the record of this case the Arizona Train Limit Law has been generally referred to as either the "Train Limit Law," or simply and without other designation as "the law." The same practice is followed in this Brief.

any railroad in the State of Arizona, to run, or permit to be run, over his, their, or its line of road, or any portion thereof, any train consisting of more than seventy freight, or other cars, exclusive of caboose.

"Section 2. It shall be unlawful for any person, firm, association, company or corporation, operating any railroad in the State of Arizona, to run, or permit to be run, over his, their, or its line of road, or any portion thereof, any passenger train consisting of more than fourteen cars.

"Section 3. Any person, firm, association, company or corporation, operating any railroad in the State of Arizona, who shall willfully violate any of the provisions of this act, shall be liable to the State of Arizona for a penalty of not less than one hundred dollars, nor more than one thousand dollars, for each offense; and such penalty shall be recovered, and suits therefor brought by the attorney general, or under his direction, in the name of the State of Arizona, in any county through which such railroad may be run or operated, provided, however, that this act shall not apply in cases of engine failures between terminals.

"Section 4. All acts and parts of acts in conflict with the provisions of this act are hereby repealed."

The law continued in full force and effect from and after its enactment, and until September 15, 1942. On the latter date observance was suspended by reason of the issuance by the Interstate Commerce Commission of its Service Order No. 85, dated September 11, 1942, published in Volume 7, Federal Register, No. 181, page 7258.

The text of the Commission's Order is set forth in the accompanying footnote.*

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*Chapter I—Interstate Commerce Commission

Subchapter A—General Rules and Regulations
(Service Order No. 85)

Part 95—Car Service

LENGTH OF TRAINS

At a session of the Interstate Commerce Commission, Division 3, held at its office in Washington, D. C., on the 11th day of September, A. D. 1942.

The Commission having under consideration operating rules, regulations, and State laws limiting the length of railroad freight and passenger trains, the Commission is of the opinion that, due to the existing state of war, an emergency exists requiring immediate action within the meaning of section 1, paragraphs (10) to (17), inclusive, of the Interstate Commerce Act.

It appearing that certain rules, regulations, practices, and laws are now in effect and are being enforced in certain states limiting the length of railroad freight trains to not more than one-half mile and limiting the number of freight cars in a railroad freight train to 70 cars, and limiting the number of cars in a railroad passenger train to 14 or 16, and that compliance by railroads subject to the Interstate Commerce Act with such rules, regulations, practices, and laws, during the present emergency, may result in congestion of tracks and terminals, wasteful use of locomotives, and interference with the free flow of traffic necessary in the present emergency; and that railroad freight trains exceeding one-half mile in length, or exceeding 70 cars in length, and railroad passenger trains exceeding 14 or 16 cars in length may be operated in accordance with safety standards now applicable, during the present emergency, in and through such states, and that such operation will facilitate the free flow of traffic necessary during the present emergency;

Therefore, it is ordered, that:

Sec.
95.1 Length of trains.
95.2 Effective period; emergency character.

AUTHORITY: §§ 95.1 and 95.2, issued under 40 Stat. 101, 41 Stat. 476, 49 Stat. 543, 54 Stat. 901; 49 U.S.C. 1 (10)-(17).

§ 95.1. *Length of trains.* From and after September 15, 1942, carriers by railroad subject to the Interstate Commerce Act shall operate their trains, when necessary for the prompt movement of freight and the clearing or avoidance of congestion by either freight or passenger trains, without regard to any rules, regulations, practices or laws now in effect and being enforced in the

(b) THE PRESENT SUIT.

Appellant operates a large railroad system in the southwestern part of the United States, and is one of the two major railroad carriers whose lines traverse Arizona. In 1940, believing that the Train Limit Law is wholly invalid, appellant determined to operate its trains in Arizona without regard to the law, and during March and April of that year, it operated over its Arizona lines some 62 "long" passenger trains, and 302 "long" freight trains.* These operations led to the institution of the present suit on April 19, 1940.

This suit was commenced by filing a complaint (R. 1-4) in the Superior Court of Arizona, in and for Pima County, in which the State was named as plaintiff, and appellant

*Throughout this brief, as in the record of this case generally, trains of more than 70 cars exclusive of caboose, and passenger trains of more than 14 cars (the limits fixed by the law) are called "long" trains; trains conforming to these limits are called "short" trains.

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various states limiting the length of freight trains to not more than one-half mile and limiting the number of cars in a railroad freight train to 70 cars or limiting the number of cars in a railroad passenger train to 14 or 16.

§95.2. *Effective period; emergency character.* This order shall remain in effect during the war in which the United States is now engaged, unless sooner terminated by subsequent order of the Commission; and that this order, being based upon conditions of war emergency, shall not constitute a precedent for peacetime operations.

It is further ordered, That this order shall be served upon each common carrier by railroad subject to the Interstate Commerce Act and upon each State railroad commission, and that notice of this order be given to the general public by depositing a copy thereof in the office of the Secretary of the Commission at Washington, D. C., and by filing it with the Director of the Division of the Federal Register, The National Archives.

By the Commission, division 3.

(Seal)

W. P. BARTEL,
Secretary.

as defendant. The complaint alleged the operation of a long passenger train, on March 2, 1940, and a long freight train on April 4, 1940, in violation of the law, and prayed judgment for the statutory penalties.

On May 9, 1940, appellant filed its answer (R. 5-32); in which, after admitting the operation of the two trains named in the complaint, it alleged that each of said trains consisted in large part of cars moving in interstate commerce and carrying interstate traffic, and denied that either of said operations was a willful violation of the law.

For a further separate and affirmative defense to the complaint, appellant alleged that the law was and is void, invalid and unconstitutional, because in violation of the Commerce Clause (Article I, Section 8, par. 3) of the Constitution of the United States, the Due-Process Clause of Section 1 of the 14th Amendment to the Constitution of the United States, and the corresponding Due-Process Clause set forth in Article II, Section 4, of the Constitution of Arizona, in that: (a) the law undertakes to regulate a subject-matter of national concern which, if required to be regulated at all, is subject to regulation only by Congress pursuant to the powers granted by the Commerce Clause; (b) the necessary effect of the law is to regulate appellant's train operations extra-territorially, that is to say, beyond the boundaries of Arizona; (c) the law directly and substantially interferes with, delays, and regulates appellant's interstate train operations in Arizona and the adjacent states; (d) the law imposes direct and substantial burdens upon the appellant's interstate train operations; (e) the law, to the extent that it has,

or is intended or claimed to have, the effect of limiting the number of cars in a train to that number which can be safely and effectively controlled or stopped by the use of air brakes and other appurtenances now in use on such trains, is in conflict with and an infringement upon existing Federal legislation having the same or similar purposes, enacted by Congress pursuant to its powers under the Commerce Clause; (f) the law deprives appellant of its property unreasonably and arbitrarily, in violation of the due-process clauses of the State and Federal Constitutions above referred to, for the reason, among others, that it bears no reasonable relation to health or safety, and does not eliminate or reduce any present hazard, but on the contrary creates certain hazards which would not otherwise exist, and increases other hazards of railroad operation in numerous respects.

The detailed facts supporting these basic allegations were set forth at length in the answer. See, in particular, paragraphs 1 to 6, inclusive, of Part III of the answer. (R. 7-23).

From the outset the suit was treated as a test case, in that the Attorney General, at the time the complaint was filed, obtained from the Superior Court an order as contemplated by the Arizona Code (Sec. 28-401, *Arizona Code Annotated*, 1939) staying all other prosecutions under the law, pending final determination of the present suit (R. 5).

(c) PROCEEDINGS IN THE TRIAL COURT.

The case was especially assigned for trial to Superior Judge Levi S. Udall, sitting without a jury. The trial com-

menced on November 19, 1940 and continued, with several intervening recesses, until and including May 1, 1941. Voluminous evidence was introduced, and since appellant undertook the burden of establishing its affirmative defense, its evidence in support was particularly complete. Appellant called 60 witnesses, who were on the stand on 37 out of the 46 days required for the trial; it offered in evidence 316 exhibits, of which 311 were received. The State called 13 witnesses, and offered in evidence 86 exhibits, of which 68 were received.

Following the trial and subsequent briefing of the case, and the submission to the trial court of proposed findings of fact by both parties, Judge Udall, on February 11, 1942, rendered his opinion and decision (R. 4042-4054), in which he stated his conclusion that the law is unconstitutional and void upon each of the grounds asserted in appellant's answer. At the same time, Judge Udall adopted, signed, and filed special findings of fact (R. 3887-4034), and separately stated his conclusions of law (R. 4035-4038); thereupon judgment was entered in favor of appellant.

The specific legal grounds for the decision, as set forth in said judgment (R. 4040) are as follows:

> "That that certain statute of the State of Arizona, known as the Arizona Train-Limit Law, being Section 69-119 of the Official Arizona Annotated Code, 1939, with statute is set forth in full in the complaint of the plaintiff herein, is unconstitutional and void, because:
>
> "*First:* Said statute invades the exclusive legislative field of Congress, as limited and defined by the Commerce Clause (par. 3, of Sec. 8, Art. 1) of the Constitution of the United States;

"*Second:* Said statute imposes direct, unreasonable and unlawful burdens upon, and interferes with, delays and obstructs interstate commerce, in violation of said Commerce Clause;

"*Third:* Said statute impairs the use and usefulness of the transportation facilities employed by defendant as a common carrier engaged in interstate commerce;

"*Fourth:* Said statute is in conflict with and infringes upon, and amounts to an unlawful attempt to supplement, the power-brake provisions of the Federal Safety Appliance Acts, and the safety-device provisions of Section 25 of the Interstate Commerce Act, which Federal statutes operate upon the same subject matter and are directed to the same objects as said Train-Limit Law and by which said statutes Congress has completely and exclusively occupied the field of regulation of train lengths;

"*Fifth:* Said statute operates unreasonably and arbitrarily to deprive defendant of its property, without due-process of law, in violation of both the Due-Process Clause of the Fourteenth Amendment to the Constitution of the United States, and the Due-Process Clause set forth in Section 4 of Article 2 of the Constitution of the State of Arizona."

(d) PROCEEDINGS ON APPEAL TO THE STATE SUPREME COURT.

On April 9, 1942, the State filed notice of appeal (R. 4054) to the Supreme Court of Arizona from the judgment of the Superior Court dated February 11, 1942. In connection with its appeal the State presented 886 separate assignments of error, asserting that the trial court had

erred: (1) in its rulings upon the admission and exclusion of evidence offered by the parties, thus preserving the objections and exceptions taken by its counsel during the trial (assignments Nos. 1 to 662, inclusive); (2) in making certain specified findings of fact, the findings thus challenged including the greater part of those adopted by the trial court (assignments Nos. 663 to 866, inclusive); (3) in making its conclusions of law (assignments Nos. 867 to 882, inclusive); and (4) in entering judgment (assignments Nos. 882 to 886, inclusive).

The appeal was submitted to the state court for decision, upon briefs and oral argument by the parties, on April 13, 1943. On December 23, 1943, the court announced its decision, concurred in by two judges (the third judge dissenting), reversing the trial court's judgment (R. 4055-4068). A motion for rehearing duly filed by appellant on January 7, 1944, was denied by the court on January 13, 1944; on the same date the dissenting opinion (R. 4068-4071) was filed. The court thereupon issued its mandate (R. 4072-4073) dated January 14, 1944, ordering the judgment to be reversed but not, it will be noted, directing that the findings of fact be vacated or modified. In obedience to said mandate, the trial court, on February 5, 1944, entered judgment (R. 4073-4074) declaring the law constitutional, and assessing against appellant a penalty of $250.00 for each of the two violations alleged in the complaint. The findings of fact were not referred to in said judgment, nor was any order entered modifying or disturbing them in any respect.

The state court's opinion is noteworthy in that it includes no discussion of the facts or the evidence, other

than mere passing mention of the two long-train operations described in the pleadings, a brief recital of the history of the enactment of the challenged law, and an indirect affirmation of the trial court's finding X-d (R. 3966-3969) that compliance with the law places upon appellant a continuing heavy burden of expense. No reference is made to the 662 alleged errors in the admission and exclusion of testimony, assigned by the State. The "findings of fact," though made the subject of 204 such assignments, are not even mentioned as such; indeed, the word "findings" appears but once in the opinion, near the end, in a sentence in which the court states that the "*opinion, condensed as it is in the foregoing pages, expresses our reason for holding that the findings and judgment of the trial court to the effect that the Train Limit Law is unconstitutional were in error.*"

This sentence cannot be construed as a pronouncement purporting to sustain the assignments of error addressed to the findings of fact, for two obvious reasons, among others: (1) there is no preceding discussion in the "foregoing opinion," relating to the findings of fact or assignments of error, or indicating any reason why the court might have considered any of the findings of fact to be erroneous; and (2) there were no findings *of fact* by the trial court "to the effect that the Train Limit Law is unconstitutional". All expressions of the trial court to that "effect" appear either as separate conclusions of law (R. 4035-4037), or in and as part of the judgment (R. 4040), or in the memorandum opinion (R. 4042). It is apparent that the state court had in mind, and intended specifically to reverse, the "findings" of unconstitutionality, which

appear *in the judgment*, for these are quoted at length in the opinion (R. 4056-4057), and are the only portions of any document signed and filed by the trial court which the state court thus mentions or quotes.

The decision of the state court rests principally upon the precedent afforded by the decision of the majority of the special three-judge Federal district court for the Western District of Oklahoma, in

Missouri-Kansas-Texas Ry. Co. v. Williamson (1941), 36 Fed. Supp. 607;

in which decision the Oklahoma Train Limit Law, imposing a limit of 70 freight or other cars, exclusive of caboose, was sustained as valid under the Constitution and laws of the United States.

It is quite apparent, from the text of the opinion, that the state court accepted the evidence as admitted (or excluded), by the trial court, and likewise accepted its findings of the facts developed by that evidence, and made no attempt to pass upon any of the alleged errors in either the rulings on the evidence, or the adoption of the findings. The court nevertheless considered that the *Oklahoma Train Limit case* afforded a satisfactory precedent, "fitting," as the court said, to be followed even though not binding upon it (R. 4062); and upon this basis reversed the judgment. To interpret the opinion as having any broader scope or purpose, or particularly as holding that the trial court erred in either its rulings or specific findings of fact, would be to read into it an intention and result not supported or suggested by any language therein,

and indeed specifically negatived by the fact that the mandate did not direct that the findings of fact be set aside or modified.

The question of the interpretation to be given to this sentence of the opinion is discussed at greater length, with the development of additional reasons for the views above expressed, in subdivision 6 of the argument in this brief (pp. 314-330). Furthermore, assuming that, because of the quoted sentence, this Court may feel that there is a possible basis for questioning whether the trial court's findings of fact properly conform to the issues and the record are fairly supported by the evidence, we present, in a separate volume, designated "Volume II: The Facts," a detailed discussion of those findings with reference to the supporting evidence. This discussion is presented under separate cover so that it may be readily omitted in the study of the case, as it should be unless the Court should consider that questions of fact are open upon this appeal.

(e) THE FACTS IN THE CASE, AS DEVELOPED IN THE SPECIAL FINDINGS OF FACT.

The Special Findings of Fact (R. 3887-4034) present a complete statement of all the relevant facts of the case as developed by the evidence. These findings are carefully and extensively annotated to the transcript and the exhibits, by the citation of the pages in the original reporter's transcript, and the exhibits by number, where is set forth the evidence relied upon to support each such finding. Such annotations form an integral part of the findings.

In order that this Court may have readily available a full statement of all the facts that are material to its

consideration of the questions presented in the case, we here set forth the following condensed summary of the findings of fact:

1. **Description of Appellant's Lines of Railroad.**

Appellant is an interstate common carrier by railroad, with lines in seven states: Arizona, Nevada, Utah, Texas, New Mexico, Oregon and California. As such, it is subject to the Interstate Commerce Act. Directly, and through its connections, it participates in the carriage of interstate commerce between all points of the United States and adjacent foreign countries. It has an extensive mileage (8648 miles of line), and a very large investment (approximately $729,000,000 in fixed property, not including rolling equipment). Its lines in Arizona consist of 1208 miles, and the investment in fixed property is approximately $69,000,000.

Appellant's lines in the affected territory extend across Southern California, Arizona, and New Mexico; there being a principal main line (via Gila and Lordsburg) over which the freight traffic is largely handled, and two alternate lines. The ruling grades and curvatures along the lines in Arizona are generally favorable, there being no very severe grades; the heaviest ruling grades are but 1.4%. The percentage of curved, to total of all track mileage, is comparatively small; on the principal main line in Arizona 84% of the total mileage is straight track; and only 1% consists of curves of more than 6°. All curves in grade territory are "compensated." The lines in Arizona are well constructed, and capable of sustaining the heaviest and most powerful locomotives and cars owned or operated by appellant.

The appellant's lines in Nevada and Utah are in territory very similar to that over which extend the lines in Arizona and New Mexico; the operating conditions are also very similar, and the lines themselves are well constructed and equipped, in accordance with the same standards as in Arizona.

(Finding of Fact No. III, R. 3890-3897.)

2. Character of Freight and Passenger Traffic Handled Upon Appellant's Lines in Arizona and Adjacent Territory: Comparison With Nevada Traffic.

The traffic, both freight and passenger, handled over the Arizona lines is predominantly (about 93%) interstate. The freight traffic consists in large part of perishable products, livestock and manufactured products requiring expeditious handling, and of empty cars returning after moving under load. The traffic across New Mexico is of the same character. The traffic handled on the main lines across Nevada and Utah is likewise similar to that handled in and across Arizona, consisting largely of interstate freight and passenger movements, and of empty cars used for the handling of such interstate movements.

(Finding of Fact No. IV, R. 3897-3901.)

3. Recent Improvements in Appellant's Transportation Plant, Both Generally, and in the Territory Affected by the Law.

Since 1912, and especially since 1923, the track, roadbed, and fixed structures of appellant's lines in Arizona and the adjacent affected territory have been greatly improved in practically every detail of construction, through the expenditures of large sums of money. Similar improvements have been made on the fixed plant and equip-

ment of appellant on other portions of its system. At the present time, however, the sidings and passing tracks on appellant's main lines in Arizona, though otherwise improved, are still of about the same lengths as in 1912, and are not generally of sufficient capacity to hold more than 70 cars, including engine and caboose.

Great improvements have also been made since 1912, and particularly since 1923, in the rolling equipment, locomotives, cars, etc., used on appellant's lines. Many stronger and heavier locomotives—the types in use in Arizona being much the same as in Nevada and Utah—were especially acquired for handling long freight and passenger trains, and have proved their ability so to do through their use in Nevada and Utah. Large sums have been expended in acquiring and improving such newer and better locomotives and cars. All freight cars now in service are built of steel, or with steel underframes; all passenger cars are entirely of steel. There have been numerous detailed improvements in the cars, notably in the wheels, running-gear, and air-brake mechanisms.

The purpose of these expenditures and improvements was to permit appellant to operate its railroad safely, economically, and efficiently. The locomotives, cars and fixed structures in Arizona are fully adequate for long-train operations; and there are no reasons, from this standpoint, why long trains could not be operated in Arizona. If the law's restrictions were removed, such operations would be initiated. The limited long-train operations of March and April, 1940, demonstrated the practicability of long-train operations in Arizona.

(Finding of Fact No. IV, R. 3902-3908.)

4. Appellant's Methods of Operation, Past and Present.

Appellant's system is subdivided into operating divisions and subdivisions; each has a terminal, where runs of trains begin and end, and trains are made up and broken up. Runs of crews and locomotives generally extend from terminal to terminal, with some exceptions. All operations are conducted according to standard codes of operating rules; the same rules, subject only to certain local deviations, are in effect in Arizona and elsewhere upon appellant's system. Systematic inspections of equipment are conducted in both the affected territory and elsewhere, to make certain that equipment is in good order; these inspections being in accordance with a general code applicable to all railroads, and for the purpose of insuring safety in train handling.

Operations in Nevada and Utah are subject to the same code of rules, and carried on in accordance with the same standards and methods, as in Arizona. The same system officials have jurisdiction over all of these operations. The same equipment is used interchangeably in both the affected territory and on the Nevada-Utah lines. The traffic conditions, operating conditions, and other factors affecting the operations are very similar, the only point of difference (other than the Arizona train-length restriction) being that colder weather prevails during the winter months in Nevada and Utah. The records maintained, and the statistical and other reports required in connection with operations in Arizona, Nevada, and Utah are of the same character, and kept or rendered pursuant to systems and methods of accounting and reporting equally applicable in both territories. The Train Limit

Law presents the only substantial difference in conditions as between the two territories, so that comprehensive comparisons between them afford a highly effective method of testing the results of the law.

In 1912 appellant operated very few long freight trains in Arizona; the longest train then operated contained only 75 cars. There were likewise very few long passenger trains operated. Up to 1922 freight train lengths in Arizona tended to increase, but since 1922 there has been no substantial increase in the average. In Nevada, on the other hand, the average train length has increased consistently since 1912, and notably since 1923. The average train length in Arizona, for the period 1936 to 1939, was 53.85 cars; in Nevada for the same period, 76.28 cars.

The practice of long-train operation is followed everywhere on appellant's system, except in Arizona, and has been followed since about the year 1925. In spite of the restraining effects of the Arizona law, the result has been to increase the average length of *all* freight trains over the entire system from 42.4 cars in 1922, to 53.6 cars in 1939.

The average length of *main line* freight trains on the system in 1939 was 60.1 cars; on the Tucson Division (which includes most of the lines in Arizona) 59.8 cars; on the Salt Lake Division, which includes most of the lines in Nevada and Utah, 85.4 cars. Since 1925 appellant has operated substantial and increasing numbers of long trains on its system, particularly in Nevada and Utah.

The effect of the law is to cause appellant to produce a far greater number of train-miles in Arizona than if it

were able to operate long trains as in Nevada and Utah. The excess train-miles thus produced over the 15-year period (1925-1939) amounted to 32.7%; for the year 1938, 37.7%. Long-train operation in Arizona to the same extent as in Nevada and Utah is entirely feasible, subject only to the extension of the passing tracks and the provision of larger locomotives.

Appellant handles through freight moving across Arizona and Nevada and Utah upon regular time-schedules. These schedules over both routes have been substantially reduced since 1921. However, the proportion of trains handled over the Arizona route, arriving on schedule, has been less than the corresponding proportion of those handled over the Nevada route.

The various important indices of efficiency and economy of operation, such as average train speeds, average gross-ton-miles per train hour, average fuel consumption, and average cost per thousand revenue ton-miles, show that the improvements in efficiency and economy in Arizona, and on the Tucson Division, have been considerably less than in the Nevada-Utah territory, or upon the system; that the long-train program in Nevada and Utah, and upon the system as a whole, has resulted in much greater improvement in efficiency and economy of operation than in Arizona and the affected territory. Appellant's inability to attain greater efficiency and economy of operation in Arizona, on the same scale as in Nevada, or upon its system as a whole, is largely and directly due to the Train Limit Law.

(Finding of Fact No. VII, R. 3909-3934.)

5. Comparison of Appellant's Methods of Operation With Those Followed on United States Railroads Generally.

The improvements in roadbed and equipment made by appellant were part of a general program of improvement agreed upon and carried out by United States railroads generally, commencing about the year 1923. In connection with this program the United States railroads built and purchased larger and heavier locomotives, larger and better freight and passenger cars, and retired the older, smaller and less efficient cars and locomotives. Improvements in the appliances upon the locomotives and cars were likewise made. All of this was for the purpose of improving service, and to permit safer, speedier, and more economical operation.

The railroads of the United States, acting through their Association, have a general code of rules covering the details in construction and equipment of cars, which all carriers are required to observe.

Improved methods of operation were undertaken contemporaneously with the 1923 program of improvement upon the railroads generally, and were made possible by reason of these improvements. These improved methods included the adoption and development of the standard long-train operating practice. The result has been that the average and actual lengths of freight trains in the United States have tended to increase continually. The long-train practice is now standard on practically every railroad in the United States, including all of the connections and competitors of the appellant. The handling of through freight on published and agreed schedules is likewise a general practice; and as methods of

operation have improved, and equipment and roadbed have likewise been improved, these schedules have been shortened and better on-time performance has been secured. Long-train operation constitutes an essential part of these improved operating methods.

Since 1923, and coincident with the substantial increase in train lengths during that period, there has been a marked improvement in the efficiency and economy of railroad operations in the United States. This improvement is comparable to that achieved upon appellant's lines, except those in Arizona, but including particularly the lines in Nevada and Utah. It is a direct result of the improvements in roadbed and equipment and operating methods, and particularly the long-train operating practice. It is shown by study of the various indices of efficiency before mentioned. It is likewise illustrated by the statistics of 16 individual systems, whose lines reach into every section of the country, and include about 54.25% of the mileage of the Class I railroads of the United States and handle about 60% of all the traffic handled by such railroads.

Each of these 16 systems follows the practice of long train operation, except to the extent that the law prevents the Santa Fe from doing so in Arizona and adjacent territory.

These improved methods of operation, and particularly the long-train practice, have resulted in substantial public benefits, through the carriers' ability to reduce the levels of their freight and passenger rates and charges, and to increase the average wages paid to their employees.

The operating rules upon United States railroads generally, and particularly the 16 individual systems referred to, are modeled upon the standard code, which also forms the basis for appellant's code of operating rules. Operating conditions upon these other railroads, traffic conditions, and other relevant circumstances are in general largely similar to those encountered upon appellant's lines in the affected territory.

(Finding of Fact No. VIII, R. 3934-3947.)

6. Recent Long-Train Operations of Appellant in Arizona: Intention to Undertake Future Long-Train Operations.

In March and April, 1940, appellant operated 62 long passenger trains, and in April, 1940, it operated 302 long freight trains, in Arizona. The average length of these long freight trains was 86.36 cars. The average length of all appellant's freight trains operated in Arizona during the month of April, 1940, was 57.85 cars. This long freight-train operation was upon a limited scale, principally because of limited siding capacities in Arizona.

If the restrictions of the law are removed, appellant will at once institute, and thereafter continue, long-train operations. In order to do so upon a substantial scale, comparable to operations in Nevada and Utah, it will be necessary to extend some 49 sidings in the affected territory; to provide additional repair and water-supply facilities; and to acquire, either by purchase or transfer from other portions of the system, some 30 or more larger locomotives. Such locomotives will replace approximately 50 smaller locomotives now in service, which will then be assigned to other parts of appellant's system.

(Finding of Fact No. IX, R. 3947-3950.)

7. Effect of the Train Limit Law Upon Appellant's Operations:

Appellant conducted redispatching studies for the purpose of determining the precise effects of the law upon its operations in the affected territory. These studies, conducted under the supervision of fully qualified officers, consisted of detailed analyses of traffic handled over the affected lines during a typical recent period, which traffic was then "redispatched" into longer trains, so as to conform the operations, for the purposes of the study, to conditions which would prevail if the law were wholly set aside. The actual redispatching was performed by chief train dispatchers who have immediate jurisdiction over operations in the affected territory.

The results of these studies present a precise and accurate determination of the effects of the law in requiring additional train service, creating or aggravating delays, and causing additional expenses.

The first of the redispatching studies related to the months of June and August, 1938. A second study related to the month of April, 1940, when long-train operations were undertaken; the operations being recast upon the basis of full observance of the law. In this way the amount of the saving actually achieved during the long-train period of April, 1940, was determined. This same period was also further redispatched, upon the basis of a completely unlimited long-train operation, to determine the amount of the potential saving if long-train operations on an unlimited scale had been possible during that period. The combination of these last two studies determines the differences between compliance with the law during April, 1940, and completely unlimited long-train operations dur-

ing that period, as to the features of additional train service, delays, and expenses.

The 1938 and 1940 studies, taken together, check and confirm each other's results.

A further study was undertaken with respect to passenger traffic during the entire year 1938, which determined the amount of the possible saving in expense and additional service if the passenger-train restriction were disregarded.

The redispatching studies demonstrate that the law imposes delays, due to necessary switching and reconsisting at terminals, both in Arizona and outside of the State, and at other points along the line outside of the State, and that in this respect it operates with substantial extra-territorial effect. Because of the substantially increased number of trains operated, the number of interferences due to the necessary meeting and passing of trains are greatly increased. The 1938 study shows that 4,304 additional unnecessary freight trains were run over the principal main line between Yuma and El Paso, via Gila and Lordsburg, which would not have been operated if it were not for the law; that such operations caused 16,512 additional meets and passes in that territory during that year. About 38.0% additional and unnecessary freight trains were thus run on said principal main line during 1938, which caused the meets and passes thereon to be increased about 63.0%.

The effect of the delays and interferences of the law was to cause scheduled freight trains to arrive later than if the law had not been observed, and to bring about

more schedule failures than would otherwise have taken place.

The law's restrictions also caused numerous delays to passenger trains and passenger-train equipment, and compelled, in 1938, the operation of 2,203 excess passenger-car miles. Many of these delays, and much of this excess car mileage, took place outside of Arizona.

By compelling the average and maximum lengths of freight trains to be reduced, the law correspondingly increases the number of trains operated and the number of train-miles and locomotive-miles produced. In 1938, if the law had not been in effect, the traffic actually moved by appellant between Yuma and El Paso, via Gila and Lordsburg, and between Tucson and El Paso, via Douglas, could have been handled (as stated) with 4,304 fewer freight trains, 638,569 fewer freight-train miles, and 798,424 fewer locomotive miles. Of the additional freight-train miles compelled by the law, 151,788 were produced in New Mexico and Texas, and were caused by and solely due to the law's extra-territorial effect. In 1940, as revealed by the 1940 redispatching studies, the traffic was heavier, and the additional and unnecessary trains, train-miles and locomotive-miles were substantially greater in number.

Similar effects follow from the passenger-train restriction, which has even wider extra-territorial effect than the freight-train restriction.

The increased annual expense of operation imposed upon appellant by the law amounts to $394,900 per year, based on 1938 operations. This figure includes the costs

due to wages of the crews on the additional trains, locomotive repairs, for the additional engines used, and fuel for the additional train operations, and certain other smaller items, but also takes into account, as an offsetting credit, all of the increased charges resulting from the increased investment in locomotives, and other facilities, in order to commence and continue unrestricted long-train operation. Of the total of the additional expense caused by the law, some $94,600 is associated with operations entirely outside of Arizona, and is made necessary by reason of the extra-territorial effect of the law.

(Finding of Fact No. X, R. 3950-3969.)

8. Slack and Slack-Action in Trains: Nature, Cause and Effects.

Freight and passenger cars are held together by means of couplers, which, in turn, are attached to the frames of the cars by draft gears. The latter provide a non-rigid connection between the units comprising the train. Most draft gears are of the friction type, but there are some few spring-type draft gears still in use. Friction-type draft gears permit a certain amount of motion, which is controlled by the friction members of the draft gears, and amounts to approximately 2¾ inches in either direction from the mean, or normal, position. In addition to this controlled movement, there is also a small amount of play—approximately 1 inch—at the coupler faces, between each pair of coupled cars.

The term "slack," as used in train operation, means the amount of movement between the coupled cars, and includes both the free motion at the coupler faces and the controlled resistance in the draft gears. The term "slack-

action" means the accumulated effect of such motion, as it comes into play as the result of train operations. Slack and slack-action exist in trains of all lengths.

Many factors affect the extent and severity of slack-action in a train at any particular time, including: the train speed; whether or not the slack is "bunched" or extended; the grade upon which the train is moving; whether it is accelerating or decelerating; the consist of the train, whether all loads or empties, and if partly loads and partly empties, the position of the loads and empties with respect to each other; and the action taken by the engineer in charge of the train. To a large degree the extent and amount of the slack-action in a freight train are within the control of the engineer, through the use of the air brakes and the engine power.

The amount and severity of slack-action in freight trains does not depend solely upon the number of cars in the train, but also upon the numerous other factors mentioned. The limitation of trains to 70 cars neither eliminates nor reduces the number or severity of the casualties attributable to slack-action. Such casualties take place on both long and short trains, and there are times when emergency stops of long trains take place without casualties, although similar stops of short trains produce severe casualties. The presence or absence of accidents and casualties due to slack-action is due to the presence or absence, in varying degree, of the factors which contribute to and control such slack-action.

In passenger-train operation, while slack and slack-action exist, it does not appear that the results of slack-action are any more severe or frequent on long than on

short trains. Nor does it appear that slack-action in passenger trains, whatever the train's length, is sufficient to cause serious injury or damage.

(Finding of Fact No. XI, R. 3969-3974.)

9. Safety of Operation as Affected by Train Lengths: Accident and Casualty Statistics.

Reports of railway accidents are made to the Interstate Commerce Commission, by each carrier, each month; those reports being summarized in annual accident bulletins published by the Commission, which classify the accidents in great detail by type and cause.

All the statistical showings of accidents and casualties received in this case were based upon statistics and reports of accidents to the Interstate Commerce Commission, or on records of accidents reportable to that Commission.

Accidents may be measured, as to their frequency, on the basis of locomotive-miles, train-miles or car-miles operated; casualties to individuals may also be measured against man-hours worked, or man-miles traveled. All these bases are in common use. The car-mile basis is the proper method to determine the frequency of casualties in relation to volume of traffic.

Side by side with the increase in train lengths on Class I railroads of the United States, during the period 1923-1939, there has been a continued downward trend in the frequency of casualties to all classes of employees. During the five-year period 1935-1939 such casualties, on a car-mile basis, were 70.33% less frequent than in the six-year period 1923-1928. On other bases of measurement, approximately the same improvement is shown.

Considering casualties sustained by road trainmen and enginemen only, there has been substantially the same improvement; the rate of frequency on the car-mile basis having improved 69.21%, comparing the five years 1935-1939 with the six years 1923-1928. As to casualties to road *freight* trainmen and enginemen *on duty*, the corresponding improvement, comparing the same two periods, was 69.32%. Considering only road freight conductors, brakemen and flagmen (not including enginemen), there was a similar downward trend, the improvement having been 66.21%, comparing the same two periods.

Confining the comparison to those casualties due to sudden start, stop, jerk or lurch of train or car, sustained by road freight conductors, brakemen and flagmen on duty (the so-called "slack-action" group), the reduction in the casualty rate, and the absolute number of casualties, has likewise been consistent over the period 1923-1939. Comparing the six years 1923-1928, with the five years 1935-1939, the improvement in the later period was 65.29%. In 1923 there were 1,957 of these casualties on all Class I railroads in the United States; in 1939, only 399 such casualties. In the five-year period 1935-1939, there were more than 37,000 casualties of all kinds to all classes of employees on duty in train and train-service accidents on Class I railroads; the unimportance of the so-called slack-action group of casualties is shown by the fact that there were but 2,473 such casualties during the same five-year period. There were only three fatal slack-action casualties in 1939; but the total of employee fatalities in all train and train-service accidents in that year was 353.

There has also been a consistent improvement in the rate of casualties to passengers on trains of Class I railroads; the improvement, on a passenger-mile basis, having been 17.66%, comparing the later five-year period 1935-1939 with the earlier six-year period 1923-1928.

The same downward trend is shown in the frequency of train accidents, i.e., that class of accidents, with or without casualties, which involve property damage in excess of $150.00. The nation-wide improvement in the accident rate of this class was 62%, comparing the later five-year period 1935-1939 with the earlier six-year period 1923-1928. Train accidents caused by defects in or failures of equipment have declined, over the 17 years 1923-1939, by 82.75%. Casualties in these classes of accidents are very infrequent, and have generally tended to decrease over the 17-year period referred to, the improvement in such frequency having been 74%.

A considerable part of the improvement in casualty rates on American railroads during the period in question is clearly shown to be directly attributable to the adoption and growth of the standard long-train method of operation, because a substantially less number of train units was operated than otherwise would have been required, and thus the opportunity for accidents and casualties was reduced.

Serious accidents are investigated by the Interstate Commerce Commission through its Bureau of Safety, which makes detailed reports. During the 12-year period 1928-1939, 1,002 serious accidents were investigated; 561 of these involved freight trains. 728 trains were involved,

of which 574 were of 70 cars or less, and 344 of 40 cars or less. Negligence of employees was assigned as the cause of 62.2% of the freight-train accidents. Defects in equipment were assigned as the cause in only 14.1% of such accidents. In none of the seriours accidents investigated was there any finding that train length had any bearing upon the accident, or that it might have been avoided if the train had been shorter. No recommendations were made by the Commission as to train length, although many other recommendations were made.

In the six year period, 1934-1939, out of 620 accidents investigated, 232 involved passenger trains; 267 passenger trains in all were involved. 261, or 97.8%, of these trains were of 14 cars or less, and 224, of 11 cars or less.

48.3% of these passenger-train accidents were caused by negligence of employees, according to the bureau's findings. Defects in equipment were charged with only 7 of these accidents, or 3% of the total. Collisions with vehicles at grade crossings were charged with 18% of these accidents; all but one of the trains involved in these grade-crossing collisions were short trains.

On appellant's Pacific Lines, the number and frequency of casualties to employees on duty, sustained in train and train-service accidents, has shown a general and substantially declining tendency. Over the 17-year period 1923-1939, the casualty rate for all classes of employees on duty has shown an improvement, comparing the five years 1935-1939, with the six years 1923-1928, of 26.86%.

The frequency of casualties to trainmen on duty on appellant's lines has likewise substantially declined since

1923. On the car-mile basis, comparing the earlier six-year period just mentioned with the recent five-year period 1935-1939, the improvement in the casualty rate was 38.16%.

The record contains exhaustive summaries of accidents occurring on appellant's lines in Arizona and Nevada, and comparisons of casualty frequency rates, as between the two states, together with exhibits and oral testimony relating to such accidents and casualties in detail. The lines in Arizona and Nevada are substantially similar, from practicaliy every standpoint; so that these comparisons afford a fair and reliable basis of contrasting operations as a whole, on the restricted basis permitted by the Arizona law, with operations conducted free of such restrictions, and show that the enforcement of the Arizona law has not been accompanied by any measurable decrease of casualties, including slack-action casualties, but has been accompanied by a greater proportion of casualties of all classes and from all causes. Since 1929, long-train operation in Nevada has greatly predominated; but prior to 1926, the operation of short trains predominated.

Comparing Arizona and Nevada, the rates of frequency of casualties to *all* classes of appellant's *employees, in all classes of service*, have generally been substantially higher in Arizona than in Nevada, and this is particularly true during the years since and including 1929. Generally speaking, the casualty rate in Arizona has been approximately twice as high, for these classes of casualties, as in Nevada. During the six years 1935-1940, there were more than three times as many injuries to employees in Arizona (266) as in Nevada (86), although in that period the

locomotive-miles in Nevada were 21,757,000, as compared with approximately 31,000,000 in Arizona.

Limiting the comparison to casualties to *all* classes of *employees on duty, in road freight-train operation*, the showing is more favorable in Nevada in every year, whether absolute number of casualties or casualty frequency rates be considered. This is particularly true of the years since 1929, when long-train operation has predominated in Nevada. Comparing frequency rates, the Arizona rates are much higher than those in Nevada, whether the train-mile or the car-mile basis is employed, the yearly frequency in Arizona being from one and one-half to two and one-half times as great as in Nevada. For the six years 1935-1940, the car-mile frequency in Arizona (16.54 per 100 million car-miles) was 2.5 times the Nevada rate (6.52). While there has been a downward trend in casualty rates in both states, the improvement in casualty rates in Nevada (61.5% on the train-mile basis, 71.1% on the car-mile basis) has been much greater than in Arizona (49.2% and 52.3%, respectively).

Confining comparisons to accidents to *road freight conductors, brakemen and flagmen on duty*, the same results are shown. Casualties have been larger in absolute number and much more frequent in their occurrence in Arizona than in Nevada, although the volume of the appellant's freight traffic handled in Nevada was about 5% greater than in Arizona. During the years of predominant long-train operation in Nevada (since and including 1929), the comparison favors Nevada still more strongly, the frequency rates of those casualties in Arizona (17.17 per 100 million c.m., 1929-34; 13.53 per 100 million c.m., 1935-40)

having been more than twice the corresponding Nevada rates (8.56, 1929-34; 6.05, 1935-40).

Considering only those accidents to trainmen *due to sudden start, stop, lurch or jerk of train or car*—the so-called "slack-action" casualties—it clearly appears that the enforcement of the 70-car limit in Arizona has not had the effect of preventing or minimizing such accidents and the incident casualties, either when the Arizona operations alone are considered, or when they are compared with the Nevada operations of the appellant. Considering absolute numbers of such casualties, there were 101 on short trains in Arizona during the 18 years 1923-1940 as compared to 94 on long trains in Nevada. Combining the two states, there were 125 such short-train casualties in both states, and 96 such long-train casualties in both states. During the 12 years 1929-1940, there were 61 such casualties on all trains in Nevada, and 62 in Arizona. As stated, the Nevada traffic was 5% greater than in Arizona.

This type of casualty is of comparatively infrequent occurrence. There were periods of several months in each state when no such casualties occurred. During the six years 1935-1940, the frequency rates were: Nevada, 3.14, and Arizona, 2.90 per 100 million car-miles, a difference of .24 casualty, or about one for each 416,666,667 c.m.: about one casualty for each 3¼ years of operation. The improvement in the frequency rate of these casualties in Nevada, which has accompanied the increase in actual and average train lengths in that state, has been much greater than in Arizona. On the car-mile basis, the improvement, comparing the six years 1935-1940 with the six years 1923-1928, has been 57.5%; in Arizona 47.7%

It clearly appears that the so-called "slack-action" accident is a minor factor in determining the reasonableness of the Train Limit Law.

Considering casualties in absolute number, and particularly from the standpoint of the additional hazard to road freight conductors, brakemen and flagmen caused by operating more train units than necessary, over the 18 years 1923-1940 there were 268 casualties to such employees in Nevada, and 449 in Arizona.

The law does not tend to minimize derailments caused by defects in or failure of equipment, as is shown by comparing Arizona and Nevada during the period 1923-1940. During that period there were 70 derailments of this class on appellant's lines in Nevada, and 106 in Arizona; and of the 70 Nevada derailments, 35 occurred on short trains; so that there were 141 out of a total of 176 derailments in both states on short trains, but only 35 on long trains. The rate of frequency of such derailments was also substantially greater in Arizona than in Nevada, throughout the 18-year period; on the car-mile basis, the rates were, respectively, 2.93 per hundred million car-miles for Nevada, and 4.64 per hundred million car-miles for Arizona.

Comparing the Nevada accidents and casualties by periods, and contrasting the earlier period when short-train operation predominated in that state, with the later period when long-train operation predominated, accidents and casualties in that state were greatly reduced in the latter period. In the three years 1923-1925, which were short-train years, there were 114 casualties to road freight-train employees on duty; in the three years

1937-1939, there were but 33 such casualties; although the volume of traffic during those three years was approximately 25% greater than in the earlier three-year period. Comparing frequency rates, on the locomotive-mile and train-mile basis, casualties during the earlier short-train period were 2.88 times as frequent as in the later long-train period; on the car-mile basis, they were more than four times as frequent.

Substantial improvements in appellant's roadbed, bridges, and equipment have been made in both Nevada and Arizona; the only fundamental difference between the two states being that created by the restrictions of the law. Therefore, while the improvements in casualty frequencies in both states are to some extent due to such improvements, the greater reduction in casualty frequencies in Nevada is largely, if not wholly, due to the absence of the train-length restriction and the consequent opportunity for long-train operation. It clearly appears that the standard long-train operation in Nevada, on appellant's lines, is much safer when all classes of employees subject to hazards in road freight-train operation are considered, than the restricted operation in Arizona.

The casualty showing for appellant's Los Angeles Division indicates that the proportion of the accidents and casualties occurring upon or in connection with the operation of long freight trains is slightly less in relation to all casualties occurring in freight-train operation, than the proportion of such long trains to the total of all trains run; and it particularly appears that there is no special or unusual hazard, produced by or associated with the operation of long freight trains on that division, that does

not also appertain to short-train operation, and that the elimination of long trains would not in any degree reduce or eliminate such hazards.

The evidence of casualties in appellant's freight-train operations in New Mexico, introduced by both appellant and appellee, shows that such casualties have been substantially less in both number and frequency than in Arizona, although somewhat more frequent than in Nevada. Average train lengths in New Mexico are somewhat greater than in Arizona, though not as great as in Nevada; and the percentage of long trains operated in New Mexico is much less than in Nevada. Considering the 11-year period 1930-1940, there were, in New Mexico, 129 casualties to *all employees associated with freight-train operation*, 98 of which were on short trains. During the five years 1936-1940, there were 61 such casualties, of which 49 were on short trains. During the same 11-year period (1930-1940) there were, in Arizona, 251 casualties to *all employees in freight-train operation*, and the casualty rates were substantially higher than in New Mexico. During the same 11-year period there were, in New Mexico, 92 casualties to *road freight conductors and brakemen on duty*, 67 of which were on short trains, whereas in Arizona there were 293 such casualties. The casualty rates for such casualties in Arizona were likewise substantially higher than in New Mexico. Considering only the so-called "slack-action" casualties, there were, during said 11-year period, only 29 such casualties in New Mexico; whereas there were 56 in Arizona; and the frequency of such casualties was again substantially higher in Arizona than in New Mexico.

Considering only train accidents in New Mexico and Arizona, the number and frequency rate of such accidents were much greater in Arizona over the 11 years 1930-1940, there having been 120 such accidents, 98 of which were on short trains, in New Mexico, and 232 such accidents, all on short trains, in Arizona.

So far as concerns passenger-train accidents in New Mexico, the evidence shows that train length has had nothing to do with any accident or casualty occurring on appellant's lines in that state during the 11-year period 1930-1940.

The Atchison, Topeka & Santa Fe Railway Company, which operates in California, Arizona and New Mexico, as well as in numerous other states, observes the Arizona law in its operations between Needles, California, and Gallup, New Mexico, a distance of 419.7 miles, but is free of such restriction, except for the extra-territorial effect of the law, in its operations in New Mexico east of Gallup. Casualty comparisons, covering accidents to road freight trainmen and enginemen on duty, and occurring while on or getting on or off road freight trains, show that in the short-train district between Needles and Gallup, the number and frequency of such casualties has been substantially greater over the 17 years 1923-1939 than in the 384-mile district between Gallup and Clovis, New Mexico. The nature and character of the traffic in the two districts compared is greatly similar, the only dissimilarity being in the length of trains. Thus, during the 17-year period, there were 119 casualties of the classes specified in the Clovis-Gallup long-train territory, but 219

in the short-train territory between Gallup and Needles; the frequency rate of such casualties on the car-mile basis was 8.75 per hundred million car-miles in the Clovis-Gallup territory, and 14.44 in the Gallup-Needles territory.

Statistics of operations on the Chesapeake and Ohio Railway, which is a Class I railroad, operating in Virginia, West Virginia, Kentucky, Ohio, Indiana, and Illinois, and which operates a very large percentage of its main-line freight trains in lengths of 70 cars or more, show pronounced reductions in the number and frequency of casualties to employees, and particularly to trainmen and enginemen in road freight-train operation. Operating conditions on the lines of this railroad are not substantially dissimilar to those in Arizona; some of the grades being more severe than on any of appellant's main lines in said state. Long-train operation greatly predominates on its main lines, it appearing that during a typical period in 1939, more than 88% of its main-line trains were long trains, and that 53.8% consisted of more than 140 cars. 150-car trains are commonly operated by this carrier. The improvement in its casualty rates, comparing the three years 1936-1938, with the four years 1924-1927, has been 62.21% for all employees, and 67.27% for trainmen and enginemen. There has been a corresponding improvement in the frequency of derailments due to defects in or failures of equipment.

There has been a continuous and marked decrease in the frequency and total number of reportable casualties in train and train-service accidents on appellant's lines in Nevada, during the 18-year period 1923-1940, but a substantially less decrease in such number and frequency

over the same period in Arizona. As before stated, train lengths have substantially increased over said 18-year period in Nevada, but have remained practically constant in Arizona. The improvement in the casualty rate per hundred million car-miles in Nevada, comparing the six years 1935-1940 with the six years 1923-1928, has been 71.1%; in Arizona, 52.3%.

Many casualties to employees occur while trains are standing; such casualties are closely related to and increase with an increase in the number of trains operated, but have no relation to the length of the train. During the 18 years 1923-1940 there were 546 reportable casualties in Arizona sustained by all classes of appellant's employees (as compared with 308 in Nevada) on duty in road freight-train operation. 177 of these Arizona casualties, or 32.4%, occurred while trains were standing, and all were on short trains. 73 of the 308 Nevada casualties, or 23.7%, occurred while the trains were standing, and 53 of the 73 were on short trains. There were likewise many casualties in connection with passenger-train operation, sustained while such trains were standing, in the 17-year period 1923-1939. There were, in Arizona, 77 such casualties, out of a total of 239 casualties of all classes, sustained in passenger-train accidents by all persons other than trespassers. In Nevada, during the same period, there were 18 such casualties out of a total of 109 similar casualties of all classes in passenger-train accidents.

There has been a substantial improvement in the frequency of passenger casualties on Class I railroads of the United States during the 17 years 1923-1939, the frequency rates of such casualties being, however, extremely small. In the period 1923-1928, the frequency of such casualties

per million passengers carried was 5.16. In the five years 1935-1939, such frequency was 5.0. On the passenger-mile basis, the improvement in the casualty rate, comparing these two periods, was 17.66%.

Comparing passenger casualties on appellant's lines in Nevada and Arizona, the operation in Nevada having been unrestricted, while in Arizona the 14-car limit has been observed through the years up to and including 1939, a satisfactory basis of comparison is afforded to determine the effectiveness of the Arizona limitation as a regulation in the purported interest of safety of passenger-train operation. The casualty rates and the total of casualties were substantially less in Nevada than in Arizona, during the 17-year period 1923-1939. There were 239 casualties to persons while on or getting on or off passenger trains in Arizona during that 17-year period, but only 109 in Nevada. The casualty rates in Arizona were approximately twice as great as in Nevada. The Nevada totals and rates are greatly inflated, by reason of 53 casualties resulting from the derailment at Harney, Nevada, on August 12, 1939, involving a 14-car train, which derailment was solely due to malicious tampering with the track, the appellant having had no responsibility for the accident or any means of avoiding it.

The Arizona 14-car limitation upon passenger trains bears no relation whatever to the safety of travelers or employees or others lawfully upon appellant's passenger trains in Arizona.

Casualties in grade-crossing accidents, considering the United States as a whole, bear a practically constant

relationship to the volume of train-service operated over such grade crossings, measured in train-miles. Over the 17 years 1923-1939, there were on the average 6.45 grade-crossing casualties, in accidents involving automobiles, per million train-miles operated; and in each year during that period the rate was very close to such average. Assuming the vehicular traffic over a grade-crossing to be constant, the hazard of grade-crossing accidents involving trains increases directly with the increased number of trains using the crossing. This hazard is therefore increased substantially if additional and unnecessary trains are operated over the crossing. Collisions occurring at such crossings are a source of casualties, not only to the occupants of vehicles, but also to the train crews and other persons on the trains or engines involved. The Train Limit Law, by requiring a greater number of trains to be run than otherwise necessary, increases the hazard of grade-crossing accidents in Arizona and the adjacent affected territory.

Considering freight-train derailments in Arizona, Nevada and New Mexico, the Train Limit Law not only does not bring about any reduction in the number and frequency of such accidents, but, by comparison with the results of operation in Nevada and New Mexico, results in an increased hazard over that resulting from the standard long-train method of operation.

There is no particular hazard of injury on long freight trains because of the emergency application of the air brakes by engineers. No reportable accident assigned to this cause has taken place in Nevada since 1936. In Arizona, during the 18-year period 1923-1940, there were nine

casualties assigned to emergency applications of brakes by the engineer, all of them on short trains. The application of the air brakes in emergency by an engineer on a freight train is a comparatively rare occurrence.

Casualties on freight trains due to undesired emergency applications of the air brakes, principally caused by light graduating springs in the triple-valve mechanism on the cars, have been practically eliminated, because of the compulsory use of heavier graduating springs, which largely prevent such undesired emergencies. Accidents on either long or short trains, due to undesired emergencies arising from this cause, are no longer a factor of material consequence.

During the period March 2 to April 30, 1940, when appellant operated 302 long freight trains and 62 long passenger trains in Arizona, there were seven accidents on passenger trains, all on trains operated in conformity with the law. There were no accidents or casualties on any of the 62 long passenger trains. There were seven accidents on or in connection with all of appellant's freight trains in Arizona, both long and short, in April, 1940. Four casualties were involved. All but one of these accidents involved short trains. The one accident involving a long train occurred while the train was standing.

Appellant's long-train operations in Arizona during March and April, 1940, were conducted without incurring any accident or casualty which could, or would, have been prevented or minimized if the law had been observed. None of the accidents during that period took place in circumstances where the length of the train had any bearing.

In 1939, there were some 2,693 employees on appellant's Tucson Division, whose safety while on duty is or might be affected in various aspects by the law. The law directly affects the opportunity for employment of train and engine-service employees on main-line freight and passenger trains only, because it compels a greater number of trains to be operated and thus increases the number of men required in such train service. Only 644, or 23.9%, of the 2,693 Tucson Division employees are train and engine-service employees in main and branch-line service.

In so far as concerns safety, all train-service employees, and all others whose duties require them to go or be upon the tracks, are affected by the law, because the increase in number of trains run increases the hazard of accidents to such employees. These hazards include: (a) the danger of being struck and run down while on the tracks; (b) head and rear-end collisions; (c) locomotive accidents; (d) grade-crossing accidents; (e) slipping or falling while getting on or off trains. There are some 1,652 employees, or about 61% of all those on the Tucson Division, whose safety is thus impaired by the law.

Appellee's contention respecting the safety features of the law refers principally, if not solely, to potential slack-action injuries to train-service employees (not including enginemen) upon main-line freight trains. There were only 331 such employees, out of the total of 2,693, on the Tucson Division. This total is to be contrasted with the 1,652 employees whose safety of employment is impaired by the law.

The frequency of train and train-service accidents is directly related to the number of train units operated;

when more trains are run than necessary to handle a given amount of traffic, the hazard in the handling of such traffic is correspondingly increased. The law required in 1938 about 31% more freight trains than actually were necessary on the Yuma-Gila-Lordsburg line alone, and compelled about 16,500 additional unnecessary meets and passes. It thus greatly increased the number of train orders, and the hazards due to misinterpretation or forgetfulness of such orders. It increased the number of employees required to move the same amount of traffic, and thus increased the hazards due to failure to observe rules or signals, and all the other classes of hazards related to the increased numbers of locomotives and train units operated, and tended to increase the hazard of accidents in yards, due to extra switching, and the hazards to maintenance employees who are required to be on tracks; and particularly the hazards of grade-crossing accidents and collisions.

Even if short-train operation might possibly result in any decrease in the number or severity of so-called "slack-action" casualties, that decrease is substantially more than offset by the increased number of accidents and casualties from other causes which follows the arbitrary limitation of trains and the consequent increase in the number required to handle the same volume of traffic. The law therefore not only bears no reasonable relation to safety, but on the contrary impairs and lessens substantially the safety of appellant's operations in Arizona and the adjacent affected territory.

(Finding of Fact No. XII, R. 3974-4022.)

10. Analysis of Certain Contentions Advanced by Appellee.

There is no evidence to support appellee's contention that trains would be delayed in long-train operation because of inadequate siding capacities at meeting and passing points. While siding capacities in the affected territory are not at present adequate in all cases to contain long trains, long-train operation in one direction or the other, but not in both directions at the same time, is perfectly feasible; moreover, if the restriction is removed, the sidings will be at once extended.

There is likewise no substance to appellee's contention that trains must be limited to 70 cars in order that members of the crew may see and interpret signals more readily. When a train is in motion, the only manual signal required is a stop signal; if such signal is given from the caboose and not seen by the engineer, the train may be stopped by the application of the conductor's emergency valve in the caboose. There can be no severe slack-action shock in the caboose in such cases. There is no evidence of any reportable casualty on appellant's lines from the use of the conductor's valve. When the train is at a standstill, if signals from the rear are not seen, no accident can result through such failure; the signal can either be repeated, or a member of the crew can go forward to pass the signal to the engineer.

No reportable *train-service* accident has occurred on appellant's lines in Arizona or Nevada over the last 18 years due to failure to observe or properly interpret signals. One reportable *train* accident assigned to that cause occurred in those two states, during said period; but it

did not involve any casualties, and related only to the movement of a helper engine with two cars and a caboose.

There is no substance to the contention that members of the crew in the cabooses of long trains are made less alert or efficient in performing their duties, because of claimed constant fear of injury. No evidence was offered to show that alertness or efficiency were thus impaired; in fact, the witnesses who testified respecting their alleged fear in cabooses of long trains have the right, by seniority choice, to work as conductors in the short-train territory between Yuma and Lordsburg; but for many years, *by choice*, they have worked in the long-train territory between Lordsburg and El Paso.

There is likewise no foundation for appellee's contention that long trains cannot be properly inspected and supervised while in operation, but that short trains can be, and that long-train operation is therefore more hazardous. Observation and inspection of trains in operation for the purpose of detecting defects or failures in the rolling equipment, can be and are as efficiently performed on long trains as on short trains. Reportable derailments due to defects in or failures of freight-car equipment are substantially less frequent in Nevada, in long-train operation, than in Arizona.

The purpose of inspection and observation of trains while en route is to detect such failures and take necessary action before an accident results. No witness who was called made or supported any claim that any accident had occurred upon a long train, as to which it was asserted or made to appear that the accident could

have been avoided, or its effects lessened, if the train had been short. No accident was referred to by any of appellee's witnesses, due to a defect in or failure of a car on a long train, as to which it was claimed that the accident could have been prevented, or its effects lessened through inspection or observation, if the train had been within the restriction of the law.

There is no basis for appellee's contention that the present type of air-brake equipment is inadequate to control the speed of and to stop long trains, but is more efficient and adequate upon short trains. The witnesses called by appellee included conductors and engineers working in both long-train and short-train territory; one of these engineers, who had handled many long trains, admitted that their control simply required more care. Another who handled certain long trains in Arizona during April, 1940, said that he had used greater care in their handling, but admitted that he had no difficulty. None of the conductors referred to any instance when the engineer was unable to control the speed of or to stop his train. A Santa Fe engineer, called by appellee, failed to refer to any instance within his knowledge when an engineer had been unable to control or stop a long freight train with the present type of air brakes. This engineer, though having sufficient seniority to work regularly in short-train territory in Arizona, has exercised his seniority to obtain and hold a preferred position in freight service in long-train territory in California.

Appellant's engineer witnesses, men of long experience, testified that the handling of long trains by engineers,

and particularly the control and stopping thereof, though requiring somewhat more care, involved no greater difficulties than in the case of short trains.

The 302 long trains operated by appellant in Arizona during April, 1940, were controlled and stopped, so far as the record shows, without difficulty. As to many of these trains, it affirmatively appears that the handling was without difficulty or incident.

(Finding of Fact No. XIII, R. 4022-4032.)

11. Extent of Penalties Imposed by the Law.

If appellant had operated its trains in 1938 without regard to the law, it would have run about 7,800 long freight trains, and about 360 long passenger trains in Arizona. Its liability for cumulative penalties would thus have ranged from about $816,000, to approximately $8,160,000.

(Finding of Fact No. XIV, R. 4032.)

12. The Permissible Number of Cars in an Inferstate Train Is a Subject of National and Not Local Concern.

The permissible number of cars in an interstate train is a subject of national and not local concern, and one which requires a general system or uniformity of regulation, if any be needed. It is a subject which therefore must, and should be, regulated by Congress, and not by the several states. It is wholly impracticable to construct and maintain railroad terminals exactly on state lines, or to split up or consolidate through trains except at terminals. Varying regulations of train lengths by the several

states, all of which would have extra-territorial effects similar to those of the Arizona law, would, if conflicting, result in serious interference, delay, and embarrassment to through interstate operations. Compliance with such varying standards of train length would likewise make useless the tremendous investment which has made long-train operation possible, and would cause the railroads to lose the efficiency and economies which have resulted therefrom.

(Finding of Fact No. XV, R. 4032-4033.)

IV.

SPECIFICATION OF ERRORS

1. The Supreme Court of Arizona erred in failing to hold that the Arizona Train Limit Law is invalid and unconstitutional, in violation of the Commerce Clause (Article I, Section 8, paragraph 3) of the Constitution of the United States, because said law undertakes to and does regulate a subject matter over which exclusive legislative jurisdiction is vested in Congress by said Commerce Clause, in that the length and consist of interstate railroad trains is a subject matter requiring a general or national system and uniformity of regulation, if such regulation should for any reason be required.

2. Said state court erred further in failing to hold said Train Limit Law invalid and unconstitutional, in violation of said Commerce Clause, because its necessary and inevitable effect is to regulate and control the lengths of the interstate trains operated over appellant's lines, not only

within Arizona, but also extra-territorially; that is to say, outside of Arizona, and in adjoining portions of California and New Mexico, and also in Texas.

3. Said state court erred further in failing to hold said Train Limit Law invalid and unconstitutional, in violation of said Commerce Clause, because its necessary and practical effect is directly, substantially and unreasonably to interfere with, delay, regulate and obstruct the operation of appellant's interstate trains, both within and without Arizona, and to impair the use and usefulness of appellant's facilities employed in interstate commerce.

4. Said state court erred further in failing to hold said law invalid and unconstitutional, in violation of said Commerce Clause, because its necessary and inevitable effect is to impose direct, substantial and unreasonable burdens upon interstate commerce as carried on by appellant, both within and without Arizona, and thus further to impair the use and usefulness of appellant's facilities employed in interstate commerce.

5. Said state court erred further in failing to hold and conclude that said Train Limit Law, to the extent that it has or may have, or is intended or claimed to have, the effect of limiting the number of cars in an interstate train to the maximum number which can be safely controlled or stopped in one train by the use of the types of air brakes now employed thereon, or any other type of train control or other safety device, is void and unenforceable against appellant, because it attempts to and does enter a legislative field already entered, and therefore occupied by Congress, and thereby conflicts with and infringes upon

existing legislation enacted by Congress, to wit, the Safety Appliance Act, as amended, and the Safety Section (Section 25) of Part I of the Interstate Commerce Act.

6. Said state court erred further in failing to hold said Train Limit Law unconstitutional and void, in violation of both the aforesaid Commerce Clause, and also the due-process clause of the Fourteenth Amendment to the Constitution of the United States, because said Train Limit Law operates arbitrarily and unreasonably to deprive appellant of its property without due process of law; in that said law (a) fixes maximum lengths of trains very much lower than those which obtain generally elsewhere throughout the United States under operating conditions substantially similar to those upon appellant's lines in Arizona; (b) makes no allowance for grade or other operating conditions, or for the construction, type, weight, or lengths of the cars composing the trains, or whether such cars are loaded or empty, or if loaded the weights of the loads; (c) imposes a great, substantial, and wholly unreasonable burden of expense upon, interference with, and delay to interstate commerce, and impairs the use and usefulness of appellant's transportation facilities; and (d) bears no reasonable relation to health or safety, and does not and will not either eliminate or to any substantial extent reduce any existing hazard, but on the contrary does and will create new and increase existing hazards and dangers of railroad operation.

7. Said state court erred further in holding and concluding that said Train Limit Law is valid and constitutional, and that the "findings and judgment of the trial

court to the effect that the Train Limit Law is unconstitutional were in error."

8. To the extent that the opinion and decision of said state court are or may be intended or construed to be a disapproval or reversal of the findings of fact of the trial court in this cause, or any part or portion of said findings of fact, said state court erred further in said opinion and decision, because the same, if and to the extent that they are or may be so construed or intended, operate to deny to appellant federal rights guaranteed by the Constitution and laws of the United States, to which it is shown by the evidence in this cause to be entitled.

V.

SUMMARY OF ARGUMENT

Introductory.

While the instant case is of first impression in this Court, there have been four prior cases in the Federal district courts involving state train-limit laws: *A. T. & S. F. Ry. Co. et al. v. LaPrade* (1933), 2 F.Supp. 855; *Southern Pacific Co. v. Mashburn* (1937), 18 F.Supp. 393; *Texas & New Orleans R. Co. v. Martin* (1936), U.S.D.C., E.D.La., No. 428 Equity (not officially reported); *M. K. & T. R. Co. v. Williamson* (1941), 36 F.Supp. 607.

In the *LaPrade case* the court declared invalid the same statute involved in the present case; but its conclusions were given no effect because this Court, in *Ex Parte LaPrade* (1933), 289 U.S. 444, held that the suit had abated by reason of the substitution as defendant of the incoming

attorney general. In the *Mashburn* and *Martin Cases* the Nevada and Louisiana laws were respectively held invalid; in the *Williamson Case*, the Oklahoma law was sustained by a divided court.

Compare, also, *Southern Pacific Co. v. Railroad Commission* (1935), 10 F.Supp. 918, in which a state regulation requiring cabooses to be placed midway in interstate trains on a particular district was held invalid; and *Ex Parte No. 156* (1943), 256 I.C.C. 523, in which the Interstate Commerce Commission declared that it had power, under the Car Service Clauses (pars. 10-17, of Section 1) of the Interstate Commerce Act, to suspend the state train-limit laws during the present war emergency.

1. The Train Limit Law Invades an Exclusive National Field of Regulation.

The principal objects of the Commerce Clause were and are to insure the national interest, as against conflicting and discriminatory state laws regulating interstate commerce, by providing for regulation of that commerce by a single authority as to all matters requiring a national and uniform system of regulation, and thereby guarding against obstructions to the free flow of such commerce. *Brown v. Maryland* (1827), 12 Wheat. 419; *Cooley v. Port Wardens* (1851), 12 How. 299; *Welton v. Missouri* (1875), 91 U.S. 275; *Mobile Co. v. Kimball* (1880), 102 U.S. 691; *Cook v. Marshall Co.* (1904), 196 U.S. 261; *Minnesota Rate Cases* (1912), 230 U.S. 352; *Port Richmond, etc. Ferry Co. v. Hudson Co.* (1914), 234 U.S. 317; *Parker v. Brown* (1943), 317 U.S. 341; *Union Brokerage Co. v. Jensen* (1944), 322 U.S. 202. Compare, also: *Wilmington Transp.*

Co. v. Railroad Commission (1915), 236 U.S. 151; *Oregon-Washington R. & N. Co. v. Washington* (1926), 270 U.S. 87; *Milk Control Board v. Eisenberg Farm Products* (1939), 306 U.S. 346; *United States v. South-Eastern Underwriters' Assn. et al.* (1944), 322 U.S. ....., 88 L.Ed. Adv. 1082.

The Congressional power to regulate commerce is exclusive whenever the subject matter is national in character, or admits of only one system or plan of regulation. *Robbins v. Shelby Co., etc.* (1887), 120 U.S. 489; *Atlantic & Pacific Telegraph Co. v. Philadelphia* (1903), 190 U.S. 160; *Kelly v. Washington* (1937), 302 U.S. 1. Inaction or silence by Congress is equivalent to a declaration that no regulation of the subject is necessary. *Hall v. DeCuir* (1877), 95 U.S. 485; *Welton v. Missouri* (1875), 91 U.S. 275; *Morrill v. Wisconsin* (1894), 156 U.S. 626; *Gloucester Ferry Co. v. Pennsylvania* (1885), 114 U.S. 196; *Covington & C. Bridge Co. v. Kentucky* (1894), 154 U.S. 204; *Leisy v. Hardin* (1890), 135 U.S. 100; *In re Rahrer* (1891), 140 U.S. 545; *Brennan v. Titusville* (1894), 153 U.S. 289; *Buck v. Kuykendall* (1925), 267 U.S. 307; *Bush v. Malloy* (1925), 267 U.S. 317.

While there is a permissible, so-called "joint" or "concurrent", field of regulation of interstate commerce, in which states may act through the exercise of their police power in the absence of action by Congress touching the same subject matter, the determination whether a particular regulation falls within that field, or on the other hand invades the exclusive national field, depends upon the nature of the subject matter regulated, and the effect of

the regulation upon interstate commerce; and does not depend on the claimed or stated purposes of the regulation or its relation to that purpose. *Minnesota Rate Cases* (1912), 230 U.S. 352; *South Covington Ry. Co. v. Covington* (1915), 235 U.S. 537; *Seaboard Airline R. Co. v. Blackwell* (1917), 244 U.S. 310; *Kansas City Southern Ry. Co. v. Kaw Valley Drainage Dist.* (1914), 233 U.S. 75; *Davis v. Farmers Coop. Co.* (1923), 262 U.S. 312; *Shafer v. Farmers' Grain Co.* (1925), 268 U.S. 189; *Parker v. Brown* (1942), 317 U.S. 341; *Union Brokerage Co. v. Jensen* (1944), 322 U.S. 202. A state cannot avoid the operation of the rule arising from the Commerce Clause, which forbids the regulation of matters of exclusive national concern, by the simple expedient of invoking "the convenient apologetics of the police power." *Kansas City Southern Ry. Co. v. Kaw Valley Drainage Dist.* (1914), 233 U.S. 75.

The undisputed facts of the instant case demonstrate that the subject matter of the length and consist of interstate freight and passenger trains moving from one state to another, or from one state across an intervening state to a third, is a matter of exclusive national concern. Intolerable obstructions to and interferences with interstate commerce would follow if each state could and should impose varying and inconsistent limitations. Such regulations, because of their inevitable extra-territorial effects, would create constant difficulty and embarrassment. Compare *Hall v. DeCuir* (1877), 95 U.S. 485; *South Covington Ry. Co. v. Covington* (1915), 235 U.S. 537; *Kelly v. Washington* (1937), 302 U.S. 1; and see also the *LaPrade, Mashburn,* and *California Midtrain Caboose Cases, supra.*

Service Order No. 85 of the Interstate Commerce Commission, suspending state train-limit laws during the present war emergency, constitutes a clear recognition of the exclusive national character of the subject matter.

The decisions in *A. C. L. R. Co. v. Georgia* (1914), 234 U.S. 280; *New York, etc. R. Co. v. New York* (1897), 165 U.S. 628; and *Smith v. Alabama* (1888), 124 U.S. 465, do not support any view that a state police-power regulation is valid if it directly and substantially interferes with and obstructs interstate commerce, or regulates a subject matter of such nature as to require a national and uniform system of regulation. These cases simply present examples of regulations in the concurrent field, having incidental and indirect effects upon commerce, which thus were valid in the absence of action by Congress. Compare: *I. C. R. Co. v. Illinois* (1896), 163 U.S. 142; *Minnesota Rate Cases* (1912), 230 U.S. 352; *M. K. & T. Ry. Co. v. Texas* (1918), 245 U.S. 484; *Southern Ry. Co. v. Indiana* (1915), 236 U.S. 439.

The *Arkansas Full Crew Cases* (*C. R. I. & P. Ry. Co. v. Arkansas* (1911), 219 U.S. 453; *St. Louis I. M. & S. Ry. Co. v. Arkansas* (1916), 240 U.S. 518; *Missouri-Pacific R. Co. v. Norwood* (1931), 283 U.S. 249), which involved the validity of the Arkansas Full-Crew Law, likewise have no bearing upon the national-field point. The *Barnwell Case* (*South Carolina Highway Dept. v. Barnwell Bros.* (1938), 303 U.S. 177), and other recent motor carrier decisions (*Morris v. Duby* (1927), 274 U.S. 135; *Sproles v. Binford* (1932), 286 U.S. 374; *Maurer v. Hamilton* (1940), 309 U.S. 598) are clearly distinguishable from the case at bar. In

the *Barnwell* and *Maurer* opinions this Court pointed out the difference in both principle and practice between state regulations covering the use of state highways, and the regulation of railroads (303 U.S., at pp. 186, 187; 309 U.S., at pp. 604, 605).

2. The Train Limit Law Regulates Interstate Commerce With Extra-Territorial Effect.

The extra-territorial effects of the law are inevitable and unchallenged. Compliance with its terms requires trains to be made up and broken up at points outside of Arizona, causes delays to trains and cars outside the state, and compels short-train operation for substantial distances in neighboring states. Additional train service outside the state, otherwise unnecessary, thus also results from the law.

A state police-power statute which unavoidably regulates the conduct of interstate commerce in other states is clearly invalid: *Hall v. DeCuir* (1877), 95 U.S. 485; *South Covington Ry. Co. v. Covington* (1915), 235 U.S. 537; *Bowman v. C. & N. W. Ry. Co.* (1888), 125 U.S. 465; and compare: *Pennoyer v. Neff* (1877), 95 U.S. 714; *Olmsted v. Olmsted* (1910), 216 U.S. 386; *Baldwin v. Seelig* (1935), 294 U.S. 511; *Connecticut, etc. Ins. Co. v. Johnson* (1938), 303 U.S. 77; *Magnolia Petroleum Co. v. Hunt* (1943), 320 U.S. 430; *McLeod v. Dilworth Co.* (1944), 322 U.S. 327.

The proper limitation of the state's police power to its own territorial jurisdiction has often been emphasized: *Minnesota Rate Cases* (1912), 230 U.S. 352; *Milk Control Board v. Eisenberg Farm Products* (1939), 306 U.S. 346; compare: *Sproles v. Binford* (1932), 286 U.S. 374, 390;

South Carolina Highway Dept. v. Barnwell Bros. (1938), 303 U.S. 177, 185. The recent decision in *Terminal R.R. Assn. v. Brotherhood* (1943), 318 U.S. 1, does not militate against our contention. The extra-territorial effects of the regulation there sustained were apparently inconsequential; i.e., at most merely "incidental and indirect". Here the extra-territorial burdens and obstructions imposed by the challenged law are inevitable, substantial, and direct.

3. The Train Limit Law Directly, Materially, and Substantially Interferes With, Burdens and Obstructs Interstate Commerce.

A state police-power regulation, even though assertedly addressed to a subject within the concurrent field, is invalid if it directly, materially, and substantially regulates, interferes with, burdens, and obstructs interstate commerce. *Illinois Central R. Co. v. Illinois* (1896), 163 U.S. 142; *Kansas City Southern R. Co. v. Kaw Valley Drainage Dist.* (1914), 233 U.S. 75; *South Covington R. Co. v. Covington* (1915), 235 U.S. 537; *St. L.-S. F. R. Co. v. Public Service Commission* (1921), 254 U.S. 535; *Adams Express Co. v. New York* (1913), 232 U.S. 14; *Seaboard Airline R. Co. v. Blackwell* (1917), 244 U.S. 310; *Davis v. Farmers Coop. Co.* (1923), 262 U.S. 312; *La Coste v. Dept. of Conservation* (1924), 263 U.S. 545; *Foster-Fountain Packing Co. v. Haydel* (1929), 278 U.S. 1; *California v. Thompson* (1941), 313 U.S. 109; *Parker v. Brown* (1942), 317 U.S. 341.

The commerce affected by the challenged statute is admittedly interstate in character. The fact that the statute is assertedly, or even actually, a safety regulation will not save it if the Court determines that in fact it infringes

the above principle. Compare *Kansas City Southern R. Co. v. Kaw Valley Drainage Dist.* (1914), 233 U.S. 75; *St. Louis & San Francisco Ry. Co. v. Public Service Commission* (1921), 254 U.S. 535; *Seaboard Airline R. Co. v. Blackwell* (1917), 244 U.S. 310; *Edwards v. California* (1941), 314 U.S. 160; *M. K. & T. R. Co. v. Texas* (1918), 245 U.S. 484; *St. Louis Southwestern Ry. Co. v. Arkansas* (1910), 217 U.S. 136; *Shafer v. Farmers Grain Co.* (1925), 268 U.S. 189. The Court has both the right and duty to make the necessary factual determination for itself. *Milk Control Board v. Eisenberg Farm Products* (1939), 306 U.S. 346; *La Coste v. Dept. of Conservation* (1924), 263 U.S. 545; *Foster-Fountain Packing Co. v. Haydel* (1929), 278 U.S. 1; *Parker v. Brown* (1942), 317 U.S. 341.

The actual obstructions, burdens, interferences or delays imposed by the challenged law are substantial, direct, continuous, and unavoidable. The heavy continuing financial burden, as found by the trial court (Finding X-d, R. 3966) is conceded by the state Supreme Court to be very large (R. 4063). The interference, delay and obstruction are equally serious (Findings X-b, X-c, R. 3953-3966; and compare the trial court's memorandum opinion, R. 4048-4049). The Interstate Commerce Commission has found that the law causes delay, congestion, and wasteful use of equipment, and interferes with the free flow of traffic: see Service Order No. 85, and the subsequent report of the Commission, 256 I.C.C. 523, 535.

The burdens and obstructions imposed upon commerce by the law wholly outweigh any possible safety benefits which may be claimed to result from its enforcement.

Such "benefits," whether consideration be given only to the so-called "slack action" hazard (a minor and relatively unimportant class of hazard), or to all hazards, are very slight at best, and indeed are actually *detriments;* the record being clear that in unrestricted operation there is much less hazard, and a much smaller casualty frequency, than under the compelled short-train operation.

4. The Train Limit Law Invades a Field of Regulation of Interstate Commerce Fully Occupied by Congress.

A state-police power regulation affecting interstate commerce, even though otherwise valid, is automatically ousted if it comes into conflict with any Federal statute or regulation covering the same subject matter. A state cannot validly enact legislation imposing additional or supplementary requirements or prohibitions. *Oregon-Washington R. & N. Co. v. Washington* (1926), 270 U.S. 87; *Southern Ry. Co. v. Reid* (1912), 222 U.S. 424; *Northern Pacific R. Co. v. Washington* (1912), 223 U.S. 370; *Erie R. Co. v. New York* (1914), 233 U.S. 671; *Missouri Pacific R. Co. v. Stroud* (1925), 267 U.S. 404; *C. R. I. & P. R. Co. v. Elevator Co.* (1913), 226 U.S. 426; *Napier v. Atlantic Coast Line R. Co.* (1926), 272 U.S. 605; *Pennsylvania R. Co. v. Public Service Commission* (1919), 250 U.S. 566. The field of safety of railroad operation as affected by train length has been occupied by Congress through the enactment of the power-brake provisions of the Safety Appliance Act (45 U.S. Code, Secs. 1, 9), and the safety section of the Interstate Commerce Act (49 U.S. Code, Sec. 25). The power-brake provisions forbid the oper-

ation of any train so long or heavy that it cannot be safely controlled, handled, and stopped in its ordinary operation by the use of the air brakes. *Virginian R. Co. v. United States* (1915), 223 Fed. 748. The Commission has investigated the matter of freight-train brakes (*Investigation of Power Brakes, etc.* (1924), 91 I.C.C. 481), and recently announced its intention to issue an order providing specifications for such brakes and requiring their application; such specifications, among other things, expressly contemplate trains of 150 cars.

There is no distinction in purpose or result between the challenged law and the two Federal statutes mentioned. Appellee's position is shown, by its own testimony and argument, to be that in the interest of safety long trains must be prohibited because with the present brakes the engineers cannot safely handle, control, and stop such trains. The decision in the *Virginian case*, 223 Fed. 748, shows that this is the purpose and result of the Safety Appliance Act. The Commission's action under Section 25 of the Interstate Commerce Act is likewise for the same purpose. The state law conflicts with the Federal acts by prohibiting the operation of trains which are lawful under the latter, because not unsafe or impossible to control: e.g., the 302 long freight trains and 62 long passenger trains actually operated in Arizona in March and April, 1940. In effect the state is attempting to substitute a fixed limit, applied regardless of attendant circumstances, for the judgment of a Federal court and jury based upon the particular facts developed in a prosecution under the Safety Appliance and Interstate Commerce Acts.

5. The Train Limit Law Operates Arbitrarily and Unreasonably to Deprive Appellant of Its Property Without Due Process of Law.

The heavy cost to appellant of compliance with the challenged law, though not controlling, may and should be considered, and contrasted with the completely negligible safety benefits flowing from such compliance. *Washington, etc. v. Fairchild* (1912), 224 U.S. 510; *Missouri Pacific R. Co. v. Norwood* (1931), 283 U.S. 249; *A. T. & S. F. Ry. Co. v. Railroad Commission* (1931), 283 U.S. 380; *Missouri-Pacific R. Co. v. Kansas* (1910), 216 U.S. 262; *Lehigh Valley R. Co. v. Commissioners* (1928), 278 U.S. 24. The only "benefit" seriously claimed is that slack-action casualties to freight trainmen are rendered less frequent and severe. Casualties of this type are relatively unimportant, constituting only about six percent of all the employee casualties occurring in freight-train operations. Even this claim has no factual basis; whereas it is clearly shown that all other classes of hazards to employees, as well as the grade-crossing hazard to non-employees, are greatly increased.

While there is a presumption of reasonableness normally favoring a police-power statute, it is not conclusive, but may be overcome by a proper showing. The courts are not precluded from examining the facts, by reason of any implied or expressed legislative declaration. *Nebbia v. New York* (1934), 291 U.S. 502; *Dobbins v. Los Angeles* (1904), 195 U.S. 223; *Lawton v. Steele* (1894), 152 U.S. 133; *Mugler v. Kansas* (1887), 123 U.S. 623; *Minnesota v. Barber* (1890), 136 U.S. 313. Compare: *N. C. & St. L. v. Walters* (1935), 294 U.S. 405; *Southern Ry. Co. v. Virginia* (1933), 290 U.S. 190; *Liggett Co. v. Baldridge* (1928), 278

U.S. 105; *St. Joseph Stockyards Co. v. United States* (1936), 298 U.S. 38; and see also, as showing that the presumption is merely *prima facie*: *Great Northern Ry. Co. v. Washington* (1937), 300 U.S. 154; *O'Gorman & Young v. Hartford Ins. Co.* (1931), 282 U.S. 251; *Pacific States, etc. Co. v. White* (1935), 296 U.S. 176; *United States v. Carolene Products Co.* (1938), 304 U.S. 144. Furthermore, a law valid when enacted may become invalid because of lapse of time and changed conditions, as in the case at bar: *N. C. & St. L. R. Co. v. Walters* (1935), 294 U.S. 405; *Albee State Bank v. Bryan* (1931), 282 U.S. 765; *Galveston Elec. Co. v. Galveston* (1922), 258 U.S. 388; and if actual changes in conditions are shown, the presumption is no longer available. *South Carolina Highway Dept. v. Barnwell Bros.* (1938), 303 U.S. 177; *Clark v. Paul Gray* (1939), 306 U.S. 583; *United States v. Carolene Products Co.* (1938), 304 U.S. 144. The state court erred in failing to recognize and apply these principles to the case at bar: compare *N. C. & St. L. R. Co. v. Walters* (1935), 294 U.S. 405, 414-415. The record here shows vast changes in the relevant conditions since the date when the law was enacted. The extent and character of these changes could not possibly have been foreseen by the Arizona legislature of 1912.

"Common belief" may be, and in many cases has been, given weight in considering the validity of challenged legislation. *Jacobson v. Massachusetts* (1905), 197 U.S. 11; *Muller v. Oregon* (1908), 208 U.S. 412; *Bunting v. Oregon* (1917), 243 U.S. 426; *West Coast Hotel Co. v. Parrish* (1937), 300 U.S. 379; *Parker v. Brown* (1943), 317 U.S. 341. In the case at bar, common belief is overwhelmingly opposed to the principle of the law. Such

statutes have been enacted in only four of the 48 states, and enforced in only two. Congress has, several times rejected proposed federal legislation fixing arbitrary maximum train-lengths. The long-train operating method has never been condemned by, but on the contrary has received at least inferential approval from the Interstate Commerce Commission, and is now standard all over the United States, except in Arizona and, recently, Oklahoma. The common opinion of the railroad industry thus clearly favors long-train operation. The only opposing opinion is that held by railroad employes in train and engine service, who constitute only a minority of those whose duties expose them to the hazards incident to train operation. The financial interest of this minority is favorably affected by train limit laws, because of increased employment opportunities. The remainder of the employes exposed to train operation, whose hazards of employment are needlessly increased by the increased number of trains run, certainly cannot be said to favor train limitation.

Service Order No. 85 reflects informed opinion respecting the adverse results of train-limit laws, and particularly their lack of merit from the safety standpoint. Compare *Ex Parte No. 156*, 256 I.C.C. 523, 536.

A purported safety measure which bears no reasonable relation to that purpose, but actually creates and increases hazards as does the Train-Limit Law—is unreasonable and invalid under the Due-Process Clause of the 14th Amendment: *Mugler v. Kansas* (1887), 123 U.S. 623; *Minnesota v. Barber* (1890), 136 U.S. 313; *Liggett Co. v. Baldridge* (1928), 278 U.S. 105; *Washington, etc. v. Roberge* (1928), 278 U.S. 116; *C. St. P. M. & O. Ry. v. Holmberg* (1930), 282 U.S. 162; *Nashville C. & St. L. R. Co. v.*

Walters (1935), 294 U.S. 405; *Treigle v. Acme Homestead Ass'n.* (1936), 297 U.S. 189. This principle has been recognized by the state court in its own earlier decisions, which, however, were wholly disregarded in the present case. *State v. Childs* (1927), 32 Ariz. 222; *Atchison, etc. Ry. Co. v. Arizona* (1928), 33 Ariz. 440; *State v. Borah* (1938), 51 Ariz. 318; *Buchman v. Bechtel* (1941), 57 Ariz. 653. The facts of record relative to safety as affected by the limitation (see Findings Nos. XI, XII, and XIII, R. 3969-4032) demonstrate that the Train-Limit Law does not reduce any hazard, even the limited and unimportant class associated with slack-action, but increases substantially—and as to some hazards actually multiplies the frequency—the hazards and casualties of railroad operation. The trial court declared (R. 4052): "as a matter of *cold fact*" the law makes "train operations more dangerous."

6. The Decision of the State Court, if Construed as a Reversal of the Trial Court's Findings of Fact, Operates to Deny to Appellant Federal Rights to Which It Is Shown by the Evidence to Be Entitled.

The lower court declared (R. 4067-4068) that its opinion expresses its reasons for holding that the trial court's findings "to the effect that the Train-Limit Law is unconstitutional were in error." This expression should not be construed as a reversal of the trial court's findings of fact, because: (1) the opinion contains no discussion of the facts in the case; (2) the state court itself, in many decisions, has stated and followed the rule that findings of fact by a trial court will not be reconsidered on appeal unless clearly erroneous, and did not here declare that it

was departing from that rule; (3) the mandate (R. 4072-4073) did not direct that the findings of fact be modified or vacated, and the judgment upon the mandate (R. 4073-4074) did not contain any expression vacating such findings; (4) there were no actual findings *of fact* "to the effect" that the law is unconstitutional.

If, nevertheless, the state court's expression is held to constitute a reversal of the trial court's findings of fact, the rule becomes applicable that where a claim of Federal rights has been made, and denied because of a factual holding by a state court, which is not properly supported by the evidence, this Court will examine the record for itself, and will not be concluded by the state court's determination. *Kansas City Southern R. Co. v. Albers Commission Co.* (1912), 223 U.S. 573; *Northern Pacific R. Co. v. North Dakota* (1915), 236 U.S. 585; *Norfolk & Western R. Co. v. Conley* (1915), 236 U.S. 605; *Aetna Life Ins. Co. v. Dunken* (1924), 266 U.S. 389; *Truax v. Corrigan* (1921), 257 U.S. 312; *Norris v. Alabama* (1935), 294 U.S. 587; *Great Northern Ry. Co. v. Washington* (1937), 300 U.S. 154; *United Gas Co. v. Texas* (1938), 303 U.S. 123; *Pierre v. Louisiana* (1939), 306 U.S. 354; *Smith v. Texas* (1940), 311 U.S. 128; *Milk Wagon Drivers' Union v. Meadowmoor Dairies* (1941), 312 U.S. 287.

In the instant case there is no real conflict of evidence: the showing is largely statistical, drawn from or based upon official sources and permanent railroad records, and thus of the same type approved by this Court in *Railroad Retirement Board v. Alton R. Co.* (1935), 295 U.S. 330. As shown in detail elsewhere (in Volume II hereof), the

trial court's findings accurately reflect and are fully supported by the record.

VI.

ARGUMENT

INTRODUCTORY STATEMENT

(Reviewing the various recent lower-court cases in which, with one exception, train-length regulations have been disapproved.)

The instant case is one of first impression in this Court, in that no previous case has been here presented in which there has been directly involved and decided the question of the validity of a state law limiting the length of interstate railroad trains. There have, however, been four such cases in the federal district courts, and also a fifth case involving a closely related question, likewise decided by a federal district court. The question was also considered by the Public Service Commission of Kansas and by the Supreme Court of that State. Quite recently, certain aspects of the general question have been considered by the Interstate Commerce Commission. As a preliminary to our argument, we shall discuss these several cases briefly.

The first of the series of cases in the federal courts, in point of time, and as well its relation to the present case, is the *First Arizona Train-Limit Case*, reported as:

A. T. & S. F. Ry. Co., et al. v. LaPrade (1933), 2 F.Supp. 855.

This decision is referred to in the opinion of the State court in the case at bar (R. 4061-4062), and also in the dissenting opinion (R. 4071).

In that case the plaintiff railroad companies directly assailed the same statute the validity of which is here challenged, and urged the same grounds of invalidity. The special three-judge court rendered a unanimous opinion, holding the statute void, on each and all of the following grounds (2 F.Supp., pp. 862-863):

> "first, it invades the exclusive legislative field of Congress, as limited by the Commerce Clause (paragraph 3, Sec. 8, art. 1) of the Constitution of the United States; second, it is in conflict with the train service clause of the car service provisions (paragraphs 10 to 17, inclusive, and paragraph 21 of section 1) of the Interstate Commerce Act; third, it is in conflict with and amounts to an unlawful attempt to supplement the Boiler Inspection Act, as amended, the power brake provisions of the Safety Appliance Acts, and section 26 of the Interstate Commerce Act, which operate upon the subject and are directed to the same object as the said Train-Limit Law, and by which Congress completely and exclusively occupied the train-length field; fourth, because it substantially and unreasonably impairs the usefulness of plaintiff's facilities; fifth, because it is an undue and unreasonable burden upon and direct interference with interstate commerce, in violation of said Commerce Clause; sixth, because it is so unreasonable as to deprive plaintiffs of their property without due process of law, in violation of the due-process clause of section 1 of the Fourteenth Amendment to the Constitution of the United States; seventh, that it is arbitrary and bears no reasonable relation to the safety of persons or property."

The conclusions expressed by that opinion were given no effect solely because of the holding of this Court in

Ex parte LaPrade (1933), 289 U.S. 444, 77 L.ed. 1311, which decided that the suit had abated because of the substitution of the incoming attorney general for the original defendant. This Court considered no other question.

In the instant case appellant alleged and urged, and the trial court held, that the law is invalid and unconstitutional for substantially the same reasons as in the *First Arizona Case*. Compare paragraphs 8 to 12, inclusive, of Part III of the answer (R. 24-27), and Conclusions of Law Nos. II to VII, inclusive, adopted by the trial court (R. 4035-4038).

The second of the train limit cases is the *Nevada Train-Limit Case:*

> *Southern Pacific Company v. Mashburn* (1937), 18 F.Supp. 393,

also cited in the two opinions rendered by the judges of the State Supreme Court (R. 4061, 4071).

In that case this appellant, as plaintiff, attacked the Nevada train-limit statute of 1935, which was apparently modeled after the Arizona law, having been very similar in both language and purport, except that (a) it contained a statement of its purpose ("safety"), and (b) it did not limit the lengths of passenger trains.

The special three-judge court held the law invalid and unconstitutional; and for exactly the same reasons which were urged before and sustained by the trial court in the instant case. The court said, in its unanimous opinion, among other things, that the challenged law bore "no reasonable relation to safety, but if enforced would impair

and lessen the safety of plaintiff's present method of freight-train operation in Nevada" (18 F.Supp. 394). No appeal was ever taken from the decision, and the Nevada law has never been complied with or enforced.

The third of the train-limit cases arose out of complaints severally filed by eight Louisiana railroads, attacking a statute of that state (enacted in 1936) limiting freight trains to 70 cars, exclusive of caboose, and passenger trains to 16 cars, and providing heavy cumulative penalties. The case was presented to a special three-judge court sitting in the Eastern District of Louisiana at New Orleans upon plaintiffs' motions for interlocutory injunctions. The evidence consisted entirely of the supporting and opposing affidavits. The case is unreported, but is identified upon the record of the court as:

Texas & New Orleans R. Co. v. Martin, et al. (1936), No. 428 Equity (and companion cases).

Following the submission, the court, with the concurrence of all the judges, ordered interlocutory injunctions to issue as prayed, which injunctions were later made permanent; the court announcing that, unless an appeal was taken, no formal findings or conclusions would be filed. No appeal was ever taken, and consequently no formal opinion has ever been rendered, nor any formal findings or conclusions filed; but the Louisiana law, like the Nevada law, stands adjudged to be invalid, and has never been observed or enforced. The reasons advanced by the plaintiffs in support of their attack on the law, and which the court apparently considered sound and well taken, were

substantially the same as in the prior train-limit cases, and in the present case.

The fourth of these cases is the *Oklahoma Train-Limit Case*:

M. K. & T. R. Co. v. Williamson (1941), 36 F.Supp. 607.

In that case one of the Oklahoma railroads challenged the Oklahoma Train-Limit Law enacted in 1937. The Oklahoma law is exactly like the Nevada law, except for the range of penalty; i.e., the law prohibits the operation of trains of more than 70 cars, exclusive of caboose, but does not mention passenger trains. This case, like the *Louisiana Case*, was heard on affidavits presented in support of and opposition to the motion for an interlocutory injunction; it being stipulated that the determination on the motion for interlocutory relief should also govern as to final relief. The majority of the special three-judge court rendered an opinion sustaining the law; the third judge dissented sharply from his associates, in an opinion (36 F.Supp. 616-617) in which he referred to the conclusions reached in the *First Arizona* and *Nevada Cases*, and declared his belief that the Oklahoma law was invalid for the reasons therein stated.

The opinion of the court of the *Oklahoma Case* is quoted at considerable length in the majority opinion of the state court in the instant case, having been apparently regarded by the judges as the controlling authority in the premises (R. 4062, 4063-4066).

The fifth case of this series, which involved the validity, not of a state train-limit law, but of a very similar at-

tempted restriction upon interstate trains and commerce, is:

Southern Pacific Co. v. Railroad Commission of California (1935), 10 F.Supp. 918.

That case (hereinafter referred to as the "*Mid-Train Caboose Case*") involved the following facts: The defendant Commission had ordered that each of the plaintiff company's trains of more than 50 cars, moving between Roseville and Calvada (the California-Nevada boundary) during the six winter months (October 1st to March 31st), be operated with an additional caboose, to be placed midway in the train. The purpose was to provide a comfortable place wherein brakemen could ride and observe the train operation, during cold or severe weather. The company's rules required brakemen to ride out upon their trains, while descending the steep grades between Roseville and Calvada, so as to observe the operation.

The Commission's order was held invalid and unconstitutional, and its enforcement permanently enjoined, for the following reasons:

(1) Entry into a field of regulation, vested in Congress by the Commerce Clause, the subject of the consist of interstate trains being one which, if regulated at all, should be regulated by the Federal Government; (2) regulation of, and interference with, the continuous movement of plaintiff's interstate freight trains in both Nevada and California; (3) imposition of burdens amounting to an interference, upon interstate trains; (4) extra-territorial regulation, in that the order, if enforced, would regulate interstate freight trains in Nevada, as far east as Sparks;

and (5) unreasonableness and arbitrary character of the order, particularly in that it would not eliminate hazards, but would tend instead substantially to increase the hazards of train operation in the affected territory; and thus violate the Commerce Clause, and the Due-Process Clause of the XIV Amendment.

In its opinion, the three-judge court referred with approval to the opinion in the *First Arizona Train-Limit Case*. No appeal was ever taken from the decision.

The Kansas proceedings in which the question of train-length regulation by the State was considered are covered by the reported opinion of the Supreme Court of that State in:

State, etc. v. A. T. & S. F. Ry. Co., et al, (1928), 125 Kan. 586; 264 Pac. 1056.

The opinion shows that two train-service brotherhoods in Kansas had initiated proceedings before the Public Service Commission, looking to the limitation of freight and passenger train lengths; that the Commission had undertaken an exhaustive investigation, as a result of which it rendered elaborate findings and conclusions. It appears, from the text of the opinion, that the contentions of the brotherhoods were substantially the same as those advanced by appellee here.

The Commission recognized the impracticability of the regulation by a state of the lengths of interstate trains. The following significant portion of its findings was quoted by the Kansas Supreme Court in its opinion:

> "'It is impracticable to direct that trains engaged in interstate commerce should, when arriving at the

Kansas state line, divide into two or more portions, each portion to be attached to an engine and caboose and manned with sufficient employes to conduct it as a train across the state. To do so would not be in the interest of economy. Locomotives, bridges, and tracks have been constructed and equipped for the purpose of hauling larger and heavier loads, thus decreasing materially the cost of operation. Economy in operation of trains, consistent with efficiency, is not only encouraged but demanded by state and national regulatory bodies. The employment of additional men in train service invites additional hazard to men, in that, as the number of employes is increased, the possibility of injury to a greater number is increased. The operation of a greater number of trains would perforce increase the hazard to the public at large at grade crossings, and accidents of this character constitute a large per cent of the serious railroad accidents of today. . . .

"'The evidence introduced herein does not by a preponderance thereof, show that accidents to employes, incurred by reason of operation of trains in Kansas, have unduly increased during the past few years solely because of the increase in length of trains. Neither has it been shown that accidents to passengers riding on such long trains have increased.'"

In each of the cited cases the statute or regulation proposed or under attack was attempted to be defended upon the ground that it was a necessary health and safety measure, undertaken and required in the interest of the health, and especially the safety, of persons, particularly train-service employees, upon freight and passenger trains. The appellee's attempt to justify the law in the instant case partakes of substantially the same character.

It may be noted that the four federal train-limit cases were heard before twelve different federal judges, five of whom were circuit judges and seven district judges. Three of the circuit judges and all of the district judges, or ten federal judges in all, agreed that state train-limit laws exactly or essentially similar to the challenged law are invalid, upon precisely the same constitutional grounds urged in the present case. Only two of these twelve judges have taken a contrary view.

Three of the ten federal judges mentioned also concurred in reaching the same result with respect to a state regulation not differing in principle from a train-limit law; although, of course, neither the volume of the traffic affected, the character and extent of the obstruction imposed, nor the financial burden was as severe and widespread as in the train-limit cases.

The expressions of the Interstate Commerce Commission to which we refer are contained in its report entitled:

Ex Parte No. 156: In the Matter of Service Order No. 85 (1943), 256 I.C.C. 523.

That report was rendered by the full commission, in denying a petition filed by the four major railroad train-service brotherhoods, seeking to have the Commission set aside its Service Order No. 85, dated September 11, 1942, (the full text of which is set forth on pages 5-6 hereof), in which the Commission had ordered railroad common carriers subject to the Interstate Commerce Act to separate their trains, when necessary, without regard to any state laws, rules, or regulations, limiting the number of

cars in railroad freight or passenger trains. Service Order No. 85 was issued by the Commission pursuant to the emergency powers created by the Car Service Clauses (pars. 10 to 17(a) of Section 1, of Part I of the Interstate Commerce Act), and had been attacked by the brotherhoods as in excess of the powers conferred by those provisions. In its report, the Commission, after referring to the several state train-limit laws, and to various decisions of this Court, said (256 I.C.C., pp. 530-531):

> "If State laws limiting the number of cars in trains are to be held valid (a question we do not decide), it would be possible for each State to set a different number of cars as the maximum to be hauled in a train. A State might even limit the length of trains to one car, although such a law would be clearly arbitrary and unreasonable. Higher limits might be set by States and found reasonable, *but lack of uniformity would place a serious burden on interstate commerce.*"

Again, after referring to this Court's opinion in *California v. Thompson* (1941), 313 U.S. 109, 85 L.ed. 1219, the Commission said (at page 534):

> "This language is significant because *train-limit laws are not matters of local concern* and the regulation of the number of cars which may be put in a train does infringe the national interest in maintaining the free flow of commerce under the present emergency war conditions." (Emphasis ours.)

We quote these expressions because of their direct bearing upon the first of the major legal propositions dis-

cussed in this argument: namely, that the field of regulation of the length and consist of interstate railroad trains is one which involves the national interest and therefore belongs exclusively to Congress, under the Commerce Clause, since it demands a national and uniform system of regulation, if any be required at all. It is significant that the Interstate Commerce Commission, with its expert knowledge of the intricate problems presented by the various phases of railroad regulation, should have expressed itself so forcefully upon this particular point.

Although obviously the several decisions cited above are closely in point in the instant case, we may assume that appellee will object vigorously to any consideration by this Court of any of them other than, of course, the *Oklahoma Case*. The cases were cited at length to both the trial court and the State Supreme Court, and in its briefs in those courts appellee sharply criticized such citations. Thus, referring particularly to our citation of the *First Arizona Train-Limit Case*, appellee reminded the state court that Mr. LaPrade, the Attorney-General in office at the time the oral argument was heard before the three-judge court, had vigorously objected to having been substituted for his predecessor in office against whom the suit had originally been brought and, when the district court overruled his objection, declined to participate further in the argument and withdrew from the court-room. Appellee argued that the decision was thus merely *ex parte* because rendered without the participation of the nominal

defendant. While it is true that Mr. LaPrade and his counsel did not take part in the oral argument, it is likewise true that elaborate briefs on the merits were filed with the court by his counsel, so that the court was fully apprised of their position and did not proceed to final judgment upon the sole basis of the showing and argument of the railroad-plaintiffs. The decision was in no sense ex parte, but on the contrary was rendered only after full consideration of the merits of the case and full opportunity to the defendant to participate. While the decision was given no effect solely because of this Court's conclusion that the substitution of the incoming Attorney-General was improper, the conclusions of the court on the merits are not for that reason to be regarded as a mere nullity. At least two other courts whose decisions were rendered subsequent to this Court's ruling in the matter have regarded as sound the views on the merits expressed in the opinion. It was cited with approval in both the *California Mid-Train Caboose Case*, 10 F. Supp. 918, 925, and the *Nevada Train-Limit Case*, 18 F. Supp. 393. None of the judges who heard and decided the *Nevada Case* had participated in the *First Arizona Case*.

In commenting upon the *Nevada Case*, appellee has suggested that that decision can hardly be regarded as persuasive in the instant case because, so it says, each of these cases must rest upon its special facts and be decided upon its own record. We may agree with appellee that each case stands on its own record; in fact, it was for that very reason that the Master who heard the *Nevada Case* and the three Federal judges before whom it was argued having decided, upon the basis of the record there

made, that the Nevada 70-car law was unconstitutional upon substantially all of the grounds urged as a matter of defense in the instant case, appellant undertook to present here a record as nearly as possible the counterpart of the Nevada record. In nearly all of its most important aspects the testimony presented by appellant in the present case is of the same character as in the *Nevada Case*, except that the statistical showings were brought down to date so as to include 1939, and 1940 where possible; whereas in the *Nevada Case* the latest year for which statistics were available was 1935. It may properly be said that in every feature the evidentiary showing made by appellant in the present case corresponds to the showing made by it as the plaintiff in the *Nevada Case*. Since there is no distinction in principle, it is beyond question that the *Nevada Case* affords a persuasive precedent in the instant case, and one which, we respectfully submit, should be given full weight by this Court.

1.

THE TRAIN-LIMIT LAW INVADES AN EXCLUSIVE NATIONAL FIELD OF REGULATION.

(Assignment of Error No. 1)

The first subdivision of this argument is addressed to the general proposition that the challenged law is invalid, as an infringement upon and violation of the Commerce Clause, because it constitutes a regulation by the State of a subject-matter which in its very nature is of national and not merely local concern, requiring a uniform system of regulation, if any be needed, and therefore exclusively subject to the regulatory powers granted to Congress by the Commerce Clause.

This proposition was expressed in Conclusion of Law No. II adopted by the trial court (R. 4035), the substance of which is as follows:

> The law constitutes an invalid exercise of the police power of the State, in the purported interest of safety, by regulating that which, if regulation be needed at all, is not subject to regulation by any of the states, but is solely of national concern, and subject only to the regulatory power of Congress under the Commerce Clause; that is to say, the number of cars that may lawfully be operated in a single train moving in interstate commerce, and operated by an interstate carrier in the continuous movement of such commerce from, to, or through Arizona. Such invalidity attaches, even though Congress may not have taken any action heretofore with respect to the specific subject, because the subject-matter—the length and consist of interstate trains—is one which requires a national or uniform system of regulation, if any be required.

We emphasize that, in considering this point, it is unnecessary for this Court to take into account whether the challenged law is really, or merely ostensibly, a safety statute; or whether it is unreasonable, arbitrary or otherwise in violation of the Due-Process Clause of the XIV Amendment. It is likewise unnecessary to consider whether the law imposes financial burdens upon, or interferes physically with, interstate commerce. The mere fact of entry into a forbidden field, reserved to the federal power, where national regulation is indispensable if any is to be attempted, is sufficient to invalidate the action

of the State, irrespective of the actual effects upon interstate commerce.

The regulation of the length and consist of interstate trains is clearly a subject upon which Congress *may* exercise its paramount authority, pursuant to the powers granted by the Commerce Clause. This premise has never been seriously disputed by appellee at any stage of this case, and was conceded in the state court, by reason of appellee's citation of, and the state court's reliance upon, the *Oklahoma Train-Limit Case*, in which the premise is practically taken for granted (36 F. Supp., at pages 615-616). Appellee has strongly contended, of course, and the lower court in effect has concluded, that Congress has taken no such action; whereas we show, in subdivision 4 of this argument, that Congress has acted in such fashion as to enter and thus to occupy the field, through the passage of the Safety Appliance Act (45 U. S. Code, Sections 1, 9), and Section 25 of Part I of the Interstate Commerce Act (49 U. S. Code, Part I, Section 25). Our immediate argument, however, goes to the point that, even if it were held that Congress has not acted, the subject-matter of train-length regulation is nevertheless exclusively national and not local in its nature, so that any character of state regulation is forbidden, whatever its apparent merit, or actual effect upon interstate commerce.

The principal objects of the Commerce Clause, as stated in numerous decisions of this Court, were to insure the national interest, as against conflicting and discriminatory state legislation regulating interstate commerce by providing for regulation of that commerce by a single authority in all fields and upon all subjects where national and

uniform regulation is required, and thereby to guard against obstructions to the free flow of such commerce.

Brown v. Maryland (1827), 12 Wheat. 419, 6 L.ed. 678;

Cooley v. Port Wardens (1851), 12 How. 299, 13 L.ed. 996;

Welton v. Missouri (1875), 91 U.S. 275, 23 L.ed. 347;

Mobile County v. Kimball (1880), 102 U.S. 691, 26 L.ed. 238;

Cook v. Marshall County (1904), 196 U.S. 261, 49 L.ed. 471;

Minnesota Rate Cases (1912), 230 U.S. 352, 57 L.ed. 1511;

Houston, E. & W. T. Ry. Co. v. United States (1914), 234 U.S. 342, 58 L.ed. 1341;

Port Richmond, etc., Ferry Co. v. Hudson Co. (1914), 234 U.S. 317, 58 L.ed. 1330;

National Labor Rel. Bd. v. Jones & Laughlin (1937), 301 U.S. 1 (36-38), 81 L.ed. 893 (911-912);

Parker v. Brown (1943), 317 U.S. 341 (363), 87 L.ed. 315 (332-333);

Union Brokerage Co. v. Jensen (1944), 322 U.S. 202, 88 L.ed., Adv., 868 (891).

In the *Welton Case*, this Court said (91 U.S., at page 280):

"The power to regulate it (commerce) embraces all the instruments by which such commerce may be conducted. . . . Where the subject to which the power applies is national in its character, or of such a nature

as to admit of uniformity of regulation, the power is exclusive of all State authority.

"It will not be denied that that portion of commerce . . . between the States which consists in the transportation and exchange of commodities is of national importance, and admits and requires uniformity of regulation. The very object of investing this power in the General Government was to insure this uniformity against discriminating State regulation."

In *Cook v. Marshall County*, supra, it was said (196 U.S., page 272):

"The power of Congress to regulate commerce among the States is perhaps the most benign gift of the Constitution. Indeed it may be said that without it the Constitution would not have been adopted. . . . The article was adopted . . . to relieve them (the States) from the embarrassing restrictions imposed upon the internal commerce of the country."

The opinion in the *Minnesota Rate Cases* contains a careful and exhaustive analysis of the respective powers of the states and Congress over interstate commerce. In the course of that discussion, this Court emphasized the supremacy of the federal power, and the exclusive authority of Congress over those subjects which are of such nature as to demand that, if regulated at all, their regulation should be by a single national authority. The Court said in part (230 U.S., at pages 399-400):

"There is no room in our scheme of government for the assertion of state power in hostility to the authorized exercise of Federal power. The authority of

Congress extends to every part of interstate commerce, and to every instrumentality or agency by which it is carried on; and the full control by Congress of the subjects committed to its regulation is not to be denied or thwarted by the commingling of interstate and intrastate operations. This is not to say that the Nation may deal with the internal concerns of the State, as such, but that the execution by Congress of its constitutional power to regulate interstate commerce is not limited by the fact that intrastate transactions may have become so interwoven therewith that the effective government of the former incidentally controls the latter. This conclusion necessarily results from the supremacy of the national power within its appointed sphere. (Citing cases.)

"The grant in the Constitution of its own force, that is, without action by Congress, established the essential immunity of interstate commercial intercourse from the direct control of the states with respect to those subjects embraced within the grant which are of such a nature as to demand that, if regulated at all, their regulation should be prescribed by a single authority. *It has repeatedly been declared by this court that as to those subjects which require a general system or uniformity of regulation, the power of Congress is exclusive.* In other matters, admitting of diversity of treatment according to the special requirements of local conditions, the States may act within their respective jurisdictions until Congress sees fit to act; and, when Congress does act, the exercise of its authority overrides all conflicting state legislation. (Citing cases.)

"The principle which determines this classification underlies the doctrine that the States cannot under any guise impose direct burdens upon interstate com-

merce. For this is but to hold that the States are not permitted directly to regulate or restrain that which from its nature should be under the control of the one authority and be free from restriction save as it is governed in the manner that the national legislature constitutionally ordains." (Emphasis supplied.)

In

Wilmington Transportation Co. v. Railroad Commission (1915), 236 U.S. 151, 59 L.ed. 508,

this Court said that the Commerce Clause

"denies authority to the states in all cases where the subject is of such a nature as to demand that, if regulated at all, its regulation should be through a general or national system, and that it should be free from restraint or direct burdens save as it is constitutionally governed by Congress."

In

Lemke v. Farmers Grain Co. (1922), 258 U.S. 50, 66 L.ed. 458,

this Court held the Grain Rating and Inspection Act of North Dakota to be void: not because it was unreasonable, but because it imposed direct burdens upon, and constituted an attempt to regulate, interstate commerce. In that case the defense raised by the state was that the statute was a proper police regulation; but the Court said (at page 58):

"It is contended that these regulations may stand upon the principles recognized in decisions of this court which permit the State to make local laws under its police power in the interest of the welfare of its people, which are valid although affecting inter-

state commerce, and may stand, at least until Congress takes possession of the field under its superior authority to regulate commerce among the States. *This principle has no application where the State passes beyond the exercise of its legitimate authority and undertakes to regulate interstate commerce by imposing burdens upon it.* This court stated the principle and its limitations in the discussion of the subject in the *Minnesota Rate Case.*" (Citing cases.) (Emphasis supplied.)

The decision in

Oregon-Washington R. & N. Co. v. Washington (1926), 270 U.S. 87, 70 L.ed. 482,

illustrates the essential distinction between the "exclusive national field" of regulation of interstate commerce, which the states may not enter at all, even in the absence of congressional action, and the "joint field" in which a state may exercise its police power, until and unless Congress has entered the field, and provided it does not *directly* and *substantially* regulate or obstruct interstate commerce; *incidental* or *indirect* effects only being permitted.

In that case, it appeared that Congress had conferred upon the Secretary of Agriculture the power to quarantine districts infected by dangerous plant diseases or insect infestations. He had failed to do so as to a certain injurious insect popularly called the alfalfa weevil; and the State of Washington itself proclaimed such quarantine, thereby shutting out importations of alfalfa hay and alfalfa meal from certain other states. This Court held that the congressional act could not be construed as leaving the states

at liberty to establish such quarantines, even in the absence of action by the Secretary of Agriculture, saying (at page 101):

> "In relation of the states to the regulation of interstate commerce by Congress there are two fields. *There is one in which the State cannot interfere at all, even in the silence of Congress.* In the other (and this is the one in which the legitimate exercise of the state's police power brings it into contact with interstate commerce so as to affect that commerce), the state may exercise its police power until Congress has by affirmative legislation occupied the field by regulating interstate commerce and so necessarily has excluded state action."

The Court in this connection stated further that the power of quarantine fell within the latter classification. In conclusion, the Court stated:

> "It follows that pending the existing legislation of Congress as to quarantine of diseased trees and plants in interstate commerce, the statute of Washington on the subject cannot be given application. *It is suggested that the states may act in the absence of any action by the Secretary of Agriculture; that it is left to him to allow the states to quarantine, and that if he does not act there is no invalidity in the state action. Such construction as that cannot be given to the Federal statute.* The obligation to act with respect to the states is put directly upon the Secretary of Agriculture whenever quarantine, in his judgment, is necessary. When he does not act, it must be presumed that it is not necessary. With the Federal law in force, state action is illegal and unwarranted." (Emphasis supplied.)

In the *Jones & Laughlin Case*, supra (301 U.S. 1) this Court discussed the nature and extent of the Congressional power under the Commerce Clause, referring with approval to the *Mobile County Case* and the *Houston E. & W. T. Ry. Co. Case*, both of which we cite herein, and said in part (301 U.S., at pages 36-38):

> "The fundamental principle is that the power to regulate commerce is the power to enact 'all appropriate legislation' for 'its protection and advancement' (*The Daniel Ball*, 10 Wall. 557, 564); to adopt measures 'to promote its growth and insure its safety' (*Mobile County v. Kimball*, 102 U.S. 691, 696, 697); 'to foster, protect, control and restrain.' *Second Employers' Liability Cases, supra*, page 47. See *Texas & N. O. R. Co. v. Railway Clerks, supra*. That power is plenary and may be exerted to protect interstate commerce 'no matter what the source of the dangers which threaten it.' *Second Employers' Liability Cases*, page 51; *Schechter Corp. v. United States, supra*. Although activities may be intrastate in character when separately considered, if they have such a close and substantial relation to interstate commerce that their control is essential or appropriate to protect that commerce from burdens and obstructions, Congress cannot be denied the power to exercise that control. . . .
>
> "That intrastate activities, by reason of close and intimate relation to interstate commerce, may fall within federal control is demonstrated in the case of carriers who are engaged in both interstate and intrastate transportation. There federal control has been found essential to secure the freedom of interstate traffic from interference or unjust discrimination and to promote the efficiency of the interstate service

(citing cases). . . . Other illustrations are found in the broad requirements of the Safety Appliance Act and the Hours of Service Act. *Southern Railway Co. v. United States*, 222 U.S. 20; *Baltimore & Ohio R. Co. v. Interstate Commerce Comm'n*, 221 U.S. 612. It is said that this exercise of federal power has relation to the maintenance of adequate instrumentalities of interstate commerce. But the agency is not superior to the commerce which uses it. The protective power extends to the former because it exists as to the latter."

In

Milk Control Board v. Eisenberg Farm Products (1939), 306 U.S. 346, 83 L.ed. 752,

this Court again referred with approval to the portions of the opinion in the *Minnesota Rate Cases* which we quote above, and said (at page 351):

"The grant of the power of regulation (of interstate commerce) to the Congress necessarily implies the subordination of the states to that power. This court has repeatedly declared that the grant established the immunity of interstate commerce from the control of the states respecting all those subjects embraced within the grant which are of such a nature as to demand that, if regulated at all, their regulation must be prescribed by a single authority."

To the same effect, see also:

Sunshine Anthracite Coal Co. v. Adkins (1940), 310 U.S. 381, 84 L.ed. 1263,

in which the Court (at page 394) referred to the congres-

sional power of regulation of interstate commerce as being "complete in itself," and paramount; and

Edwards v. California (1941), 314 U.S. 160 (174, 176), 86 L.ed. 119,

in which the Court quoted with approval the above excerpt from the *Milk Control Board* opinion.

The most recent pronouncement upon this topic is found in the opinion in:

United States v. South-Eastern Underwriters' Assn., et al. (1944), 322 U.S. ....., 88 L.ed., Adv. 1082,

in which this Court said (88 L.ed., Adv., pp. 1092-1094):

> "The precise boundary between national and state power over commerce has never yet been, and doubtless never can be, delineated by a single abstract definition. The most widely accepted general description of that part of commerce which is subject to the federal power is that given in 1824 by Chief Justice Marshall in Gibbons v. Ogden, 9 Wheat. 1, 189-190: 'Commerce, undoubtedly, is traffic, but it is something more: it is intercourse. It describes the commercial intercourse between nations, and parts of nations, in all its branches. . . .' Commerce is interstate, he said, when it 'concerns more States than one'. Id., 194. No decision of this Court has ever questioned this as too comprehensive a description of the subject matter of the Commerce Clause. To accept a description less comprehensive, the Court has recognized, would deprive the Congress of that full power necessary to enable it to discharge its Constitutional duty to govern commerce among the states."

"*The power confided to Congress by the Commerce Clause* is declared in The Federalist to be *for the purpose of securing the 'maintenance of harmony* and proper intercourse *among the States.'* But its purpose is not confined to empowering Congress with the negative authority to legislate against state regulations of commerce deemed inimical to the national interest. The power granted Congress is a 'positive power.' It is the power to legislate concerning transactions which, reaching across state boundaries, affect the people of more states than one;—to govern affairs which the individual states, with their limited territorial jurisdictions, are not fully capable of governing. This federal power to determine the rules of intercourse across state lines was essential to weld a loose confederacy into a single, indivisible Nation; its continued existence is equally essential to the welfare of that Nation.

"*Our basic responsibility in interpreting the Commerce Clause is to make certain that the power to govern intercourse among the states remains where the Constitution placed it.* That power, as held by this Court from the beginning, is vested in the Congress, available to be exercised for the national welfare as Congress shall deem necessary." (Emphasis supplied.)

So, in the case at bar, where this Court is confronted with a regulation imposed by a state, in a guise of a claimed exercise of the police power, the effect of which is to control and govern the conduct of commercial intercourse among the states and across state lines (i.e., not only within, but also far outside of the physical boundaries

of Arizona), it would seem to become this Court's "basic responsibility" to strike down that regulation, because it is an impairment and infringement upon the exclusive powers vested in Congress; for only by such action will this Court make certain that the power to regulate and govern the interstate commerce now subject to regulation by the Arizona statute shall remain where the Constitution placed it.

The power to regulate commerce is necessarily exclusive whenever the subjects of it *are national in their character, or admit only of one uniform system, or plan of regulation.*

Robbins v. Shelby County Taxing District (1887), 120 U.S. 489, 30 L.ed. 694;

Atlantic & Pac. Teleg. Co. v. Philadelphia (1903), 190 U.S. 160, 47 L.ed. 995;

Kelly v. Washington (1937), 302 U.S. 1 (9, 14-15), 82 L.ed. 3.

Inaction or silence by Congress is equivalent to a declaration that interstate commerce shall remain free and untrammeled.

Hall v. DeCuir (1877), 95 U.S. 485, 24 L.ed. 547;

Welton v. Missouri, supra (91 U.S. 275, 23 L.ed. 374);

Pickard v. Pullman Southern Car Co. (1886), 117 U.S. 34, 29 L.ed. 785;

Morrill v. Wisconsin (1877), 154 U.S. 626, 23 L.ed. 1009;

Gloucester Ferry Co. v. Pennsylvania (1885), 114 U.S. 196, 29 L.ed. 158;

Brown v. Houston (1885), 114 U.S. 622, 29 L.ed. 257;

Case of the State Freight Tax (1872), 15 Wall. 232, 21 L.ed. 146;

Covington & C. Bridge Co. v. Kentucky (1894), 154 U.S. 204, 38 L.ed. 962;

Philadelphia & S. Mail S. S. Co. v. Pennsylvania (1887), 122 U.S. 326, 30 L.ed. 1200;

Leisy v. Hardin, (1890), 135 U.S. 100, 34 L.ed. 128;

In re Rahrer (1891), 140 U.S. 545, 35 L.ed. 572;

Brennan v. Titusville (1894), 153 U.S. 289, 38 L.ed. 719.

In

Buck v. Kuykendall (1925), 267 U.S. 307, 69 L.ed. 623,

it was held that a statute of Washington, under which truck operators on the highways of that state engaged exclusively in interstate commerce were prohibited from operating, without first applying for and obtaining from the State Department of Public Works a certificate of public convenience and necessity, was invalid, as a regulation of interstate commerce. This Court said (at page 316):

> "Thus, the provision of the Washington statute is a regulation, not of the use of its own highways, but of interstate commerce. Its effect upon such commerce is not merely to burden but to obstruct it. Such state action is forbidden by the Commerce Clause."

In

Bush v. Malloy (1925), 267 U.S. 317, 69 L.ed. 627,

in which the facts resembled closely those presented in the *Buck Case*, this Court said (at pages 324-325):

> "The state action in the Buck Case was held to be unconstitutional, not because the statute prescribed an arbitrary test for the granting of permits, or because the director of public works had exercised the power conferred arbitrarily or unreasonably, but because the statute, as construed and applied, invaded a field reserved by the Commerce Clause for Federal regulation."

It may be noted that, at the time these cases were decided, Congress had not undertaken to regulate the transportation of persons or property by motor carrier, over public highways, in interstate commerce; such regulation was not undertaken until the enactment on August 9, 1935, of the Motor Carrier Act, 1935 (49 U. S. Code, Chapter 8; Interstate Commerce Act, Part II, Sections 201-228). Nevertheless, this Court held that, despite congressional inaction, the states had invaded a field reserved by the Commerce Clause for federal regulation, and that their action was invalid.

Appellee has never seriously contended, at any stage of this case, that the "exclusive national field" of regulation does not exist nor does the state court in its opinion announce any such conclusion. In any event, the principle is thoroughly settled by the repeated decisions of this Court cited above; e.g., *Minnesota Rate Cases*, supra (230 U.S. 352, at pp. 399-400); *Milk Control Board v. Eisen-*

Berg Farm Products, supra (306 U.S. 346, at p. 351); *Kelly v. Washington*, supra (302 U.S. 1, at pp. 9, 14-15). Rather, the position taken by appellee in its argument presented to the courts below, and in effect though not expressly sustained by the state Supreme Court, has been somewhat as follows:

(a) Although there is an "exclusive national field" of regulation of interstate commerce, no invasion of that field takes place when a state undertakes to regulate in the interest of safety; because "safety is always in the joint field".

(b) In considering whether a challenged state regulation infringes the exclusive national field, the Court therefore needs to determine only whether the regulation was enacted for the purpose of promoting safety and bears a reasonable relation to that purpose; the Court need not concern itself with the nature of the subject-matter regulated, or the effects of the regulation apart from its relation to its claimed purpose.

(c) If the state regulation is for the purpose of safety, and bears a reasonable relation thereto, its other effects upon interstate commerce are, *in legal contemplation*, never more than "incidental" and "indirect", no matter how great the actual burdens, obstructions or interferences may be *in fact*.

(d) The Court cannot inquire or determine whether a challenged police-power measure imposes an unduly severe burden upon interstate commerce, the only remedy in that event lying with Congress.

(e) The Court likewise cannot undertake to determine from the evidence whether the challenged law is actually a safety measure; the law must be sustained unless, upon the entire record, the Court can say that there is no possible rational basis for the safety claim.

This argument depends initially upon the assumption that the Arizona Legislature enacted the train-limit law for the purpose of promoting safety. While the state Supreme Court has subscribed to this assumption, and has even declared in its opinion that no reason other than safety "could possibly be assigned" to this law (R. 4059), neither the assumption, nor the declaration of the court adopting it, are founded upon or supported by any facts of record. No such declaration of purpose was made by the Arizona Legislature of 1912, and no reference whatever to safety appears in the text of the statute. The companion statutes, adopted at the same session of the Arizona Legislature, to which the state court refers to support its conclusion, are wholly irrelevant; they were separately enacted, and it cannot be assumed, simply because of enactment at the same session, that the same purpose or motive was present. In point of fact, these other statutes, like the train-limit law, are wholly lacking in any preamble or specific statement of purpose, and contain no references whatever to safety.

In the light of the facts as they existed in 1912, it is highly doubtful whether the legislature had any safety purpose in mind. The law when enacted did not actually modify contemporaneous operating practices (R. 1107,

1108; Exhibits 149, 150, 182, 213); there had been no long-train operations in the state from which the legislature could have obtained any idea as to their safety compared to short-train operations. Therefore it is much more probable that the law was advocated and passed as a measure to continue existing conditions, and particularly to promote and preserve the employment of railroad trainmen by directly regulating interstate commerce. Certainly that has been, and is, its most obvious practical (but extra-legal) purpose and, as experience has shown, one of its principal results. The record before this Court demonstrates that the law bears no relation *in fact* to safety; the state wholly failed to prove the contrary, and, indeed, made no serious attempt to do so. We therefore submit that appellee's argument fails at the outset, because it depends upon the assumption that a particular purpose may be ascribed to the challenged law although the statement of that purpose does not appear of record and, in fact, was conspicuously omitted by the enacting legislature.

Apart from this basic defect, however, the state's position as above outlined is not supported by the controlling decisions of this Court. Those decisions, when read together, definitely lead to and sustain the following principles having immediate bearing upon the "national-field" phase of this case:

(a) There is a field of regulation of interstate commerce reserved exclusively to the national government, embracing all of those subjects which are of national and not merely local concern, as to which uniformity of regulation is essential if any be required. In this field state

action is wholly forbidden, whether or not Congress has acted.

Minnesota Rate Cases, supra, 230 U.S. at p. 399;
South Covington Ry. Co. v. Covington (1915), 235 U.S. 537, 59 L.ed. 350;
Kelly v. Washington, supra, 302 U.S. at pp. 9, 14;
Milk Control Board v. Eisenberg, supra, 306 U.S. at p. 351;
Edwards v. California, supra, 314 U.S. at p. 176.

(b) There is a second, so-called "joint" or "concurrent" field of regulation, embracing those matters of local nature and local concern, where in the absence of action by Congress, state regulation is permissible, even though interstate commerce is thereby affected to some degree; provided that the national interest is not impaired nor the free flow of interstate commerce obstructed.

Oregon-Washington R. & N. Co. v. Washington, supra, 270 U.S., at p. 101;
Minnesota Rate Cases, supra, 230 U.S., at p. 400;
Milk Control Board v. Eisenberg, supra, 306 U.S., at p. 351;
California v. Thompson, supra, 313 U.S., at p. 116;
Parker v. Brown, supra, 317 U.S., at pp. 362-363.

(c) In determining whether a challenged state regulation falls within the prohibited federal field or the permissible joint field, it is immaterial that the regulation may be for the purpose of safety or reasonably related to that purpose. The determination turns upon the nature

of the subject-matter regulated, and the incidence of the regulation upon interstate commerce, and not upon the claimed or stated purpose.

Minnesota Rate Cases, supra, 230 U.S., at p. 400;
South Covington Ry. Co. v. Covington, supra (235 U.S. 537);
Seaboard Airline R. Co. v. Blackwell (1917), 244 U.S. 310, 315-316, 61 L.ed. 1160;
Kansas City Southern Ry. Co. v. Kaw Valley Drainage District (1914), 233 U.S. 75, 78-79, 58 L.ed. 857;
Davis v. Farmers Coop. Co. (1923), 262 U.S. 312, 315, 67 L.ed. 996;
Shafer v. Farmers Grain Co. (1925), 268 U.S. 189, 69 L.ed. 909;
Parker v. Brown, supra, 317 U.S., at p. 363;
Union Brokerage Co. v. Jensen, supra, 322 U.S., at p. 210.

Appellee has heretofore particularly relied upon certain language found at page 402 of the opinion in the *Minnesota Rate Cases*, supra, to support its argument that the question whether a state law infringes the exclusive national field must be determined by reference solely to its purpose and its relation to that purpose, and not by consideration of the nature of the subject-matter regulated; the particular passage thus relied upon being as follows:

> "But within these limitations there necessarily remains to the States, until Congress acts, a wide range for the permissible exercise of power appropriate to their territorial jurisdiction although interstate com-

merce may be affected. It extends to those matters of a local nature as to which it is impossible to derive from the constitutional grant an intention that they should go uncontrolled pending Federal intervention. *Thus, there are certain subjects having the most obvious and direct relation to interstate commerce, which, nevertheless, with the acquiescence of Congress, have been controlled by state legislation* from the foundation of the Government because of the necessity that they should not remain unregulated and *that their regulation should be adapted to varying local exigencies;* hence the absence of regulation by Congress in such matters has not imported that there should be no restriction but rather that the States should continue to supply the needed rules until Congress should decide to supersede them. Further, it is competent for a State to govern its internal commerce, to provide local improvements, to create and regulate local facilities, *to adopt protective measures of a reasonable character in the interest of the health, safety, morals and welfare of its people, although interstate commerce may incidentally or indirectly be involved.* Our system of government is a practical adjustment by which the National authority as conferred by the Constitution is maintained in its full scope without unnecessary loss of local efficiency. Where the subject is peculiarly one of local concern, and from its nature belongs to the class with which the State appropriately deals in making reasonable provision for local needs, it cannot be regarded as left to the unrestrained will of individuals because Congress has not acted, although it may have such a relation to interstate commerce as to be within the reach of the Federal power. *In such case, Congress must be the judge of the necessity of Federal action.*

> Its paramount authority always enables it to intervene at its discretion * * *." (Emphasis as in appellee's closing brief to the State Supreme Court.)

It will be apparent at once, we believe, that the quoted language does not sustain appellee's views. This Court was careful to point out that the power permitted to the states extends to "matters of a *local* nature"; and again this Court said that, "where the subject-matter is peculiarly one of *local concern*, and from its nature belongs to the class with which the state appropriately deals, etc.," it is subject to reasonable state action in the absence of action by Congress. This emphasis on "local concern" is heightened by the repeated use of the word "local," not less than eight times in this same paragraph (pp. 402-403 of the opinion).

The same concept has been treated as controlling throughout the later decisions of this Court, and finds its most recent expressions in *California v. Thompson*, and *Parker v. Brown*, supra. In the *Thompson Case* this Court referred (313 U.S., at p. 116) to the authority of the state, in the exercise of its police power, to regulate negotiations for interstate transportation "where they affect *matters of local concern* and do not infringe the national interest in maintaining the free flow of commerce and in preserving uniformity in the regulation of commerce in matters of national concern." In *Parker v. Brown*, supra, this Court said (317 U.S., at p. 362):

> "When Congress has not exerted its power under the Commerce Clause and state regulation of *matters*

of local concern is so related to interstate commerce that it also operates as a regulation of that commerce, the reconciliation of the power thus granted with that reserved to the state is to be attained by the accommodation of the competing demands of the state and national interests involved." (Citing cases.) (Emphasis supplied.)

These authorities thus show that the state's power to regulate, no matter what the *purpose* of the regulation, extends only to *matters of local concern;* those matters which are of national concern are wholly beyond the scope of the state power. As was said in the *Milk Control Board Case* (306 U.S., at p. 351) and again in the *Edwards Case* (314 U.S., p. 176), quoting the substance of the earlier pronouncement in the *Minnesota Rate Cases*, (230 U.S., p. 399):

> "This Court has repeatedly declared that the grant (the Commerce Clause) established the immunity of interstate commerce from the control of the states respecting all those subjects embraced within the grant which are of such a nature as to demand, that if regulated at all, their regulation must be prescribed by a single authority."

There are not less than three cases, all decided since the *Minnesota Rate Cases*, and one of very recent date, in which this Court has held that state police-power laws or regulations, obviously in the interest of public safety and welfare, and apparently bearing some relation to that purpose, were invalid because in violation of the Commerce Clause: specifically, because either they invaded the exclusive national field, or in the guise of regulating a

local matter they directly interfered with and obstructed interstate commerce. In

Kansas City Southern Ry. Co. v. Kaw Valley Drainage Dist., supra (233 U.S. 75),

the railroad company had challenged the validity of certain orders requiring it to remove bridges which were part of its interstate railroad system. There had recently been disastrous floods in the streams crossed by these bridges, and a comprehensive flood and drainage program had been authorized by the state. The removal or substantial change in the location of these bridges would have greatly facilitated completion of the project. It was not seriously disputed that these orders were thus reasonably related to public health and safety. But this Court, without undertaking to review that issue, held the orders invalid because they were a direct invasion of an exclusive national field, in that they undertook to regulate a subject-matter which by its very nature was subject only to federal control. This Court said (233 U.S., pp. 78-79):

> "They are out and out orders to remove bridges that are a necessary part of lines of commerce by rail among the States. But *that subject-matter is under the exclusive control of Congress, and is not one that is left to the States until there shall be further action on its part.* The freedom from interference on the part of the States is not confined to a simple prohibition of laws impairing it, but extends to interference by any ultimate organ.
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> . . . . . .
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> *The decisions also show that a State cannot avoid the operation of this rule by simply invoking the con-*

venient apologetics of the police power. It repeatedly has been said or implied that a direct interference with commerce among the States could not be justified in this way. *The State can do nothing which will directly burden or impede the interstate traffic of the company, or impair the usefulness of its facilities for such traffic.* (Citing cases.)" (Emphasis ours.)

In

Seaboard Airline R. Co. v. Blackwell, supra (244 U.S. 310),

this Court held invalid a Georgia statute which required the engineer of every railroad train to sound the whistle at least 400 yards before arriving at each highway grade crossing, and at the same time to check and keep checking the speed of his train so as to be able to stop in time if the crossing were occupied by highway traffic. It was shown that interstate trains, if required to conform to this law, would be delayed several hours beyond their normal schedules. Although there was not, and could not be, any question but that the state regulation bore a reasonable relation to public health and safety, the Court did not consider that point; it found the regulation to be invalid because of the direct and intolerable burden imposed upon interstate commerce.

In

Edwards v. California, supra (314 U.S. 160),

this Court reviewed a California statute which prohibited the bringing or assisting into the state of any indigent non-resident, and held it invalid, in violation of the Com-

merce Clause, because it directly regulated a subject matter which, if regulated at all, must be regulated only by Congress itself.

It might be argued, with considerable force, that a statute prohibiting the influx of indigent persons is directly and reasonably related to the public health and welfare, because if operates to relieve local communities of the burden of care sometimes imposed by the presence of large numbers of persons without adequate means of support. Indeed, an argument somewhat to that effect was presented in support of the law before this Court. But the Court did not attempt to decide whether the regulation was reasonable or bore a reasonable relation to its claimed purpose. After citing *California v. Thompson*, supra (313 U.S. 109), and referring to the principle that the states may regulate, under the police power, in *matters of local concern* even though interstate commerce is affected, the Court said (at pp. 173-174, 176):

> "But this does not mean that there are no boundaries to the permissible area of State legislative activity. There are. *And none is more certain than the prohibition against attempts on the part of any single State to isolate itself from difficulties common to all of them by restraining the transportation of persons and property across its borders.* It is frequently the case that a State might gain a momentary respite from the pressure of events by the simple expedient of shutting its gates to the outside world. But, in the words of Mr. Justice Cardozo: 'The Constitution was framed under the dominion of a political philosophy less parochial in range. It was framed upon the theory that the people of the several States

must sink or swim together, and that in the long run prosperity and salvation are in union and not division.' *Baldwin v. Seelig*, 294 U.S. 511, 523.

"It is difficult to conceive of a statute more squarely in conflict with this theory than the Section challenged here. Its express purpose and inevitable effect is to prohibit the transportation of indigent persons across the California border. The burden upon interstate commerce is intended and immediate; it is the plain and sole function of the statute. . . . We think this statute must fail under any known test of the validity of State interference with interstate commerce."

After further discussion, the Court continued with the quotation from the opinion in *Milk Control Board v. Eisenberg Farm Products*, supra, to which reference has already been made, as follows:

"'This Court has repeatedly declared that the grant [the commerce clause] established the immunity of interstate commerce from the control of the States respecting all those subjects embraced within the grant which are of such a nature as to demand that, if regulated at all, their regulation must be prescribed by a single authority.' *Milk Control Board v. Eisenberg Farm Products*, 306 U.S. 346, 351. We are of the opinion that the transportation of indigent persons from State to State clearly falls within this class of subjects." (Emphasis supplied.)

The application of this decision to the facts in the case at bar is plain and obvious. The train-limit law, like the California statute in the cited case, is plainly an attempt to regulate interstate commerce in the interest of some

local or, as the Court says, "parochial" purpose, and without regard to the results of the restraint upon the general conduct and movement of interstate commerce. The inevitable effect of the law is to regulate and obstruct the transportation of interstate commerce across the Arizona boundaries, and across the territory of both the state itself and the adjoining states. The burden upon interstate commerce is intended and immediate; it is the plain and obvious function and result of the statute. If the transportation of only *one* class of person (indigents) from state to state is a subject as to which national regulation alone may be had, then certainly it cannot be argued that the transportation of *all kinds* of persons and property in interstate commerce from state to state, and across several states, is not equally a subject for national regulation alone.

The essential question is therefore whether, upon the facts, and in the light of the controlling pronouncements, the challenged law is, on the one hand, a regulation of a subject matter of national concern, embraced within the exclusive national field; or is, on the other, a regulation of a matter of purely local concern, which may be appropriately regulated by the several states as long as they do not impair the national interest in preserving uniformity on national matters or obstruct the free flow of commerce, and thus permissible provided other conditions of validity are satisfied; that is, provided: (1) the burdens or interferences imposed upon commerce are not more than incidental or indirect; (2) the state has acted within its own proper territorial jurisdiction; (3) Congress itself has not acted in such fashion as to occupy the field; and (4) other

constitutional restrictions, e.g., the Due-Process Clause, are not disregarded.

It requires only brief consideration of the nature of the regulation accomplished by the Arizona law, and of the inevitable effects of the statute, to demonstrate that it constitutes a regulation of a subject matter which, if regulated at all, must be regulated by Congress. The following situation, which might arise if the doctrine were generally sustained that the several states may regulate the length of interstate trains, will serve to illustrate the point. If Arizona may properly limit the length of interstate trains to 70 cars, equally New Mexico may limit their length to 65 cars, and California to 75 cars. Texas might enact a 60-car law. Oklahoma now has a 70-car law. If we assume that the general subject is properly within the power of the several states, then the number of cars which might be permitted certainly would vary in the different states, as the result of the varying judgments of the several state legislatures, or the effectiveness with which the advocates of train-limit legislation were able to press their views upon the legislators. With these varying limitations in effect, over the route of which appellant's lines across Arizona form an essential part, let us suppose that a California shipper of fresh fruits desires to ship 90 cars from a point in Southern California, over the lines of appellant and its connection the Rock Island Railroad, to some point in Kansas or beyond. With the 75-car limit in California, 15 cars of the total must be left behind, either to be handled in a following train, or deteriorate from the delay. The 75-car train can then proceed to a point west of the

Arizona boundary, such as Indio; or, if the present policy of the State of Arizona is continued, it may be moved into Yuma, even though thereby it actually crosses into Arizona with more than 70 cars. Because of the Arizona law, it must then be broken up, and five cars left behind to follow on some later train. At some point in Arizona near to but west of the New Mexico boundary line, five more cars would have to be left behind, with consequent delay. As the remaining cars approached the New Mexico-Texas boundary near El Paso, the process would have to be repeated. After re-entering New Mexico, the train could again be built up to 65 cars, and upon entering Oklahoma, to 70 cars, although not, in either case, with the cars that had been left behind; and if we suppose further that no train-limit law had been enacted in Kansas, the train, upon approaching that state, could either continue with the 70 cars, or could be held just inside of the Kansas boundary, until the cars which had previously been detached were brought forwa d and consolidated.

A similar situation could, of course, exist on any other through route passing through several states: for example, the route of the Pennsylvania Railroad from Washington to New York City. This line extends for about 226 miles, through or across five different states and the District of Columbia. Assuming as in the first example that different train-length restrictions were imposed in each of these states, and that Congress had not acted in the field, through trains moving from one of these cities to the other would have to be made up and broken up not less than four times, or on the average once every 57 miles. The

only practical alternative would be to make up each train, at point of origin, in conformity with the shortest prescribed train length in any one of the five states. In either event, speedy and efficient movement of interstate railroad traffic over the through route would become virtually impossible.

These illustrations are not in the least fanciful or overdrawn; on the contrary, they are well within the bounds of possibility.

A second consideration, which shows that the subject-matter of the Arizona law is one which must be regulated by the federal authority alone, is found in the admitted and inevitable extra-territorial effect of the limitation. The Arizona law, as a regulation of the length of interstate trains, is not restricted in effect to operations in Arizona alone. The testimony in this case establishes, with a finality which appellee never attempted to challenge, that it is wholly impracticable to locate, outside of but precisely at the Arizona boundaries, the terminals required for the making up and breaking up of trains, in order to conform their lengths to the law's restrictions. Such trains have to be operated from and to the nearest terminals outside of Arizona, in units not exceeding 70 freight cars or 14 passenger cars (in which case the extra-territorial effects of the law extend as far as Indio, California, and Lordsburg, New Mexico, and in many cases as far east as El Paso, more than 170 miles outside of the state); or, such trains have to be stopped at some convenient points outside of Arizona, when approaching the state boundary, and there remade so as to conform to the law when enter-

ing the state, and again must be stopped when leaving the state, either at those points or at points further distant, in order to be made up in the longer units which the laws in the adjoining states permit. In practice, the extra-territorial effect is to some extent avoided at the westerly boundary, by operating trains across the boundary and into the yard at Yuma, on the Arizona side, where the operation of making up and breaking up the trains is performed. There is still, however, substantial extra-territorial effect in California in the case of passenger trains, because it is not always practicable to reconstitute such trains at Yuma and they must therefore be run from or to their originating or destination terminal, at Los Angeles (a distance of 250 miles outside of Arizona), in sizes to fit the Arizona law. At the easterly boundary, there is no terminal adjacent to the state line, and none can be there constructed, except at great expense; nor would it then be practicable for use. The result is that trains are operated in conformity with the law's restrictions as far east as Lordsburg, 23 miles from the state line, and in many cases as far east as El Paso, Texas, 171 miles. This extra-territorial effect is continuous and inevitable under the law, and, as we show elsewhere, is not only not challenged, but in effect conceded by appellee (R. 1918).

In recognition of these possibilities, the Interstate Commerce Commission, in the opinion relative to *Service Order No. 85* (256 I.C.C. 523, supra) voiced the expressions already quoted and here repeated for emphasis (256 I.C.C., pp. 530-531, 534):

"If State laws limiting the number of cars in trains are to be held valid (a question we do not decide), it would be possible for each State to set a different number of cars as the maximum to be hauled in a train. A State might even limit the length of trains to one car, although such a law would be clearly arbitrary and unreasonable. Higher limits might be set by States and found reasonable, but lack of uniformity would place a serious burden on interstate commerce.

. . . . . .

"This language* is significant because train-limit laws are not matters of local concern and the regulation of the number of cars which may be put in a train does infringe the national interest in maintaining the free flow of commerce under the present emergency war conditions."

We anticipate that appellee may argue that the failure of Congress to enact legislation relative to train lengths should be taken as expressing the congressional view that the subject matter is appropriate for state regulation, and so not exclusively national in character; and in this connection it may also contend that any relief from the state restrictions must be sought from Congress and not by court action. This argument is completely disposed of by those decisions of this Court, already cited, which establish that when the subject matter is of such nature as to demand uniformity of regulation by a single authority, silence or inaction by Congress is equivalent to

*The "language" referred to appears in the next to the concluding paragraph on page 116 of this Court's opinion in *California v. Thompson*, supra (313 U.S. 109), which paragraph was quoted in full by the Commission.

a declaration that interstate commerce shall be free and untrammeled. Compare:

Welton v. Missouri, supra, 91 U.S. 275, 282;
Missouri v. Kansas Natural Gas Co. (1924), 265 U.S. 298, 310, 68 L.ed. 1027.

As this Court indicated in the *Minnesota Rate Cases*, supra (230 U.S., at pp. 402-403), it is only when the "subject is peculiarly one of *local* concern" that inaction by Congress leaves the field open to the state to make reasonable provision for local needs.

Furthermore, the argument that relief against regulation of a subject matter of national concern must be sought from Congress alone loses sight of realities. If the subject matter is of national concern but not heretofore regulated by Congress, and there has been no disposition on the part of Congress to enact such regulation, then, it may be asked, just how would one interested in setting aside a state regulation present the matter to Congress? Could he ask for the passage of a resolution affirmatively declaring that no regulation is necessary? Or should he ask Congress to adopt some affirmative regulation (though believing that none is needed) simply to make certain that the state regulation is set aside?

Although congressional regulation has extended to a great many phases of the construction and operation of interstate railroads, there has never been, so far as we can discover, any federal law or regulation prescribing the width (gauge) of the tracks. The present standard, which by common acceptance prevails throughout the nation and in adjacent foreign countries, is four feet eight and

one-half inches. Suppose that a state should now pass a law, expressly stated to be in the interest of greater safety, prohibiting the operation of any railroad within its boundaries not having a gauge of at least six feet. It can be argued, with at least as much plausibility as in the case of a train-limit law, that a regulation imposing this wider gauge is in the interest of safety, and bears a reasonable relation to that purpose. If the theory of the "national field" heretofore advanced by appellee and impliedly sustained by the state court is correct, the regulation would fall within the "joint field", and (assuming apparent reasonableness) this Court could not interfere; the only remedy would be by petition to Congress. Of course, the interruption and obstruction to interstate commerce resulting from such a law would be so immediate, obvious, and complete as to leave no judicial doubt of the necessity of uniform regulation; if any were required; and we cannot believe that any court would hesitate to hold the law wholly invalid under the Commerce Clause.

A regulation of the width of the track and thus of the trains is no different in principle, and not greatly different in its effects upon interstate commerce, from a law which limits the length of trains. For each of these two regulations a specious claim of greater safety can probably be made. Each unquestionably would, and in the case of the train-limit law demonstrably does, interfere with the proper conduct of interstate commerce, imposing direct and substantial obstructions to its free movement. A regulation of gauge would of course actually prevent the through movement of cars, and compel physical

transfer of freight and passengers at or before reaching the state boundaries; the regulation of train length, however, delays and at times prevents the movement of cars, because it requires them to be detached from trains in which they are being handled and could continue to be handled, and held at points adjacent to or outside of state boundaries until trains can be made up in lengths conforming to the restriction, so that the cars can proceed. In the case of passenger traffic, the restriction of train length may, and upon occasion does, require the actual transfer of passengers from one car to another, and thus is practically equivalent, from the standpoint of delay and inconvenience, to a compulsory change of gauge.

The precise question whether the subject matter of the length and consist of interstate railroad trains falls within the exclusive national field of regulation has never been presented to this Court in such form as to result in a direct ruling. There are, however, not less than three decisions of this Court which, although not relating directly to the subject of train lengths, do relate to subjects so closely similar that no distinction in principle can be observed, and thus hold, at least indirectly, that the subject matter is one requiring a national or uniform system of regulation, and hence within the exclusive national field; viz.:

Hall v. DeCuir, supra (95 U.S. 485);
South Covington Ry. Co. v. Covington, supra (235 U.S. 537);
Kelly v. Washington, supra (302 U. S. 1).

The *DeCuir Case* arose out of a Louisiana law requiring equal rights and privileges without discrimination as to

race and color. Mrs. DeCuir, a negress, sought accommodations on a boat plying between Louisiana and Mississippi and demanded them in the cabin specially set apart for white persons. Her demand was refused. She sued for damages under the state act, and the defense was that the statute was void because an attempt to regulate commerce among the states. This Court, in denying her claim, said (95 U.S., at pp. 488-490):

> "But we think it may safely be said that state legislation which seeks to impose a direct burden upon interstate commerce or to interfere directly with its freedom, does encroach upon the exclusive power of Congress. The statute now under consideration, in our opinion, occupies that position. It does not act upon the business through the local instruments to be employed after coming within the state, but directly upon the business as it comes into the state from without or goes out from within. While it purports only to control the carrier when engaged within the state, it must necessarily influence his conduct to some extent in the management of the business throughout his entire voyage.
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> "It was to meet just such a case that the commercial clause in the Constitution was adopted. The river Mississippi passes through or along the borders of ten different states, and its tributaries reach many more. The commerce upon these waters is immense, and its regulation clearly a matter of national concern. *If each state was at liberty to regulate the conduct of carriers while within its jurisdiction, the confusion likely to follow could not but be productive of great inconvenience and unnecessary hardship.* Each state could provide for its own passengers and

regulate the transportation of its own freight, regardless of the interests of others. Nay more; it could prescribe rules by which the carrier must be governed within the state in respect to passengers and property brought from without. On one side of the river or its tributaries he might be required to observe one set of rules, and on the other another. *Commerce cannot flourish in the midst of such embarrassments.*"

"As was said by Mr. Justice Field, speaking for the court in Welton v. The State of Missouri, 91 U.S. 282, 'inaction (by Congress) . . . is equivalent to a declaration that interstate commerce shall remain free and untrammeled'. Applying that principle to the circumstances of this case, congressional inaction left Benson at liberty to adopt such reasonable rules and regulations for the disposition of passengers upon his boat, while pursuing her voyage within Louisiana or without, as seemed to him most for the interest of all concerned. The statute under which this suit is brought, as construed by the state court, seeks to take away from him that power so long as he is within Louisiana; and while recognizing to the fullest extent the principle which sustains a statute, unless its unconstitutionality is clearly established, we think this statute, to the extent that it requires those engaged in the transportation of passengers among the states to carry colored passengers in Louisiana in the same cabin with whites, is unconstitutional and void. If the public good requires such legislation, it must come from Congress and not from the States." (Emphasis ours.)

Although the *DeCuir Case* was decided in 1877, it has frequently been cited and followed by this Court, and is

unquestionably still regarded as a correct statement of principle. Thus, it was one of the leading cases referred to in the opinion in the *Minnesota Rate Cases*, supra (230 U.S., at p. 401), and was likewise cited in *South Carolina Highway Dept. v. Barnwell Bros.* (1938), 303 U.S. 177, 185, 82 L. ed. 734.

In *South Covington R. Co. v. Covington*, supra (235 U.S. 537), it was held that the City of Covington, Kentucky, could not regulate the interstate business of a street railway company transporting passengers from that city to Cincinnati, Ohio, by restricting the number of passengers which the company might admit to its cars, and requiring it to operate sufficient cars to accommodate the public within such restriction. The Court said (235 U.S., at pages 547-548):

> "To comply with these regulations, the testimony shows, would require about one-half more than the present number of cars operated by the Company, and more cars than can be operated in Cincinnati within the present franchise rights and privileges, held by the Company, or controlled by it, in that City. Whether, in view of this situation, this regulation would be so unreasonable as to be void, we need not now inquire. These facts, together with the other details of operation of the cars of this Company, are to be taken into view in determining the nature of the regulations here attempted, and whether it so directly burdens interstate commerce as to be beyond the power of the State. We think the necessary effect of these regulations is not only to determine the manner of carrying passengers in Covington and the number of cars that are to be run in connection with

the business there, but necessarily directs the number of cars to be run in Cincinnati, and the manner of loading them when there, where the traffic is much impeded and other lines of street railway and many hindrances have to be taken into consideration in regulating the traffic. If Covington can regulate these matters, certainly Cincinnati can, and interstate business might be impeded by conflicting and varying regulations in this respect, with which it might be impossible to comply. *On one side of the river one set of regulations might be enforced, and on the other side quite a different set, and both seeking to control a practically continuous movement of cars.* As was said in Hall v. DeCuir, 95 U.S. 485, 489, 'commerce cannot flourish in the midst of such embarrassments.'

"We need not stop to consider whether Congress has undertaken to regulate such interstate transportation as this, for it is clearly within its power to do so, and absence of Federal regulation does not give the power to the State to make rules which so necessarily control the conduct of interstate commerce as do those just considered." (Emphasis supplied.)

Like *Hall v. DeCuir*, supra, the *South Covington Case* has also been cited frequently by this Court. Moreover, it has not been overruled in the so-called *Second South Covington Case (South Covington etc. R. Co. v. Kentucky* (1920), 252 U.S. 399, 64 L.ed. 631), as appellee has at times suggested. Reference to the majority opinion in the latter case (252 U.S., at pp. 403, 404) will reveal that the Court drew a very substantial distinction between the Kentucky statute, which it sustained in the *Second South Covington Case*, and the city ordinance which it invalidated in the *First Case*. In the *Second Case*,

the Court held that there was a distinct operation in Kentucky, authorized and required by the charter of the companies, and that the state act in question regulated that operation and not more, and therefore was not a regulation of interstate commerce. It also said, after citing the *First Case*, that the state act affected interstate business *incidentaly*, and did not subject it to unreasonable demands.

Referring further to the *First Case*, the Court said (p. 404):

> "The cited case expresses the principle of decision and marks the limitation upon the power of a state, and when its legislation is or is not an interference with interstate commerce."

In any event the *First South Covington Case* has apparently not been regarded by this Court as without authoritative force. It has been cited with approval in other decisions both before and since the *Second Case*. Prior thereto it was cited in:

Western Oil Refining Co. v. Lipscomb (1917), 244 U.S. 346 (349), 61 L.ed. 1181 (1184);

M. K. & T. Ry. Co. v. Texas (1918), 245 U.S. 484 (489), 62 L.ed. 419 (422); and

Denver & Rio Grande R. R. Co. v. Denver (1919), 250 U.S. 241 (246), 63 L.ed. 958 (962).

In the *Denver Case* it was referred to in support of the proposition that a city ordinance requiring the removal of a spur track from a street intersection was not invalid, in violation of the Commerce Clause, for the following reason as stated by the Court (p. 246):

"The ordinance makes no discrimination against interstate commerce, will not impede its movement in regular course, and will affect it only *incidentally and indirectly.*" (Emphasis ours.)

Subsequent to the *Second Case*, the *First Case* was cited with approval in the unanimous opinion of the Court in

Hartford Accident, etc., Co. v. Illinois (1936), 298 U.S. 155 (158), 80 L.ed. 1099 (1102),

where it was coupled with the *Minnesota Rate Cases.*

The most recent citation of the *First South Covington Case* is at the conclusion of this Court's opinion in *Terminal Railroad Assn. v. Brotherhood* (1943), 318 U.S. 1, 9, 87 L.ed. 571, where the results of the *South Covington* decision were briefly summarized, and it was pointed out that the challenged ordinance was struck down "because of the likelihood that serious burdens would be imposed upon interstate commerce by virtue of the impossibility of compliance with probable conflicting regulations."

The *Kelly Case* (*Kelly v. Washington*, 302 U.S. 1) arose out of an attempt by the State of Washington to enforce a code of regulations applying to motor-driven tugs; it appearing that Congress, though it had enacted a rather complete code of regulation for steam vessels, as well as for motor-driven vessels of certain sizes, had restricted the scope of the regulations applying to the latter so as to exclude all but a very few of the tugs involved in this case. An initial question in the case was therefore whether Congress, by means of the federal acts, had occupied the field of regulation in such fashion as to exclude the state;

there was also the further question whether the state law must fall in its entirety, on the theory that the subject matter was one as to which uniformity of regulation was required, so that no state action whatever could be undertaken.

As to the argument that Congress had occupied the field, the Court said (302 U.S., at page 9):

> ". . . The argument is also unnecessary and inapposite if the subject is one demanding uniformity of regulation so that state action is altogether inadmissible in the absence of federal action. *In that class of cases the Constitution itself occupies the field even if there is no federal legislation.*" (Emphasis supplied.)

The Court said further (at pages 14-15):

> "The remaining question is whether the state law must fall in its entirety, not because of inconsistency with federal action, but because the subject is one as to which uniformity of regulation is required and hence, whether or not Congress has acted, the State is without authority. *Cooley v. Board of Wardens*, 12 How. 299, 319; *Minnesota Rate Cases*, 230 U.S. 352, 399, 400.
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> "The state law is a comprehensive code. While it excepts vessels which are subject to inspection under the laws of the United States, it has provisions which may be deemed to fall within the class of regulations which Congress alone can provide. For example, *Congress may establish standards and designs for the structure and equipment of vessels, and may prescribe rules for their operation, which could not properly be left to the diverse action of the States. The State of*

Washington might prescribe standards, designs, equipment and rules of one sort, Oregon another, California another, and so on." (Emphasis supplied.)

The Court then concluded that the state might, for the protection of its people, provide for the inspection of vessels which were actually unsafe and unseaworthy, and that such inspection, for the purpose of insuring those objects, constituted a subject matter as to which uniformity of regulation in all aspects was not required; but the Court continued (at page 15):

> ". . . . If, however, the State goes farther and attempts to impose particular *standards* as to structure, design, equipment *and operation which* in the judgment of its authorities may be desirable but *pass beyond what is plainly essential to safety and seaworthiness*, the State will encounter the principle that such requirements, if imposed at all, must be through the action of Congress which can establish a uniform rule." (Emphasis supplied.)

The quoted language applies with peculiar force to the instant case. Clearly the train-limit law is no mere provision for the inspection of trains or cars, to insure the detection of those which are defective, and thus unsafe to be handled. On the contrary, it is a positive and inelastic state-made "*rule and standard*" for the operation of appellant's interstate trains; indeed, it is hard to conceive of any rule which a state might prescribe more directly controlling and regulating such operations. It is just such a rule as might (to borrow the Court's illustration) be of "one sort" in Arizona, another in California, still another in New Mexico, "and so on". It

therefore falls squarely within the condemnation expressed in the portion of the opinion last quoted: i.e., it passes "beyond what is plainly essential to safety", and "encounters the principle that such requirements, if imposed at all, must be through the action of Congress which can establish a uniform rule" if one be required.

The question whether the regulation of train lengths falls within the exclusive national field was *directly* presented in each of the series of train-limit cases in the United States District Courts, to which we have already referred. In both the *First Arizona* and the *Nevada Cases* the courts held that the subject matter is such as to demand uniform regulation, and thus within the exclusive national field. In the *Oklahoma Case*, on the other hand, the majority held that the subject matter lies within the so-called "joint" field; and is properly subject to regulation by the state, unless and until the National Government acts, and always provided, of course, that the burden imposed upon interstate commerce is no more than *incidental* or *indirect*.

The three-judge court which rendered the opinion in the *First Arizona Train-Limit Case* appears to have regarded the *DeCuir* and *First South Covington Cases* as practically determinative, for the cases were cited and relied upon in that part of its opinion relating to the point now under discussion. Specifically, it was said, in the *Arizona Case* (2 F.Supp., at page 859):

> "Clearly, the Constitution has conferred upon Congress full and exclusive power to regulate commerce between the states, and any attempted enforcement of the statute of a state, passed under the guise of the police power, which directly affects interstate com-

merce to such an extent as to amount to a regulation thereof, is void and will be enjoined. (Hall v. DeCuir, 95 U.S. 485, and other cases.)

"If it should be determined that the various states have power to regulate interstate train lengths, then each state might prescribe a different limitation. A transcontinental shipment originating in California and destined for the Atlantic seaboard would require the carrier to break up and rearrange its trains before it could enter the boundaries of each state to comply with these varying limitations. This would involve an unreasonable delay in the handling of interstate traffic and impose an unreasonable burden on the same. The evidence shows that attempts have been made in the states of Indiana, Illinois, Wisconsin, California, Colorado and others to pass statutes, the effect of which are to limit the number of cars in trains. Indiana proposed a 70-car limit; Illinois a half-mile limit; Wisconsin a 3,300 ft. limit; California various limits based on grades—of a half mile or more, and different limits on different grades; Colorado a 65-car limit on certain grades and on grades of not less than one per cent, a 55-car limit.

"The present practice of the plaintiffs in its observance of the Arizona Law is illustrative of the extent of interference and the burden that would be imposed upon commerce if different regulations should be prescribed in different states. At the present time east-bound freight trains leave points in California consisting of from eighty to one hundred cars or more. These trains are hauled to division points west of the boundary of Arizona. They are there broken up into shorter trains of seventy cars or less to comply with the Arizona law. Additional train and en-

gine crews are provided, the short trains are then hauled through the state to a division point east of the state boundary, where they are again coupled up into long trains which continue on their transcontinental journeys. The same practice prevails as to west-bound transcontinental traffic."

The court then quoted a portion of the language from the opinions in the *DeCuir* and *Covington Cases*, and continued:

> *"We are convinced that the subject of the length of trains engaged in interstate traffic is national in its character, requiring uniformity of regulation, and that the power to so regulate is exclusively conferred upon Congress by the Commerce Clause of the Constitution."* (Emphasis supplied.)

The Mid-Train Caboose Case:

(Southern Pac. Co. v. Railroad Commission (1935), 10 F.Supp. 918).

We have heretofore called attention to the close resemblance, particularly in legal aspect, between the instant case and the *California Mid-Train Caboose Case*. In that case the court cited and relied upon many of the authorities referred to in this brief; and this was particularly true of its review of the point, there presented by this appellant (as plaintiff) in substantially the same manner as in the instant case, that the order challenged as invalid constituted an invasion by the State, under the "convenient apologetics of the police power," of a field of regulation where Congress possesses exclusive power and the State may not enter even in the absence of Congressional

action. The court said, in part (10 F. Supp., at page 920):

> "That the Commerce Clause of the Constitution has conferred upon Congress full power to regulate interstate commerce is all but elementary, and any attempt by a state to interfere with such exclusive regulation has been held unconstitutional and void."

The court then cited certain of the decisions referred to herein; and quoted from the opinions in the *Minnesota Rate Cases* and the *K. C. S. Ry. Co. Case*; also citing *Hall v. DeCuir*, supra, to the point (page 922):

> "It is equally well settled that a state may not under the guise of the police power directly interfere with interstate commerce."

The court also said (at page 922):

> "If the order bears a reasonable relationship to public health and safety, and does not transgress the constitutional protection of interstate commerce, the power of the state to make it cannot be questioned."

We emphasize the twofold condition which, the court declared, must be satisfied if a purported police-power order is not to be set aside. The sentence last quoted might, with equal propriety and fidelity to controlling principles announced by this Court, have been phrased as follows:

> "Even if the order bears a reasonable relationship to health and safety, but also transgresses the constitutional protection of interstate commerce, the power of the state to make it cannot be sustained."

Such was indeed precisely the holding of the court in the case. After a lengthy discussion (pages 923-924) of the evidence bearing upon the reasonableness of the order as a health and safety measure, the court said (page 924):

> "*The issue relative to the order as an attempted regulation in the interests of health and safety is not free from doubt*, but we think that what was said by the Supreme Court in Hall v. DeCuir, 95 U.S. 485, 24 L.ed. 547, is applicable to the issue." (Emphasis supplied.)

The court then quoted at length from the opinion in *Hall v. DeCuir*, including particularly in its quotation the following language from that opinion (95 U.S., at page 488):

> "We think it may safely be said that State legislation which seeks to impose a direct burden upon interstate commerce or to interfere directly with its freedom, does encroach upon the exclusive power of Congress. The statute now under consideration, in our opinion, occupies that position. It does not act upon the business through the local instruments to be employed after coming within the State, but directly upon the business as it comes into the State from without or goes out from within. While it purports only to control the carrier when engaged within the State, it must necessarily influence his conduct to some extent in the management of his business throughout his entire voyage. Uniformity in the regulations by which he is to be governed from one end to the other of his route is a necessity in his business, and to secure it Congress, which is untrammeled by State lines, has been invested with the exclusive legislative power of determining what such regulations shall be."

To support its view, the court cited also the *First South Covington Case*, supra, among others.

We emphasize again that the question whether the statute under attack was reasonable *as a police-power regulation* was not the essential point decided in *Hall v. DeCuir*: the essence of that decision was that a state regulation, *even though it might be reasonable*, could not stand if in purpose and effect it directly regulated a subject matter within the exclusive national field. Such was precisely the position taken by the court in the *Mid-Train Caboose Case*: it recognized that *Hall v. DeCuir* was and is controlling, even though the reasonableness of the order, as a police power regulation, was "not free from doubt."

Interstate Commerce Commission Service Order No. 85.

In earlier passages of this brief, we have called attention to Service Order No. 85, issued by the Interstate Commerce Commission effective September 15, 1942, which order requires all interstate rail carriers subject to the Interstate Commerce Act to operate their trains during the present emergency without regard to state train-limit laws, when necessary to avoid congestion or move traffic promptly; the order being predicated upon recitals of fact by the Commission that such train-limit laws may result in congestion, wasteful use of locomotives, and interference with the free flow of traffic, and that "long" trains may be operated in accordance with existing safety standards.

Considered superficially, it might seem that the greater significance of this order in the instant case is in relation to either the "safety" or the "interference" issues. While

undoubtedly the order is of great pertinency in those respects, we think it also has direct bearing upon the point now under discussion: the "exclusive national field" issue.

The order is addressed to an emergency, presently declared to exist, and by its terms will continue effective only for the duration of that emergency; but it is not based upon an emergency statute. The provisions found in paragraphs 10 to 17 of Section 1 of the Interstate Commerce Act, under authority of which the order by its terms was issued, were enacted in 1917, and expanded in 1920 (41 Stat. L. 476) and have been continued in effect, with amendments not material to this discussion, up to the present time. Congress thus recognized many years ago that the power exists, under the Commerce Clause, to prevent interferences with and delays to the free flow of interstate commerce moving in the cars and trains of railroad carriers; recognized, further, the necessity for efficient and economical use of motive power and other equipment; and thereupon delegated to its own agency, the Interstate Commerce Commission, the exercise of that power; just as, for other purposes, it has delegated to the Commission its constitutional power to regulate the rates and charges, and various other aspects of the operations and activities of such carriers. To be sure, the power is now exercised because of the necessities arising from the emergency. But the emergency does not create the power; it has simply called for its exercise, because the Commission has recognized that the interferences, burdens and delays imposed by the Train-Limit Law, though serious in time of peace, have in time of war become much more acute, and therefore an intolerable impediment and hazard, not merely to

the free flow of the commerce of the nation, but to the national welfare, and, indeed, the national existence. The emergency has simply accentuated and brought into sharper relief that the power to abate these interferences exists, and must and should be exercised. But the power itself, by virtue of which the carriers are required to disregard the state restrictions, rests today, as it did in 1917 when the statutory provisions were passed, and as it has, indeed, ever since 1789, when the Federal Government under our Constitution first commenced to function, upon the grant of power expressed in the Commerce Clause, and the essential immunity from state regulation thereby conferred upon those aspects of interstate commerce as to which a uniform national system of regulation must prevail if any be required.

The order is therefore, beyond any question, an exercise of power by Congress through its delegated agency which, even if the field of train-limit regulation were joint or concurrent, would oust completely the conflicting state enactment. But the order is much more: it is a definite expression of the exclusive federal power; a recognition, by mandatory direction, of the paramount federal interest in the employment by the railroads constituting the national transportation system of those operating methods which, are notoriously known and, by this record, convincingly shown to result in the speediest, safest, and most efficient transportation, and in the elimination of the artificial, state-imposed handicaps which create and augment waste, delay, and hazard.

It may be suggested, on behalf of appellee, that as a result of this order the instant case has become moot, or

that the penalties demanded by the complaint have been suspended. Such is not the fact. The alleged violations occurred in March and April, 1940, long before the issuance of the order. If the statute is valid, appellant is liable for those penalties; but if it is invalid, there is no liability. As already emphasized, the instant case is a prosecution of the character contemplated by Section 28-401 of the Arizona Annotated Code, 1939 (Laws of 1931, Chapter 84), and was brought for the express purpose of enabling the validity of the challenged statute to be tested.

Furthermore, since the order by its terms suspends the train-limit restrictions for the period of the emergency only, it does not afford the same permanent character of relief which would follow from a final decision holding the law invalid. Because of the temporary character of the order and the uncertainty as to when it will expire by its terms, appellant cannot undertake the permanent investments in siding extensions, roundhouse and shop facilities and other improvements which, as the record shows, will be necessary to enable it to conduct a standard long-train operation in Arizona in the same manner and to the same extent as elsewhere upon its system. These investments would be warranted only if appellant were reasonably assured that the restrictions are permanently removed. The temporary relief granted by the order of course enables appellant to achieve much greater economy, efficiency, and safety in its Arizona operations, and to avoid the wasteful congestion, interference and delay inherent in restricted operations; but the long-train operations are still limited, just as they were during the month of April, 1940, by the fact that the fixed plant and

equipment in Arizona is not at present adapted to long-train operation. For example, just as in 1940, and because the passing tracks and sidings in Arizona do not generally accommodate trains of more than 70 freight cars, it is not presently practicable to operate long trains in both directions at the same time.

Irrespective of the order, therefore, it is essential that the instant case be fully and finally decided by this Court, so that the present uncertainty may be ended, and appellant may know whether it will be warranted in undertaking the extensive improvements required to enable its Arizona properties to be operated efficiently, safely and economically, and in accordance with the standard practice prevailing elsewhere in the United States.

The Court will note that in the preamble to its order the Commission has declared that long trains may be operated "in accordance with safety standards now applicable." The present safety standards are the same as those existing in 1940 and 1941, when the instant case was tried; there have been no amendments to existing state or federal safety statutes applicable to the operation of railroad trains in Arizona, nor any new enactments. The order should, therefore, be given great weight, as an expression of view by an expert tribunal "created by law and informed by experience" (*Illinois Central R. Co. v. Commission* (1907), 206 U.S. 441, 454; 51 L.ed. 1128), on the question whether long-train operation is safe, practicable, and efficient in those states (Arizona and Oklahoma), where train-limit laws now exist. However, the order is more than a mere expression of such views; it is an outright

recognition of the correctness of the trial court's finding and conclusion that the permissible number of cars in an interstate train is a subject of exclusive national concern, as to which the states have no power of regulation, even in those cases where Congress has not seen fit to act, either directly or by its delegated agency.

Review of Certain Cases Heretofore Relied Upon by Appellee.

In its discussions of the "national field" issue in the lower courts, appellee has largely relied upon certain decisions of this Court which we shall here review in some detail.

The Georgia Electric Headlight, New York Car Heating, and Alabama Engineer Cases:

(*Atlantic Coast Line R. Co. v. Georgia* (1914), 234 U.S. 280, 58 L.ed. 1312;
(*New York, N. H. & H. Ry. Co. v. New York* (1897), 165 U.S. 628, 41 L.ed. 853;
(*Smith v. Alabama* (1888), 124 U.S. 465, 31 L.ed. 508.)

The *Georgia Headlight Case* involved the validity of a statute of Georgia requiring the use of electric headlights on locomotives using main lines. After a trial the railroad company was convicted of violating the law; and the judgment of the Supreme Court of the state was reviewed by writ of error.

Speaking through Mr. Justice Hughes, this Court held that the argument that other contiguous states might prescribe an oil or acetylene headlight and that "if state requirements conflict, it will be necessary to carry addi-

tional apparatus and make various adjustments at state lines, which would delay and inconvenience interstate traffic", was disposed of by the *New York Car-Heating Case*, supra; and that the suggestion was only one of "possible inconvenience": a far different situation than the picture here presented of direct, daily and substantial interference with, and obstruction to, the free movement of trains and cars engaged in a large and continuous movement in interstate commerce.

This Court held that the case was one in which, "in the absence of legislation by Congress," the states might secure "needed local protection" until Congress acted, provided that the "legislation *must not be arbitrary*, or pass beyond the limits of a *fair judgment* as to what the *exigency* demands."

In the *New York Car-Heating Case*, it was said (165 U.S., page 632):

> "The statute in question is not directed against interstate commerce. Nor it is within the meaning of the Constitution, a *regulation* of commerce, although it controls, *in some degree*, the conduct of those engaged in such commerce."

In answer to the carrier's argument that conflict between the state regulations in respect to heating of passenger cars used in interstate commerce might require passengers to leave cars at state lines, and get into other cars heated in a different mode required by the law of the state they were about to enter, the Court said that "these *possible inconveniences*" could not affect the state's police power, and also again characterized the possible

effect of the act as merely an "inconvenience." That statute was of quite a different sort from the Train-Limit Law; it did not require cars concededly fit for the transportation of passengers or freight, moving therein in a continuous movement in interstate commerce, to be detached at the state line, to remain there or be sent forward on another train. The Arizona statute does so. Nor did it, as does the Arizona law, require, outside as well as inside the borders of the state, expensive and unnecessary operations by limiting the length of trains engaged in continuous movement in interstate commerce.

Smith v. Alabama, supra (124 U.S. 465, 31 L.ed. 508), was also cited in the *Georgia Headlight Case* (234 U.S., p. 291) to the point that state rules prescribed for railroad construction and for their management and operation, designed to protect persons and property otherwise endangered by their use, are strictly within the limits of the local law. *They are not per se regulations of commerce; it is only when they operate as such in the circumstances of their application, and conflict with the expressed or presumed will of Congress* exerted on the same subject that they can be required to give way to the supreme authority of the Constitution." That case upheld an Alabama statute requiring locomotive engineers in that state to be examined and licensed. Upholding the statute, and following a long discussion which does not at all bear on the question of entry into a national field, it was concluded by the Court (124 U.S. at page 482, italics ours):

"In conclusion, we find, therefore, first, that the statute of Alabama, the validity of which is under

consideration, *is not, considered in its own nature, a regulation of interstate commerce,* even when applied as in the case under consideration; secondly, that it is properly an act of legislation within the scope of the admitted power reserved to the State to regulate the relative rights and duties of persons being and acting within its territorial jurisdiction, intended to operate so as to secure for the public, safety of person and property; and, thirdly, that *so far as it affects transactions of commerce among the States, it does so only indirectly, incidentally, and remotely, and not so as to burden or impede them, and, in the particulars in which it touches those transactions at all, it is not in conflict with any express enactment of Congress on the subject, nor contrary to any intention of Congress to be presumed from its silence.*" (A clear recognition of the "exclusive field" principle.)

Applying that quotation to the case at bar, we find that the Arizona statute "considered in its own nature" is "a regulation of interstate commerce" and that "so far as it affects transactions of commerce among the states" it does so directly and not, as in the *Alabama Case*, merely "indirectly, incidentally and remotely"; also, in the instant case, the Arizona law burdens and *impedes* interstate commerce, and is "contrary to any (the) intention of Congress to be presumed from its silence" in a matter which, if regulated at all, should be regulated by Congress.

N. C. & St. L. Ry. Co. v. Alabama (1888), 128 U.S. 96, 32 L.ed. 352, is a companion to *Smith v. Alabama*, supra, in that it follows much the same line of reasoning, and in fact quotes extensively from the

opinion. So far as the present case is concerned, it is sufficient to note that the Court pointedly remarked that the state regulation under attack, which required all operating employees on railroads to be examined and certified as being free of color blindness, was of the same character as the statute requiring engineers to be examined and certified; the Court saying further (128 U.S., at p. 101; 32 L.ed., at p. 354):

> "Such legislation is not directed against commerce, and only affects it *incidentally*, and therefore cannot be called, within the meaning of the Constitution, a regulation of commerce."

The *Alabama Cases* must also be read with the qualification expressed by the Court at the end of the opinion in *Illinois Central Railroad Co. v. Illinois* (1896), 163 U.S. 142, 41 L.ed. 107, that (page 154):

> "The State may make reasonable regulations to secure the safety of passengers, even on interstate trains, while within its borders. But the State can do nothing which will *directly burden* or *impede* the interstate traffic of the company, or *impair the usefulness of its facilities for such traffic*. Railroad Co. v. Richmond, 19 Wall. 584, 589; Stone v. Farmers' Loan & Trust Co., 116 U.S. 307, 334; Smith v. Alabama, 124 U.S. 465."

The *Illinois Central Case* was relied on in the opinion in the *First Arizona Case*. It was also cited with approval in *Cleveland etc. Ry. Co. v. Illinois* (1900), 177 U.S. 514, 44 L.ed. 869. The *Cleveland Case* refers at the beginning of the opinion to a number of cases, including *Smith v.*

Alabama, supra, and *New York etc. R. R. v. New York*, supra, and characterizes them as "local laws," saying (at p. 517)—and the disjunctive "or" is significant:

> "In none of these cases was it thought that the regulations were unreasonable *or* operated in any just sense as a *restriction upon interstate commerce.*" (Emphasis supplied.)

But what to us is the most persuasive argument that, by his opinion in the *Georgia Headlight Case*, Mr. Justice Hughes did not depart from the "national field" doctrine, is the list of cases he cited following his quotation from the *Alabama Case*. He included the *Minnesota Rate Cases*, supra—in which he wrote the opinion—and referred to page 402 of that opinion.

In the portion of the opinion immediately preceding that page, and as shown by our prior quotation therefrom, it was held "that the states cannot, under any guise, impose *direct* burdens upon interstate commerce * * * that the states are not permitted *directly* to regulate or restrain that which, from its nature, should be under the control of the one authority, and be free from restriction save as it is governed in the manner that the national legislature constitutionally ordains." Thereafter, with the citation of many authorities, the opinion enumerated certain types of regulation which were forbidden to the states, and continued with the following language, already quoted (230 U.S., at p. 402):

> "But within these limitations there necessarily remains to the States, until Congress acts, a wide range for the permissible exercise of power *appro-*

priate to their territorial jurisdiction although interstate commerce may be affected. *It extends to those matters of a local nature as to which it is impossible to derive from the constitutional grant an intention that they should go uncontrolled pending Federal intervention. . .*

. . . Further, it is competent for a state to govern its internal commerce, to provide local improvements, to create and regulate local facilities, to adopt protective measures of a reasonable character in the interest of the health, safety, morals and welfare of its people, although interstate commerce may be *incidentally* or *indirectly* involved." (Emphasis supplied.)

The *Georgia Headlight Case* was decided June 4, 1914. When the Court came to decide the *First South Covington Case* (235 U.S. 537) on January 5, 1915, evidently the *Georgia Case* was not an obstacle.

We think it apparent that, in speaking for the Court in the *Georgia Headlight Case*, Mr. Justice Hughes did not intend to depart from the principle, upon which we insist, that a state may legislate in the absence of congressional regulation only as to matters of local concern as described in the *Minnesota* opinion.

The essential difference between the *Georgia Headlight Case* and the case at bar is that the matter of locomotive headlights lies in the *concurrent* field, in which a state may prescribe safety regulations for cars and trains, even though they are engaged in interstate commerce, and such regulations, if not unreasonable or arbitrary, or directly affecting commerce, will be valid until and unless Congress acts on the subject; while the regulation of the

number of cars in a train employed in interstate commerce, especially in the circumstances and with the results shown in the case at bar, lies within the field exclusively reserved for congressional action.

In the *Georgia Headlight Case*, as well as in the *New York Car-Heating* and *Alabama Cases* just referred to, there was no direct and material interference with interstate commerce, or substantial delay and obstruction thereto, as in Arizona under the challenged law. The interference and delay were regarded as speculative and negligible. It was pointed out by Mr. Justice Hughes, in the *Georgia Case* (234 U.S., p. 292), that if the plaintiff's fears became "realities," the remedy was with Congress. There is no such speculation here. The actual interference is real and substantial, resulting directly from enforced compliance with the law. Long trains are standard practice on the through main line that crosses Arizona, California, and New Mexico, except between Yuma and Lordsburg; and by thrusting the law's limitations between California and New Mexico, Arizona in effect chokes and directly interferes with the continuous stream of interstate transportation that passes across the Arizona "bridge."

Requiring a safety device on a locomotive, or a safer method of heating cars, are in a different category, and have effects quite different, from the actual interference with and obstruction to the free flow of interstate commerce within and without the state, that result from limiting the length of interstate trains. This Court has not hesitated to interpose the protection of the Commerce Clause when train operation is actually interfered with. By the *Covington*

Case (235 U.S. 537), and the *Train-Schedule Case* (*M. K. & T. Ry. Co. v. Texas* (1918), 245 U.S. 484, 62 L.ed. 419), the Court has denied the interpretation appellee's counsel have sought to place upon the decision in the *Georgia Case*; that is, that by that case this Court intended to give implied approval to a state train-limit law. In the *Covington Case* both the *Headlight* and *Car-Heating Cases* were characterized as "*only incidentally affecting interstate business, and not subjecting the same to unreasonable demands.*" In

Southern Ry. Co. v. R. R. Com. of Indiana (1915), 236 U.S. 439, 59 L.ed. 665,

this Court (at page 446) clarified its intention in the *Georgia Headlight Case* by saying, just before citing that case, with respect "to the appliances with which certain instrumentalities of interstate commerce may be furnished, in order to secure the safety of employees, until Congress entered that field, the states could *legislate as to equipment in such manner as to incidentally affect, without burdening* interstate commerce."

Again, after citing the *Georgia Case* and other cases, the Court said (at page 447):

> "Without, therefore, discussing the many cases sustaining the right of the States to legislate on subjects which, while *not burdening, may yet incidentally affect interstate commerce*, it is sufficient here to say that Congress has so far occupied the field of legislation relating to the equipment of freight cars with safety appliances as to supersede existing and prevent further legislation on that subject." (Emphasis ours.)

The *Georgia Headlight, New York Car-Heating* and *Alabama Cases*, which, necessarily, were discussed together,

are not therefore out of harmony with either the later or the earlier cases upon which we rely. They are leading cases, in a distinct group of cases, that hold that there is a concurrent field of regulation in which the state may legislate as to matters of *local concern* even though interstate commerce is affected, until Congress exercises its authority; that thereupon state legislation in that particular field is precluded and existing state legislation is suspended, even though it only supplements the congressional action; that the congressional action may be only to delegate to an administrative tribunal the power to regulate in the particular field, but will nevertheless be sufficient if the delegated power is duly exercised; further (and this is important) that even in the absence of congressional action in this concurrent field, the state law must not be unreasonable or arbitrary, and must not infringe the national interest in the regulation of commerce or materially obstruct the free flow thereof.

The Arkansas Full Crew Cases:

C. R. I. & P. Ry. Co. v. Arkansas (1911), 219 U.S. 453, 55 L.ed. 290;

St. Louis, I. M. & S. Ry. Co. v. Arkansas (1916), 240 U.S. 518, 60 L.ed. 776;

Missouri Pacific R. Co. v. Norwood (1931), 283 U.S. 249, 75 L.ed. 1010 (modified in 283 U.S. 809).

These three cases involved the validity of the Arkansas Full Crew Law; the first case having considered those provisions of the Act which prescribe the minimum number of employees to be used in the operation of freight trains; the second having construed those provisions which

specify the number of men on switching crews within the city limits; while the third related to the validity of the law generally. None of these cases has any bearing upon the "national field" phase of the instant case. There is a marked distinction between a state, in the absence of Congressional legislation on the subject, prescribing the number of employees who must man a train or work together as a switch crew within the state, and the same state limiting the length of trains in interstate commerce, as they enter, pass through, or leave the state. Full crew legislation relates only to the manning of trains; train limit legislation dictates how trains shall be made up, and greatly increases the number of trains, not only between points within the state, but when entering and leaving the state, and while in adjoining states. It is obvious that while a "full-crew" law enacted by a state may add expense to the operation of interstate trains, by requiring the employment of more men in train operation than the management might otherwise employ, it does not result in any delay to interstate traffic while crossing a state, or in any interference with interstate traffic as it enters or leaves the state.

A further important distinction between the *Arkansas Full-Crew Cases* and the instant case is, that in those cases no claim was made that the Arkansas Full-Crew statutes had extra-territorial effect. While that point may have been incidentally involved, the opinions do not indicate that it was relied upon by the railroad companies as a ground of complaint, or that it was passed upon by either the state or the federal courts, in considering the validity of the statutes. That distinction between those cases and

the case at bar is very important, for the evidence here shows (and appellee perforce concedes) that the challenged law operates directly to control the lengths of appellant's interstate trains, not only within Arizona, but also for substantial distances in California, New Mexico, and Texas.

It would be only in occasional and inconsequential instances that a state full-crew law would have extra-territorial effect, in its practical operation. Train and enginemen are paid on the basis of hours served or miles run (whichever results in the greatest pay for a tour on duty) and, universally, eight hours *or less* on duty, or 100 miles *or less* run, constitute a day's work and entitle the train or engineman to a day's pay. Running an extra man across the state line, as a train leaves the state and to the nearest division terminal where crews are changed, or putting him on the crew at that nearest terminal as the train is about to enter the state, would in the vast majority of cases not increase his pay above that which he would be paid if he boarded or left the train exactly at the state line. Moreover, putting the extra man on, or taking him off, does not delay the train, or require it to be broken up before it enters the state, as does a train-limit law. In any event, that point does not appear to have been urged in the *Arkansas Cases*.

The Barnwell Case and Other Motor Carrier Cases:

In earlier discussions of the "national field" issue appellee has also frequently cited this Court's recent decision in the *Barnwell Case* (*South Carolina Highway De-*

partment v. Barnwell Bros. (1938), 303 U.S. 177, 82 L.ed. 734) and certain other decisions relative to state regulations of motor carriers on state highways, particularly:

Morris v. Duby (1927), 274 U.S. 135, 71 L.ed. 967;

Sproles v. Binford (1932) 286 U.S. 374, 74 L.ed. 1167;

Maurer v. Hamilton (1940), 309 U.S. 598, 84 L.ed. 969.

In the *Barnwell Case*, this Court was directly concerned with a challenge addressed to regulations imposed by the Highway Department of South Carolina upon the weight and widths of motor vehicles, including those engaged in interstate commerce, operating upon its public highways. The evidence before the lower court was apparently conflicting upon the propriety and reasonableness of the limitations in question; and the court had undertaken to resolve that conflict, and had thereby reached the conclusion that the limitations were unreasonable and imposed unlawful burdens upon interstate commerce. That judgment was reversed on appeal, this Court holding that where a rational basis for the regulation was shown, and the means of regulation chosen were reasonably adapted to the end sought, the regulation would be sustained even though interstate commerce was *incidentally* affected.

There are a number of important features of the opinion which in our view deserve particular mention:

First, the case related to the regulation by a state of the use of its own public highways. The Court in this, as in many other cases, has recognized that the problem of regulation of vehicles on highways is peculiarly local

in character, and here observed a clear distinction between the regulation of vehicles on state-owned public highways, on the one hand, and privately-owned transportation agencies operating upon their own rights of way (i.e., railroads), on the other, saying (303 U.S., at pages 186-187):

> ". . . *The commerce clause has also been thought to set its own limitation upon state control of interstate rail carriers so as to preclude the subordination of the efficiency and convenience of interstate traffic to local service requirements.*

"But the present case affords no occasion for saying that the bare possession of power by Congress to regulate the interstate traffic forces the states to conform to standards which Congress might, but has not adopted, or curtails their power to take measures to insure the safety and conservation of their highways which may be applied to like traffic moving intrastate. Few subjects of state regulation are so peculiarly *of local concern as is the use of state highways.* There are few, local regulation of which is so inseparable from a substantial effect on interstate commerce. *Unlike the railroads, local highways are built, owned and maintained by the state or its municipal subdivisions.* The state has a primary and immediate concern in their safe and economical administration. The present regulations, or any others of like purpose, if they are to accomplish their end, must be applied alike to interstate and intrastate traffic both moving in large volume over the highways. The fact that they affect alike shippers in interstate and intrastate commerce in large number within as well as without the state is a safeguard against their abuse." (Emphasis supplied.)

Second, this Court, although stating that in matters of local concern, and where the field of regulation is joint, the state may act as to many subjects unless and until Congress acts and thereby occupies the field, also reaffirmed the principle for which we contend; namely, that the Commerce Clause of its own force forbids state regulation upon those subjects which by their very nature are of national concern. The Court said (at pages 185-186):

> "The commerce clause, by its own force, prohibits discrimination against interstate commerce, whatever its form or method, and the decisions of this Court have recognized that there is scope for its like operation when state legislation nominally of local concern is in point of fact aimed at interstate commerce, or by its necessary operation is a means of gaining a local benefit by throwing the attendant burdens on those without the state. (Citing cases.)
>
> It was to end these practises that the commerce clause was adopted."

That expression is particularly applicable here. For the challenged law, whether or not originally intended as a regulation of interstate commerce, is "in point of fact aimed at" that commerce, the traffic affected by it being approximately 94% interstate in character. The heavy burden cast upon appellant's operations thus creates obvious discriminations against such commerce. The cost of compliance cannot be recouped except by either increasing the appellant's rates and fares and thus its total revenues, or by reducing its expenditures for other purposes, and thus in some degree its ability to render adequate service. In either event, the burden is borne by inter-

state commerce, and principally by appellant's patrons shipping and traveling from and to points outside of Arizona. In a word, interstate commerce bears the added burden so that limited benefits, principally by way of increased employment opportunities, may be afforded to a comparatively few residents of Arizona.

Third, the Court did not say, as appellee has heretofore attempted to infer, that a purported police-power statute must be upheld merely because supported by expressions of partisan opinion given by interested witnesses. The Court's opinion makes it clear that a challenged state regulation must bear a *reasonable* relation to its supposed object; and must be founded on some rational basis. The presumption that a legislative enactment is supported by facts known to the legislature will not save the regulation if, upon an examination of the record, it is clear that the law does not rest upon a rational foundation. And how could the Arizona Legislature of 1912 have known what the railroad operation of 1941 would be?

Appellee's principal emphasis, in its citation of the *Barnwell Case* upon the "national-field" point, has been directed, however, to the proposition that it is not the Court's function to determine whether the burdens imposed upon interstate commerce by state regulation, *otherwise permissible*, are too great. That argument entirely misses the point now under discussion. The excerpts from the opinion upon which appellee has relied clearly show that before any need arises for the determination whether too great a burden is imposed, the challenged regulation must be shown to be "otherwise permissible". A regulation which attempts to deal with a matter falling

within the *exclusive* national field is not "otherwise", or in any degree, "permissible": the Constitutional grant, of its own force, has precluded the states from attempting *any* such regulation, no matter whether it bears heavily or lightly upon interstate commerce.

Minnesota Rate Cases, supra (230 U.S. 352, 399-400);

Milk Control Board v. Eisenberg Farm Products, supra (306 U.S. 346, 351);

Edwards v. California, supra (314 U.S. 160, 174, 176).

It is impossible to draw, from the *Barnwell Case*, any support for the argument that the exclusive national field does not exist, or that the Train-Limit Law does not invade that field. On the contrary, this Court in both the *Barnwell opinion* itself, and as well in later opinions, particularly the *Milk Control Board Case*, *California v. Thompson*, and *Parker v. Brown*, has recognized and reaffirmed the existence of the exclusive national field, where all manner of state regulation is prohibited, even in the absence of congressional action.

It is noteworthy that the *Barnwell Case* is cited in the opinions in both the *Thompson* and *Parker Cases* (309 U.S., p. 116; 317 U.S., p. 362), in direct connection with the passages in those two opinions in which emphasis is laid upon the *national* interest in preserving uniformity of regulation in matters of national concern, and maintaining the free and unobstructed flow of commerce.

The *Morris*, *Sprales* and *Maurer Cases* resemble the *Barnwell Case*, in that they involved simply the validity of state regulations of motor carriers operating upon

state highways, with particular reference to weights, lengths, and sizes. In fact, these decisions are largely along the same lines as the *Barnwell* decision. Obviously, and as was fully recognized, particularly in the *Barnwell Case* (compare the excerpts quoted in the preceding discussion), the regulation of truck weights and lengths for the purpose of preserving state highways is quite a different thing from the regulation of lengths of freight and passenger trains entering the state upon, and using in the state, in continuous journeys in interstate commerce, a line of railroad in private ownership.

In the *Maurer Case*, this Court recognized and commented at length upon the essentially different problems involved in the national regulation, on the one hand, of rail carriers "operating over roads and with privately owned and controlled equipment, with standards of roadbed, operation and equipment substantially uniform throughout the country"; and on the other, the regulation of vehicular traffic over the highways of the several states. As to the latter, it said that the problem bore little resemblance to the regulation of other systems of transportation, because it involved a far more varied and complex undertaking; the differences between highway characteristics and usage in the various states being substantial, while state regulation, developed over a period of years, had been directed to the safe and convenient use of highways and their conservation with reference to varying local needs and conditions (309 U.S., at pp. 604-605).

In none of these cases was any claim made or sustained that the state regulations had other than *incidental*

effects upon interstate operations; nor do these decisions warrant any argument that this Court should sustain a state enactment, such as the Train-Limit Law, which *directly, substantially* and *immediately* controls and regulates interstate commerce. On the contrary, it may be particularly noted that in the *Sproles Case*, Mr. Chief Justice Hughes, who rendered the opinion, referred to his own prior opinion in the *Minnesota Rate Cases*, supra, and particularly to pages 399 and 400 of that opinion, and declared that the regulations adopted by the State fell within that class where states may take action in matters admitting of diversity of treatment, according to special requirements of local conditions; but not, as specifically stated on page 400 of the *Minnesota* opinion, in any manner so as to impose direct burdens upon interstate commerce, or to regulate directly, or restrain, that which from its nature should be under the control of the one authority and free of restriction, save as it is governed in the manner that the national legislature constitutionally ordains.

We conclude our argument upon the "national field" issue by quoting that portion of the memorandum opinion of the trial court in which the point is discussed (R. 404):

> "There is a field of regulation of interstate activities which, under the Commerce Clause, is exclusively reserved to the National Government, and I am firmly convinced that the subject of the length of trains engaged in interstate traffic falls within that class. This for the reason that the subject matter is national in its character, requiring uniformity of regulation by

a single authority. If each state was at liberty to regulate the conduct of carriers while within its jurisdiction, the confusion likely to follow could not but be productive of great inconvenience and unnecessary hardship. The very purpose of the Commerce Clause was to insure uniformity of regulation of interstate commerce against conflicting and discriminating state legislation, such as the law in question. The absence of any act of Congress on the subject of train lengths is equal to its declaration that commerce in that matter shall be free. In other words, the inertia of government should be on the side of freedom of commerce, rather than on the side of restraint of commerce. The determination of this entire case might well be decided upon this exclusive Federal field doctrine, which is in effect saying that Arizona never had the right to pass this legislation in the first instance."

This expression unquestionably sets forth the principles correctly applicable to the case at bar, as declared in the controlling decisions of this Court. It follows that the state supreme court, which neither noticed nor discussed the "national field" issue, and particularly failed (unless possibly by indirection) to state any conclusion thereon, erred as a matter of law in such omission.

We respectfully submit that this Court should correct that error by holding and declaring:

(1) The subject matter of the length and consist of interstate trains is clearly shown to be of such nature that, if regulated at all, the regulation should be prescribed by a single nation-wide authority.

(2) Said subject matter therefore falls within the exclusive national field, and state regulation is not permissible, even in the absence of affirmative action by Congress.

(3) Because the subject matter is thus exclusively national in character, it is unnecessary, in determining whether the state regulation is invalid as an invasion of the national field, to consider whether it is a proper police-power measure, either in the interest of safety or otherwise; and it is equally unnecessary to undertake to consider whether any actual financial burden is imposed upon interstate commerce, or any physical interference or obstruction created. The mere fact of entry into a field of regulation which is a subject of national concern, where national regulation is indispensable if any be required, is sufficient to invalidate the law regardless of its tangible effects upon interstate commerce, or its real or claimed relation to public health and safety. Since the subject matter falls within the national field, where "a general system or uniformity of regulation is required," the power of the national government is exclusive; the state cannot regulate under any pretext; and any reasons, whether of safety or otherwise, ascribed or claimed for attempted action by the state in the field become wholly immaterial.

2.

THE TRAIN-LIMIT LAW REGULATES INTERSTATE COMMERCE WITH EXTRATERRITORIAL EFFECT.

(Assignment of Error No. 2)

In its Conclusion of Law No. III (R. 4035-4036) the trial court held that the challenged law is unconstitutional, in violation of the Commerce Clause, because its neces-

sary and inevitable effect is to regulate the lengths of appellant's interstate trains in the adjacent states of California, New Mexico, and Texas, as well as in Arizona; in other words, because it operates with extraterritorial effect.

The opinion of the state court contains no mention whatever of this point—not even the implied disapproval of the lower court's reasoning upon the other major issues which may be said to follow from the lengthy quotation (R. 4063-4066) from the opinion in the *Oklahoma Train-Limit Case*. For while each of these other points was discussed at some length in that opinion, the question of the possible extraterritorial effect of the Oklahoma law is not referred to, and apparently was not presented to that court. The issue is nevertheless important in the present case and, in view of the decisions of this Court, should be regarded as controlling, irrespective of the conclusions reached upon the other issues.

The extraterritorial effects of the law are widespread, substantial, and completely unavoidable. The unchallenged testimony shows that, in order to comply strictly with the law's restrictions, appellant must reconsist (i.e., reduce or build up) its trains at points outside Arizona; that it is, in a practical sense, impossible to locate the terminals required for these operations exactly at the state lines. At the eastern boundary of the state the reconsisting operations are and for years have been performed at points outside of Arizona: on the principal main freight line, at Lordsburg, New Mexico, or points farther east. At the westerly boundary, reconsisting operations have been performed at Yuma, which is physically

within Arizona, and extraterritorial effects are thus largely avoided; but although this practice has prevailed for many years, there can be no question (and appellee's counsel have in effect conceded) that absolute compliance with the law would require appellant to perform the reconsisting operations at some point in California (R. 1918).

In any event it is not disputed that the inevitable effect of the law is to control (i.e., to "regulate") the lengths of all trains for at least 23 miles in New Mexico (the distance from Lordsburg to the boundary), and as to a substantial proportion (approximately 75 per cent of the freight trains) this control extends as far east as El Paso, more than 170 miles beyond the boundary, and into the State of Texas. In the case of passenger trains, the reconsisting operations compelled by the law are frequently performed at El Paso, and occasionally at points in California; so that as to passenger-train operation the extraterritorial control extends for 171 miles beyond the easterly boundary of Arizona, and as far west as Los Angeles, California, 250 miles from the Arizona boundary. These extraterritorial effects of the law are, we repeat, wholly unchallenged by appellee.

The reconsisting operations themselves are necessary, solely because of the law's requirements. Since they are largely performed at points outside of Arizona, they constitute an additional extraterritorial effect of the law upon appellant's operation of its interstate trains. This further extraterritorial effect of the law is likewise wholly unchallenged.

The enforced extraterritorial operation of shorter trains, as far as the reconsisting points, and as far as Los Angeles

and El Paso at certain times, necessarily causes and requires appellant to operate additional train service in the extraterritorial districts where such shorter trains are compelled to be run, and to incur additional expense of that service. That this additional extraterritorial train service is compelled by the law is likewise virtually conceded by appellee; and while certain items of the expense thereof may be questioned, it cannot be disputed that some expense, of material amount, is incurred.

The evidence establishes that the reconsisting operations result in delays to all "long" trains, and the cars therein, incident to the operations themselves; further, that the cars required to be set out at the reconsisting points to await movement by following trains are delayed for varying periods. Many of these delays, which are wholly due to the law, and would be avoided if it were set aside, occur at points outside of the state. The law thus contributes still another extraterritorial effect, by way of obstructions to and interferences with the continuous movement of interstate commerce, imposed at points outside Arizona.

Appellee has never challenged our convincing showing that the law thus inevitably operates with extraterritorial effect. It is difficult to see how any such challenge could be attempted. Appellant's evidence on the point is clear and convincing; moreover, appellee failed to introduce any evidence of its own, and did not even attempt to indicate how the extraterritorial effects of the law, outside of Arizona, could be avoided or minimized, if the law were fully complied with within the state. As we have said, its counsel even admitted that the law can be com-

pletely observed *within* Arizona, only if its restrictions are also made effective in those portions of the adjoining states immediately beyond the boundary lines, and extending "* * *to the next terminal" (R. 1918).

In a number of cases this Court has reviewed state laws or regulations the necessary effects of which were directly to regulate commerce beyond their own boundaries. The consistent trend of these decisions supports the principle that a state may not, consistently with the power delegated to the Federal Government by the Constitution, regulate transactions in interstate commerce occurring in part, or entirely, outside of the state; and that when a state law or regulation, whatever its merits or desirability, of necessity and by inevitable and inescapable effect regulates and controls interstate commerce outside of the state boundaries, as does the Train-Limit Law, it thereby conflicts with the Commerce Clause and must be set aside.

In

Hall v. DeCuir, supra (95 U.S. 485),

the point is very definitely presented. We call attention to the following language from the opinion (95 U.S. at page 488):

> "The statute now under consideration . . . does not act upon the business through the local instruments to be employed after coming within the state, but directly upon the business as it comes into the state from without or goes out from within. *While it purports only to control the carrier when engaged within the state, it must necessarily influence his conduct to some extent in the management of his business*

throughout his entire voyage. His disposition of passengers taken up and put down within the state, or taken up within to be carried without, *cannot but affect in greater or less degree* those taken up without and brought within, and sometimes *those taken up and put down without.*" (Emphasis supplied.)

The decision in the *First South Covington Case* is equally in point. As this Court said, to comply with the regulations imposed by Covington would have required about one-half more than the number of cars being presently operated by the railway, and more cars than could be operated in Cincinnati within its franchise rights. That the Court regarded the regulations as extraterritorial in operation, and therefore void, clearly appears from the following portion of the opinion (235 U.S., at pages 547-548):

> "We think *the necessary effect of these regulations is not only to determine the manner of carrying passengers in Covington and the number of cars* that are to be run in connection with the business there, *but necessarily directs the numbers of cars to be run in Cincinnati, and the manner of loading them when there, where the traffic is much impeded and other lines of street railway and many hindrances have to be taken into consideration* in regulating the traffic. If Covington can regulate these matters, certainly Cincinnati can, and interstate business might be impeded by conflicting and varying regulations in this respect, with which it might be impossible to comply. On one side of the river one set of regulations might be enforced, and on the other side quite a different set, and both seeking to control a practically continuous movement of cars." (Emphasis supplied.)

The decision in

Bowman v. C. & N. W. Ry. Co. (1888), 125 U.S. 465, 31 L.ed. 700,

is likewise directly in point. The case involved the validity of a statute of Iowa which forbade a common carrier knowingly to transport into the state any intoxicating liquor. A shipment had been tendered to the carrier at a station in Illinois; and having been refused for transportation, this suit had been brought in the federal court for Illinois. The carrier pleaded its inability to receive and transport the shipment, relying upon the prohibition of the Iowa statute.* This Court held that this plea could not be sustained, declaring the Iowa law to be void because it was a regulation of interstate commerce, and particularly because it operated with extra territorial effect upon interstate transportation, which would be commenced outside of Iowa. The Court referred to prior cases, including certain of the decisions cited in the preceding subdivision of this argument, in which it had been declared that there are certain classes of subjects, as to which the power of regulation by the Federal Government under the Commerce Clause is exclusive, because there can of necessity be only one system or plan of regulation; that inaction by Congress in such cases is a declaration of purpose that the commerce shall be free. It then said (at page 486):

> "The principle thus announced has a more obvious application to the circumstances of such a case as the

*There was at that time no Federal statute similar to the Webb-Kenyon Act which was passed later to remove the protection of the Commerce Clause from shipments of intoxicating liquor into a "dry" state.

present, when it is considered that the *law of the State of Iowa under consideration*, while it professes to regulate the conduct of carriers engaged in transportation within the limits of that state, nevertheless *materially affects, if allowed to operate, the conduct of such carriers, both as respects their rights and obligations, in every other state into or through which they pass* in the prosecution of their business of interstate transportation. In the present case, the defendant is sued as a common carrier in the State of Illinois, and the breach of duty alleged against it is a violation of the law of that state in refusing to receive and transport goods which, as a common carrier, by that law, it was bound to accept and carry. It interposes as a defence a law of the State of Iowa, which forbids the delivery of such goods within that state. *Has the law of Iowa any extra-territorial force which does not belong to the law of the State of Illinois?* If the law of Iowa forbids the delivery, and the law of Illinois requires the transportation, which of the two shall prevail? How can the former make void the latter? *In view of this necessary operation of the law of Iowa, if it be valid, the language of this court in the case of* Hall v. DeCuir, 95 U.S. 485, 488, *is exactly in point.*" (Emphasis supplied.)

The Court then referred at length to the opinion in *Hall v. DeCuir*, supra; and after enumerating the various matters properly subject to state legislation and the police power, and quoting at length from *Robbins v. Shelby Taxing District*, supra (120 U.S., at page 493) continued:

"The section of the statute of Iowa, the validity of which is drawn in question in this case, does not fall within this enumeration of legitimate exertions of the police power. *It is not an exercise of the jurisdiction*

of the state over persons and property within its limits. On the contrary, it is an attempt to assert that jurisdiction over persons and property within the limits of other states. It seeks to prohibit and stop their passage and importation into its own limits, and *is designed as a regulation for the conduct of commerce before the merchandise is brought to its border.* It is not one of those local regulations designed to aid and facilitate commerce . . . It is, on the other hand, a regulation directly affecting interstate commerce in an essential and vital point. *If authorized, in the present instance, upon the grounds and motives of the policy which have dictated it, the same reason would justify any and every other state regulation of interstate commerce upon any grounds and reasons which might prompt in particular cases their adoption.* It is, therefore, a regulation of that character which constitutes an unauthorized interference with the power given to Congress over the subject. If not in contravention of any positive legislation by Congress, it is nevertheless a breach and interruption of that liberty of trade which Congress ordains as the national policy, by willing that it shall be free from restrictive regulations."

In answer to the contention that the statute in question was designed only to prohibit sales within Iowa, the Court said that that argument could not be sustained because the right to prohibit sales arises only after the transportation has been determined, and the sales which the state may forbid are those *within its jurisdiction.* The Court said further (at page 499):

"Its (the state's) power over them does not begin to operate until they are brought within the terri-

torial limits which circumscribe it. It might be very convenient and useful in the execution of the policy of prohibition within the state to extend the powers of the state beyond its territorial limits. *But such extra-territorial powers cannot be assumed upon such an implication. On the contrary, the nature of the case contradicts their existence.* For if they belong to one state, they belong to all, and cannot be exercised severally and independently. The attempt would necessarily produce that conflict and confusion which it was the very purpose of the Constitution by its delegations of national power to prevent."

The general principle that state statutes cannot validly operate beyond the boundaries of the state by which they are made is, of course, of long standing.

In

Pennoyer v. Neff (1877), 95 U.S. 714, 24 L.ed. 565,

this Court, after stating that each state has exclusive jurisdiction within its territory, subject to the paramount provisions of the Federal Constitution, said further (at page 722):

"The other principle of public law referred to follows from the one mentioned; that is, that no state can exercise direct jurisdiction and authority over persons or property without its territory."

In

Olmsted v. Olmsted (1910), 216 U.S. 386, 54 L.ed. 530,

it was said (at page 395):

"The legislature of Michigan had no power to pass an act which would affect the transmission of title to lands located in the State of New York."

In

Baldwin v. Seelig (1935), 294 U.S. 511, 79 L.ed. 1032,

this Court held invalid an attempt by the State of New York to project a police power statute, directly affecting interstate commerce, beyond its own boundaries and into the territorial limits of another state. The statute undertook to prescribe the minimum prices to be paid by distributors, for milk brought from any source, either within or without the state, into New York City and there sold for public consumption. The Court said (294 U.S., at page 521):

> "New York has no power to project its legislation into Vermont by regulating the price to be paid in that state for milk acquired there. So much is not disputed."

In

Connecticut General Life Insurance Co. v. Johnson (1938), 303 U.S. 77, 82 L.ed. 673,

this Court, in its decision relating to the power of the state to impose taxes upon a foreign corporation with respect to transactions taking place in another state, said (at pp. 80-81):

> ". . . A state which controls the property and activities within its boundaries of a foreign corporation admitted to do business there may tax them. But the due process clause denies to the state the power to tax or regulate the corporation's property and activities elsewhere." (Citing cases)

In

Magnolia Petroleum Co. v. Hunt (1943), 320 U.S. 430, 88 L.ed. Adv. 161,

this Court, in the course of a discussion of the effect to be given, in the courts of Louisiana, to a final judgment obtained in the courts of Texas, said (pp. 439, 440):

> "The full faith and credit clause like the commerce clause thus became a nationally unifying force. . . . But whether the Texas award purported also to adjudicate the rights and duties of the parties under the Louisiana law or to control persons and Courts in Louisiana is irrelevant to our present inquiry. For Texas is without power to give extraterritorial effect to its laws." (Citing cases.)

In

McLeod v. Dilworth Co. (1944), 322 U.S. 327, 88 L.ed. Adv., 910,

this Court affirmed a decision of the Supreme Court of Arkansas, holding that the Commerce Clause prohibited the application of an Arkansas sales-tax statute to sales carried on and completed in Tennessee, even though the goods after purchase were shipped to a destination in Arkansas for subsequent use; saying (at pp. 330-331):

> ". . . . For Arkansas to impose a tax on such transaction [a sale made in Tennessee] would be to project its powers beyond its boundaries and to tax an interstate transaction.
>
> ". . . . A tax on an interstate sale like the one before us and unlike the tax on the enjoyment of the goods sold, involves an assumption of power by a State which the Commerce Clause was meant to end. The very purpose of the Commerce Clause was

to create an area of free trade among the several States. That clause vested the power of taxing a transaction forming an unbroken process of interstate commerce in the Congress, not in the States."

In its arguments addressed to the courts below, relating to this issue, appellee has relied largely upon the *New York Car Heating, Georgia Electric Headlight, Arkansas Full Crew*, and *Barnwell Cases*, each of which has already been reviewed in our discussion of the "exclusive national field" phase of the case. Appellee has contended particularly that the statutes or orders which in those cases were sustained would nevertheless substantially affect interstate commerce, beyond the state boundaries, because they would require either a complete change of equipment at the state line, or an adjustment of the entire interstate operation to the most restrictive requirement encountered along the route.

None of these cases affords any real support for appellee's argument; on the contrary, they all recognize the fundamental principle, stated in the *Minnesota Rate Cases*, and again in *Milk Control Board v. Eisenberg Farm Products*, that even when acting in the "joint field," for the purpose of making regulations to meet the "special requirements of local conditions," the states' freedom of action is limited to "their respective jurisdictions." Thus, in the *Minnesota Rate Cases*, this Court said (230 U.S., pp. 399-400, 402):

> "In other matters, admitting of diversity of treatment according to the special requirements of local conditions the States may act *within their respective jurisdictions* until Congress sees fit to act. . . .

"But within these limitations (of subject matter) there necessarily remains to the States, until Congress acts, a wide range for the permissible exercise of power *appropriate to their territorial jurisdictions* although interstate commerce may be affected." (Emphasis supplied.)

The *New York Car-Heating* and *Georgia Headlight Cases* contain nothing to indicate approval by this Court of any state police-power regulation having the far-reaching extra-territorial effects shown to result from the Arizona law. In the *Car-Heating Case*, the Court was careful to specify that the power of the state in the premises was "to regulate the relative rights and duties of those *within its limits*"; that "the state's plenary authority existed *within its territorial limits*" (165 U.S., at p. 632; 41 L.ed., at p. 854). (We have previously shown that the exercise of this "plenary authority" cannot, in the light of later decisions, involve any obstruction to the free flow of commerce, or impairment of the national interest in uniformity of regulation of matters requiring such regulation.)

In the *Georgia Headlight Case*, this Court said that the state's power to regulate, even though interstate commerce might incidentally be "inconvenienced," was for the purpose of protecting "life and property *within its borders*" (234 U.S., at p. 292).

The *Barnwell Case* plainly affords no support for appellee, for no question of extra-territorial effect was involved. In point of fact, this Court, in a footnote to its opinion (303 U.S., p. 185), remarked:

"State regulations affecting interstate commerce, whose purpose or effect is to gain for those within the state an advantage at the expense of those without, or *to burden those out of the state without any corresponding advantage to those within*, have been thought to impinge on the constitutional prohibition even though Congress has not acted." (Emphasis supplied.)

Hall v. DeCuir, *Bowman v. C. & N. W. Ry. Co.*, and *Baldwin v. Seelig*, supra, among other cases, were cited to support this statement, and with apparent approval.

In the *First Arkansas Full Crew Case* (219 U.S. 433), this Court likewise indicated that the state's power must be confined within its own territorial limits: the protection claimed to be afforded by the law being, as the Court said, extended to interstate travelers as well as to local citizens, *while within Arkansas* (219 U.S., at p. 465); and it was further said (at p. 466) that this regulation related "to the rights and duties of all *within the jurisdiction*."

In *Sproles v. Binford*, supra (286 U.S. 374), also one of the cases upon which appellee has heretofore greatly relied, this Court again followed the doctrine declared in the *Minnesota Rate Cases*; for the Court referred (286 U.S., at p. 390) to the portions of that opinion already cited in this discussion, and to

"the established principle that in matters admitting of diversity of treatment, according to the special requirements of local conditions, the states may act *within their respective jurisdictions* until Congress sees fit to act." (Emphasis supplied.)

The *Sprolès* opinion also directly supports our contention that local regulation by a state within its borders may not, by necessary effect, extend beyond those borders, for the Court said, immediately following the excerpt last quoted:

> "As this principle maintains essential local authority to meet local needs *it follows that one state cannot establish standards which would derogate from the equal power of other states to make regulations of their own.*" (Emphasis supplied.)

Paraphrasing this language: it is obvious that Arizona cannot establish maximum standards for the lengths of trains, which by necessary effect also prevail in California and New Mexico (as admittedly the train-limit restrictions do), and derogate from the equal power of those states to make corresponding regulations of their own. The very fact, however, as we earnestly contend, that a state regulation of the lengths of interstate trains operating in continuous movement over a through route cannot be confined to the state of its making, but must, if fully enforced within those boundaries, also directly regulate and control operations in adjoining states, demonstrates that the entire subject matter falls within the exclusive national field.

We anticipate that appellee will also rely largely, as it did in oral argument to the state court, upon

Terminal Railroad Association v. Brotherhood, supra (318 U.S. 1, 87 L.ed. 571).

That case involved the validity of an order of the Illinois Commerce Commission requiring cabooses to be attached

to guts of cars, for certain inter-yard movements at and adjacent to East St. Louis, Illinois, including movements across the Mississippi River bridges, and thus from and to locations in the adjacent State of Missouri. This Court remarked that on its face the order required only that cabooses be used within Illinois, and did not require their use in Missouri, but assumed that as a practical consequence of the order cabooses used in Illinois on the interstate runs must also be used at least as far as the nearest switching point in Missouri. The Court said (318 U.S., at pp. 8, 9):

> "If lack of facilities at the State lines requires as a practical matter that in order to provide cabooses in Illinois appellant must also provide them for some distance in Missouri, that fact does not preclude Illinois from regulating the operation to the limits of its territory." (Citing *Missouri P. R. Co. v. Kansas*, 216 U.S. 262, 54 L.ed. 472; *South Covington & C. R. Co. v. Covington*, supra, 235 U.S. 537, 59 L.ed. 350.)

The *Terminal Case* is readily distinguishable on its facts from the case at bar. The opinion shows that any extra-territorial effects resulting from the Illinois Commission's order could properly be described as merely incidental and indirect; in fact, of no material consequence at all. There was certainly no real and substantial burden and interference, as in the instant case, whereby trains and cars moving in a continuous course in interstate commerce are subjected to a regulation which directly and completely controls their movement, for long distances before they reach and after they have left the state; an

extra-territorial regulation which admittedly cannot be avoided if the law is literally complied with inside the state. While the measure of the financial burden incurred because of the extra-territorial effect considered in the *Terminal Case*, is not stated in the opinion, it must have been very slight; the movement of a caboose, attached to a cut of cars, for a few hundred yards beyond the state line, could hardly involve more than a mere nominal expense over and above the cost otherwise. But the burden imposed by the Arizona law, solely because of the compelled extra-territorial operations, and excluding any burden associated with the effects of the law within the state, is nearly $100,000 per year, based upon 1938 operations.

The Court's reference in the *Terminal Case* (318 U.S., at p. 8) to the "governing principles" of *Parker v. Brown*, supra (317 U.S. 341, 361-363), emphasizes the distinction. For the governing principle stated in that case is that "state regulations of matters of local concern" which also regulate interstate commerce are to be sustained, provided they relate to a matter of *local* character, which may be appropriately regulated *locally*, and because of its nature may never be adequately dealt with by Congress, and provided also that the national interest in the regulation of commerce by a single authority is not impaired, nor the free flow of commerce materially obstructed.

The Train-Limit Law does not come within the classification thus stated. It regulates a matter clearly of national and not local concern, for which possibly varying local regulations are wholly inappropriate; indeed, its very

nature shows that it can be dealt with adequately only by Congress, if any regulation is needed. The law likewise directly and substantially impairs the national interest in uniformity of regulation, and seriously obstructs the free flow of commerce. Since it is thus wholly distinct, in both character and subject matter regulated, from the order involved in the *Terminal Case*, clearly the principle of the *Parker Case* cannot be invoked to sustain the law; and it follows equally that in considering the extra-territorial point the *Terminal Case* has no application.

Apart from these considerations, it is clear that the Court did not intend, in the *Terminal Case*, to announce or approve any general principle that an admitted extra-territorial regulation of interstate commerce shall be disregarded as immaterial, in considering the validity of a state police-power regulation. This is made clear by the citation, at the close of the opinion, of the *First South Covington Case*. In that case, as the Court points out (318 U.S., at p. 9, Note 16) the local ordinance under attack was held invalid for the reason, among others, that there was a likelihood that serious burdens would be imposed upon interstate commerce because of the impossibility of compliance with probable conflicting regulations; or, as stated in the *Covington* opinion itself, because the ordinance not only determined the manner of carrying passengers in Covington and the number of cars to be run there, but also necessarily "directs the number of cars to be run in Cincinnati and the manner of loading them when there. . . . On one side of the river one set of regulations might be enforced, and on the other

quite a different set, and both seeking to control a practically continuous movement of cars" (235 U.S. 537, 548). These same factors have been shown to exist in the present case. Compare our prior discussion of the "national field" point, and particularly the quoted excerpts from the recent opinion of the Interstate Commerce Commission sustaining as lawful its Service Order No. 85 (256 I.C.C. 523).

The discussion of extraterritorial effect of the law, in the opinion rendered by the trial court, is brief and to the point and merits the attention of this Court. It reads as follows (R. 4049):

> "What is even more serious from the standpoint of those who seek to uphold the Act is it extraterritorial effect. The challenged law lays hands upon interstate commerce moving over defendant's lines long before it reaches the physical boundaries of Arizona, and continues directly to affect and regulate that commerce long after it has left Arizona. As a practical matter, it nearly controls the length of passenger trains from Los Angeles to El Paso, and of freight trains from Yuma to Lordsburg, the latter point being twenty-three miles east of the state line, and frequently on to El Paso, 171 miles beyond Arizona's boundary. Under the decided cases it is fatal for any police-power statute to operate with extra territorial effect, and under the guise of police power no state may thus directly interfere with interstate commerce."

In its disposition of this same issue, the court in the *First Arizona Case* held that the Train-Limit Law operated directly to interfere with interstate commerce and

imposed undue and unreasonable burdens thereon (as indicated by the excerpt quoted in the preceding subdivision of this brief); and emphasized the extraterritorial effect of that law, by pointing to the fact that eastbound trains of greater length than permitted by the law were required to be broken up into Arizona-size trains at terminals west of the Arizona boundary, which short trains were then handled across the state to terminals east of the Arizona line, where they were again consolidated into trains of larger size, and normal operating methods resumed.

The question of extraterritorial effect was also involved in the *Mid-Train Caboose Case*, in which it was said (10 F. Supp. at page 921):

> "Plaintiff challenges the order upon the ground of its extraterritorial effect. While the order designates only intrastate lines, it has a direct bearing on interstate commerce. Defendant commission, appreciating that in practical operation the order would have extraterritorial effect, said in its decision:
>
> > "'Legally, of course, any order made by this Commission must be limited to intrastate train operations. Since the company does not now have trackage facilities at Calvada adequate to permit of the addition or withdrawal of a caboose from trains at this point, it would be compelled, if the work is to be done there, to construct such facilities. The estimated cost of construction is $6,700.00. The delay occasioned there by the necessary switching would be approximately thirty minutes. Practically, however, no such costs or delays would be occasioned, for obviously, if the company is re-

quired to comply with the trainmen's demand, it will actually perform such switching at Sparks, Nevada, its regular division point, seventeen miles east of the state line.'

"Plaintiff pleads that, in the interest of economy and expeditious handling of interstate commerce, it would, if forced to a choice, take the course which the commission stated was obvious."

As before stated, the court followed the principles declared in *Hall v. DeCuir* and the *First South Covington Case*, supra, and held the challenged order invalid.

In the *Nevada Train-Limit Case* the court, after making specific findings of fact setting forth the extraterritorial delays, interferences, and other burdens upon interstate commerce which the Nevada statute, if enforced, would inevitably create and impose in the adjoining states of California and Utah, adopted a conclusion of law reading as follows:

"IV. Said Train-Limit Law is further unconstitutional and void, and in violation of said Commerce Clause, because its necessary, practical, and inevitable effect is, and would and will be, to regulate the length of the interstate railroad trains operated over plaintiff's lines, not only within Nevada, but also in adjoining portions of the states of California and Utah."

We call attention to the close resemblance between the trial court's Conclusion of Law No. III (R. 4035-4036) dealing with the point now under discussion, and that adopted in the case last cited. That similarity is not in the least

fortuitous. The challenged law in the *Nevada Case* was virtually identical with the Arizona law, and its extra-territorial effects were necessarily substantially the same.

It is clear, we think, from the foregoing authorities that even when a state undertakes to regulate a subject even of local concern, and in so doing enacts a statute which, by necessary and inevitable result, directly and substantially regulates the conduct and flow of interstate commerce beyond the state's territorial boundaries and within the borders of other states, such regulation cannot be sustained; if it operates extraterritorially, it is invalid because in violation of the Commerce Clause. The challenged statute offends against this principle, because it admittedly and inevitably regulates and controls interstate commerce in the adjoining states.

3.

THE TRAIN-LIMIT LAW DIRECTLY, MATERIALLY, AND SUBSTANTIALLY INTERFERES WITH, BURDENS, AND OBSTRUCTS INTERSTATE COMMERCE.

(Assignments of Error Nos. 3 and 4)

In its Conclusions of Law Nos. IV and V (R. 4036), the trial court held the train-limit law invalid, under the Commerce Clause, because its necessary and inevitable effects are directly, substantially and unreasonably to interfere with, regulate, and delay the operation of appellant's interstate trains in Arizona and adjacent states, and to impose direct, substantial and unreasonable financial burdens upon the interstate commerce there conducted by appellant; and thus to impair the use and usefulness of its transportation facilities employed in interstate com-

merce. The substance of these two conclusions is also recited in paragraphs second and third of the trial court's judgment of February 11, 1942, reading as follows (R. 4040):

> "*Second:* Said statute imposes direct, unreasonable and unlawful burdens upon, and interferes with, delays and obstructs interstate commerce, in violation of said Commerce Clause;
>
> "*Third:* Said statute impairs the use and usefulness of the transportation facilities employed by defendant as a common carrier engaged in interstate commerce;"

Although these conclusions were appropriately challenged by the state upon its appeal from the judgment, no specific discussion of the issue appears in the opinion of the state Supreme Court. However, the court, in quoting from the majority opinion in the *Oklahoma Train Load Case* (R. 4063), included the passage (36 F.Supp., at p. 942) which expresses the view that a state police power regulation may be sustained, if reasonable, even though it necessarily "affects interstate commerce in an *incidental* or *indirect* manner, but not otherwise." (Emphasis ours.) This reference, coupled with the reversal of the trial court's judgment, may be taken as expressing the court's conclusion that the law affects interstate commerce only "incidentally or indirectly," and "not otherwise."

The state court thus appeared to recognize the basic principle of law upon which the trial court's conclusions are founded: namely, that a state statute, though claimed

to be an exercise of the police power in the so-called joint or concurrent field (i.e., a regulation of matters of local concern), and even though assertedly or actually enacted in the interest of public health or safety, will be set aside as an infringement of the Commerce Clause if it directly, substantially, and materially regulates, burdens, and interferes with interstate commerce. The court's reversal of the judgment can be assigned therefore to its failure or refusal either to recognize the facts, or, recognizing them, to view the interferences, obstructions, and burdens imposed by the law as direct, material and substantial."

The principle just stated, the correctness of which was plainly conceded in the *Oklahoma Case*, and thus inferentially by the state court in the case at bar, has been announced and followed in repeated decisions by this Court, many of which have been cited in conjunction with our preceding discussion addressed to the "exclusive national field" issue. We call particular attention to:

Illinois Central R. Co. v. Illinois, supra (163 U.S. 142, 41 L.ed. 107);

K. C. S. R. Co. v. Kaw Valley Drainage Dist., supra (233 U.S. 75, 58 L.ed. 857);

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*The state court declared in its opinion (R. 4063) immediately preceding its lengthy quotation from the *Oklahoma* decision, that, "in that case, *like the one at bar*, the railroad company was compelled . . . to expend *great sums of money* in order to comply with the restrictions . . . "; but apparently thought that the "*great sum*" ($400,000 per year, as found by the trial court) was not a sufficiently *direct* and *substantial* burden to justify the invocation of the commerce clause.

South Covington R. Co. v. Covington, supra (235 U.S. 537, 59 L.ed. 350);

St. L.-S. F. R. Co. v. Public Service Comm., (1921), 254 U.S. 535, 65 L.ed. 389;

Minnesota Rate Cases, supra (230 U.S., at pp. 400-401);

Savage v. Jones (1912), 225 U.S. 501, 56 L.ed. 1182;

Adams Express Co. v. New York (1913), 232 U.S. 14, 58 L.ed. 490;

Seaboard Airline R. Co. v. Blackwell, supra (244 U.S. 310, 61 L.ed. 1176);

M. K. & T. Ry. Co. v. Texas, supra (245 U.S. 484, 62 L.ed. 419);

Milk Control Board v. Eisenberg Farm Products Co., supra (306 U.S., at pp. 351, 352);

Davis v. Farmers Co-Op. Co., supra (262 U.S. 312, 67 L.ed. 996);

La Coste v. Dept. of Conservation (1924), 263 U.S. 545, 68 L.ed. 437;

Foster-Fountain Packing Co. v. Haydel (1929), 278 U.S. 1, 73 L.ed. 147;

Brennan v. Titusville, supra (153 U.S. 289, 38 L.ed. 719);

California v. Thompson, supra (313 U.S. 109, 85 L.ed. 1219);

Parker v. Brown, supra (317 U.S. 341, 87 L.ed 315).

There is no question, and none has ever been raised by appellee, that the commerce affected and regulated by the challenged law is interstate in character, and thus

within the protection of the above principle. The fact is that substantially every train which moves on appellant's lines in Arizona and is thus controlled as to its length by the law, and certainly every train on the main lines, consists in large part (and in many cases entirely) of interstate traffic; that is to say, these trains are composed largely, if not altogether, of cars carrying freight and passengers moving in interstate commerce from and to points beyond Arizona, or between points in other states and points in Arizona; or of empty cars returning from points outside Arizona to points within or beyond that state. By comparison with the total traffic handled upon appellant's lines in Arizona, the volume of the local, i.e., intrastate, traffic is inconsiderable. It is apparent that substantially every train operated by appellant which is compelled to observe the limitations of the law is a train moving in and handling interstate commerce, and that the effect of the law, apart from its effects upon operations in adjacent states, has been, is, and will be to lay hands upon, interfere with, and regulate, interstate commerce upon appellant's line within Arizona.

For the immediate purpose of this discussion the essential question is therefore not so much whether the commerce regulated is interstate in character, nor whether the law was enacted for the purpose of safety and is reasonably related to that purpose. Rather, the question is whether, even assuming (which we deny) that the law is a reasonable regulation of a matter of local concern, and so within the joint or concurrent field, on the one hand it actually regulates, interferes with, and burdens interstate commerce directly and substantially, and imposes

substantial and material obstructions to the free flow of such commerce, or whether, on the other, it affects interstate commerce only indirectly and incidentally, and without impairing the national interest.

As noted in subdivision 1 of this argument (the "national field"), appellee has contended before that (1) a state safety law or regulation, if reasonably related to that purpose, can never *in legal contemplation* impose more than indirect or incidental burdens or interferences upon interstate commerce; (2) therefore, the court cannot inquire into the actual effects of such a law upon interstate commerce, until and unless it has determined that the law has no possible rational basis; (3) the courts cannot give relief in any event, for if the burden or obstruction imposed upon interstate commerce is too great, resort must be had to Congress, which alone can provide the remedy. Addressing itself to the factual questions of the burdens and interferences occasioned by the law, appellee has also contended that (4) there is here no competent or otherwise adequate showing of actual burden, obstruction or interference, the extensive findings of the trial court to that effect being unsupported by sufficient lawful probative evidence.

The first of these expected contentions has already been reviewed in the preceding discussion, and there shown to be opposed to the principle and result of those decisions of this Court, in which state police power statutes or orders, in the interest of public health, safety or convenience and apparently bearing some reasonable relationship to that object, have been set aside because of direct, material and substantial burdens and obstructions

imposed upon interstate commerce. These decisions are clear to the effect that such interferences and obstructions cannot be excused or justified by resort to the "convenient apologetics of the police power." Thus, in *Kansas City Southern R. Co. v. Kaw Valley Drainage District*, supra, this Court said, in language already quoted in earlier references to this case (233 U.S., p. 79):

> "The decisions also show that a state cannot avoid the operation of this rule by simply invoking the convenient apologetics of the police power. It repeatedly has been said or implied that *a direct interference with commerce among the states could not be justified* in this way. *The state can do nothing which will directly burden or impede the interstate traffic of the company* or impair the usefulness of its facilities for such traffic." (Citing cases.) (Emphasis supplied.)

We call particular attention to the expressions used by the Court in the *South Covington* and *Illinois Central Cases*, in the quotations from those opinions which appear in the portion of this brief devoted to the "national field" phase.

In the *Illinois Central Case*, this Court also said (163 U.S., at page 153):

> "The effect of the statute of Illinois, as construed and applied by the Supreme Court of the state, is to require a fast mail train, carrying interstate passengers and the United States mail, from Chicago, in the State of Illinois to places south of the Ohio River, over an interstate highway established by authority of Congress, *to delay the transportation* of such pas-

sengers and mails, by turning aside from the direct interstate route, and running to a station three miles and a half away from a point on that route, and back again to the same point, and thus traveling seven miles which form no part of its course, before proceeding on its way; and to do this for the purpose of discharging and receiving passengers at that station, for the interstate travel to and from which, as is admitted in this case, the railroad company furnishes other and ample accommodation.

"This court is unanimously of opinion that this requirement is an *unconstitutional hindrance and obstruction of interstate commerce*, and of the passage of the mails of the United States." (Emphasis supplied.)

In the *St. Louis and San Francisco Ry. Case*, supra, the question was as to the validity of an order of the State Commission, which required the detouring of certain through passenger trains which were interstate in character, the detour being to serve a city of some 4,000 inhabitants which was already adequately served by other trains. This order, of course, could only have been justified under the police power; and in holding it invalid because it unduly burdened interstate commerce, the Court said (254 U.S., at p. 537):

"Considering the facts disclosed, we think it plain that the fourteen local passenger trains meet the reasonable requirements of Caruthersville, and that the Commission's order unduly burdens interstate commerce. *Compliance with it would require the railway to maintain 16 more miles of track at the high standard essential for the through trains, and to move the*

latter 16 miles further, with consequent delay and inconveniences all along the line. The burden certainly would not be less serious than those which were condemned in some, if not all, of the cases above referred to." (Emphasis supplied.)

In other words, the state might require adequate local service but could not lay its regulating hand on through interstate trains *as such*. Practically all of appellant's main-line trains in Arizona are of that character.

In the *La Coste Case*, supra, it was said (263 U.S. at page 550):

> "The commerce clause (art. 1, Sec. 8, clause 3) confers on Congress power to regulate interstate and foreign commerce, and therefore such power is impliedly forbidden to the states. 'Even their power to lay and collect taxes, comprehensive and necessary as that power is, cannot be exerted in a way which involves a discrimination against such commerce.' . . . A state may not enforce any law, the necessary effect of which is to prevent, obstruct, or burden interstate commerce. . . .
>
> "This court will determine for itself what is the necessary operation and effect of a state law challenged on the ground that it interferes with or burdens interstate commerce. The name, description, or characterization given it by the legislature or the courts of the state will not necessarily control. Regard must be had to the substance of the measure rather than its form."

In *Seaboard Airline R. Co. v. Blackwell*, supra (244 U.S. 310), this Court, as already noted, invalidated the so

called Georgia "blow-post" law, which would have required the slowing down of trains at grade crossings, to such an extent as to delay them several hours beyond their normal schedules. The sole ground of the decision was that the regulation imposed a direct and intolerable burden and obstruction upon the free flow of interstate commerce, and the obvious and apparently unquestioned relation of the statute to the public health and safety did not avail to save it.

In *Shafer v. Farmers Brain Company* (1925), 268 U.S. 189, 69 L.ed. 909, this Court held invalid, under the Commerce Clause, a state statute which undertook to control the purchase and shipment of grain produced in and moving out of the state. The law was defended as an alleged necessary exercise of police power in the interest of the local producers. But the Court said (at p. 199):

> "The decisions of this court respecting the validity of state laws challenged under the commerce clause have established many rules covering various situations. Two of these rules are specially invoked here, one, that a state statute enacted for admissible state purposes, and which affects interstate commerce only incidentally and remotely, is not a prohibited state regulation in the sense of that clause; and the other [illegible] at *a state statute which, by its necessary operation, directly interferes with or burdens such commerce, is a prohibited regulation and invalid, regardless of the purpose with which it was enacted.*" (Emphasis supplied.)

In *Edwards v. California*, supra (314 U.S. 160), this Court set aside the California statute forbidding the

bringing of indigent persons into the state; again, despite the apparent relation between the law and the public welfare, and solely because of the direct obstruction thus imposed upon the freedom of movement of persons in interstate commerce.

In

Missouri, Kansas & Texas R. Co. v. Texas, supra (245 U.S. 484, 62 L.ed. 419),

this Court reversed a judgment rendered in a suit for penalties brought by the State of Texas, which penalties had been assessed for the violation of an order of the State Railroad Commission requiring

> "passenger trains in Texas to start from their point of origin and from stations on the line in accordance with advertised schedule, allowing them not to exceed thirty minutes at origin or points of junction with other lines to make connection with trains on such other lines, and not exceeding ten minutes more if at the end of thirty minutes the connecting trains were in sight."

The Court said (245 U.S., at page 488):

> "Again the question is not what the State Commission might require of a road deriving its powers from the State, with regard to local business (Missouri Pacific Ry. Co. v. Kansas, 216 U.S. 262, 283) but whether the order if applied to this case would not unlawfully interfere with commerce among the States.
>
> "On its face the order as applied was an interference with such commerce. It undertook to fix the time allowed the stops in the course of interstate transit.

It was a serious interference, for it made the defendant liable for an interstate train not starting on schedule time, when the train did not come into the defendant's hands, from another company in another state, until too late. This, as we understand the facts, was the train to which the advertised schedule applied, and if so, the mere statement of the result is enough to show that the burden imposed not only was serious but was unwarranted as well as unjust. The suggestion that compliance with the order could have been secured by having an extra train ready to run if the regular one was not on time hardly is practical, and is not an adequate answer, even in form. For the defendant advertised, or at least had the right to advertise, the interstate train, and, if it did so, would not free itself from liability for a delay on the part of that train by offering another. We think it plain that this order was applied in a way that was beyond the power of the Commission and courts of the State. Seaboard Air Line Ry. v. Blackwell, 244 U.S. 310. Chicago, Burlington & Quincy R. R. Co. v. Railroad Commission of Wisconsin, 237 U.S. 220, 226. South Covington & Cincinnati Street Ry. Co. v. Covington, 235 U.S. 537, 548."

In

St. Louis S. W. Ry. Co. v. Arkansas (1910), 217 U.S. 136, 54 L.ed. 698,

this Court reversed a judgment of the Supreme Court of Arkansas imposing penalties on the railroad for an alleged failure to furnish cars for loading by a shipper. The state court had held that the railroad was not excused, even though the failure was due solely to its inability to regain its own cars which had been sent from its own line, over

other railroads as required to reach the billed destinations. This Court said (at p. 149):

> "Coming to the merits, we think it needs but statement to demonstrate that the ruling of the court below involved necessarily the assertion of power in the State to absolutely forbid the efficacious carrying on of interstate commerce, or, what is equivalent thereto, to cause the right to efficiently conduct such commerce to depend upon the willingness of the company to be subjected to enormous pecuniary penalties as a condition of the exercise of the right."

It will be noted that Conclusion of Law No. IV declares the law to be invalid because of the physical interference, obstruction and delay imposed upon appellant's interstate trains; whereas Conclusion of Law No. V refers to the financial burden imposed upon appellant's operations in Arizona by reason of enforced compliance with the law. Both the physical interference and obstruction, and the financial burden, fall within the prohibition of the principle above set forth; in fact, many of the decisions make no distinction in terms as between a purely physical interference *with* or obstruction to interstate commerce and the financial burden upon it—both the words "burden" and "interference" having been used either interchangeably or as synonymous. But as the authorities show, whether the burden and interference be due to financial imposition or direct interference and obstruction, they are equally prohibited under the Commerce Clause. To be strictly and technically correct, it is quite conceivable that a state might impose a forbidden burden upon interstate commerce—for example, by a license fee or a tax on gross receipts from interstate

transactions—without interfering with it in the sense of physically hindering or preventing its being carried on between the state and adjoining states, or through the state, provided that the tax or license fee is paid. Compare: *Fisher's Bend Station v. Tax Commission* (1936), 297 U.S. 650 (655), 80 L.ed. 956. It is likewise conceivable that, as illustrated by the situations in *K. C. S. Ry. Co. v. Kaw Valley Drainage Dist.*, supra (233 U.S. 75), and *Seaboard etc. R. Co. v. Blackwell*, supra (244 U.S. 310), a direct physical interference or obstruction may take place, though no immediate financial burden is imposed. These considerations may have persuaded the trial court to adopt the conclusions of law in their present form, so as to differentiate between the interference and the burden, treating the one as purely physical and the other as largely financial in character, though there are many cases in which either may be construed as equivalent to the other. The distinction is perhaps unimportant, because both are forbidden—the attempted exercise of the state police power to the contrary notwithstanding.

We think that it may be taken as settled law, therefore, as laid down in the numerous decisions above cited, and in a host of others, including many largely relied upon by appellee at earlier stages of the case (for example, the *Alabama Engineers' Case*, the *Minnesota Rate Cases*, the *Milk Control Board Case*, and the *Oklahoma Train Limit Case*), that a state regulation of a matter of even local concern, enacted in the exercise of the police power, even though reasonably claimed to be in the interest of safety, will be set aside as a violation of the Commerce Clause if it materially and substantially regulates, burdens, in-

terferes with, or obstructs interstate commerce; *incidental, remote* or *indirect* effects or burdens being all that are permitted.

The decisions likewise show that the courts have not only the right, but also the duty, in any case in which the validity of a state police power regulation is called into question because of allegedly imposing unlawful burdens, interferences, or obstructions upon interstate commerce, of considering the facts as they are developed in the record, to determine whether the claimed burden or interference is merely incidental, indirect and nominal, and without substantial effect upon interstate commerce, or is, on the other hand, direct, material and substantial, so as to impose practical obstructions, interferences and burdens upon the free flow of commerce and thus to impair the national interests. Necessarily the court must undertake this function; for otherwise the protection now afforded to interstate commerce against widespread local interferences and burdens would be effectively nullified by a perfunctory affirmative declaration adopted, perhaps, by a majority of a local city council or board of supervisors, or even set forth in the mere fiat of an individual state or county official, to whom power had been delegated by local statute or ordinance. Naturally this Court has recognized the right to determine *independently*, notwithstanding the legislative declaration, as to the extent and character of the alleged burden or interference. Thus, in the recent *Milk Control Board Case*, upon which appellee has frequently relied, the Court, after stating (306 U.S., at pp. 351-352) the general principles controlling the exercise of the power to regulate interstate commerce by both the

Federal Government and the states, turned to a review of the particular statute the validity of which was in issue. It said (at pp. 352-353):

> "The purpose of the statute under review obviously is to reach a domestic situation in the interest of the welfare of the producers and consumers of milk in Pennsylvania . . . the question is whether the prescription of prices to be paid producers in the effort to accomplish these ends constitutes a prohibited burden on interstate commerce or an incidental burden which is permissible until superseded by Congressional enactment. *That question can be answered only by weighing the nature of the respondent's activities, and the propriety of local regulation of them as disclosed by the record.*"

The Court then reviewed the facts of record and concluded:

> "These considerations, we think, justify the conclusions that the effect of the law on interstate commerce is *incidental* and not forbidden by the constitution, in the absence of regulation by Congress." (Emphasis supplied.)

In

La Coste v. Dept. of Conservation, supra,

this Court said, in language already quoted (263 U.S., at p. 550):

> "This court will determine *for itself* what is the necessary operation and effect of a state law challenged on the ground that it interferes with or burdens interstate commerce. The name, description or characterization given it by the legislature or the

courts of the state will not necessarily control. Regard must be had to the substance of the measure rather than its form."

In

Foster-Fountain Packing Co. v. Haydel, supra,

the Court said (278 U.S., at p. 10):

> "*One challenging the validity of a state enactment on the ground that it is repugnant to the commerce clause is not necessarily bound by the legislative declarations of purpose.* It is open to him to show that in their *practical operation* its provisions directly *burden* or destroy interstate commerce. *Minnesota v. Barber*, 136 U.S. 313, 319, 34 L.ed. 455, 457; *Brimmer v. Rebman*, 138 U.S. 78, 81, 34 L.ed. 862, 863. In determining what is interstate commerce, courts look to *practical considerations* and the established course of business. *Swift & Co. v. United States*, 196 U.S. 375, 398, 49 L.ed. 518, 525; *Lemke v. Farmers Grain Co.*, 258 U.S. 50, 59, 66 L.ed. 458, 464; *Binderup v. Pathe Exch.*, 263 U.S. 291, 309, 68 L.ed. 308; *Shafer v. Farmers Grain Co.*, 268 U.S. 189, 198, 200, 69 L.ed. 909, 914, 915. *Interstate commerce includes more than transportation; it embraces all the component parts of commercial intercourse among states. And a state statute that operates directly to burden any of its essential elements is invalid.*" (Emphasis supplied.)

The *Foster-Fountain Packing Co. Case* was cited with apparent approval, in two different footnotes to the opinion in the *Barnwell Case* (303 U.S., pp. 185-188).

In the *Blackwell Case*, supra, 244 U.S. 310 (also, as noted, cited with apparent approval in the *Barnwell Case*)

this Court reviewed at length the factual situation revealed by the record, and concluded that the statute involved (which was purely a police-power measure, in the purported interest of safety) had been shown invalid because of the *burden* imposed upon interstate commerce; as the Court said, in the later *Burnwell* opinion (303 U.S., at p. 187), it was "an unnecessarily harsh restriction."

In the *M. K. T. Ry. Case*, supra, the Court likewise reviewed the facts before arriving at its conclusions (245 U.S., at p. 488) that the challenged regulation constituted an undue and improper interference with and burden upon interstate commerce.

In *Parker v. Brown*, supra (317 U.S. 341) this Court said (pp. 362-363):

> "But they (state regulations of "matters of local concern") are to be upheld *because upon a consideration of all the relevant facts and circumstances* it appears that the matter is one which may appropriately be regulated in the interest of safety, health and well being of local communities, and which, because of its local character and the practical difficulties involved, may never be adequately dealt with by Congress." (Emphasis supplied.)

We cite these cases merely as illustrative; many others to the same effect might be added. It is clear that this Court is not prevented from examining the facts of record, as they have been determined and summarized in the findings adopted by the trial court, in order to determine whether actual, immediate and direct burdens, interferences, and obstructions are imposed.

Heretofore appellee has attempted to support its position respecting the function of the Court in this connection, by referring to a portion of the opinion in the *Barnwell Case* reading as follows (303 U.S., pp. 189-190):

> "Congress, in the exercise of its plenary power to regulate interstate commerce, may determine whether the burdens imposed on it by state regulation, otherwise permissible, are too great, and may, by legislation designed to secure uniformity or in other respects to protect the national interest in the commerce, curtail to some extent the state's regulatory power. But that is a legislative, not a judicial function, to be performed in the light of the Congressional judgment of what is appropriate regulation of interstate commerce, and the extent to which, in that field, state power and local interests should be required to yield to the national authority and interest."

In prior discussion in this brief we have called attention to the qualifying phrase "otherwise permissible," used by the Court in referring to those state regulations with respect to which Congress may provide relief when the burden becomes too great. The decisions of this Court, both before and since the *Barnwell Case*, show that a state regulation of even a "matter of local concern," if it materially and substantially obstructs and interferes with interstate commerce, is not "otherwise permissible," any more than if it were an attempted regulation of a matter of exclusive national concern. In either event, it is wholly forbidden by the Commerce Clause itself, without any necessity for the exercise of the plenary powers of Congress;

it is automatically removed and set aside when the Commerce Clause is duly invoked and applied. The quoted passage therefore means that even when a state regulation is particularly addressed to a matter of local concern, and because affecting interstate commerce only incidentally and indirectly is "otherwise permissible," Congress may still act in the joint field, if convinced that uniformity is desirable or that the national interest will in other respects be promoted, and thereby curtail still further even the limited powers available to the state.

There is nothing in the opinion to indicate that a court may not inquire and determine whether an alleged interference with interstate commerce by a state exceeds in degree what is "otherwise permissible"; on the contrary, the entire opinion shows that there was no intent on the part of this Court to alter, in any way, the well-recognized and uniformly sustained principles of decision which have been announced both before and since the *Barnwell Case*, and find particular expression in the later decisions in *Milk Control Board v. Eisenberg*, and *Parker v. Brown*, supra.

While appellee has at times attempted to question whether there is any direct, substantial and material interference, burden or obstruction, the facts, as revealed by the record and found by the trial court, are wholly against its contention.

The physical interferences and obstructions created by the law, and the direct regulatory effects of the law are covered by several specific findings of the trial court. Finding X(b) (R. 3953-3962) specifies the interferences with and

delays to appellant's interstate trains and traffic, which occur both within and without Arizona and consist of (1) interference with and delays to cars and trains at terminals; (2) delays to individual cars, as distinguished from delays to entire trains; and (3) interferences with and delays to trains while on line between terminals; Finding X(c) (R. 3962-3966) sets forth the regulatory effects of the law upon appellant's train operations, showing how the law operates to reduce the average and actual lengths of the trains operated in Arizona and the adjacent affected territory below the actual and average lengths which would prevail if the law were not in effect, and therefore increases the number of trains, train miles, and locomotive miles necessarily operated to handle the same volume of traffic. Thus in 1938, a year of relatively light traffic, the law compelled the operation of 4,304 more freight trains, producing 638,569 more freight train miles, and 798,424 more locomotive miles than would otherwise have been necessary. Expressed in percentages, 30.8% more freight trains, 33.1% more freight-train miles, and 35.9% more locomotive miles were produced than otherwise would have been required; and of the additional train miles, 151,789, or 23.8% were produced in New Mexico and Texas, and were solely due to the extra-territorial effects of the law. It is, of course, unquestioned that these delays, interferences and regulatory effects are imposed entirely upon interstate commerce; for, as Finding IV(a) shows, about 93% of all of the revenue freight-ton-miles made in Arizona, and over 95% of all revenue passenger-miles, over the five-year period 1935-1939, were interstate in character; and it is clear that practically every train

affected by the law, including each of the additional trains which the law compels to be operated, is an interstate train.

The financial burdens, expressed both in terms of the expense incurred directly because of appellant's enforced compliance, and as the impairment of usefulness arising because of appellant's inability to use its transportation facilities in Arizona and the adjacent territory as efficiently and economically as would be possible if the law's restrictions were removed, are likewise covered by specific findings.

Finding X(d) (R. 3966-3969) directly sets forth the actual additional expense imposed upon appellant, and which it would save if it did not comply with the law, amounting to $394,900 per year, based upon the year 1938. All of this expense could be avoided if the law were not complied with. Nearly $95,000 out of this total is compelled to be incurred outside of Arizona, because of the extra-territorial effect of the law. As already noted, the State Supreme Court concurred, at least inferentially, in the finding that a heavy financial burden of compliance is imposed.

Finding VII, and particularly paragraph (d)(3) of that Finding (R. 3929-3934), shows the extent to which appellant has been unable, because of the restriction, to make efficient and economical use of its Arizona facilities; particularly, it demonstrates the degree to which such efficiency and economy in Arizona, and upon the Arizona lines, have lagged behind, by contrast with the efficiency and economy obtained on other parts of the system—notably in Nevada and Utah, where long-train operations

under conditions generally quite similar to those in Arizona (apart from the train-limit restriction) have been normally developed and carried on. This Finding thus sets forth both the fact and the extent of the impairment in the use and usefulness of appellant's property and facilities employed in interstate commerce, which is directly caused by, and attributable to, the restrictions of the law.

It seems clear, beyond any possibility of dispute, that these direct, immediate, material and substantial interferences, obstructions and regulations, accompanied by these substantial and continuing burdens, affecting, as they do, every train operated by appellant in Arizona, as well as in the adjacent territory, must be considered as "direct," "immediate," "material," and "substantial," within the meaning of the controlling decisions; they cannot, under any theory, be classed as "indirect," "incidental," or "remote." Clearly, there is a *direct, substantial,* and *immediate regulation* of, *interference* with, and *obstruction* to interstate commerce when, in a year of comparatively light traffic, the law compels the operation of approximately one-third more freight trains, train miles and locomotive miles than otherwise would be required, and imposes upon that operation the necessity of reconsisting interstate freight and passenger trains at points outside of Arizona, as well as at Yuma, with delay to both the trains themselves; and the cars which must be left behind or held for consolidation; when it imposes further upon the operation some 16,612 additional meets and passes, or about 63% more than otherwise would have been required, each of which meets and passes involves

a delay to at least one train, and possibly to others. Equally, there is clearly a substantial, direct and immediate burden when, in such a year of light traffic, compliance with the law results in the additional and unnecessary expenditure of approximately $400,000, over and above the expenses which would be incurred if the law were not complied with.

The discussion of this point in the memorandum opinion of the trial court is particularly illuminating. That court said (R. 4048-4049):

> "The heavy direct burden cast by the law upon interstate commerce can not be seriously questioned and the impairment of the efficient use of defendant's property is of itself an unlawful taking of that property without due process of law, which is a violation of both the state and Federal constitutions. . . .
>
> "The record here also amply discloses that the law causes real interference with, and delay to, interstate commerce, practically to the extent that Arizona operations create a bottle-neck. Actually ninety-three per cent of the freight traffic and ninety-five of the passenger business of the defendant in Arizona is interstate commerce. Furthermore, the law certainly imposes a great, substantial and wholly unreasonable burden of expense upon this interstate traffic. To hold in this case that interstate commerce was only incidentally or indirectly involved would be less than realistic, for the interference and regulation is *substantial, continuous, direct and unavoidable*, as is pointed out in detail in the findings of fact." (Emphasis as in the original.)

If there were any possible doubt that the burden, interference and obstruction is substantial, direct, imme-

diate and unavoidable, that doubt is finally set at rest by the findings of the Interstate Commerce Commission in the recitals preceding the ordering paragraphs of its *Service Order No. 85*, and affirmed by it in its opinion in which it sustained its power to make that order: *Ex parte 156*, supra, 256 I.C.C. 523, 535. In those recitals the Commission said that:

> "compliance by railroads subject to the Interstate Commerce Act with such rules, regulations, practices and laws (referring to state train-limit laws) during the present emergency, may result in congestion of tracks and terminals, wasteful use of locomotives and interference with the free flow of traffic necessary in the present emergency . . . and that such operation (without compliance with train limits) will facilitate the free flow of traffic necessary during the present emergency."

The Commission accordingly ordered carriers subject to the Interstate Commerce Act to operate their trains without regard to such train-limit laws "when necessary for the prompt movement of freight and the clearing or avoidance of congestion."

The suggestion is sometimes made that in a case involving a state regulation in the concurrent field, the court may and should analyze and evaluate the factual showing as to the burdens and obstructions imposed and the benefits claimed, so as to determine, by balancing the one against the other, whether the challenged regulation infringes the reasonable protection of the Commerce Clause. If that course is thought desirable in the present case, the only conclusion that can possibly follow is that the

safety benefits claimed and shown to result from the Train-Limit Law are at best so exceedingly slight as to merit no consideration by contrast with the admittedly heavy, substantial, continuous, and unavoidable burdens and obstructions imposed.

The extensive factual showing of the law's results, from the safety standpoint, presents no actual conflict, being primarily based upon official reports and statistics. It is carefully summarized in the trial court's findings Nos. XI, XII, and XIII (R. 3969-4032), the substance of which is restated, for convenience, in our preceding statement of facts. Without here undertaking to review that evidence at length,* there are certain salient features of the safety phase which we emphasize:

(1) The essential question is not, as appellee has contended at earlier stages of this case, whether a given number of long trains can be operated more or less safely than an equal number of short trains; but whether the *entire* operation (i.e., the movement of *all* the traffic which appellant, as a common carrier, must handle into, within and across Arizona) can be accomplished with fewer casualties if appellant is permitted to run trains of all lengths necessary to the handling of that traffic, and thus to meet the transportation requirements effectively, but with as few train units as practicable, rather than being compelled to observe fixed restrictions, and thus to operate many more train units than are needed.

(2) Again, the essential question is not whether a compelled short-train operation results in more or fewer

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*A discussion of the safety evidence in its relation to the trial court's safety findings is included in Volume II of this brief.

casualties of the particular type heretofore emphasized by appellee (the so-called "slack action" type, which comprises only about 6% of all of the employee casualties which occur in train operation; see Exhibits 262, 266; R. 3300, 3304), as compared to the unrestricted operation; but whether *all* classes of accidents and casualties incident to railroad operation are reduced or increased by the enforcement of the law's restrictions.

(3) The answers to these two questions need not be sought in hypothesis, speculation or opinion; they are to be found in *actual experience* with both long (unrestricted) and short (restricted) train operations, as reflected in accident and casualty reports and statistics, covering each and all of the 18 years immediately preceding the date of the trial, and covering not only the Arizona lines, but also other parts of appellant's own system, as well as the other railroads of the United States.

That experience convincingly shows beyond any possible debate that, from the casualty standpoint, the unrestricted operation carried on with as few train units as practicable results in far less hazard, and a much smaller casualty frequency, whether all classes of accidents and casualties or only restricted groups of casualties be considered, than does the restricted (short train) operation. Even considering the narrow issue of the number and frequency of the slack-action type of casualties, the record of accidents and casualties in Arizona and elsewhere shows that the law has not eliminated this class of accident, or even measurably affected its frequency.

(4) There is no evidence of record which shows, or tends to show, nor even any claim by any of appellee's

witnesses, that any accident or casualty has occurred upon or in connection with a long freight or passenger train as to which it could be reasonably said that the same accident would not have occurred if the train had been within the limits prescribed by the law, or, if occurring, would have been less severe.

(5). The results, from the casualty standpoint, of appellant's long-train operations in Arizona during March and April, 1940, though not claimed to be conclusive, strongly indicate that long-train operation is *less* hazardous (and certainly not *more* hazardous) than short-train operation. There were *no* accidents or casualties on *any* of the 62 passenger trains which, during that period, were operated without regard to the law. There was but *one* casualty occurring on *one* of the 302 *long* freight trains operated during that period, *which took place when a brakeman fell while dismounting from the caboose of a 91-car train, the caboose being detached at the time* and handled alone by the engine. There were, during the period of long passenger train operation, 7 accidents with 7 casualties, all occurring upon trains operated in conformity with the law. There were, during the period of long freight train operations, 6 accidents, with 4 casualties, occurring upon *short* freight trains.

It follows that the law can not be upheld under the Commerce Clause, because upon consideration of all the relevant facts and circumstances—the nature of the subject matter regulated, the substantial interferences and obstructions to and heavy burdens upon interstate commerce, as against the very dubious safety benefits, and the certainty that many if not all of the hazards incident

to train operation are materially increased—it plainly appears that the matter here regulated is not local in character; that there are no practical difficulties preventing adequate treatment by Congress; and—of great importance—that even assuming that the subject matter may be considered "local", there is no scope for this particular regulation, because it substantially impairs the national interest in the uniform regulation of interstate commerce and materially obstructs the free flow of that commerce. The competing demands of the state and national interests, asssuming that there is a demand by the state, can be accommodated here only by holding the state law invalid.

This conclusion is strongly supported by the reasoning followed and the results reached by this Court, in *Terminal Railroad Association v. Brotherhood*, supra (318 U.S. 1). The Court there stated (at page 8):

> "It (the challenged state regulation) finds its origin in the local climatic conditions and in the hazards created by particular local physical structures, and it has rather obvious relation to the health and safety of local workmen. The record in the case does not afford a sure basis for calculating the costs to commerce resulting from the order against the costs to the safety and health of the workmen which it was intended to minimize, and there is evidence in the case that nearby railroads have seen fit in the absence of legal compulsion to provide cabooses in circumstances substantially similar to those upon which appellant relies to establish absence of state power."

The Train-Limit Law, by contrast, was not apparently inspired by any peculiar local climatic or other condition, and certainly is not seriously claimed or shown to be necessary as a safety measure on this account. The hazard (of slack action), to which it is alleged to be particularly addressed, plainly is not local to Arizona, nor is there any unusual condition in that state which is claimed to increase that hazard. The relation of the law to local health and safety is not only not "obvious"; to the contrary, it is clearly shown, and specially found, that the law is a source of increased hazard and multiplied casualties: "As a matter of cold fact, it makes these short-train operations more dangerous" (Opinion of trial court, R. 4053). The record here affords a sure and (even to the state court) "satisfactory" basis for computing the cost to commerce resulting from the law, in terms of financial burden; and an equally sure and satisfactory basis of measuring the added cost in terms of the obstructions imposed, and especially the additional and unnecessary hazards created. There are no "costs to health and safety of workmen" incident to the unrestricted operation which the challenged law measurably reduces, not even the "slack-action" hazard: so that there is nothing by way of tangible benefit against which the added cost to commerce can be placed. The delay, burden, and obstruction are imposed by the law upon commerce as a purchase price of claimed "benefits" which become, upon analysis of the record, actual and positive detriments.

Finally, and as contrasted with the evidence in the *Terminal Case*, showing a general voluntary adoption by other

nearby railroads of the practice required by the challenged order, there is in the case at bar a complete and uncontradicted showing that long-train operation is the common, standard, and regular practice upon the major railroads throughout the nation, and has been for many years; that the compelled short-train practice has prevailed, during the last fifteen to twenty years, only in Arizona (and for a brief period, since the record closed, in Oklahoma); that the circumstances under which such long-train operations are carried on are not essentially different, and certainly no more favorable generally to the practice, than in Arizona; and—as we again emphasize—that there have taken place, side by side with the development and extension of this long-train operating practice, very substantial improvements in the efficiency, speed, economy, and above all, the *safety*, of railroad operations throughout the nation.

In the light of the trial court's findings, the summary thereof in the trial court's opinion, and the confirmatory conclusions of the Interstate Commerce Commission, we think there can be no doubt as to the applicability in the present case of those principles or decision set forth in this Court's opinions cited above; that is to say, the law must be held invalid as an infringement upon, and a violation of, the Commerce Clause, because even though considered as a possible exercise of the state's police power in the concurrent field, it imposes burdens, obstructions, and interferences which far exceed the mere incidental, indirect, or remote effects permitted to the state, and are instead inevitable, material, direct, substantial, and con-

tinuous, and far outweigh any possible "benefits" which, from even the most partisan standpoint, can be claimed on this record to flow from the law.

4.

THE TRAIN LIMIT LAW INVADES A FIELD OF REGULATION OF INTERSTATE COMMERCE FULLY OCCUPIED BY CONGRESS.

(Assignment of Error No. 5).

We turn now to a discussion of the "occupancy-of-the-field" issue; i.e., the proposition that the challenged law is invalid because it infringes upon, conflicts with, and attempts to supplement federal legislation having the same or similar purposes, whereby Congress, acting both directly and through its delegated agency, the Interstate Commerce Commission, has fully occupied the field of regulation of the length and consist of interstate railroad trains.

This proposition is set forth at length in Conclusion of Law No. VI of the trial court, the substance of which is as follows (R. 4036-4037):

> "To the extent that the Train Limit Law has, or is claimed to have, the effect of limiting the length of a train to the maximum number of cars which can be safely controlled or stopped by the use of the air brakes and appurtenances now employed thereon, or by any other form of train control or other safety device, said law is void because it enters a legislative field already entered and therefore occupied by Congress, and conflicts with and infringes upon Federal legislation enacted under the Commerce clause: namely, the power-brake provisions of the Safety

Appliance Act (Secs. 1 and 9), and the provisions of Section 25 of Part I of the Interstate Commerce Act, whereby full power was delegated to the Interstate Commerce Commission to investigate and determine the adequacy of air brakes and other forms of train-control and safety devices used on interstate railroad trains, and by order to prescribe the form and type of such airbrakes and other devices; which power and authority the Commission has duly exercised."

Although this conclusion was challenged by the state upon its appeal to the state Supreme Court, the point was not separately discussed by the latter in its opinion, except to the extent that it may have done so by its quotation (R. 4064-4066) from the majority opinion in the *Oklahoma Case*, where the same issue is reviewed at length (36 F. Supp., pp. 614-616). In his dissenting opinion in the court below, however, Judge Ross made clear his view that the law invades the federally occupied field, saying (R. 4070):

> "The Train Limit Law, if an allowable state regulation originally, is no longer allowable for the following reasons: . . .
>
> "3. It invades the field of regulation occupied by the Congress in its legislation providing for safety appliances in railroad operations (*Virginian Ry. Co. v. United States* (1915), 223 Fed. 748) and the safety provisions of the Interstate Commerce Act."

[4] The general principle applicable to this branch of the case may be stated as follows: A state police-power statute which, in the absence of federal legislation touching the subject matter, might possibly be sustained as a law-

ful regulation in the "concurrent field", because addressed to a matter of local concern, and not imposing any material burden upon, or obstruction to, the free flow of interstate commerce, or otherwise impairing the national interest, is immediately set aside when Congress, exercising its delegated power under the Commerce Clause, enacts any legislation which, by direct statement or necessary effect, clearly manifests the congressional intent to cover the subject matter; for the field is thereby occupied, and any existing or future state legislation upon the subject is precluded.

Among the cases which support this principle are:

Oregon-Washington R. & N. Co. v. Washington, supra (270 U.S. 87, 70 L.ed. 482);

Southern Railway Co. v. Reid (1912), 222 U.S. 424 (436), 56 L.ed. 257;

Northern Pacific Railway Co. v. Washington (1912), 222 U.S. 370 (378), 56 L.ed. 237;

Erie R. Co. v. New York (1914), 233 U.S. 671, 58 L.ed. 1149;

Missouri Pacific R. Co. v. Stroud (1925), 267 U.S. 404 (407-408), 69 L.ed. 683;

C. R. I. & P. R. Co. v. Elevator Co. (1913), 226 U.S. 426 (435), 57 L.ed. 284;

Napier v. Atlantic Coast Line R. Co. (1926), 272 U.S. 605 (612-613), 71 L.ed. 432;

Pennsylvania R. Co. v. Public Service Commission (1919), 250 U.S. 566 (569), 63 L.ed. 1142.

The *Napier* and *Pennsylvania Cases* are of particular interest, because they hold that when there is a delegation

of power to the Commission with respect to a particular subject matter (the character of the appliances to be used upon railroad locomotives and equipment in interstate commerce), and even though the Commission may not have exercised the delegated power to the full extent conferred, any state legislation is nevertheless precluded: for "the states can no more supplement the federal requirements than they can annul them."

Our argument upon the "occupancy-of-the-field" point is addressed to and predicated upon a contention advanced by appellee and sustained by the state court: a contention which, moreover, appellee is virtually compelled to make by the very nature of the case and the issues as they arise from the affirmative defense presented by appellant as the original defendant. In its answer appellant attacked the law as having no justification as a purported safety measure, and at the trial it presented voluminous evidence to support that challenge. It was therefore essential to appellee's attempt to sustain the law's validity that it should undertake in the trial court to show, and upon its appeal to the state court to convince that tribunal, that the restrictions upon train operations imposed by the law are necessary in the interest of safety; for it is apparently conceded that if the law cannot be sustained as a safety measure, it cannot be sustained at all.

By far the greater part of the testimony of appellee's rebuttal witnesses, as well as practically all of its discussion and criticism of appellant's safety evidence, therefore is and has been addressed to its claim and theory that the law is necessary as a safety statute, and particularly to the specific contention that long trains cannot be

operated (i.e., handled, controlled and stopped) in Arizona with as few hazards as short trains.

Two federal statutes are referred to in appellant's answer (par. 12(b) of Part III; R. 26-27), and also in the text of the trial court's Conclusion No. VI, as having constituted the means whereby Congress has entered, and thereby occupied, the field of regulation in which the Train Limit Law attempts to operate: viz., the power-brake provisions (Sections 1 and 9) of the Safety Appliance Act (45 U.S. Code 1, 9), and the Safety Section (Sec. 25) of Part I of the Interstate Commerce Act (49 U.S.C., I, 25).

(a) The power brake provisions of the Safety Appliance Acts:

Section 1 of the Safety Appliance Act, enacted March 7, 1893 (27 Stat. 531; Section 1, Title 45, U.S.C.) now reads:

> "It shall be unlawful for any common carrier engaged in interstate commerce by railroad to use on its line any locomotive engine in moving interstate traffic not equipped with a power driving-wheel brake and appliances for operating the train-brake system, or to run any train in such traffic after said date that has not a sufficient number of cars in it so equipped with power or train brakes that the engineer on the locomotive drawing such train can control its speed without requiring brakemen to use the common hand brake for that purpose."

Section 9, enacted March 2, 1903 (32 Stat. 943; Sec. 9, Tit. 45, U.S.C.) now reads:

> "Whenever, as provided in sections 1-7 of this title, any train is operated with power or train brakes

not less than 50 per centum of the cars in such train shall have their brakes used and operated by the engineer of the locomotive drawing such train; and all power-braked cars in such train which are associated together with said 50 per centum shall have their brakes so used and operated; and, to more fully carry into effect the objects of said sections, the Interstate Commerce Commission may, from time to time, after full hearing, increase the minimum percentage of cars in any train required to be operated with power or train brakes which must have their brakes used and operated as aforesaid; and failure to comply with any such requirement of the said Interstate Commerce Commission shall be subject to the like penalty as failure to comply with any requirement of this section."

While Section 9 thus required at least 50 per cent of the cars in each train to be equipped with power brakes operated by the engineer, it also authorized the Commission, after due hearing, to increase that percentage. Pursuant to that delegation, the Commission has from time to time issued successive orders until the requirement now stands at 85 per cent* (cf. *New York Central R. Co. v. U. S.* (1924), 265 U.S. 41, 68 L.ed. 892; *U. S. v. Panhandle & Santa Fe R. Co.* (1938), 21 F. Supp. 919).

*Order of Interstate Commerce Commission of June 6, 1910.

It Is Ordered, That on and after September 1, 1910, on all railroads used in interstate commerce, whenever as required by the safety appliance act as amended March 2, 1903, any train is operated with power or train brakes, not less than 85 per cent of the cars of such train shall have their brakes used and operated by the engineer of the locomotive drawing such train, and all power-brake cars in every such train which are associated together with the 85 per cent shall have their brakes so used and operated.

Section 6 of the Safety Appliance Act makes it "the duty of the Interstate Commerce Commission to lodge with the proper district attorneys information of any such violations as may come to its knowledge."

Congress also annually makes appropriations to enable the Commission to "keep informed regarding and to enforce compliance with" the Safety Appliance Act.*

It will be noted that Section 1 of the Act does not provide *in terms* that air brakes shall be used for the purpose of controlling trains but only that such and so much equipment shall be placed on trains that the engineer can control them; but certainly this is the necessary implication, and the federal courts, in construing the Act, have therefore held that Congress intended not only that trains should be equipped with air brakes, but that they should be controlled in a reasonably safe manner by air brakes, and to that end must be made short enough so that they can be so controlled.

The leading Circuit Court of Appeals decision in which this doctrine was announced was:

Virginian Ry. Co. v. United States (1915), 223 Fed. 748.

*For instance, in 1929 Congress appropriated upwards of $500,000 "To enable the Interstate Commerce Commission to keep informed regarding and to enforce compliance with Acts to promote the safety of employees and travelers upon railroads; the Act requiring common carriers to make reports of accidents and authorizing investigations thereof; and to enable the Interstate Commerce Commission to investigate and test appliances intended to promote the safety of railway operation, as authorized by the joint resolution approved June 30, 1906 (U. S. C., page 1441, section 35), and the provision of the Sundry Civil Act approved May 27, 1908 (U. S. C., page 1441, sections 36, 37), to investigate, test experimentally, and report on the use and need of any appliances or systems intended to promote the safety of railway operation, inspectors, and for traveling expenses." (45 Stat. 1239.)

The facts in the case were these:

In 1912 it was the common practice of the Virginian Railway to operate coal trains of 100 cars, each carrying approximately 54 tons; those trains exceeded in tonnage, if not in number of cars, the trains in ordinary use on any of the other railroads.

Over a certain section of the track, because of its condition, trains were limited by order to speeds of five miles an hour at one point and ten miles an hour at other points. With respect to operation at that rate of speed with air brakes alone, the court said:

> "It was found, however, that these very long trains could not be operated safely, at the slow rate of speed required on this grade, when air brakes only were used for their control. This was because air brakes could not be applied with needed effect, if at all, without exerting a pressure which would stop the train, or, if released before the train came to a standstill, would cause such a jerking and surging of the train as to break the cars apart, and accidents of this kind were of frequent occurrence."

Under those circumstances the company in May, 1912, promulgated an order as to when hand brakes only should be used except that:

> "The automatic air brakes will be used if it is seen that the hand brakes are not holding properly to make a quick stop on account of being flagged, or in other cases of emergency."

The following stipulation was introduced in evidence:

> "The engines on each of said trains were equipped with a power driving wheel brake, and appliances

for operating the train brake system, and all of the cars in each of said trains were equipped with power or train brakes, so that the engineer on each of said engines could control the speed of the trains without requiring brakemen to use a common hand brake for the purpose. All of said cars in each of said trains were also equipped with hand brakes."

The court summed up the facts and stated the question at issue as follows:

"It appears to be conceded by defendant, and the fact is clearly established by the testimony, that *trains of a smaller number of cars could be safely operated on this section of road, even at the slow rate of speed stated, by using only the air brakes and the locomotive power brake.* Just how many cars could be handled without the use of hand brakes is not altogether certain, but apparently there was no difficulty with trains of 50 cars, or even more than that number. In short, *the alleged necessity for requiring hand brakes to be used resulted wholly from the extreme length of the trains,* coupled with the low rate of speed at which they were moved. Shorter trains could be operated with entire safety, as respects control of speed and otherwise, without the aid of hand brakes.

The situation, then, was this: All the appliances contemplated by the statute were fully provided, were of proper construction, and in good working order. *Trains of say 50 cars, probably more, could be safely operated without the aid of hand brakes; but for trains of greater length, certainly for those of 80 to 100 cars, it was necessary,* in order to avoid the risk of accident, *to make use of hand brakes* as provided in the quoted order. *Was the use of hand brakes un-*

der such circumstances a violation of the Federal statute?" (Emphasis ours.)

The court then held that the Safety Appliance Acts, when properly construed, required not only that trains be so equipped that they could be controlled by power brakes, but that, except in emergencies, they must be so controlled, and, in order to effectuate such purpose, *that only trains short enough to be controlled by air brakes with safety could be operated.* This is precisely the field of regulation which, as appellee has asserted, has not been occupied by federal legislation, and the precise purpose for which, as it has plainly contended, the challenged law was enacted.

The essence of the decision is this: that Congress by enacting the Safety Appliance Act has imposed the requirement, not only that air brakes shall be applied upon a definite minimum proportion (now 85 percent) of the cars in a train, but also that they shall so function that the train may be controlled by the engineer; *that the operation of a train longer than can be so controlled is forbidden, under penalty;* and that in determining the question of ability to control, the *length of the train*, its loading, the character of the territory where it is operated, and all other relevant circumstances are to be taken into account.

The *Virginian Case* has been cited with approval in several later cases:

New York C. R. Co. v. U. S., supra (265 U.S. 1) (46), 68 L.ed. 892);

U. S. v. Great Northern Ry. Co. (1916), 229 U.S. 927;

Pennsylvania Co. v. U. S. (1917), 241 Fed. 824 (830);

U. S. v. G. R. & I. R. Co. (1916), 244 Fed. 609 (613) (affirmed, 249 Fed. 650).

In this connection we call attention also to the Interstate Commerce Commission's interlocutory report in:

Investigation of Power Brakes and Appliances (1924), 91 I.C.C. 481,

in which the Commission, after lengthy investigation, including hearings at which testimony was offered by representatives of both the carriers and the train service employees, made certain findings respecting the development, present methods of use and efficiency of existing types of air-brake equipment. This report was introduced in evidence by appellee as Exhibit 385 (R. 2706).

In that proceeding the Commission referred to the first type of power brake developed, the so-called straight air-brake, similar to the present street car air brake, in which the brake was applied when the train line pressure was increased, and released when the train line pressure was reduced; but the brake was wholly inoperative when a train broke in two.

Next came the plain automatic brake, which, according to the Commission, was "placed in service when trains of 25 or 30 cars were common"; and then the third, or H type, was developed "as train lengths increased to 50 cars." The evidence shows that neither of those types is presently used by appellant; but it is obvious that neither could be used on a train containing even seventy

loaded cars, particularly in heavy grade mountain territory, without violating the Safety Appliance Act, because, although such a train undoubtedly could be stopped, it would be impossible for the engineer to *control* it in a reasonably safe and proper manner. While the K-type of brake, developed and made standard in 1919, "as train lengths were still further increased to 100 or more cars," undoubtedly can lawfully be used on trains of 100 cars or substantially more, yet there is a limit to the length of the train which can be controlled properly and with a reasonable degree of safety when equipped with that type of brake. Just what that limit would be in any particular case is a question for the federal courts to determine in a prosecution under the act and in the light of the facts developed in such case. Neither state courts nor state legislatures are authorized to pass upon that question.

(b) Section 25 of Part I of the Interstate Commerce Act:

The power brake provisions of the Safety Appliance Acts were the only federal train-control regulations in effect until 1920; they were then supplemented by the addition to the Interstate Commerce Act of Section 26. In 1920 that section provided that the Commission might order any railroad carrier subject to the Interstate Commerce Act to install automatic train-stop or train-control devices or other safety devices, in compliance with specifications and requirements prescribed by the Commission. In 1937 the section was amended and greatly amplified. In September, 1940, it was renumbered as Section 25 of Part I of the Interstate Commerce Act (by the passage of the Transportation Act, 1940) but was not otherwise

changed. As amended in 1937, and at present, Section 25 provides in part:

> ". . . The Commission may, after investigation, if found necessary in the public interest, order any carrier within a time specified in the order, to install the block signal system, interlocking, *automatic train stop, train control, and/or* cab-signal *devices, and/or other similar appliances, methods, and systems intended to promote the safety of railroad operation,* which comply with specifications and requirements prescribed by the Commission, upon the whole or any part of its railroad, such order to be issued and published a reasonable time (as determined by the Commission) in advance of the date for its fulfillment:" (Emphasis supplied.)

This section in terms thus authorizes the Commission to prescribe and require automatic train-stop or train-control devices, or other similar appliances, methods and systems intended to promote the safety of railroad operations. Under settled rules of statutory construction the words "other similar appliances, methods, and systems" refer to devices of the same general nature, and performing the same functions as "train-stop" or "train-control" devices. The air brakes themselves are "train-stop" or "train control devices," and it is only by their application that trains can be controlled and stopped.

In the interlocutory report in the *Power Brake Investigation Case*, the Commission's opinion begins with the following statement:

> "This is a proceeding instituted by us on our own motion under Section 26* of the Interstate Commerce

*Now renumbered as Section 25.

Act, which authorizes us, after investigation, to order the installation of automatic train-stop or train-control devices, or other safety devices, which comply with specifications and requirements prescribed by us, upon the whole or any part of the railroad of any carrier by railroad subject to the act."

The Commission followed this statement by reference to the power brake provisions of the Safety Appliance Act, and to the minimum percentage of cars and trains required to be equipped with power brakes, and then said (91 I.C.C., at page 483):

> "As a result of its investigations our Bureau of Safety has reported to us that many serious train accidents, in which have occurred numerous deaths and injuries to persons as well as great damage to property, have been caused by faulty or inadequate power-brake equipment. The reports of our inspectors have indicated a lack of improvement in power-brake conditions commensurate with the requirements of safe and efficient operation. . . .
>
> The situation on the whole demanded a broad general inquiry by us into the subject of the use and operation of power brakes, and, following the receipt of a petition on behalf of the Automatic Straight Air Brake Company for an investigation under Section 26 of the Interstate Commerce Act, we entered our order in this proceeding on February 20, 1922."

In the report the Commission found that improvements in methods of operation and maintenance of power brakes should be made, and that also the air-brake apparatus should be changed so as to provide for certain additional functions not performed by the apparatus then in use.

The Commission also suggested certain tentative general specifications and requirements for changes in air brakes, but held the case open for the purpose of giving the matter further consideration before prescribing final and complete specifications.

Subsequently investigations and tests were conducted by the American Railway Association; and in 1933 the carriers adopted the specifications of the new type ("AB") brake, meeting the Commission's suggestions (Exhibit 396; R. 3572-3577).

The most recent action dealing with the matter of air brakes, taken by the Commission pursuant to Section 25, occurred on July 29, 1944, and October 19, 1944, when the Commission issued its further general orders in the *Power Brake Investigation Case*, requiring all interstate railroad carriers to show cause why an order should not be made, prescribing the specifications for the power brakes to be applied to cars used in freight service, and setting a definite time limit within which all cars so used must have the specified air brakes applied.

Pertinent portions of the order of July 29, 1944, are quoted in the accompanying footnote,* and the entire order is re-

*"*It appearing*, That on July 18, 1924, the Commission made and filed a report in this proceeding in which there were enumerated certain general requirements which should be met by power brakes for passenger and freight trains, in the interest of increased safety in train operation; . . .

It further appearing, That respondents . . . after extended investigation and tests, adopted, on August 16, 1933, specifications and requirements for power brakes, and appliances for their operation, in freight service . . .

It is ordered, That all common carriers by railroad subject to section 25 of the Interstate Commerce Act be, . . . cited to show cause, . . . why . . .

(1) Specifications and requirements as set forth in the appen-

produced as Appendix "A" to this volume.* It will be noted that the specifications of air brakes thus proposed to be adopted by the Commission are substantially identical with the "Specifications for Freight Brakes" adopted as above stated by the American Railway Association in 1933; except that the Commission's specifications contain in addition the express statement (which appears *twice*) that both the service and emergency requirements are based upon brake-pipe pressure of 70 lbs., *and train length of 150 cars*. This particular phrase does not appear in the Association's specifications (Exhibit 396).

Thus the Commission's latest order not only recognizes the obvious and immediate relationship between air brake requirements and the number of cars in the train, but also definitely contemplates the operation of trains consisting of *more than twice* as many cars as the Arizona law permits. The record shows that such trains are often operated (Exhibits 44, 81, 100, 117, 118; R. 404, 874-878).

In the meantime, the Commission's order of 1924 with respect to improvement in the methods of operation and in maintenance of air brakes has been complied with; by the installation of heavier graduating springs in triple valves, undesired emergency applications of the brakes

*The specifications were slightly modified by the order of October 19, 1944. The appendix sets forth the modified specifications.

dix to this order should not be prescribed by the Commission for power brakes and appliances for operating power brake systems, to be applied to cars used in freight service; and

(2) If specifications and requirements in substantial conformity with those set forth in the appendix to this order are prescribed by the Commission, an order should not be issued requiring that all cars used in freight service be equipped with power brakes and appliances for operating power brake systems, conforming to such specifications and requirements, on or before January 1, 1946.

(i.e., those not due to action of the engineer or the conductor) were eliminated almost completely. That improved methods of maintenance and operation of air brakes have been placed in effect and observed was recognized and admitted by appellee's principal witnesses (*Cooper*, R. 2304, 2349-2350; *Durnil*, R. 2406; *Kennedy*, R. 2428; *Shaw*, R. 2653).

The point of our citation of the Commission's opinion and recent order in the *Power Brake Case* is not that the Commission's findings of fact and observations themselves prove or disprove any claim respecting the operations or other characteristics of air brakes; but the report and order absolutely and conclusively show that the Commission has exercised and is actually exercising its powers under the Safety Appliance Acts, and Section 25 of the Interstate Commerce Act, *as to railroad air brake equipment;* which necessarily includes, as the Commission has expressly recognized, the lengths of trains controllable by such equipment. Common fairness as well as the requirements of due process have dictated that no order should be entered without a hearing and thorough investigation. *But the power to order has been delegated to the Commission by Congress and is being constitutionally exercised. Because of interchange of cars between railroads an order of national effect is indispensable.*

It is our position therefore that Congress has directly entered and occupied the *entire* field—not merely the air brake and safety appliance features—of train-length regulation by enacting the Safety Appliance Act and delegating to the Commission the powers conferred by Section 25.

It is obvious that there must be some limit to the effectiveness of any air brake; much testimony was offered by appellee supporting that view. For illustration, probably no one would contend that the modern air brake, although shown to be fully adequate to control trains of substantially more than 70 cars and indeed of more than double that number, would operate effectively on the 500th car of a 500-car train, under all conditions. What that effective limit is no witness in this case attempted to say, except that certain of appellee's witnesses made rather casual references to 100 cars as constituting a long train requiring greater care in handling. The Commission's recent order shows that the effective limit is believed to be not less than 150 cars.

(c) In determining whether the Train-Limit Law is in conflict with acts of Congress, the entire scheme of the Federal legislation, including not only what Congress did say, but what it did not say, with all other relevant facts and circumstances, must control.

In

Savage v. Jones, supra (225 U.S. 501, 56 L.ed. 1182), this Court, speaking through Mr. Justice Hughes, said (225 U.S., at p. 533):

> "When the question is whether a Federal act overrides a state law, *the entire scheme of the statute must of course be considered* and that which needs must be implied is of no less force than that which is expressed. If the purpose of the act cannot otherwise be accomplished—if its operation within its chosen field else must be frustrated and its provisions be

refused their natural effect—the state law must yield to the regulation of Congress within the sphere of its delegated power." (Emphasis supplied.)

While the rule of statutory construction laid down in that case is peculiarly applicable here, there is not here presented the question whether the Arizona law has been overridden by Congress. Arizona has never had the power to determine the number of trains to be run across the state boundary lines, or in New Mexico and California. Insofar as train control is concerned, the original Safety Appliance Act was passed in 1893, and amended in 1903 and 1910, the latest amendment thus preceding the enactment of the challenged law by two years. The addition of Section 26 (now Section 25) to the Interstate Commerce Act, in 1920, and its substantial amendment in 1937, supplemented the pre-existing federal train-control legislation, and reinforced the prior legislation by which Congress had (as the *Virginian Case*, supra, 223 Fed. 748, makes clear) provided that trains should be limited to safely controllable lengths.

By the original Safety Appliance Act, and Section 3 of the amendatory act of 1910, the Commission, acting either by itself or in cooperation with the railroads, was authorized to prescribe certain construction details of safety appliances other than power brakes; but Congress did not at that time either itself prescribe, or authorize the Commission to prescribe, the details of construction of power brakes. Such power has, however, apparently been conferred upon the Commission by Section 25 of the Interstate Commerce Act; for that statute now states that the

Commission may require railroad carriers to install automatic train-stop or train-control devices, or *other safety devices* which comply with specifications and requirements prescribed by the Commission. The Commission, in the *Power Brake Investigation*, supra, has held that by the section as first enacted it was vested with such power; and now, by its order of July 29, 1944, it has taken direct steps to exercise that power.

But, insofar as the present case is concerned, it is immaterial whether that specific power was conferred upon the Commission; nor is it material that Congress did not go further, and, in addition to providing in the Safety Appliance Act and in Section 25 for the safe control of trains by air brakes, provide also, for train-control purposes, that trains in excess of specified lengths should not be run; that omission does not leave room for the Arizona law to operate in the train-control field.

The situation arising out of the passage of the Train Limit Law, after the enactment by Congress of the Safety Appliance Acts, was similar to that which obtained when Congress by the passage of the Employers' Liability Act merely made railroads liable to their employees for personal injuries caused by negligence, and failed to mention injuries not caused by carriers' negligence. The State of New York, by its Workmen's Compensation law, attempted to remedy the apparent oversight of Congress. In

N. Y. C. R. R. Co. v. Winfield (1917), 244 U.S. 147; 61 L.ed. 1045,

which involved the New York statute, this Court stated the contentions of the respective parties and its views as follows (p. 149):

"By one side it is said that the act, although regulating the liability or obligation of the carrier and the right of the employee where the injury results in whole or in part from negligence attributable to the carrier, does not cover injuries occurring without such negligence, and therefore leaves that class of injuries to be dealt with by state laws; and by the other side it is said that the act covers both classes of injuries and is exclusive as to both. * * *

In our opinion the latter view is right and the other wrong. Whether and in what circumstances railroad companies engaging in interstate commerce shall be required to compensate their employees in such commerce for injuries sustained therein are matters in which the Nation as a whole is interested and *there are weighty considerations why the controlling law should be uniform and not change at every state line.*" (Emphasis supplied)

Not only did the Federal Employers' Liability Act fail to provide compensation for injuries occurring without negligence, but it also failed to define negligence. In

C. & O. R. R. Co. v. Stapleton (1929), 279 U.S. 587, 73 L.ed. 861,

it was contended that by reason of this omission of Congress state legislatures had the right to determine that certain acts or omissions amounted to negligence; but this Court held that Congress, though it had failed to prescribe the acts or omissions constituting negligence, did not intend thereby to permit the states so to do. In so deciding, the Court said (p. 592):

"The exclusive operation of the Federal Employers' Liability Act within the field of rights and duties as

between an interstate commerce common carrier and its employees has been illustrated in opinions of this Court applying that Act by quotations of the words of Mr. Justice Story in Prigg v. Pennsylvania, 16 Pet. 539, 617, used in another association:

'If this be so, then it would seem upon just principles of construction, that the legislation of Congress, if constitutional, must supersede all state legislation upon the same subject; and by necessary implication prohibit it. For, if Congress have a constitutional power to regulate in a particular subject, and they do actually regulate it in a given manner, and in a certain form, *it cannot be that the state legislatures have a right to interfere, and, as it were, by way of complement to the legislation of Congress, to prescribe additional regulations, and what they may deem auxiliary provisions for the same purpose.* In such a case, the legislation of Congress, in what it does prescribe, manifestly indicates, that it does not intend that there shall be any further legislation to act upon the subject matter. Its silence as to what it does not do is as expressive of what its intention is as the direct provisions made by it.'" (Emphasis supplied.)

In this connection, note should also be taken of *Pennsylvania R. Co. v. Public Service Commission*, supra (250 U.S. 566), in which an order of the Pennsylvania commission relating to the safety appliances to be used upon end cars of trains was held to be invalid, because it was an attempt to supplement orders made by the Commission pursuant to Section 3 of the Safety Appliance Act of 1910.

There, as here, the Safety Appliance Act was relied on. Insofar as it was applicable to the *Pennsylvania Case*, it

provided that certain appliances should be attached to cars to enable employees to get on and off trains with safety; the State of Pennsylvania concluded that another appliance was necessary for the same general purpose, and the real question was whether Congress by the legislation it had enacted and its failure to supplement it intended that it should be exclusive. If it did, then the Pennsylvania law would be void because, as was said by Mr. Justice Holmes, when Congress exercises "its exclusive powers over interstate commerce so far as to take possession of the field the states no more can supplement its requirements than they can annul them."

There would seem to be no room for argument that inasmuch as the two federal statutes referred to were clearly passed for the purpose of regulating interstate train operations in the interest of safety, the Train Limit Law, if claimed to be sustainable upon the ground that it is likewise a regulation of train operation in the interest of safety, must be held invalid because of this clear conflict in purpose and effect; for of course it is incompetent, as the cited cases plainly hold, for a state to attempt either to supplement federal statutes having a similar purpose and effect, or to attempt to annul or override them. In the lower courts appellee attempted to avoid this conflict, by arguing that the Train Limit Law regulates a different phase of train operation than the federal acts, and with somewhat different motives or considerations in mind. That is to say, appellee sought to place the state and federal acts in separate compartments in the same field of regulation, by (1) denying that the federal acts have anything to do with train limits, or amount to anything except require-

ments respecting the appliances to be placed in and used upon trains; (2) attempting to draw a distinction between the regulation of train lengths for the sake of the control of train speed (asserted by appellee to be the purpose of the Safety Appliance Act), and similar regulation for the sake of control of the slack action (the asserted purpose of the Train Limit Law); and (3) contending that in practical experience over the past thirty years, the Train Limit Law and the Safety Appliance Act have operated wholly without any conflict.

In order to understand precisely what is meant by the terms "slack" and "slack action," as used in this discussion, reference may be had to the trial court's findings. We call particular attention to paragraphs (a), (b), (c) and (d) of Finding XI (R. 3969-3973). Paragraphs (a) and (b) describe the manner in which cars in trains are coupled together, referring to the couplers and draft gears which connect the cars and the amount of play or free motion, as well as controlled motion, or "controlled resistance," which is built into draft gears and couplers, and is necessary for purposes of train operation. "Slack" and "slack action" are then defined in paragraph (c): "Slack" as:

> "The amount of the movement, including both the free motion at the coupler faces and the controlled resistance in the draft gears, which may take place between the coupled cars of a moving train;"

and "slack action" as:

> "The accumulated effect of such motion, as it may be created or brought into play as the result of train operations."

It is also stated, in the finding, that slack and slack action exist and occur in trains of all lengths.

No exception was taken by appellee, in the lower court, nor any error assigned, in connection with paragraphs (a), (b) or (c) of Finding XI; and a large portion of paragraph (d) was likewise not challenged.

(d) Analysis of the evidence showing appellee's position respecting the dangers intended to be eliminated by the challenged law:

In the course of appellee's case on rebuttal, it called as witnesses three locomotive engineers in appellant's employ, and one employed by the Santa Fe: Witnesses Kennedy, Cheek, Stevenson and Cooper.

These witnesses gave lengthy testimony, in answer to questions by appellee's counsel, with regard to the details of the air brakes and their appliances in use on freight and passenger trains; *and particularly testified as to the ability of engineers to control their trains while in operation, and to stop them, with the use of the air brakes.* Counsel notably and repeatedly asked these witnesses whether the engineer's ability to control and stop his train was affected by the train's length; in each case receiving an affirmative answer.

Thus, Mr. Cooper, after giving detailed testimony as to the air brake system and air brake appliances (R. 2292-2310), said (R. 2314) that ability to control the slack in the train was dependent solely upon the ability to apply and release the brakes throughout the train; and that his ability to start and stop a train was affected by the length, particularly comparing a 70-car train with the train of 109 cars (R. 2338-2339).

The witness was then asked by counsel (R. 2341):

"Mr. Strouss: As the length of the train increases, what, if any, effect does it have upon your ability to safely control the slack in the train?

A. You increase the length of the train and you increase the slack of the train, because every car added adds just that much more to it, and quite naturally, if you have a long train you have more slack than you have in a shorter train, and it is more difficult to control because there is more of it."

The testimony of Messrs. Kennedy and Stevenson, though much briefer, was along similar lines; both witnesses replying, when asked as to the effect of train length upon their ability to control and stop their trains, that the longer the train, the slower the brakes apply, and the less they apply on the rear, so that controlling and stopping a long train of 100 cars takes a longer time and a greater distance (R. 2423, 2425, 2456, 2461).

This same subject matter is dealt with in Finding XIII (e) of the trial court (R. 4030-4032), in which the testimony of these witnesses is briefly analyzed; we ask the Court to refer to that finding. We may emphasize, in passing, that neither Messrs. Cooper, Kennedy, nor Stevenson, nor any other witness called by appellee, was willing to admit that he was not able to control adequately and without accident any and every train which he had been or might be called upon to handle; that the engineers employed by appellant (called by appellee) also agreed that the controlling of long trains required only greater care, but did not involve any greater *difficulty*; their testimony

in this respect being strongly confirmed by appellant's engineer witnesses.

Appellee is thus committed, by the careful phrasing of its counsel's repeated questions, and the testimony of its witnesses, to the proposition that trains exceeding the lengths fixed by the law cannot be safely operated and controlled with the present types of air brakes; that the essential safety purpose of the law is to limit trains to lengths which with the present types of air brakes can be properly handled and safely controlled.

In the concluding portion of its argument to the court below upon this phase of the case, appellee attempted to ascribe to the law the narrow purpose of limiting the amount of the slack in the train to that maximum quantity beyond which the care required for control of such slack, and the hazards from the slack action, are too great to be permitted. This argument not only does not accord adequate recognition to appellee's evidentiary showing; it is also at variance with the arguments advanced in its opening brief to that court (pp. 408-409, 415, 418-419), under the topic *Air Brakes and Their Operation;* where it discussed certain portions of the testimony. Thus, in that brief appellee asserted (at p. 408):

> "*The safety of train operations depends upon the engineer's ability to control his train* and to control the slack in that train, which in turn depends upon the efficiency of the braking system. . . . *Maximum control of the train*, and of the slack therein, *is obtained only when the brakes* on each car *fully and promptly apply or release* in response to the engineer's valve on the engine. . . . *The result of long*

train operation is, by increasing with each car the length of the brake pipe . . . *to increase the delay in the application or release of the brakes* on the rear end and the probability that some brakes on the rear will be partially or wholly inoperative." (Emphasis and omissions supplied by *appellant.*)

Appellee also quoted in that brief (p. 415) from the *Southern Pacific Air Brake Manual*, introduced by appellee as its Exhibit 319, as follows:

> "Smooth train handling depends upon the ability to control the slack and how to prevent it from running in or out harshly. . . . . The heavier the engine and the longer the train *the greater is the care required.*" (Emphasis and omissions as in *appellee's* quotation.)

Appellee further contended in the same brief (p. 418):

> "In mountain or grade operations typical of the Southern Pacific operation in Arizona, where frequent applications of the brakes are required to control the train as the length of the train increases, it becomes more difficult to release and to apply the brakes, especially where loads are handled."

At page 419 of the same brief, and as if to show that the Train Limit Law is necessary to supplement the safety purposes and results of compliance with the provisions of the Safety Appliance Act, appellee said:

> "A greater distance will be required to stop a long train than a short train, although the brake system complies with all the requirements of the Safety Appliance Act. The longer the train the greater the time required for the reduction wave to reach the rear cars

and the longer the *delay* in the application of the brakes on the rear cars. In other words, the longer the train *the longer the delay in the full application of the braking power of the train.* The result will be an increase in the time and distance required to stop the train." (Emphasis as in the original.)

In concluding the discussion in that brief of air brakes and their operations, appellee added this illuminating revelation of its true position (p. 420):

> "In this aspect of its safety purpose the Train Limit Law recognizes that all *the foregoing is true, regardless of the type of brake in use.*" (Emphasis as in the original.)

It is noteworthy that appellee did not, either in this discussion or elsewhere specifically deny that its essential contention was and has been precisely as we have stated it: that the law undertakes, in the purported interest of safety, to limit trains to the lengths which, with the present types of air brakes and their appurtenances, can be properly and safely handled and controlled.

(e) There is no distinction in purpose or result between the federal statutes and the challenged state law.

The attempted distinction in purpose and result, as between the federal statutes and the Train Limit Law, is wholly imaginary and non-existent. In the first place, the federal statutes not only require that safety appliances be placed on the cars and locomotives, but also that they be serviceable; that they control not only the speed of trains, but also that they *control their operation safely.* The essence of the *Virginian Ry. Co.* decision was that

with the appliances then (1912) available, and in the circumstances prevailing upon that railroad, the *longer* (80 to 100 cars) and heavier trains could not be *safely operated and controlled*, with the use of air brakes only; hence operation of these longer trains was a violation of the Safety Appliance Act, and subject to penalty. The act was definitely construed to require that trains must be short enough to be safely controlled by the engineer by means of the air brakes.

Control of the *train* carries with it control of the *slack* and the potential *slack action* in the train. Slack is admittedly present in the train at all times, and is essential to train operation (R. 1673, 2446). Proper control of the slack is necessary for safety, according to appellee and its witnesses although (so appellee has asserted) frequently unobtainable because of the inadequacy of the present types of air brakes (R. 2314, 2423). Safe control of the train operation therefore imports safe and adequate control of the slack action; and the Safety Appliance Act, as interpreted in the *Virginian Case*, since it requires such safe control and forbids the operation of trains which are so long as to prevent such control, thereby equally requires trains to be so limited that the slack action may also be adequately controlled.

There is no such difference between control of *speed* and control of *slack action* as appellee has endeavored to present. Slack action is created by the motion of the train, and occurs only as a result of sudden changes of speed (Ex. 319, p. 8; R. 2429, 2796); its strength and severity, and particularly the consequences when it occurs, are

largely dependent upon the speed at the time of the occurrence (R. 2415, 2429). An engineer of ordinary experience, by proper use of the throttle and the brakes, is able to and does control the speed and thus the slack and slack action in the train (R. 2434-2435, 2787-2799, 2815-2817). We do not say that speed and slack action are identical, for of course they are not. But control of speed and control of slack action involve substantially the same factors; because slack action is so closely related to train speed, and so largely determined by the speed, both as to occurrence and result, that proper and safe control of the train speed necessarily results in large measure in a similar degree of control of the slack action.

The Safety Appliance Act as construed in the *Virginian Case*, supra, is a true, practical, and logical train-limit law, because it permits the operation of as many cars in the train as can be safely controlled, having in mind the loading of the cars, the physical characteristics of the territory over which the train operates, and the functioning of the brakes, and only forbids the operation of a greater number. Its effectiveness as an actual regulation of appellant's train operations in Arizona is greatly diminished by the Train Limit Law because the latter names a fixed limit which cannot be exceeded, no matter what may be the conditions affecting the safe control of the train.

It follows that the two laws have not operated, and do not operate, without conflict. The state law imposes a fixed limit which has been demonstrated, not only by experience in all of the other states of the United States, but also by appellant's own long-train operations in March

and April, 1940, to be substantially less than would be and is imposed, under the conditions prevailing in Arizona, by the federal statute. Specifically, and as stated in Finding No. IX(a) of the trial court (R. 3947), appellant operated 302 long freight trains and 62 long passenger trains over its Arizona lines during March and April, 1940. There was not only *no* testimony that any of these long freight trains was not properly controlled at all times; there was in fact *positive* testimony, from at least two of the engineers who handled some of these trains, that no particular difficulty of control was experienced (R. 2435, 2815). There was no reportable accident or casualty occurring upon any of these long trains, which could be ascribed to a lack of control, or to ineffectiveness of the air brakes, or to any other condition alleged by appellee to be associated with long-train operation.

All these trains were therefore lawful under the federal act, but forbidden by the state statute. We repeat that the conflict between the two statutes is obvious and inevitable.

Appellant's witnesses Fifield and Menzies, who are locomotive engineers of long experience in both train handling and the observation and supervision of other engineers, showed by their testimony that appellant's engineers, in both Arizona (in the 1940 long-train operations) and elsewhere on the system, and notably in Nevada, have no difficulties in handling freight and passenger trains of all lengths, including those much longer than 70 or 14 cars, and in controlling and stopping them, by the use of the present types of air brakes (R. 2787, 2797, 2801, 2806, 2816-2817).

The conclusions to be drawn from this testimony are fully confirmed by the findings of the Interstate Commerce Commission in connection with Service Order No. 85. In the recitals accompanying that order the Commission declared that "railroad freight trains exceeding . . . 70 cars in length, and railroad passenger cars exceeding 14 or 16 cars in length, may be operated in accordance with safety standards now applicable, during the present emergency, in and through such (train limit) states"; and in its opinion, in which it sustained the validity of Service Order No. 85 (*In re Service Order 85*, supra, 256 I.C.C. 523) the Commission again said (at p. 536):

> "The fact that freight trains in excess of 70 cars and passenger trains in excess of 14 cars are safely operated in other states is convincing evidence of its safety, except where unusual operating conditions exist."

There is no showing that unusual operating conditions exist on appellant's lines in Arizona; on the contrary, the conditions are demonstrated by the record to be more favorable than in many other states where long-train operation is the common standard practice.

But this discussion is not, in our view, all that is to be said upon this branch of the case. The fact is that appellee attempted to lay the foundation for a claim that one of the objects of the law is to confine trains to the lengths which can be efficiently handled by a type of air brake that has been and is being successfully used in the actual handling of long trains. Thus the state is undertaking

to accomplish by indirection what it cannot do by direct legislation; that is, to limit the lengths of trains to 70 or 14 cars, on the theory that the modern air brake will not safely control trains of greater lengths.

To illustrate: Under the Safety Appliance Acts, the Interstate Commerce Commission has required certain types of end and side ladders on box cars; two end ladders and two side ladders to each car. The state can no more supplement that regulation than it can annul it: if the state passed a law requiring four end ladders and four side ladders, even of the same type as that prescribed by the Interstate Commerce Commission, the law would unquestionably be invalid under the Commerce Clause and the Federal Safety Appliance Acts. But it could be attacked by a railroad affected by it on two grounds: *first*, under the Fourteenth Amendment, on the ground of unreasonableness; and, *second*, under the Commerce Clause, on the ground of attempted entry into a completely occupied field. If the state in such a suit proved, by clear and cogent evidence, that the additional side ladders were necessary and, therefore, that the statute was reasonable, that proof would have no bearing whatever on the ground of attack based on the Commerce Clause; even if the court should find that the additional ladders were reasonable, the law, nevertheless, would be void under the Commerce Clause point. On the other hand, if in such a case the court should find, under the Fourteenth Amendment point, that the requirement of additional ladders was unreasonable and arbitrary, that would

not deprive the complaining railroad of the right to have a finding in its favor on the Commerce Clause point.

That situation is exactly comparable with the situation here. On the issue of reasonableness, based on the Due Process Clause, appellee has tried to show that the statute is reasonably necessary, because it limits the length of trains to a length that can be properly and successfully handled with the modern air brakes. The inefficiency of the air brake is claimed to be the controlling reason for the law; the gravamen of the state's indictment of long-train operation. That claim and the consequent conflict with federal statutes are not evident on the face of the challenged law; therefore, appellant was not bound to anticipate the claim in its case in chief; but it was completely overcome in rebuttal. But the absence of proof of the claim does not deprive appellant of the right to have a final decision on the Commerce Clause point, that the said statute is in conflict with and amounts to an unlawful attempt to supplement the power-brake provision of the Federal Safety Appliance and Interstate Commerce Acts, by which statutes Congress has completely and exclusively occupied the field of regulation of train lengths.

To illustrate further: The evidence warrants the conclusion that the modern air brake would not be sufficient to control a train of a consist of say 500 cars. If such a train were made up in a terminal yard, and ran on a trip along the road, undoubtedly a federal prosecution would lie under the Safety Appliance Act, for operation of a train not equipped with adequate brakes; and it would be no defense

to assert that no brakes had yet been or, from present knowledge, are likely to be invented which will effectively control a train of 500 cars. The offense would consist in running a train that could not be safely and properly controlled by the air brakes. Such was precisely the basis of the prosecution and final decision in the *Virginian Case*, supra, 223 Fed. 748. What Arizona has plainly tried to do, by the Train Limit Law, is to substitute its judgment for that of a federal court or a federal jury, under proper instructions, in a prosecution for violation of the Safety Appliance Act, as to the length of a train that may be properly controlled by the modern air brake; and that attempted substitution is nothing less than a direct entry into a field of federal regulation which has already been entered and occupied by Congress, to the extent that the state cannot even supplement the regulation.

Moreover, if appellee should claim that it has proven that a long train cannot be safely controlled by the modern air brake and that the statute is a proper police regulation to limit trains to lengths that can be safely controlled by that means, then the law is brought even more completely within the "occupied field" doctrine, because it will have been not only alleged but clearly shown—according to appellee's assumed claim—that the state has stepped in and legislated, for the specific purpose of supplementing or adding to the congressional acts, and the regulations made pursuant thereto.

Appellee is thus brought to a completely untenable position. It must either claim that the law is necessary as a safety measure, or admit that it is not a safety regulation.

If it takes the latter course, it necessarily admits that the law is unreasonable and arbitrary; for as previously stated if the law cannot be sustained as a safety measure, it cannot be sustained at all. Necessarily, therefore, appellee claims that the law is a justified and necessary safety measure, which achieves that object by forbidding the dangerous operation inherent in running long trains; the prohibited long-train operation being assertedly more dangerous than the permitted short-train operation because the long train contains so much more slack that when in motion the slack action cannot be safely controlled. This result is said to be due to the fact that the brakes, although of the same type as on a short train, do not function as well on the long train, so that the control is incomplete and insufficient. The argument thus reduces to the contention that the law promotes safety by limiting trains to the lengths which can be safely controlled, handled, and stopped with the types of air brakes in use, and for that purpose forbids the operation of the longer, allegedly unsafe, trains. This contention, when fairly analyzed, thus brings the law into the occupied field, and squarely into conflict with the federal statutes and the regulations made by the Commission thereunder, because the latter have precisely the same purposes and are addressed to the same subject matter.

Whichever position appellee may choose, that choice is equivalent to a confession of the law's invalidity: either because it is not a safety measure, and has no relation to that purpose; or because, as a regulation of interstate commerce, it conflicts with and infringes upon federal

statutes having identical purposes and operating in the same field.

In prior argument upon this issue appellee has relied particularly upon:

Kelly v. *Washington*, supra (302 U.S. 1, 82 L.ed. 3).

As pointed out in our earlier discussion of this case, this Court held that there was no inconsistency between the federal acts regulating shipping on navigable waters and the state law under attack (so far as it applied to the craft involved in the case), because Congress had been careful to delimit its exercise of jurisdiction, and though regulating steam vessels, and seagoing motor-driven vessels of 300 tons or more; had not regulated but had exempted the smaller motor-driven craft. The state law therefore touched that which the federal laws and regulations had clearly and with apparent intention left untouched.

But the decision presents no analogy to the instant case. Here the Congress, and the Commission as its agency, have regulated the air brakes (the only means of controlling trains) as well as other safety appliances, for all rolling equipment (cars and locomotives) used by steam railroads, and for all trains in which they are run: not merely of a certain size or length, or used in a particular service, but of all sizes, lengths and classes, and in all kinds of service. It is inconceivable that there should now be any remnant of authority left in the state which would permit it to regulate, even indirectly, in the field of train handling and control by means of the air brakes. Safety appliances do not [illegible]

of a dual or concurrent jurisdiction (*Napier v. Atlantic Coast Line R. Co.*, supra, 272 U.S. 605); and in safety appliance matters the state "can no more supplement" the federal provisions "than it can annul them" (*Pennsylvania R. Co. v. Public Service Commission*, supra, 250 U.S. 566).

The exclusive character of federal safety appliance acts is shown by the holding in:

Gilcary v. Cuyahoga Valley R. Co. (1934), 292 U.S. 57 (60), 78 L.ed. 1123:

"The Safety Appliance Acts govern common carriers by railroad engaged in interstate commerce. The Act of 1893 applied only to vehicles used by them in moving interstate traffic. 45 U. S. C. Sec. 2. Its requirements were by the Act of 1903 extended to all their vehicles. Id., Sec. 8. Southern Ry. Co. v. United States, 222 U.S. 20, 26. Moore v. Chesapeake & Ohio Ry. Co., 291 U.S. 205, 213. So far as the safety equipment of such vehicles is concerned, these Acts operate to exclude state regulation whether consistent, *complementary, additional* or otherwise. Prigg v. Pennsylvania, 16 Pet. 539, 617. Southern Ry. Co. v. Railroad Comm'n, 236 U.S. 439, 446. Internat. Shoe Co. v. Pinkus, 278 U.S. 261, 265. The imposition of penalties (id., Sec. 6) and abrogation of assumption of risk (id., Sec. 7) are measures for enforcement." (Emphasis ours.)

The *Georgia Electric Headlight Case*, supra (234 U.S. 280), previously cited by appellee in this same connection, is likewise of little assistance to its argument. In that case this Court, after referring to the Safety Appliance Acts,

the Boiler Inspection Act, the Accident Reports Act, and certain related statutes, said (234 U.S., at p. 293):

> "But it is manifest that none of these acts provides regulations for locomotive headlights. .... It does not appear, however, either that Congress has acted or that the Commission under the authority of Congress has established any regulation so far as headlights are concerned. As to these, the situation has not been altered by any assertion of Federal power and the case stands as it has always stood without regulation unless it be supplied by local authority."

Clearly that language does not apply to the situation presented in the present case. Here it is manifest that Congress has provided, both directly and through the agency of the Commission, regulations for air brakes to be used on cars and trains of interstate carriers, requiring them to be of such character, number and effectiveness that trains may be adequately controlled and stopped by their use; and, as specifically held in the *Virginian Case*, supra, has forbidden under penalty the operation of a train longer than can be safely controlled and stopped with the air brakes. The very essence of appellee's evidentiary showing is, however, an attempt to prove that the present air brakes do not adequately control long trains, and thereby to support the claim that a rational basis for the law is afforded. It is plain that the law, if construed as or claimed to be necessary for that reason, is nothing but an attempt by the state to supplement or replace the federal regulations. The situation is such that the federal power has been directly exerted to compel the provision and use of adequate brakes and other safety

devices on appellant's cars and trains, and no need or place exists for regulation by local authority. This legislation, by which Arizona attempts to shorten the lengths of trains so that the type of air brakes approved by the Interstate Commerce Commission under its broad powers may effectively operate is certainly, and in the instant case is obviously claimed to be "complementary" or "additional" to the Safety Appliance Acts, Section 25 of the Interstate Commerce Act, and the Commission's regulations thereunder; and such was the explicit holding in the *First Arizona* and *Nevada Cases*, where the same claims were made as are indicated here.

The Supreme Court's latest decision in the *Arkansas Full-Crew Cases:*

> *Missouri Pacific R. Co. v. Norwood* (1933), 290 U.S. 600, 78 L.ed. 527,

offers no comfort to appellee. The railroad in that case did not rely upon the Safety Appliance Act, as supplemented by Section 25 of the Interstate Commerce Act. Such statutes could not have had any possible relevancy in that case. The decision therefore did not pass upon our specific point that the Commission was directly given power to regulate air brakes, regardless of state laws to the contrary. The decision upon the issue of conflict between the state law and federal statutes is summed up in the concluding expression by the Court in the earlier decision of the same case (283 U.S. 249, 258):

> "We think it very clear that Congress has not prescribed or empowered the Commission to fix the number of men to be employed in train or switching crews."

Appellee has also referred, in prior argument upon this issue, to:

Missouri, Kansas & Texas Ry. Co. v. Haber (1898), 169 U.S. 613, 42 L.ed. 878;

Welch Co. v. New Hampshire (1939), 306 U.S. 79, 83 L.ed. 500;

Maurer v. Hamilton, supra (309 U.S. 598, 84 L.ed. 969).

The *Haber Case* was cited by appellee, jointly with the *Kelly Case*, supra, to the point that a state police-power statute is not to be regarded as set aside by an act of Congress, unless the repugnance or conflict between the two statutes is so direct and positive that they cannot be reconciled or consistently stand together. It is apparent that that principle cannot be invoked in the present case to save the challenged law. As we have shown, there is a direct and positive conflict between the Safety Appliance Act and Section 23 of the Interstate Commerce Act, on the one hand, and the Train Limit Law on the other; for the Train Limit Law undertakes to forbid, in Arizona, an operation which the other laws, addressed to the same subject matter, permit. That is to say, the Safety Appliance Act, though forbidding the operation of any train which is so long or so heavy that it cannot be safely controlled, handled and stopped, imposes no fixed limit, but permits all of the relevant conditions, such as grade, weight and loading of cars, and the like to be taken into consideration; whereas the Train Limit Law imposes fixed and arbitrary limits, regardless of these conditions and regardless of the fact that experience has demonstrated

that longer trains can be and are safely and effectively operated, handled, controlled, and stopped.

The *Welch* and *Maurer Cases* were referred to apparently because of the expressions in those opinions to the effect that the congressional intention to *displace* local laws relating to health or safety is not in general to be inferred, unless clearly indicated. Obviously, this principle has no application here, because the Safety Appliance Act was passed initially more than nineteen years before the enactment of the Train Limit Law; even the 1910 amendment preceded the Law by two years. Thus, instead of the federal act having superseded or displaced the state law, the latter has invaded a field already occupied by Congress.

The "occupied-field issue" was also presented in the *First Arizona Case,* and was discussed in the following language in that opinion (2 F. Supp., pp. 860-861):

> "The defense of these suits is based on the contention that Congress has passed no Act dealing with the subject of train lengths; that the Boiler Inspection Act, the Power Brake Provision of the Safety Appliance Act and Section 26 of the Interstate Commerce Act, do not cover certain dangers and hazards of train operations and, until Congress deals specifically with those subjects the states are free to adopt such reasonable regulations—in the exercise of its police power.
>
> We cannot agree to this proposition: . . .
>
> "Sections 22 and 34, inclusive, Title 45 USCA, are what are known as the Boiler Inspection Act. This Act requires that every locomotive, its boiler, tender,

and all parts and appurtenances thereof must be inspected, as provided in the Act. Section 1 of the same Title makes it unlawful for any common carrier engaged in interstate commerce by railroad to use on its line any locomotive engine not equipped with power driving-wheel brakes and appliances for operating the train-brake system. Section 2 provides that it shall be unlawful for a common carrier by railroad to haul or permit to be hauled or used on its line any car not equipped with automatic couplers which can be uncoupled without the necessity of men going between the ends of cars. Section 4 requires each car to be equipped with secure grab irons or handholds in the ends and sides of each car for greater security to men in coupling and uncoupling cars. Section 5 prohibits the use of freight cars which do not comply with the prescribed standard as to height of drawbars. Section 11 makes it unlawful for a common carrier to permit to be hauled or used on its line any car not equipped with secure sill steps and efficient hand brakes, ladders and running boards. Section 12 provides that all these appliances shall remain as standard equipment to be used on all cars unless changed by order of the Interstate Commerce Commission. Section 17 makes it unlawful for the carrier to operate a locomotive not equipped with an ash pan which can be dumped without the necessity of any employee going under the locomotive. Section 26 of Title 49 provides that the Commission may order a carrier by railroad to install automatic train-stop or train-control devices, *or other safety devices, which comply with specifications and requirements prescribed by the Commission*, upon the whole or any part of its railroad. All of these acts deal with the subject of safety in the operation of railroad trains in interstate commerce.

It will seem from this that Congress has dealt quite extensively with the subject of safety of interstate train operation. The fact that it has not dealt specifically with each element or factor is immaterial, as the Commission, under power conferred by Congress, is fully authorized to prescribe rules and regulations affecting the subject of train operation."

The court then cited this Court's decision in

Napier v. Atlantic Coast Line R. Co., supra (272 U.S. 605),

and continued:

"From the foregoing, *we conclude that Congress has occupied the field of legislation involved, and has granted to the Interstate Commerce Commission full power and authority to deal with the subject, and that legislation by the states is thereby superseded.*" (Emphasis supplied)

The following discussion of the issue, in the Memorandum Opinion of the trial court in this case, likewise merits the attention of this Court (R. 4047-4048):

"There is a second so-called 'joint' field of regulation, relating to those matters which require diversity of treatment according to local conditions, where the states may act within their respective jurisdictions, unless and until Congress sees fit to exercise its paramount authority. But even if the law in question were found not to fall in the 'exclusive Federal field,' but rather in the 'joint field' of regulation, still the law must be stricken down for the reason that in my opinion Congress has, by the enactment of the Safety Appliance Act, Boiler Inspection Act, etc., coupled with the broad powers delegated to the Inter-

state Commerce Commission, fully 'occupied' this joint field of regulation. This would automatically oust the State of any power to supplement or expand such regulations any more than it could annul or amend them. *Clearly if the law is necessary as a safety measure because 'long trains' cannot be properly controlled and stopped with the present types of air brakes, then it gets over into a field already occupied by the Congress* through the passage of the safety acts above referred to. Engineer Thrace Cooper of the Santa Fe System called by the State testified: 'Your ability to control slack in a train rests solely on your ability to apply and release the brakes throughout the train." (Emphasis supplied.)

We submit that this Court should hold and conclude that Congress, acting both directly, and through the medium of orders issued by the Interstate Commerce Commission as the congressional agency, has undertaken to regulate train lengths in the interest of safety, by limiting interstate trains to the maximum number of cars capable of being safely handled, controlled and stopped with the use of the air brakes and other safety devices required by such federal statutes and orders, and has thus completely occupied the field in which the challenged state law operates; so that the latter, which regulates the same subject matter, and by its requirements conflicts with and attempts to modify or supplement the federal regulations, is wholly invalid.

5.

THE TRAIN LIMIT LAW OPERATES ARBITRARILY AND UNREASONABLY TO DEPRIVE APPELLANT OF ITS PROPERTY WITHOUT DUE PROCESS OF LAW.

(Assignment of Error No. 6)

The fifth major issue of this case, as presented by appellant's affirmative defense (Answer, Part III, pars. 5 and 11, in particular; R. 19-22, 25) and the evidence of both parties, is whether the challenged law is a reasonable exercise of the state's police power in the interest of safety. Appellant contends that the law not only fails to promote safety but actually and substantially increases hazards, so that, taking into consideration the concededly heavy burden of compliance and the arbitrary nature of the regulation itself, it is unreasonable and without rational basis, and thus in violation of the due-process guarantee of the XIV Amendment, as well as the Commerce Clause.

This point was covered at length and in detail in appellant's evidence. There was both an ample and wholly uncontradicted showing of the heavy burden and direct obstruction and interference cast upon appellant by the law, and also an exhaustive treatment of the safety issue. The state likewise dealt with the safety issue, devoting practically all of its comparatively limited counter-showing to that point. Since the statistical portion of the state's evidence was predicated upon reports made by or to the Interstate Commerce Commission, or the Arizona Corporation Commission, to that extent it duplicated certain portions of appellant's testimony, and thus served to confirm the conclusions to be drawn therefrom. There is practically no factual conflict in the testimony of the parties on the safety

point; they differ principally in the conclusions they seek to draw.

The "due-process" issue was very fully covered in the Findings, Conclusions, and Memorandum Opinion of the trial court. There were the detailed findings on the points of financial burden (Finding X(d), R. 3966-3969); interference, delay and obstruction (Findings X(b) and (c), R. 3953-3966) and impairment of efficient and economical use of appellant's property (Finding VII(b)(2), R. 3917-3921; VII(d)(3), R. 3929-3934; XVIII, R. 4034); and there were also specific findings addressed to all phases of the safety question, and all of the claims advanced by appellee and its witnesses in attempted justification of the law (Findings XI, XII, XIII, R. 3969-4032). In line with these findings the trial court adopted its Conclusion of Law No. VII (R. 4037-4038), the substance of which is as follows:

> The law is invalid and in violation of the Commerce Clause and both the Federal and State Due-Process Clauses, because it operates arbitrarily and unreasonably to deprive appellant of its property without due process of law; in that (a) it fixes maximum train lengths very much lower than generally obtain elsewhere throughout the United States under similar operating conditions; (b) it makes no allowance for grade or other revelant conditions, including the consist of the trains themselves; (c) it imposes substantial and wholly unreasonable burdens, interferences and delays, and impairs the use and usefulness of appellant's transportation facilities; and (d) it bears no reasonable relation to safety, and neither eliminates nor reduces any existing hazard, but on the contrary creates hazards not otherwise existing,

and increases other hazards and dangers of railroad operation.

Five principal questions, involving both law and fact, represented by the five propositions stated below, are in our view controlling upon the "due-process" point in this case:

(a) In considering whether the law is an unreasonable exercise of the police power, the cost or expense of compliance is properly a factor to be taken into account, though not the sole factor.

(b) In considering whether the law is unreasonable and thus in violation of the due-process clause, the Court is entitled to exercise its independent judgment upon the facts as developed in the record and found by the trial court, and in this respect is not bound or hampered by any legislative declaration of purpose, either actual or presumed. The legislative choice is at best supported by merely a rebuttable presumption of reasonableness; but this presumption may be overcome by adequate proof, or may not even arise in a particular case because of other circumstances therein.

(c) A law which, when enacted, may have been reasonable and valid under the due-process provision, may by lapse of time and change in conditions become unreasonable, and therefore invalid. If relevant conditions have in fact changed substantially since enactment of the law, the presumption of reasonableness above referred to is no longer available.

(d) Common belief, as exemplified by the almost total absence of similar state or Federal laws, and also by the recent action of the Interstate Commerce Commission (Service Order No. 85), may be relied upon to show, and does show, that the law is wholly unreasonable.

(e) A purported safety measure which in fact bears no reasonable or any relation whatever to health or safety, but on the contrary increases certain hazards and creates others which would not otherwise exist, is unreasonable and without rational basis and therefore, and without regard to its claimed or actual effects upon interstate commerce, should be held invalid because in violation of the due-process clause. The challenged law is shown by the evidence and the findings of the trial court to fall within this principle.

(a) In Considering Whether the Law Is an Unreasonable Exercise of the Police Power, the Cost or Expense of Compliance With Its Provisions Is Properly a Factor to Be Taken Into Account, Although Not the Sole Factor.

Finding No. XVI of the trial court (R. 4033-4034) states, in substance, that the added expense caused by appellant's compliance with the law is a factor (but not the sole or controlling factor) which may and should properly be, and has been, taken into consideration in passing upon the reasonableness of the law as a purported safety measure, and in finding that the law is unreasonable and arbitrary, and without any reasonable relation to its claimed, or purported, purpose; and that wholly apart from any question of the burden imposed upon interstate commerce by such compliance, the added cost which appellant is compelled to incur by reason of obedience to the law is wholly out of proportion to, and far exceeds, any safety to any persons which has been, or can or will be promoted by the law.

The principle which is followed in this finding, namely, that expense of compliance is properly a factor to be taken into consideration in determining the reasonableness of a

police-power regulation challenged under the due-process guarantee, is of long standing and has been frequently stated by this Court.

In

Washington ex rel. O. W. R. and N. Co. v. Fairchild (1912), 224 U.S. 510, 56 L. ed. 863,

the Court said (at p. 529):

> "The question in each case must be determined in the light of all the facts, and with a just regard to the advantage to be derived by the public and the expense to be incurred by the carrier."

In

Missouri Pacific R. Co. v. Norwood, supra (283 U.S. 249, 75 L. ed. 1010),

the Court said (at p. 255):

> "The cost of complying with state laws enacted to promote safety is an element properly to be taken into account in determining whether such laws are arbitrary and repugnant to the Due-Process Clause of the Fourteenth Amendment."

In

A. T. & S. F. Ry. Co. v. Railroad Commission (1931), 283 U.S. 380, 75 L. ed. 1129,

in a case involving an attack upon a state order requiring the building of a new station for the convenience and comfort of the people of the City of Los Angeles (a clear exercise of the police power), the Court said (at pp. 395-396):

> ". . . But the power to regulate is not unlimited. 'It may not unnecessarily or arbitrarily trammel or interfere with the operation and conduct of railroad

properties and business.' *Norfolk & Western Ry. Co. v. Public Service Comm.*, 265 U.S. 70, 74; *Mississippi Railroad Comm. v. Mobile & Ohio R. Co.*, *supra*. The question in each case is whether, in the light of the facts disclosed, the regulation is essentially an unreasonable one. *Wisconsin, Minnesota & Pacific R. Co. v. Jacobson*, *supra*, *Norfolk & Western Ry. Co. v. Public Service Comm.*, *supra*. And 'the matter of expense is an important criterion to be taken into view in determining the reasonableness of the order.' *Oregon R. & Nav. Co. v. Fairchild*, 224 U.S. 510, 529."

As the Court said, in

Wisconsin etc. R. R. v. Jacobson (1900), 179 U.S. 287 (301), 45 L. ed. 194,

with reference to a police power order:

"A statute, or a regulation provided for therein is frequently valid, or the reverse, according as the fact may be, whether it is a reasonable or an unreasonable exercise of legislative power over the subject matter involved. *And in many cases questions of degree are the controlling ones by which to determine the validity, or the reverse, of legislative action.*"

In

Missouri Pacific R. Co. v. Kansas (1910), 216 U.S. 262, 54 L.ed. 272,

which involved the validity of a state commission's order requiring the carrier to maintain passenger-train service, this Court said (at p. 278):

"Of course, the fact that the furnishing of necessary facilities ordered may occasion an incidental pecuniary loss is an important criterion to be taken into

view in determining the reasonableness of the order, but it is not the only one."

In

Lehigh Valley R. Co. v. Commissioners (1928), 278 U.S. 24, 73 L.ed. 161,

involving the validity of an order for the elimination of a highway grade crossing, this Court said (at p. 33):

> "The board has the discretion to fix the cost. The function of the court is to determine whether the outlay involved in the order of the board is extravagant in the light of all the circumstances, in view of the importance of the crossing," . . .
>
> "An increase from $200,000 to $300,000 for a railroad crossing might well, under different circumstances from those here, be regarded as so unreasonable as to make the order a violation of the company's constitutional rights, and to be in the nature of confiscation. The protection of the 14th Amendment in such cases is real and is not to be lightly regarded."

With particular reference to the earlier decision in

Erie R. Co. v. Commissioners (1921), 254 U.S. 394, 65 L. ed. 322,

the Court said, further, in the *Lehigh Valley case*, that the rule of the *Erie case* that the police power is effective, even though it may lead to bankruptcy in individual cases . . .

> "is not to be construed as meaning that danger to the public will justify grade expenditures unreasonably burdening the railroad when less expenditure can reasonably accomplish the object of improvements and avoid the danger. If the danger is clear,

reasonable care must be taken to eliminate it, and the police power may be exerted to that end. But it becomes the duty of the court, where the cost is questioned, to determine whether it is within reasonable limits. This follows from principles clearly established by this court." (Citations.) "We emphasize this, not because there is doubt about it, but because *we deprecate the impression apparently entertained by some that in the safeguarding of railroad crossings by order of state or local authority the exercise of police power escapes the ordinary constitutional limitations of reasonableness of cost.*" (Emphasis supplied.)

The State Supreme Court notably failed to include, in its quotation from the *Oklahoma case*, any portion of that opinion dealing with the "due-process" issues, as presented to the Oklahoma court (although the "due-process" issue was discussed therein at considerable length: 36 F. Sup. 612-614), except that portion dealing with the consideration to be given to the cost of compliance (36 F. Sup. p. 614). The Oklahoma court said, in this connection, in language reproduced in the opinion of the state court (R. 4063-4064):

"Plaintiff relies upon the Due-Process Clause of the 14th Amendment. It is obvious that to comply with the statute plaintiff will be required to expend additional sums in the operation of its business. The cost of compliance with a statute of this kind is an element for appropriate consideration in determining whether the statute is arbitrary, capricious or repugnant to due process, but, standing alone, it is not always enough to warrant judicial determination of invalidity." (Citing: *Missouri Pacific R. Co. v. Kansas*, supra; *Lehigh Valley R. Co. v. Commis-*

sioners, supra; *Missouri Pacific R. Co. v. Norwood*, supra.).

The State Court thus apparently accepted the views of the trial court as expressed in its Finding No. XVI and repeated in the proposition which serves as the sub-caption for this discussion; but declined to apply that principle to the case before it, in spite of its inferential agreement with the trial court that compliance with the statute compels appellant "to expend great sums of money".*

We do not and cannot claim that this very heavy continuous and recurring expense, fully proven as it is, would alone justify annullment under the due-process clause.

But unquestionably the Court may set up that expense against any benefits it thinks may be conferred by the law, and determine whether upon a fair consideration of the evidence the supposed benefits are not outweighed by the large cost. There is no evidence that a reduction in damage to equipment and lading is accomplished by the arbitrary limitation or the operation compelled thereby and the record shows that the long-train method of operation is more economical in that respect.

Decrease in the hazard of casualties to all classes of employes arising from road freight or passenger train operation, or even in hazards to trainmen from all causes, has not been claimed by appellee as either the real object of the

*As already noted, the state court said, immediately preceding its quotation from the opinion in the *Oklahoma Case* (R. 4062-4063):

> "In that (Oklahoma) case, *like the one at bar*, the railroad company was compelled . . . to expend great sums of money in order to comply with the restriction . . ." (Emphasis supplied.)

law or the result of its enforcement. In the face of the evidence such a claim would be futile; indeed the trial court found that the hazards just mentioned, with their consequent casualties, are greatly increased. We assert that the evidence shows that clearly, convincingly and beyond any fair debate.

Appellee must stake its all on slack-action accidents. We submit, on the analysis of the evidence made in Finding No. XII of the trial court, that the most that can be said is that compliance with the law does not measurably change the ratio of those accidents to freight-train miles run, and actually increases them on the true basis of arriving at the relative safety of the short-train and long-train methods of operation—the car-mile basis. By appellee's silence on the subject of short-train casualties, and casualties to others than men on the train or in the caboose, it failed even to create a conflict with appellant's showing that by far the safest way to handle the traffic is to use as few train-units as are practicable, even though thereby the standard long-train method of operation is followed. That question, upon the basis of all the evidence, is not even debatable.

In earlier argument appellee has cited *Nashville C. & St. L. Ry. Co. v. White* (1929), 278 U.S. 456, 73 L.ed. 452, in connection with its discussion of the "cost of compliance," and particularly has emphasized a sentence of the opinion reading:

> "There is a marginal chance that occasionally a life may be saved."

We believe that that quotation is peculiarly unfortunate for appellee, in the light of the experience gained with the Train-Limit Law.

Casualties of all classes occur in both long-train and short-train operation: the most that appellee may claim for the law is that it prevents or minimizes certain of these hazards, and it stresses particularly the so-called slack-action hazard. The test of experience may be applied to this claim in a number of ways. The readiest example is found in those exhibits showing the results of appellan t's operations in Nevada and Arizona. During the past several years, and particularly since and including 1929, long-train operation has prevailed in Nevada, while the law has been fully observed in Arizona, except for a brief period in March and April, 1940; but all other conditions pertaining to train operations have been identical in both states, or very nearly so. If the law is truly a safety measure, then the accidents and casualties in Arizona should have been much less frequent, for the law should have prevented the occurrence in Arizona of many accidents of the kind attributable (if appellee is correct) to the Nevada long-train operation. This record shows that the law has not only failed in this asserted purpose, but indeed has had exactly opposite effects.

Thus, in the 12 years 1929-1940, there were, *in Nevada*, 134 casualties to all classes of employees on duty, incident to road freight train operation; in the same period, *in Arizona*, there were 290 such casualties (Exhibit 277, R. 3372). In terms of frequency, there were 10.08, or about 100% *more* (i.e., *double*) such casualties per 100,000,000 car miles in Arizona during the six years 1929-1934, and 10.02, or about 170% *more* (i.e., nearly *treble*) during the six years 1935-1940. Otherwise stated, if the 70-car limit had been observed in freight-train operation in Ne-

vada during those 12 years, and the same dubious "benefits" had been realized as were actually experienced in Arizona, there would have been at least ten more of these casualties in Nevada for every 100,000,000 car miles produced, or a total of 162 more such casualties, over the 12 years, than actually occurred in the long-train operation. The increase would have been about 125%, or *more than double.*

Even taking slack-action casualties, experience has shown that the limitation does not measurably reduce either their number or their frequency. Thus, during the ten-year period 1929-1938, there were in Arizona 48 such accidents, with 57 casualties; 47 of which, with 55 casualties, were on short trains. In the same ten-year period there were 41 such accidents in Nevada, with 54 casualties. Thus there were more accidents and casualties of this type on *short* trains in Arizona than on all trains in Nevada during those ten years. The volume of the Arizona traffic, measured in car miles, was about five percent less than in Nevada during that period.

Taking again the same 12-year period (1929-1940) above referred to: there were in Nevada during those years, 61 slack-action casualties to trainmen, associated with the operation of 1,619,000,000 freight car miles; there were in Arizona 62 such casualties, associated with the operation of 1,544,550,000 car miles. The casualty rate per hundred million car miles was 3.77 in Nevada; 4.01 in Arizona (Exhibit 280, R. 3375).

Thus, the 70-car limitation has not only failed to reduce the slack-action casualty frequency in Arizona to the level

experienced in Nevada under long-train operation—and this is all that appellee could have claimed for the law, from the most optimistic view-point—there have actually been, under the compelled Arizona operation, .24 more casualties for each 100,000,000 car miles produced during the 12-year period.

Another example of the effect of the law as an accident maker rather than preventer is afforded by the grade crossing hazard. There is no question that the law requires about one-third more train miles to be operated than would otherwise be necessary; its underlying purpose is to compel the affected railroads to operate more trains. In the year 1938, the additional train-miles thus operated by appellant totaled about 680,000 in Arizona and the adjacent territory (Finding X(c), R. 3964, 3965).* The history of grade-crossing accidents and casualties in the United States shows that their frequency bears a practically constant relationship to the number of train-miles operated; in any year, and regardless of other circumstances which may vary from year to year, experience shows that there are almost certain to be about 13 persons killed or seriously injured, at railroad highway grade crossings, for every two million train-miles operated (Ex. 269, R. 3307). Thus, the law in 1938, by compelling about two-thirds of a million additional and unnecessary train-miles to be run, produced a virtual certainty of at least 4 additional deaths or serious injuries at grade crossings on appellant's lines alone; this entirely apart from its effects in increasing other classes of hazards and resulting casualties.

*In 1940, the excess of train miles compelled by the law was about 730,000; R. 3964.

The reasons for these inevitable results are simple and obvious. The law, by increasing the number of trains operated approximately one-third, also requires approximately one-third more train and enginemen to be employed than would otherwise be needed, and exposes these additional men to every hazard that may occur in connection with train operations, whether the train is moving or standing. By placing one-third more trains on the tracks, it creates additional hazards for those employes whose duties require them to be on the tracks, and who are or may be struck or run down by passing trains. By causing more train units to be operated, it requires more signals to be given, more meetings and passings of trains to be made, more train orders to be issued, and thus involves more opportunities for oversight, negligence, forgetfulness, or disobedience of orders. All of these factors combined produce the results which are plain and inescapable upon the face of the unchallenged record. There is no doubt that the law, far from affording even a "marginal chance" of occasionally saving a life or avoiding an accident, practically insures an increased number of deaths and serious injuries from almost every class of hazard associated with railroad operations.

It is particularly clear that in this case there can be no genuine attempt by appellee to array "*human* flesh and blood" against mere money. Its primary safety claim relates to slack-action casualties and not to any other type of accident or hazard. Giving to this contention all the weight possible in the light of the facts, observance of the

law in Arizona has apparently resulted in about one *more* slack-accident casualty, for each 417,000,000 car miles produced during the 12-year period 1929-1940, than would have occurred with long-train operation (Exhibit 280, R. 3375). This "benefit" falls so far short of justifying the claim as to compel the conclusion that the law's supporters, i.e., the major train and engine-service brotherhoods, have no real concern with safety. Their true motives are quite different: they have never denied that they support this and other similar restrictions, because the affected railroads are thereby compelled to operate more trains and thus increase the employment opportunities of their members. The practical financial aspect of train limitation constitutes their real interest.

Appellant, and those others who join with it in opposing arbitrary train limits, although in part motivated by financial considerations, are entitled to support their cause by pointing also to the public benefits realized from long train operation, in the way of both a better railroad transportation performance and a greater degree of railroad safety. It is established, and indeed not seriously disputed, that when the restriction is not observed, appellant and other railroads are much better able to provide speedy and efficient transportation service at reduced cost to their patrons, and thus to discharge their public obligation. The facts of record, recited in part above, show equally beyond any question that long-train operation without regard to fixed limitations has also resulted in greater safety for the public, and for all classes of railroad employees, including all of those who by reason of their duties face any of the hazards of train operation; that even as to the limited

class of casualties with which appellee and its supporters are nominally concerned, the law results in no real benefit, and has in fact demonstrated its inability to reduce even this limited and unimportant class of hazards.

The Train Limit Law has been and is a costly experience, whether the price be measured in *money*, or in *interference*, *delay* and *obstruction* to essential transportation, or in *human life* and *limb*.

(b) There Is a Rebuttable Presumption of Reasonableness Normally Attending a State Police-Power Statute, Challenged Under the Due-Process Clause; but

(c) In the Instant Case That Presumption Is of No Avail Because of the Lapse of Time and Changes in Conditions Since the Law Was Enacted

It has been pointed out that in its opinion the state court failed to give any independent consideration (i.e., other than as indicated by its quotation from and reliance upon those portions of the *Oklahoma* opinion in which similar issues were treated) to any of the legal issues of this case except the "due-process" issue. Even the court's consideration of that issue was far from comprehensive; for it consisted essentially of: (a) the statement, as a premise, that the law was enacted "for the purpose of the safety and protection of employees and people being transported by railroad," because "no other reason (than safety) could possibly be assigned" (R. 4059); (b) the citation of but *one* decision of this court (*Barbier v. Connolly*, (1885), 113 U.S. 27, 28 L.ed. 923), and four state decisions, and a quotation from the text of *Corpus Juris Secundum*; (c) the quotation of the part of the *Oklahoma*

opinion, 36 F.Sup. 611 (614) already mentioned, which deals with the consideration properly to be given to the expense of compliance; (d) the indirect statement, also already noted, that enforced compliance with the challenged law imposes great additional expense; and (e) the conclusion which, although not expressly stated may be fairly inferred from the context, that as a safety measure the law is supported against appellant's challenge under the due-process clause by an overwhelming and virtually conclusive presumption of validity.

That the court was convinced of and accepted as correct this theory of "overwhelming presumption" is shown by the quotations included in the opinion; and even more persuasively by its failure to review or discuss any of the evidence of the parties or findings of the trial court, addressed to the safety issue and thus to the ultimate question of reasonableness under the due-process clause. This omission is consistent only with acceptance of the supposed presumption: otherwise, in view of appellant's extensive showing, and the careful and detailed findings of the trial court, at least some review of the evidence would have been essential to support reversal of the trial court's judgment.

In this same vein, it should also be noted that in its quotation from the *Oklahoma* opinion the court omitted the greater part of the discussion of the due-process point, and particularly omitted the portion dealing with the safety showing in that case: compare that opinion, 36 F. Supp. at pages 612-614. Naturally, to have included this discussion would have reflected unfavorably upon the complete omission of all reference to the apparently much more

complete safety showing in the instant case, and also upon the acceptance of the overwhelming presumption. For the Oklahoma court, *as a trial court,* held only that the safety evidence before it tending to support the challenged law had "greater strength" than the opposing showing, and hence, in view of all the facts, that it could not be said that the Oklahoma statute bore no reasonable or substantial relation to safety, or was unreasonable or arbitrary. The state court's professed acceptance of the *Oklahoma case* as the guiding authority was thus far from complete.

Apart from this inconsistency, the state court erred in failing to conclude, in accordance with the controlling decisions of this Court, that a state police-power statute attacked under the due process clause is supported by merely a *rebuttable* presumption of reasonableness, which may even disappear if the fact situation warrants. This Court has repeatedly held that in a case of this character the court has not only the power, but the duty, to review the facts, to reach an independent determination thereon, and to hold the challenged statute invalid if it clearly appears, even though the evidence be conflicting, that the regulation is unreasonable and arbitrary, and without reasonable relation to its declared or ostensible purpose. Thus the Court said, in

Nebbia v. New York (1934), 291 U.S. 502 (525), 78 L. ed. 940:

"The Fifth Amendment, in the field of Federal activity (*Addyston Pipe & Steel Co. v. U. S.*, 175 U.S. 211, 228, 229) and the Fourteenth, as respects state action (*Barbier v. Connelly*, 113 U.S. 27, 31; *C., B. & Q. R. Co. v. Illinois* (200 U.S. 561, 562) do not prohibit

governmental regulation for *the public welfare*. They merely condition the exertion of the admitted power, by securing that the end shall be accomplished by methods consistent with due process. And the guaranty of due process, as has often been held, demands only that the law *shall not be unreasonable, or capricious, and that the means selected shall have a real and substantial relation to the object sought to be attained.* It results that a regulation valid for one sort of business, or in given circumstances, may be invalid for another sort, or for the same business under other circumstances, *because the reasonableness of each regulation depends upon the relevant facts.*" (Emphasis supplied.)

Not always have the state courts borne in mind that the *power* to substitute the judicial judgment for that of the legislative exists, and with the power the *duty* to do so in proper cases; undoubtedly misled by the reiteration of the rule of caution against its exercise. Thus in *Dobbins v. Los Angeles* (1903), 139 Cal. 179 (183), 72 Pac. 970, it was held that if the subject matter of the legislation is within the legislative power, the legislature is the exclusive judge of the propriety of the particular exercise, and that a court *would not* substitute its judgment. On writ of error to this Court (*Dobbins v. Los Angeles* (1904), 195 U.S. 223, 49 L. ed. 169) the judgment was reversed. The Court referred to the lower court's basis of decision as being "the proposition . . . that the act of the municipality in question *cannot* be reviewed, because so to do would be a substitution of the judgment of the court for that of the council upon a matter left within the exclusive control of the legislative body." Admitting that "every intendment" was to be in-

dulged in favor of the legislation, and that it was not the province of the courts to invalidate it "except in clear cases," it was nevertheless held to be "thoroughly well settled" that legislation under the police power was "subject to investigation in the courts"; that the legislature's "determination as to what is a proper exercise of its police powers is not final or conclusive, but is subject to the supervision of the courts"; citing *Lawton v. Steele* (1894), 152 U.S. 133, 38 L. ed. 385.

In the *Lawton Case*, this Court had said (152 U.S., at pp. 136-137):

> "To justify the state in thus interposing its authority in behalf of the public, it must appear, first, *that the interests of the public generally, as distinguished from those of a particular class*, require such interference; and, second, that the means are reasonably necessary for the accomplishment of the purpose, and not unduly oppressive upon individuals. The legislature may not, under the guise of protecting the public interests, arbitrarily interfere with private business, or impose unusual and unnecessary restrictions upon lawful occupations. *In other words, its determination as to what is a proper exercise of its police powers is not final or conclusive, but is subject to the supervision of the courts.*" (Emphasis supplied.)

It is particularly true that in no case has it ever been declared by this Court that there is any preferred class of purposes among those for which the state's police power may be exercised. Thus, a purported safety law or order has no higher standing than a law or order which merely

promotes public comfort or convenience by requiring a new railroad station to be built or added train service to be afforded, or one which in order to safeguard public health or morals declares certain practices or things to be public nuisances and abatable as such. It has no greater sanctity or presumption of necessity or propriety than a state law or order fixing public utility rates which is sustainable only under the police power and the most common ground for attack on which is that it violates the Fourteenth Amendment. In all cases where a statute or regulation is attacked upon the ground that it violates the due-process clause, a court will always disregard the ostensible purpose and inquire into the substance and effect in order that it may *for itself* determine whether the law has any real or substantial relation to public health, safety, etc.; and will not be bound by legislative declarations of purpose.

In

Mugler v. Kansas (1887), 123 U.S. 623, 31 L. ed. 205, this Court said (at p. 661):

> "The courts are not bound by mere forms, nor are they to be misled by mere pretences. They are at liberty—indeed, under a solemn duty—to look at the substance of things, whenever they enter upon the inquiry whether the legislature has transcended the limits of its authority. *If, therefore, a statute purporting to have been enacted to protect the public health, the public morals, or the public safety, has no real or substantial relation to those objects, or is a palpable invasion of rights secured by the fundamental law, it is the duty of the courts to so adjudge, and thereby give effect to the constitution.*" (Emphasis supplied.)

In

Minnesota v. Barber (1890), 136 U.S. 313, 34 L. ed. 455,

the Court said (at p. 319):

> "The presumption that this statute was enacted, in good faith, for the purpose expressed in the title, namely, to protect the health of the people of Minnesota, cannot control the final determination of the question whether it is not repugnant to the Constitution of the United States. There may be no purpose upon the part of a legislature to violate the provisions of that instrument, and yet a statute enacted by it, under the forms of law, may, by its necessary operation, be destructive of rights granted or secured by the Constitution." (Citing *Henderson etc. v. New York etc.*, 92 U.S. 259, 268, 23 L. ed. 543.)

After referring to the *Mugler Case*, supra, the Court also said:

> "Upon the authority of those cases, and others that could be cited, it is our duty to inquire, in respect to the statute before us, not only whether there is a real and substantial relation between its avowed objects and the means devised for attaining those objects, but whether by its necessary or natural operation it impairs or destroys rights secured by the Constitution of the United States."

In

Adams v. Tanner (1917), 244 U. S. 590, 61 L. ed. 1336,

this Court rejected the theory that mere reference to the police power can create any unassailable presumption, saying (at p. 595):

"Happily for all, the fundamental guaranties of the Constitution cannot be freely submerged if and whenever some ostensible justification is advanced and the police power invoked."

In

Meyer v. Nebraska (1923), 262 U.S. 390, 67 L. ed. 1042,

this Court, after citing numerous earlier cases, declared the rule to be as follows (pp. 399-400):

"The problem for *our determination* is whether the statute, *as construed and applied*, unreasonably infringes the liberty guaranteed to the plaintiff in error by the 14th Amendment." (Emphasis supplied.)

In *Lehigh Valley R. Co. v. Commissioners*, supra, (278 U.S. 24, 73 L. ed. 161) already cited in the discussion upon the "Cost of Compliance," this Court said (at p. 33):

" . . . The function of the court is to determine whether the outlay involved in the order of the board is extravagant in the light of all the circumstances . . . it becomes the duty of the court, where the cost is questioned, to determine whether it is within reasonable limits."

In

N. C. & St. L. R. Co. v. Walters (1935), 294 U.S. 405, 79 L. ed. 458,

the railroad company had protested against being compelled to pay one-half of the cost of the construction of an underpass whereby a main trunkline highway was to be carried beneath one of its main lines. The company, conceding that the state may ordinarily, under its police power,

impose upon a railroad the entire cost, or any part of the cost, of eliminating a grade crossing, claimed that under the special circumstances there shown the statute which imposed the cost upon it, as well as the order of the state authority made pursuant thereto, were arbitrary and unreasonable, in violation of the due-process clause of the Fourteenth Amendment. Upon the facts, this Court held that the state court had erred in refusing to consider the special facts relied upon by the railroad company, and reversed that court's dismissal of the suit. The Court said, in part:

> "*A statute valid as to one set of facts may be invalid as to another. A statute valid when enacted may become invalid by change in the conditions to which it is applied.* The police power is subject to the constitutional limitation that it may not be exerted arbitrarily or unreasonably . . . The promotion of public convenience will not justify the requiring of a railroad, any more than of others, the expenditure of money, unless it can be shown that a duty to provide the particular convenience rests upon it."

This Court thus made it plain that even when a matter so clearly involving safety as a grade-crossing elimination is before it, it will nevertheless protect a railroad by examining closely into the reasonableness of the challenged statute or order, as related to the facts presented.

In another case involving a state statute under which a railroad was required to build an overhead crossing:

Southern Ry. Co. v. Virginia (1933), 290 U.S. 190, 78 L. ed. 260,

the Court said (at p. 196):

"The claim that the questioned statute was enacted under the police power of the State and, therefore, is not subject to the standards applicable to legislation under other powers, conflicts with the firmly established rule that every State power is limited by the inhibitions of the Fourteenth Amendment." (Citing cases.)

In

Fairmont Creamery Co. v. Minnesota (1927), 274 U.S. 1, 71 L. ed. 893,

this Court commented (at p. 11), upon the "duty of the Court *to inquire into the real effect* of any statute duly challenged because of interference with freedom of contract guaranteed by the 14th Amendment, and to declare it invalid when without substantial relation to some evil within the power of the State to suppress and a clear infringement of private rights."

In

Liggett Co. v. Baldridge (1928), 278 U.S. 105, 73 L.ed. 204,

this Court held invalid a police-power statute of Pennsylvania which prohibited the ownership of a drug store by other than a registered pharmacist. The Court said (at p. 111):

"Unless justified as a valid exercise of the police power the act assailed must be declared unconstitutional because the enforcement thereof will deprive appellant of its property without due process of law. * * *"

"The act is sought to be sustained specifically upon the ground that it is reasonably calculated to promote

the public health; and the determination we are called upon to make is whether the act has a real and substantial relation to that end or is a clear and arbitrary invasion of appellant's property rights guaranteed by the Constitution . . . A statute cannot 'under the guise of protecting the public arbitrarily interfere with private business or prohibit lawful occupations or impose unreasonable and unnecessary restrictions upon them.' (Citing cases.) In the light of various requirements of the Pennsylvania statutes, it is made clear, if it were otherwise doubtful, that mere stock ownership in a corporation owning and operating a drug store, can have no real or substantial relation to the public health; and that the act in question creates an unreasonable and unnecessary restriction upon private business. No facts are presented by the record, and, so far as appears, none were presented to the legislature which enacted the statute that properly could give rise to a different conclusion."

In

St. Joseph Stockyards Co. v. United States (1936), 298 U.S. 38, 80 L. ed. 233,

which involved the reasonableness of certain rates fixed by a Federal legislative agency (and assailed under the due-process clause of the Fifth Amendment), this Court announced its views in language which is directly pertinent here. After saying (298 U.S., at p. 50) that "the fixing of rates is a legislative act" and that the legislature may delegate this authority, the Court further said that where the legislative agency is required to accord a fair hearing, and act upon evidence so as to satisfy the requirements of due process, the judicial inquiry goes no further than to

ascertain whether there is evidence to support the findings, and the question of the weight of the evidence in determining issues of fact lies with the legislative agency. The Court then said (at pp. 51-52):

> "But the Constitution fixes limits to the rate-making power by prohibiting the deprivation of property without due process of law or the taking of private property for public use without just compensation. *When the legislature acts directly, its action is subject to judicial scrutiny and determination in order to prevent the transgression of these limits of power. The legislature cannot preclude that scrutiny or determination by any declaration or legislative finding.* Legislative declaration or finding is necessarily subject to independent judicial review upon the facts and the law by courts of competent jurisdiction to the end that the Constitution as the supreme law of the land may be maintained."

Even if the Train Limit Law were a recent enactment, instead of having been passed in 1912, at a time when practically all of the circumstances material to its enactment were far different than at the present time, no state legislature, either as a body or by committee, could possibly have given to a police-power statute, passed with the declared intent to promote safety, so thorough an examination of the facts as is presented by the record, and summarized by the findings in the present case. Practically, such an examination would be impossible. To say that either the trial court, or this Court upon appeal, must blindly and unquestionably accept the legislative conclusions, express or implied, is to foreclose a citizen from judicial review; unless, on its face, the statute is so plainly unreasonable or arbi-

trary that within itself exist the seeds of its judicial dissolution.

Many cases might be cited—each of which must be viewed in the light of its facts—declaring the reluctance of a court to set aside a police power statute or order on the sole ground of unreasonableness; but this Court has not hesitated to give relief in a proper case and has never applied the "scintilla" rule in favor of the state or the rule of "moral certainty and beyond a reasonable doubt" against the citizen, as has the state court in the case at bar.

In

Pacific States Box & Basket Co. v. White (1935), 296 U.S. 176, 80 L. ed. 138,

which was a case involving a disputed police-power regulation of the State of Oregon, the Court (at p. 185) referred to "this rebuttable presumption of the existence of a state of facts sufficient to justify the exertion of the police power."

In

Great Northern Ry. Co. v. Washington (1937), 300 U.S. 154, 81 L. ed. 573,

in which this Court considered the question of the validity of a state statute imposing fees upon public utilities operating in the state, which the state court had held to be in the nature of regulatory or inspection fees, it was said (at pp. 160-161):

> "A law exhibiting the intent to impose a compensatory fee for such a legitimate purpose is *prima facie* reasonable. If the exaction be so unreasonable and disproportionate to the service as to impugn the good

faith of the law it cannot stand either under the Commerce Clause or the 14th Amendment . . . Such a statute may, in spite of *the presumption of validity*, show on its face that some part of the exaction is to be used for a purpose other than the legitimate one of supervision or regulation, and may, for that reason, be void. *And a statute fair on its face may be shown to be void and unenforceable on account of its actual operation.*" (Emphasis supplied.)

In

O'Gorman & Young v. Hartford Ins. Co. (1931), 282 U.S. 251, 75 L. ed. 324,

this Court clearly indicated that while there is a presumption favoring the constitutionality of a challenged police-power statute, that presumption may be overcome by adequate proof. The Court said (pp. 257-258):

"The statute here questioned deals with a subject clearly within the scope of the police power. We are asked to declare it void on the ground that the specific method of regulation prescribed is unreasonable and hence deprives the plaintiff of due process of law. As underlying questions of fact may condition the constitutionality of legislation of this character, *the presumption of constitutionality must prevail in the absence of some factual foundation of record for overthrowing the statute.*" (Emphasis supplied.)

Compare, also, the statement in the opinion in the *Minnesota Rate Cases*, supra (230 U.S. 352, 452-453, 57 L. ed. 1511):

"It is fundamental that the judicial power to declare legislative action invalid upon constitutional grounds is to be exercised only in clear cases. The constitu-

tional invalidity must be manifest, and if it rests upon disputed questions of fact, the invalidating facts must be proved."

In

United States v. Carolene Products Co. (1938), 304 U.S. 144, 82 L.ed. 1234,

this Court said (at p. 153):

"Where the existence of a rational basis for legislation whose constitutionality is attacked depends upon facts beyond the sphere of judicial notice, such facts may properly be made the subject of judicial inquiry, *Borden's Farm Products Co. v. Baldwin*, 293 U.S. 194, and the constitutionality of a statute predicated upon the existence of a particular state of facts may be challenged by showing to the court that those facts have ceased to exist."

The erroneous views of the state court as to the presumption are revealed, not only by its failure to recognize controlling decisions of this Court, but also by the nature of the authorities upon which it actually relied. Thus, it cited a portion of Section 100 of the article in *Corpus Juris Secundum* dealing with the subject of Constitutional Law (See 16 C.J. (2) 277, 278; R. 4059), and apparently treated this quotation as a correct statement supporting the view that no inquiry into the facts could be undertaken by the court. The excerpt, when analyzed, does not support the state court's conclusion; at most, it establishes only that it is to be presumed that the legislature, when it enacted the challenged law, was possessed of full knowledge of the facts and circumstances intended to be reached by the legislation, and acted in good faith and in the light of its knowledge. This presumption, such as it may be, would

in this case extend only to the action of the legislature *in 1912*; it would not avail to support the challenged law, under the greatly changed conditions prevailing *in 1940*. Furthermore the same section of the text, in a portion not cited by the court, declares that the presumption supporting the legislative determination is not conclusive, but merely rebuttable:

16 *C. J.* (2) 281-282:

> "So, when a statutory classification is called into question, if any state of facts reasonably can be conceived that would sustain it, the existence of that state of facts at the time the law was enacted must be assumed. However, *this presumption of the existence of factual conditions, or of the correctness of legislative findings, supporting legislation, is a rebuttable presumption of fact and not a rule of law which makes legislative action invulnerable to constitutional attack.* The party attacking the statute has the burden of establishing the invalidating facts on which his claim is based, if the court cannot take judicial notice of such facts."

The opinion in *Salem Lodge, etc. v. Swails* (1935), 209 Ind. 347, 197 N.E. 837, cited by the state court (R. 4059), contains no statement such as attributed to it by the court. No question was presented under the federal due-process clause, or any other provision of the Federal Constitution. The decision simply has no relation at all to the case at bar.

In

State ex rel. Blaine v. Wisconsin Telephone Co. (1919), 169 U.S. 198, 172 N.W. 255,

also cited in the state court's opinion (R. 4059), the question was as to the power of the state to continue to reg-

ulate the rates of telephone companies, after possession and control of their facilities had been assumed by the President, on July 31, 1918, pursuant to authority of Congress, as an incident to the war effort. The decision obviously has no bearing, unless to support the principle of Federal supremacy in matters of joint concern.

State ex rel. McBride v. Superior Court (1918), 103 Wash. 409, 174 Pac. 973 (cited at R. 4059-4060), involved the question of the legality of the detention of a diseased individual, who was held pursuant to an administrative order of a local health commissioner, acting under a local city ordinance. In its opinion the Washington court made certain pronouncements respecting the scope of the inquiry where the police power is involved, which, however, must be read in relation to the facts before the court, and also in the light of the controlling decisions of this Court. On its facts, the case bears no resemblance to the instant case, and certainly does not support any view that when the validity of an alleged safety statute is duly questioned, and the facts supporting invalidity are carefully developed, the court cannot consider them in arriving at its determination.

The decision in *People ex rel. Rogers v. Letford* (1938), 102 Colo. 284, 79 Pac.(2d) 274, (R. 4067) is likewise without particular bearing in the present case. The case involved generally the validity of the Water Conservancy Act of Colorado; and the pronouncement quoted in the opinion herein was merely a sort of general preamble to the discussion of the particular issues. The statement of the Colorado Court to the effect that invalidity must be established

"beyond a reasonable doubt" is not supported by the pronouncements of this Court. As shown by the numerous decisions already cited, the requirement is no more than that the invalidating facts be *clearly* established.

The state court's approach to the issues in the instant case thus resembles that of the Supreme Court of Tennessee in its decision in *Nashville, C. & St. L. Ry. v. Baker* (1934), 167 Tenn. 470, 71 S.W.(2d) 678, which, as noted above, was reversed upon appeal to this Court: *Nashville, C. & St. L. Ry. v. Walters*, supra (294 U.S. 405, 79 L.ed. 458). In summarizing the state court's decision this Court said (294 U.S., at pp. 414-415):

> "The Supreme Court (of Tennessee) declined to consider the special facts relied upon as showing that the order, and the statute as applied, were arbitrary and unreasonable; and did not pass upon the question whether the evidence sustained those findings. It held that the statute was, upon its face, constitutional; that when it was passed the State had, in the exercise of its police power, authority to impose upon railroads one-half of the cost of eliminating existing or future grade crossings; and that the Court could not 'any more' consider 'whether the provisions of the act in question have been rendered burdensome or unreasonable by changed economic and transportation conditions,' than it 'could consider changed mental attitudes to determine the constitutionality and enforceability of a statute'."

So, here, the state court apparently declined to consider the facts specially found, and relied upon as showing that the Train-Limit Law is arbitrary and unreasonable; or even to pass upon any question whether the evidence sus-

tains those findings. It has held that the challenged statute is upon its face constitutional as an exercise of the police power, and supported by a presumption of reasonableness so strong as to render consideration of the facts unnecessary as well as improper. It has wholly failed to consider whether the statute, even if it could be assumed to have been valid when enacted in 1912, has become invalid because of the vast changes in conditions during the intervening years. In the light of the *Walters case* and the other decisions cited, the state court's consideration of the case was incomplete and partial, and its conclusions were wholly erroneous.

Whatever may be the correct rule generally as to the nature of the presumption in favor of the validity of a police-power statute, and, correspondingly, the extent of the consideration of the facts which must be undertaken by the court before which such a statute is challenged, no such presumption is available in the instant case to assist the appellee in its attempt to sustain the law, nor to justify or support the state court's failure to make a proper determination of the law's merits as an asserted safety measure, upon full consideration of all the facts. Such determination was properly made by the trial court in the first instance, and may and should now be made by this Court on this appeal.

A series of recent decisions of this Court, some of which have been greatly relied upon by appellee in the courts below, make it very clear that the presumption favoring the reasonableness of a state law arises, because the legislative determination "is presumed to be supported by facts known

to" the legislature, which is "assumed to have acted upon information available to the courts"; but that such presumption does not arise if "facts judicially known or proved preclude the possibility" of the legislature having so acted. Compare:

South Carolina Highway Dept. v. Barnwell Bros., supra (303 U.S., at p. 191);
Clark v. Paul Gray (1939), 306 U.S. 583 (at p. 594); 83 L. ed. 1001;

and see, also:

Chastleton Corporation v. Sinclair (1924), 264 U.S. 543 (547), 68 L. ed. 841;
United States v. Carolene Products Co., supra, (304 U.S. 144, 153, 82 L. ed. 1234).

In the instant case, we have precisely the situation contemplated by the Court's qualifying phrase: in that facts both judicially known, and amply established by competent proof, demonstrate that the law cannot *today* be supported by the facts assumed to have been known to the legislature which passed it in 1912.

Conceivably, the prima facie presumption of validity illustrated by the decisions might assist to support the law, if reliance could be placed upon conditions as they existed in 1912, and the knowledge of those conditions, presumably available to and acted upon by the 1912 legislature; in other words, if this were a prosecution for a violation committed in 1912 or shortly thereafter, and while the conditions were fairly similar to those prevailing at the time of the enactment.

However, it is here shown, so clearly that extended argument is unnecessary, that the present conditions are vastly and fundamentally different from those existing when the law was passed. It is equally true, of course, that the 1912 legislature could not possibly have had any knowledge or appreciation, or even any prevision, of present conditions. Appellant's railroad plant in Arizona, as of the months of March and April, 1940 (the precise period of the long-train operations which are the subject of the present case) is entirely different from that which existed in 1912. Both the rolling equipment and the fixed plant have been completely changed, through the medium of extensive improvement and reconstruction. The volume and characteristics of the traffic are quite different from that which was carried in 1912. The evidence upon this point, which is wholly unchallenged, is summarized in the trial court's Findings of Fact Nos. IV(a) (R. 3897-3898), VI(a) and (b) (R. 3902-3907) and VII(b) and (c) (R. 3915-3924). Finding IV(a) in its entirety, and as well Findings VI(a) and (b) in large part, were not questioned nor assigned as error by appellee upon its appeal to the state court. Furthermore, throughout the entire course of the case, appellee has never made any contention that these sweeping changes have not occurred; nor referred to any evidence which would challenge or contradict the showing of the fact and extent of the changes. On the contrary, the changes were treated as established facts (appellee's opening brief in the state court, pp. 240, 274-275).

It follows that in the instant case there is no presumption such as mentioned in the cited cases, grounded upon sup-

posed legislative knowledge, and now requiring consideration in connection with a judicial examination of the facts as they have been found to exist, and the determination, upon the basis of existing facts, whether the law is a proper and reasonable exercise of the police power. A presumption, based upon supposed legislative knowledge of 1912 conditions, would have no value to sustain a claim that the law is valid as applied to the wholly different conditions of 1940. On the other hand, the legislative determination cannot be presumed to be supported by the facts of 1940, upon which the case must now rest, because this Court knows judicially, and the evidence of the record proves beyond challenge, that those facts are wholly different from the facts which were presumably known to the 1912 legislature; and further knows that, in the very nature of things, that legislature could not have known the 1940 facts, nor accurately foreseen them.

What we have said above is perhaps another phrasing of the principle expressed in those decisions of this Court which hold that a statute, which may possibly be valid as against a challenge of unreasonableness at the time of its enactment, may, through lapse of time, and resulting change in conditions, become unreasonable and therefore invalid. Typical of these cases is *Nashville, C. & St. L. R. Co. v. Walters*, supra, in which, as previously noted, the Court said (294 U.S., at p. 415):

> "A statute valid as to one set of facts may be invalid as to another. *A statute valid when enacted may become invalid by change in the conditions to which it is applied.*" (Emphasis supplied.)

In *Albee State Bank v. Bryan* (1931), 282 U.S. 765, 75 L. ed. 699, which was a suit to enjoin enforcement of a Nebraska state law upon the ground of violation of the due-process clause, the Court said (p. 775):

> "The principle that a police regulation, valid when adopted, may become invalid because in its operation it has proved to be confiscatory, carries with it the recognition of the fact that earlier compliance with the regulation does not forfeit the right of protest when the regulation becomes intolerable."

So, in the present case, the possible suggestion that the Train-Limit Law was enacted in 1912, but its validity never contested until 1929, when the *First Arizona Train-Limit Case* was filed, obviously affords no reason for criticizing appellant's present endeavor to have the law declared invalid.

In *Galveston Electric Co. v. Galveston* (1922), 258 U.S. 388, 66 L. ed. 678, this Court stated its views in practically the same language used in the *Nashville case*, supra, saying (at p. 400):

> "A rate ordinance invalid when adopted may later become valid, just as *an ordinance valid when made may become invalid by change in conditions* (citing cases)." (Emphasis supplied.)

Equally this argument may be said to follow somewhat the same line of reasoning as in

Southern Ry. Co. v. Virginia, supra (290 U.S. 190),

in which the Court held invalid an asserted police power statute which provided that a state administrative officer might make a mandatory order for the elimination of a

grade crossing, without prior notice or investigation; the Court declaring that such an officer could not be empowered to make an order of that type, having final and binding effect, merely upon the basis of his view and opinion. Dealing with the argument that the legislature might itself have passed a specific statute ordering the elimination of the crossing, without giving to the railroad company notice or opportunity to be heard, the Court said (at p. 197):

> "There is an obvious difference between legislative determination and the finding of an administrative official not supported by evidence. In theory, at least, the legislature acts upon adequate knowledge, after full consideration and through members who represent the entire public."

If, however, it should appear, as in the present case, that the legislative action as applied to present-day conditions is not and cannot be based upon adequate, *or any*, knowledge of those conditions, or any consideration of them, and that the conditions which the enacting legislature knew or might have known have wholly changed, then the "obvious difference" noted by the Court disappears; and unreasonable legislative action having no present factual basis is no less a denial of due process than similar arbitrary action of an administrative official.

We close this discussion with the citation of the decision of the United States District Court for Arkansas, in

Missouri Pacific R. Co. v. Norwood (1933), 13 Fed. Supp. 23.

In this decision, later affirmed by this Court on December 11, 1933 (290 U.S. 600, 78 L. ed. 527), in a brief memor-

andum opinion, the District Court expressly recognized that even though the statute there involved (the Full-Crew Law of Arkansas) might have been sustained in earlier decisions, a re-examination of the facts currently existing should be made so as to determine whether conditions had so changed as to render the statute arbitrary and unreasonable, in the light of those changes. The court said (at p. 26):

> "Concisely, the issue is whether conditions in operation affecting these freight train and switching activities and/or expense of compliance with the laws have so changed since these statutes became law as to render application of them now clearly unreasonable and arbitrary, although such was not so under conditions existing when they were enacted. The 'conditions' and the changes therein are to be considered as to their effect upon the safety of employees and of the public. The 'expense' is to be considered as 'an element properly to be taken into account in determining whether such laws are arbitrary.' Missouri Pac. R. Co. v. Norwood, 283 U.S. 249, 255, 51 S. Ct. 458, 461, 75 L. ed. 1010.
>
> "We are dealing with operating conditions of freight trains (both on the road and in the yard) and the changes on the road which have come about therein within the 25 years since the brakeman law was enacted in 1907, and changes in the city yards during the 19 years since the switchman law was enacted in 1913. To give a picture of these changes, counsel have properly found it necessary to introduce much evidence and upon many different details."

The distinction between the *Norwood Case* and the instant case, insofar as concerns the present discussion, is

that in that case there were two earlier decisions in which the challenged law had been sustained upon the basis of the conditions as they then existed; whereas in the instant case, no earlier decision exists sustaining the challenged law. The only prior judicial expression rendered involving this law (the final opinion of the three-judge court in the *First Arizona Case*, 2 F. Supp. 855) condemns it as invalid upon substantially all of the grounds announced in the opinion, conclusions, and judgment of the trial court herein. It is difficult to see how any greater presumption can exist to favor appellee, or support the law, than was recognized in the *Norwood Case;* and certainly no greater affirmative burden here rested upon appellant, in presenting its affirmative defense, than was faced by the moving party in that case. In fact, in the present case, the presumption is not available for the reasons shown; and the burden upon appellant in sustaining its due-process point should not be regarded as any greater than to show, by a fair preponderance of the evidence, that in the light of present-day conditions (upon which, alone, appellee must rely to sustain its position) the challenged law bears no reasonable relation to its alleged object of safety, and, instead of promoting that object, actually increases many hazards and creates many others which would not exist if the law were not enforced. Even if it could be held, however, that the presumption still remains and must be overcome, the evidentiary showing here was ample, as the trial court indicated, to establish the facts which demonstrate that the law is unreasonable, and thus to overcome the presumption completely.

(d) Common Belief, as Exemplified by the Almost Total Absence of Similar State or Federal Laws, and Also by the Recent Action of the Interstate Commerce Commission (Service Order No. 85), May Be Relied Upon to Show, and Does Show, That the Law Is Wholly Unreasonable.

This Court has frequently given consideration in its decisions to what it has termed "common belief" or "common knowledge", in determining the propriety and validity of challenged police-power regulations. Examples of such cases are:

Jacobson v. Massachusetts (1905), 197 U.S. 11, 49 L. ed. 643;
Muller v. Oregon (1908), 208 U.S. 412, 52 L. ed. 551;
Bunting v. Oregon (1917), 243 U.S. 426, 61 L. ed. 830;
West Coast Hotel Co. v. Parrish (1937), 300 U.S. 379, 81 L. ed. 703.
Parker v. Brown, supra (317 U.S. 341).

In the *Jacobson Case*, the Court sustained a compulsory vaccination law, and took judicial notice of the fact that "it is the *common belief* of the people of the United States" that vaccination prevents smallpox.

In the *Bunting Case*, the Court sustained the Oregon 10-hour law applicable to men factory-workers, and referred in its opinion to the "*well-known fact* that the custom in our industries does not sanction a longer service than ten hours per day;" and said, therefore, that it could not be held, as a matter of law, that the legislative requirement was unreasonable or arbitrary.

In the *Muller Case*, the Court, in passing upon the validity of an Oregon statute limiting the hours of labor of

women to not more than 10 hours per day, took into consideration the fact that there is "a *widespread belief* that woman's physical structure, and the functions she performs in consequence thereof, justify special legislation restraining or qualifying the conditions under which she should be permitted to toil." The Court further definitely indicated that common belief or opinion may readily serve to support either side of a controversy over the validity of a statute, saying (208 U.S., at pp. 420-421):

> "Constitutional questions, it is true, are not settled by even a consensus of present public opinion, for it is the peculiar value of a written constitution that it places in unchanging form limitations upon legislative action, and thus gives a permanence and stability to popular government which otherwise would be lacking. At the same time, when a question of fact is debated and debatable, and the extent to which a special constitutional limitation goes is affected by the truth in respect to that fact, a widespread and long continued belief concerning it is worthy of consideration. We take judicial cognizance of all matters of general knowledge."

In the *West Coast Hotel Case*, the Court referred to the action of "many states" as evidencing "a deep-seated conviction;" and relied upon "common knowledge" and "judicial notice" as affording added support for its views, saying (300 U.S., at p. 399):

> "We may take *judicial notice* of the unparalleled demands for relief which arose during the recent period of depression and still continue . . . It is unnecessary to cite official statistics to establish what is of *common knowledge* through the length and breadth of

the land. While in the instant case no factual brief has been presented, there is no reason to doubt that the State of Washington has encountered the same social problem that is present elsewhere." (Emphasis supplied.)

In *Parker v. Brown*, supra, this Court took "judicial notice" (317 U.S., pp. 363-365) of available data respecting the nature of the problem involved, including material from such sources as bulletins issued by federal and state departments of agriculture, studies made under the auspices of the state university, reports issued by the Federal Farm Board, and the like.

In the instant case the record shows that although train-limit legislation has been advocated in the legislatures of many states, and before Congress, those proposals have been rejected in all but four of the states, and that train limit laws have actually been enforced in only two states: Arizona and Oklahoma. The practice of standard long-train operation, as defined in Finding No. 1 of the trial court, R. 3888, is the general, uniform, and standard practice everywhere in the United States on all, or practically all, major railroads, except only in the two states mentioned. The testimony specifically shows, in considerable detail, the nature and character of such operations, upon appellant's lines and also in every section and in almost every state of the United States, and covers not only the entire national transportation system, in a general way, but also, and specifically, the lines of appellant's principal competitors and connections. This specific showing relates to 16 major lines or systems, which operated in 1939 nearly 126,000 miles of railroad, or more than 54%

of the total mileage of the class I railroads of the United States, and handled approximately 60% of all the railroad freight and passenger traffic.

This evidence certainly justifies this Court in reaching the conclusion that there is a common, widespread and virtually uniform belief among those who actually operate the railroads that the standard long-train operating practice is highly desirable and beneficial, simply because it is so nearly universal, and that an arbitrary and inflexible limit is wholly improper and of no benefit to anyone except the limited class of employes* whose opportunities for employment are artificially increased. Because the Arizona law thus directly conflicts with the standard railroad practices throughout the United States, it should be regarded as opposed to common belief and opinion, and therefore as arbitrary and unreasonable. Certainly the term "common belief," as used by this Court, does not mean the belief held solely by the limited class of employes directly and financially benefited by this particular regulation. These are the only classes of persons who have urged or supported train-limit laws, appearing generally through their national organizations in arguing for such measures before various state legislatures and before the committees of Congress, and, as well, in litigation like the present case, including the various train-limit cases to which we have

*Exhibit 194 (R. 3106) shows that in 1939 644 train and engine-service employes, out of a total of 2,693 employes of all classes on appellant's Tucson Division in Arizona (or 23.9 per cent) would and did have their employment opportunities affected because of the increased number of trains operated by reason of the law's limitations.

referred. The financial interest of these employes is apparent.

There is no showing, nor any basis for assuming, that the other 76 per cent of railroad employes as a class hold any general opinion or belief favoring train-limit regulation. No representatives of any classes of employes other than the train and engine-service group (trainmen, conductors, engineers, and firemen), took part in the instant case, or have, to our knowledge, supported that group in any other train-limit disputes. The true interest of these other employes is clearly opposed to the law, for it not only does not make more jobs for them (as it does for the train and engine group), but actually makes their work much more hazardous. For example, Exhibit No. 276 (R. 3371) shows that in the 12 years 1929-1940, inclusive, 444 employes *in all classes of appellant's service* suffered reportable casualties as a result of train and train-service accidents in Arizona, as compared to 207 such casualties in Nevada; although the aggregate of appellant's Nevada traffic was about 5 percent greater, measured in car miles. During these twelve years long-train operation prevailed in Nevada, and short-train operation in Arizona, but conditions otherwise were practically identical. Clearly the common belief of the 76 percent of the employes whose hazards of employment are increased, though their employment opportunities are not improved at all by the law, may fairly be presumed to be opposed to the arbitrary limitation.

That "common belief" is opposed to the arguments of the restricted class of employes whose financial well-being

is improved is also shown by various facts of record, and other matters which the Court may properly notice judicially: that no state other than Arizona and Oklahoma has enforced any law limiting the length of, or number of cars in, a railroad train; that the National Government has refused to impose any *fixed maximum* limit, or any limitation at all, other than that which requires that trains shall not be longer than can be safely controlled with the air-brakes; and the repeated approval by the Interstate Commerce Commission, as the agency of Congress, of the purchase of larger and heavier locomotives designed and used principally for the handling of long trains. Although the Commission is authorized and required by law to investigate unsafe practices (which, according to the argument of those who favor the Train-Limit Law, includes the operation of trains of more than 70 freight or 14 passenger cars) and to take steps to eliminate such practices, or to recommend additional Federal legislation if necessary, it has never found or held that the operation of long trains is a dangerous practice, or recommended that train lengths be limited as required by this law. It conducted an extensive investigation into the operation of power brakes, and has now, as a result of that investigation, issued its tentative order which contemplates, among other things, operation of freight trains of 150 cars. It likewise conducted 1002 accident investigations during the 12-year period 1928 to 1939 (as tabulated in Exhibits 270, 271; R. 3310-3348); but it did not, in any of those investigations, make any reference to or recommendation concerning the length of trains, although empowered to do

so, and although recommendations were made respecting other features of operations.

It is clear that the common belief of all those, both in railroad circles and in public office, who are charged with responsibility for the operation of trains and the movement of traffic, including the safety of such operations, as well as the action of the vast majority of the states (compare the *West Coast Hotel Case*, supra), is decidedly opposed to the principle of arbitrary train limitation expressed in the Arizona law. The operation of long trains substantially exceeding the Arizona limits is the common and ordinary practice in every state, except Arizona and Oklahoma; that practice has been successfully followed by appellant on all parts of its system, except in Arizona and the adjacent affected territory, for more than 20 years last past, and is being followed today, under authority of Service Order 85, in that territory as well.

It is the common belief *of today, not of 1912*, which is to be given consideration in the present case.

Just at present, and in view of the existing national emergency, common belief and opinion are more than ever overwhelmingly opposed to the crippling impediments imposed by the law upon speedy, efficient and economical railroad transportation. Even in normal times it is highly important that the free flow of the interstate commerce of the nation should not be hampered by artificial restrictions. In time of war and national peril it is not merely important: it is absolutely vital to the national existence. Appellant's lines across Arizona and New Mexico constitute an inseparable and indispensable

part of an essential through route, over which move, and must move, not alone the ordinary commerce of the country, but also the men, materials and supplies required for the national war effort. That the enforcement of the law does, and will continue to, interfere with, delay and obstruct the free movement of that essential traffic, require the employment of more men and consequent wastage of manpower, and cause the wasteful use of locomotives, is completely established upon the record, and would, indeed, be obvious, even without the careful development of the facts which appears in the testimony.

Full recognition of these facts, which are notorious among those belonging to, or interested in, the railroad industry, was accorded by the Interstate Commerce Commission when it issued Service Order 85. In the recitals preceding the order, the Commission called attention to the delays, congestion, interference, and locomotive wastage caused by compliance with state train-limit regulations, and declared that long trains could be operated in accordance with existing safety standards, and that the free flow of traffic would be thereby facilitated. These recitals were not based upon any extended hearing or investigation, or any substantial evidentiary showing, for none was required, the order having been made as an emergency measure under par. 15 of Section 1 of the Interstate Commerce Act. They reflect rather the great body of common knowledge and informed opinion respecting the reasonableness of train-limit restrictions, as judged by their effects and results. The Commission's conclusion that the law *must* be disregarded, in the emergency, merely emphasizes, however, that even in normal times

the free flow of traffic is greatly impeded, wasteful practices are compelled, and interstate commerce is directly interfered with and burdened, without any tangible or compensatory benefits whatever, from the safety standpoint; for if it is true, as is undoubtedly the fact, that long trains can be operated "in accordance with safety standards *now* applicable" (i.e., during the present emergency), it is equally true that they can be operated, in normal times, in accordance with the highest safety standards. In its opinion dealing with the validity of Service Order 85, the Commission said (256 I.C.C. at p. 536):

> "The fact that freight trains in excess of 70 cars and passenger trains in excess of 14 cars are operated in other states is convincing evidence of its safety, except where unusual operating conditions exist."

The operating conditions on appellant's lines in Arizona are not unusual but, on the contrary, somewhat more favorable than in many states where long-train operation is the normal and ordinary practice. There is nothing to suggest that the present safety standards of railroad operation are any different than in 1938, 1939, or 1940, or in any recent period; and there have been no new enactments or amendments of existing federal laws, dealing with safety of train operations, since this case was commenced.

(e) A Purported Safety Measure Which in Fact Bears No Reasonable, Nor Any Relation Whatever, to Health or Safety, but on the Contrary Increases Certain Hazards and Creates Others Which Would Not Otherwise Exist, Is Unreasonable and Without Rational Basis, and Without Regard to Its Claimed or Actual Effects Upon Interstate Commerce, Should Be Held Invalid Because in Violation of the Due-Process Clause. The Train Limit Law Comes Within This Principle, and Is Therefore Invalid.

The first sentence of the above caption states a legal principle which is so well known and so widely accepted, that extensive citation of authority is probably unnecessary. We shall, therefore, refer to only a few of the leading decisions. In

Mugler v. Kansas, supra (123 U.S. 623, 31 L. ed. 205),

this Court said (at p. 661):

> "If, therefore, a statute purporting to have been enacted to protect the public health, the public morals, or the public safety, has no real or substantial relation to those objects, or is a palpable invasion of rights secured by the fundamental law, it is the duty of the courts to so adjudge, and thereby give effect to the constitution."

In

Minnesota v. Barber, supra (136 U.S. 313, 34 L. ed. 455),

the Court, after referring to the *Mugler Case*, said:

> ". . . It is our duty to inquire, in respect to the statute before us, not only whether there is a real and substantial relation between its avowed objects and the

means devised for attaining those objects, but whether by its necessary or natural operation it impairs or destroys rights secured by the Constitution of the United States."

In *Liggett Co.* v. *Baldridge*, supra, this Court said, in addition to the portions of the opinion already quoted (278 U.S., at pp. 111, 112):

> "The police power may be exerted in the form of state legislation where otherwise the effect may be to invade rights guaranteed by the 14th Amendment only when such legislation bears a real and substantial relation to the public health, safety, morals or some other phase of the general welfare."

After reviewing the facts relied upon to support the law under attack, the Court said further (at p. 114):

> "The claim, that mere ownership of a drug store by one not a pharmacist bears a reasonable relation to the public health, finally rests upon conjecture unsupported by anything of substance. This is not enough; and it becomes our duty to declare the act assailed to be unconstitutional as in contravention of the Due Process Clause of the 14th Amendment."

In *Washington, etc.*, v. *Roberge* (1928), 278 U.S. 116, 73 L. ed. 219, this Court, quoting from *Nectow* v. *Cambridge* (1928), 277 U.S. 183, 188, 72 L. ed. 842, said (278 U.S., p. 121):

> "'The governmental power to interfere by zoning regulations with the general rights of the landowner by restricting the character of his use, is not unlimited and, other questions aside, such restriction cannot be

imposed if it does not bear a substantial relation to the public health, safety, morals, or general welfare.' Legislatures may not, under the guise of the police power, impose restrictions that are unnecessary and unreasonable upon the use of private property or the pursuit of useful activities."

In *Chicago, St. Paul, M. & O. Ry.* v. *Holmberg* (1930), 282 U.S. 162, 75 L. ed. 270, this Court, in declaring invalid an order of the Nebraska State Railroad Commission requiring the installation of an underpass, made the following pronouncement (at p. 167):

> "It is plain that the Commission proceeded upon the assumption that the statute authorized it to compel plaintiff to establish the underground pass for the convenience and benefit of defendant in the use of his own property, and that that alone was the ground and purpose of the order. The application thus given to the statute deprives plaintiff of property for the private use and benefit of defendant, and is a taking of property without due process of law, forbidden by the Fourteen Amendment (citing cases)."

In *Nashville, C. & St. L. Ry. Co.* v. *Walters*, supra, already cited to the point that a statute valid as to one set of facts may be invalid as to another, or though valid when enacted may become invalid by change of conditions, the Court also said (294 U.S., at p. 415):

> "The police power is subject to the constitutional limitation that it may not be exerted arbitrarily or unreasonably. To this limitation, attention was specifically called in cases which have applied most broadly the power to impose upon railroads the cost of separation of grades." (Citing cases.)

In *Treigle* v. *Acme Homestead Assn.* (1936), 297 U.S. 189, 80 L. ed. 575, this Court said (at p. 197):

> "Though the obligations of contracts must yield to a proper exercise of the police power, and vested rights cannot inhibit the proper exertion of the power, it must be exercised for an end which is in fact public and the means adopted must be reasonably adapted to the accomplishment of that end and must not be arbitrary or oppressive."

In its own earlier decisions, which, however, were wholly ignored in its opinion in the case at bar, the state court has recognized the constitutional limitations upon the police power expressed in the cited decisions of this Court. Compare:

State v. Childs (1927), 32 Ariz. 222, 257 P. 366;
Atchison etc. Ry. Co. v. Arizona (1928), 33 Ariz. 440, 265 Pac. 602;
State v. Borah (1938), 51 Ariz. 318, 76 P.(2d) 767;
Buchman v. Bechtel (1941), 57 Ariz. 363, 144 P.(2d) 227; 134 A.L.R. 1374.

The fundamental principle being clear, the question whether it is applicable in the present case is essentially a question of fact: namely, whether the challenged law actually promotes safety, or on the other hand, not only fails to do so, but actually increases the hazards of train operation, both generally, and as to specific classes of accidents.

We do not propose at this point to argue at length all of the evidence bearing upon the safety issue; it is carefully reviewed in the safety findings (Nos. XI, XII, XIII; R. 3969-4032) adopted by the trial court, and also

discussed in some detail in Volume II of this brief. In preceding portions of the argument in this volume, we have called attention to some of the more significant features of this phase of the case. For example, in the discussion of the "Concurrent Field" (part 3 of this argument), we have contrasted the serious burdens and obstructions imposed, against the nebulous safety benefits actually realized. Again, in our review of the "Cost of Compliance" (subdivision (a) of the present topic), we show that even considering only the one minor class of hazards claimed by appellee to be favorably affected by the law, the most that can be said, upon the basis of experience gained during the twelve most recent years (1929-1940) for which statistics were available at the time of trial, is that operation under the short-train restriction is only a little more dangerous *in this respect*, than the long-train practice; this being equally true whether overall totals of casualties, or their relative frequencies, or both, are considered.* But when *all* classes of hazards to the same group of employees (road freight conductors and trainmen) claimed to be subject to the slack-action hazard are considered, the law increases the dangers substantially;† when all classes of hazards to *all* employes, in-

*Actually, in the restricted operation in Arizona, there were 62 slack-action casualties to trainmen on duty, during the twelve years, as compared to 61 in Nevada; on the basis of casualty rates, there was approximately one more casualty of this type, in Arizona, for each four hundred and seventeen million car miles, than under the long-train practice in Nevada. (Ex. 280, R. 3375)

†Ex. 279, R. 3374, shows, for example, 117 casualties to road freight conductors and trainmen on duty during the twelve long-train years (1929-1940) in Nevada, and 225 during the same twelve years in Arizona; the casualty rates per one hundred million car miles were: 7.23 for Nevada, and 14.57 for Arizona.

cluding both enginemen and trainmen, engaged in road freight train operation are considered, the increased hazards are still more clearly shown;* and finally when all classes of hazards, to *all* employees on duty, arising out of train operations generally are considered, the effects of the law as a consistent creator of unnecessary danger stand convincingly revealed.†

The conclusions drawn from these Arizona-Nevada comparisons, whose propriety is affirmatively declared in both the findings (R. 3985-3986), and the opinion (R. 4049-4050) of the trial court, are strongly confirmed by the comparisons of casualties in Arizona and New Mexico, including both the appellant's operations in those two states (Finding XII-j, R. 4001-4004; Exhibits 387, 388, 389, 397, R. 3549-3565, 3578), and those of the Santa Fe, which also operates in the two states, and likewise under substantially identical conditions, apart from the train limit law (Finding XII-k, R. 4004-4006; Exhibit 296, R. 3435); by the casualty experience of the Chesapeake and Ohio Railway, which has developed the long-train operating practice to a degree probably not exceeded by any other major carrier (Finding XII-l, R. 4006-4008; Exhibits 122, 123, R. 2982-2983); and by the national showing of the consistent

*Ex. 277, R. 3372, shows that the total of the Nevada casualties sustained by these employees during the twelve-year period was 134; the corresponding Arizona total was 290. The casualty rates per one hundred million car miles were: 8.27 in Nevada, and 18.77 in Arizona.

†Ex. 276, R. 3371, shows, for the same twelve-year period, 207 casualties in Nevada sustained by all classes of employees on duty occurring in train and train-service accidents, and 544 such casualties in Arizona. The casualty rates per million locomotive miles were: 4.77 in Nevada, and 9.22 in Arizona. This showing includes all passenger, freight, and other train operations.

general reductions in both numbers and frequency of all classes of accidents and casualties involving employes and passengers, from all classes of hazards, which have taken place side by side with the widespread development and adoption of the long-train practice, and the consequent increases in the length of trains and the number of long trains operated (Exhibits 262 to 267, inc., 269, 390, R. 3300-3305, 3307, 3566).

While the State Supreme Court, as already noted, omitted from its opinion any conclusion based upon the evidence relative to the safety aspect of the case, the memorandum opinion of the trial court was by contrast quite complete. We quote the following significant passages from that opinion (R. 4050-4053):

> "Long-train method of operation prevails in *passenger service* all over the United States, except in Arizona, and the statistics demonstrate, from the safety angle, that the fourteen-car limit has no logical or reasonable basis. Furthermore, long passenger-train operations in Arizona are entirely practicable and would result in greater efficiency, economy and safety.
>
> "Hence, certainly as applied to passenger-train operations, the challenged law bears no reasonable relation to its claimed object of safety, and instead of promoting that object actually increases many hazards, and creates many others which would not exist if the law were not enforced."
>
> * * * * * * *

After referring to freight-train operations, the opinion continued with the following comments, applicable to both classes of operations:

"Essentially then the question is not whether a given number of long trains may be operated with fewer casualties than an equal number of short trains, but rather whether the long-train method of moving the entire volume of traffic results in fewer casualties, of all classes, than the movement of the traffic in a larger number of trains of restricted length.

"In determining then whether the law bears any reasonable relation to safety, only the over-all result in casualties of the entire operation should be considered and when thus weighed *it is clear that the law not only does not increase safety of train operations in Arizona, but that as a matter of cold fact it makes these short-train operations more dangerous.*

"Thus the Arizona Train-Limit Law not only bears no reasonable relation to safety but, to the contrary, does, and if enforced will continue to, impair and lessen substantially the safety of defendant's train operations in Arizona and the adjacent affected territory." (Emphasis supplied.)

We have cited the *First Arizona* and *Nevada Train-Limit Cases* on the points of invasion of the exclusive national field, and occupancy of the field by Congress. These cases are also applicable in considering the extent to which a court may and should go in extending the protection of the due-process clause to one who is seriously interfered with and burdened by a statute defended under the "convenient apologetics of the police power." In each of those cases, as here, one of the important issues was whether, in fact, the regulation was reasonably required to protect life, limb and property, or whether it bore no reasonable relation to that object. The evidence

in support of the regulation was largely opinion evidence of men in train service, and their relation of the circumstances of accidents and the details and hazards of train operation. That was offset and overcome by statistics of actual operation—some of which are referred to in the opinions—which showed that the unusual hazards claimed by those witnesses had no foundation in fact. It was extensively and ably argued in briefs on the merits in both cases that the court had no power to substitute its judgment for that of the legislature if there was *any* evidence tending to support the claim that the statute was a safety statute. But both courts found no difficulty in holding on *conflicting* evidence that the statutes were void "because * * * so unreasonable as to deprive plaintiffs of their property without due process of law" and "that it is arbitrary and bears no reasonable relation to the safety of persons or property" (2 Fed. Supp. 862; 18 Fed. Supp. 393). In the case at bar there is *no conflict* in the evidence on the safety issue—or any other phase of the case.

We do not claim that either of these decisions controls the instant case on the facts. But we do believe that the result of the thorough trial, argument, and personal consideration by the judges of the issues of law and fact in those cases, should be of considerable assistance in the consideration of the issues of law and fact in the case at bar.

6.

IF THE DECISION OF THE LOWER COURT BE CONSTRUED AS A REVERSAL OF THE FINDINGS OF FACT OF THE TRIAL COURT, IT OPERATES TO DENY TO APPELLANT FEDERAL RIGHTS TO WHICH IT IS SHOWN BY THE EVIDENCE TO BE ENTITLED.

(Assignments of Error Nos. 7 and 8)

In the opening statement we have summarized the detailed findings of fact (R. 3879-4034) adopted by the trial court. As we there point out, these findings were rendered by the judge who, sitting without a jury, had heard and considered all of the testimony, both oral and documentary, offered by both parties. The findings are separately stated, and accompanied by formal conclusions of law (R. 4035-4039), in accordance with the established practice in the Superior Courts of Arizona, which is modeled after and follows closely the practice in the District Courts of the United States.

The findings, which cover every phase of the case, are carefully annotated to the testimony, by references to pages of the reporter's typewritten transcript, and the particular exhibits (by numbers) where the evidence relied upon is to be found. Thus they constitute a complete and accurate summary of all the material and relevant evidence of record in the case.

No reference whatever to the findings *of fact*, as such, appears in the opinion of the majority of the state court. Indeed, that court employs the word "findings" only once in the opinion, in the sentence (already cited in our State-

ment of the Case) near the end of the opinion reading in part as follows (R. 4067-4068):

> "the opinion, condensed as it is in the foregoing pages, expresses our reason for holding that the findings and judgment of the trial court to the effect that the Train Limit Law is unconstitutional were in error."

This expression could not have been intended by the state court, and certainly cannot be construed, as a determination that the trial court's findings *of fact* were either wholly erroneous, or even erroneous in any essential respect, in so far as any of said findings, or any portion thereof, may have constituted a determination of a material fact.

This is evident first, from consideration of the opinion itself. The quoted sentence declares that "the opinion, condensed . . . in the foregoing pages, expresses (the) reason" for holding the findings and judgment erroneous. But the opinion is wholly lacking in any discussion of the factual issues of the case, and fails completely even to mention any of the findings *of fact*, either as an entirety or in detail; notwithstanding that the state as appellant had presented to that court some 204 separate assignments of error addressed to the findings. The "foregoing opinion" contains literally no expression whatever capable of being construed as a reason for holding the findings of fact erroneous. Indeed, it contains no reference whatever to the evidence or to any factual matters at all, other than the early history of the law, the operation of the two trains which were the subject of the prosecution,

and, by i. direction, the heavy burden of expense imposed upon appellant (R. 4062-4063). If the court had intended to express actual disapproval of the trial court's findings *of fact*, or indicate that other, different, or contrary findings were warranted upon the evidence of record, it could hardly have avoided including in the opinion some discussion of the factual issues and the evidence. Its virtual adoption of the trial court's finding respecting the continuing heavy burden of expense imposed by the law thus strongly suggests a contrary intention.

That the quoted sentence is not intended and cannot be construed as a reversal of the trial court's findings is also strongly supported by the principle that findings of fact, when made by a trial judge sitting without a jury, are virtually conclusive upon an appellate court, and will not be modified or reversed unless substantial error is clearly shown. This principle is embodied in a statutory rule in Arizona (Sec. 21-1028, *Arizona Code Annotated*, 1939), reading as follows:

> "Findings of fact shall not be set aside unless clearly erroneous, and due regard shall be given to the opportunity of the trial court to judge the credibility of the witness."

This rule, which is identical with Rule 52-a of the Federal Rules of Civil Procedure, applies particularly to the case at bar, since it was tried upon the facts to the court sitting without a jury, and the court was duly requested to make special findings of fact and to state separately its conclusions of law thereon.

However, the state court, long prior to the enactment of the statutory rule (1939) had announced and followed the same principle:

Abernathy v. Reynolds (1903), 8 Ariz. 173, 71 Pac. 914:

"The rule, which we have often stated, is that *this Court will not disturb the findings of the trial court as to the facts if there is any evidence fairly tending to support them.* An examination of the record shows that the findings of fact were fairly supported by the evidence, and the conclusions drawn therefrom by the court are correct." (Emphasis supplied.)

California Development Co. v. Yuma Valley Land & Water Co. (1906), 9 Ariz. 366, 84 Pac. 88:

"The evidence is also conflicting upon the question of the acceptance of the dredge by Sexsmith in behalf of the development company. *We must* therefore *take the findings* of the court *as conclusive* upon both of these controverted questions of fact . . ." (Emphasis supplied.)

Curtis v. Peterson, et al. (1926), 31 Ariz. 235, 251 Pac. 723:

"The learned trial judge resolved the question in favor of appellees, and, under our decisions, we must accept his determination of that question as binding."

Blackford v. Neaves (1922), 23 Ariz. 501, 205 Pac. 587:

"Of course in passing on questions as to the sufficiency of the evidence in an appeal of this nature,

every presumption is in favor of the findings of the trial judge, and, if there is any evidence in the record which will sustain them, we must accept them as correct."

First Baptist Church of Willcox v. Connor (1926), 30 Ariz. 234, 245 Pac. 932:

"The evidence on this point is in conflict, and we are thereby bound to assume that the necessary finding of the trial court on this matter was correct. In our opinion there is sufficient evidence in the record, if believed by the trial judge as we must assume it was, to sustain the judgment."

Stillsbury, et al. v. School District No. 19 (1930), 37 Ariz. 43, 288 Pac. 1027:

"In determining this question, we must construe the evidence in the most favorable light possible in favor of plaintiff. And if from the evidence so viewed findings could reasonably be made which would support the judgment, we must assume that the court did make such findings."

Charlebois, et al. v. Renaud, et al. (1931), 38 Ariz. 378, 300 Pac. 190:

"We must assume that, where there is a conflict in the evidence, the trial court took that view of it which would support the findings of fact and judgment. In re Estate of Schuster, 35 Ariz. 457, 281 Pac. 38. And this is binding on us if any reasonable testimony sustains it. Moeur v. Farm Builders Co., 35 Ariz. 130, 274 Pac. 1043."

Cano v. Arizona Frozen Products Co. (1931), 38 Ariz. 404, 300 Pac. 953:

"We must assume, following our well established rule, that the trial court took that view of the evidence which would sustain its judgment."

Since 1939, the Court has followed the same rule, the entire doctrine of its decisions on this point being summed up in its opinion in

Daily Mines Co. v. Control Mines, Inc. (1942), ... Ariz. ....., 124 Pac.(2d) 324:

"In passing upon the appeal, there are certain principles of law governing our consideration thereof, which cannot be disputed: (a) If there is reasonable evidence to support the findings of fact of the trial court, they will be sustained by this court. Glaspie v. Williams, 46 Ariz. 381, 51 P.2d 254. (b) If there is sufficient legal and competent evidence to support such findings, the erroneous admission of other evidence by the trial court will not justify a reversal of the case. First Baptist Church v. Connor, 30 Ariz. 234, 245 P. 932; Glaspie v. Williams, supra. (c) If different inferences as to the ultimate facts may be drawn from evidentiary facts, we must accept the inference drawn by the trial court. First National Bank v. Osborne, 39 Ariz. 107, 4 P.2d 384."

The Arizona rule is thus substantially the same as that which this Court has frequently announced and followed; compare:

Butte & Superior Copper Co. v. Clark-Montana Realty Co. (1919), 249 U.S. 12, 30, 63 L.ed. 447;

District of Columbia v. Pace (1944), 320 U.S. 698, 88 L.ed., Adv. 319, 321.

The state court's opinion contains nothing to indicate an intention on its part to depart from its own consistent rule, let alone to abandon it completely. If there had been such intention, certainly the point would have been mentioned in the opinion, with some statement of the reasons why the court felt impelled to make an exception in the present case, or otherwise to hold the rule inapplicable. Absent such an express declaration, it can only be concluded that the court, following its own rule, accepted the trial court's findings without amendment, and did not intend to substitute instead its own views of the evidence.

That the quoted sentence was not intended and cannot be construed as a reversal of the trial court's findings is further strongly supported by the language of the mandate (R. 4072-4073), which merely ordered the lower court's judgment reversed, but did not direct that the findings be vacated. The trial court, in entering judgment as directed, though declaring the law constitutional, did not disturb its own earlier findings (R. 4073-4074).

That the quoted sentence was not intended and is not to be construed as a reversal of the trial court's findings is again supported by the wording of the sentence itself. That sentence, which we again quote in part for ready reference, refers to the "findings and judgment of the trial court *to the effect that the train limit law is unconstitutional.*" There is no punctuation in the portion of the sentence quoted, indicating a purpose to separate the findings from the judgment; in other words, as the sentence reads, the court was undertaking to declare erroneous "the findings . . . *to the effect* that the train limit law

is unconstitutional," as well as the judgment to that effect. In the strict and literal sense, the trial court made no such "*finding of fact*"; its findings may be searched in vain for any expression declaring the law invalid or unconstitutional. By far the greater part of the trial court's findings of fact contain no statement which can be construed as even *indirectly* holding, or holding "in effect" that the law is invalid.

It is true that in four rather brief and summary findings (Nos. XVI to XIX, incl., R. 4032-4034), appearing at the conclusion of the detailed findings of fact, the trial court stated certain factual conclusions respecting the character of the burdens imposed by the law, and their effect upon appellant's use of its property in its business as an interstate carrier; these findings might perhaps be regarded as "to the effect" that the law is invalid, though no such expression is actually used therein. All the remaining findings are, however, straightforward statements of fact, and express no legal conclusions at all. All the direct statements of the law's invalidity made by the trial court are contained in the separate conclusions of law (R. 4035-4039), or in the judgment (R. 4039-4041), or in the opinion rendered immediately prior to the entry of that judgment (R. 4042-4054). The word "findings," as it appears in the quoted sentence, can therefore be taken only to mean the conclusions, or those portions of the opinion or judgment corresponding thereto, which declare the invalidity of the law, including possibly also Findings Nos. XVI to XIX, inclusive; but it cannot, in the light of the context, be taken as meaning those findings of fact which simply reflect and summarize the pertinent evidence, and

thus do not hold or declare, even "in effect," that the law is invalid.

Notwithstanding these cogent reasons, the appellee may contend that the quoted sentence, or the opinion as a whole, should be construed as a determination that the trial court erred, as a matter of fact, in adopting the special findings; that other and contrary findings should have been made; and that upon the basis of such findings a judgment sustaining the law instead of holding it invalid should have been entered.

Assuming that that argument can be maintained, the state court's decision then becomes equivalent to findings, either of fact or of mixed fact and law, as a result of which important federal rights have been denied to appellant. In these circumstances there becomes applicable the consistent rule, repeatedly declared and followed, under which this Court, in order properly to exercise its own functions under the Constitution, will analyze the facts in order to determine whether or not federal rights duly asserted, have been denied as a result of a purported determination of fact by the state court which is without proper evidence to support it; and if this Court concludes that the lower court has thus acted, it will take such steps as may be warranted in the premises.

The following decisions of this Court particularly declare and illustrate this rule:

Kansas City Southern Ry. Co. v. Albers Commission Co. (1912), 223 U.S. 573, 591, 56 L.ed. 556;

Northern Pacific Ry. Co. v. North Dakota (1915), 236 U.S. 585, 593, 59 L.ed. 735;

Norfolk & Western Ry. Co. v. Conley (1915), 236 U.S. 605, 609, 59 L.ed. 745;

Aetna Life Ins. Co. v. Dunken (1924), 266 U.S. 389, 394, 69 L.ed. 342;

Postal Telegraph-Cable Co. v. Newport (1918), 247 U.S. 464, 473, 62 L.ed. 1215;

Truax v. Corrigan (1921), 257 U.S. 312, 324-325, 66 L.ed. 254;

Baltimore & Ohio Southwestern R. Co. v. Burtch (1924), 263 U.S. 540, 543, 68 L.ed. 433;

Fiske v. Kansas (1927), 274 U.S. 380, 385, 71 L.ed. 1108;

Beidler v. South Carolina Tax Commission (1930), 282 U.S. 1, 8, 75 L.ed. 131;

Norris v. Alabama (1935), 294 U.S. 587, 590, 79 L.ed. 1074;

Great Northern Ry. Co. v. Washington, supra (300 U.S. 154, 165-166, 81 L.ed. 573);

United Gas Co. v. Texas (1938), 303 U.S. 123, 143, 82 L.ed. 702;

Pierre v. Louisiana (1939), 306 U.S. 354, 358, 83 L.ed. 757;

Smith v. Texas (1940), 311 U.S. 128, 130, 85 L.ed. 84;

Milk Wagon Drivers Union v. Meadowmoor Dairies (1941), 312 U.S. 287, 293, 85 L.ed. 836.

The rule is well stated in *Norris v. Alabama*, supra, in which this Court said (294 U.S. at p. 590):

"When a federal right has been specially set up and claimed in a state court, it is our province to in-

quire not merely whether it was denied in express terms but also whether it was denied in substance and effect. If this requires an examination of evidence, that examination must be made. Otherwise, review by this Court would fail of its purpose in safeguarding constitutional rights. Thus, whenever a conclusion of law of a state court as to a federal right and findings of fact are so intermingled that the latter control the former, it is incumbent upon us to analyze the facts in order that the appropriate enforcement of the federal right may be assured." (Citing cases.)

Truax v. Corrigan, supra (257 U.S. 312), is of special interest because, like the case at bar, it involved a decision of the Supreme Court of Arizona, brought to this Court by writ of error, in which the state court had undertaken to deny the federal rights asserted by the plaintiffs in error on the basis of factual conclusions which did not accord proper recognition to undisputed facts. Assuming that the quoted sentence is construed as relating to the trial court's findings of fact, the same court has reached the same result in the present case, and by the same method. The cases differ only in that the facts in the *Truax Case* were presented by the complaint and exhibits, the decision having been rendered on demurrer; in the instant case they are developed by findings which rest upon testimony as to which there is no factual conflict. In the cited case this Court said (257 U.S., at pp. 324-325):

"In cases brought to this court from state courts for review, on the ground that a Federal right set up in the state court has been wrongly denied, and

in which the state court has put its decision on a finding that the asserted Federal right has no basis in point of fact, or has been waived or lost, this court, as an incident of its power to determine whether a Federal right has been wrongly denied, may go behind the finding to see whether it is without substantial support. If the rule were otherwise, it almost always would be within the power of a state court practically to prevent a review here. (Citing cases.) Another class of cases in which this court will review the finding of the court as to the facts is when the conclusion of law and findings of fact are so intermingled as to make it necessary, in order to pass upon the question, to analyze the facts. (Citing cases.) In view of these decisions and the grounds upon which they proceed, it is clear that in a case like the present, where the issue is whether a state statute, in its application to facts which are set out in detail in the pleadings and are admitted by demurrer, violates the Federal Constitution, this court must analyze the facts as averred and draw its own inferences as to their ultimate effect, and is not bound by the conclusion of the state supreme court in this regard."

In *Great Northern Ry. Co. v. Washington*, supra (300 U.S. 154), this Court, dealing with a similar issue, said (p. 165):

"Passing the appellant's contention that a federal right may not be denied under the guise of the application of a state rule of evidence, we come to the question whether, when the asserted right has been denied, this court is concluded by a finding of fact or a mixed finding of law and fact made by the state court. We have repeatedly held that in such case we

must examine the evidence to ascertain whether it supports the decision against the claim of federal right."

The Court then cited and quoted from *Norris v. Alabama*, supra (294 U.S. 587); *Beidler v. South Carolina Tax Commission*, supra (282 U.S. 1); and *Johnson Oil Co. v. Oklahoma* (1933), 290 U.S. 158, 159-160, and concluded its discussion of the point by saying (p. 167):

"Citation of authority for the same principle might be multiplied indefinitely."

In *Pierre v. Louisiana*, supra (306 U.S. 354), one of the most recent decisions involving this same principle, *Norris v. Alabama* is referred to with approval, the Court indicating that, while the factual conclusions reached by the state court are entitled to great respect, yet when a claim is properly asserted that a right guaranteed by the Federal Constitution has been denied, it becomes the solemn duty of the Court to make independent inquiry and determination of the disputed facts.

More recently still, in the *Milk Wagon Drivers Union Case*, supra (312 U.S. 287), this Court said (p. 293):

"Still it is of prime importance that no constitutional freedom, least of all the guarantees of the Bill of Rights, be defeated by any insubstantial findings of fact screening reality. That is why this Court has the ultimate power to search the records in the state courts where a claim of constitutionality is effectively made."

We shall not at this point argue at length the correctness of the findings of fact made by the trial court,

from the standpoint of evidentiary support, and the consequent error of the state court's conclusion (if its opinion be so construed) that those findings of fact are incorrect ("erroneous") and must be reversed. Volume II of this brief ("The Facts") contains a detailed discussion of each of the findings of fact, explaining its purpose and referring to the evidence which supports it. Volume II should be reviewed, however, only if the reader is convinced that the state court not only intended to pass upon the correctness of the findings of fact made by the trial court and to reverse those findings, but also actually did so through the medium of the quoted sentence, thereby giving rise to the questions of fact presented by appellant's eighth assignment of error.

If the Court undertakes to review the findings in the light of the evidence, it will be impressed with the fact that the findings, though somewhat detailed, are a very accurate summary of all the testimony. No pertinent evidence introduced by either party has been disregarded. Taken in their entirety, the findings present a complete picture of the entire case, and set forth every factual consideration necessary to a correct decision.

It cannot be too strongly emphasized that there is no real conflict in the evidence. This is primarily for the reason that it consists largely of statistical material, condensed into exhibits and accompanied by explanatory oral testimony, which material is taken from official or other unimpeachable sources; such as, for example, official publications of the Interstate Commerce Commission; periodical and other reports rendered to that Commission or to

state commissions, pursuant to statute; permanent underlying records of the appellant and of other railroads, and other records prepared and maintained by the railroads as a part of the ordinary course of their business; and studies based principally upon day-to-day records of actual train movements. The evidence is thus very largely of the same character as that presented in the recent *Retirement Act case* (*Railroad Retirement Board v. Alton R. Co. et al.* (1935), 295 U.S. 330, 79 L.ed. 1468). In fact, certain of the tabulated exhibits presented in the present case correspond closely to exhibits which were before the Court in the *Retirement Act Case*. Compare, for example, Exhibits Nos. 262 and 263 (R. 3300, 3301) with the tabulations appearing in the footnote on page 365 of the report in the cited case; and see also footnote 11 on page 366. Statistical showings of this type were referred to by this Court as "incontrovertible" (295 U.S. 364); and it was further stated that they constituted "overwhelming evidence," which demonstrated the results shown "without contradiction."

Only to a minor extent does the testimony include statements based upon the observation or experience of witnesses, as distinguished from written records; but even this testimony presents no *factual* conflict. The only differences between the appellant and the state, so far as concerns any of the testimony, arise because of either (1) the admission of evidence offered by appellant which the state considered immaterial, irrelevant or incompetent, and the exclusion of certain other testimony offered by the state, on corresponding grounds; or (2) opposing views as to the factual and legal conclusions to be drawn

from facts which are themselves undisputed. But it has not been asserted, and no such assertion could be genuinely made, that any part of the factual showing of either party is false, or erroneous because true only in part, or misleading as a representation of fact. Appellee has made no such assertion at any stage of the case; it has never challenged the truth of any of appellant's factual testimony, even though continuously insisting that much of said testimony was incompetent or otherwise inadmissible.

The issues before this Court do not involve, however, any alleged errors because of the admission or exclusion testimony. No such question was decided by the State Supreme Court; for even though 662 assignments of alleged error in the rulings of the trial court upon the admission of testimony were presented by appellee and argued to that court, the findings were not declared by that court to be erroneous because based upon supposedly inadmissible testimony. We point out again that the opinion, "condensed * * * in the foregoing pages," stated by that court to express its reasons for holding the "findings" erroneous, contains no discussion of evidence, nor any statement sustaining any fragment of the state's challenge upon the ground of error in the trial court's rulings. So far as the opinion reveals the court's views upon the evidence, it accepted the record as made in the trial court. Its statement in the quoted sentence now under discussion must therefore be taken as either relating to the trial court's conclusions rather than its findings of fact (the construction we suggest above), or as holding that, despite the evidence of record, contrary findings of fact should have

been and should now be made. If the latter, the court's action was a mere arbitrary refusal to recognize the facts: in effect a denial of the truth of matters which on the record were and are factually unchallenged, and thus a deliberate misfinding of the facts in order to support the declared conclusion. In such circumstances, this Court's duty as proclaimed in its decisions is clear. This Court has both the power and the duty to review the record, and thereby determine for itself that the state court has reached factual conclusions which are without substantial or indeed any evidentiary support, and upon that basis has denied to appellant rights guaranteed under the Federal Constitution which, upon the actual record, should have been sustained.

CONCLUSION

In conclusion we submit that:

1. The matter of the regulation of the length and consist of interstate railroad trains is a subject as to which a national or uniform system of regulation is necessary if any regulation at all be required; and it therefore falls within the exclusive national field. The Train Limit Law invades this exclusive national field of regulation.

2. The Train Limit Law necessarily, practically, and inevitably regulates and controls the length and consist of appellant's interstate trains, and other railroad operations of appellant, not only within Arizona but also, as appellee has conceded, in adjoining states and for substantial distances beyond the boundary lines of Arizona. It is

therefore wholly void, because it undertakes to and does regulate interstate commerce with extra-territorial effect.

3. Even though it should be considered, for the sake of argument, that the regulation of the lengths of interstate trains falls within the "concurrent" field, the Train Limit Law, because it imposes direct and substantial burdens and restrictions upon and directly and materially obstructs and interferes with the free flow of interstate commerce, goes far beyond any powers which the state may have in the concurrent field, and is therefore invalid.

4. The Train Limit Law, if considered or claimed to be an attempted limitation of the lengths of trains for the sake of proper handling and safe control, infringes upon, conflicts with, and attempts to supplement existing Federal legislation and regulations having the same or similar purposes and effects, and is therefore invalid.

5. The Train Limit Law is not fortified or assisted by any presumption of reasonableness based upon assumed legislative knowledge of conditions existing at the date when this case arose. Although claimed to be an exercise of the police power in the interest of safety (despite the fact that no legislative declaration of the purpose of the law was made, and no purpose is evident on the face of the law), it bears no reasonable or any relation whatever to health and safety. It is clearly in excess of the legislative power; and also arbitrary and unreasonable, and deprives and will continue to deprive appellant of its property without due process of law.

6. The opinion and decision of the Supreme Court of Arizona, if construed as a reversal by that Court of the

findings of fact made by the trial court, are equivalent to an attempted finding upon factual matters not supported by and in conflict with the evidence, as the result of which appellant has been deprived of federal rights to which it is shown by the record to be entitled.

7. Upon the record, and in the light of the controlling principles, the Train Limit Law should be held invalid and unconstitutional, upon each and all of the grounds above set forth, because it violates and infringes upon the Commerce Clause of, and the Due Process Clause of the 14th Amendment to, the Constitution of the United States. The decision and judgment of the Supreme Court of Arizona should be reversed, and the cause remanded with instructions to enter judgment in favor of appellant.

Respectfully,

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Dated at San Francisco, California,
November 10, 1944.

(APPENDIX FOLLOWS)

Appendix

ORDER

At a Session of the
INTERSTATE COMMERCE COMMISSION,
Division 3,
held at its office in Washington, D. C.,
on the 29th day of July, A. D. 1944
No. 13528

INVESTIGATION OF POWER BRAKES AND APPLIANCES FOR OPERATING POWER-BRAKE SYSTEMS

It appearing, That on July 18, 1924, the Commission made and filed a report in this proceeding in which there were enumerated certain general requirements which should be met by power brakes for passenger and freight trains, in the interest of increased safety in train operation; and that the proceeding was held open to afford opportunity for the formulation of full specifications and requirements and for consideration of the form of order to be entered;

It further appearing, That respondents, through the American Railway Association (now Association of American Railroads), after extended investigation and tests, adopted, on August 16, 1933, specifications and requirements for power brakes, and appliances for their operation, in freight service to comply with certain of the general requirements referred to in the preceding paragraph hereof, and promulgated a rule requiring that all freight cars built new after September 1, 1933, be equipped with power brakes which conformed to said specifications and

requirements; and on November 20, 1934, modified their interchange rules to require that on and after January 1, 1945, all freight cars in interchange service must be equipped with air brakes meeting the requirements of said specifications;

And it further appearing, That reports filed semi-annually with the Commission by the Association of American Railroads show that the progress in equipping freight cars in interchange service with air brakes meeting said specifications has not been as rapid as anticipated, and that only approximately 50 per cent of such cars are now so equipped,

It is ordered, That all common carriers by railroad subject to section 25 of the Interstate Commerce Act be, and they are hereby, cited to show cause, if any there be, in writing, on or before August 26, 1944, why—

(1) Specifications and requirements as set forth in the appendix to this order should not be prescribed by the Commission for power brakes and appliances for operating power brake systems, to be applied to cars used in freight service; and

(2) If specifications and requirements in substantial conformity with those set forth in the appendix to this order are prescribed by the Commission, an order should not be issued requiring that all cars used in freight service be equipped with power brakes and appliances for operating power brake systems, conforming to such specifications and requirements, on or before January 1, 1946;

It is further ordered, That a prehearing conference to discuss and consider the subject-matter of this order, at

which Chairman Patterson will preside, be, and it is hereby called for September 6, 1944, at 10:00 o'clock A.M., at the Morrison Hotel in Chicago, Ill.

And it is further ordered, That a copy of this order be served upon all common carriers subject to section 25 of the Interstate Commerce Act and upon all national organizations of railroad employees and that notice be given the general public by depositing a copy of this order in the Office of the Secretary of the Commission at Washington, D. C.

By the Commission, Division 3.

W. P. BARTEL,
Secretary.

(Seal)

No. 13528

INVESTIGATION OF POWER BRAKES AND APPLIANCES FOR OPERATING POWER-BRAKE SYSTEMS

APPENDIX TO ORDER OF JULY 29, 1944*

Specifications and Requirements for Power Brakes and Appliances for Operating Power Brake Systems for Freight Service

PURPOSE

The purpose of this specification is to define and prescribe requirements for power brakes and appliances for operating power brake systems.

DEFINITIONS

For purpose of this specification, terms used herein are defined as follows:

1. Power Brake—A combination of parts operated by compressed air and controlled manually, pneumatically or electrically, by means of which the motion of a car or locomotive is retarded or arrested.

2. Power Brake System—The power brakes on locomotives and cars of a train so interconnected that they can be operated together and by means of which the motion of the train is retarded or arrested.

3. Brake Valve—The valve of the locomotive equipment by means of which operation of the power brake system is controlled.

*As modified by the further order of October 19, 1944.

4. Equalizing Reservoir—The small reservoir connected to the brake valve only, the pressure of which is reduced by the engineer for making service applications.

5. Brake Pipe—The line of pipe and hose extending throughout the length of the train by means of which compressed air is supplied to the brake devices on the several cars and the pressures so controlled as to effect the application and release of the brakes.

6. Operating Valve—Device on each car, the operation of which results in:

(a) Admission of air to brake cylinder,

(b) Release of air from brake cylinders, and

(c) Charging of one or more reservoirs.

7. Service Reduction—A decrease in brake pipe pressure, usually of from 5 to 25 pounds, at a rate sufficiently rapid to move the operating valve to service position, but at a rate not rapid enough to operate the valve to emergency position. Quick service is that feature of the operating valve which provides for local reduction of brake pipe pressure.

8. Service Application—A brake application which results from one or more service reductions.

9. Full Service Reduction—A service reduction sufficient in amount to cause equalization of pressure in brake cylinder with pressure in the reservoir from which compressed air is supplied to brake cylinder.

10. Full Service Application—A brake application which results from one or more brake pipe reductions sufficient in amount to cause a full service reduction.

11. Emergency Reduction—A depletion of brake pipe pressure at a rate sufficiently rapid to move the operating valve to emergency position.

12. Emergency Application—A brake application which results from an emergency reduction.

13. Emergency Brake Cylinder Pressure—The force per square inch exerted upon piston in brake cylinder by compressed air which is admitted to brake cylinder as a result of an emergency reduction. Effective emergency brake cylinder pressure is a pressure not less than 15 per cent nor more than 20 per cent greater than the brake cylinder pressure obtained from a full service reduction on the same car and from the same initial pressures.

Specifications

General Requirements.

14. The design of the operating valve shall be such as will insure efficient and reliable operation, both in its application and release functions and when intermingled with other types of power brakes. It shall be so constructed that the rate of brake cylinder pressure development may be adjusted to meet such changes in train operating conditions as may develop in the future.

15. The design of the service and emergency valves shall be such as to permit their removal for cleaning and repair without disturbing pipe joints.

16. The portions of the car brake which control the brake application and release, and also the brake cylinder, shall be adequately protected against the entrance of foreign matter.

17. The apparatus conforming to the requirements of these specifications shall be so constructed, installed and maintained as to be safe and suitable for service.

Service Requirements.

The apparatus shall be so designed and constructed that:

(Based upon 70 pounds brake pipe pressure and train length of 150 cars.)

18. With a service reduction of 5 pounds in the equalizing reservoir at the brake valve all brakes will apply.

19. An initial 5-pound equalizing reservoir reduction at the brake valve will produce substantially 10 pounds brake cylinder pressure throughout the train, including brakes having piston travel in excess of 8 inches.

20. With an equalizing reservoir reduction of 10 pounds, the difference in time of obtaining substantially 10 pounds pressure in the brake cylinder of the 1st and 150th brakes will be nominally 20 seconds or less.

21. A brake pipe reduction of 10 pounds will result in pressure in each brake cylinder of not less than 15 pounds nor more than 25 pounds.

22. A total brake pipe reduction of 25 pounds will result in equalization of brake cylinder pressure with pressure in the reservoir from which compressed air is supplied to the brake cylinder, and brake cylinder pressure

of not less than 48 pounds nor more than 52 pounds will be obtained.

23. Quick service activity of the train brakes will cease when the initial quick service action has been completed.

24. The quick service feature of the brake will produce substantially uniform time of quick service transmission regardless of the unavoidable variations in frictional resistance of the parts.

25. The brake will so function as to prevent a degree of wave action in brake pipe pressure sufficient to cause undesired release of any brakes while the brakes are being applied.

26. The degree of stability will be sufficient to prevent undesired service application occurring as a result of unavoidable minor fluctuations of brake pipe pressure.

27. The brake cylinder pressure increase resulting from quick service operation will be less when the brake is reapplied with pressure retained in the brake cylinder than with applications made when the brake cylinder pressure is zero.

28. Undesired quick action will not result with any rate of change in brake pipe pressure which may occur during service application or release of the brake.

29. In the normal release of train brakes, individual car brake will not start recharging from the brake pipe until brake pipe pressure has increased sufficiently to have accomplished the release of adjacent valves.

30. The recharge of auxiliary reservoirs in the forward portion of the train will be automatically retarded while full release position of the brake valve is being used to initiate the release of train brakes.

31. After 15-pound service reduction has been made and brake valve exhaust has closed, in a release operation in which brake valve is moved to release position and after 15 seconds is moved to running position, all operating valves will move to release position within 40 seconds after brake valve is placed in release position.

32. After a 15-pound service reduction has been made and brake valve exhaust has closed, in a release operation in which brake valve is moved to release position and after 15 seconds is moved to running position, brake pipe pressure at car 150 will be increased 5 pounds within 1½ minutes after brake valve is placed in release position.

33. The rate of release of pressure from the brake cylinder will be nominally 23 seconds from 50 pounds to 5 pounds.

Emergency Requirements.

The apparatus shall be so designed and constructed that:

(Based on 70 pounds brake pipe pressure and train length of 150 cars.)

34. Emergency application operation will always be available irrespective of the existing state or stage of brake application or release.

35. Emergency application initiated during a release of a previous brake application will produce a material

increase in brake cylinder pressure over that which would result from a full service application made under the same conditions.

36. When operating valve acts in emergency it will so function as to develop nominally 15 pounds brake cylinder pressure in not more than 1½ seconds and maximum pressure in nominally 10 seconds.

37. With an emergency reduction of brake pipe pressure all brakes, including the 150th, will start to apply within 8.2 seconds and develop not less than 15 per cent nor more than 20 per cent in excess of 50 pounds brake cylinder pressure within 18.2 seconds from the movement of the brake valve to emergency position.

38. The operating valve will so function that, when an emergency application is made subsequent to a service application which has produced not less than 30 pounds brake cylinder pressure, the maximum brake cylinder pressure will be attained in nominally 4 seconds from the beginning of the emergency action of the valve.

39. Emergency application will produce from a charged system between 15 and 20 per cent increase in brake cylinder pressure over that which results from a full service application and irrespective of any degree of prior service application.

40. With any group of three consecutive brakes cut out, an emergency reduction made with the brake valve will cause the remainder of the brakes to operate in emergency and produce normal emergency pressures in the same time as when all brakes are cut in.

41 The brake will so function as to accomplish the release of an emergency application with the same degree of certainty secured in the release of service applications.

42. When releasing brakes following an emergency application, each brake will so function as to decrease the auxiliary reservoir pressure prior to the actual release.

43. Both service and emergency brake applications will be released when the brake pipe pressure is increased to not more than 1¾ pounds above that of the auxiliary reservoir and irrespective of the increased frictional resistance to release movement of the piston and slide valves after a period of operation in train service.

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SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY,
a corporation,
Appellant,

vs.

STATE OF ARIZONA ex rel. JOE CONWAY,
Attorney General of the State of
Arizona,
Appellee.

BRIEF FOR APPELLANT

VOLUME II — THE FACTS

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SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY,
a corporation,
Appellant,

vs.

STATE OF ARIZONA ex rel. JOE CONWAY,
Attorney General of the State of Arizona,
Appellee.

BRIEF FOR APPELLANT

VOLUME II — THE FACTS

FOREWORD

This second volume of appellant's brief, submitted as a supplement to the brief on the law (Vol. I), contains a discussion of the findings of fact adopted by the trial court (R. 3879-4034), with particular reference to the evidence and other matters of record which support those findings.

The purpose of this discussion is to assist this Court, if it should conclude that the Supreme Court of Arizona has

undertaken to reverse the trial court's findings of fact (a point which we discuss in some detail in Subdivision 6 of the argument in our brief on the law: Vol. I, at pp. 314-330), in that examination and determination which this Court has declared that it is bound to make whenever federal rights, duly asserted, have been denied by a state court because of findings of fact not supported by, or contrary to, the evidence.

No findings of fact in this cause appear of record, other than those made and adopted by the trial court. No proposed amendments to or substitutions for such findings were ever presented to the State Supreme Court, by the State, upon its appeal to that court from the judgment of the trial court; nor were any new findings, or any specific changes or even general suggestions for changes in the findings already made, adopted by the State Supreme Court or even discussed by it in its opinion. The trial court's findings thus constitute the only concrete and specific findings of fact, or proposals with respect thereto, which are of record before this Court, and so afford the natural and logical objective of this discussion of the evidence.

In this review we show that those findings are fully in accord with the evidence, and present an accurate review and summary of all the evidence; that they respond to the issues of fact as presented by the pleadings in the case; and that no other, contrary or inconsistent findings, if any should now be proposed, would be fairly warranted or adequately supported upon the record.

For the sake of easy reference, we here employ the same topical headings as in the findings. Citations of the oral testimony are by names of witnesses and pages of the printed record; citations of exhibits are by the numbers assigned at the time of their tender in evidence.

We suggest that each subdivision of each finding, as it appears in the printed record, should be reviewed before reading the section of this brief carrying the same number and topical heading. The discussion and review of the evidence herein has been written with that method of review in mind, so that duplication or repetition in the recital of facts may be avoided.

THE PREAMBLE (R. 3887).

The preamble is simply a brief history of the proceedings in this case up to and including the rendition of the trial court's initial decision. All of the recitals in the preamble relate to matters of record, as to which no dispute or challenge is possible.

I.

DEFINITION OF TERMS (R. 3888)

For convenience it was believed desirable to incorporate in the initial paragraph of the findings a definition of certain terms frequently used thereafter.

The terms "Train-Limit Law" and "the law" were generally used, by both counsel and witnesses, during the course of the trial and later proceedings, to designate the statute under which the case is brought, the validity of which is challenged herein.

The terms "long trains" and "short trains" are used to apply, respectively, to trains of more than 70 freight or other cars (exclusive of caboose), or more than 14 passenger cars, and trains containing less than those numbers of cars. These terms were also commonly used by both counsel and witnesses, during the course of the litigation. The definitions correspond to the limitations fixed by the Train-Limit Law, and in fact incorporate the law's limitations by express reference.

"Interstate trains" are defined as all trains which carry any interstate commerce or are engaged in interstate transportation. This is the ordinary definition, frequently used in decisions of courts and the Interstate Commerce Commission.

The definition of "standard long-train operation", as the practice of hauling freight traffic in long freight trains, and passenger traffic in long passenger trains, whenever efficiency and economy can thereby be subserved, and of handling such traffic in short trains when economy and convenience are not promoted by long-train operation, is likewise desirable. The standard long-train practice, as thus defined, does not contemplate that *every* train operated shall be a long train; but only that traffic shall be moved in such units when greater efficiency and economy results.

The expression "the affected territory" is frequently used in the findings to designate the lines in Arizona, and in the adjacent portions of California, New Mexico, and Texas where, according to the testimony, the Train-Limit Law affects the railroad operations carried on by appellant.

II.

NATURE OF THE CASE: THE PARTIES INVOLVED (R. 3889-3890).

(a) THE PARTIES (R. 3889).

This paragraph simply reproduces, in summary form, certain portions of the complaint and the answer, the accuracy of which is either not challenged, or is apparent on its face. The finding is necessary, as a preliminary to the remainder of the findings of fact, in that it sets forth the status and identity of the parties to the cause.

Complaint, Par. (1) (R. 1).
Answer, Par. (1); Part III (R. 7).

(b) THE ISSUES (R. 3889-3890).

This paragraph is likewise a summary of certain essential allegations and admissions of the complaint and the answer. It is desirable to have such a summary appear at the outset of the findings, in order that the character of the issues involved may be set forth in advance of the more specific findings upon the various points presented by the testimony at large.

III.

DESCRIPTION OF DEFENDANT'S[1] LINES OF RAILROAD (R. 3680-3897).

(a) GENERAL DESCRIPTION OF THE SYSTEM (R. 3890-3891).

This finding describes the appellant's railroad system as to general location, and shows also that in view of its connections with other interstate carriers, it enters into and forms a part of the nation-wide railroad transportation system. The finding is essential, as a preliminary to the further discussion of appellant's position as an interstate carrier which appears in connection with later findings, particularly those relating to the effect of the law upon appellant's operations in interstate commerce.

Answer, Par. 2, Part III (R. 7-9).
Sines, R. 58-61.
Exhibits 1 (R. 2851), 175 (R. 1284).

There is also included in the findings, as a proper foundation for later detailed discussion, a brief statement of the total system mileage, the total investment in fixed property (not including equipment), and the mileage in the main lines in the territory immediately affected by the law: i.e., the lines of Arizona, including also the entire main-line mileage between Yuma and El Paso, Texas.

Masson, R. 860-861.
Exhibits 110 (R. 2964), 111 (R. 2965) 115 (R. 2975).

---

[1]The defendant in the trial court is appellant before this Court; however, we preserve for the purpose of this discussion the topical headings as they appear in the trial court's findings of fact.

The transcript references appended to the finding include references to the oral testimony and the exhibits which directly describe appellant's system, and also to the testimony of operating officials of other railroads, showing that the appellant actually participates in through transportation service with these other carriers, and thus enters into and becomes a part of the nation-wide railroad transportation system.

Wright, R. 151-158; *Kirk*, R. 253-258; *Young*, R. 301-302; *Fertig*, R. 500-501, 503-505, 511; *Green*, R. 537-538; *Kraemer*, R. 561-563; *Randall*, R. 591; *Triem*, R. 634; *Hammond*, R. 667-668; *Warfel*, R. 691; *Peckenpaugh*, R. 754-755; *Mahoney*, R. 1024, 1037-1039; *F. P. McDonald*, R. 1615; *Judson*, R. 1625.

(b) THE LINES IN THE AFFECTED TERRITORY (R. 3891-3896).

(1) Location; principal stations; double track (R. 3891-3892): This paragraph contains a description in some detail of the appellant's main lines in the territory between Yuma, Arizona, on the west, and El Paso, Texas, on the east, with some reference as well to the main lines between Los Angeles and Yuma, and between El Paso and Tucumcari, New Mexico; particular mention being made of the principal stations, the extent of single and double track, and the points where the main lines enter and leave Arizona. Reference is also made to the branch lines in Arizona, principally for the sake of completeness; the fact being that the law apparently has little, if any, effect upon such branch-line operations. For convenient refer-

ence, we here insert a copy of the system map in evidence as Exhibit 1 (R. 2851).

Sines, R. 58-59, 66-67; *Masson*, R. 861-863.
Exhibits 1 (R. 2851), 115 (R. 2975), 154 (R. 3028), 175 (R. 1284).

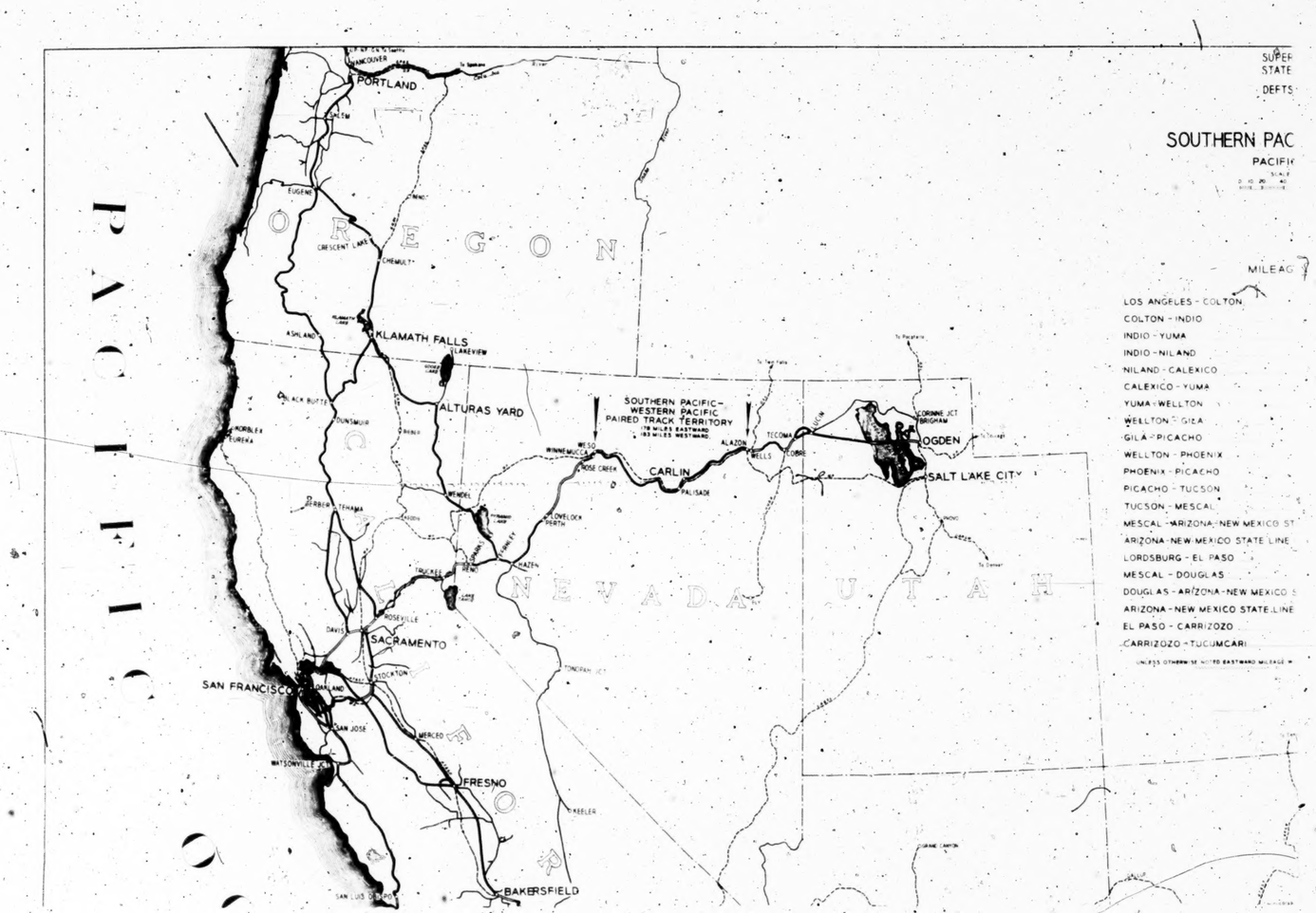
The finding also sets forth that the line principally used by appellant for the handling of interstate freight traffic across Arizona extends from Yuma via Gila, Tucson, Bowie, Arizona, and Lordsburg, New Mexico, to El Paso, Texas. That line is frequently referred to in the findings as appellant's Yuma-Gila-Lordsburg line. The two auxiliary main lines via Wellton, Phoenix and Picacho, and via Mescal, Douglas and Anapra, which handle a lesser proportion of the interstate freight traffic moving across Arizona, are for brevity referred to, the former as the Phoenix line, and the latter as the Douglas line. A substantial proportion of the passenger traffic across the state is routed over these two lines; in fact, the major proportion of the passenger traffic between Picacho and Yuma moves via Phoenix.

Masson, R. 861; *Sines*, R. 1375; *Herbert*, R. 1653-1654, 1663, 1665-1668.
Exhibits 1 (R. 2851), 175 (R. 1284), 176 (R. 3065).

This paragraph corresponds to and largely reproduces part of paragraph 2 of Part III of the answer (R. 7-8).

(2) Ruling grades and curvatures (R. 3893-3895):

This subparagraph describes the grade conditions encountered in the affected territory, dealing first with the



SUPERIOR COURT PIMA CO. ARIZONA
STATE v. S.P.CO. NO 20087
DEFTS EX NO _____ (WITNESS _____)

SOUTHERN PACIFIC COMPANY

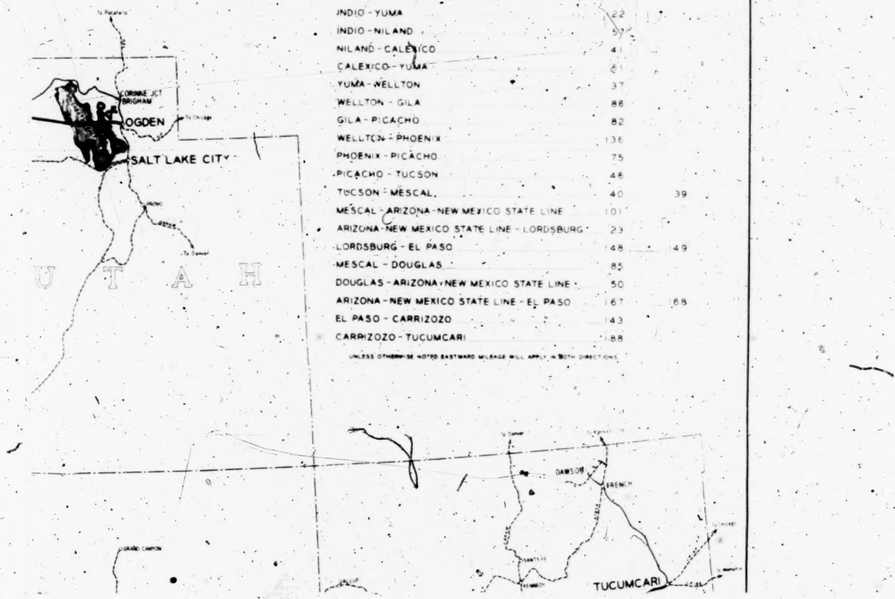
PACIFIC LINES

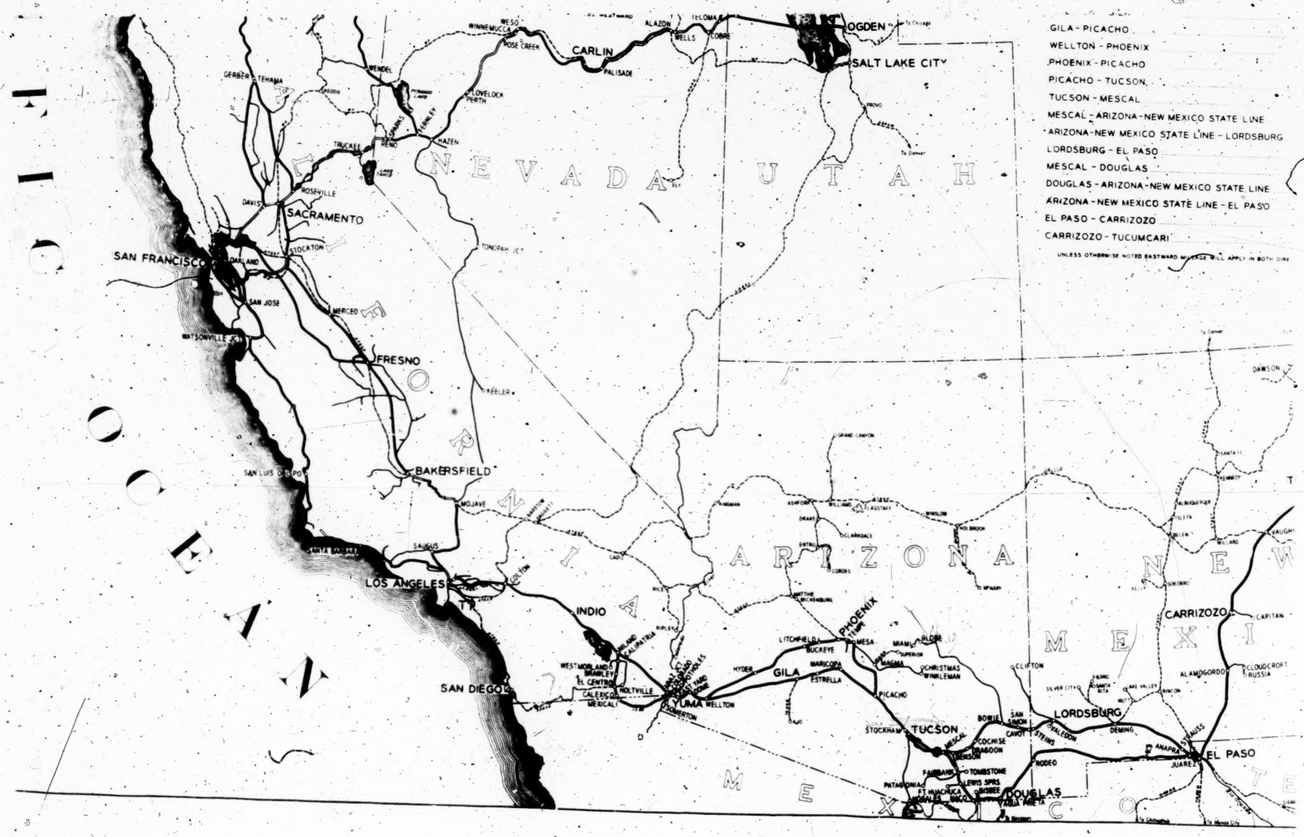
SCALE IN MILES

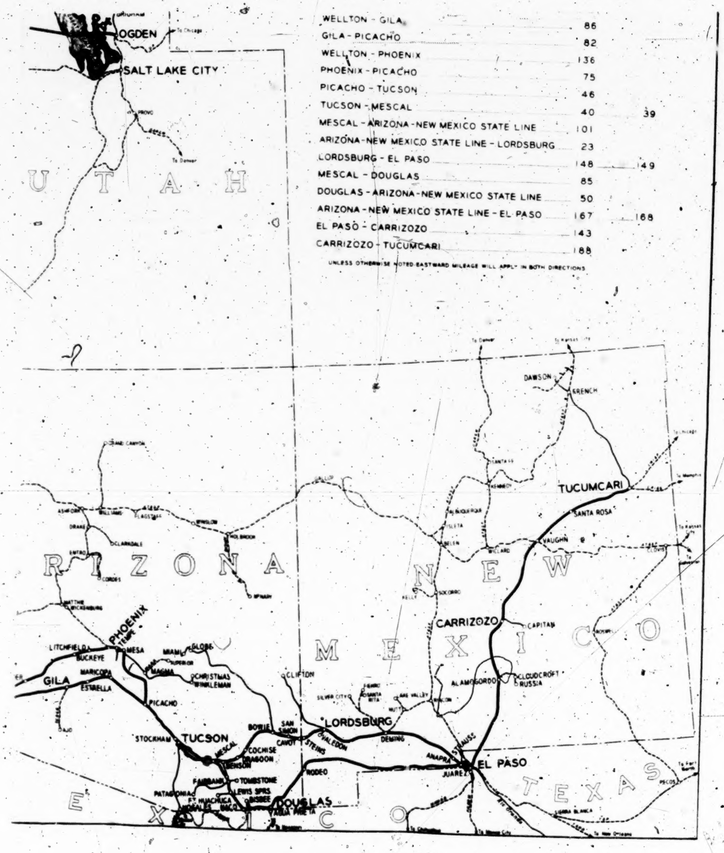
MILEAGE TABLE

	EASTWARD	WESTWARD
LOS ANGELES - COLTON	59	
COLTON - INDIO	72	
INDIO - YUMA	22	
INDIO - NILAND	57	
NILAND - CALEXICO	4	
CALEXICO - YUMA	61	
YUMA - WELLTON	37	
WELLTON - GILA	88	
GILA - PICACHO	82	
WELLTON - PHOENIX	136	
PHOENIX - PICACHO	75	
PICACHO - TUCSON	46	
TUCSON - MESCAL	40	39
MESCAL - ARIZONA - NEW MEXICO STATE LINE	101	
ARIZONA - NEW MEXICO STATE LINE - LORDSBURG	23	
LORDSBURG - EL PASO	48	49
MESCAL - DOUGLAS	85	
DOUGLAS - ARIZONA - NEW MEXICO STATE LINE	50	
ARIZONA - NEW MEXICO STATE LINE - EL PASO	67	68
EL PASO - CARRIZOZO	43	
CARRIZOZO - TUCUMCARI	88	

UNLESS OTHERWISE NOTED EASTWARD MILEAGE WILL APPLY IN BOTH DIRECTIONS




PACIFIC OCEAN
OGDEN
SALT LAKE CITY
CARLIN
PALISADE
WINNEMUCCA
ROSE CREEK
GERLACH
TERMINA
MENDEL
LOVELOCK
PERTH
WEED
TRUCKEE
RENO
FALLON
HAZEN
ROSEVILLE
DAVIS
SACRAMENTO
STOCKTON
SAN FRANCISCO
OAKLAND
SAN JOSE
MERCED
WATSONVILLE
FRESNO
TONOPAH JCT
WABUSKA
SAN LUIS OBISPO
BAKERSVILLE
MOJAVE
SAUGUS
LOS ANGELES
INDIO
SAN DIEGO
YUMA
WELLTON
GILA
PHOENIX
PICACHO
TUCSON
LORDSBURG
CARRIZOZO
EL PASO
JUAREZ
DOUGLAS
NEVADA
UTAH
ARIZONA
NEW MEXICO
MEXICO
TEXAS
GILA - PICACHO
WELLTON - PHOENIX
PHOENIX - PICACHO
PICACHO - TUCSON
TUCSON - MESCAL
MESCAL - ARIZONA-NEW MEXICO STATE LINE
ARIZONA-NEW MEXICO STATE LINE - LORDSBURG
LORDSBURG - EL PASO
MESCAL - DOUGLAS
DOUGLAS - ARIZONA-NEW MEXICO STATE LINE
ARIZONA - NEW MEXICO STATE LINE - EL PASO
EL PASO - CARRIZOZO
CARRIZOZO - TUCUMCARI
UNLESS OTHERWISE NOTED EASTBOUND MILEAGE WILL APPLY IN BOTH DIRECTIONS


OGDEN
SALT LAKE CITY
UTAH
ARIZONA
NEW MEXICO
TUCUMCARI
SANTA ROSA
CARRIZOZO
LORDSBURG
EL PASO
TUCSON
PHOENIX
GILA
PICACHO
DOUGLAS
TEXAS
MEXICO
WELLTON - GILA 86
GILA - PICACHO 82
WELLTON - PHOENIX 136
PHOENIX - PICACHO 75
PICACHO - TUCSON 46
TUCSON - MESCAL 40 39
MESCAL - ARIZONA - NEW MEXICO STATE LINE 101
ARIZONA-NEW MEXICO STATE LINE - LORDSBURG 23
LORDSBURG - EL PASO 48 49
MESCAL - DOUGLAS 85
DOUGLAS - ARIZONA - NEW MEXICO STATE LINE 50
ARIZONA - NEW MEXICO STATE LINE - EL PASO 167 168
EL PASO - CARRIZOZO 43
CARRIZOZO - TUCUMCARI 188
UNLESS OTHERWISE NOTED EASTBOUND MILEAGE WILL APPLY IN BOTH DIRECTIONS

grade conditions in the territory between Indio, California, and Lordsburg, and then more generally with the grades and curvatures east of Lordsburg and west of Indio. This finding is based largely on the descriptive testimony offered through Witness Kirkbride, and also upon the showing of grades and curvatures which appears in detail upon the profiles introduced in evidence by and through that witness.

The finding itself responds to an allegation embodied in paragraph 2 of Part III of the answer (R. 8-9). That allegation relates particularly to grade conditions in southern Arizona and New Mexico. The finding as proposed includes reference to the grades encountered in the California portion of the affected territory, because they are material to the consideration of the ultimate effect of the law upon appellant's freight and passenger-train operations.

Kirkbride, R. 1126-1127, 1176-1177.
Exhibit 155 (R. 3029).

We call particular attention to the comparatively favorable operating conditions which exist on the main lines throughout the affected territory, and particularly those portions east of Yuma. Between Yuma and Tucson the line ascends eastward on comparatively gentle grades, which nowhere exceed 1 per cent, except for the short distance from Lava to Sentinel, a distance of 4.1 miles, and from Gila to Estrella, 18.9 miles, where the ruling grade in each case is 1.02 per cent.

There are long stretches between Yuma and El Paso where the track is level or nearly so, or the grades nominal. There are four comparatively short districts east of

Tucson, three for eastward traffic and one for westward traffic, where the opposing grades are somewhat more severe. These are all between Tucson and Lordsburg. Between Tucson and Mescal, about 40 miles, the ruling grade eastward is 1.06 per cent. From Benson to Dragoon, about 21 miles, the ruling grade is 1.4 per cent; and from San Simon to Steins, 14.7 miles, the ruling grade is 1.4 per cent. Westward from Lordsburg there is a very short ruling grade of 1.4 per cent near the summit of Steins Pass; and between Benson and Mescal, about 9 miles, the westward ruling grade is 1.4 per cent. The only other grade in excess of 1 per cent opposed to westward traffic is between Cochise and Dragoon, where the ruling grade is 1.1 per cent, for about 12 miles.

The curvatures, like the grades, are comparatively light and infrequent upon the lines in the affected territory. Less than one-sixth of the total main-line mileage between Yuma and El Paso via Gila and Lordsburg consists of curved track; and there are only 5.5 miles of track in that line (or less than 1 per cent), consisting of curves of more than 6 degrees. Curvatures on the alternate main lines are similarly of minor importance.

In all cases, where curvatures exist in grade territory, the grades are compensated for the curves, in that the rise of the line, expressed in feet of distance per mile, or in percentage, is reduced around each curve so that the combined effect of the resistance to the movement of traffic afforded by the grade itself, and also by the curvature considered apart from the grade, are together equal to and in all events not greater than the resistance contrib-

uted by the grade itself upon a corresponding and usually adjacent stretch of "tangent" (straight) track. In other words, in territory where grades and curves are both encountered, the ruling grade, including allowance for resistance afforded by curves, may be expressed in terms of percentage rise alone, because all the grades are "compensated." It may be added that this practice of compensating for curves in grade territory prevails on all parts of appellant's Pacific Lines.

Kirkbride, R. 1131-1136, 1139-1140, 2190-2193, 2194-2196.

Exhibits 155 (R. 3029), 175 (R. 1284), 301 (R. 2097), 302 (R. 2101), 303 (R. 2102), 309, 310 (R. 2210).

In districts other than in Arizona where 1.4 per cent or heavier grades are encountered, the operation of long trains is not prevented nor even hampered by the grade and curve conditions. Such long-train operation is, and has been in fact, the regular and standard operating practice of the appellant; and, as shown elsewhere in the testimony and in the findings predicated thereon, it is a general practice on practically every other major railroad in the United States, under conditions which are in many instances less favorable than in Arizona.

Kirkbride, R. 1176-1178; and see *Findings* VII(b), R. 3915-3920, VIII(b), R. 3937, and VIII(f), R. 3945-3946, with annotations.

(3) **Helper districts (R. 3985-3986):**

In this subdivision helper districts are defined; and the location of the freight helper districts in Arizona specified.

We emphasize the point that the mileage of the helper districts in the affected territory east of Yuma is comparatively small. There are less than 95 miles of regular freight helper districts on the main lines between Yuma and El Paso, although, as shown by subparagraph (a) of this finding, the total mileage of the main lines between Yuma and El Paso is 1,069 road miles.

For the sake of completeness this finding includes a reference to the helper districts between Colton and Indio, California. These districts are a part of the affected territory, in that the enforcement of the law affects appellant's operations, particularly of passenger trains, as far west as Los Angeles.

Dyer, R. 1116-1118; *Sines*, R. 1414-1415, 1417-1420, 2285-2286.

Exhibits 155 (R. 3029), 175 (R. 1284).

(4) The affected lines well constructed (R. 3896):

This subparagraph summarizes into two short sentences the extensive testimony of witnesses Kirkbride and J. B. Baker, whereby the essential facts were established. Mr. Baker's testimony shows the amount invested by appellant in its lines in the affected territory, particularly during the years since and including 1924; while Mr. Kirkbride's testimony establishes the adequacy of the track and track structures to carry the heaviest type of locomotive or other equipment owned or used by appellant. This same testimony likewise establishes that block signals and numerous other safety devices of approved modern type have been installed on every part of the affected main line.

There was no showing, or even suggestion, on the part of appellee that any portion of the track or structures in the affected territory would be overloaded or impaired by, or inadequate to permit, the operation of long trains. As fully explained by Mr. Kirkbride, the ability of track or bridges to sustain the weight of heavy locomotives is largely determined by the speed at which locomotives are operated, subject to consideration of the load upon each individual driving axle of the locomotive unit. The locotives now operated by appellant in the affected territory, particularly in freight service, have an average load per driving axle approximately equal to and, in some instances, greater than that of the heavier and larger types used elsewhere on the system. In so far as concerns speed, the strains and stresses imposed upon track and track structures by relatively light locomotives in high-speed passenger-train service are far more serious than those imposed by substantially heavier locomotives used in freight service and moving at the maximum speeds (45 miles per hour) permitted in freight-train operation. Furthermore, no freight or passenger cars, even including freight cars loaded to maximum capacity, impose any strains or stresses greater than those imposed by the locomotives hauling the trains; consequently the capacity of the track is measured by its capacity to withstand passenger locomotive usage.

J. B. Baker, R. 824-830, 837-839, 846-856; *Dyer*, R. 1115, 1117-1118; *Kirkbride*, R. 1140-1176.

Exhibits 110 to 114 (R. 2964-2974), 157 to 159 (R. 3031-3033).

This finding bears directly upon the question whether the lines in the affected territory are of sufficient strength to permit the operation of long trains, in the event the law's restrictions should be removed; i.e., whether the law imposes any real restriction upon appellant's operations, or whether they should be properly restricted regardless of the fixed limitation imposed by law. This finding, taken together with the preceding subdivisions hereof, shows that there is no limitation inherent in the present physical plant in Arizona which renders impossible or impracticable the commencement and continuance of long-train operation which, as set forth in the findings hereafter, has been followed by appellant on all parts of its system, other than Arizona, for more than 18 years last past, and was in fact followed upon a limited scale and for a brief period in the affected territory as well.

(c) DEFENDANT'S LINES IN NEVADA AND UTAH: DESCRIPTION: COMPARISON WITH ARIZONA LINES (R. 3896-3897).

For the purpose of showing the effects of the law, both as a purported safety measure, and as a regulation imposing burdens and interference on appellant's operations, numerous comparisons have been made between such operations in Arizona and the affected territory generally, and the operations in Nevada and Utah. To support these comparisons, appellant has shown that the operating and traffic conditions which prevail in Nevada and the adjoining territory are essentially similar to, or at least fairly comparable with those which prevail in the territory affected by the Arizona law.

Finding III(c) relates primarily to the operating conditions, as distinguished from the character of traffic handled, in Nevada and Utah. It shows that in that territory the ruling grades and curvatures are approximately the same, and in any event no more favorable, than in Arizona; and that there are no ruling grades encountered in Arizona which exceed those in Nevada. The main lines in Nevada and Utah, like those in Arizona, are constructed in accordance with the best modern standards, and well maintained and equipped throughout with block signals and other safety devices.

We invite especial attention to the profiles of the lines across Arizona: Exhibits 155, 309 and 310, which should be compared with the profiles of the lines across Nevada: Exhibits 156, 306, 307 and 308. Further comparisons showing the percentage of the mileage on which the grades exceed one per cent in relation to total mileage, in both Nevada and Arizona, and the curvatures and other principal characteristics as well, expressed in percentages of total main-line mileage, are set forth in the testimony. This showing establishes the essential similarity of the operating conditions, and particularly shows that in Nevada and Utah conditions are certainly no more favorable than in Arizona, and may properly be considered, in view of the severe winter climate, to be somewhat less so.

None of the testimony, either oral or statistical, referred to in support of this finding, was in any way challenged as to its accuracy, nor was there any question whatsoever of the qualifications of appellant's witnesses. The finding

is fully supported, and is germane and essential for the reasons stated.

Answer, Par. 2, Part III (R. 9).

Dyer, R. 1111; *Kirkbride*, R. 1135-1140, 1161-1163, 1167-1176, 1177-1178, 1182-1183, 2102-2105, 2185-2200.

Exhibits 110 (R. 2964), 155-159 (R. 3029-3033), 301, (R. 2097), 302 (R. 2101), 303 (R. 2102), 306-308 (R. 2188), 309-310 (R. 2210).

IV.

CHARACTER OF FREIGHT AND PASSENGER TRAFFIC HANDLED UPON DEFENDANT'S LINES IN ARIZONA AND ADJACENT TERRITORY: COMPARISON WITH NEVADA TRAFFIC (R. 3897-3901).

(a) PREDOMINANT INTERSTATE CHARACTER OF ARIZONA FREIGHT AND PASSENGER TRAFFIC (R. 3897-3898).

An outstanding fact in this case is that substantially all of the traffic handled across Arizona, and thus subjected to the interferences and burdens imposed by the law, is interstate; that is to say, it either originates at or is destined to points outside of Arizona. In fact, approximately two-thirds of such traffic appears to be "bridge" traffic: i.e., it has both origin and destination outside of the state.

Witness Masson's Exhibits 141 to 148 inclusive (R. 3917-3924), contain an analysis of the freight and passenger traffic handled by appellant in Arizona for various years

and groups of years, and in various classifications, up to and including the year 1939. Thus, Exhibit 143 contains an analysis of the freight traffic actually carried by appellant in Arizona for the years 1925 to 1939, inclusive, as measured in revenue freight ton miles; while Exhibit 147 contains a similar analysis of passenger traffic as measured in revenue passenger miles. A computation from Exhibit 143 shows that for the five years 1935 to 1939, inclusive, 92.74 per cent of the revenue freight ton miles related to interstate freight traffic; while a similar computation, from Exhibit 147, shows that 95.49 per cent of the revenue passenger miles in Arizona related to interstate passenger traffic. Exhibit 144 contains a more detailed analysis of the freight traffic carried in four typical years, 1925, 1929, 1938 and 1939; the segregation being made as between traffic originating without and terminating within the state, that originating within and terminating without the state, that passing through the state but having both origin and destination outside, and that which is wholly intrastate in character. In both the years 1938 and 1939, the traffic originating and terminating outside of the state, and passing through the state, exceeded 68 per cent of the total traffic. A similar analysis of passenger traffic is found on Exhibit 148, which shows that the so-called "bridge" traffic was, in both 1938 and 1939, more than 74 per cent of the total.

Exhibit 141 contains an analysis of freight revenue, associated with the handling of freight traffic within or across Arizona, the revenues on interstate shipments being allocated to the state in accordance with mileage prorate formula adopted and followed by the Arizona Cor-

poration Commission though not subscribed to by appellant as accurate. This formula, which allocates to Arizona the same proportion of the total revenues earned by an interstate shipment which the distance traveled in Arizona bears to the total distance traveled by the shipment, is inaccurate particularly in so far as bridge traffic is concerned, because it makes no allowance for originating or terminating services, but assumes that all mileage is entitled to the same proportion of earnings. Regardless of such inaccuracies, the allocation shows that in every year since 1912, more than 90 per cent of the total freight revenues within Arizona have accrued with respect to interstate traffic; for the 5-year period 1935-1939, the proportion was approximately 93 per cent. In the year 1939, moreover, as shown by Exhibit 142, the bridge traffic passing across Arizona was responsible for more than 64 per cent of the total freight revenue earned in the state; and the figure for 1939 is representative generally of the years since and including 1930. In so far as concerns passenger earnings, the results are similar. In the most recent five years, more than 95 per cent of the passenger earnings within Arizona have accrued with respect to interstate passenger traffic.

Masson, R. 1058-1078, 1225-1226, 1236-1239; *Sines*, R. 1368-1373.

Exhibits 167 (R. 3041), 170 (R. 3044), 189 (R. 3082), 190 (R. 3083).

There can be little doubt that every freight and passenger train upon the main lines in the affected territory is an interstate train, within the meaning of the definition

set forth in Finding I. It is noteworthy that there was no attempt, on the part of appellee, to challenge or contest this showing of the predominant interstate character of the Arizona traffic; nor has there been any contention that any trains operated upon appellant's main lines during any recent period, or at the present time, consist or have consisted exclusively of cars moving in intrastate commerce.

The finding responds to the allegations of paragraph 6 of Part III of the answer (R. 22-23), and is important and essential, because it establishes that the trains moving upon the lines in Arizona, which are affected and regulated by the law, are all interstate trains, and carry interstate traffic almost exclusively; in other words, that the law is a regulation of commerce which is almost entirely interstate in character.

(b) CHARACTER OF COMMODITIES TRANSPORTED: NEED FOR EXPEDITION (R. 3898-3900).

In paragraph 6 of Part III of the answer (R. 22-23), it is also alleged that a substantial portion of the interstate traffic handled across Arizona consists of perishable agricultural products, which must be so transported as to avoid delay in delivery at eastern market destinations, with consequent losses due to price fluctuations, and decay and deterioration en route.

The evidence shows that more than 120,000 carloads, or 46 per cent of the approximately 262,000 carloads of all kinds of freight, both interstate and intrastate, handled on appellant's lines in Arizona in 1939, consisted of

products of agriculture or livestock; that approximately 89,000 carloads consisted of fruits and vegetables, and other perishable agricultural products. In the same year, out of approximately 191,000 carloads handled by appellant in New Mexico, 109,500 consisted of products of agriculture or livestock, and 87,000 carloads of perishable agricultural products. The predominant direction of movement of such perishables is shown to be eastbound.

As showing further the importance of the perishable traffic in the affected territory, 59 per cent of the eastbound cars handled into El Paso by appellant during the five years ending in 1939 were loaded refrigerator cars, while about 53 per cent of the westward cars handled out of El Paso were empty refrigerator cars. Refrigerator cars are, as stated in this finding, designed and in nearly all cases used for the transportation of perishable traffic. While this count of refrigerator cars and other traffic was made at El Paso, the evidence leaves no doubt that a traffic analysis at that point shows with close accuracy the character of the traffic moving across Arizona, because there are no stations between El Paso and the Arizona-New Mexico line at which any substantial number of cars moving either eastward or westward would be received, delivered, or diverted.

The necessity is apparent for prompt handling of this perishable and livestock traffic, and as well of the manufactured products of high intrinsic value referred to in the first paragraph of the finding; and moreover, such necessity is demonstrated by uncontested testimony. There is equal necessity for the prompt return of empty refrig-

erator cars, moving westward to the producing areas, and of other empty equipment used in handling this traffic.

Sines, R. 67-68, 1368-1373; *Kirk*, R. 255-257; *Fertig*, R. 505-506; *Cartmill*, R. 982-983, 986-987; *Mahoney*, R. 1022-1024; *Dyer*, R. 1110-1111; *Masson*, R. 1225-1228, 1236-1239, 1726-1730; *G. C. Baker*, R. 1284-1287, 1456.

Exhibits 167 (R. 3041), 168 (R. 3042), 170 (R. 3044), 175 (R. 1284), 189 (R. 3082), 190 (R. 3083), 217 (R. 3204-3208), 218 (R. 3206-3207).

The purpose of the finding is to show that the interstate traffic which is subjected to the restrictions, delays, and regulations of the Train-Limit Law is of the type which requires speedy handling, and suffers most directly from such delay and interference; and thus to show that the law operates with particularly drastic effect upon the principal traffic handled in the affected territory.

(c) ARIZONA TRAFFIC COMPARED WITH TRAFFIC ACROSS NEVADA (pp. 20-21).

This finding is a companion to Finding IV(c), and responds also to the allegations contained in paragraph 6 of Part III of the answer (R. 22-23). It is based upon undisputed statistics, which show that the traffic handled upon appellant's lines across Nevada and Utah is similar in character, both in that it is predominantly interstate, and in its distribution as between perishable products and other types of freight, to the traffic in the affected territory.

It also appears that the volume of appellant's freight traffic in and across Arizona does not vary to any marked extent from the volume handled in and across Nevada. This is definitely shown by the comparisons of the total volume of the traffic, measured in car miles, in the States of Nevada and Arizona, which appear upon many of the exhibits: notably Exhibits 149, 150, 277, 279 and 280. Exhibit 277 shows that during the six-year period 1935-1940, there were about 859,500,000 freight-car miles accumulated in Nevada, and 828,000,000 accumulated in Arizona. In the 18-year period 1923-1940 there were 2,391,000,000 freight-car miles accumulated in Nevada, and 2,283,000,000 in Arizona. In 1940 there were 164,482,000 car miles accumulated in Nevada, and 155,909,000 in Arizona, a difference of about 5 per cent.

The analysis of traffic moving over appellant's lines into Ogden, Utah, eastward, and out of Ogden, westward, which appears in Exhibit 189, and as well the analysis of loaded and empty car miles made by Pacific Fruit Express Company refrigerator cars and other cars in the two states, which appears in Exhibit 190, indicate approximately the same distribution as between refrigerator-car traffic, empty-car movements, and other car traffic, in Nevada as in Arizona. Ogden is comparable to El Paso, in that appellant's principal main line across Nevada and northern Utah connects there with the lines of several other carriers, and a count of eastward and westward traffic can readily be made; moreover, there are few if any stations between Ogden and the Nevada-Utah line at which any considerable volume of traffic is diverted, received, or delivered by appellant. Just as in the case of El Paso, sub-

stantially all of the traffic moving over appellant's line west of Odgen in either direction is interstate traffic moving either from or to points in or beyond Nevada. The distribution of the Arizona and Nevada traffic as between refrigerator-car traffic and other types is in substantially the same proportions in both states.

Dyer, R. 1110-1111; *Masson*, R. 1228-1239, 1726-1729; *Sines*, R. 1368-1373, 1386-1387.

Exhibits 167 (R. 3041), 169 (R. 3043), 170 (R. 3044), 189 (R. 3082), 190 (R. 3083), 217 (R. 3204-3205), 219 (R. 3208-3209).

The purpose of this finding is like that of Finding IV(c); namely, it indicates that from the standpoint of the traffic handled, appellant's lines in Nevada can also properly be compared with the lines in the affected territory.

V.

THE TRAIN-LIMIT LAW: HISTORY AND TEXT (R. 3901-3902).

This finding reproduces without any material variation (except the addition of the reference to the most recent compilation of the Arizona Statutes) the allegations of the initial paragraphs of each of the two causes of action set forth in the complaint (R. 1-4). These allegations were expressly admitted in paragraph 1 of Part I (R. 5), and paragraph 1 of Part II (R. 6) of the answer. The finding was incorporated for the purpose of setting forth in full the text of the challenged statute, and in order that the findings as a whole might be a complete recital of all matters involved in the case.

VI.

RECENT IMPROVEMENTS IN DEFENDANT'S TRANSPORTATION PLANT, BOTH GENERALLY, AND IN THE TERRITORY AFFECTED BY THE LAW (R. 3902-3908).

(a) IMPROVEMENTS IN TRACK, ROADBED, BRIDGES AND OTHER FIXED STRUCTURES (R. 3902-3904).

This finding responds to that part of the allegations contained in section (a) of paragraph 3, Part III, of the answer (R. 9), which relates to the improvements in the track and fixed structures on appellant's lines in the affected territory, made since 1912 and particularly since 1920. The finding refers in detail to all of the various permanent improvements which have thus been made, such as: replacement of lighter rail by heavier sections; use of crushed rock and slag ballast in place of gravel ballast, and in greater quantity; constant renewal and replacement of ties, and use of better ties in greater number; repair, renewal and replacement of bridges; separation of grades, and construction of automatic warning signals at highway crossings; construction of double track, and of additional yard and terminal facilities; the installation of block signals and interlocking signal plants; and the acquisition, reconstruction, and improvement of the lines formerly owned by the Arizona Eastern and El Paso and Southwestern railroad companies.

Kirkbride, R. 1132-1133, 1155-1176; *Herbert*, R. 1540-1545.

Exhibits 157 (R. 3031), 158 (R. 3032), 159 (R. 3033), 200 (R. 3149), 201 (R. 3150).

This finding is in part predicated upon Exhibits 110 to 114, inclusive (R. 2964-2974), which present the detail of

the additional investment in track and fixed structures made since January 1, 1924. We call special attention to the fact that in the 16 years, 1924 to 1939, inclusive, more than $21,000,000 in new money was invested by appellant for permanent improvements to the roadbed and fixed structures in the territory between Yuma and El Paso, which figure does not include any moneys expended in acquiring the El Paso and Southwestern or Arizona Eastern properties. The net additional investment in Arizona alone, for permanent improvements to roadbed and fixed structures, during said 16-year period, was about $18,400,000.

J. B. Baker, R. 824-830, 837-839, 846-856.

The finding also reflects the detailed testimony of witness Kirkbride, appellant's Chief Engineer, as to the manner in which renewals, replacements and new construction have been carried on in the affected territory, and the present state of the appellant's fixed physical plant.

Finally, the finding includes reference to the fact that the sidings and passing tracks on appellant's lines in Arizona, in 1912, the year when the Train-Limit Law became effective, were not generally of greater length than just sufficient to accommodate a 70-car train of that day, with its engine and caboose. While, as stated in the finding, such sidings have been generally improved since 1912, by being relaid with heavier rail or in other ways, and there have been some changes at various stations, the sidings in Arizona at the present time, apart from those at the more important stations, are still generally not longer than approximately 70 car lengths, including engine and

caboose. Many such sidings will not accommodate a full 70-car train.

Dyer, R. 1105.
Exhibit 197 (R. 3114).

While it is not necessary to discuss the point in connection with this finding, it is worth while to point out that there has been no reason or incentive for appellant to extend its Arizona sidings beyond the lengths prevailing in 1912. Sidings are necessarily adjusted to the lengths of the trains which they are called upon to accommodate. To install additional siding capacity would involve useless and unnecessary expense. It cannot properly be argued, however, that appellant has in any way neglected a desirable improvement in its fixed plant in Arizona, by having failed to extend siding capacities beyond those necessary for 70-car trains; nor can it be argued that appellant would be unable to operate long trains even if the restrictions of the law were removed. If the law is to be observed, as has been the consistent course of appellant throughout the years since 1912 (except for the period of limited long-train operation in 1940, and since 1942, under authority of Service Order 85), extensions of sidings would be a useless and unnecessary investment. On the other hand, a limited long-train operation is practicable, as was demonstrated in April, 1940, even with present siding capacity. Moreover, as stated elsewhere in the findings and fully shown by undisputed testimony, the siding extensions necessary to long-train operation on a substantial and virtually unlimited scale are wholly prac-

ticable, and can be accomplished by a relatively moderate investment.

See *Findings* IX(a) and (b): R. 3947-3950.

Finding VI(a) responds to an essential allegation of the affirmative defense, as to which there was no opposing testimony offered by appellee. In fact, to the extent that the subject-matter was treated at all in the testimony of appellee's witnesses, that showing tends to confirm the facts set forth in the finding.

(b) IMPROVEMENTS IN LOCOMOTIVES, CARS AND EQUIPMENT (R. 3904-3907).

Finding VI(b) corresponds to the preceding finding, in that it sets forth the improvements in the motive power and equipment used in the affected territory, corresponding to the improvements in fixed property which are the subject of the preceding finding. It will be noted that the finding also states that the same types of equipment are in use upon appellant's lines in Nevada and Utah.

This finding responds to the issues tendered by sections (a) and (b) of paragraph 3 of Part III of the answer (R. 9-10).

As to the locomotives in service or available for service in the affected territory, the testimony shows the consistent improvement of appellant's motive power, and the present ownership and use of modern-type locomotives, fully adequate to handle long trains with speed, economy, efficiency, and safety. These locomotives are equipped with the various devices, referred to in the finding, which promote economy of operation while permitting the attain-

ment of greater speeds, accompanied by better control of trains while on the road. The locomotives in use in the affected territory are among the latest and most modern types owned by appellant; and are the same types which have recently been and presently are in use in Nevada, as well as in those adjacent portions of California and New Mexico where the traffic handled and the service rendered is substantially the same as in Arizona. These locomotives have demonstrated, over several years of use, that they are fully capable of handling and controlling appellant's long trains, including both loaded and empty cars, at the speeds made necessary by present-day schedule requirements, in territory not essentially different from Arizona.

The amount expended by appellant in acquiring this new and more efficient motive power is not a matter of dispute. The detail of the expenditures made since 1922 in the acquisition of new locomotives, pursuant to authority granted by the Interstate Commerce Commission under Section 20a of Part I of the Interstate Commerce Act, is shown on Exhibit 7; while the dates and citations of the Commission's orders in connection with each such authority appear on Exhibit 174. In each such proceeding it was made to appear and was found, in conformity with Section 20a, that the expenditures proposed were for a purpose necessary to the conduct of appellant's obligations as a common carrier and consistent with the performance of that obligation, and would reasonably be necessary in furtherance of such performance of appellant's common-carrier duty. In each proceeding the character of the locomotives to be purchased, including the power which they would develop and the amount of the tonnage which they

would haul, were all expressly set forth in the applications, and generally referred to in the Commission's decisions. It was particularly made to appear, at least as to the more recent acquisitions of heavier locomotive types, that such locomotives were individually capable of hauling many more than 70 freight cars in ordinary operation, and thus that they were being acquired expressly for the purpose of operating or continuing the operation of long trains, in accordance with appellant's established practice. The Commission, by giving the express authority required by law for the acquisition of these locomotives has thus approved, authorized, and encouraged the long-train operating method followed by appellant on all parts of its system except in the affected territory.

Russell, R. 97-112; *Masson*, R. 1261-1264; *Sines*, R. 1350-1354, 1710-1711, 2285-2286; *Burke*, R. 1609-1611; *F. P. McDonald*, R. 1612-1614; *Fifield*, R. 2792, 2799, 2800-2801, 2806; *Menzies*, R. 2815-2816.

Exhibits 5 (R. 2855), 6 (R. 2856), 7 (R. 2857), 174 (R. 3064), 183 (R. 3075), 212 (R. 3196).

That portion of the finding which relates to improvements in the freight and passenger car equipment used in the affected territory and elsewhere is equally important, in that it shows the greater factor of safety (from the standpoint of the strength and other characteristics of the freight and passenger cars in service) introduced into appellant's train operations, side by side with the adoption and carrying out of the long-train program.

Improvements in freight-car construction have included the complete elimination of the wooden-underframe car, insofar as through or interchange service is concerned. This restriction means that such wooden cars cannot be loaded with freight to be interchanged, without transfer of the lading, at El Paso or Tucumcari or any other interchange point. In a practical sense, wooden-underframe cars are no longer used in main-line service.

The arch-bar type of truck, which appears to have been a point of weakness and thus responsible for accidents involving freight cars in earlier years, has likewise been eliminated; all cars in use in interchange service in the affected territory are entirely equipped with trucks having cast-steel side-frames. Another important improvement is the elimination of the older double-plate type of wheel; single-plate cast-iron wheels are now in universal use upon all freight equipment in the affected territory.

Other improvements have included the use of heavier types of graduating springs in the triple valves, described by one of appellee's witnesses (*Cooper*, R. 2442) as one of the best improvements ever accomplished. The effect of this replacement, which is now complete as to all cars in interchange service, has been to eliminate in a practical sense the so-called "quick-action" triple valve, which in the past was a common source of unintended ("undesired") emergency action. A further improvement, now in progress, is the adoption of the improved type of freight-brake valve known as the "AB" valve. This valve is now standard upon all cars built new during the last ten years, and by express requirement of the Interstate Commerce Com-

mission will shortly be required upon *all* cars used in revenue freight service.

A further important improvement in freight-car equipment has been the widespread use of the modern friction draft gear, in place of the older-type tandem-spring draft gear. All refrigerator cars, and more than 80 per cent of all of the other freight cars owned by appellant and used in interchange service, are equipped with friction draft gears.

The finding states, and the evidence likewise establishes, that substantial improvements have been made in passenger-car equipment. Among such improvements have been the complete elimination of wooden passenger cars; the substantial reconstruction and improvement of the braking appliances; the strengthening, and improvement otherwise, of the couplers, draft gears, and draft riggings; and the installation of many other devices, shown in detail in the evidence, all contributing to the safety and comfort of the traveling public and the employes on the passenger trains, and greater ease, safety and economy of passenger-train operation.

Leriche, R. 72, 78, 80-94, 113; *Parke*, R. 787-798, 805-824; *Cartmill*, R. 989-1012; *Browning*, R. 1557-1575; *Bohnstengel*, R. 1673-1706; *Barker*, R. 1866-1868.

Exhibits 2 to 4 (R. 2852-2854), 107 to 109 (R. 2960-2963), 135 (R. 3002), 136 (R. 3003-3005), 204 (R. 3153-3180), 210 (R. 3194), 247 (R. 3253), 396 (R. 3572-3577).

The purpose of this finding is to sustain the important allegations above referred to, which are incorporated in the affirmative defense. The annotations show that there is no real conflict in the testimony. The finding is directly material and essential, because it serves to show that the equipment available to appellant, in actual use in its trains in the affected territory as well as in Nevada and elsewhere upon its system, is of the same adequacy to permit long-train operation, as the roadway, track, and fixed structures described in Finding VI (a); that the arbitrary restriction created by the law is unnecessary, and defeats the very purpose for which were incurred the substantial outlays made by appellant, and expressly authorized by the Interstate Commerce Commission; and thus, to a very large extent, unnecessarily deprives appellant of the use and usefulness of such property.

At the risk of repetition, we emphasize again the initial sentence of Finding VI(b), and in this connection refer also to the initial sentence of Finding VI(a). These sentences call attention to the fact that the improvements, set forth in detail in each of these findings, have taken place during the years since 1912, when the Train-Limit Law was enacted, and more especially since 1923. We believe that they were incorporated in the findings for the particular purpose of calling attention to the very great changes in the railroad properties, both fixed and movable, operated by appellant in the affected territory. No principle is more universally recognized than that which declares that a rule or regulation directed to a particular set of circumstances, and which might be reasonable in the light of the facts then existing, may become wholly

unreasonable, and necessarily subject to change or rescission, when the essential circumstances themselves are changed. Even though it be argued that the Train-Limit Law had some ostensible warrant as a safety measure, in the light of appellant's plant, equipment, and operating methods in Arizona in 1912, the extensive and virtually complete redesign and reconstruction of that plant and equipment in the intervening 29 years, accompanied (as shown in succeeding findings) by equally extensive revisions of operating methods, creates at least a strong presumption, if it does not fully establish, that the Train-Limit Law is outmoded and obsolete, addressed to a state of affairs which no longer exists, and therefore wholly unreasonable and unnecessary as applied to present-day conditions.

(c) PURPOSE OF THE IMPROVEMENTS MADE BY DEFENDANT: ADEQUACY OF DEFENDANT'S PRESENT TRACK, STRUCTURES, AND EQUIPMENT TO PERMIT OPERATION OF LONG TRAINS (R. 3907-3908).

This paragraph of the findings responds very largely to the allegations in the concluding sentence of section (a) and also the concluding sentence of section (c) of paragraph 3 of Part III of the answer (R. 10-11).

There can be no question, in the light of the testimony of appellant's witnesses, particularly Messrs. Dyer and Kirkbride, that the heavy expenditures for the improvement of appellant's road and equipment were undertaken for the primary purpose, as stated in the finding, of enabling the appellant's railroad properties to be operated with the greatest possible safety, efficiency, and economy,

and in furtherance of the proper discharge of its public duty as a common carrier. Appellee has never contended that such was not the purpose, or that any other purpose was intended.

The finding refers to the expenditures undertaken by appellant, particularly those since 1923, as being part of the general program of betterment of the railroad transportation plant commenced in that year by United States railroads generally. The testimony of Dr. Parmelee establishes that the general program was agreed upon and instituted in 1923, and that appellant participated therein.

Parmelee, R. 186-190.

The careful inspection and maintenance of the track, bridges, and other structures in the affected territory, and their present adequacy to permit the operation of the heaviest locomotives and trains owned or used by appellant, are matters of fact as to which there is no conflict. As to the locomotives, it is shown that those presently in use in that territory are fully adequate to handle long freight and passenger trains; moreover, there are available heavier and more powerful locomotives which will handle such trains with even greater efficiency and economy. There is no question as to the adequacy, from the standpoint of strength and construction, and the devices and appliances with which they are equipped, of the cars operated or to be operated in appellant's trains. In short, long-train operation, with equipment which appellant now has in use or available for use in the affected territory, and upon the lines in that territory in their present condition, is completely practicable. Climatic con-

ditions, and all other conditions affecting train operation, are favorable, or do not in any event constitute a limiting factor. The intention of appellant to operate long trains at once if relieved of the restrictions, to the extent that present siding capacities permit, and to increase siding capacities in order to develop the long-train program more fully, is likewise fully shown.

Dyer, R. 1115-1117.

The final and convincing demonstration of the practicability of long-train operation in Arizona is set forth in the concluding paragraph, which refers to the experience gained during the months of March and April, 1940, when appellant operated 62 long passenger trains and more than 302 long freight trains in Arizona, without any sacrifice of efficiency, or schedule requirements, or safety of operation; in fact, as is stated more fully in subsequent findings, with substantially increased efficiency and economy, and without any casualty or accident which could be in any way ascribed to or associated with train length.

VII.

DEFENDANT'S METHODS OF OPERATION, PAST AND PRESENT (R. 3909-3934).

Finding VII embodies a description of the methods of operation, past and present, followed by appellant upon its system generally, with particular reference to operating methods and the results of such operations in the affected territory.

The finding describes, first, the operating subdivisions, the runs of crews and locomotives, and the general topics

of operating rules and inspections, and then deals with the subject of train lengths, and the development of the long-train program upon the system generally and in the various states other than Arizona. Appellant's freight-train schedules, both past and present, are also referred to in some detail. Finally, there are set forth the effects of the long-train program upon the efficiency and economy of operations, as reflected in the operating statistics, regularly maintained by appellant, and brought from appellant's permanent records into the testimony. The finding thus deals with the issues specifically tendered in section (d) of paragraph 3 of Part III of the answer (R. 11-12) and the first sentence of section (g) of the same paragraph (R. 14).

(a) OPERATING SUBDIVISIONS: RUNS OF CREWS AND LOCOMOTIVES: OPERATING RULES: INSPECTIONS (R. 3909-3915).

(1) Operating divisions and subdivisions (R. 3909-3911):

The first subdivision of Finding VII(a) is essentially preliminary to the later paragraphs. This paragraph defines the divisions and subdivisions in the affected territory, and also in Nevada and Utah, and names the stations designated as freight-train terminals. The operations at those terminals are likewise briefly described, as well as the manner in which the trains are operated. The finding is based upon the undisputed testimony of the several witnesses for appellant who dealt with this subject-matter.

Sines, R. 66-69, 1360-1363, 1384-1385, 1519-1526, 1718, 1721-1722, 1795-1797, 2283-2284; *Kirkbride*, R. 1124-1125; *G. C. Baker*, R. 1285-1286, 1305-1306, 1455-1470; *Herrell*, R. 1487-1488, 1492-1497.

(2) Runs of crews and locomotives (R. 3911-3912):

Subdivision 2 is a continuation of the general description of the operations in the affected territory, containing a brief reference to the customary runs of crews and locomotives in both freight and passenger service.

This paragraph is complementary, in a sense, to paragraph (1), and has been incorporated in the findings with the same purposes in mind. It is also based upon undisputed testimony, principally that of Mr. Sines, as supplemented by Chief Dispatchers Baker and Herrell.

Sines, R. 66-69, 1411-1420, 1423-1424, 1721-1722, 1768, 2284; *Baker*, R. 1456-1463; *Herrell*, R. 1489-1490.

(3) Operating rules (R. 3912-3913):

The general subject of operating rules is discussed at length in the record, particularly in the examination of certain of appellee's witnesses. Paragraph (3) of Finding VII(a) condenses that testimony into one rather brief paragraph, which states that such rules exist, and are codified into the two printed books referred to by name in the text of the finding. It will be noted that the finding also expressly states that these rules apply to operations in all parts of the system, including both the affected territory and the lines in Nevada and Utah.

Dyer, R. 1109-1110; *Cheek*, R. 2482; *Durnil*, R. 2384; *Stevenson*, R. 2490; *Fifield*, R. 2808-2811; *Menzies*, R. 2820-2824.

Exhibits 319, 320 (R. 2287).

This finding is essential, because it deals with a subject matter important to the case from the standpoint of both

parties. The finding does not contain any statement as to which there is any conflict of testimony or opinion. We call especial attention to the specific statement therein to the effect that the rules under which appellant's operations are carried on are complete and adequate, and insure safe operations, *provided that they are fully observed and complied with.*

(4) Inspections (R. 3913-3914):

This paragraph deals rather fully with the matter of car inspections, covering the purpose and character thereof; the places where made; the employes by whom made; the frequency; and the results which follow.

The subject of inspections of cars was dealt with at some length in appellant's testimony, and was also mentioned, somewhat more briefly, by certain of appellee's witnesses. Appellant's witnesses also referred to and produced the code promulgated by the mechanical division of the Association of American Railroads, of which association appellant is a member; and established that appellant, by reason of its membership, of necessity complies with and conforms to the code. Testimony was also offered through Mr. L. E. Cartmill, General Superintendent of the Car Department of the Pacific Fruit Express Company, describing in detail the additional and separate inspections given to refrigerator cars. These refrigerator cars form approximately 50 per cent of the consist of the through freight trains operating over the appellant's lines in both the affected territory and across Nevada.

Cartmill, R. 998-1003; *Browning*, R. 1557-1569.
Exhibits 137 (R. 3006), 204 (R. 3153-3189).

As the finding states, there are frequent inspections of trains and cars by car forces at terminals and interchange points, and by train crews at terminals, and while trains are on the road between terminals. The result of such inspections, as made by trainmen upon long and short trains in that portion of the affected territory between Lordsburg and El Paso, during the six months' period January to June, inclusive, 1940, was made the subject of special and separate study: Exhibit 397 (R. 3578). That exhibit demonstrates that such inspections are effective, on both long and short trains, to discover defects of equipment and other conditions which might cause delay or accident, or otherwise interfere with train movements.

Sines, R. 1423-1425, 1758-1759; *Reid*, R. 1596-1600, 1603-1604; *Burke*, R. 1607-1609, 1611; *F. P. McDonald*, R. 1614-1616.

See also *Finding* XIII(d) (R. 4026-4029).

This paragraph is thus a condensed summary of the pertinent testimony upon this subject, which, however, avoids any disputed or controverted matters. It is based upon competent and unchallenged testimony, and reflects all of the essentials thereof. The finding is necessary, to present a fair and complete description of train operations in the affected territory and elsewhere upon the system, and of the factors which enter into the safety of those operations, and thus, in particular, to afford a foundation for subsequent findings dealing more directly with the subject of safety.

(5) Similarity of operating methods, rules, records, etc., on defendant's lines in Nevada and Utah to those in the affected territory (R. 3914-3915).

This paragraph is similar in purpose to subparagraph (c) of Finding III and subparagraph (c) of Finding IV; in that it sets forth that the operating methods, rules, and records relating to operations in Nevada and Arizona are substantially identical; that the same system officials have jurisdiction over operations in both states; and that the full-crew laws of both states, insofar as they concern appellant's train operations, are also practically the same. The finding likewise emphasizes that the same equipment is used interchangeably in both the affected territory, and Nevada and Utah.

We call particular attention to that portion of the finding which states that the records maintained by appellant, and the numerous statistical and other reports required by regulatory commissions, are developed, maintained and rendered in accordance with substantially identical rules and standards. It follows that operating and other statistics relating to operations in the affected territory or in Arizona, on the one hand, and in Nevada and Utah, or in the State of Nevada alone, on the other, are fully and properly comparable, and reflect operating results upon identical bases.

Dyer, R. 1108-1119; *Masson*, R. 1236-1239; *Sines*, R. 61-62, 1354-1355, 1708-1711, 3145-3149.

Exhibits 8 (R. 114), 9 (R. 115-116), 170 (R. 3044), 184 (R. 3076), 191 (R. 3084), 195 (R. 3107-3112), 212 (R. 3196), 260 (R. 3272), 305 (R. 3430).

This finding is likewise essential, because it shows that a proper and adequate—indeed, a complete—foundation has been laid, for reference to and reliance upon the numerous comparisons between operations in the affected territory and those in Nevada and Utah, which afford the basis for a number of important subsequent findings.

(b) LENGTHS OF DEFENDANT'S TRAINS (R. 3915-3920).

(1) Train lengths on the system generally (R. 3915-3916):

In section (d) of paragraph 3 of Part III of the answer (R. 11-12) it is alleged that the operation of through long freight trains is a common practice on main trunk lines throughout the United States, including appellant's lines; and in section (e) of the same paragraph (R. 12) it is stated that the operation of long freight trains is a general practice on appellant's main lines, and likewise on the lines of its competitors and connections, except in Arizona. In section (a) of paragraph 4 of Part III (R. 16-17) somewhat similar allegations are made as to passenger-train operations.

Subparagraph (1) of Finding VII(b) responds in part to the issues thus tendered. It sets forth the date when long freight and passenger-train operation was first undertaken on a substantial scale; the continuance of the practice ever since; the fact that it prevails on all the system, except in Arizona and the adjacent affected territory; that it has resulted in a substantial increase in the average length of all trains operated; and finally presents figures showing the increases in average train lengths, and the percentage of long trains to all freight trains operated during a recent representative period, upon the

principal main-line districts in the several states, other than Arizona, where appellant operates.

Dyer, R. 1106-1107, 1115, 1119-1120; *Masson*, R. 1078-1082; *Herbert*, R. 1315-1316, 1324-1325, 1337-1339; *Sines*, R. 1359-1366, 1707-1708; *Fifield*, R. 2784-2786, 2805-2806.

Exhibits 149 (R. 3025), 150 (R. 3026), 162 (R. 3036), 177-180 (R. 3066-3072), 185-188 (3077-3081), 211 (R. 3195).

The finding is based upon unchallenged testimony. The showing is very complete, having been compiled from appellant's original records. The finding is essential, because it has direct bearing upon the point that enforcement of the law has prevented and continues to prevent the adoption, in the affected territory, of an operating method which has been successfully followed for many years last past upon all other parts of the system; and, as shown by subsequent findings, particularly Findings VII(d) and XII, with constantly improving efficiency, economy, and safety.

(2) Train lengths in Arizona, past and present: Comparison with other portions of the system, and with the system as a whole (R. 3917-3920):

The purpose of this subparagraph of Finding VII(b) is to set forth the extent of long-train operations in Arizona during the period immediately preceding the effective date of the law, and to show how the law has operated to keep the average train lengths in Arizona at a fairly constant figure, throughout all the period since 1912. The

finding sets forth comparisons between Arizona and Nevada average freight-train lengths, and also compares Arizona and Nevada average train lengths with those which have developed on the system as a whole, and on the main lines of the Tucson and Salt Lake Divisions. This finding thus really carries forward the history of long-train operations on appellant's system, set forth in part in subparagraph (1).

The effect of the long-train program in Nevada, in enabling appellant to move the traffic with a substantially less number of freight trains, by comparison with Arizona, is also set forth. In the four years, 1922-1925, inclusive, the actual traffic handled in Nevada, expressed in car miles, was approximately 420,673,000, or about 11.2 per cent more than was handled in Arizona during the same period (the Arizona figure having been 378,372,000). To move these car miles in Nevada, appellant operated a total of 7,924,000 train miles, or about 14.0 per cent more than the 6,953,000 train miles which were operated in Arizona in the same period for the purpose of handling the Arizona traffic. During the years 1922-1925 the total volume of traffic in Nevada thus exceeded the total volume of traffic in Arizona by a margin slightly lower than the percentage by which the total number of trains run in Nevada (expressed in train miles produced) exceeded the corresponding figure for Arizona.

These results were obtained before the initiation of the long-train program on a substantial scale in Nevada. They may therefore be compared with results obtained during the most recent typical four-year period for which statistics were available at the time the testimony was

received: the years 1936-1939. During that period appellant produced in Nevada 564,256,000 freight-car miles, or approximately 3.9 per cent *more* than the 543,210,000 which were produced in the same period in Arizona. It handled the Nevada traffic with 7,397,000 train miles, or 26.7 per cent *less* than the 10,086,000 train miles which were produced in Arizona for the purpose of handling the smaller volume of the Arizona traffic. It should be noted, also, that in the four years, 1936-1939, appellant handled in Nevada a volume of traffic 34.1 per cent greater than in the four years 1922-1925, but actually produced 6.7 per cent fewer train miles in so doing.

The effect of the Train-Limit Law in requiring the operation of additional and unnecessary trains is further developed by the comparison between the Tucson and Salt Lake Divisions, set forth in the finding. If appellant had disregarded the Train-Limit Law, and thereby obtained on the Tucson Division the same average train lengths as prevailed on the Salt Lake Division during the fifteen years 1925-1939, it could have saved 6,325,000 train miles; i.e., some 32.7 per cent *more* train miles were produced than would have been necessary if the long-train practice had prevailed. For the one year 1938, approximately 565,000 train miles, or 37.7 per cent of the total produced on the Tucson Division, were excessive and unnecessary, and could and would have been eliminated by long-train operation.

This subfinding concludes with the statement that long-train operation is entirely practicable in Arizona, subject only to certain siding extensions and other comparatively minor alterations of the physical plant, and the asssign-

ment of locomotives of the larger types now in use upon other parts of appellant's system. This finding is based upon undisputed testimony, as to which appellee offered no challenge.

Masson, R. 1078-1082; *Dyer*, 1106-1108, 1114-1115, 1117-1118; *Herbert*, R. 1234-1236, 1343-1345; *Sines*, R. 1346-1355, 1710-1714, 1831-1832.

Exhibits 149 (R. 3025), 150 (R. 3026), 180-183 (R. 3072-3075), 213 (R. 3197).

(c) REDUCTIONS IN SCHEDULES OF FREIGHT TRAINS (R. 3920-3924).

In sections (d) and (e) of paragraph 3 of Part III of the answer (R. 11-12) it is alleged in general terms that freight is transported between all parts of the United States upon dependable schedules, and in long trains, except that such trains are not operated in Arizona and the adjacent affected territory; that such schedules are one-half to one-third faster than prevailed prior to 1924, and that such long-train operation does not retard or delay such freight traffic, but on the contrary expedites it materially, and promotes and makes possible its early delivery.

Finding VII(c) describes the prior and present schedules in effect in both the affected territory and likewise in Nevada and Utah, and thus corresponds directly to such allegations. The finding explains how present-day schedules for eastbound perishable freight have been worked out, based upon definite departure hours and times en route from specified concentration points; together with the provisions for "run-off" time, made necessary

because, *first*, cars containing perishable freight and intended to move under these schedules cannot all arrive at the concentration points, and be made ready for departure at the same time each day; *second*, when more than one train is to leave a concentration point with cars moving on schedule, not all of the trains of the same day can leave at the same moment. In practice, therefore, those cars and trains which leave after the initial scheduled departure hour on a particular day are so operated as to make up ("run off") the time interval prior to their departure, so that they arrive in Chicago or other eastern markets upon a parity with all other shipments leaving upon the same day, and moving under the same schedule.

G. C. Baker, R. 1285-1295.
Exhibit 176 (R. 3065).

The finding contains a history of the reductions in the schedules, both eastbound for perishable freight, and westbound for manifest and similar freight; and shows that the present-day schedules are very much faster than those in effect previously, particularly prior to about the year 1924. In 1924, for example, the basic eastward schedule from California concentration points to Chicago was 154 hours over-all, with no provision for run-off time; today, the schedule contemplates an over-all time of 139 hours and 30 minutes, but also provides for 16 hours of run-off time, so that the net elapsed time is 123 hours and 30 minutes. This represents a reduction of 31 hours and 30 minutes in net time, as compared to 1924, or a net reduction of more than 20 per cent. The history of the westbound schedules shows a reduction from an over-all time of 226 hours, which existed up to 1926, to a present-day

over-all time of 109 hours: a reduction of substantially more than 50 per cent. The schedules applying from northern California, and in general from all Pacific Coast points served by the routes through Nevada and Arizona, are upon the same bases.

G. C. Baker, R. 1296-1302.

Although the faster schedules necessarily import greater difficulty in achieving and maintaining on-time performance, the record indicates that there has been no failure in this regard. Nevertheless, the schedule performance of those trains directly affected by and subject to the restrictions of the law has not been as satisfactory as in the case of those trains where the law's effects are either wholly absent or somewhat less in proportion. Thus, for those eastbound trains or blocks which moved from Colton, California, to El Paso, in 1939, and were directly affected by the law for the entire distance between Yuma and El Paso, the on-time percentage was 82.5. For those trains or blocks which moved from Colton to Tucumcari, New Mexico, and were unaffected by the law between El Paso and Tucumcari, the on-time percentage was 94.8 per cent. On the Nevada route, for traffic out of Roseville, California, a concentration point corresponding to Colton (and where the movement is entirely free of any train limit), the on-time percentage at Ogden was 88.8 per cent. For those westbound trains which moved across Arizona, the on-time performance at Los Angeles was 90.7 per cent; but for the westbound trains moving across the Nevada route to San Francisco, the on-time performance was 95.4 per cent.

G. C. Baker, R. 1478-1482.

The fact that freight-train schedules applying to transcontinental movements have been so substantially reduced, side by side with the institution and development of the long-train program, is no mere coincidence. The reductions in schedules are not merely theoretical. The participating carriers hold these schedules out to the general public as an index of expected performance, and are subject to claims if loss of market or spoilage should result from a schedule failure for which a carrier is responsible. In fact, as the percentages just recited show, the schedule reductions have been accompanied by operation of the scheduled trains in substantial conformity with the guaranteed schedules; and it is noteworthy that as the influence of the Train-Limit Law is absent, or is reduced in proportion to the total transportation service performed, the percentage of schedule performance becomes better. It will be borne in mind that the adoption of the long-train program, in connection with transcontinental schedules via Arizona, is not completely prevented by the Arizona law. That statute affects these transcontinental movements principally over the district between Yuma and El Paso; but once the traffic has passed through El Paso or Yuma, long-train operation is again possible except to the extent that Oklahoma's train-limit law, effective since 1941, imposes a barrier; and, as established by the testimony of witnesses representing the various carriers with which appellant connects, such long-train operation, particularly in the handling of through traffic, both perishable and non-perishable, is the customary, standard, and regular practice.

The finding is an accurate summary of the undisputed testimony of record, and responds directly to allegations of appellant's affirmative defense.

(d) EFFECT OF THE LONG-TRAIN PROGRAM UPON THE EFFICIENCY AND ECONOMY OF DEFENDANT'S TRAIN OPERATIONS (R. 3924-3934).

(1) As to the system generally (R. 3924-3927):

In Section (g) of paragraph of Part III of the answer (R. 14-15) it is alleged that appellant's compliance with the Train-Limit Law results and has resulted in greatly reducing the efficiency and economy of its freight-train operations in the affected territory. Finding VIII(d) responds to the issue thus presented.

As to the system generally, in Finding VII(b) it is set forth that the average length of appellant's freight trains on the entire system has increased from 42.4 cars per train, exclusive of caboose, in 1922, to 51.7 cars in 1934, and 53.6 cars in 1939. In Finding VII(d) are set forth the improvements in efficiency and economy of railroad operation on appellant's system, which have accompanied this increase in average train lengths, and have been experienced side by side with the adoption of long-train operation upon all parts of the system, except in Arizona and the adjacent territory affected by the law.

An important index of operating efficiency, which particularly reveals the effect of long-train operation, is found in the average speed of all freight trains. The importance of this index and also of the indices of gross ton miles and net ton miles per freight-train hour, as

reflecting efficiency, was recognized by this Court in the *Retirement Act Case: Railroad Retirement Board v. Alton R. Co., et al.* (1935), 295 U.S. 330 (366); 79 L.ed. 1468 (1485).

The term "average train speed", as used in Finding VII(b) and elsewhere, means the average speed of trains while on the road between terminals, including all stops en route, but not including time spent in terminals. The average speed of appellant's main-line freight trains increased from 11.2 miles per hour in 1922 to 17.8 miles per hour in 1939; an improvement of 58.9 per cent. It is clear, from this fact alone, that the long-train program has not resulted in the slowing down of the movement of main-line freight traffic on the system; on the contrary, there has been an acceleration amounting to almost 60 per cent.

Herbert, R. 1338, 1340-1341.
Exhibit 180 (R. 3072).

As stated above, the "average gross ton miles per freight-train hour" was also recognized by this Court as an important index of efficiency of operation. This index is determined by first multiplying the total tonnage transported (which includes the weight of the cars and their contents, but not the weight of the locomotives) by the miles over which it is moved. The product represents the total gross ton miles produced. This total is then divided by the total number of hours spent on the road by the freight trains whose total gross ton miles were determined. The quotient represents the average performance, in gross ton miles per freight-train hour. This index

thus reflects both the speed and the loading of the trains, and provides a test of both factors: the higher the figure, the better the relative performance. For appellant's system, and considering main-line freight trains only, the total of gross ton miles per freight-train hour was 20,727 in 1923; and increased to 41,886 in 1939: an improvement of 102.1 per cent, or more than double. These figures simply mean that, coincident with the adoption and development of the long-train program on the system, appellant was enabled to and did move more tonnage, for greater distances, during each freight-train hour on the average: in other words, both heavier train loading, and higher train speeds were made possible and were accomplished. It should be borne in mind that the year 1923 was prior to the adoption of the long-train program, whereas 1939 was a year of general long-train operation.

Masson, R. 1207-1209.
Exhibits 162 (R. 3036), 193 (R. 3105).

A corresponding index is afforded by net ton miles per freight-train hour. This figure takes into account only the net weight of the lading transported, and does not include the weight of locomotives, or of cars exclusive of their contents. In 1922, this index, for all freight trains on the system, both main and branch, was 7,258; it increased to 12,490 in 1939: an improvement of 72.1 per cent. That is, the combined effect of greater train loading, and greater train speeds, which accompanied the adoption of the long-train program, thus enabled appellant to obtain more than 72 per cent greater efficiency in the movement of the

freight, considered separately from the equipment in which it was carried.

Masson, R. 1204.
Exhibit 162 (R. 3036).

Another important index of operating efficiency is found in the relationship between fuel consumed and traffic moved. This index is sometimes expressed in total of performance, measured in gross ton miles, for each ton of fuel consumed. In the case of a railroad such as appellant, which uses comparatively little coal, the consumption of fuel oil is measured in units equivalent to pounds of coal, the total equivalent pounds of coal being divided into the total gross ton miles produced in order to obtain the average figure. For all freight trains, both main and branch, on the system, the average gross ton miles per ton of fuel in 1922 was 11,405; in 1939 it was 17,318; an improvement of 51.8 per cent. This result simply means that with longer and heavier trains; and despite greater train speeds, nearly 52 per cent more actual performance was obtained for each ton of fuel consumed in freight-train operation.

Exhibit 162 (R. 3036).

The relationship between the total of operating expenses, and the revenue traffic handled, likewise affords an important index, particularly in comparing the over-all economy of operations year by year. The lower the average cost, the better the performance; i.e., the greater the efficiency. For the system, the average cost per thousand revenue ton miles, for all operating expenses, declined from $11.10 in 1922, to $7.05 in 1939; an improvement of

36.5 per cent. The average for the years 1922-1925 (the period immediately preceding the general adoption of long-train operation) was $9.94; the average for the four years 1936-1939 was $7.15: an improvement of 28.1 per cent.

Exhibit 151 (R. 3027).

The index last referred to, which includes all operating expenses, takes into account those costs of maintenance and general overhead which enter into costs of operation. The finding also includes reference to the average cost per thousand revenue ton miles for transportation expenses only. These expenses include those directly associated with freight-train operations, but do not include costs of maintenance of way, or other general expenses not directly incident to the running of trains. For the system, the 1922 figure of average cost per thousand revenue ton miles was $5.47; for 1939 the corresponding figure was $3.82: an improvement of 43.2 per cent. For the four years 1922-1925 the system figure was $5.03, and for the four years 1936-1939 $3.95: an improvement of 21.5 per cent. These figures simply mean that coincident with the adoption and development of the long-train program on the system, there was a reduction in the direct expense of freight-train operations of more than 20 per cent.

Exhibit 151 (R. 3027).

A further important index, particularly for the purpose of making comparisons between operating costs for different periods, on the system or on the same division, or as between different portions of the system, is afforded by the so-called selected direct operating expenses. These

selected expenses include fuel costs, trainmen's and enginemen's wages, enginehouse expenses, other locomotive supplies, and train supplies and expenses; and thus include all of the major items directly associated with the movement of trains. They exclude all indirect items of expense, such as wages of yard employes, maintenance costs, wages and expenses of supervisory employes and officers, and the like. The finding shows that the average cost per thousand gross ton miles, for these selected direct expenses, for all freight trains operated on the system, decreased from 93.4 cents in 1924, to 63.6 cents in 1939: an improvement of more than 31 per cent. In 1932 the figure was 60.3 cents. We call particular attention to this figure, because the principal development of long-train operation occurred during the period 1924-1932. The increases in average train lengths have been less marked since 1932 than during the previous eight years.

Exhibit 179 (R. 3068-3071).

We call attention also to the comparison by two-year periods, which is set forth in the portion of the finding dealing with the improvement in the system average cost per thousand gross ton miles for selected direct expenses. This comparison by two-year periods avoids any possible criticism which might be made of a direct comparison between individual years; it tends to iron out any inequalities or peculiar conditions which may be associated with particular years. This comparison shows that the combined total improvement, as between the two-year period 1924-1925, and the two-year period 1938-1939 was more than 25 per cent.

This subfinding concludes with a reference to the index of efficiency afforded by the quantity of fuel consumed per thousand gross ton miles. This index corresponds to the other index of fuel efficiency previously mentioned: gross ton miles per ton of fuel. In obtaining this index, the fuel consumed is converted into its equivalent in pounds of coal; the total gross ton miles produced is then divided into the total fuel consumed in order to obtain the amount consumed for each unit of one thousand gross ton miles. On the basis of comparisons by two-year periods, between 1924-1925, and 1938-1939, this index shows an improvement, for all freight trains on the system, amounting to 22.38 per cent.

Exhibit 249, (R. 3258-3261).

We have suggested before, in this discussion, that the substantial improvements in the efficiency and economy of train operations on the appellant's system is no mere accident or coincidence. The finding compares the improvement as between the years, such as 1922, 1923 and 1924, when the long-train program had not yet been adopted, and 1932, 1938 and 1939, all of which were years when the long-train program had reached substantial development everywhere on the system except in the affected territory. The record shows that the improvement has been continuous and progressive year by year, with only incidental departures from the general trend, just as the development of the long-train program has also been continuous and progressive. If only one or a comparatively small number of these several indices indicated improvement, while others were stationary, it might be possible

to argue that the long-train program had had no effect; but where the improvement in efficiency and economy is so definite and consistent, and has continued year after year, side by side with a continuing increase in the average lengths of trains and the proportion of long trains operated, there can be no question but that the increased efficiency and economy must be credited to the long-train program. Certainly there is no possible foundation for any contention, nor has any been suggested by appellee, that the long-train program has prevented or impeded the development of efficiency and economy on the system.

(2) In the Nevada-Utah territory (R. 3927-3929):

Paragraph 2 of Finding VII(b) summarizes the showing made on appellant's various exhibits which set forth the improvements in efficiency and economy of freight-train operations in Nevada and Utah during the period 1922 to 1939, inclusive. This showing relates to both the State of Nevada and, more particularly, to the Salt Lake Division, because the underlying data from which the statistics were directly computed largely relate to division operations. In the same manner any of the indices of efficiency and economy referred to in subparagraph (3) of this finding, which relates to results of operations in Arizona and the affected territory generally, are taken from statistics of the Tucson Division. It is not disputed that Salt Lake Division statistics reflect the Nevada operations with reasonable accuracy, for practically all of the lines in Nevada are included within the Salt Lake Division.

Exhibit 154 (R. 3028).

In Finding VII(b) are set forth the average lengths of freight trains on the system, and in Nevada and on the Salt Lake Division, for certain years between and including 1920 and 1939. It is there shown that there has been a rather consistent increase, year by year, in both Nevada and on the Salt Lake Division, commencing in about 1925, and continuing to the present time. Throughout the years, the Nevada and Salt Lake Division average train lengths have consistently been much greater than the system average; and this is particularly true since and including 1927.

If the theory were correct, as has sometimes been suggested, that long-train operation results in greater difficulty of freight-train handling, average train speeds on the Salt Lake Division should be less than the system average, and particularly less than the Arizona or Tucson Division averages; and the substantial increase in average lengths on the Salt Lake Division should have been accompanied by a decline in average train speeds, or at least by a failure to achieve the same improvement as on the system or the Tucson Division. The results, as presented upon appellant's exhibits, particularly Exhibit 180 (R. 3072), are exactly the contrary. In 1922, the average speed of main line freight trains on the Salt Lake Division was 14.7 miles per hour, at which time the average train length (52.0 cars) was considerably less than on the Tucson Division; in 1932 the corresponding figure was 19.7 miles per hour, the average train length having increased to 81.0 cars; and in 1939 the average speed was 21.4, the average train length being 85.4 cars. The improvement, contrasting 1939 with 1922, was 45.5 per cent. It is clear that the

predominant long-train operation in Nevada and Utah had the effect of causing rather than preventing substantial increases in average speed of freight trains.

The index of average gross ton miles per freight-train hour likewise shows a consistent and very substantial improvement on the Salt Lake Division; and the absolute figures are much higher than for the system as a whole, or for the Tucson Division. The Salt Lake Division improvement, contrasting 1939 with 1922, was 146.4 per cent, and the absolute figure on the Salt Lake Division in 1939 was nearly 75 per cent greater than the system figure, and about 53 per cent greater than the Tucson Division figure. The average cost per thousand revenue ton miles, for all Nevada freight-train operations, both main and branch, declined by 37.8 per cent during the period 1922-1939; the system improvement during the same period was 36.5 per cent; while the corresponding improvement in Arizona was only 25.7 per cent.

Exhibits 161 (R. 3035), 193 (R. 3105).

We have previously referred to the selected direct expenses associated with operation, and the figures of average cost per thousand gross ton miles, for all freight trains operated on the system. Similar figures are of record for the Salt Lake Division. This cost on the Salt Lake Division declined from 56 cents, in 1924, to 35.4 cents in 1939; an improvement of 36.7 per cent. On the basis of comparisons by groups of two-year periods, the improvement as between 1924-1925, and 1938-1939, was 27.72 per cent. The earlier period was, of course, prior to the general development of long-train operation on the divi-

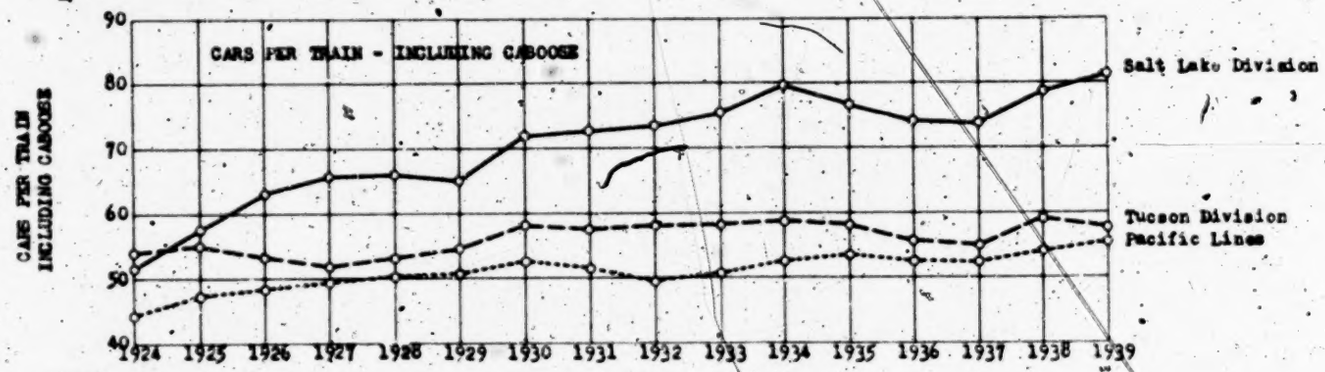
Superior Court, Pima Co., Arizona
State v. S.P.Co. No. 20087

Defts. Ex. No._____(Witness_____)

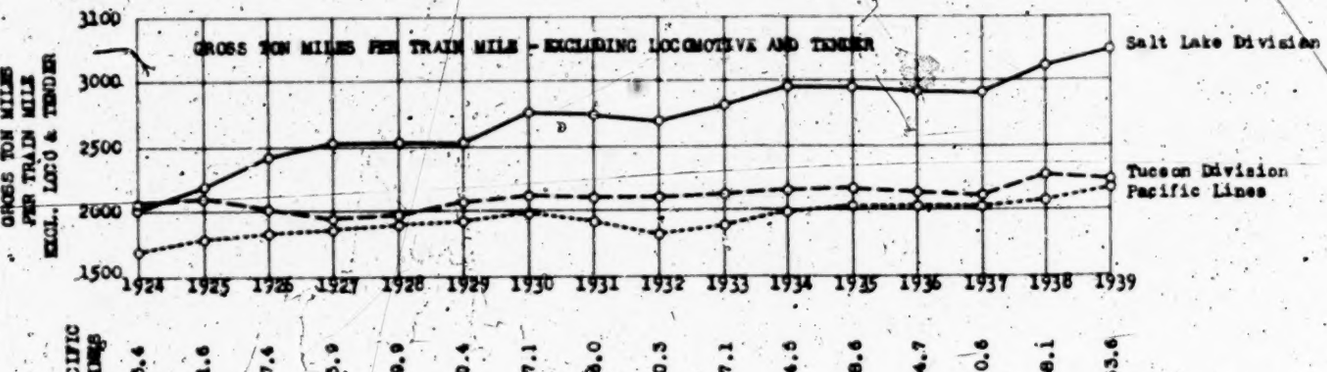
SOUTHERN PACIFIC COMPANY
(Pacific Lines)

MAIN AND BRANCH LINE FREIGHT TRAIN COMPARISONS
TUCSON AND SALT LAKE DIVISIONS AND PACIFIC LINES
CARS PER TRAIN, GROSS TON MILES PER TRAIN MILE,
COST PER 1,000 GROSS TON MILES

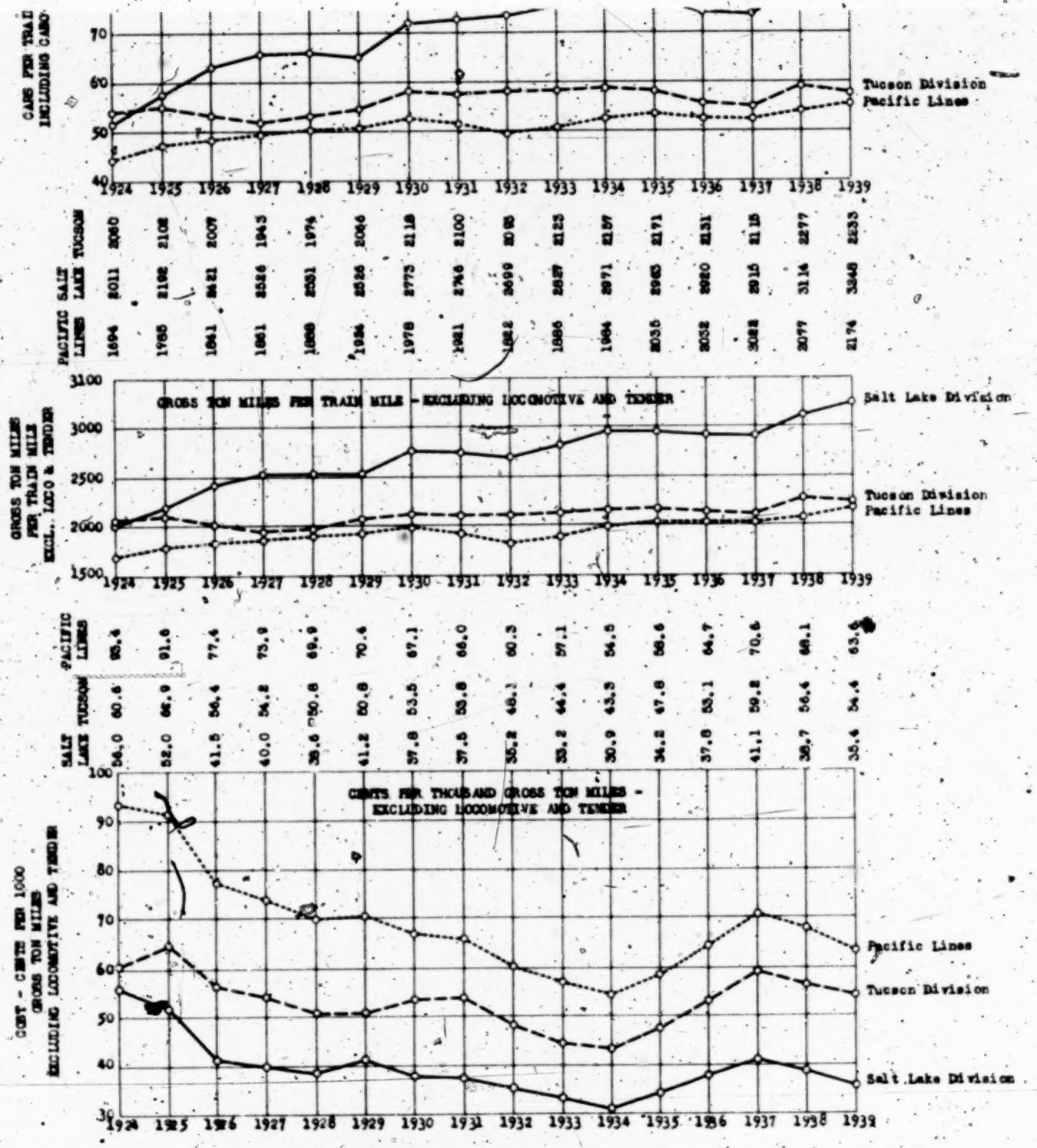
	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Pacific Lines	44.6	47.4	48.7	49.3	50.1	50.4	52.5	51.4	49.5	50.6	52.7	53.6	52.7	52.4	54.0	55.6
Salt Lake	51.6	57.6	63.1	65.8	66.2	65.2	72.0	72.9	73.4	73.5	73.7	76.7	74.1	73.8	78.6	81.2
Tucson	54.0	55.1	53.3	51.8	52.0	54.5	58.0	57.6	58.1	58.2	59.6	59.1	55.6	54.9	59.1	57.8



	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Pacific Lines	1694	1786	1841	1861	1888	1924	1978	1921	1882	1886	1984	2035	2052	2028	2077	2174
Salt Lake	2011	2192	2421	2526	2551	2526	2773	2746	2699	2827	2971	2965	2920	2915	3114	3348
Tucson	2080	2102	2007	1943	1974	2036	2118	2100	2085	2125	2197	2171	2131	2115	2277	2233



	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Pacific Lines	85.4	91.6	77.4	75.9	69.9	70.4	67.1	68.0	69.3	67.1	64.5	58.6	64.7	70.6	68.1	63.6


CARS PER TRAIN INCLUDING CABO
70
60
50
40
1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939
Tucson Division
Pacific Lines
PACIFIC LINES 1664 1985 1841 1861 1888 1934 1978 1921 1822 1886 1964 2035 2052 3028 2077 2174
SALT LAKE 2011 2192 2421 2526 2551 2525 2773 2746 2699 2827 2871 2965 2920 2915 3114 3348
TUCSON 2000 2108 2009 1943 1974 2046 2118 2100 2082 2125 2157 2171 2131 2115 2277 2333
GROSS TON MILES PER TRAIN MILE EXCL. LOCO & TENDER
GROSS TON MILES PER TRAIN MILE - EXCLUDING LOCOMOTIVE AND TENDER
3100
3000
2500
2000
1500
1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939
Salt Lake Division
Tucson Division
Pacific Lines
PACIFIC LINES 85.4 91.6 77.4 73.9 69.9 70.4 67.1 66.0 60.3 57.1 54.5 58.6 64.7 70.4 68.1 63.6
SALT LAKE 56.0 52.0 41.8 40.0 38.6 41.2 37.8 37.5 35.2 33.2 30.9 34.2 37.8 41.1 38.7 36.4
TUCSON 60.6 66.9 56.4 54.2 50.6 50.8 53.5 53.8 46.1 44.4 43.5 47.8 53.1 59.2 56.4 54.4
COST - CENTS PER 1000 GROSS TON MILES EXCLUDING LOCOMOTIVE AND TENDER
CENTS PER THOUSAND GROSS TON MILES - EXCLUDING LOCOMOTIVE AND TENDER
100
90
80
70
60
50
40
30
1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939
Pacific Lines
Tucson Division
Salt Lake Division
LEGEND
Tucson Division
Salt Lake Division
Southern Pacific (Pacific Lines)

sion; while the latter figure represents the costs obtained after the long-train program had reached practically full development.

Exhibit 179 (R. 3068-3071).

The operation of substantially longer trains, and of more long trains in proportion to the total, has resulted in a particularly favorable showing of fuel economy on the Salt Lake Division. In 1924, when the average length of all trains (main and branch) on the division was 51.6 cars, the average fuel consumed per thousand gross ton miles for all such freight trains was 100 pounds. In 1939, when the corresponding average train length was 81.2 cars, the corresponding index of fuel consumption had dropped to 73 pounds; an improvement of 27 per cent. The comparison by groups of two-year periods shows a similar result: the index for the two-year period 1924-1925 having been 96.2, and for the two-year period 1938-1939, 73.9. The combined total improvement was 26.06 per cent.

Exhibits 178 (R. 3067), 249 (R. 3258-3261).

For convenient reference we here reproduce Exhibit 178, which sets forth a graphic comparison of efficiency and economy in relation to average train lengths, as between the system and the Tucson and Salt Lake Divisions.

The effect of variations train lengths upon the average cost of performing freight-train service is well exemplified by Exhibit 177 (R. 3066). The exhibit shows the month-to-month variations in average expense per thousand gross ton miles, for freight-train service on the

Tucson and Salt Lake Divisions, set side by side with the average train lengths, month to month, for the 36 months included in the years 1937, 1938, and 1939. The exhibit demonsfrates precisely that in those three years, as the average train length varied from month to month, the average expense of freight-train service varied inversely; increasing train lengths were accompanied by reductions in average cost, almost in precise proportion. Thus, on the Salt Lake Division in January, 1938, the average train length was 70.6 cars; the average selected expense cost per thousand gross ton miles was 45.5 cents. In February the average train length declined to 66.8 cars, and the average expense increased to 48.6 cents. In May, with an average train length of 80.3 cars, the average expense declined to 37.8 cents. A slight decline in average train length during June brought a slight increase in average expense. Further increases in train length, to a high figure of 85.4 cars per train during August, brought a reduction of expense to 34.8 cents. As train lengths tended to decline thereafter, during the balance of the year, reaching a figure of 78.3 in December, so average expenses tended to rise, reaching a figure of 39.3 cents for the same month.

Even on the Tucson Division, where variations in train length are much less marked than on the Salt Lake Division, primarily because of the 70-car maximum and the natural tendency of the appellant to operate as many of its trains as possible with the maximum number of cars permitted, the close relationship between variations in train length and inverse variations in unit cost are equally apparent. The showing demonstrates that not only in

Nevada, but also in the affected territory, increases in train lengths tend to be accompanied by reductions in average unit cost of train operation; and equally that an arbitrary restriction which compels the operation of trains of shorter average lengths, and in greater number than otherwise required, is accompanied by a definite tendency toward increase in cost.

We emphasize again the fact that substantially greater efficiency and economy are shown to have been accomplished in the Nevada-Utah territory than on the system generally, or in Arizona. This result is due to a combination of several causes. In the first place, the traffic handled over the Nevada-Utah lines is almost entirely through traffic, and the operating and other conditions in that territory, like those in Arizona, are favorable to the movement of traffic in long-train units; whereas on the system generally, operating conditions vary greatly, and there is much local traffic in certain districts. Furthermore, the greater efficiency and economy in Nevada and Utah have been achieved independently of any influence of the Arizona law; whereas the restrictions of that law prevent the attainment of comparable efficiency and economy in Arizona and the adjacent affected territory, and tend to bring down the system performance, but do not affect the results of the Nevada-Utah operations.

(3) Defendant's inability to achieve comparable efficiency and economy in the territory affected by the Arizona Train-Limit Law (R. 3929-3934):

In the subfinding bearing the above title, we set forth an analysis of the Arizona operations, from the stand-

point of efficiency and economy, employing the same indices as for the system generally and for the Nevada-Utah operations.

The statistics thus summarized relate largely to the Tucson Division, but to some extent to the State of Arizona. The main lines of the Tucson Division include nearly all of appellant's principal main lines in Arizona, excluding only the alternate main line between Mescal and the Arizona-New Mexico boundary west of Rodeo, New Mexico (the so-called Douglas line), and including about 17 miles of main line in New Mexico west of Lordsburg, where the Arizona law operates with extra-territorial effect. The main lines of the Tucson Division thus include all of the Yuma-Gila-Lordsburg line west of Lordsburg.

Exhibit 154 (R. 3028).

Reference is made in the finding to the fact that the boundaries of the Tucson Division were changed in 1930, by the addition of the main line between Tucson and Lordsburg, and the branch line between Bowie and Live Oak. As stated in Finding VII(a), the boundaries of the Salt Lake Division were also changed in 1929, by the addition of the main line between Wendel and Alturas, California, and at the same time the Fernley-Wendel line was reclassified as main line. These changes in divisional boundaries do not, of course, affect any comparisons between the states of Nevada and Arizona; for the lines affected by the changes were of course continued in their previous locations. The method of comparison employed, whereby the years are grouped according to periods prior

and subsequent to the changes of divisional boundaries, eliminates any disturbing effect which might otherwise result therefrom. In point of fact these disturbances are very minor, and in so far as concerns comparisons either between the two divisions, or between the earlier or later groups of years, could very properly be disregarded.

It was possible to group the years prior and subsequent to 1930, in making these comparisons, because the Tucson Division operating statistics for the year 1930 were recomputed, or "restated," in 1931, so as to reflect operations for the year 1930 as if the change of divisional boundaries had taken place at the beginning of that year instead of in July. This restatement permits a true comparison between 1931 and 1930 operations, and likewise between 1930 and later years in the same manner. The Salt Lake Division statistics were likewise available for the year 1930, without any disturbing effect caused by the change made in November, 1929.

Mason, R. 1212.

The outstanding conclusion, to be drawn from the showing for the affected territory, is stated in the initial paragraph of subfinding VII(d)(3). The improvements in road and equipment made in Arizona are comparable to and as extensive as in Nevada and Utah, or on other parts of the system; the operating rules are the same; and the volume and character of the traffic handled, and the operating conditions, are essentially similar in both Arizona and Nevada; but nevertheless the improvements in efficiency and economy achieved in the affected territory are substantially less than in Nevada and Utah. Since the

only differentiating factor, as between Nevada-Utah, on the one hand, and the affected territory, on the other, is the Train-Limit Law itself, this failure to achieve comparable efficiency and economy can and must be ascribed only to the law's restrictions.

Thus, dealing first with the matter of average freight-train speeds: the Tucson Division improvement in speeds of main-line freight trains was 40.8 per cent as between 1923 and 1939; on the system the improvement was 58.9 per cent, and on the Salt Lake Division 45.5 per cent. It is particularly significant that between the years 1922 and 1932, which were the years of major development of the long-train program, the Salt Lake Division improvement was 34 per cent; the system improvement was 47.3 per cent; but the Tucson division improvement only 21.1 per cent.

Exhibit 180 (R. 3072).

The important index of efficiency, presented by gross ton-miles per train hour, shows some improvement on the Tucson Division as between 1923 and 1932 (26.7 per cent); but the corresponding improvement on the Salt Lake Division was 98 per cent. Comparing 1939 with 1923, the Tucson Division improvement was 55.5 per cent; but the Salt Lake Division improvement was 146.4 per cent.

Comparison may also be made between 1939 and 1930 for both divisions. This comparison escapes any possible criticism which may be made because of the fact that the division limits on both divisions were changed about the year 1930. It also compares a period of general long-train operation on the Salt Lake Division with a period

of completely restricted operation on the Tucson Division. In this period the gross ton miles per train hour for all trains on the Tucson Division improved 24.5 per cent; but the corresponding improvement on the Salt Lake Division was 41.8 per cent. Clearly this much greater improvement simply reflects the advantage of the long-train program in Nevada-Utah on the one hand, and the hampering effect of the law's restrictions in Arizona on the other.

Exhibit 193 (R. 3105).

The index of average net tons of freight per main-line freight train shows an actual reduction on the Tucson Division from 1923 to 1932, amounting to 24.1 per cent, whereas on the Salt Lake Division during the same period there was an increase of 9.9 per cent. Comparing 1939 with 1932, the increase on the Tucson Division amounted to approximately 24 per cent; but on the Salt Lake Division it was 33.4 per cent.

Exhibit 193 (R. 3105).

Turning to cost figures: the average cost per thousand revenue ton miles, for all operating expenses for all freight-train operations within Arizona, shows an improvement (reduction) of 25.7 per cent, comparing 1939 with 1922; but the improvement in Nevada over the same period was 37.8 per cent. Comparing the four-year period 1936-1939 with 1922-1925, the Arizona improvement was 19.5 per cent; but the Nevada improvement was 30.7 per cent.

Considering the average cost per thousand revenue ton miles, for transportation expenses only, for freight-train operations in the two states, there was but little change

in Arizona between 1922 and 1939, the improvement (reduction) having been only 8.7 per cent. The corresponding Nevada improvement was 31.6 per cent. Comparing the same four-year periods previously mentioned the Arizona improvement was 6.8 per cent; but the Nevada improvement was 24.4 per cent. Cost figures for transportation expenses only, as above stated, take into account the costs directly associated with train operations, a substantial proportion of which consists of fuel, locomotive repairs and wages of train and engine service employes. These items tend to increase directly with the number of trains run; and the failure to obtain any substantial improvement in Arizona clearly reflects the influence of the Train-Limit Law, in compelling the running of many more trains, and the consequent production of a substantially increased volume of train miles, than would otherwise be necessary for the handling of the traffic. By contrast, the Nevada figures attest the economies in these particular items of expense, which have been achieved as the result of the long-train practice, and the consequent elimination of unnecessary trains and train miles in that state.

Exhibit 160 (R. 3034), 161 (R. 3035).

Two of the comparisons set forth in Finding VII(d)(3) are by groups of years prior and subsequent to 1930. These comparisons include particularly, cost per thousand gross ton-miles for selected direct expenses of freight-train operations, and figures of fuel consumption per thousand gross ton-miles for freight trains on the Tucson and Salt Lake Divisions. This method of comparison, as before stated, has the effect of producing figures showing

relative improvements over the years considered, without any possible distortion resulting from the changes in the boundaries of the two divisions during the period. These comparisons show combined total improvements, comparing 1924 and 1925 together with 1928 and 1929, and then comparing 1930 and 1931 together with 1938 and 1939, amounting, in the case of average cost per thousand gross ton-miles for direct expenses of freight-train operations, to 15.93 per cent on the Tucson Division, and 27.72 per cent on the Salt Lake Division; and, considering average pounds of fuel consumed per thousand gross ton-miles, to 12.62 per cent on the Tucson Division, but 26.06 per cent on the Salt Lake Division. Considering fuel consumption during the years following 1930, there was a decrease, in the index of gross ton-miles per ton of fuel for all freight trains, on the Tucson Division, of 0.5 per cent, comparing 1939 with 1930; but an improvement on the Salt Lake Division of 15.3 per cent.

Exhibits 179 (R. 3068-3071), 249 (R. 3258-3261).

The finding concludes with the statement that appellant's inability to effect improvements in the efficiency and economy of its freight-train operations in Arizona, comparable to those achieved in Nevada or upon the system generally, has been and is largely and directly due to the restrictions imposed by the Arizona law. This conclusion of fact is not merely justified; it is unavoidable. In preceding findings it is set forth that the operating conditions in Arizona are essentially similar to, if not slightly more favorable than, those in Nevada; that the characteristics of the traffic handled are practically the same;

that the volume of the traffic, over the years studied, has been about the same, year by year, in both states. The operating rules are virtually identical. The same equipment is used interchangeably in both states, and the same standards of construction and maintenance are observed. No attempt was made to show that Nevada employes render any better or more efficient service in the handling of trains, within the limits imposed by rule, law and custom, than their fellow employes in Arizona. Appellee called no employes of appellant as witnesses to testify respecting Nevada operations, and made no attempt in its case in rebuttal to draw any distinction between operations in Nevada and Arizona. In these respects our showing is wholly uncontradicted. Since there is shown to be substantial identity of all of the conditions which may or might affect the result, except the single factor contributed by the restrictions of the law, the substantial differences in the results obtained from the Arizona operations must be ascribed to that one differentiating factor, and to that alone.

This finding is not only material, but highly important, because it bears so directly upon the results which have followed from compliance with the Arizona law, and also indicates clearly the results which would unquestionably follow if the restrictions of the law were removed. It presents the results of appellant's actual experience with methods of operation exactly as they would be carried on if the law were not in effect, and under conditions which, as we again emphasize, are as nearly identical to those existing in Arizona as could well be obtained.

Like all other subdivisions of Finding VII(d), subdivision (3) is predicated upon the competent testimony, which is reproduced or carefully excerpted from basic records and accounts regularly kept by appellant; and again we point out that this showing was not disputed or challenged in any way by opposing testimony.

VIII.

COMPARISON OF DEFENDANT'S METHODS OF OPERATION WITH THOSE FOLLOWED ON UNITED STATES RAILROADS GENERALLY (R. 3934-3947).

(a) IMPROVEMENTS IN ROAD AND EQUIPMENT (R. 3934-3937).

In subparagraph (a) of paragraph 3 of Part III of the answer (R. 9) it is alleged in substance that in recent years "great improvements have been made in both road and equipment . . . on railroads throughout the United States generally." Finding VIII(a) responds to the issue thus tendered.

This finding not only disposes of this issue of fact, but also and more precisely demonstrates, by an affirmative statement, that the improvements in its own property, accomplished by appellant, as detailed in Finding VI, were not isolated or exceptional, but part of a nation-wide program agreed upon and carried out by all of the major railroads of the United States, acting more or less in concert.

Parmelee, R. 187-190, 194-195.
Exhibit 15 (R. 2863).

The essential fact is that when appellant undertook its extensive investments, and constructed or purchased the improvements which have enabled it to adopt and follow the long-train practice, and thereupon did adopt and now employs that practice, it was proceeding along the same progressive course, followed at the same time by other railroads generally, including the major trunk lines with which it competes and connects. The Arizona law obstructs the development and employment of progressive modern methods of railroading, by forbidding appellant and the Atchison, Topeka & Santa Fé Railway Company, the other major Arizona line, to use one of the most essential and universal of these methods, and imposes instead upon these two railroads an additional and arbitrary restriction from which many of their principal competitors are free.

In a sense, Finding VIII(a) is the preliminary part of what may properly be termed, collectively, the "national finding." We shall not undertake to analyze in detail the testimony upon which the finding is based. The statistical showing is founded largely, if not entirely, upon official publications of the Interstate Commerce Commission. The competency of such statistics cannot properly be challenged. The oral testimony was given by experienced and fully qualified statisticians (Messrs. Parmelee and Otterback), and by experienced railroad operating officers, presently engaged in the active supervision and conduct of the operations of their respective systems. No opposing showing of any character was attempted by appellee.

(b) **INCREASED TRAIN LENGTHS (pp. 68-71).**

Paragraph VIII(b) responds to the allegations of subparagraph (d) and (e) of paragraph 3 of Part III of the answer (R. 11-12), wherein it is stated that the long-train practice has been since about the year 1924, and now is, the common practice throughout the United States; that the maximum length of freight trains on main trunk lines throughout the nation is much greater than permitted by the Arizona law; and that the standard long-train practice is general on major trunk lines, including the main lines of appellant's principal competitors and connections.

Parmelee, R. 223-225.
Exhibit 22 (R. 2870).

The finding in this paragraph thus carries forward the story of the national situation. It shows that the operation of long trains by appellant was and is in line with the best and most progressive modern practices which have been and now are regularly followed; and that the restricted operation which the Arizona law compels is unusual, extraordinary, and, in the light of national experience, both unwise and unnecessary.

We call attention to the number of systems and the total mileage as to which specific testimony of operating methods was introduced. This detailed testimony covered methods of operation followed upon railroad systems extending into every section of the United States. These carriers, in 1939, operated 125,885 miles of line, or more than 50 per cent of the total of the mileage of Class I railroads in the United States, and produced more than 13 billion freight-train miles, about 59 per cent of the total

of all Class I railroads, and more than 13½ billion revenue passenger miles, or about 60 per cent of the total for all Class I carriers. The railroads covered by this testimony include all or nearly all of appellant's competitors, and likewise nearly all of the lines which connect with and join appellant in handling through traffic between Pacific Coast points, on the one hand, and destinations on and east of the Missouri and Mississippi Rivers, on the other.

Exhibit 248 (R. 3257).

(c) IMPROVED SCHEDULES AND PERFORMANCE (R. 3939-3940).

In paragraph 3(b) of Part III of the answer (R. 10), and again in paragraph 3(e) (R. 12), it is alleged that freight is transported between all parts of the United States in long trains upon dependable schedules which are from one-half to one-third faster than performed prior to 1924; that the practice of standard long-train operation does not retard the movement of traffic, but expedites such movement materially and promotes and makes possible early delivery. Finding VIII(c) is addressed to the issue thus tendered.

Schedules similar to those maintained by appellant and its connections, between Pacific Coast points and eastern destinations (described in Finding VII(c), R. 3920-3924), are generally maintained by the major railroads in the United States, and frequently participated in by three or more connecting carriers. These schedules were instituted as a part of an organized effort of the railroads of the nation toward betterment of service; and as improved

operating methods were developed, including particularly the long-train practice following 1923, these schedules and the performances under them were improved. . .

This finding condenses the lengthy testimony of numerous witnesses, officials of railroads other than appellant, who testified as to the operations of the carriers by which they are employed. It is not necessary to review this testimony in detail; the finding presents its essentials. Every part of the finding is fully supported by highly competent testimony, the correctness of which has never been challenged.

(d) INCREASED EFFICIENCY AND ECONOMY (R. 3940-3942).

Finding VIII(d) presents another phase of the national picture, and corresponds in that respect with Finding VII(d), wherein the effect of the long-train program on the efficiency and economy of appellant's operations is set forth. This finding sets forth the results for both the United States carriers as a whole, and in a general way for a number of individual railroads, of the adoption and development of the 1923 program of betterment, and particularly the long-train operating method which forms an essential part of that program.

In the finding reference is made to a number of the indices of efficiency and economy which were also used in Finding VII(d). For example, referring to road speed of freight trains, the finding shows an increase in the average for all Class I railroads from 11.1 miles per hour in 1922, to 16.7 miles per hour in 1939: an improvement of 50.5 per cent. As to fuel consumption, indicated by the

gross ton miles produced per ton consumed, the index increased from 10,750 in 1923, to 15,528 in 1939: an improvement of 44.4 per cent. Freight train performance, expressed in gross ton miles per train hour, for all freight trains of Class I carriers, more than doubled between 1922 and 1939; the increase was from 16,188 in 1922 to 32,808 in 1939: an improvement of 102.7 per cent.

Exhibit 22 (R. 2870).

In the *Railroad Retirement Act Case*, supra, this Court discussed statistics of the same kind, there presented for the purpose of showing the efficiency and economy of carrier operations generally. The Court said (295 U.S., at p. 366):

> "How stands the case for efficiency? Here again the record without contradiction demonstrates that in step with the alleged progressive superannuation on the railroads their operations have increased in efficiency. The trial court found, and its finding is not assigned as error: 'Railroads were, when the Act was enacted, and are now, operated efficiently and safely and more efficiently and much more safely than at any time in history.'"

In a footnote to the excerpt just quoted, the Court said further:

> "Thus it appears that the average speed of freight trains between terminals in 1928 was 10.9 miles per hour, in 1929 was 13.2 miles per hour, and in 1933 was 15.7 miles per hour. Excluding weight of locomotive and tender each freight-train hour in 1928 produced 16,764 gross ton-miles; in 1929 produced 24,539 gross ton-miles; and in 1933 produced 27,34[illegible]

gross ton-miles; and net ton miles per freight-train hour increased 41.2 per cent. from 1923 to 1933, and 3.7 per cent. from 1929 to 1933. Cost of transportation is also shown to have decreased in the same periods."

It will be noted that the Court recited the fact that the cost of transportation was shown to have decreased. The finding sets forth that the average expense per thousand revenue ton miles, for all freight operating expenses of Class I railroads, declined from $8.71 for the four years 1922-1925, to $6.49 for the four years 1936-1939; a reduction or improvement of 25.5 per cent. Referring to average expense per thousand revenue ton miles, for freight transportation expenses only, the corresponding improvement (reduction), comparing the two 4-year periods just mentioned, was 23.6 per cent. Turning to expenses in passenger-train service, the improvement in expense per passenger-train car mile, again comparing the two periods just referred to, was 21.74 per cent; or, taking into account passenger transportation expenses only, the improvement, again contrasting the same two periods, was 20.06 per cent.

Exhibits 20 (R. 2868), 21 (R. 2869).

We call particular attention to the increase in efficiency and economy evidenced by the fact that the Class I railroads were able to handle their aggregate revenue freight traffic in the four years 1936-1939, which amounted to only 15 per cent less in volume than in the four-year period 1922-1925, with an average ownership of 34 per cent less locomotives, and 26 per cent less freight cars; although, as

the evidence establishes, the traffic was handled more cheaply, at higher speeds, and on faster schedules.

Exhibits 20 (R. 2868), 33 (R. 2882-2883), 37 (R. 2889).

The record of efficiency and economy for individual railroads, as shown by the testimony of witnesses representing sixteen major systems other than appellant, corresponds to the record of the United States railroads as a group. These sixteen systems include carriers in every major section of the country; the long-train operating method is the standard practice on their lines, except to the extent that the Santa Fe cannot operate long trains in Arizona and adjacent territory.

The finding responds to the allegation found in subparagraph (e) of paragraph 3 of Part III of the answer (R. 12) that long trains are commonly, safely and economically operated throughout the United States, and the allegation that the long-train operating practice has proved an efficient method of operation (answer, Part III, paragraph 3(b); R. 10).

(e) RESULTS OF THE LONG-TRAIN PROGRAM FROM THE STANDPOINT OF THE PUBLIC, THE EMPLOYES, AND THE RAILROAD OWNERS (R. 3943-3945).

(1) Reduction in average transportation charges paid by the public (R. 3943).

In subparagraph (d) of paragraph 3 of Part III of the answer (R. 11-12) it is alleged that the improved methods of operation, of which long-train operation is an essential part, adopted following 1923, have resulted in substantial

public benefits. Finding VII(e) sets forth that these benefits have extended to the public at large which patronizes the railroad industry, and to railroad employes; but shows also that the same benefits have not been experienced by the railroad owners, in spite of the generally increased efficiency, economy and safety of railroad operation.

Subparagraph 1 particularly shows the benefits realized by the general public from the reduction in average transportation charges paid. It is shown that the reduction in average freight charges was, between 1922 and 1939, 17.4 per cent; and in average passenger fares, 39.2 per cent. These are benefits directly received by and accruing to the general public.

Exhibit 16 (R. 2864).

(2) Increases in average wages paid to employes (R. 3943-3944):

Subparagraph 2 of this finding sets forth particularly the benefits accruing to railroad employes, as an incident of and accompaniment to the long-train practice, and the general betterment program adopted following 1923. Expressed in average rates per hour, the wage-level for all employes advanced 22.1 per cent since 1922, to an average figure of 74.9 cents per hour in 1939. Dealing particularly with train and engine-service employes, who form the classes of employes particularly affected by the Train-Limit Law, the average hourly wage increased between 1922 and 1939 to 92.2 cents, an increase of 16.5 per cent. These are, of course, substantial and continuing benefits to the employes concerned.

Exhibits 17 (R. 2865), 18 (R. 2866).

(3) Effect on returns to owners of the railroads (R. 3944-3945):

This paragraph of the finding presents the results of the 1923 betterment program, from the standpoint of the financial returns to the railroad owners. It shows that the benefits have been largely, if not entirely, absorbed in the reductions in charges extended to the general public, and increases in wages given to the railroad employes. In so far as concerns actual income from the operations of the railroad properties, the returns earned, particularly since and including the year 1930, have been very small; in at least four years substantial deficits were experienced, and in no year since and including 1931 has there been a percentage return in excess of 2.57 per cent.

Exhibit 19 (R. 2867).

These findings thus emphasize that the 1923 betterment program, and the long-train operating practice as an essential feature thereof, have not operated merely to promote the self-interest of the owners of the properties; on the contrary, they have principally contributed genuine and long-lasting benefits to the general public which the railroad industry serves and to the vast number of persons who depend directly upon the railroad industry for their employment and support; but they have not operated, except to the extent of preventing or minimizing operating losses, to benefit the actual owners of the railroads in any corresponding degree.

(f) SIMILARITY OF OPERATING CONDITIONS AND OPERATING RULES ON OTHER RAILROADS TO THOSE PREVAILING UPON DEFENDANT'S LINES IN THE AFFECTED TERRITORY (R. 3945-3947).

In paragraph 3(e) of Part III of the answer (R. 12), after referring to nation-wide operation of long freight and passenger trains, it is alleged that the operating conditions under which such operations are carried on are substantially as favorable as those on the appellant's main lines in Arizona. Finding VIII(f) relates directly to the issue thus tendered.

The operating conditions in the affected territory are set forth at length in Findings III and VII. The testimony and exhibits relative to operations upon the other individual railroads which were severally represented by witnesses called by appellant contain a showing of the operating conditions upon these railroads, particularly in the districts covered by the several "long-train" exhibits. In general, it appears that the traffic handled under the long-train practice, upon other railroads, is largely of the same kind as handled in appellant's trains in the affected territory; that the grades vary from level to 1.5 per cent or less, about the same as in Arizona; that there are both single-track and double-track operations on these railroads, and in the particular districts studied, which is also true of Arizona operations; that the same general code of operating rules is followed; in short, that the circumstances under which the long-train practice is followed on these other railroads, from whatever standpoint considered, and while they present a variety of situations are such as to duplicate to a greater or less extent the con-

ditions encountered in at least some part of the affected territory.

One purpose of this finding is to make clear that there is no substance to the objection, continually insisted upon by counsel for appellee, that comparisons between operations of the appellant in Arizona and the adjacent affected territory, and operations on other railroads were incompetent or immaterial. The finding shows also that no special or unusual conditions exist in Arizona which justify the arbitrary imposition of a restriction which compels appellant to depart from the accepted and ordinary methods of operation, generally followed upon the lines of other carriers in the United States, both at the present time or for at least sixteen years last past; and that in seeking to conform its practice to the practice of other carriers, including its principal competitors and connections, appellant only desires to follow methods found by experience to be efficient and economical, and to result in speedier and safer transportation service, under conditions not essentially different from those which prevail in Arizona; in other words, to show that it is impossible to point to any experience of operating results gained upon the other railroads of the United States under conditions similar to those encountered in Arizona, which does not condemn as unreasonable, illogical, and unnecessary, the purely arbitrary limitations created by the Train-Limit Law.

IX.

RECENT LONG-TRAIN OPERATIONS OF DEFENDANT IN ARIZONA: INTENTION TO UNDERTAKE FUTURE LONG-TRAIN OPERATIONS (R. 3947-3950).

(a) LONG-TRAIN OPERATIONS OF DEFENDANT IN ARIZONA IN 1940 (R. 3947-3948).

In this finding there is included specific reference to the limited long-train operations undertaken in Arizona by appellant during the months of March and April, 1940. The complaint refers (R. 2-4) to two such long trains; but the testimony shows that long passenger trains were operated in Arizona on 62 different occasions between and including March 2nd and April 30, 1940 (*Exhibit* 246, R. 3255) while 302 long freight trains were operated during the 27 days between April 4 and April 30, 1940 (*Exhibit* 234, R. 3231). Practically all of the testimony relating to these long-train operations was adduced by appellant, either through its own witnesses or by questioning of appellee's witnesses; except, of course, the purely formal testimony of appellee's witnesses in chief, offered for the purpose of proving the operation of the two trains particularly referred to in the complaint. The finding shows the total volume of the traffic handled in the long trains operated by appellant, measured in passenger and freight car miles accumulated within Arizona; and shows also that the long freight trains had an average length of 85.36 cars.

Exhibit 295 (R. 3424).

It is also stated, and we call particular attention to the fact, that this long freight-train operation was necessarily

upon a limited scale, because the fixed physical plant in Arizona is not presently adapted to long-train operation upon the same scale as prevails upon appellant's lines in Nevada, for example; furthermore, because the necessary changes in locomotive assignments, which would be carried out if unrestricted long-train operation were undertaken, were not made for the purposes of the 1940 operation.

One particular and important limitation is afforded by the fact that most of the passing tracks along the single-track main lines in Arizona will not accommodate trains of more than 70 cars. Because of this, the long freight-train operation was largely confined to the movement of long trains in the westward direction only.

This finding is important in that it serves as a foundation for the subsequent finding setting forth the effect of the law upon appellant's operations, and the amount of savings and other benefits capable of being realized if the law's restrictions are removed. It is also preliminary to certain findings relative to safety; for, as appears more fully in those findings, the long-train Arizona operations of 1940 were not attended by any accident or casualty occurring upon a train operated in disregard of the law's provisions, as to which it was made to appear or could reasonably be contended that the length of the train had any bearing whatsoever upon the accident.

Sines, R. 1820-1835, 1860-1863.

Exhibits 197 (R. 3114), 234 (R. 3231), 235 (R. 3232), 246 (R. 3255), 295 (R. 3424).

The finding is important also because of its direct bearing upon the fundamental question in the case: namely, whether long-train operation is feasible and practicable, and capable of being conducted with reasonable safety, in Arizona; or whether there are, on the other hand, some peculiar conditions which justify the continuance of the restrictions. The Arizona 1940 long-train experience clearly demonstrates the entire practicability of such operations, and refutes any contention that peculiar conditions exist in Arizona which set that state apart from the other states in which the long-train practice has been so long and so successfully followed.

(b) FUTURE LONG-TRAIN OPERATIONS CONTEMPLATED BY DEFENDANT: CHANGES IN PLANT AND EQUIPMENT (R. 3948-3950).

In this finding there is set forth the fact, which is both undisputed and directly material to the question whether appellant suffers any substantial injury or impairment because of the law, that appellant plans and intends, if the law's restrictions are removed, immediately to commence and thereafter to continue the operation of long trains in the affected territory. The finding then sets forth the changes in physical plant and equipment necessary for the purposes of such operation on the same substantial scale as is followed in Nevada and elsewhere upon appellant's system.

The necessity for these changes, and the cost of the changes thus contemplated, are fully established by competent testimony. There will be need for a considerable number of siding extensions, and other changes in the

physical plant in order to permit larger locomotives and longer trains to be readily operated; also 30 larger locomotives will be required (on the basis of 1938 traffic volume), and will be substituted for some 51 locomotives presently in service, which will be displaced and made available for use in other territory. With the reduction in the number of train units operated, 21 cabooses now in use will become unnecessary (again assuming the same volume of traffic as in 1938), and there will be a substantial saving on this account.

This finding serves as a preliminary to and foundation for those portions of the next succeeding finding which deal with the amount of the net saving capable of being realized, if long-train operation should become the standard practice in the affected territory, in that it develops the annual charges on additional capital investment, which are deductible from the larger annual operating savings.

Dyer, R. 1115-1117; *Sines*, R. 1404-1405, 1769-1780, 2234-2238, 2251-2252, 2285; *Herbert*, R. 1545-1554, 1570-1574; *Russell*, R. 98-99.

Exhibits 197 (R. 3114), 202 (R. 3151), 205 (R. 3190), 222-255 (R. 3211-3214).

X.

EFFECT OF THE TRAIN-LIMIT LAW UPON DEFENDANT'S OPERATIONS (R. 3950-3969).

In subparagraphs (f), (g), (h) and (i) of paragraph 3, and also in paragraph 4, of Part III of the answer (R. 13-18) are set forth general allegations relative to the

results which follow from appellant's enforced observance of the Train-Limit Law. Thus in paragraphs 3(f) (R. 13), and 4(a) (R. 16-17), it is alleged that the law affects appellant's operations and controls the lengths of its trains, not only in Arizona, but also in adjacent portions of California, and in New Mexico and Texas as far east as El Paso; in paragraphs 3(g), 3(h) (R. 14-15), and 4(c) (R. 18), that the law imposes continuing annual burdens of additional expense upon appellant, amounting to more than $300,000 in the case of freight traffic upon the Yuma-Gila-Lordsburg line alone, and $10,000 in the case of passenger traffic; in paragraphs 3(i) (R. 15-16) and 4(b) (R. 17-18), that the law causes interstate trains and traffic in the affected territory to be greatly interfered with and delayed. In paragraph 5 of Part III (R. 19-22) it is further alleged that the law interferes with and burdens interstate commerce, and produces and increases congestion and train interferences. In paragraph 14 of Part III (R. 28) the allegation appears that the added expense to appellant of enforced obedience to the law is not less than $300,000 annually.

Finding X in its various subdivisions deals with the issues of fact thus tendered. In the interest of a more precise treatment, we shall take up each such subdivision separately in the discussion which follows but before doing so we shall point out how the evidence supporting this finding corresponds and is directly related to the other evidence of record tending to show the effects of the challenged law, and the results which would follow if the restrictions of the law were removed.

In presenting the "national picture", appellant brought before the trial court testimony which showed that the operation of long freight and passenger trains is a practice followed by numerous major railroad systems throughout the country; that it has resulted in greatly increased efficiency and economy of railroad operations; that improved schedules, made possible by the higher train speeds and greater efficiency resulting from the long-train program, have been placed in effect, with resulting benefit to the public at large. The evidence relative to the national picture also shows, as we point out in our discussion of Finding XII, that there has been a marked, continuous, and substantial reduction in the frequency of accidents and casualties, occurring side by side with the development of the long-train program. This national showing, supported as it is by evidence that conditions in Arizona are not essentially distinguished from those in other parts of the United States generally, is of itself sufficient to sustain a finding that the challenged law, in that it prevents the adoption of the same methods of operation in Arizona, impairs the efficiency and economy of railroad operations in that state, reduces the possible benefits to the general public, and hinders the program elsewhere attained in the reduction or elimination of the hazards of railroad operation.

However, appellant did not rest with the presentation of the national picture alone, or the showing of similarity of conditions as between its lines in Arizona, on the one hand, and the lines of United States railroads generally. It presented also a showing of the effects of the long-train program from the standpoint of efficiency, economy, and

safety upon its system as a whole. This testimony, in so far as it bears upon efficiency and economy, and the general achievement of better railroad performance for the benefit of appellant's patrons, is discussed at considerable length in the various subdivisions of Finding VII, and, in so far as it concerns safety, in connection with appropriate subdivisions of Finding XII. By this means appellant has shown that it has achieved upon its own line results substantially similar to those achieved nationally by the carriers as a whole, and individually by its several competitors and connections which were the subject of separate individual showings.

Appellant did not, however, rest its case even with a system showing. It went still further: it selected a portion of the system where the essential conditions, other than the existence of the arbitrary restrictions of the law, are essentially the same as in Arizona. We refer, of course, to the comparisons between Arizona, and the Tucson Division on the one hand, and Nevada and the Salt Lake Division, on the other. In the light of the substantially greater efficiency and economy experienced in the Nevada-Utah territory, as compared to the affected territory, and the substantially greater safety of operation in Nevada than in Arizona, particularly during the period since about 1925 when the long-train practice has prevailed in Nevada, there could no longer be any possible doubt that the law, and the law alone, imposes direct restrictions and hindrances upon appellant's Arizona operations, and instead of promoting safety, actually prevents the elimination of accidents and hazards.

The showing to which Finding X directly relates constitutes a still further method of proving, with a precision not possible in conjunction with the other evidence just discussed, the effects of the Train-Limit Law in imposing additional and unnecessary expense upon appellant, and creating or aggravating delays to and interferences with the traffic handled in the affected territory. In other words, while the experience of appellant in Nevada and upon its system generally, coupled with the experience of the railroads of the United States as a whole or as individuals, compels the conclusion that the Arizona restrictions impose substantial and unnecessary expenses upon appellant, and cause a very definite and inevitable loss of efficiency, that experience does not of itself and naturally cannot indicate precisely what the added expense and loss in efficiency amount to. Furthermore, there is no means of determining from that experience, except in a rather general way, the other effects of the law, such as the interferences with and delays to trains and traffic.

(a) THE REDISPATCHING STUDIES (R. 3950-3953).

For these reasons, appellant undertook the detailed analyses of traffic actually handled in the affected territory, which were presented to the trial court as the "redispatching studies".

In making these studies the methods generally adopted were as follows:

A typical period was selected, during which trains had been operated and traffic had moved, in accordance with the restrictions imposed by the law; and then, having the

records and the results of actual operations available for study, those results were contrasted with the results of the operations which would take place, if precisely the same traffic had moved, under precisely the same conditions, except as modified by removal of the law's limitations.

In other words, the determination was made by following the method employed, for similar purposes, in both the *First Arizona Train-Limit Case*, and the *Nevada Train-Limit Case*, using the experience there gained for the purposes of the instant case.

The initial study (the 1938 freight redispatch) involved the selection of two months in 1938, one of them (June) the month of heaviest traffic and the other (August) the month of lightest traffic. The traffic which actually moved during those two months was studied; and it was contemplated, in that study, that it would move under the same actual conditions, except in so far as the removal of the law's limitations would have permitted or required modifications in appellant's operating methods, and warranted certain changes in equipment and facilities, particularly the substitution of more powerful locomotives, the extension of sidings at certain stations and passing tracks in the affected territory where siding lengths are now 70 cars or less, and necessary changes in locomotive round-house and shop facilities. Because of the fact that the traffic had actually moved in trains limited to 70 cars, it had to be redistributed into longer trains, and those trains had to be "redispatched". The study in its entirety was therefore named the "redispatching study", and is so

referred to in the testimony and findings, and in this discussion.

Sines, R. 1402-1407.

Exhibits 196 (R. 3113), 198 (R. 3115), 205 (R. 3190).

The passenger redispatching study for the year 1938 was conducted in the same manner as the freight redispatching study, except that it was unnecessary for the purposes of that study to assume changes in locomotive assignments, facilities, or siding capacities.

Sines, R. 1406, 1448-1449.

A redispatching study covering Phoenix-Tucson operations for the month of December, 1938, was also undertaken. This study likewise assumed that the traffic would be recast into longer trains, and contemplated the use of longer sidings and locomotives having increased hauling capacity.

Appellant also conducted two separate, but closely related, redispatching studies of the traffic handled during the period April 4th to April 30th, inclusive, 1940, when as stated in Finding IX, appellant operated some 302 long freight trains in Arizona. In the first of these studies the traffic actually handled was redistributed into short trains, it being assumed for the purposes of that study that the restrictions of the law were observed. In this manner appellant was able to ascertain the amount of the saving in train miles and certain direct expenses associated with train operations, achieved by the (actual) limited long freight-train operation, and also to determine

whether there had been any improvement in freight-train performance. For the second of these studies it was contemplated that long-train operation should be undertaken upon the same scale as in connection with the 1938 redispatching study; in other words, the second 1940 study contemplated the use of the more powerful locomotives, extended sidings, and other permanent facilities planned in connection with the 1938 study. The two 1940 studies taken together enable comparisons to be made between (1) a completely restricted operation, (2) the limited long-train operation which prevailed and was hampered by inadequate siding capacities, and (3) a long-train operation predicated upon the use of appropriate locomotives and with adequate sidings and other facilities.

Sines, R. 1397-1410, 1416-1437, 1448-1455, 1517-1526, 2251-2252, 2284-2285; *Baker*, R. 1469-1474, 1483-1486, 1513-1516, 1575-1588; *Herrell*, R. 1487-1509, 2201-2205; *Cassady*, R. 1530-1540, 2214-2215, 2217-2219.

The redispatching studies were supervised and conducted by responsible employes of appellant whose qualifications could not be and were not questioned. The actual work of reconsisting and redispatching the trains was performed by and under the supervision of the chief train dispatchers who had jurisdiction over the lines in the affected territory. Each of these men had had many years of experience in his position and in prior subordinate positions leading to the position of chief dispatcher, and had necessarily become thoroughly familiar with the operation of trains in his particular district or division.

Sines, R. 1401-1402.

The permanent records of the movement of the trains and traffic, consisting of the dispatchers' train sheets, the conductors' time returns and delay reports, the conductors' wheel reports; the train consists, the dispatchers' letters and message files, the yardmasters' log books at the Yuma, Tucson and Lordsburg terminals, and all other necessary records were gathered and placed at the disposal of the dispatchers, who were relieved of other duties and gathered together as a working party for a period of several months. The redispatching work was then performed directly from the original train-sheet records of the actual movements.

Sines, R. 1402-1403, 1426-1427.

The work was done with great care and accuracy; the methods were sound; the assumptions reasonably made were wholly justified; and the results are unimpeachable. *All of the underlying records, together with the working papers, including the redispatched train sheets and the white work sheets (Exhibit 198, R. 3115) upon which were recorded, side by side, the actual and redispatched movements, were tendered to and accepted by the appellee's counsel, for examination and study, and were retained (and presumably, closely studied) by them for substantial periods; but no opposing testimony was offered, challenging in any way the accuracy, as to either detail or result, of the redispatching studies, or criticizing the soundness of the methods employed.* No serious question was raised during the trial as to any of the assumptions necessarily made for the purposes of the studies. *It may properly be said that, in so far as its methods, details and*

mathematical results are concerned, the redispatching studies rest upon a secure and unshaken foundation, and stand unchallenged in the record.

Appellee's counsel have suggested, however, that the redispatching studies should be regarded as purely imaginary, in that the redispatched trains were never operated except "on paper"; that consequently no worthwhile showing of actual results is possible. We doubt whether this criticism was seriously intended; in any event, it was properly regarded by the trial court as entirely without merit. The redispatching studies are no more imaginary than any other reliable calculation which results from the use of standard methods, and is made by experienced and qualified experts, who base their conclusions upon careful surveys of all of the relevant factors.

The long-train operating practice is not imaginary or merely potential. It has been developed by the appellant, in common with practically all of its competitors and connections; and it is now followed on every part of the appellant's system, except in Arizona and the immediately adjacent territory. Appellant's officers, particularly the men who made the redispatching studies, are fully familiar with long-train operations, the methods by which they are carried on, and the results which follow. It required no effort of the imagination for them to apply their knowledge in order to reconstruct the handling of a known and definite movement of traffic, as to which a complete and continuous record was available, when all of the conditions governing the movement were either known, or capable of being readily determined from broad experience.

Many situations comparable to those presented by the redispatching studies can be thought of; the following may serve as an example:

Suppose an individual owns several office buildings, located in various parts of the same city. All of these buildings, except one, are of 10 stories or more; one is limited to 7 stories, because of a local ordinance. All have been designed by the same architect and built by the same contractor. The owner wishes to find out the cost of adding 3 stories to his 7-story building in the event the ordinance should be repealed or set aside, and whether, from the standpoint of income and operating costs, the outlay would be justified. He calls in the architect and contractor, asks them to prepare plans and estimates, and draws upon his operating and income experience with all his buildings. Could such an estimate be called unreliable or imaginary, or an unsatisfactory foundation for a decision by the owner as to the practicability of the proposed investment? On the contrary, men in every-day transactions use such estimates as the bases of their business decisions. In fact, municipal zoning ordinances, which are nothing more than police-power regulations of the same character as claimed for the Train-Limit Law, have been set aside or modified, largely or entirely upon the basis of showings by property owners of contemplated uses not permitted by the challenged ordinances, and consequent deprivations, measured in money; although no buildings had actually been constructed on the lands affected.

The redispatching studies are nothing less than careful surveys of the changes in operating methods which will follow if the restrictions are removed, and determinations

of the results thereof, based upon the application of known factors and actual experience to known and determined movements of traffic. They are at least as accurate as would be the study and estimate of the costs of construction and operation of the addition to the 7-story building, above cited for the purposes of illustration, and equally above the criticism or suggestion of being imaginary.

It is important to note that while the redispatching studies represent weeks and even months of detailed study and analysis by the individuals who participated in and presented them to the trial court, the basic problems were, nevertheless, comparatively simple. Essentially, the studies are comparisons between train operations, with the maximum lengths permitted by the law, and operations with maxima of 100 or 125 freight cars, and whatever convenient number of passenger cars might be required. It is beyond controversy, and indeed obvious without analysis, that the handling of the same quantity of traffic in longer trains will result in fewer train miles and train interferences, and less operating expense. While the redispatching studies may appear to be complicated, in that the review of a multitude of details was required, they are really quite simple; for they involve only the four basic arithmetical operations: (1) *dividing* a given amount of traffic into short trains, and again into long trains; (2) *adding* the number of train miles thus required; (3) *multiplying* the train miles by known costs, and aggregating the separate costs, so as to produce a lump sum for each method of operation; and (4) *subtracting* the total for one method from the total for the other. All of these are elementary

operations, with which opposing counsel have no quarrel, and in fact could not quarrel.

It may also be pointed out that in so far as the redispatching study involves the determination of the additional train service required by compliance with the law (or alternately the train service saved by noncompliance), or the number of interferences thus contributed, the problem was even simpler than stated, for the multiplication by unit cost factors became unnecessary.

The redispatching studies present probably less favorable results, and thus a lower estimate of the savings in train service and expense, than would actually be realized. For example, in the 1938 redispatching study, all delays due to locomotive defects, which occurred in actual operation, were also taken into account and assigned to redispatched trains; although a considerably less number of redispatched trains were operated, and fewer locomotives were used, with consequent less opportunity for the occurrence of locomotive failures. Again, the times allowed for inspections of the redispatched long trains by train crews were substantially greater than actually used in corresponding inspections of short trains. No saving in time or delay was assumed for the redispatched trains on account of assumed non-occurrence of accidents or casualties occurring in connection with the starting and stopping of trains although obviously with the fewer and longer trains, there would be much less starting and stopping and much less opportunity for such accidents. On the contrary, all starting and stopping accidents, and all delays incident thereto, which occurred on short trains, were

reproduced and respectively assigned to redispatched long trains, operating at or near the places and times of the short trains on which such delays occurred. No account was taken, in the redispatching studies, of any savings in yard or terminal expense which might accrue from the operation of fewer and longer trains; although it is apparent that with long-train operation, trains would undergo much less switching and reconsisting at Yuma and Lordsburg than with short-train operation. No account was taken of the considerable saving in switching operations of passenger trains at Yuma and El Paso, although again it is obvious that such switching expense would largely be saved with long passenger-train operation, although now occurring frequently where trains have to be readjusted to the 14-car limitation. It is clear that the results of redispatching studies are at least conservative, and understate rather than overstate the savings in train service, expense, delay, and interference which would follow if the restrictions of the law were removed.

Sines, R. 1420-1428, 1448-1450, 2234.

We have referred above to the fact that the redispatching studies follow methods previously employed in both the *First Arizona Train-Limit Case* and the *Nevada Train-Limit Case*. The studies in those cases were conducted largely in the same manner as in the instant case: that is to say, under the direct supervision of a member of the executive staff, the actual work of redispatching the trains being performed by the chief train dispatchers having jurisdiction over the operating divisions and subdivisions affected or threatened to be affected by the Arizona

and Nevada laws. The Arizona redispatching studies received the favorable comment and approval of the United States District Court for Arizona; that court having said in part, in its final opinion in that case (2 Fed. Supp. at p. 862):

> "The financial burden imposed upon the plaintiff by the Arizona law is another important question. * * * The bill of complaint of the Southern Pacific Company alleges that its cost study shows that by long train operation on its main line between Indio, California, and El Paso, Texas, via Maricopa and Lordsburg, their freight train expenses could be reduced over $400,000.00 annually. * * * Vaile S. Andrus, assistant to the Vice President, conducted the Southern Pacific study, and the evidence shows that * * * (he) * * * has had vast experience in that line of work. (He) prepared work sheets containing 33 items necessary to be considered in making a careful estimate, including tonnage, number of cars in the various trains, time of departure and arrival and mileage traveled by all locomotives in connection with the movement of traffic. Timekeepers inserted the wage information called for by the work sheets, including wages of engine men on train engines, double-header engines, helper engines while double-heading and wages of train men. There is also an estimate of fuel consumption and many other factors. * * * The showing of estimated savings for the Southern Pacific Company is $417,858.81. These estimates seem to be accurate and reliable and to fully justify and establish the allegations of the bills on this question."

In the findings adopted by the United States District Court for Nevada, in the *Nevada Train-Limit Case*, that

Court, in referring to the Nevada redispatching study, said in part:

> "* * * The redispatching study was carefully conducted under the direct supervision of experienced and qualified operating and executive officers of the plaintiff, by chief train dispatchers who now and for many years past, have supervised the operation and movement of plaintiff's trains on the Nevada lines. The result of this study presents as accurate a determination as possible of the effects of the law in the following particulars: (1) in requiring additional train service to be operated by plaintiff on the Nevada lines; (2) in creating or aggravating delays to and interference with plaintiff's trains and cars and the traffic transported therein; and (3) in imposing additional expense upon plaintiff's operations."

(b) INTERFERENCE WITH AND DELAYS TO INTERSTATE TRAFFIC (R. 3953-3962).

The question whether the law causes and creates delays to and interferences with the handling of traffic and movement of trains upon appellant's lines in the affected territory is one of the important issues of the case. It is presented by the allegations of paragraphs 3(f) and 3(h) (R. 13-15), and 6 (R. 22-23), of Part III of the answer.

Appellant's showing upon this issue was very complete; on the other hand, appellee offered but little testimony having any bearing thereon, and that testimony tends to confirm appellant's showing.

The delays to and interferences with the traffic and the trains handled in the affected territory are of three kinds. As enumerated in the findings they are: (1) interferences with and delays to cars and trains at terminals, principally at points outside of or at the boundary of Arizona, at which trains moving toward Arizona are reduced to sizes conforming to the law, and trains moving from Arizona built up, from 70 cars or less to the greater lengths prevailing in the adjoining states; (2) delays to individual cars, as distinguished from trains, at terminals and other stations; and (3) interferences with and delays to trains while en route, due principally to the increased number of meets and passes created by the operation of the increased number of trains compelled by the law.

(1) Terminal delays (R. 3953-3957):

The nature and character of terminal delays occasioned by the law are set forth in considerable detail in the subparagraph of this finding which carries the above title.

The evidence cited in the finding, relating to delays incurred at points on the boundary of or just outside of Arizona for the purpose of reducing or building up trains, shows that these operations are performed at Yuma on the west, and Lordsburg and Rodeo on the east; except that in many cases, particularly where passenger trains are involved, such trains are made up and broken up at El Paso, on the east. It is immaterial, however, whether these operations be actually performed at the stations mentioned, or at some other stations either nearer to the boundary line on the east or beyond the boundary line on the west. The reasons for selecting Yuma, Lordsburg

and Rodeo, in the case of freight trains, as the points of make-up and break-up of trains are simply that the yard and other facilities required exist at those points.

The reasons that El Paso is the point of make-up or break-up of passenger trains to or from Arizona are twofold. First of all, it is a terminal point where the facilities exist; second, it is a junction point of the lines through Lordsburg and Douglas, so that cars from a westward train which exceeds the limit can, in some cases, be shifted to another westward train proceeding over the alternate route, thereby avoiding at times the operation of extra sections. Similar considerations govern in the case of eastbound passenger trains.

The construction of a terminal nearer to the state line than Lordsburg, if not impracticable because of topography, would at least be difficult and expensive; moreover, the operation of a terminal at the state line would entail serious difficulties because of the grade (approximately 1.4 per cent) at the point where the Tucson-Lordsburg line crosses the boundary.

The delays incident to making up and breaking up trains are not so directly associated with the points at which the operations take place, as with the character and extent of the operations required. These delays are not avoided by shifting the scene of the operations; they are necessarily and inevitably the result of the compulsion of the law, in that trains entering Arizona must be reduced to the permitted size before they proceed across the state, while those leaving or about to leave the state must, as a matter of economic necessity and in order to avoid addi-

tional expense and train interferences, be brought up to the larger sizes which make for efficient and economical operation.

It is especially to be noted that appellee has not asserted that the methods of operation now followed by appellant, and dealt with at length in the testimony and in this portion of the findings, are not proper and economical; that is to say, appellee does not contend that the most efficient, economical, and logical method of complying with the law is to follow the present long-train method of operation in the adjoining states, and to bring long trains approaching Arizona as near to the boundary as practicable before reducing them, while building up trains which have left Arizona into long trains as soon as possible.

It will be noted, and indeed the finding emphasizes, that the delays and interferences incident to observance of the law in connection with freight trains approaching Arizona from the east, or leaving Arizona at the eastern boundary line, are experienced at points outside of the state; in other words, that all such delays and interferences are extra-territorial. Similar extra-territorial effects are avoided at the westerly boundary only because appellant has for many years followed the practice of operating its long freight trains into and out of Yuma, and there performing the reconsisting operations, even though the yard at Yuma is well within the boundary of Arizona. Appellee's counsel appear, in effect, to concede that this is the logical and proper method of operation, and that the law could be complied with otherwise, only

by running short trains over the lines west of Yuma, to and from some station where they might be reduced or built up in the same manner as presently followed at Yuma (R. 1918). To follow such a method would, of course, transfer the delays to a point outside of Arizona, and thus give the law extra-territorial effects similar to those experienced at Lordsburg, Rodeo and other stations east thereof; but it could not conceivably eliminate or even reduce the delays at all. The burden of extra-territorial expense imposed by the law would, of course, also be materially increased over and above what is now experienced, as set forth in subparagraph (b) of this finding.

We ask the Court to note particularly that the delays to trains and cars incurred at Lordsburg and points east thereof, as set forth in the subdivision of this finding carrying that sub-heading, are wholly extra-territorial and can be avoided, in so far as eastbound trains are concerned, only if the 70-car restriction is observed for the entire 171 miles between Cavot and El Paso. In practice, and because the great preponderance of the eastward trains arriving at Lordsburg contain perishable freight and, in many instances because of schedule requirements, cannot be held at that point for consolidation, a large proportion of the trains arriving from the west at Lordsburg with 70 cars or less are run through Lordsburg, and all the way to El Paso, without being built up.

Cars intended for westbound movement into or across Arizona, particularly refrigerator cars which at times are urgently required, are nevertheless delayed at Lordsburg

and points east thereof, solely because trains must be reduced to 70 cars at that point, and the surplus cars held to await movement on following trains. It frequently happens that space is not available on trains immediately following, and special trains must be run when locomotives and crews are available at Lordsburg. At times the storage space at Lordsburg available for these empties is completely filled; in which event the cars are stored at Deming or Strauss, N. M., or even at El Paso, until such time as they can be moved in trains conforming to the Arizona restriction. These delays are, of course, wholly extra-territorial in character, and emphasize the widespread effect of the law.

Sines, R. 66-69, 1721-1723, 1795-1797, 2076-2082, 2246-2247; *Baker*, R. 1294-1295, 1305-1307; *Herrell*, R. 1493-1497; *Herbert*, R. 2070-2075.

Exhibits 1 (R. 2851), 175 (R. 1284), 185 (R. 3077), 215 (R. 3199), 297 (R. 3426).

(2) Delays to trains en route: Meets and passes (R. 3957-3958):

Meetings and passings of trains are necessary incidents of train operation and they cause delays to the trains involved or at least some of them; for when a meet or pass occurs between two trains, one of the two must take siding, and occasionally it must wait, after clearing the main track, for a considerable time until the other train has either arrived or left. Naturally, however, an effort is made by appellant's operating officials to reduce delays at meetings and passing points to the minimum. Apart from the mere factor of delay, meets and passes are a source of hazard to trainmen, because

of the additional stops, and the necessity of mounting and dismounting trains while in motion in order to open or close switches.

In fact, at least one of appellee's witnesses agreed that the most desirable operation occurs when a train is able to proceed from terminal to terminal, with as few stops for meets or passes, or other purposes, as possible.

Ash, R. 2596; *Durnil*, R. 2372-2376.

The Train-Limit Law causes the numbers of meets and passes to be greatly increased, simply because it compels a substantially greater number of trains to be operated. An increase in the number of trains increases the number of meets and passes involved in the operation, not merely in direct proportion to the increase, but practically in proportion to the square of the total number of trains.

The formula which determines the number of meets and passes which will occur in conjunction with operations over a particular district (as, for example, between Yuma and El Paso via Gila, Tucson and Lordsburg) is capable of mathematical determination; and in this case that formula was carefully and accurately determined for the district just mentioned, by means of a series of computations predicated upon actual operations as shown on the original dispatcher's train sheets. Applied to the instant case, the formula gives the following results: The operation of 4,304 additional freight trains, during the year 1938, over the principal main line between Yuma and El Paso via Gila and Lordsburg, which additional trains were run solely because of the restrictions of the

law and would have been eliminated if the law were not in effect, created about 16,500 additional meets and passes, which would not have occurred if long-train operation had prevailed; or, alternately expressed, an increase of about 28.4 per cent over and above the number of trains (both freight and passenger), which appellant would have run if it had not been for the law, caused an increase in the total number of meets and passes, between all trains operated, amounting to about 63.0 per cent.

Exhibits 220 (R. 3210), 298 (R. 3427).

The effect of the increased number of trains, in the way of added train interferences due to the greater number of meets and passes, is shown graphically upon the chart of train movements received in evidence as Exhibit 220. This exhibit traces the movement of every freight and passenger train operated on the Yuma-Gila-Lordsburg-El Paso line during the twenty-four hours, midnight to midnight, on June 18, 1938; that day being selected because it was the day of heaviest movement in June, 1938, which month was, in turn, the month of heaviest traffic volume in that year. Side by side with the chart of actual movement, upon that exhibit, are charted the trains operated during the same twenty-four hour period, as they appear on the redispatched train sheets of the redispatching study. Although this exhibit was the subject of considerable cross-examination by appellee's counsel, who were also furnished the underlying data from which the exhibit was made, and in fact retained that material in their possession for some time, no opposing testimony was adduced, nor was the essential accuracy of the exhibit challenged, except in minor details.

Appellee's counsel affected to regard our exhibits and testimony relative to the increased number of meets and passes as speculative and theoretical, apparently believing that the computations thereby presented to the Court were of little value. These computations, and the results therefrom submitted to the Court, present a purely mathematical calculation based upon a series of observations, from which is deduced a precise mathematical formula. That formula is no more speculative or theoretical than any other natural mathematical law: for example, the mortality tables, upon which are based the fundamental calculations of the life-insurance companies; the experience tables of fire and casualty insurance companies; the basic formulae used in the highly accurate science of naval gunnery; the formulae relative to the flow and measurement of water; or the formula representing the law of gravity. It is no more difficult for a competent engineer or mathematician to calculate the formula which will represent the normal and expected incidence of the meets and passes for a particular district or territory, given an adequate number of observations on which to base that calculation, than for the same or a similarly competent engineer or mathematician to calculate any other formula which he may need as to the strength, behavior, or occurrence, of natural phenomena; provided only a sufficient number of observations have been made. Since there is no question in this case as to the competency of the engineer who made the calculations, nor the adequacy of the observations taken from actual experience, the correctness of the result is not open either to challenge by appellant's counsel or to the suggestion or inference that it is speculative.

It is quite true that the mathematical method of calculating as closely as possible the exact number of additional meets and passes created by compliance with the law employs an analytical process with which the ordinary layman is not familiar; and this very fact may have influenced opposing counsel and inspired their suggestions. Nevertheless the basic principle remains, and is not challenged in any way, that an increase in the number of trains operated brings about a disproportionately greater increase in the number of meets and passes, with the attendant delays, interferences and hazards. Therefore, even giving every effect to counsel's criticism, there is still no avoidance of the result that the operation of the additional trains compelled by the law (and we emphasize that the undoubted effect, if not the outspoken purpose, of the law is to compel such additional operation) brings about a very much larger increase in the number of meets and passes. Whether this increase is 16,500, on the principal main freight line via Gila and Lordsburg, because of the operation of 4304 additional trains, or as few as 10,000 or as many as 20,000, is perhaps unimportant; the important fact is that the law necessarily creates these additional delays, interferences and hazards, although they could readily be avoided by removing the restrictions on the train lengths, and thus reducing the number of trains operated.

Herbert, R. 1341-1342; *G. C. Baker*, R. 1463; *Sines*, R. 1731-1745, 2086-2090, 2231-2234, 2281-2282; *Durnil*, R. 2375-2377; *Menzies*, R. 2819.

Exhibits 220 (R. 3210), 226 (R. 3215), 298 (R. 3427).

(3) Delays to and interferences with passenger trains and traffic (R. 3959-3960):

The finding carrying the above sub-heading is predicated upon the elaborate studies of trains and traffic introduced as Exhibit 199 (R. 3116), as supplemented by the supporting oral testimony and certain other exhibits.

The delays to and interferences with passenger trains and traffic are much more widespread, and particularly experienced to a much greater degree outside of Arizona, than in the case of freight traffic. The very nature of passenger traffic renders these results inevitable, and they are accentuated by the fact that the limitation (14 cars) is so comparatively small. It is not possible, in passenger-train operation, ordinarily to set out excess cars at a station at or near the state boundary with the purpose of having them moved on some following train; nor is it possible ordinarily to stop short trains at or near the state boundary for the purpose of consolidating with other trains. Such set-outs and consolidations, if made, must be at points such as El Paso or Yuma, where alternate routes converge and other passenger trains are available to handle the excess cars. If set-outs are made at points or at times where other trains having capacity to handle the excess cars are not available, extra sections must be made up and run, thus contributing additional train interferences and possible delays. Necessarily, the operations of reswitching trains at points where cars are set out or picked up involve delays, not only to the trains themselves, but in even greater degree to the cars.

It also sometimes happens that cars at intermediate points such as Phoenix or Tucson, and occasionally Yuma, intended for movement in particular passenger trains, must be left behind to follow on some other train, or handled as a special movement, solely because the train in which they were intended to be handled is already at the limit when it arrives at the station. Special movements of large parties who, with their baggage and other property, occupy more than 14 cars cannot be made in single passenger-train units across Arizona; the trains must either be broken up or, as sometimes happens, the entire movement diverted to some other line (usually a competitor) which is not compelled to observe a 14-car restriction.

Mahoney, R. 1049.

The finding sets forth the detail of the various interferences taking place during the year 1938. It is shown that these interferences occurred 222 times during that year, and involved 359 trains, and that a substantial proportion of the interferences were at points outside of Arizona. The correctness of this showing was not challenged by appellee, nor was there any opposing testimony.

G. C. Baker, R. 1306-1309; *Sines*, R. 1364-1367, 1449-1450, 1517-1526, 1805-1812, 2226-2230.

Exhibits 187 (R. 3079), 188 (R. 3081), 199 (R. 3116-3148), 230 (R. 3228).

(4) Summary of effect of delays and interferences (R. 3961-3962):

The combined results of all the delays to and interferences with freight traffic caused by the law, as well as

any speeding-up which long-train operation might permit, are set forth in Exhibits 227 (R. 3217), 228 (R. 3223), 237 (R. 3235), 238 (R. 3240), 243 (R. 3248) and 244 (R. 3252), the substance of which is stated in the finding bearing the above caption. These exhibits present the results of the redispatching study for June and August, 1938, and the other redispatching studies for April, 1940. Comparing the number of trains and traffic handled in the redispatched trains with movement of the same traffic as it took place and was recorded upon the train sheets of actual movement, they demonstrate that if the law had not been in effect in 1938, and appellant had then been able to operate its freight trains free of the 70-car restriction and with the changes in power assignments, siding capacities, and other facilities contemplated in connection with the 1938 redispatching study, the scheduled and identified fruit blocks and manifest sections operated during June and August, and individual cars handled in that month, would have spent less time en route on the average between El Paso and Yuma, and arrived upon or ahead of scheduled times more frequently, and late on schedule less frequently, than was the case in actual experience with the short-train operation.

The first 1940 redispatching study, which relates to the limited long-train operation actually undertaken during the period April 4th to April 30th, 1940, shows, according to the summaries presented by Exhibits 237 (R. 3235) and 238 (R. 3240), that the redispatched short trains made slightly better times, on the average, than the actual limited long-train operation. Eastward, out of 185 blocks

and manifest sections involved, 134 made the same times as the actual; 40 made slightly better times; and 11 arrived on the average a little later. The total time gained by the 40 redispatched blocks which arrived earlier was 38 hours, 55 minutes; the total time lost by the 11 redispatched blocks which arrived later was 8 hours and 10 minutes. Of the 185 actual trains involved, however, all but five arrived at El Paso on or ahead of schedule; and only two of the five were more than 15 minutes late. Westward there were 96 blocks and manifest sections involved; all but 14 of the redispatched blocks made the same times, 8 arriving in advance of the actual, and 6 later than the actual. This comparison, it may be emphasized, was between a short-train operation in conformity with the law and a limited long-train operation, which was inevitably hampered by the absence of the adequate siding capacities necessary for satisfactory long-train operation and the non-availability of the proper types of locomotives to handle the heavier trains most efficiently. The results which would obtain, however, if long-train operation with proper facilities had been conducted in April, 1940, are shown on Exhibits 243 (R. 3248) and 244 (R. 3252). Exhibit 243 shows that out of 179 blocks and manifest sections involved, 106 made better time and only 60 made poorer time eastward than in actual operation, while out of 96 blocks or manifest sections operated eastward, 24 made better time than actual, and only 17 made poorer time. The average variation from the actual time of both those arriving earlier and those arriving later than actual was only slightly more than 20 minutes.

Sines, R. 1790-1800, 1835-1839, 1852-1857, 1868-1871.

The results shown on Exhibits 243 and 244 confirm very strongly the direct comparison between restricted operations, and long-train operations with proper facilities, as set forth on Exhibits 227 and 228. They demonstrate the truth of the allegation, found in paragraph 3(e) of Part III of the answer (R. 12), that the practice of standard long-train operation does not retard, but on the contrary expedites materially, the movement of traffic, and does not delay but on the contrary promotes and makes possible the early delivery of such traffic.

(c) REDUCTION IN TRAIN LENGTHS: INCREASE IN NUMBER OF TRAINS OPERATED (R. 3962-3966).

(1) Freight train operations (R. 3962-3965):

This finding sets forth the undisputed fact that the enforcement of the law causes and will continue to cause both the average and the maximum lengths of the freight trains operated in the affected territory to be greatly reduced, and correspondingly compels the operation of a substantially larger number of trains and necessarily a substantially greater number of train miles and locomotive miles, than would be necessary for the handling of the same total volume of traffic if it were not for the law.

The finding also contains a statement, which we again emphasize, that the effects of the law in this respect are not confined to Arizona, under the methods of operation now followed in order to comply with the law. The 70-car restriction is completely effective, and train lengths are completely controlled thereby, as far east as Lordsburg and Rodeo, New Mexico. To a large extent the law also controls the lengths of trains as far east as El Paso.

The exact extent of the effects of the law upon average train lengths is set forth graphically upon Exhibits 215 (R. 3199), 235 (R. 3232) and 241 (R. 3245). The substance of those exhibits is stated in the findings, and to avoid repetition we here reproduce the exhibits. We call especial attention to the showing of the effect of the law in the district between the Arizona-New Mexico line and El Paso.

The showing on these exhibits is based directly upon the redispatching study. The comparison on Exhibit 215 is between the average length of the trains operated during the months of June and August, 1938, and the length of the redispatched trains, shown on the redispatched train sheets and work sheets A (Exhibit 198, R. 3115), which handled the same traffic. The overall effect of the law, succinctly stated, as applied to 1938 traffic, was to cause the average length of the freight trains operated between Yuma and El Paso via Gila, Tucson and Lordsburg to be reduced from 90.1 cars per train, to 66.0 cars: a percentage reduction of 26.7 per cent (Exhibit 226, R. 3215). The comparison on Exhibit 235 is between the actual limited long-train operation of April, 1940, and a redispatched operation conforming to the law; while the showing on Exhibit 241 is between the actual limited long-train operation, and a long-train operation employing the proper facilities: that is to say, the more powerful locomotives, the longer sidings, and the other additions to permanent facilities which are referred to in Finding X(b) (R. 3948). The effect of compliance with the law in holding train lengths below the figures which would otherwise be obtained, as determined from the 1940 redispatching studies, may readily be seen by studying Exhibits 235 and 241

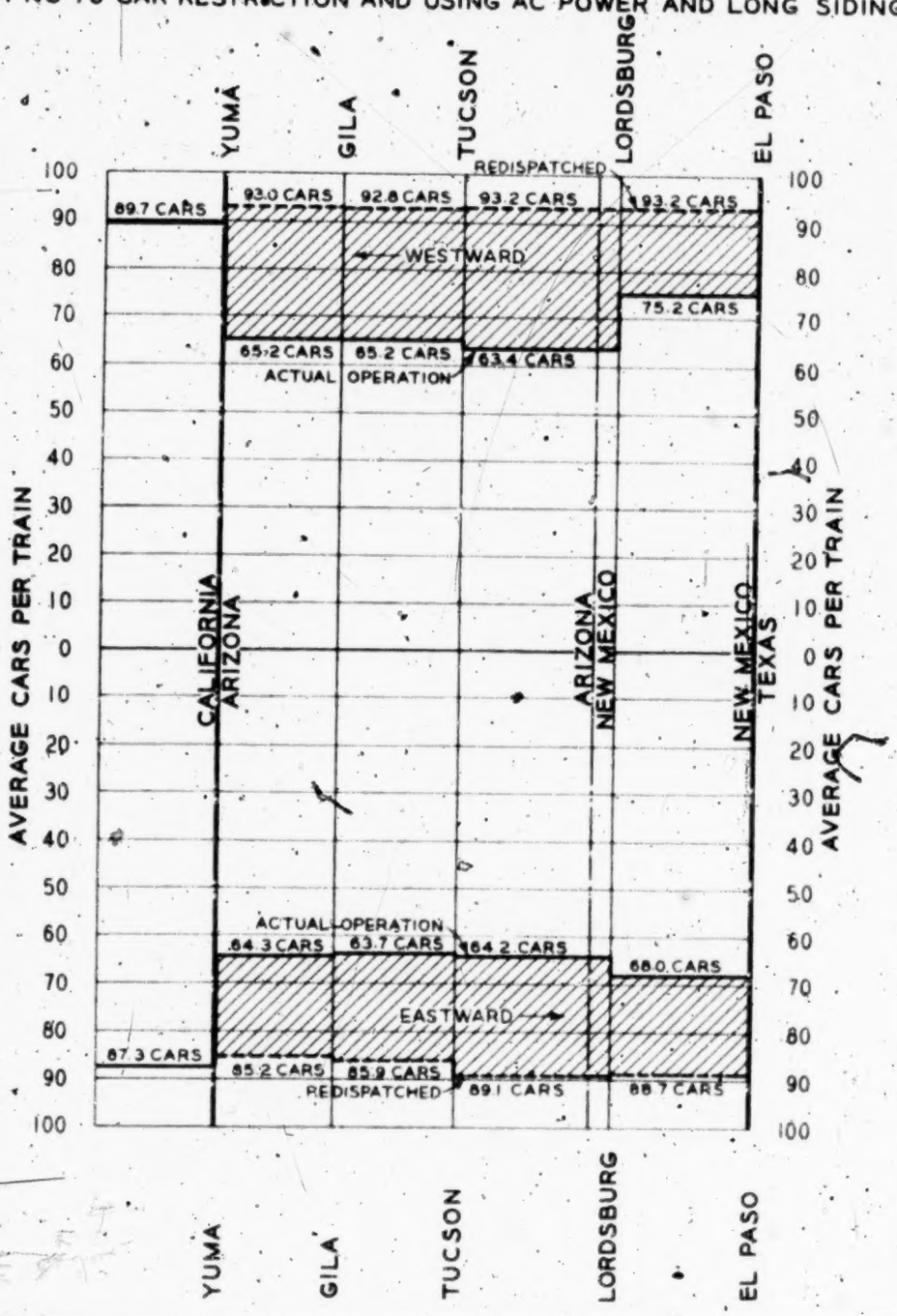
SUPERIOR COURT, PIMA CO., ARIZONA
STATE V S.P.CO. NO 20087.
DEFTS. EX. NO 215 (WITNESS _____)

SOUTHERN PACIFIC COMPANY.

RELATIVE TRAIN LENGTHS

CALIFORNIA - ARIZONA - NEW MEXICO - TEXAS.

THROUGH AND LOCAL FREIGHT TRAINS
OPERATING VIA YUMA, GILA, TUCSON, LORDSBURG AND EL PASO
EXCLUDING STRAUSS TURNAROUND TRAINS
BASED ON REDISPATCHING STUDY OF JUNE AND AUGUST 1938
WITH NO 70 CAR RESTRICTION AND USING AC POWER AND LONG SIDINGS



241

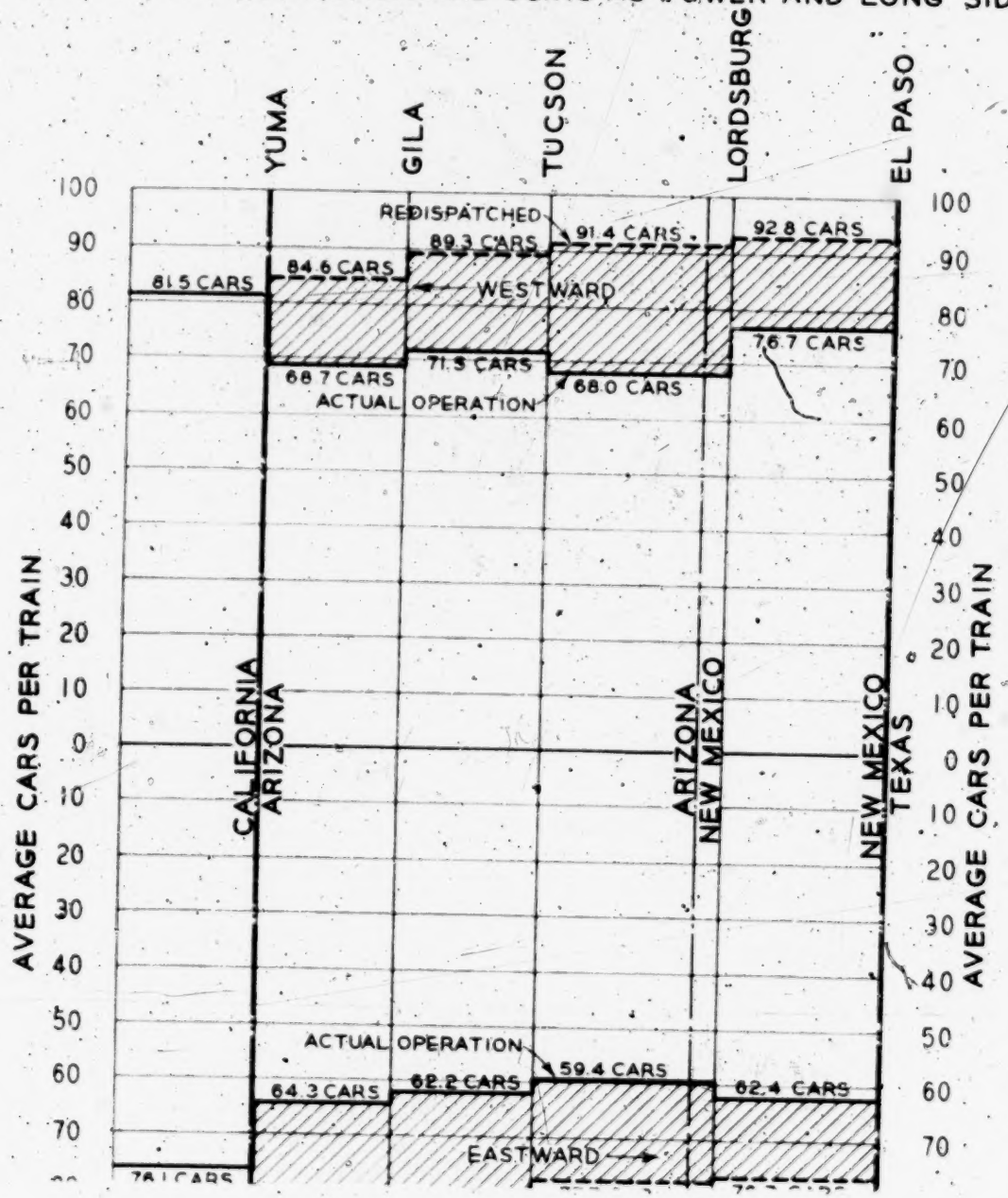
SUPERIOR COURT, PIMA CO., ARIZONA
STATE V. S.P.CO. NO 20087
DEFTS. EX. NO. ____ (WITNESS ____)

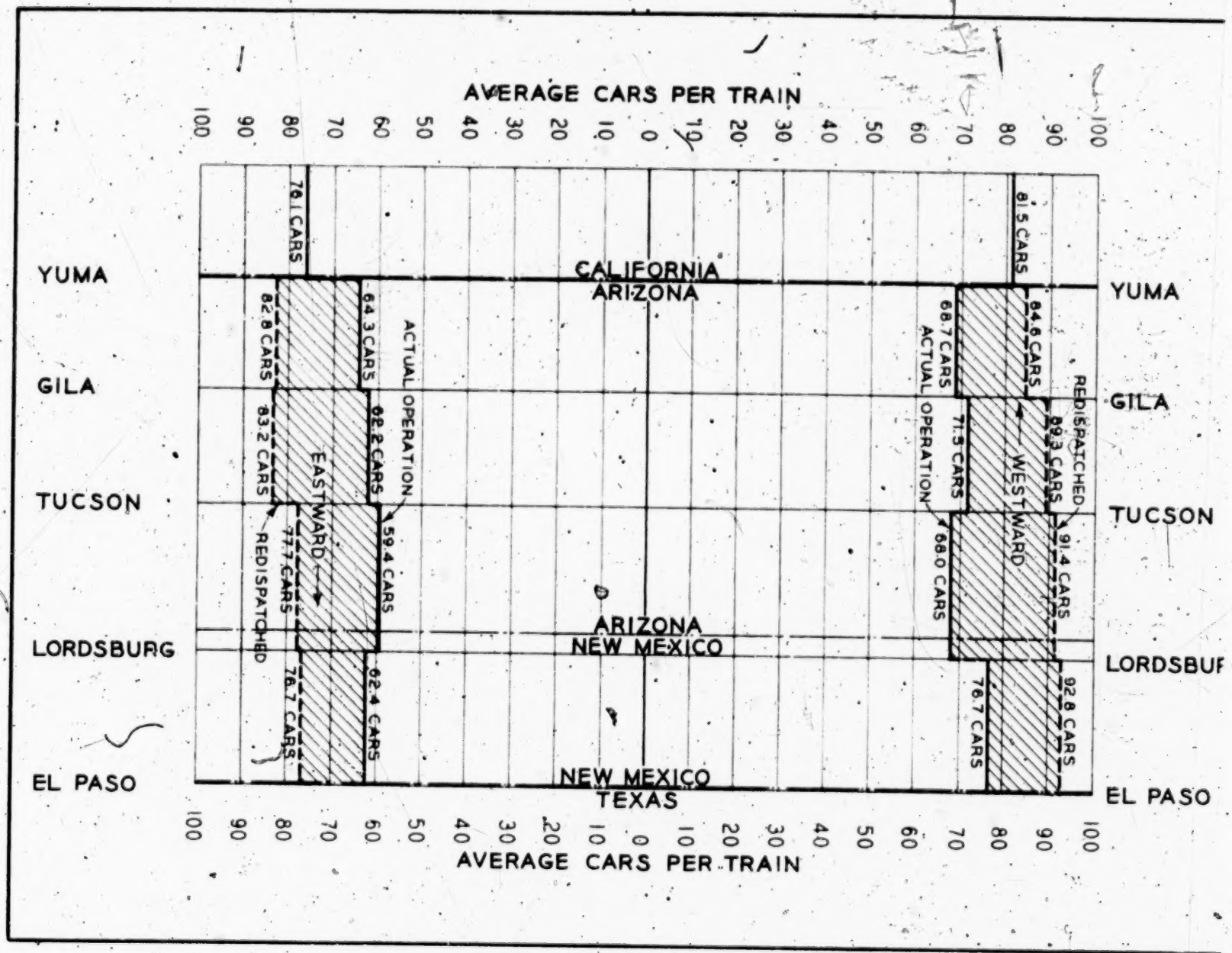
SOUTHERN PACIFIC COMPANY

RELATIVE TRAIN LENGTHS

CALIFORNIA - ARIZONA - NEW MEXICO - TEXAS.

THROUGH AND LOCAL FREIGHT TRAINS
OPERATING VIA YUMA, GILA, TUCSON, LORDSBURG AND EL PASO
EXCLUDING STRAUSS TURNAROUND TRAINS
BASED ON REDISPATCHING STUDY OF APRIL 1940
WITH NO 70 CAR RESTRICTION AND USING AC POWER AND LONG SIDINGS




AVERAGE CARS PER TRAIN
100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100
YUMA
GILA
TUCSON
LORDSBURG
EL PASO
CALIFORNIA
ARIZONA
ARIZONA
NEW MEXICO
NEW MEXICO
TEXAS
79.1 CARS
82.8 CARS
83.2 CARS
77.7 CARS
78.7 CARS
64.3 CARS
62.2 CARS
59.4 CARS
62.4 CARS
ACTUAL OPERATION
EASTWARD
REDISPATCHED
81.5 CARS
84.6 CARS
89.3 CARS
91.4 CARS
92.8 CARS
68.7 CARS
71.5 CARS
68.0 CARS
78.7 CARS
ACTUAL OPERATION
WESTWARD
REDISPATCHED
YUMA
GILA
TUCSON
LORDSBUF
EL PASO
AVERAGE CARS PER TRAIN

together. It will be observed that the figures representing actual operations, and the graphic representations of the actual operations, are identical in both exhibits.

The effect of the law, as it appears from the 1940 studies, is also shown on Exhibits 236 (R. 3233) and 242 (R. 3246). From these two exhibits, taken together, it appears that for the 27 days of April, 1940, the average train lengths between Yuma and El Paso via Gila and Lordsburg, if the law had been complied with, would have been 64.4 cars; whereas if long-train operation with larger locomotives and longer sidings had been undertaken the average train length would have been 85 cars: so that the reduction incident to compliance would have been 20.6 cars, or 24.3 per cent.

If the law had not been in effect during 1938, appellant could and would have handled the traffic which moved over the main line between Yuma and El Paso via Gila and Lordsburg and over the alternate line between Tucson and El Paso via Douglas with 4304 fewer freight trains. The actual additional operation caused by the law, expressed in train miles and locomotive miles, is shown on Exhibit 226 (R. 3215). Based upon the study of two months' operations, and expanding the figures by the appropriate ratio, it appears that the additional train miles required by the law amounted to 638,569; the additional locomotive miles to 798,424. Expressed in percentage, the law compelled appellant to operate 30.8 per cent more freight trains, and produce 33.1 per cent more freight-train miles, and 35.9 per cent more freight-locomotive miles, than would otherwise have been required. The additional

locomotive miles are somewhat greater in number than the additional train miles, because of helper-engine and light-engine movements which accumulate locomotive miles, but not train miles. For ready reference, particularly as showing the substantial proportion of the additional operation compelled by the law in the territory east of Lordsburg and Douglas, we here reproduce Exhibits 226, 236 and 242:

The showing on Exhibit 226 relates to the year 1938, as stated; but the accuracy of the showing thereon can readily be confirmed by examination of Exhibits 236 and 242. Those exhibits show that for the 27-day period short-train operation in compliance with the law would have required the running of 378 more trains than if "unrestricted" long-train operation had prevailed; the additional train miles produced would be 56,182, and the additional locomotive miles 74,329. The 27 days from April 4 to April 30, inclusive, represent a little more than 1/13th of all the days of the year 1940; and an approximation of the total amount of the annual savings by unrestricted operation can therefore be obtained by multiplying the figures for the 27-day period by 13. On this basis appellant would have saved approximately 5,000 trains, about 700,000 train miles, and about 900,000 locomotive miles, as compared to short-train operation, if it had followed unrestricted operation throughout the year 1940.

Sines, R. 1846-1852.

We ask the Court to note particularly the statement in the finding that 151,789 of the additional freight-train miles which the law compelled in 1938, or 23.8 per cent of

Superior Court, Pima Co., Arizona
State v. S.P.Co. No. 20087

Defts. Ex. No. _____ (Witness _____)

(Sheet 1 of 2 sheets)

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY - OPERATING STATISTICS
YUMA, ARIZONA TO EL PASO, TEXAS
EXCLUDING PHOENIX LINE
FOR PERIOD JUNE AND AUGUST, 1938

	NUMBER OF TRAINS (a)	TRAIN MILES (b)	OTHER LOCOMOTIVE MILES (c)	TOTAL LOCOMOTIVE MILES (d)	NUMBER OF CARS (e)	CARS PER TRAIN (f)
NORTH LINE						
I - Yuma - Gila						
Actual	771	94,833	4,223	99,056	49,940	64.8
Redispatch	554	68,165	1,878	69,843	49,373	89.1
Saving for period	217	26,668	2,345	29,213	(1) 567	24.3
II - Gila - Tucson						
Actual	767	98,176	16,518	114,694	49,468	64.5
Redispatch	550	70,400	10,746	81,146	49,178	89.4
Saving for period	217	27,776	5,772	33,548	(2) 290	24.9
III - Tucson - Lordsburg						
Actual	756	123,010	60,878	183,874	48,240	63.8
Redispatch	521	85,079	39,418	124,497	47,499	91.2
Saving for period	235	37,931	21,457	59,377	(3) 741	27.4
IV - Lordsburg-El Paso (Through trains only)						
Actual	674	100,084	563	100,647	48,255	71.6
Redispatch	521	77,335	1,728	79,063	47,399	91.0
Saving for period	153	22,749	(1) 1,165	21,584	(4) 856	19.4
V - El Paso-Strauss (Turnaround trains only)						
Actual	4	68	-	68	200	(5) 100.0
Redispatch	56	952	-	952	2,800	(5) 100.0
Saving for period	(1) 52	(1) 884	-	(1) 884	(1) 2,600	
VI - TOTAL NORTH LINE						
Actual	2,972	416,171	82,179	498,339	196,103	(6) 66.0
Redispatch	2,802	301,931	53,570	355,501	196,249	(6) 90.1
Saving for period	770	114,240	28,609	142,838	(1) 146	24.1
SOUTH LINE						
VII - Tucson - Douglas						
Actual	121	15,128	-	15,128	5,958	48.8
Redispatch	122	15,128	-	15,128	6,876	56.4
Saving for period	-	-	-	-	(7) 918	7.6
VIII - Douglas-Bisbee Jct. (Turnaround trains only)						
Actual	52	1,208	-	1,208	2,851	54.8
Redispatch	52	1,208	-	1,208	3,082	59.3
Saving for period	-	-	-	-	(8) 231	4.5
IX - Douglas - El Paso						
Actual	122	26,596	-	26,596	5,865	48.1
Redispatch	122	26,596	-	26,596	6,763	55.4
Saving for period	-	-	-	-	(9) 898	7.3
X - TOTAL SOUTH LINE						
Actual	296	42,932	-	42,932	14,674	(10) 48.5
Redispatch	296	42,932	-	42,932	16,721	(10) 56.9
Saving for period	-	-	-	-	(1) 2,047	7.4
XI - TOTAL NORTH AND SOUTH LINES						
Actual	3,268	459,103	82,179	541,271	210,777	(11) 64.7
Redispatch	2,498	344,863	53,570	398,433	212,970	(11) 85.6
Saving for period	770	114,240	28,609	142,838	2,193	21.9
XII - PER CENT CHANGE, SAVING vs. ACTUAL	23.6%	24.9%	34.8%	26.4%	-	33.8%
XIII - SAVING FOR YEAR (Saving for period						

REDISPATCH STUDY - OPERATING STATISTICS
YUMA, ARIZONA TO EL PASO, TEXAS
EXCLUDING PHOENIX LINE
FOR PERIOD JUNE AND AUGUST, 1938

	NUMBER OF TRAINS (a)	TRAIN MILES (b)	OTHER LOCOMOTIVE MILES (c)	TOTAL LOCOMOTIVE MILES (d)	NUMBER OF CARS (e)	CARS PER TRAIN (f)
NORTH LINE						
I - Yuma - Gila						
Actual	771	91,833	4,223	99,056	49,940	64.8
Redispatch	554	68,166	1,678	69,843	49,373	89.1
Saving for period	217	26,668	2,545	29,213	(1) 567	24.3
II - Gila - Tucson						
Actual	767	98,176	16,518	114,694	49,468	64.5
Redispatch	550	70,400	10,746	81,146	49,178	89.4
Saving for period	217	27,776	5,772	33,548	(2) 290	24.9
III - Tucson - Lordsburg						
Actual	756	123,010	60,875	183,874	48,340	63.8
Redispatch	521	83,079	39,418	124,497	47,499	91.2
Saving for period	235	37,931	21,457	59,377	(3) 741	27.4
IV - Lordsburg-El Paso (Through trains only)						
Actual	674	100,084	563	100,647	48,255	71.6
Redispatch	521	77,335	1,728	79,063	47,399	91.0
Saving for period	153	22,749	(1) 1,165	21,584	(4) 856	19.4
V - El Paso-Strauss (Turnaround trains only)						
Actual	4	68	-	68	200	(5) 100.0
Redispatch	56	952	-	952	2,800	(5) 100.0
Saving for period	(1) 52	(1) 884	-	(1) 884	(1) 2,600	
VI - TOTAL NORTH LINE						
Actual	2,972	416,171	83,179	498,339	196,103	(6) 66.0
Redispatch	2,802	301,931	53,570	355,501	196,249	(6) 90.1
Saving for period	770	114,240	28,609	142,838	(1) 146	24.1
SOUTH LINE						
VII - Tucson - Douglas						
Actual	127	15,128	-	15,128	5,958	46.8
Redispatch	122	15,128	-	15,128	6,876	56.4
Saving for period	-	-	-	-	(7) 918	7.6
VIII - Douglas-Bisbee Jct. (Turnaround trains only)						
Actual	52	1,208	-	1,208	2,851	54.8
Redispatch	52	1,208	-	1,208	3,082	59.3
Saving for period	-	-	-	-	(8) 231	4.5
IX - Douglas - El Paso						
Actual	123	26,596	-	26,596	5,865	48.1
Redispatch	122	26,596	-	26,596	6,763	55.4
Saving for period	-	-	-	-	(9) 898	7.3
X - TOTAL SOUTH LINE						
Actual	296	42,932	-	42,932	14,674	(10) 48.5
Redispatch	296	42,932	-	42,932	16,721	(10) 56.9
Saving for period	-	-	-	-	(1) 2,047	7.4
XI - TOTAL NORTH AND SOUTH LINES						
Actual	3,268	459,103	83,179	541,271	210,777	(11) 64.7
Redispatch	2,498	344,863	53,570	398,433	212,970	(11) 85.6
Saving for period	770	114,240	28,609	142,838	2,193	21.9
XII - PER CENT CHANGE, SAVING vs. ACTUAL	23.6%	24.9%	34.4%	26.4%	-	33.8%
XIII - SAVING FOR YEAR (Saving for period increased in ratio of 17.89% to 100%)	4,304	638,569	159,918	798,424	-	-

(1) - INCREASE

(1) YUMA - GILA DISTRICT: Decrease of 618 engine water cars and 25 deadhead cabooses, and increase of 70 loads which moved via Phoenix Line in actual operation and via Gila Line in redispatched operation, produces net decrease of 567 cars.

(2) GILA - TUCSON DISTRICT: Decrease of 338 engine water cars and 34 deadhead cabooses, and increase of 70 loads which moved via Phoenix Line in actual operation and via Gila Line in redispatched operation, produces net decrease of 290 cars.

(3) TUCSON-LORDSBURG DISTRICT: Decrease of 23 deadhead cabooses, 231 east empties and 642 west empties, which moved North Line in actual operation but South Line in redispatched operation, offset by an increase of 155 west empties which reached Tucson on the redispatch but which were left at Bowie on the actual, produces a net decrease of 741 cars.

(4) LORDSBURG-EL PASO DISTRICT: Decrease of 231 east empties and 642 west empties which moved North Line in actual operation but South Line in redispatched, offset by an increase of 17 deadhead cabooses in redispatched operation, produces net decrease of 856 cars.

(5) EL PASO - STRAUSS DISTRICT: Average cars per train computed for Strauss turnarounds in westward direction only (two trains in actual, and 28 trains in redispatch) as eastward trains were without cars.

(6) TOTAL NORTH LINE: Average cars per train computed, omitting El Paso-Strauss turnaround trains and cars handled by those trains.

(7) TUCSON - DOUGLAS DISTRICT: Increase of 231 east empties, and 642 west empties which moved North Line in actual operation but South Line in redispatched, plus 20 westward empties which reached Tucson on the redispatch but which were left at Douglas on the actual, plus 25 west empties which reached Tucson on the redispatch, but which were left at Rodeo on the actual in order to comply with the law, produces total increase of 918 cars.

(8) DOUGLAS - BISBEE JCT. (Turnaround trains only): Increase of 231 empties handled Douglas to Bisbee Jct., by redispatched turnaround trains to avoid helping redispatched through westward trains Douglas to Bisbee Jct.

(9) DOUGLAS - EL PASO DISTRICT: Increase of 231 east empties and 642 west empties which moved North Line in actual operation but South Line in redispatched, plus 25 westward empties which reached Douglas (and Tucson) on the redispatch, but which were left at Rodeo on the actual in order to comply with the law, produces a total increase of 898 cars.

(10) TOTAL SOUTH LINE: Average cars per train computed omitting Douglas-Bisbee Jct., turnaround trains and cars handled by those trains.

(11) TOTAL NORTH AND SOUTH LINES: Average cars per train computed omitting Strauss and Douglas-Bisbee Jct., turnaround trains and cars handled by those trains:-

ACTUAL:	4	Strauss turns with	200 cars
	52	Douglas-Bisbee Jct. turns	2,851 cars
	56	trains omitted with	3,051 cars
REDISPATCH:	56	Strauss turns with	2,800 cars
	52	Douglas-Bisbee Jct. turns	3,082 cars
	108	trains omitted with	5,882 cars

DERIVATION OF RATIO - 17.89%

	GROSS TON MILES (Thousands)	
	YEAR 1938	PERIOD JUNE AND AUGUST
Yuma - Tucson	2,644,436	482,345
Tucson - Lordsburg	1,747,285	308,788
Lordsburg - El Paso	1,556,795	279,795
Tucson - El Paso vi Douglas	457,857	75,158
TOTAL	6,406,373	1,146,086
Per Cent total period June and August to year 1938		17.890%

Superior Court, Pima Co., Arizona
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Defts. Ex. No. 236 Witness B. S. SINES
(Sheet 1 of 2 sheets)

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY - OPERATING STATISTICS
YUMA, ARIZONA TO EL PASO, TEXAS
FOR PERIOD APRIL 4TH TO APRIL 30TH, 1940
ACTUAL OPERATION COMPARED WITH REDISPATCHED OPERATION,
OBSERVING 70 CAR RESTRICTION AND USING PRESENT POWER AND SHORT SIDINGS

	NUMBER OF TRAINS (a)	TRAIN MILES (b)	OTHER LOCOMOTIVE MILES (c)	TOTAL LOCOMOTIVE MILES (d)	NUMBER OF CARS (e)	CARS PER TRAIN (f)
NORTH LINE						
I - Yuma - Gila						
Redispatch	399	49,077	5,145	54,222	25,279	63.4
Actual	377	46,371	2,784	49,155	25,123	66.6
Increase for period	22	2,706	2,361	5,067	(1) 156	(D) 3.2
II - Gila - Tucson						
Redispatch	404	51,582	9,867	61,449	25,771	63.8
Actual	382	48,766	7,991	56,757	25,643	67.1
Increase for period	22	2,816	1,876	4,692	(2) 128	(D) 3.3
III - Tucson - Lordsburg						
Redispatch	433	70,589	31,135	101,664	26,647	61.1
Actual	413	67,378	31,384	98,702	26,376	63.9
Increase for period	20	3,211	(D) 249	2,962	(3) 71	(D) 2.8
IV - Lordsburg - El Paso						
Redispatch	378	56,134	231	56,365	26,367	69.8
Actual	378	56,134	231	56,365	26,310	69.6
Increase for period	-	-	-	-	(4) 57	.2
V - TOTAL NORTH LINE						
Redispatch	1,614	227,322	46,378	273,700	103,664	64.4
Actual	1,550	218,589	42,390	260,979	103,452	66.7
Increase for period	64	8,733	3,988	12,721	(5) 412	(D) 2.3
SOUTH LINE						
VI - Tucson-Douglas (Through trains only)						
Redispatch	71	8,803	810	9,613	3,532	49.7
Actual	71	8,803	810	9,613	3,577	50.4
Increase for period	-	-	-	-	(6)(D) 45	(D) .7
VII - Douglas-Bisbee Jct. (Turnaround trains only)						
Redispatch	48	1,050	-	1,050	3,108	64.7
Actual	48	1,050	-	1,050	3,171	66.1
Increase for period	-	-	-	-	(7)(D) 63	(D) 1.4
VIII - Douglas - El Paso						
Redispatch	59	12,426	218	12,644	2,677	45.0
Actual	57	12,426	218	12,644	2,734	48.0
Increase for period	-	-	-	-	(8)(D) 57	(D) 1.0
IX - TOTAL SOUTH LINE						
Redispatch	178	22,279	1,028	23,307	9,315	(9)66.5
Actual	176	22,279	1,028	23,307	9,482	(9)49.3
Increase for period	-	-	-	-	(D) 167	(9)(D)0.8
X - TOTAL NORTH AND SOUTH LINES						
Redispatch	1,790	249,601	47,406	297,007	113,179	(10)63.2
Actual	1,726	240,868	43,418	284,286	112,934	(10)66.4
Increase for period	64	8,733	3,988	12,721	245	(10)(D) 2.2

D - Indicates Decrease

(1) Yuma - Gila District: Increase 20 additional engine water cars east, 20 additional deadhead cabooses, 21 additional engine water cars west, and 95 west empties which moved via Phoenix Line in actual operation, and via Gila line in redispatched operation, total 156 cars.

(2) Gila - Tucson District: Increase 12 additional deadhead cabooses east, 21 additional engine water cars west, and 95 west empties which moved via Phoenix line in actual operation and via Gila line in redispatched operation, total 128 cars.

(3) Tucson - Lordsburg District: Increase, 14 additional deadhead cabooses and 57 west empties which moved via south line in actual operation and via north line in redispatched operation, total 71 cars.

(4) Lordsburg-El Paso District: Increase 57 west empties which moved via south line in actual operation and via north line in redispatched operation.

(5) Increase - sum of (1), (2), (3) and (4) in column (a) on sheet 1.

(6) Tucson-Douglas (Through trains only): Decrease account 57 west empties which moved via south line in in actual and via north line in redispatched operation, and 8 loads, 4 empties, which moved on eastward Bisbee Jct. turnaround train in actual operation and on eastward through train in redispatched operation, produces net difference of 45 cars.

(7) Douglas-Bisbee District (Turnaround trains only): Decrease account 33 west empties from Douglas and 30 west empties from Calumet which were moved on turnaround trains in actual operation, and by through trains in redispatched operation, and 8 loads, 4 empties which were moved by an eastward turnaround train in actual operation and by a through eastward train in redispatched operation, total 65 cars.

(8) Douglas-El Paso District: Account 57 west empties which moved via south line in actual operation and north line in redispatched operation.

(9) Average cars per train computed for total south line omitting 48 Douglas - Bisbee Jct. turnaround trains and cars handled by those trains. (Actual 3,171 cars; redispatched 3,106 cars.)

(10) Average cars per train computed for total north and south lines omitting 48 Douglas - Bisbee Jct. turnaround trains and cars handled by those trains. (Actual 3,171 cars, redispatched 3,106 cars.)

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Defts. Ex. No. 242 (Witness B. S. SIMES)
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SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY - OPERATING STATISTICS
YUMA, ARIZONA TO EL PASO, TEXAS
FOR PERIOD APRIL 4TH TO APRIL 30TH, 1940
ACTUAL OPERATION COMPARED WITH REDISPATCHED OPERATION,
WITH NO RESTRICTION AND USING AC POWER AND LONG SIDINGS

	NUMBER OF TRAINS (a)	TRAIN MILES (b)	OTHER LOCOMOTIVE MILES (c)	TOTAL LOCOMOTIVE MILES (d)	NUMBER OF CARS (e)	CARS PER TRAIN (f)
NORTH LINE						
I - Yuma - Gila						
Actual	397	46,371	2,784	49,155	25,123	66.6
Redispatch	396	36,408	2,776	39,184	24,804	65.8
Decrease for period	81	9,963	8	9,971	(1) 319	17.2
II - Gila - Tucson						
Actual	388	48,766	7,991	56,757	25,643	67.1
Redispatch	395	37,630	6,700	44,330	25,527	66.6
Decrease for period	87	11,136	1,291	12,427	(2) 116	19.4
III - Tucson - Lordsburg						
Actual	413	67,318	31,384	98,702	26,376	63.9
Redispatch	311	50,645	17,938	68,597	26,360	84.8
Decrease for period	102	16,673	13,452	30,125	(3) 16	20.9
IV - Lordsburg-El Paso (Through trains only)						
Actual	378	56,134	231	56,365	26,310	69.6
Redispatch	310	46,037	823	46,860	26,313	84.9
Decrease for period	68	10,097	592	9,505	(4)(1) 3	15.3
V - El Paso-Strauss (Turnaround trains only)						
Actual	-	-	-	-	-	-
Redispatch	84	420	-	420	1,057	(5) 88.1
Decrease for period	(1) 84	(1) 420	-	(1) 420	(1) 1,057	(5) 88.1
VI - TOTAL NORTH LINE						
Actual	1,550	218,589	42,390	260,979	103,452	66.7
Redispatch	1,236	171,140	28,231	199,371	104,061	(6) 85.0
Decrease for period	314	47,449	14,159	61,608	(1) 609	(6) 18.3
SOUTH LINE						
VII - Tucson-Douglas (Through trains only)						
Actual	71	8,803	810	9,613	3,577	50.4
Redispatch	71	8,803	810	9,613	3,577	50.4
Decrease for period	-	-	-	-	-	-
VIII - Douglas-Bisbee Jct. (Turnaround trains only)						
Actual	48	1,050	-	1,050	3,171	66.1
Redispatch	48	1,050	-	1,050	3,171	66.1
Decrease for period	-	-	-	-	-	-
IX - Douglas - El Paso						
Actual	57	12,428	216	12,644	2,734	48.0
Redispatch	57	12,428	216	12,644	2,734	48.0
Decrease for period	-	-	-	-	-	-
X - TOTAL SOUTH LINE						
Actual	176	22,279	1,026	23,307	9,482	(7) 49.3
Redispatch	176	22,279	1,026	23,307	9,482	(7) 49.3
Decrease for period	-	-	-	-	-	-
XI - TOTAL NORTH AND SOUTH LINES						

(Witness _____)

(Sheet 1 of 2 sheets)

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

REDISPATCH STUDY - OPERATING STATISTICS
YUMA, ARIZONA TO EL PASO, TEXAS
FOR PERIOD APRIL 4TH TO APRIL 30TH, 1940
ACTUAL OPERATION COMPARED WITH REDISPATCHED OPERATION,
WITH NO RESTRICTION AND USING AC POWER AND LONG SIDINGS

	NUMBER OF TRAINS (a)	TRAIN MILES (b)	OTHER LOCOMOTIVE MILES (c)	TOTAL LOCOMOTIVE MILES (d)	NUMBER OF CARS (e)	CARS PER TRAIN (f)
NORTH LINE						
I - Yuma - Gila						
Actual	377	46,371	2,784	49,155	25,123	66.6
Redispatch	296	36,408	2,776	39,184	24,804	83.8
Decrease for period	81	9,963	8	9,971	(I) 319	17.2
II - Gila - Tucson						
Actual	388	48,766	7,991	56,757	25,643	67.1
Redispatch	296	37,630	6,700	44,330	25,527	86.5
Decrease for period	87	11,136	1,291	12,427	(I) 116	19.4
III - Tucson - Lordsburg						
Actual	413	67,318	31,386	98,702	26,376	63.9
Redispatch	311	50,645	17,938	68,577	26,360	84.8
Decrease for period	102	16,673	13,452	30,125	(I) 16	20.9
IV - Lordsburg-El Paso (Through trains only)						
Actual	378	56,134	231	56,365	26,310	69.6
Redispatch	310	46,037	825	46,860	26,313	84.9
Decrease for period	68	10,097	592	9,505	(4)(I) 3	15.3
V - El Paso-Strauss (Turnaround trains only)						
Actual	-	-	-	-	-	-
Redispatch	34	420	-	420	1,057	(5) 88.1
Decrease for period	(I) 34	(I) 420	-	(I) 420	(I) 1,057	(5) 88.1
VI - TOTAL NORTH LINE						
Actual	1,550	218,589	42,390	260,979	105,452	66.7
Redispatch	1,236	171,140	28,231	199,371	104,061	(5) 80.0
Decrease for period	314	47,449	14,159	61,608	(I) 609	(6) 13.3
SOUTH LINE						
VII - Tucson-Douglas (Through trains only)						
Actual	71	8,803	810	9,613	3,577	50.4
Redispatch	71	8,803	810	9,613	3,577	50.4
Decrease for period	-	-	-	-	-	-
VIII - Douglas-Rincon Jct. (Turnaround trains only)						
Actual	48	1,050	-	1,050	3,171	66.1
Redispatch	48	1,050	-	1,050	3,171	66.1
Decrease for period	-	-	-	-	-	-
IX - Douglas - El Paso						
Actual	57	12,426	218	12,644	2,734	48.0
Redispatch	57	12,426	218	12,644	2,734	48.0
Decrease for period	-	-	-	-	-	-
X - TOTAL SOUTH LINE						
Actual	176	22,279	1,028	23,307	9,482	(7) 49.3
Redispatch	176	22,279	1,028	23,307	9,482	(7) 49.3
Decrease for period	-	-	-	-	-	-
XI - TOTAL NORTH AND SOUTH LINES						
Actual	1,726	240,868	43,418	284,286	114,934	(8) 65.4
Redispatch	1,412	193,419	29,259	222,678	113,543	(8) 81.6
Decrease for period	314	47,449	14,159	61,608	(I) 609	(8) 16.2

I - Indicates Increase

(Sheet 2 of 2 sheets)

(1) Yuma - Gila District: Decrease of 156 engine water cars east, and 167 west; increase of four deadhead cabooses east. Total decrease of 319 cars on the redispatched trains.

(2) Gila - Tucson District: Decrease of 112 engine water cars and 4 deadhead cabooses.

(3) Tucson-Lordsburg District: Decrease of 14 deadhead cabooses east and 2 west. Total decrease of 16 cars on the redispatched trains.

(4) Lordsburg-El Paso District: Increase of 2 deadhead cabooses east, and 1 west. Total increase of 3 cars on the redispatched trains.

(5) El Paso - Strauss: Average cars per train (redispatch) computed for Strauss turnarounds by omitting 12 trains in the eastward direction as those trains handled none of the 1,057 cars, (all of these cars moved westward).

(6) Average cars per train (redispatch) computed omitting 24 El Paso - Strauss turnaround trains and 1,057 cars handled by those trains.

(7) Average cars per train computed for total south line omitting 48 Douglas - Bisbee Jct. turnaround trains and 3,171 cars handled by those trains.

(8) Average cars per train for total north and south lines omitting Strauss, and Douglas - Bisbee Jct., turnaround trains and cars handled by those trains

ACTUAL	No Strauss turnarounds	
	48 Douglas-Bisbee Jct. turnarounds with	3,171 cars
Total	48 trains omitted	3,171 cars omitted
REDISPATCH	24 Strauss turnarounds with	1,057 cars
	48 Douglas-Bisbee Jct. turnarounds with	3,171 cars
Total	72 trains omitted	4,228 cars omitted

the total, were produced in New Mexico and Texas. The 1940 studies show that about 21.4 per cent of the additional freight-train miles which the law would have required, contrasting full compliance with unrestricted operation, would have been produced extra-territorially in New Mexico and Texas.

The figures of additional train miles, both within Arizona and extra-territorially, set forth in Finding X(c), are based upon the redispatching study; however, they find confirmation in another independent computation which appears in the record. We refer to Exhibit 181 (R. 3073), which shows the traffic handled on the Tucson Division, measured in freight-car miles, the train miles required, and the average cars per train thus obtained, for the years 1925 to 1939, inclusive. The exhibit also shows the average train lengths which prevailed on the Salt Lake Division during the same years, and the number of train miles which would have been produced on the Tucson Division, if the average train length had been equal to that obtained on the Salt Lake Division. The differences between the train miles computed as last described, and those which were actually produced, represent the excess train miles incident to the compelled short-train operation on the Tucson Division. For 1938, the "excess" train miles thus derived amounted to 564,717. When it is considered that this figure relates only to operations between Yuma and Lordsburg, not including any operations on the Douglas main line, it serves to confirm very closely the showing on Exhibit 226. That exhibit shows a total train-mile saving for the main-line districts west of Lordsburg, not including the Phoenix line, of 92,675 train

miles for the two months of June and August; which figure, duly expanded to the annual basis as heretofore explained, produces a saving of 515,757 train miles for the districts mentioned, capable of accomplishment by unrestricted long-train operation. The variation between this figure and that obtained from the redispatching study is less than 9 per cent, which is readily accounted for when we remember that the calculation on Exhibit 181 takes into account all operations on the Tucson Division, including the alternate or auxiliary main line, and the branch lines; whereas the figure taken from the redispatching study relates only to operations on the principal main freight line between Yuma and Lordsburg via Gila and Tucson.

This finding likewise rests upon testimony not controverted in the least by appellee. It is directly material to the important issues presented by subparagraphs (f) and (g) of paragraph 3 of Part III of the answer (R. 13-15); and it also leads up to the succeeding finding, relating to the additional expense imposed upon appellant in the affected territory, by reason of its enforced compliance with the law.

(2) Passenger-train operations (R. 3965-3966):

This finding is a companion to Finding X(c)(1), setting forth a summary of the showing of record as to the effects of the law in restricting the lengths of passenger trains and compelling the operation of additional trains. The total of the compelled additional passenger-train service in 1938 amounted to 14,218 train miles, 3,900 of which were

extra-territorial, and 18,860 locomotive miles, 5,042 of which were extra-territorial.

There is no question of the practicability of long passenger-train operation in Arizona. The experience of March and April, 1940, is of itself a sufficient demonstration; but if it were not, the fact that appellant regularly and continually operates long passenger trains across Nevada and Utah, under conditions which are certainly no more favorable than in Arizona, amply attests the practicability of long passenger-train operation in Arizona.

Sines, R. 1365-1367, 1804-1912, 1815-1817, 1860-1863.
Exhibits 187 (R. 3079-3080), 188 (R. 3081), 230-232 (R. 3228-3230), 246 (R. 3255).

This finding responds to the essential allegations contained in paragraph 4 of Part III of the answer, particularly subparagraph (c), (R. 18) and is supported by undisputed testimony.

(d) INCREASED ANNUAL EXPENSE OF OPERATION, ETC., IMPOSED BY THE LAW (R. 3966-3969).

The question of the added expense imposed by the law is of much importance.* It was the subject of lengthy testimony, including numerous detailed exhibits. The finding, although it presents with some completeness the items which go to make up the total of the additional expense which the law would compel, really condenses the testimony within a comparatively brief compass.

*As pointed out at various places in Volume I of this brief, the State Supreme Court has conceded, by inference at least (its opinion, R. 4062-4063), that appellant's enforced compliance with the law compels it "to expend great sums of money."

The first paragraph of the finding (R. 3966) undertakes to state its entire substance: viz., that the additional expense imposed upon appellant amounts to not less than $394,900 per year, all of which expense is and will continue to be recurring and irreparable, and could be saved and avoided if the restrictions of the law were removed. There can be no real question that the added expense, whatever its amount, is continuous and irreparable. The precise amount shown in our exhibits and stated in the findings may possibly be disputed; but that it is substantial, recurring, continuous, and irrecoverable, even though the law should be set aside, must be conceded. The very fact that this prosecution has been so vigorously sponsored by the interested railroad labor organizations shows that the amount of the wage item alone must be very substantial.

Most of the items which go to make up the total are not seriously questioned. These include in particular: (1) the wages of additional enginemen and trainmen, now incurred because of the additional freight trains compelled by the law, but which would not be incurred if such trains were not compelled to be operated, amounting to $285,653.42; (2) the additional passenger operating expenses, including wages, enginehouse expenses, locomotive supplies and locomotive repairs, incident to the additional passenger train service compelled by the law, amounting to $10,884.00 per year; (3) interest, maintenance, and depreciation charges upon the additional investment in 21 cabooses which would not be required if the law were disregarded, and are now required solely because of the

additional freight-train service compelled by the law, amounting to $8,747.00 per year.

Exhibits 225 (R. 3214), 229 (R. 3227), 231 (R. 3229).

The total of these undisputed items is $305,284 per year. They are somewhat offset, however, by the annual charges for interest, maintenance, and depreciation upon the additional facilities which appellant would construct or acquire in order to conduct long freight-train operations readily, efficiently and economically in the affected territory; that is to say, the extensions of yard tracks and sidings, the increased investment in larger locomotives, and the expanded roundhouse, water service, and shop facilities required for the proper maintenance and servicing of those locomotives. The total of these offsetting charges amounts to $87,752 per year.

Exhibit 225 (R. 3214).

In addition to the above mentioned items of savings, as to which there is apparently no dispute at all, there are two additional items of potential savings which appellee has sought to question: locomotive fuel; and locomotive repairs for locomotives in freight-train service. The saving in locomotive fuel during the months of June and August, 1938, for locomotives operating between Lordsburg and Yuma amounts to $17,352 (Exhibit 250, R. 3262), and for locomotives between Lordsburg and El Paso $2,660 (Exhibit 251, R. 3263), a total of $20,012; which when expanded to the annual basis, gives a total potential saving in locomotive fuel, on the basis of the 1938 traffic volume, amounting to $111,860. The derivation of the

figures showing the fuel saving for the year 1938, and also the corresponding saving achieved or capable of achievement by long-train operation during the period April 4th to 30th, 1940, are fully set forth on Exhibits 249, 250, and 251 (R. 3258-3263), and in the accompanying testimony (*Sines*, R. 1875-1891); and to save repetition we invite attention to the testimony. The potential fuel saving in the affected territory is based upon the showing of actual fuel savings achieved by long-train operations on other portions of the system; but the fuel saving shown for the affected territory is understated, being considerably less than actually achieved by appellant's long-train operations elsewhere.

The showing of potential savings in locomotive repairs is likewise based upon actual experience in the affected territory, and upon the system as a whole, for the types of locomotives presently in use and those contemplated for use in the long-train operation. Locomotive repairs are of two general classes: so-called "shop" repairs, as to which an accurate cost record is compiled, by individual locomotives and by types, for years and groups of years; and "running" repairs, where no such individual or type record is compiled, only the total amounts expended, by divisions and for the system, being recorded. Appellant thus has a record for each year of the cost of all locomotive repairs; and a record, by types and individual locomotives, of all shop repairs; and by experience can determine, on the basis of the relationship borne by all shop repairs to all repairs, the total cost of all repairs to a particular class or type of locomotive. Locomotive repair costs are calculated on the cents-per-mile basis, for each

mile operated by each class of locomotive. Since the locomotive miles actually run by the locomotives in freight service in the affected territory during June and August, 1938, were of course available, and the locomotive miles made by the various types used on the redispatched trains were also capable of being computed and were in fact compiled, there was no difficulty in obtaining, on the one hand, the computed aggregate cost of locomotive "shop" repairs of the locomotives actually run, or the corresponding computed aggregate cost of "shop" repairs of the locomotives handling the redispatched trains.

Sines, R. 1897-1913.

Exhibits 254 to 257 (R. 3260-3269).

The difference, amounting to $36,024 (Exhibit 317, R. 3435), represents the actual saving in shop repairs, which would have been achieved if long freight-train operation had been undertaken throughout the year 1938 in the affected territory. This figure, however, represents only 55.5 per cent of the total cost of all repairs; for the system experience over the last ten years shows that on the average running repairs are 44.5 per cent of the total locomotive repair bill (Exhibit 257, R. 3269). Expanding the figure of savings in shop repairs to a proper figure representing the savings in both shop and running repairs, the total is $65,500.00.

Adding together all of the potential savings, including the items of wages, fuel, locomotive repairs, caboose interest and maintenance, and savings in passenger train operations, and offsetting them by the added annual charges previously referred to, the net potential saving,

which is also the measure of the added annual expense imposed by the law, and which could be avoided if it were not for the law, amounts to not less than $394,900.

Extra-Territorial Portion of the Added Expense Imposed by the Law (R. 3968).

Just as a substantial proportion of the added train service compelled by the law is performed outside of Arizona, so a substantial proportion of the added cost incident to that train service is incurred extra-territorially. The concluding portion of Finding X(d) sets forth that that total extra-territorial expense, based upon the 1938 redispatching study, amounts to $94,600. The computation by which this figure is derived is comparatively simple. It consists merely of obtaining, in the case of freight service, the average cost per train mile for the particular items as to which a saving is established by the testimony, and applying that average saving to the extra-territorial train miles compelled by the law. A similar method is followed in computing the additional expense involved in extra-territorial passenger train operations.

Sines, R. 1894-1897.

Exhibits 232 (R. 3230), 253 (R. 3265), 299 (R. 3429).

Separate computations appear in the record, based upon the 1940 redispatching studies, showing the additional expense imposed by the law, both in the aggregate, and as related to extra-territorial operations. (Exhibits 256, R. 3268, 258, R. 3270, and 259, R. 3271). Without going into the detail of these exhibits, it may be said that, as stated in the concluding paragraph of the finding, they

confirm very closely the showing of additional expense based on the 1938 study.

XI.

SLACK AND SLACK-ACTION IN TRAINS: NATURE, CAUSE AND EFFECTS (R. 3969-3974).

Appellee's counsel, in the course of the examination of certain of its witnesses, laid considerable stress upon slack and slack-action in moving trains, as an alleged source of potential hazard and injury; taking the position that the length of a train, and that factor alone, determines the amount and severity of the slack-action, and that the challenged law has, as its purpose and result, the elimination of that supposed source of hazard by means of the fixed limits imposed upon train lengths. On the other hand, appellant sharply challenges this position and contention of appellee, and presented testimony, summarized in Finding XII, which shows the nature and extent of that alleged hazard, as reflected in the casualty and accident statistics.

The trial court concluded that it was essential that the findings should present a complete and accurate description of slack, and the slack-action associated therewith, as to their nature, extent and controlling factors; and accordingly it adopted Finding XI, wherein is summarized the testimony of witnesses for both parties on this phase. We see no need to argue this finding at length; the facts, as presented by the finding, are themselves the best argument. We shall, however, emphasize certain of the more

significant points developed by the record, and summarized in the finding.

(a) DESCRIPTION OF DRAFT RIGGING (R. 3969-3970).

This portion of the finding is based upon undisputed testimony, and is included primarily for the purpose of permitting a proper understanding of the following subdivisions. None of the facts set forth in this paragraph is questioned.

Exhibit 210 (R. 3194).

(b) ACTION OF DRAFT GEARS (R. 3970-3971).

This portion of the finding enumerates and describes the two types of gears, the tandem-spring type, and the friction type, now in use on freight cars, and explains briefly the means whereby these draft gears absorb and reduce the pushing and pulling shocks imparted to cars in the course of operation. This portion is likewise based upon undisputed testimony: primarily of Witness Bohnstengel, whose qualifications upon the subject matter are outstanding.

Bohnstengel, R. 1679-1698, 1705-1706.
Exhibit 210 (R. 3194).

The portion of the finding which states the amount of force which a friction draft gear can absorb, before the complete amount of the movement of which it is capable is produced (i.e., "complete closure"), is particularly significant because of the apparent contention of at least one of appellee's witnesses (*Purnil*, R. 2372) that there is a foot (12 inches) or more of slack in every car of a freight

train, when the train is running. The fact is that the total movement (or so-called "free slack", plus "controlled resistance") is much less than 12 inches in normal operation (apparently about 7½ inches); but whatever the amount it is not fully extended in a moving train by the pulling force of the locomotive.

(c) SLACK AND SLACK-ACTION DEFINED (R. 3971).

This paragraph of the finding consists simply of definitions, as to which there has been no dispute. It was included, apparently, for the purpose of avoiding the confusion, revealed at times in the testimony of appellee's witnesses, between "slack" (i.e., relative motion of the cars, on the one hand) and "slack-action", which, as the finding states, is the accumulated effect of that motion, as created or brought into play in train operation.

(d) FACTORS AFFECTING SLACK-ACTION: AMOUNT DEVELOPED IN OPERATION (R. 3971-3973).

This paragraph of the finding reproduces in summary form, statements made by appellant's witnesses, and confirmed by several of appellee's witnesses, principally in admissions made in their answers to cross-examination. It demonstrates that appellee's counsel err completely, when they suggest or contend that the extent and severity of slack-action, as experienced in train operation, depend entirely or even principally upon the number of cars in the train.

The fact is that a wide variety of circumstances affect or may affect slack-action; and the combination of these circumstances determines whether, when the opportunity for slack-action occurs, the action will be severe, or mild,

or possibly not developed at all. The principal factors which thus affect and determine slack-action are: the speed of the train at the time; consist of the train (whether loads or empties, and if partly loads or empties, the proportion of each); weights of the loads in the train; distribution and relative position of loaded and empty cars; grade upon which the train is running; whether the train is starting, accelerating, or slowing down; and the action taken by the engineer, in the use of the air brakes and the locomotive power.

The train length is of minor importance, compared to any of these other factors; if other conditions exist favorable to the development of severe slack-action, the result may be much more serious at the rear of a train substantially shorter than the law permits, than would be produced, under other conditions adverse to the development of shock, at the rear of a much longer train. The law, since it is only a "make-work" measure masquerading as a safety statute, cannot and does not attempt to take any of these other factors into account; and therein resides one of its most arbitrary and indefensible characteristics.

The contention or suggestion of opposing witnesses, that emergency stops of long freight trains almost always cause severe slack action at the rear end of the trains, with resulting injuries, or possibility thereof, to persons riding in the caboose, is likewise shown to be untenable by the testimony summarized in this part of the finding. The fact is that emergency stops of long freight trains, both desired and undesired, can and do occur without severe shock; on the other hand, as shown by the testimony sum-

marized in Finding XII and our discussion of that finding, emergency stops of short trains, when they occur, sometimes cause severe shocks with results which, from the casualty standpoint, are at least as unfavorable as those experienced in long-train accidents.

Bohnstengel, R. 1692-1697, 1701-1702; *Durnil*, R. 2390-2392; *Kennedy*, R. 2415-2416, 2429-2430, 2433-2437; *Cooper*, R. 2443-2446; *Stevenson*, R. 2489-2491, 2493, 2496, 2498-2501; *Ash*, R. 2576-2577, 2579-2580, 2596-2603; *Fail*, R. 2611-2613; *Shaw*, R. 2649-2650, 2652-2653; *Fifield*, R. 2786-2799, 2800-2804, 2805-2806; *Menzies*, R. 2815-2823.

Exhibits 210 (R. 3195), 266 (R. 3304), 270 (R. 3310-3335), 274 (R. 3351-3363), 275 (R. 3364-3370), 280 (R. 3375), 295 (R. 3424), 386 (R. 3533-3547), 387 (R. 3548-3557).

The contention that the challenged law results in eliminating or even reducing slack-action casualties is wholly unfounded. The ultimate test of that contention is found in the results of the regulation of train lengths in Arizona, as contrasted with the results of operation without that limitation in Nevada and other states. That analysis will be found in those parts of our proposed Finding XII comparing the Nevada, Arizona, and other slack-action casualties over a period of years. The experience with the Arizona law demonstrates that the mere limitation of length is quite ineffective for the purpose asserted by appellee. That ineffectiveness is plainly due largely to the fact that the law operates arbitrarily upon train length alone, without regard to the other factors enumerated in

subfinding (d), all of which may and do contribute to and determine the extent and severity of slack-action.

(e) SLACK-ACTION IN PASSENGER-TRAIN OPERATION (R. 3974)

The finding concludes with a brief paragraph relating to slack-action in passenger-train operation.

The evidence wholly fails to indicate that there is any hazard whatever, from a practical standpoint, because of slack and slack-action in passenger-train operation, no matter what the length of the train. It is particularly noteworthy that the showing upon this subject is almost entirely negative in character. Appellee was unable to point to any slack or slack-action casualties in passenger-train operation and in fact indicated, by the testimony of its only witness who discussed the subject, that such casualties rarely if ever occurred; and appellant's witnesses confirmed this showing. In the exhibits which describe and list the passenger-train casualties occurring in Nevada, Arizona and New Mexico, there are no casualties described as having occurred by reason of slack-action in a passenger train of more than 14 cars, occurring in circumstances where the operation of that train would not have taken place if the Train-Limit Law had been observed. There is no showing of any Nevada or New Mexico casualty occurring on a long train where slack-action was involved. There is a showing (Exhibit 294, R. 3423) of a claimed "sudden-jerk" injury to a woman passenger on a consolidated train in Arizona, consisting of 26 cars; but the train, though exceeding the 14-car limit, was within the provisions of the Arizona law, be-

cause of the exception permitting trains to be consolidated in the event of engine failure between terminals.

Exhibits 271 (R. 3336-3348), 292 (R. 3412-3421), 294 (R. 3423), 362 (R. 3501-3506).

The fact is that in passenger-train operation, and whether the train be considerably less than 14 cars or considerably over that figure, the action of the brakes, when an emergency application takes place, although not simultaneous through the train is very rapid; and there is practically no opportunity for slack-action to develop. A sudden stop of a passenger train is therefore, to all intents and purposes, much like the sudden stop of an automobile or a street car; while the stop may be severe, the surge and shock is the same in the head cars of the train as in the rear cars. The shock in the rear cars is due, as in the forward cars, to the sudden application of the braking power throughout the train, rather than to any sudden stopping of the rear cars because of running into the forward cars already halted by the brake application.

Cheek, R. 2467-2471, 3477-2480, 2483-2486; *Hardwicke*, R. 2731; *Fifield*, R. 2799-2800, 2806.

The total lack of significance of the 14-car limitation, insofar as slack-action is created or the engineer's ability to control the train affected thereby, is pointedly illustrated by the testimony of appellee's witness Cheek. Although Engineer Cheek handled two long passenger trains between Tucson and Yuma during the month of April, 1940 (Exhibits 393 and 394, R. 3569-3570), he was

apparently unaware of that fact until it was demonstrated to him by inspection of the permanent records. Compare also the testimony of witness Fifield, appellant's Road Foreman of Engines, to the effect that an engineer handling a passenger train is frequently uninformed whether his train exceeds 14 cars or not, and neither seeks nor requires that information, insofar as good train handling is concerned (R. 2806).

General recognition of this fact, by appellee's counsel and witnesses, was apparently responsible for their failure to contend seriously that slack and slack-action constitute a factor of importance, or indeed of any significance at all, from the standpoint of hazard to persons and property, growing out of or connected with passenger train operation.

XII.

SAFETY OF OPERATION AS AFFECTED BY TRAIN LENGTHS: ACCIDENT AND CASUALTY STATISTICS (R. 3974-4022).

While the safety findings are lengthy, they are not argumentative except by the inexorable logic of established facts.

To avoid needless repetition in this discussion we again suggest that the finding be examined before reading the comment thereon in the subsections under this chapter heading. What we shall have to say as to Finding XII is largely a series of footnotes to its respective subdivisions.

Statistical trends and comparisons.

When an attempt is made to express in statistical form the frequency of accidents or casualties on modern railroads or even on one large railroad system, the units of service or performance to which the comparatively small number of such occurrences must be related are almost astronomical in their immensity.

Thus, the standard bases of measurement used by the Interstate Commerce Commission and carried in the statistical tables with which this chapter will largely deal are translated into terms of everyday experience and observation:

A *million freight-train miles* would provide 2551 trips across Arizona (392 miles) on appellant's main line, or 2257 trips across Nevada on appellant's line from Calvada to the Utah line (443 miles). A trainman on a regular freight run seldom makes more than 3500 miles in a month.

A *hundred million freight-car miles* equals 3644 seventy-car freight trains traveling across Arizona, or 3225 across Nevada.

A *million man hours* equals 125,000 eight-hour work days.

A *million passenger miles* equals 155 eight-day round trips, San Francisco via Chicago to New York and return (6446 miles).

It is only by comparison of such frequencies over periods of time sufficient properly to discount fluctuations and to present trends and averages, rather than casual hap-

penings widely differing in resulting damage or injury, that proper conclusions can be reached as to the relative merits of different methods of operation.

That is particularly true of a selected class of accidents or casualties, such as those charged to slack action, which arise from a combination and concurrence of a number of factors, lack regularity of occurrence and are so infrequent that—particularly referring to Arizona, Nevada, and New Mexico—one or two, even of minor consequence, will distort frequency rates, overweight averages, and impair comparisons, unless the period considered is of sufficient length to be fully representative.

In statistical presentations, trends are particularly significant when they appear in a fully representative period and consistently rise or decline, even though there may be fluctuations in individual years during the period.

When as here methods of operation have radically changed over a series of years, a comparison of a representative period during which the old method prevailed with the latest similarly representative period of the changed operation is of great value. For it should be remembered that the reasonableness of the challenged law is to be measured by present-day conditions and not by those obtaining in 1912, more than thirty years ago.

Use of the year 1923 as the starting point in practically all of the statistical tables hereinafter referred to is justified because it was in 1923 that railroads in general, including appellant, adopted the standard long-train method of operation and initiated the improvements neces-

sary to carry that method into effect. (*Parmelee*, R. 189-190).

In *St. Louis and O'Fallon Ry. Co. v. United States* (1929), 279 U.S. 461, 73 L.ed. 798, Mr. Justice Brandeis graphically described (p. 523) the changes that were made to produce what he termed the "efficient post-war railroad plant"; those changes, as shown by the evidence in the case at bar, were determined upon in 1923, and at once begun and continued.

As practically all of the statistical tables of accidents and casualties introduced by appellant were based on the Accident Bulletins of the Interstate Commerce Commission, or reports to that commission from its Bureau of Safety in special cases, or on Form T reports made to the commission under the Accident Reports Act, it is in point here to quote the language of this Court in: *Retirement Board v. Alton Railroad Co. et al.*, supra (295 U.S. 330, at p. 364):

> "*Incontrovertible statistics* obtained from the records of the Interstate Commerce Commission *show a steady increase in safety of operation* during this period of alleged increasing superannuation."

The tables appended as a note to that statement were taken from the Accident Bulletins of the Interstate Commerce Commission, cover the period 1923-1932, and were the same as those for the years 1923-1932 contained in the exhibits offered through Mr. Sullivan, who carried the same statistical comparisons down to the latest available dates.

Again, the Court said (p. 366):

> "The trial court found, and its finding is not assigned as error: 'Railroads were, when the Act was enacted, and are now, operated efficiently and safely and more *efficiently* and *much more safely* than at any time in history.'" (Emphasis ours).

We have previously referred to the note on that page, in which the Court called attention to the progressive increase in speed of freight trains and in the average gross ton miles and net ton miles per freight train, using many of the same figures, from the same sources, as used by Dr. Parmelee in the instant case.

The trends in operating averages commented on by the Court in that opinion which was written in 1935, have continued to the last available statistical date, as we showed in detail on a series of exhibits we now briefly review.

The foundation and background for the national statistics relating to train and train-service accidents are summarized in our discussion of preceding findings and in the findings themselves. First there were the exhibits and testimony from Dr. Parmelee and Mr. Otterback, who dealt with the railroads as a national transportation plant composed of a large number of railroad systems, physically connected, freely exchanging cars and their contents under uniform interchange rules and joint schedules, whose operating rules are in general standardized, and who through mutual understanding have collectively improved the national transportation plant since 1923 by an expenditure of more than seven billion dollars.

Testimony and exhibits were produced by appellant from officers of seventeen railroads, including appellant, which in 1939 performed about sixty per cent of the freight-train car miles and revenue-passenger miles of Class I American railroads.

At this point we summarize the exhibits covering the Class I railroads as a group, as well as the individual railroads.

FREIGHT TRAIN STATISTICS
PERCENTAGE INCREASES 1939 OVER 1922

Exhibit Number	Name of Railroad	Cars per Train	Net Tons per Train	Tractive Power per Locomotive	Speed M.P.H.	Gross Ton Miles per Freight Train Hour
22	Class I Rys. of U. S.	27.9	20.3	34.6	50.5	102.7
12	New York Central	12.7	16.0	24.4	52.3	83.0
25	Missouri Pacific	32.4	15.4	41.4	53.9	113.9
29	Illinois Central	8.0	—	36.6	44.2	59.1
47	Great Northern	36.6	30.2	45.2	44.7	115.0
49	Northern Pacific	26.3	22.8	36.2	25.6	72.3
52	Rock Island	23.1	9.9	43.3	55.5	103.5
56	Erie	35.3	17.3	33.6	63.5	128.4
60	St. Louis S. W.	22.2	1.5	29.5	84.1	128.9
64	Chicago & N. W.	42.2	41.2	24.4	36.4	111.2
68	Pennsylvania	55.6	39.1	34.9	50.0	133.1
79	Union Pacific	32.5	15.3	39.1	60.0	122.0
87	Boston and Maine	63.3	65.1	34.9	35.3	144.9
95	Chgo., Mil., St. P. & Pac.	21.2	17.6	27.1	45.1	92.9
103	Chgo., Burl. & Quincy	11.6	—	39.9	47.9	74.3
121	Chesapeake & Ohio	53.2	59.3	38.2	68.2	170.1
131	A. T. and S. Fe	10.6*	3.1*	29.9	51.9*	83.3*
162	So. Pac. Co. Pac. Lines	25.8*	13.3*	40.2	53.2*	105.6*

*The Santa Fe and Southern Pacific System average percentages of improvement were of course subject to the depressing influence of the Arizona Train-Limit Law.

The operations of those railroads were described in considerable detail. The development of their motive power

and equipment, including the refrigerator and Pullman cars that have a widespread and interchangeable use, was also testified to. In general that development followed along the same lines as the motive power, equipment, and refrigerator cars of the appellant shown pictorially and by description on Exhibits 2 (R. 2852), 3 (R. 2853), 4 (R. 2854), 5 (R. 2855), 6 (R. 2856), 107 (R. 2960), and 135 (R. 3002).

Copies of the exhibits just mentioned by number are, for convenient reference, bound inside the last cover page of this brief.

From annual reports of the carriers to the Interstate Commerce Commission exhibits were introduced, showing the character and volume of commodities handled in freight service (Exhibits—S. P. Co., Arizona, 167, R. 3041, 217, R. 3204; S. P. Co., Nevada, 169, R. 3043, 219, R. 3208-3209; S. P. Co., New Mexico, 168, R. 3042, 218, R. 3246; Illinois Central, 105, 106, R. 2958-2959; Erie, 57, R. 2908; Chicago and Northwestern, 65, R. 2916; Pennsylvania, 69, R. 2920; Northern Pacific, 70, R. 2921; Rock Island, 71, R. 2922; Great Northern, 72, R. 2923; Union Pacific, 80, R. 2932; Boston & Maine, 88, R. 2941; Chicago, Milwaukee, St. Paul & Pacific, 96, R. 2949; Chicago, Burlington & Quincy, 104, R. 2957; Santa Fe, 132, 133, 134, R. 2994-3001).

These exhibits further support the comparability of the operating statistics.

Witness Browning went fully into the development of the interchange rules (Exhibits 203, R. 1559-1562, 204, R. 3153-3189), and Chief Engineer Parke of the Pullman

Company into that of Pullman equipment (Exhibits 107, 108, 109, R. 2960-2963).

As far as practicable, and without protracting the trial to inordinate length, the increase in operating efficiency and freight-train lengths and speeds was shown by the series of exhibits which we have summarized in tabular form above.

Feeling that the mere statistical average of average freight-train lengths obtained by dividing car miles by train miles was not completely representative of long-train operation as a standard national practice, appellant submitted a series of exhibits showing typical freight and passenger-train operations on the sixteen railroad systems referred to, which is summarized in Finding VIII(b).

It is obvious that an individual safety showing could not have been made for each of those sixteen railroads, such as made for appellant, without taking an enormous amount of time in preparation and trial. It is equally obvious that such a showing would merely have confirmed the national showing of trends of train and train-service accidents which we made in great detail.

However, a casualty showing was made as to the Santa Fe which is summarized in Finding XII(k), R. 4004-4006; and the Chesapeake and Ohio, an outstanding example of long freight-train operation, summarized in Finding XII(l), R. 4006-4007.

The foundational findings for the national comparisons are grouped under the following subdivisions of Finding VIII, and are, by subdivisions:

(a) Improvements in Road and Equipment (R. 3934).

(b) Increased Train Lengths (R. 3937).

(c) Improved Schedules and Performance (R. 3939).

(d) Increased Efficiency and Economy (R. 3940).

(e) Results of the Long-Train Program From the Standpoint of the Public, the Employes, and the Railroad Owners (R. 3943).

(1) Reduction in Average Transportation Charges Paid by the Public (R. 3943).

(2) Increases in Average Wages Paid to Employes (R. 3943).

(3) Effect on Returns to Owners of the Railroads (R. 3944).

(f) Similarity of Operating Conditions and Operating Rules on Other Railroads to Those Prevailing Upon Defendant's Lines in the Affected Territory (R. 3945).

No useful purpose can be served by a mere collection of casualties or accidents occurring on or to trains within or without the law's limitations. Such a list affords no criterion of hazard unless it is related to some proper basis of frequency measurement.

We can and did match every reported "long-train" casualty or train accident referred to by appellee with one or more "short-train" casualties or train accidents of the same character. But that alone would not materially assist the Court in concluding which is the safer method of operation.

Relation of the frequency of such occurrences to some unit of performance is necessary to informed judgment.

On this branch of the case the law under attack must be sustainable, if at all, under the state's police power. Neither by title nor by recital does it declare any reason for its enactment, or describe any situation to be remedied or prevented.

Appellee's counsel have contended, and will doubtless again contend, that it is a "safety regulation". No opinion evidence on that point is before the Court; the proof pro and con is wholly statistical as to occurrences, and descriptive as to conditions. The claim of "safety" has been largely if not entirely confined to the so-called slack-action accidents, but the evidence shows that since 1912 great improvements in road-bed, signals, motive power, and equipment, and the consequent increase in train lengths, have so reduced accidents from that cause that they have decreased to a point that is difficult to express statistically; and further, that as a practical matter the frequency of such accidents is generally the same on both classes of trains, on a train-mile basis, and substantially less on a car-mile basis, in moving the traffic by the long train method of operation. If "safety" means, as it should mean, safety from all causes and to all persons subject to the hazard of train operation, then the evidence shows—not "beyond a reasonable doubt", but beyond *any doubt*—that the long-train method of operation is by far the safest.

We again emphasize that the railroad plant of today, in Arizona, on the appellant's Pacific Lines, and in the

nation as a whole, is entirely different from that of 1912. Safety of operation is to be measured by the standards of the present. The railroad management has the duty to receive, transport, and deliver freight and passengers, when and as presented for transportation. We believe that it is not even "debatable" that that duty can be performed with the greatest safety to all persons and property so transported, by using as few train miles as the character and volume of traffic, and the physical characteristics of road, motive power and equipment wil permit.

Having made that showing, the appellant has proven its case under the due-process clause of the Fourteenth Amendment, and has fully measured up to the degree of proof required by even the most extreme opinions that have considered attacks on state police power statutes.

(a) ACCIDENT REPORTS TO INTERSTATE COMMERCE COMMISSION (R. 3974-3975).

This finding is necessary as a proper foundation for the finding that follows and is based on the exhibits shown in the annotation, which are excerpts from the Interstate Commerce Commission's rules governing reports of train and train-service accidents. Its correctness has never been challenged by appellee.

(b) BASES FOR COMPUTING ACCIDENT AND CASUALTY RATES (R. 3976).

This finding is the basis for the constant references in the successive findings to the various methods of measuring frequency of train and train-service accidents. Its correctness likewise has never been disputed by appellee.

Most of the exhibits pertaining to freight-train operation covered by the series of findings under Finding XII are on both the train-mile and car-mile basis. Some of them include as well one or both of the bases of man hours and locomotive miles, explanation for the bases used having been given in most cases when the exhibit was identified.

As to the *car-mile basis* Mr. Sullivan said (R. 1939) that it "is a recognized measurement of the occurrence of casualties to the movement of a given amount of traffic."

That basis was not always available, but when statistics afford its use it is peculiarly applicable to the instant issue. The railroad is a common carrier and holds itself out as ready, able and willing to carry property for hire. It must do so when and as that property is tendered to it for transportation. It is liable under bill-of-lading provisions for delay or damage to freight due to its negligence.

Freight traffic is measured in units of cars because practically all freight moves in carload lots; only a very small percentage of the total volume moves in less-than-carload lots, and even those are handled in cars.

The fairest and most accurate method of measuring casualty frequency as to different types of freight operation is to use the car-mile basis, because the purpose and obligation of the carrier is to move and deliver cars and not trains, and the duty and concern of the management is to handle the cars under the operating practices that will expose employes and the public to the least hazard

of casualty; a secondary but important consideration in the protection of equipment and lading.

In some of the exhibits casualties are related to *man hours* because neither train miles nor car miles were statistically available; e.g., in terminal yards, where neither of those classes of miles is accumulated (*Sullivan*, R. 1939-1940).

Locomotive miles also appear in some of the exhibits which include terminal operations, where train miles are not produced and therefore not statistically reported. But locomotive miles are also accumulated in train operation. A train with a single locomotive running 100 miles would be statistically reported to the Interstate Commerce Commission as producing 100 train miles and 100 locomotive miles; whereas if two locomotives were used for the trip 200 locomotive miles but only 100 train miles would be reported. The same applies to helper service.

But let us take the illustration of three trains instead of two being used to handle 210 cars on the road—the wasteful practice compelled by the Arizona law. Assuming the run to take eight hours with one engineer, one fireman, one conductor and three brakemen on each train, as would be required in Arizona, the movement of the 210 cars by short trains would produce 144 man hours of exposure to occupational hazard, while the long trains performing the same amount of transportation service would furnish a similar exposure of but 96 hours; this does not take into account the multiplication of hazard by the increased number of trains.

The same trains in single engine operation would produce 300 short-train locomotive miles and but 200 long-

train locomotive miles. In the latter case there would be one-third less hazard from the causes of train and train-service accidents inherent in the operation of a train drawn by but one locomotive, again disregarding the unnecessary trains that used the same trackage and yards.

The *train-mile* basis is not to be disregarded. Cars are moved in trains and the number of trains used to move a given number of cars has an important bearing on the safety of operation. It is a controlling factor in the hazard of transportation, to individuals as well as to motive power, cars and contents.

The train-mile basis is less satisfactory than the car-mile basis when comparisons are undertaken between long-train operation in one territory and restricted operation under a compulsory maximum limit in another; especially if the purpose of the comparison is, as in the present case, to develop whether the hazards incident to the discharge of the railroad's obligation to move the traffic are increased or reduced by the compulsory limitation. For such a purpose the car-mile basis is obviously more accurate, because the amount of traffic to be moved (which is the measure of the carrier's performance of its obligation) is measured in car miles, not train miles. Again, the artificial limitation compels the production of a far larger number of train miles than otherwise would be necessary for the movement of the traffic; and thus, while increasing the exposure and (as is shown by experience) the actual number of accidents and casualties incurred in proportion to the traffic moved, also arti-

ficially increases the base against which their frequency is measured, if the train-mile basis alone be used. As a concrete example, accidents and resulting casualties are, and have been in general, substantially more numerous in Arizona than in Nevada, although the traffic volume in the two states has been approximately equal (from 3 to 5 per cent greater in Nevada); but because of the artificial increase in the number of trains run, and the number of train miles made, in Arizona (solely because of the law's limitations) comparisons between the two states on the train-mile basis show somewhat less differences in the frequency rates than corresponding comparisons on the car-mile basis.

Of course, no such infirmity obtains in comparisons on the train-mile basis, when made between different years or groups of years, in the same states or on the same system, and where the differentiating factor of an artificial limit is absent. And in the national statistics where the enforced limitation on the Santa Fe and Southern Pacific in Arizona affects a relatively small percentage of the national totals, the train-mile basis affords instructive comparisons between different years and groups of years.

Thus if, as is compelled in Arizona, three freight trains must be run to handle the same number of cars that might be, and on other parts of the system are, handled in but two trains, eighteen employes instead of twelve are exposed to whatever hazards are inherent in the operation of a single train. And those hazards are further increased by the multiplication of hazards from collisions, grade-

crossing accidents, meeting and passing other trains, etc. This demonstrable increase in hazard accounts for the substantially more favorable casualty showing of long-train operation, even on the *train-mile basis*. There are inescapable and unpredictable *hazards* inherent but of irregular occurrence in the movement of any train; the movement of any means of conveyance, whether it be a horse, a bicycle, a motor vehicle, a street-car or a steam or electric train, has known dangers. Common observation tells us this, and actuarial tables based on experience and used in fixing premium rates for casualty insurance are merely calculations of hazard based on experience statistics such as we have produced.

The tables we analyze show beyond any doubt that the so-called slack-action casualty is so infrequent and subject to so many factors of production that limiting trains to the Arizona maxima has no perceptible limiting effect on that class of accidents. In fact, as we show statistically as well as by reason, the limit of 70 cars to a freight train tends to increase that class of accident. There is no hazard from slack action that can be statistically shown as to passenger trains of any length.

Whatever method of measurement be used, the "incontrovertible" statistics leave no room for debate as to the extreme arbitrariness and unreasonableness of a regulation that compels appellant to use additional and unnecessary man hours, locomotive miles and train miles to handle a volume of traffic that can be far more safely handled by the method it and other railroads use elsewhere.

(c) NATIONAL ACCIDENT AND CASUALTY STATISTICS (R. 3976-3980).

This sub-finding first states the source of the statistics above referred to, and is further divided into six classifications to which we shall now briefly refer.

The first paragraph of this sub-finding refers to the national accident and casualty exhibits in general terms, calling attention to Finding VIII(b) for a description of the increases of the lengths of freight trains on Class I railroads of the United States during the 17-year period, 1923-1939. The subdivision of that finding which deals with increased train lengths is on pages 3937-3938 of the record and is fully annotated to the testimony. It states the growth and prevalence of standard long freight-train operation in the United States. The significance of the national statistical tables covering train and train-service accidents cannot be appreciated, without considering that the improvement in accident and casualty rates therein shown is accompanied by and closely corresponds to the increases of average length of freight trains shown by the various tables referred to in the annotations to Finding VIII(b). It should also be borne in mind that the national figures on freight-train lengths are arrived at by dividing freight-car miles by freight-train miles, and that the averages are depressed because the only available statistics include all freight trains, through and local, main line and branch line. It is a fair conclusion from the testimony of the witnesses who represented 125,885 miles of the 232,026 road miles operated by Class I American Railroads in 1939, and produced 58 per cent of the freight-train car miles operated and 60.06 per cent of the revenue-

passenger miles (Exhibit 248, R. 3257), that the percentage decreases in the various classes of train and train-service accidents throughout the period covered by the study have accompanied a very much greater percentage increase, in the lengths of the freight trains that carry through traffic, than the national average of all freight trains would indicate.

It has been argued by appellee that the substantial national improvement in accident and casualty frequencies is due primarily to the improvements in road and equipment. To whatever extent that be true, it is an additional reason for striking 32-year-old fetters from the hands of interstate commerce. Unquestionably those improvements have had a large share in the lessening of railroad operating hazards, but they were made for the very purpose of permitting the *safe, economical* and *efficient* operation of long trains; and it is evident from the record that the improvements were in and of themselves merely one of the factors, and not the sole major factor, in producing the decrease of accident and casualty rates. If this were not true, appellant's operations in Arizona, which shared with Nevada the appellant's program of improvement in road and equipment, would have shown relatively the same rate of decrease in train and train-service accidents during and following that program of improvement; but this has not occurred, as we shall hereafter show. Also, the Santa Fe, whose improvement program covered the entire line from Needles to Belen—part long-train and part short-train operation—would have shown the same or relatively the same ratio of improvement in both the long and short-train portion of that line; but this has not fol-

lowed, as pointed out in Finding XII(k) (R. 4004-4006), which we shall later discuss.

Negligence of employes is the major factor in the production of train and train-service accidents. See Exhibits 270 (R. 3310-3335), 271 (R. 3336-3348), and 312 (R. 2266-2267), discussed and summarized in Finding XII(e) "Commission's Investigation of Train Accidents—National" (R. 3982-3983). Improvements in roadbed and equipment can have had but a negligible part in lessening such negligence, while the use of a lesser number of train units to handle a given volume of freight or passenger traffic will obviously have a great effect in lessening accidents due to negligence, because less opportunities are thereby provided for human failure. Casualties to individuals caused by their momentary forgetfulness or inattention, or that of fellow-employes, of which there are a number of classes and a large volume, are increased by an increased number of men employed. The fewer train units that are run to handle a given volume of traffic, the less opportunity there is for such casualties; and the increase in the length of trains, both freight and passenger, has undoubtedly had that effect. These observations do not apply to train and enginemen exclusively. For example, the train dispatcher, skillful as he is, is only human, and the more meets and passes he has to carry in his mind or on his sheet, the more opportunity there is for serious oversight.

(1) All Employes (R. 3977):

This finding is based on Exhibit 262 (R. 3300), as explained by Mr. Sullivan in his testimony (R. 1937-1939,

Superior Court, Pima Co., Arizona
State v. S.P. Co. No. 20087

Defts. Ex. No. 262 (Witness J.J SULLIVAN)

CASUALTIES TO ALL CLASSES OF EMPLOYES ON DUTY
SUSTAINED IN TRAIN AND TRAIN-SERVICE ACCIDENTS
CLASS I RAILROADS OF THE UNITED STATES
REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION

YEARS 1923 TO 1939, INCLUSIVE

	Year	Total Car Miles (Thousands)	Total Train Miles (Thousands)	Total Locomotive Miles (Thousands)	Man-Hours Worked by All Employes (Thousands)	Casualties to All Classes of Employes on Duty in Train and Train-Service Accidents			Casualty Rate Per			
						Killed	Injured	Total	100 Million Car Miles	Million Train Miles	Million Locomotive Miles	Million Man-Hours
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
(1)	1923	29 432 500	1 245 099	1 756 170	4 856 983	1 507	38 520	40 027	136.00	32.15	22.79	8.24
(2)	1924	28 889 085	1 204 302	1 672 584	4 472 049	1 131	31 302	32 433	112.27	26.93	19.39	7.25
(3)	1925	30 785 543	1 220 846	1 697 798	4 458 702	1 180	31 275	32 455	105.42	26.58	19.12	7.28
(4)	1926	32 666 043	1 248 897	1 778 071	4 567 481	1 249	32 907	34 156	104.56	27.35	19.21	7.48
(5)	1927	32 462 178	1 220 987	1 728 040	4 416 147	1 121	27 085	28 206	86.89	23.10	16.32	6.39
(6)	1928	32 994 940	1 202 678	1 698 744	4 200 547	916	22 854	23 770	72.04	19.76	13.99	5.66
(7)	TOTAL 1923-28	187 230 289	7 342 809	10 331 407	26 971 909	7 104	183 943	191 047	AVERAGE 102.04	AVERAGE 26.02	AVERAGE 18.49	AVERAGE 7.08
(8)	1929	33 828 943	1 214 360	1 731 883	4 234 806	1 037	21 228	22 265	65.82	18.33	12.86	5.26
(9)	1930	30 177 596	1 106 386	1 550 246	3 648 890	690	13 033	13 723	45.47	12.40	8.85	3.76
(10)	1931	25 608 792	965 181	1 327 467	2 937 370	472	9 077	9 549	37.29	9.89	7.19	3.25
(11)	1932	20 350 867	821 158	1 104 953	2 291 540	414	6 943	7 357	36.15	8.96	6.66	3.21
(12)	1933	20 597 254	786 720	1 080 016	2 117 011	371	5 970	6 341	30.79	8.06	5.87	3.00
(13)	1934	22 179 787	818 473	1 124 043	2 267 515	372	6 252	6 624	29.87	8.09	5.89	2.92
(14)	TOTAL 1929-34	152 743 239	5 712 278	7 918 608	17 497 132	3 356	62 503	65 859	AVERAGE 43.12	AVERAGE 11.53	AVERAGE 8.32	AVERAGE 3.76
(15)	1935	22 512 343	829 198	1 149 494	2 265 664	413	6 195	6 608	29.35	7.97	5.76	2.92
(16)	1936	25 588 229	905 749	1 285 048	2 531 764	519	8 246	8 765	34.25	9.68	6.82	3.46
(17)	1937	26 848 096	933 219	1 310 646	2 646 909	582	8 433	9 015	33.58	9.66	6.88	3.41
(18)	1938	23 141 532	825 682	1 132 482	2 192 822	339	5 906	6 245	26.99	7.56	5.51	2.85
(19)	1939	25 258 741	853 179	1 190 362	2 342 153	353	6 360	6 713	26.58	7.87	5.64	2.87
(20)	TOTAL 1935-39	123 348 941	4 347 027	6 068 032	11 979 312	2 206	35 140	37 346	AVERAGE 30.28	AVERAGE 8.59	AVERAGE 6.15	AVERAGE 3.12
(21)	GRAND TOTAL 1923-39	463 322 469	17 402 114	24 318 047	56 448 353	12 666	281 586	294 252	AVERAGE 63.51	AVERAGE 16.91	AVERAGE 12.10	AVERAGE 5.21

COMPARISONS OF AVERAGE CASUALTY RATES

	Year	(Thousands)	(Thousands)	(Thousands)	(Thousands)	Killed	Injured	Total	Per Million Train Miles			
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
(1)	1923	29 432 500	1 245 099	1 756 170	4 856 983	1 507	38 520	40 027	136.00	32.15	22.79	8.24
(2)	1924	28 889 085	1 204 302	1 672 584	4 472 049	1 131	31 302	32 433	112.27	26.93	19.39	7.25
(3)	1925	30 785 543	1 220 846	1 697 798	4 458 702	1 180	31 275	32 455	105.42	26.58	19.12	7.28
(4)	1926	32 666 043	1 248 897	1 778 071	4 567 481	1 249	32 907	34 156	104.56	27.35	19.21	7.48
(5)	1927	32 462 178	1 220 987	1 728 040	4 416 147	1 121	27 085	28 206	86.89	23.10	16.32	6.39
(6)	1928	32 994 940	1 202 678	1 698 744	4 200 547	916	22 854	23 770	72.04	19.76	13.99	5.66
(7)	TOTAL 1923-28	187 230 289	7 342 809	10 331 407	26 971 909	7 104	183 943	191 047	AVERAGE 102.04	AVERAGE 26.02	AVERAGE 18.49	AVERAGE 7.08
(8)	1929	33 828 943	1 214 360	1 731 883	4 234 806	1 037	21 228	22 265	65.82	18.33	12.86	5.26
(9)	1930	30 177 596	1 106 386	1 550 246	3 648 890	690	13 033	13 723	45.47	12.40	8.85	3.76
(10)	1931	25 608 792	965 181	1 327 467	2 937 370	472	9 077	9 549	37.29	9.89	7.19	3.25
(11)	1932	20 350 867	821 158	1 104 953	2 291 540	414	6 943	7 357	36.15	8.96	6.66	3.21
(12)	1933	20 597 254	786 720	1 080 016	2 117 011	371	5 970	6 341	30.79	8.06	5.87	3.00
(13)	1934	22 179 787	818 473	1 124 043	2 267 515	372	6 252	6 624	29.87	8.09	5.89	2.92
(14)	TOTAL 1929-34	152 743 239	5 712 278	7 918 608	17 497 132	3 356	62 503	65 859	AVERAGE 43.12	AVERAGE 11.53	AVERAGE 8.32	AVERAGE 3.76
(15)	1935	22 512 343	829 198	1 149 494	2 265 664	413	6 195	6 608	29.35	7.97	5.75	2.92
(16)	1936	25 588 229	905 749	1 285 048	2 531 764	519	8 246	8 765	34.25	9.68	6.82	3.46
(17)	1937	26 848 096	933 219	1 310 646	2 646 909	582	8 433	9 015	33.58	9.66	6.88	3.41
(18)	1938	23 141 532	825 682	1 132 482	2 192 822	339	5 906	6 245	26.99	7.56	5.51	2.85
(19)	1939	25 258 741	853 179	1 190 362	2 342 153	353	6 360	6 713	26.58	7.87	5.64	2.87
(20)	TOTAL 1935-39	123 348 941	4 347 027	6 068 032	11 979 312	2 206	35 140	37 346	AVERAGE 30.28	AVERAGE 8.59	AVERAGE 6.15	AVERAGE 3.12
(21)	GRAND TOTAL 1923-39	463 322 469	17 402 114	24 318 047	56 448 353	12 666	281 586	294 252	AVERAGE 63.51	AVERAGE 16.91	AVERAGE 12.10	AVERAGE 5.21
	COMPARISONS OF AVERAGE CASUALTY RATES											
(22)	PERIOD 1929 - 34 COMPARED WITH PERIOD 1923 - 28 - DECREASE								57.74%	55.69%	55.00%	46.89%
(23)	PERIOD 1935 - 39 COMPARED WITH PERIOD 1929 - 34 - DECREASE								29.78%	25.50%	26.08%	17.02%
(24)	PERIOD 1935 - 39 COMPARED WITH PERIOD 1923 - 28 - DECREASE								70.33%	66.99%	66.74%	55.93%

SOURCE: Column (b) - I.C.C. Statistics of Railways in the United States, Statement 31 in issue of 1928 for years 1923 to 1928 inclusive; table No. 55 issue of 1938 for years 1929 to 1938, inclusive. Preliminary Abstract of Railway Statistics for Year 1939.

Column (c) - I.C.C. Statistics of Railways in the United States, Statement No. 30 issue of 1928 for years 1923 to 1928 inclusive; table No. 53 issue of 1938 for years 1929 to 1938 inclusive. Preliminary Abstract of Railway Statistics for Year 1939

Column (d) - I.C.C. Annual Accident Bulletins, Table No. 101 for years 1923 and 1924; Table No. 97 for subsequent years.

Column (e) - (f) - (g) - I.C.C. Annual Accident Bulletins, Table No. 55.

2107-2108). The casualty rates, 1923-1939, are computed on the four bases of car miles, train miles, locomotive miles, and man hours. The exhibit relates to casualties to all classes of employes on duty sustained in train and train service accidents. Man hours were added to the other three bases, because the work of such employes as section foremen, section laborers and extra gangs engaged in construction work, track walkers, signal supervisors and maintainers, station forces, etc., is in connection with the movement of trains which they themselves do not take any part in operating. This work is measured by hours, not by accomplishment. There is a hazard in their employment, as the detailed statistics show, which arises from the possibility of being struck or run over by a train, and, of course, an increase in train miles correspondingly increases that hazard. The exhibit includes train and enginemen as well as the employes just referred to. It deserves study, and for that reason we insert it opposite this page. It shows (line 20) that for the five-year period, 1935-1939, the average casualty rate for all classes of employes on duty who are subject to being killed or injured in train and train service accidents was less than one-third of what it was in the years 1923-1928, on the car-mile basis (30.28 to 102.04); less than one-third on the train-mile basis (8.59 to 26.02); about one-third on the locomotive-mile basis (6.15 to 18.49), and less than one-half on the man-hour basis (3.12 to 7.08). The comparisons of average casualty rates in lines 22, 23 and 24 of the exhibit are also striking.

(2) Road Trainmen and Enginemen on Duty, all classes (R. 3977-3978):

This finding is based on Exhibit 263 (R. 3301), prepared and offered by Mr. Sullivan (R. 1944-1947). For convenient reference we insert the entire exhibit opposite this page.

As stated before, the car-mile basis is the most accurate basis for determining casualty rates in comparing one method of freight operation with another as we are here doing, especially when the transition from the operation of so-called short trains as a standard practice was gradual over a period of years while the plant was being fully prepared for the long-train operation, when there then came the full standard long-train operation which has continued to the present time. During the first or transitional six-year period, the average casualties were 53.11 per 100 million car miles, which dropped during the second six-year period to 23.16, and again during the five years ending with 1939 to 16.35, a total decline of 69.21 per cent on a car-mile basis; somewhat greater than the decline of 65.73 per cent during the same period on the train-mile basis; or the decline of 55.92 per cent on the man-hour basis.

(3) Road Freight Trainmen and Enginemen on Duty (R. 3978):

This classification narrows the comparisons by excluding all employes except those actually engaged in operating road freight trains, such as engineers, firemen, conductors, brakemen, and flagmen (rear brakemen), and is based on Exhibit 264, R. 3302 (a copy of which we insert opposite this page), and the explanatory testimony of Mr. Sullivan

Superior Court, Pima Co., Arizona
State v. S.P. Co. No. 20087

Defts. Ex. No. 263 (Witness J J SULLIVAN)

CASUALTIES TO ROAD TRAINMEN AND ENGINEMEN ON DUTY
ALL CLASSES OF SERVICE
SUSTAINED IN TRAIN AND TRAIN-SERVICE ACCIDENTS
CLASS I RAILROADS OF THE UNITED STATES
REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

	YEAR	TOTAL CAR MILES (Thousands)	TOTAL TRAIN MILES (Thousands)	MAN-HOURS WORKED BY ROAD TRAINMEN (Thousands)	CASUALTIES TO ROAD TRAINMEN ON DUTY IN TRAIN AND TRAIN SERVICE ACCIDENTS			CASUALTY RATE PER		
					KILLED	INJURED	TOTAL	100 MILLION CAR MILES	MILLION TRAIN MILES	MILLION MAN-HOURS
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
(1)	1923	29 432 500	1 245 099	499 275	545	21 093	21 638	73.52	17.38	43.34
(2)	1924	28 889 085	1 204 302	534 229	376	16 781	17 157	59.39	14.25	32.12
(3)	1925	30 785 543	1 220 846	529 615	388	16 262	16 650	54.08	13.64	31.44
(4)	1926	32 666 043	1 248 897	540 739	403	16 918	17 321	53.02	13.87	32.03
(5)	1927	32 462 178	1 220 987	510 068	372	14 062	14 434	44.46	11.82	28.30
(6)	1928	32 994 940	1 202 678	481 525	275	11 959	12 234	37.08	10.17	25.41
(7)	Total 1923-28	187 230 289	7 342 809	3 095 451	2 359	97 075	99 434	Average 53.11	Average 13.54	Average 32.12
(8)	1929	33 828 943	1 214 360	482 244	325	10 838	11 163	33.00	9.19	23.15
(9)	1930	30 177 596	1 106 386	409 413	251	7 037	7 288	24.15	6.59	17.80
(10)	1931	25 608 792	965 181	332 460	187	5 113	5 300	20.70	5.49	15.94
(11)	1932	20 350 867	821 158	266 228	163	3 990	4 153	20.41	5.06	15.60
(12)	1933	20 597 254	786 720	256 904	155	3 435	3 590	17.43	4.56	13.97
(13)	1934	22 179 787	818 473	268 510	185	3 696	3 881	17.50	4.74	14.45
(14)	Total 1929-34	152 743 239	5 712 278	2 015 759	1 266	34 109	35 375	Average 23.16	Average 6.19	Average 17.55
(15)	1935	22 512 343	829 198	269 939	166	3 552	3 718	16.52	4.48	13.77
(16)	1936	25 588 229	905 749	306 789	212	4 637	4 849	18.95	5.35	15.81
(17)	1937	28 848 096	933 219	312 500	231	4 482	4 713	17.55	5.05	15.08
(18)	1938	23 141 532	825 682	261 282	164	3 207	3 371	14.57	4.08	12.90
(19)	1939	25 258 741	853 179	273 602	153	3 368	3 521	13.94	4.13	12.87
(20)	Total 1935-39	123 348 941	4 347 027	1 424 112	926	19 246	20 172	Average 16.35	Average 4.64	Average 14.16
(21)	Grand Total 1923-39	463 322 969	17 402 114	6 535 322	4 551	150 430	154 981	Average 33.45	Average 8.91	Average 23.71
	COMPARISONS OF AVERAGE CASUALTY RATES									
(22)	PERIOD 1929 - 1934 COMPARED WITH PERIOD 1923 - 1928,				DECREASE			56.39%	54.28%	45.36%
(23)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1929 - 1934,				DECREASE			29.40%	25.04%	19.32%
(24)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1923 - 1928,				DECREASE			69.21%	65.73%	55.92%

CASUALTIES TO ROAD TRAINMEN AND ENGINEMEN ON DUTY
ALL CLASSES OF SERVICE
SUSTAINED IN TRAIN AND TRAIN-SERVICE ACCIDENTS
CLASS I RAILROADS OF THE UNITED STATES
REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

	YEAR	TOTAL CAR MILES (Thousands)	TOTAL TRAIN MILES (Thousands)	MAN-HOURS WORKED BY ROAD TRAINMEN (Thousands)	CASUALTIES TO ROAD TRAINMEN ON DUTY IN TRAIN AND TRAIN SERVICE ACCIDENTS			CASUALTY RATE PER		
					KILLED	INJURED	TOTAL	100 MILLION CAR MILES	MILLION TRAIN MILES	MILLION MAN-HOURS
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
(1)	1923	29 432 500	1 245 099	499 275	545	21 093	21 638	73.52	17.38	43.34
(2)	1924	28 889 085	1 204 302	534 229	376	16 781	17 157	59.39	14.25	32.12
(3)	1925	30 785 543	1 220 846	529 615	388	16 262	16 650	54.08	13.64	31.44
(4)	1926	32 666 043	1 248 897	540 739	403	16 918	17 321	53.02	13.87	32.03
(5)	1927	32 462 178	1 220 987	510 068	372	14 062	14 434	44.46	11.82	28.30
(6)	1928	32 994 940	1 202 678	481 525	275	11 959	12 234	37.08	10.17	25.41
(7)	Total 1923-28	187 230 289	7 342 809	3 095 451	2 359	97 075	99 434	Average 53.11	Average 13.54	Average 32.12
(8)	1929	33 828 943	1 214 360	482 244	325	10 838	11 163	33.00	9.19	23.15
(9)	1930	30 177 596	1 106 386	409 413	251	7 037	7 288	24.15	6.59	17.80
(10)	1931	25 608 792	965 181	332 460	187	5 113	5 300	20.70	5.49	15.94
(11)	1932	20 350 867	821 158	266 228	163	3 990	4 153	20.41	5.06	15.60
(12)	1933	20 597 254	786 720	256 904	155	3 435	3 590	17.43	4.56	13.97
(13)	1934	22 179 787	818 473	268 510	185	3 696	3 881	17.50	4.74	14.45
(14)	Total 1929-34	152 743 239	5 712 278	2 015 759	1 266	34 109	35 375	Average 23.16	Average 6.19	Average 17.55
(15)	1935	22 512 343	829 198	269 939	166	3 552	3 718	16.52	4.48	13.77
(16)	1936	25 588 229	905 749	306 789	212	4 637	4 849	18.95	5.35	15.81
(17)	1937	26 848 096	933 219	312 500	231	4 482	4 713	17.55	5.05	15.08
(18)	1938	23 141 532	825 682	261 282	164	3 207	3 371	14.57	4.08	12.90
(19)	1939	25 258 741	853 179	273 602	153	3 368	3 521	13.94	4.13	12.87
(20)	Total 1935-39	123 348 941	4 347 027	1 424 112	926	19 246	20 172	Average 16.35	Average 4.64	Average 14.16
(21)	Grand Total 1923-39	463 322 469	17 402 114	6 535 322	4 551	150 430	154 981	Average 33.45	Average 8.91	Average 23.71
	COMPARISONS OF AVERAGE CASUALTY RATES									
(22)	PERIOD 1929 - 1934 COMPARED WITH PERIOD 1923 - 1928, DECREASE							56.39%	54.28%	45.36%
(23)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1929 - 1934, DECREASE							29.40%	25.04%	19.32%
(24)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1923 - 1928, DECREASE							69.21%	65.73%	55.92%

NOTE: Road Trainmen and Enginemen, includes conductors, brakemen, flagmen, baggagemen, engineers and firemen.

SOURCE: Column (b), I.C.C. Statistics of Railways in the United States, Statement No. 31 issue of 1928 for years 1923 to 1928, inclusive; table No. 55 issue of 1938 for years 1929 to 1938, inclusive. Preliminary Abstract of Railway Statistics for year 1939.

Column (c), I.C.C. Statistics of Railways in the United States, statement No. 30 issue of 1928 for years 1923 to 1928; table No. 53 issue of 1938 for years 1929 to 1938, inclusive. Preliminary Abstract of Railway Statistics for year 1939.

Columns (d), (e) and (f), I.C.C. Annual Accident Bulletins, Table No. 55.

Superior Court, Pima Co., Arizona
State v. S.P. Co. No. 20087

Defts. Ex. No. 264 (Witness J J SULLIVAN)

CASUALTIES TO ROAD FREIGHT TRAINMEN AND ENGINEMEN ON DUTY

SUSTAINED IN TRAIN AND TRAIN-SERVICE ACCIDENTS
CLASS I RAILROADS OF THE UNITED STATES
REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

	YEAR	TOTAL FREIGHT TRAIN AND WORK TRAIN CAR MILES (Thousands)	TOTAL FREIGHT TRAIN AND WORK TRAIN TRAIN MILES (Thousands)	MAN-HOURS WORKED BY ROAD FREIGHT TRAINMEN AND ENGINEMEN (Thousands)	CASUALTIES TO ROAD FREIGHT TRAINMEN AND ENGINEMEN ON DUTY, IN TRAIN AND TRAIN-SERVICE ACCIDENTS			CASUALTY RATE PER		
					KILLED	INJURED	TOTAL	100 MILLION CAR MILES	MILLION TRAIN MILES	MILLION MAN-HOURS
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
(1)	1923	25 797 580	678 898	460 561	436	17 778	18 214	70.60	26.83	39.55
(2)	1924	25 193 036	633 288	401 340	295	13 955	14 250	56.56	22.50	35.51
(3)	1925	26 990 496	646 304	399 608	292	13 710	14 002	51.88	21.66	35.04
(4)	1926	28 780 342	670 458	412 781	311	14 270	14 581	50.66	21.75	35.32
(5)	1927	28 581 119	647 534	385 660	298	11 851	12 149	42.51	18.76	31.50
(6)	1928	29 145 755	636 469	362 306	197	9 970	10 167	34.88	15.97	28.06
(7)	Total 1923-28	164 488 328	3 912 951	2 422 256	1 829	81 534	83 363	Average 50.68	Average 21.30	Average 34.42
(8)	1929	29 922 710	648 909	364 808	247	9 118	9 365	31.30	14.43	25.67
(9)	1930	26 450 708	563 262	299 734	195	5 906	6 101	23.07	10.83	20.35
(10)	1931	22 290 854	479 632	237 583	136	4 213	4 349	19.51	9.07	18.31
(11)	1932	17 550 925	400 512	187 178	117	3 286	3 403	19.39	8.50	18.18
(12)	1933	18 030 948	403 619	186 302	104	2 883	2 987	16.57	7.40	16.03
(13)	1934	19 531 651	434 073	198 272	135	3 109	3 244	16.61	7.47	16.36
(14)	Total 1929-34	133 777 796	2 930 007	1 473 877	934	28 515	29 449	Average 22.01	Average 10.05	Average 19.98
(15)	1935	19 801 769	440 865	199 897	141	2 998	3 139	15.85	7.12	15.70
(16)	1936	22 756 196	501 073	233 074	178	3 929	4 099	18.01	8.18	17.59
(17)	1937	23 853 441	516 834	237 171	193	3 772	3 965	16.62	7.67	16.72
(18)	1938	20 309 599	431 891	191 014	122	2 631	2 753	13.56	6.37	14.41
(19)	1939	22 378 131	462 296	204 884	123	2 885	3 008	13.44	6.51	14.68
(20)	Total 1935-39	109 099 136	2 352 959	1 066 040	749	16 215	16 964	Average 15.55	Average 7.21	Average 15.91
(21)	Grand Total 1923-39	407 365 260	9 195 917	4 962 173	3 512	126 264	129 776	Average 31.86	Average 14.11	Average 26.15
	COMPARISONS OF AVERAGE CASUALTY RATES									
(22)	PERIOD 1929 - 1934 COMPARED WITH PERIOD 1923 - 1928, DECREASE							56.55%	52.82%	41.95%
(23)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1929 - 1934, DECREASE							29.35%	28.26%	20.37%
(24)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1923 - 1928, DECREASE							69.32%	66.15%	53.78%

CASUALTIES TO ROAD FREIGHT TRAINMEN AND ENGINEMEN ON DUTY

SUSTAINED IN TRAIN AND TRAIN-SERVICE ACCIDENTS
CLASS I RAILROADS OF THE UNITED STATES
REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

	YEAR	TOTAL FREIGHT TRAIN AND WORK TRAIN CAR MILES (Thousands)	TOTAL FREIGHT TRAIN AND WORK TRAIN MILES (Thousands)	MAN-HOURS WORKED BY ROAD FREIGHT TRAINMEN AND ENGINEMEN (Thousands)	CASUALTIES TO ROAD FREIGHT TRAINMEN AND ENGINEMEN ON DUTY, IN TRAIN AND TRAIN-SERVICE ACCIDENTS			CASUALTY RATE PER		
					KILLED	INJURED	TOTAL	100 MILLION CAR MILES	MILLION TRAIN MILES	MILLION MAN-HOURS
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
(1)	1923	25 797 580	678 898	460 561	436	17 778	18 214	70.60	26.83	39.55
(2)	1924	25 193 036	633 288	401 340	295	13 955	14 250	56.56	22.50	35.51
(3)	1925	26 990 496	646 304	399 608	292	13 710	14 002	51.88	21.66	35.04
(4)	1926	28 780 342	670 458	412 781	311	14 270	14 581	50.66	21.75	35.32
(5)	1927	28 581 119	647 534	385 660	298	11 851	12 149	42.51	18.76	31.50
(6)	1928	29 145 755	636 469	362 306	197	9 970	10 167	34.88	15.97	28.06
(7)	Total 1923-28	164 488 328	3 912 951	2 422 256	1 829	81 534	83 363	Average 50.68	Average 21.30	Average 34.42
(8)	1929	29 922 710	648 909	364 808	247	9 118	9 365	31.30	14.43	25.67
(9)	1930	26 450 708	563 262	299 734	195	5 906	6 101	23.07	10.83	20.35
(10)	1931	22 290 854	479 632	237 583	136	4 213	4 349	19.51	9.07	18.31
(11)	1932	17 550 925	400 512	187 178	117	3 286	3 403	19.39	8.50	18.18
(12)	1933	18 030 948	403 619	186 302	104	2 883	2 987	16.57	7.40	16.03
(13)	1934	19 531 651	434 073	198 272	135	3 109	3 244	16.61	7.47	16.36
(14)	Total 1929-34	133 777 796	2 930 007	1 473 877	934	28 515	29 449	Average 22.01	Average 10.05	Average 19.98
(15)	1935	19 803 769	440 865	199 897	141	2 998	3 139	15.85	7.12	15.70
(16)	1936	22 756 196	501 073	233 074	170	3 929	4 099	18.01	8.18	17.59
(17)	1937	23 853 441	516 834	237 171	193	3 772	3 965	16.62	7.67	16.72
(18)	1938	20 309 599	431 891	191 014	122	2 631	2 753	13.56	6.37	14.41
(19)	1939	22 378 131	462 296	204 884	119	2 885	3 008	13.44	6.51	14.68
(20)	Total 1935-39	109 099 136	2 352 959	1 066 040	749	16 215	16 964	Average 15.55	Average 7.21	Average 15.91
(21)	Grand Total 1923-39	407 365 260	9 195 917	4 962 173	3 512	126 264	129 776	Average 31.86	Average 14.11	Average 26.15
	COMPARISONS OF AVERAGE CASUALTY RATES									
(22)	PERIOD 1929 - 1934 COMPARED WITH PERIOD 1923 - 1928, DECREASE							56.55%	52.82%	41.95%
(23)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1929 - 1934, DECREASE							29.35%	28.26%	20.37%
(24)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1923 - 1928, DECREASE							69.12%	66.15%	53.78%

SOURCE: Column (b), I.C.C. Statistics of Railways in the United States, statement No. 31 in issue of 1935 for years 1923 to 1935 inclusive; table No. 55 for years 1936 and 1937; table No. 158 for year 1938. Preliminary Abstract of Railway Statistics for Year 1939.

Column (c), I.C.C. Statistics of Railways in the United States, statement No. 30 in issue of 1928 for years 1923 to 1928 inclusive; table No. 53 in issue of 1938 for years 1929 to 1938 inclusive. Preliminary Abstract of Railway Statistics for Year 1939.

Columns (d), (e) and (f), I.C.C. Annual Accident Bulletins, table No. 55

Superior Court, Pima Co., Arizona
State v. S.P. Co. No. 20087

Defts. Ex. No. 265 (Witness J.J. SULLIVAN)

CASUALTIES TO ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN ON DUTY
SUSTAINED IN TRAIN AND TRAIN-SERVICE ACCIDENTS
CLASS I RAILROADS OF THE UNITED STATES
REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

	YEAR	TOTAL FREIGHT TRAIN AND WORK TRAIN CAR MILES (Thousands)	TOTAL FREIGHT TRAIN AND WORK TRAIN TRAIN MILES (Thousands)	MAN-HOURS WORKED BY ROAD FREIGHT CONDUCTORS, BRAKEMEN, AND FLAGMEN (Thousands)	CASUALTIES TO ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN ON DUTY IN TRAIN & TRAIN-SERVICE ACCIDENTS			CASUALTY RATE PER		
					KILLED	INJURED	TOTAL	100 MILLION CAR MILES	MILLION TRAIN MILES	MILLION MAN-HOURS
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
(1)	1923	25 797 580	678 898	268 548	322	11 910	12 232	47.42	18.02	45.33
(2)	1924	25 193 036	633 288	234 752	215	9 838	10 053	39.90	15.87	42.82
(3)	1925	26 990 496	646 304	232 998	228	9 855	10 083	37.36	15.60	43.28
(4)	1926	28 780 342	670 458	239 990	256	10 282	10 538	36.62	15.72	43.91
(5)	1927	28 581 119	647 534	224 081	215	8 876	9 091	31.81	14.04	40.57
(6)	1928	29 145 755	636 469	210 124	163	7 662	7 825	26.85	12.29	37.24
(7)	Total 1923-28	164 488 328	3 912 951	1 410 493	1 399	58 423	59 822	Average 36.37	Average 15.29	Average 42.41
(8)	1929	29 922 710	648 909	211 276	176	6 910	7 086	23.68	10.92	33.54
(9)	1930	26 450 708	563 262	173 888	152	4 587	4 739	17.92	8.41	27.25
(10)	1931	22 290 854	479 632	137 510	109	3 275	3 384	15.18	7.06	24.61
(11)	1932	17 550 925	400 512	107 909	97	2 586	2 683	15.29	6.70	24.86
(12)	1933	18 030 948	403 619	106 829	82	2 283	2 365	13.12	5.86	22.14
(13)	1934	19 531 651	434 073	113 645	106	2 460	2 566	13.14	5.91	22.58
(14)	Total 1929-34	133 777 796	2 930 007	851 057	722	22 101	22 823	Average 17.06	Average 7.79	Average 26.82
(15)	1935	19 801 769	440 865	114 415	105	2 403	2 508	12.67	5.69	21.92
(16)	1936	22 756 196	501 073	133 026	125	3 119	3 244	14.26	6.47	24.39
(17)	1937	23 853 441	516 834	135 565	138	2 973	3 111	13.04	6.02	22.95
(18)	1938	20 309 599	431 891	109 601	92	2 069	2 161	10.64	5.00	19.72
(19)	1939	22 378 131	462 296	117 045	86	2 294	2 380	10.64	5.15	20.33
(20)	Total 1935-39	109 099 136	2 352 959	609 652	546	12 858	13 404	Average 12.29	Average 5.70	Average 21.99
(21)	Grand Total 1923-39	407 365 260	9 195 917	2 871 202	2 667	93 382	96 049	Average 23.58	Average 10.44	Average 33.45

COMPARISONS OF AVERAGE CASUALTY RATES

	YEAR	TOTAL FREIGHT TRAIN AND WORK TRAIN CAR MILES (Thousands)	TOTAL FREIGHT TRAIN AND WORK TRAIN TRAIN MILES (Thousands)	WORKED BY ROAD FREIGHT CONDUCTORS, BRAKEMEN, AND FLAGMEN (Thousands)	CASUALTIES TO ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN ON DUTY IN TRAIN & TRAIN-SERVICE ACCIDENTS			CASUALTY RATE PER		
					KILLED	INJURED	TOTAL	100 MILLION CAR MILES	MILLION TRAIN MILES	MILLION MAN-HOURS
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
(1)	1923	25 797 580	678 898	268 548	322	11 910	12 232	47.42	18.02	45.33
(2)	1924	25 193 036	633 288	234 752	215	9 838	10 053	39.90	15.87	42.82
(3)	1925	26 990 496	646 304	232 998	228	9 855	10 083	37.36	15.60	43.28
(4)	1926	28 780 342	670 458	239 990	256	10 282	10 538	36.62	15.72	43.91
(5)	1927	28 581 119	647 534	224 081	215	8 876	9 091	31.81	14.04	40.57
(6)	1928	29 145 755	636 469	210 124	163	7 662	7 825	26.85	12.29	37.24
(7)	Total 1923-28	164 488 328	3 912 951	1 410 493	1 399	58 423	59 822	Average 36.37	Average 15.29	Average 42.41
(8)	1929	29 922 710	648 909	211 276	176	6 910	7 086	23.68	10.92	33.54
(9)	1930	26 450 708	563 262	173 888	152	4 587	4 739	17.92	8.41	27.25
(10)	1931	22 290 854	479 632	137 510	109	3 275	3 384	15.18	7.06	24.61
(11)	1932	17 550 925	400 512	107 909	97	2 586	2 683	15.29	6.70	24.86
(12)	1933	18 030 948	403 619	106 829	82	2 283	2 365	13.12	5.86	22.14
(13)	1934	19 531 651	434 073	113 645	106	2 460	2 566	13.14	5.91	22.58
(14)	Total 1929-34	133 777 796	2 930 007	851 057	722	22 101	22 823	Average 17.06	Average 7.79	Average 26.82
(15)	1935	19 801 769	440 865	114 415	105	2 403	2 508	12.67	5.69	21.92
(16)	1936	22 756 196	501 073	133 026	125	3 119	3 244	14.26	6.47	24.39
(17)	1937	23 853 441	516 834	135 565	138	2 973	3 111	13.04	6.02	22.95
(18)	1938	20 309 599	431 891	109 601	92	2 069	2 161	10.64	5.00	19.72
(19)	1939	22 378 131	462 296	117 045	86	2 294	2 380	10.64	5.15	20.33
(20)	Total 1935-39	109 099 136	2 352 959	609 652	546	12 858	13 404	Average 12.29	Average 5.70	Average 21.99
(21)	Grand Total 1923-39	407 365 260	9 195 917	2 871 202	2 667	93 382	96 049	Average 23.58	Average 10.44	Average 33.45
	COMPARISONS OF AVERAGE CASUALTY RATES									
(22)	PERIOD 1929 - 1934 COMPARED WITH PERIOD 1923 - 1928,				DECREASE			53.09%	49.05%	36.76%
(23)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1929 - 1934,				DECREASE			27.96%	26.83%	18.01%
(24)	PERIOD 1935 - 1939 COMPARED WITH PERIOD 1923 - 1928,				DECREASE			66.21%	62.72%	48.15%

SOURCE: Column (b), I.C.C. Statistics of Railways in the United States, statement No. 31 in issue of 1935 for years 1923 to 1935 inclusive; table No. 55 for years 1936 and 1937; table No. 158 for year 1938. Preliminary Abstract of Railway Statistics for year 1939.

Column (c), I.C.C. Statistics of Railways in the United States, statement No. 30 in issue of 1928 for years 1923 to 1928; table No. 53 in issue of 1938 for years 1929 to 1938, inclusive. Preliminary Abstract of Railway Statistics for year 1939.

Columns (d), (e) and (f), I.C.C. Annual Accident Bulletins, table No. 5

(R. 1947-1948, 2109-2110). The same remarks as to trends and comparisons apply to this exhibit as to the preceding Exhibit 263. It is noteworthy that the decrease in average casualty rates for the period 1935-1939, compared with the period 1923-1928, is shown by line 24 of this exhibit to have been 69.32 per cent on the car-mile basis as compared with 69.21 per cent on the same basis for all road trainmen and enginemen on duty, as shown by line 24 of Exhibit 263. The other comparisons of decreases are relatively the same. In fact, considering the tremendous performances to which the casualties are applied in both of these exhibits—100 million car miles, one million train miles, one million man hours—it may fairly be said that the rate of decrease on any period-comparison is the same in both exhibits.

(4) Road Freight Conductors, Brakemen and Flagmen (R. 3978-3979):

This subfinding is based on Mr. Sullivan's testimony (R. 1949-1950) explaining his Exhibit 265 (R. 3303), a copy of which we insert opposite this page.

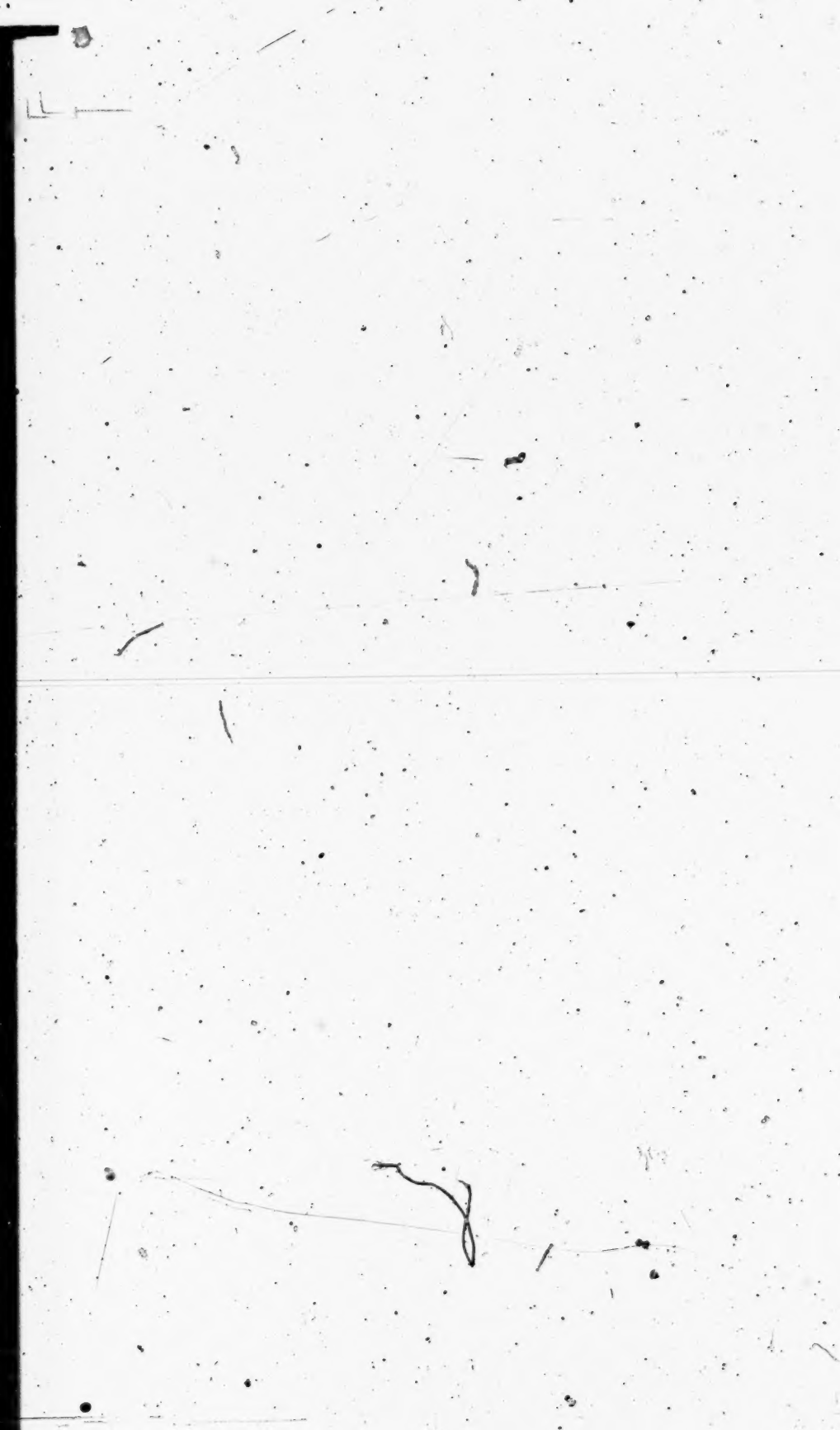
It further narrows the study to those classes of employes which have been claimed in all of the former train-limit cases, as well as in the Congressional hearings and hearings before State Legislatures, to be most directly and injuriously affected by the long-train method of operation; the claim being based on the theory that that method was productive of a substantially greater hazard from slack-action accident to these classes of employes than where the freight-train operation was limited to 70 cars or less. Such is the claim repeatedly advanced by appel-

lant as shown by its briefs at earlier stages of this case. We anticipated the challenge and were fully prepared to meet it. Again we say that the safety of a given method of freight-train operation is not to be judged by selecting one type of accident of comparatively infrequent occurrence, and which is produced, if at all, by the concurrence of a number of factors, practically all of which are potential in all freight train operation. The true criterion is that of the hazard from all causes which may produce death or personal injury to the class of employes under consideration. Exhibit 265 again shows the downward curve of casualty rates measured on any of the three bases, the curve on the car-mile basis quite naturally being steeper in its descent, for the reasons which we have perhaps tiresomely stated and reiterated.

When we compare the decreases in average casualty rates, as shown in lines 22, 23 and 24 of this exhibit, with the corresponding lines in Exhibits 263 and 264, we find a close correspondence between all three sets of percentages of decrease, a correspondence so close that, considering the great mass of performances to which the casualties in their aggregate are related, from a practical and realistic standpoint the occupational hazard of the classes of employees covered by Exhibit 265 is practically the same as that of the larger classes of which they form a part, who are covered in the two preceding exhibits.

(5) Conductors, Brakemen and Flagmen—Slack Action (R. 3979-3980):

This subfinding is based on Exhibit 266 (R. 3304), as explained by Mr. Sullivan at the time of its introduction (R. 1951-1955).



Superior Court, Pima Co., Arizona
State v. S.P.Co. No. 20087

Defts. Ex. No. 266 (Witness J.J. SULLIVAN)

CASUALTIES TO ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN
TRAIN-SERVICE ACCIDENTS CAUSED BY
SUDDEN STOP, START, LURCH OR JERK OF LOCOMOTIVE, CAR OR TRAIN
ALL RAILROADS OF THE UNITED STATES
REFLECTED BY STATISTICS OF THE INTERSTATE COMMERCE COMMISSION
YEARS 1923 TO 1939, INCLUSIVE

	YEAR	TOTAL FREIGHT AND WORK TRAIN CAR MILES (Thousands)	TOTAL FREIGHT AND WORK TRAIN TRAIN MILES (Thousands)	CASUALTIES TO ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN, CAUSED BY SUDDEN STOP, START, LURCH OR JERK OF TRAIN			CASUALTY RATE PER	
				KILLED	INJURED	TOTAL	100 MILLION CAR MILES	MILLION TRAIN MILES
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
(1)	1923	25,797,580	678,898	11	1,946	1,957	7.59	2.88
(2)	1924	25,193,036	633,288	8	1,667	1,675	6.65	2.64
(3)	1925	26,990,496	646,304	10	1,818	1,828	6.77	2.83
(4)	1926	28,780,342	670,458	8	1,922	1,930	6.71	2.88
(5)	1927	28,581,119	647,534	10	1,777	1,787	6.25	2.76
(6)	1928	29,145,755	636,469	6	1,571	1,577	5.41	2.48
(7)	TOTAL 1923-28	164,488,328	3,912,951	53	10,701	10,754	AVERAGE 6.54	2.75
(8)	1929	29,922,710	648,909	4	1,451	1,455	4.86	2.24
(9)	1930	26,450,708	563,262	5	971	976	3.69	1.73
(10)	1931	22,290,854	479,632	5	709	714	3.20	1.49
(11)	1932	17,550,925	400,512	4	499	503	2.87	1.26
(12)	1933	18,030,948	403,619	3	417	420	2.33	1.04
(13)	1934	19,531,651	434,073	3	493	496	2.54	1.14
(14)	TOTAL 1929-34	133,777,796	2,930,007	24	4,540	4,564	AVERAGE 3.41	1.56

(8)	1929	29,922,710	648,909	4	1,451	1,455	4.86	2.24
(9)	1930	26,450,708	563,262	5	971	976	3.69	1.73
(10)	1931	22,290,854	479,632	5	709	714	3.20	1.49
(11)	1932	17,550,925	400,512	4	499	503	2.87	1.26
(12)	1933	18,030,948	403,619	3	417	420	2.33	1.04
(13)	1934	19,531,651	434,073	3	493	496	2.54	1.14
(14)	TOTAL 1929-34	133,777,796	2,930,007	24	4,540	4,564	AVERAGE 3.41	1.56
(15)	1935	19,801,769	440,865	3	509	512	2.59	1.16
(16)	1936	22,756,196	501,073	3	671	674	2.96	1.35
(17)	1937	23,853,441	516,834	5	565	570	2.39	1.10
(18)	1938	20,309,599	431,891	2	316	318	1.57	.74
(19)	1939	22,378,131	462,296	3	396	399	1.78	.86
(20)	TOTAL 1935-39	109,099,136	2,352,959	16	2,457	2,473	AVERAGE 2.27	1.05
(21)	GRAND TOTAL 1923-39	407,365,260	9,195,917	93	17,698	17,791	AVERAGE 1.37	1.93

COMPARISONS OF AVERAGE CASUALTY RATES

(22)	PERIOD 1929 - 34 COMPARED WITH PERIOD 1923 - 28, DECREASE	47.86%	43.27%
(23)	PERIOD 1935 - 39 COMPARED WITH PERIOD 1929 - 34, DECREASE	33.43%	32.69%
(24)	PERIOD 1935 - 39 COMPARED WITH PERIOD 1923 - 28, DECREASE	65.29%	61.82%

SOURCE: Column (b)- I.C.C. Statistics of Railways in the United States, Statement No. 31 in issue of 1935 for years 1923 to 1935, inclusive; Table No. 55 for years 1936 and 1937; Table No. 158 for year 1938, Preliminary Abstract of Railway Statistics for year 1939.

Column (c)- I.C.C. Statistics of Railways in the United States, Statement No. 30 in issue of 1928 for years 1923 to 1928, inclusive; Table No. 53 in issue of 1938 for years 1929 to 1938, inclusive, Preliminary Abstract of Railway Statistics for year 1939.

Columns (d) and (e)- I.C.C. Annual Accident Bulletins, Table No. 80, Code Causes 7007, 7008, 7009 and 7010 combined.

A complete copy of that exhibit is inserted opposite this page. The title of the subfinding is relatively short, but the exhibit covers the years 1923 to 1939 inclusive, and is entitled "Casualties to Road Freight Conductors, Brakemen and Flagmen, from Train and Train Service Accidents Caused by Sudden Stop, Start, Lurch or Jerk of Locomotive, Car or Train: All Railroads of the United States".

The casualty rates are calculated on the bases of 100 million car miles and one million train miles.

First we call attention to the fact that in the 17 years covered by Exhibit 266 the total number of casualties from the code causes described in the title was 17,791 (line 21, column f), or 6 per cent of the 294,252 casualties to all classes of employes on duty, sustained in train and train service accidents during the same period, as shown in line 21, column h, of Exhibit 262, hereinbefore discussed and inserted.

During the first six years shown, 1923-1928, the rate per 100 million car miles in Exhibit 262 (line 7, column i) was 102.04, as contrasted with 6.54 in Exhibit 266 (line 7, column g), which was but 6.4 per cent of the all-employe casualty rate thus stated. That was during the transitional period from the short-freight-train method to the long-freight-train method of operation. A gradual decline is shown on both exhibits during the middle period, 1929-1934 inclusive; and a comparison of the last five years, 1935-1939, shows that of a total of 37,346 (line 20, column h, Exhibit 262) all-employe casualties in train and train-service accidents, there were but 2,473 accidents of

the character described in Exhibit 266 (line 20, column f) a percentage of 6.6 per cent. The average number of casualties per 100 million car miles, to all employes on duty (line 21, column i, Exhibit 262) was 30.28 during the latest five-year period; while Exhibit 266 shows that during the same period the corresponding rate for this particular type of casualty was but 2.27. It is apparent that the advocates of train-limit laws such as the Arizona statute are in reality proposing to increase the hazard of casualties in train and train-service accidents which inevitably accompanies an unnecessary increase in the number of trains run, for the sake of what is shown to be an ineffectual effort to minimize the occurrence of casualties which amounted to but 6.6 per cent of the total number sustained in train and train-service accidents during the five years ending with 1939. We are justified in using all casualties in train and train-service operation as a basis for this argument, even though those figures include passenger-train employe casualties, because both classes of trains are operated on the same tracks, have meets and passes, and the safety of their operation is directly affected by the number of trains of all classes operated in a particular district.

We again call attention to the comparison of average casualty rates on lines 22, 23 and 24 of Exhibit 266, with the corresponding figures in Exhibits 263, 264 and 265. For all practical purposes the decreases in the so-called slack action casualty rates have been practically the same, in percentages, as the decreases just mentioned; and the percentage trend as shown by Columns (h) and (i) in all

of the four exhibits, likewise descends as steeply in one as in any of the others.

We think it clear, taking the other evidence in the case into consideration, that a very important factor in the decrease of the slack-action accidents has been the running of less train miles to handle the same volume of traffic measured in car miles. The speed of a freight train is one of the factors that concurs with other factors in producing slack-action shock, and it is apparent from the testimony, and particularly the detailed list of accidents in Nevada and Arizona which usually show the speed of the train when casualties occur, that slack-action shocks are more severe at slow speeds than at higher speeds. When air-brakes are applied a car is decelerated in proportion to its speed. In running fewer trains to handle the same volume of traffic, a substantial increase in the average speed of freight trains has been attained, as shown by the evidence, and, what is more important in its bearing on slack-action accidents, long-train operation has necessitated fewer stops and startings of freight trains and fewer occasions for taking sidings to pass trains approaching on single track in the opposite direction, or to allow superior trains to overtake and pass on either single or double track. Thus the frequency of slack-action accidents in handling a given number of cars bears a direct relation to the number of trains operated to handle that volume of traffic; because the additional trains give more occasion to stop and start and take sidings.

As shown by Finding X(b), "Delays to Trains Enroute: Meets and Passes" (R. 3957-3958), in the year 1938 the

4,304 additional freight trains which the law compelled the appellant to run between Yuma and El Paso via Gila and Lordsburg entailed 16,512 additional meets and passes over and above those which would have occurred if long-freight-train operation had prevailed, an increase of about 63 per cent in meets and passes between all the trains, both freight and passenger, run in that territory.

These national statistics are particularly valuable in considering the hazard of slack-action accidents. There are, relative speaking, so few of those accidents during the year in any state on the appellant's Pacific Lines—as illustrated by the Nevada and Arizona comparative statistics—that a very few accidents of that character, causing slight and almost trivial disability, will weigh heavily in arriving at either the train-mile or the car-mile frequency rate in a given year or even in a period of two or three years. It is only when trends are considered, or a substantial period of time is taken, that dependable conclusions can be reached. The comparison of slack-action casualties in Arizona and Nevada, which later will be dealt with, illustrates this thought. But when one takes the accidents on all of the railroads of the United States, the absolute number in each year clearly indicates the minor importance, relatively speaking, of this class of casualties, and the trend eloquently speaks of their rapid decrease coincident with the running of fewer and consequently longer trains to handle the same volume of traffic.

(6) Passengers on Trains (R. 3980):

This sub-finding is based on Mr. Sullivan's Exhibit 267 (R. 3305), as explained in his testimony on pages 1959-1961 of the printed record.

Although there may have been some reason advanced for this law in 1912, as applied to passenger trains, we have yet to hear any one seriously suggest what it was. If there was one, it has long since vanished. The improvements in road bed and signals, as well as in passenger equipment, shown by the chronological exhibits 4 (R. 2854) and 6 (R. 2856), and by the similar exhibit 107 (R. 2960) relating to Pullman cars, are responsible. These improvements are shown by the testimony of the officials of the other sixteen railroads to correspond closely to those made in their own motive power and equipment. The testimony of Mr. Parke, Chief Engineer of The Pullman Company, is particularly illuminating, when it is considered that Pullman equipment is nationally used and is practically the only sleeping-car equipment in use (*Parke*, R. 787-798, 805-824). It was not seriously suggested, by cross-examination or in rebuttal, or indeed at any stage of the case, that there is any difficulty or hazard in handling passenger trains of substantially over fourteen cars; and that practice is shown by the evidence to be prevalent on all of the railroads whose testimony was presented. There is not the shadow of an argument in favor of the regulation of the length of passenger trains, not even the nebulous argument that revolves around slack action.

Exhibit 267 is on two different bases of calculation of casualty rates, neither of which for obvious reasons appears in any of the preceding exhibits. The number of passengers carried, no matter how far carried, and the number of revenue passengers carried one mile are given in separate Columns (b) and (c). The casualties are then

given, divided between train accidents and train-service accidents. The casualties in the aggregate are then related in Columns (m) and (n) to "million passengers carried" and "100 million passenger miles". Mr. Sullivan explained Exhibit 267 as follows (R. 1959-1960):

"Mr. Booth: In respect to the length of time of disability, how do the casualties shown in this exhibit; where they did not result in death, differ from those shown in the preceding exhibits insofar as they dealt with employes?

A. Well, as indicated in the note at the foot of the exhibit an injury to a passenger is reportable if the injury is sufficient to incapacitate the injured person from following his customary vocation or mode of living for a period of more than one day. In the case of employes, the injury is not reportable unless it disables the employe for more than three days within the ten days immediately following the occurrence of the accident.

Q. Under the reporting rules of the Commission, how are deaths to passengers handled in reporting the accident?

A. In the same manner as the deaths to any person. If death results within twenty-four hours after the occurrence of the accident, it is reported in the statistics as a person killed. If death results after the expiration of twenty-four hours, it is reported as a person injured and a report made of the subsequent fatality.

Q. You are shown the casualty rates by two methods, per million passengers carried and per hundred million passenger miles. Have you any observations you desire to make as to that?

A. Yes, million passengers carried represents the absolute number regardless of the distance that the individual passengers may have travelled. In order to give an idea as to the occurrence of accidents and the exposure to injury, generally, casualties are measured against the miles travelled by the passenger which is shown in column C, and the rate is shown in column N."

The exhibit shows that the average casualty rates, based either on the number of passengers carried or the number of passenger miles traversed, have remained fairly constant since 1923. This is largely accounted for by the fact that the great improvements in the strength and appurtenances of passenger equipment took place prior to that year. See Exhibit 4, "Chronology of Passenger Coach and Chair Cars", and Exhibit 107, "Chronology of Advances in Sleeping Car Construction of Cars Owned by The Pullman Company". These exhibits will be found among those inside the last cover page of this brief. The practice of handling through passenger trains, when and as traffic and operating conditions permit, in train units of substantially more than fourteen cars has apparently, considering Exhibit 267, failed to increase the hazard to passengers.

And finally, passenger train operation, considering the country as a whole, had evidently reached in 1940 a practically irreducible minimum of casualties to passengers, measured on any recognized basis.

(d) TRAIN ACCIDENTS—NATIONAL (R. 3980-3981).

Exhibit 269 (R. 3307) is the primary basis for the testimony (R. 1967-1970, 2760-2762) upon which the finding is predicated.

The exhibit is an elaborate study, in three sheets, showing on bases of car miles, train miles, and locomotive miles the number of train accidents by Interstate Commerce Commission classes, the number resulting in casualties, and the number of casualties occurring on all United States railroads during the years 1923-1939, inclusive. The third sheet of the exhibit relates these train accidents and their attendant casualties to car miles and train miles. The exhibit is fairly analyzed in the finding. We have few additional comments to make.

Sheet 3, Columns h, i, j, and k, relate the rear-end and head-end collisions, and the casualties occasioned thereby, to train miles and locomotive miles. The locomotive-mile basis is used because the locomotive is the active agent in a collision. During the five years 1935-1939, there was an improvement of 62 per cent in the frequency of such collisions, on the train-mile basis, and 61.76 per cent on the locomotive-mile basis; a result due largely, if not almost entirely, to the lesser number of the locomotives used to handle the traffic. The casualty rate to trainmen and enginemen during the same period declined 61.54 per cent on the train-mile basis, and 61.11 per cent on the locomotive-mile basis. The almost immediate effect on the frequency of collisions arising from the long-train method of operation is shown by comparing the averages for the first six years, while the long-train program was under

...ARY OF ACCIDENT INVESTIGATION REPORTS,
INTERSTATE COMMERCE COMMISSION - BUREAU OF SAFETY,
IN SO FAR AS IT RELATES TO ACCIDENTS INVOLVING ROAD FREIGHT TRAINS, INCLUDING MIXED TRAINS HANDLING FREIGHT CARS
YEARS 1928 TO 1939

I. C. C. BUREAU OF SAFETY SUMMARY OF ACCIDENT INVESTIGATION REPORTS NO.	PERIOD COVERED	TOTAL NUMBER OF ACCIDENTS ALL KINDS OF TRAINS INVESTIGATED	NUMBER OF ACCIDENTS INVESTIGATED INVOLVING FREIGHT TRAINS: TOTAL NUMBER INVOLVING FREIGHT TRAINS	COLLISIONS	DERAILMENTS	LOCOMOTIVE BOILER AND OTHER LOCOMOTIVE ACCIDENTS	MISCELLANEOUS	PERSONS KILLED	PERSONS INJURED	TOTAL NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS: 40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	PRIMARY CAUSE OF ACCIDENT INVESTIGATED: DEFECTS IN OR FAILURES OF FRT. CARS	DEFECTS IN OR FAILURES OF LOCOMOTIVES	DEFECTS IN OR FAILURES OF MofW & STRUCTURES	ALL OTHER CAUSES EXCEPT NEGLIGENCE	NEGLIGENCE OF EMPLOYES: CONDUCTORS & BRAKEMEN	ENGINEERS & FIREMEN	JOINT TRAINMEN & ENGINEMEN	TRAIN DISPATCHERS & OPERATORS	ED
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	
67	Jan. to Mar. 1936	28	16	8	8	-	-	21	64	12	1	4	2	-	-	-	2	5	-	-	3	2	1	4	-	
68	Apr. to June 1936	18	13	6	7	-	-	14	219	9	2	2	1	-	-	-	1	1	1	-	4	-	3	1	-	
69	July to Sept 1936	28	15	6	9	-	-	24	44	8	3	3	2	-	1	-	-	2	1	2	3	2	2	1	-	
70	Oct. to Dec. 1936	27	18	13	5	-	-	24	68	14	1	2	6	2	2	1	1	3	-	1	2	3	1	6	1	
	TOTAL YEAR 1936	101	62	33	29	-	-	83	395	43	7	11	11	2	3	1	4	11	2	3	12	7	7	12	1	
71	Jan. to Mar. 1937	36	26	19	7	-	-	29	117	15	5	3	4	1	2	1	2	1	-	2	1	4	8	7	-	
72	Apr. to June 1937	18	8	2	6	-	-	7	15	3	4	1	-	-	-	1	-	2	-	2	-	-	2	-	-	
73	July to Sept 1937	17	12	5	7	-	-	20	32	11	1	2	-	-	-	-	-	1	-	-	3	1	2	3	-	
74	Oct. to Dec. 1937	39	21	11	10	-	-	31	62	13	2	4	-	4	2	-	1	4	-	-	6	1	2	5	-	
	TOTAL YEAR 1937	110	67	37	30	-	-	87	226	45	12	10	4	5	4	2	3	8	-	4	10	6	14	15	-	
75	Jan. to Mar. 1938	22	13	10	3	-	-	21	78	7	2	-	1	2	1	1	1	-	-	-	2	3	3	2	1	
76	Apr. to June 1938	17	9	3	6	-	-	7	47	3	3	1	-	2	-	-	-	1	2	-	3	-	-	2	-	
77	July to Sept 1938	17	9	5	3	-	1	9	42	5	2	1	-	1	-	1	-	1	-	1	1	1	1	2	-	
78	Oct. to Dec. 1938	24	15	9	6	-	-	30	100	10	3	2	1	1	1	-	1	1	-	1	5	-	3	4	1	
	TOTAL YEAR 1938	80	46	27	18	-	1	67	267	25	10	4	2	6	2	2	2	3	2	2	11	4	7	10	2	
79	Jan. to Mar. 1939	20	15	-	-	-	-	17	83	7	1	3	1	-	1	1	3	3	-	-	4	1	5	2	-	
80	Apr. to June 1939	26	17	-	-	-	-	24	79	7	4	1	2	4	2	1	1	-	1	2	5	-	3	5	1	
81	July to Sept 1939	17	9	-	-	-	-	9	57	3	-	2	3	2	-	-	3	-	1	-	1	1	4	2	-	
82	Oct. to Dec. 1939	18	10	-	-	-	-	7	118	7	1	-	2	-	1	1	2	-	-	-	1	-	3	6	-	
	TOTAL YEAR 1939	81	51	-	-	-	-	57	337	24	6	6	8	6	4	3	9	3	2	2	11	2	15	15	1	
	GRAND TOTAL 12 YEARS	1002	561	298	206	-	7	751	3,327	344	86	69	75	50	38	23	43	71	8	33	86	56	128	121	14	

CAUSES OF ACCIDENTS, CASUALTIES, AND NUMBER OF FREIGHT TRAINS BY VARIOUS LENGTHS

	CAUSE	PER CENT. OF TOTAL ACCIDENTS	NUMBER OF ACCIDENTS	PERSONS KILLED	PERSONS INJURED	NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE: 40 AND LESS	41 TO 50	51 TO 60	61 TO 70	71 TO 80	81 TO 90	91 TO 100	OVER 100	TO
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
I.	NEGLIGENCE OF EMPLOYES	62.2	349	390	2,428	258	53	45	53	31	22	15	22	
II.	DEFECTS IN OR FAILURES OF EQUIPMENT	14.1	79	108	318	24	11	10	6	9	9	6	15	
III.	DEFECTS IN OR IMPROPER MAINTENANCE OF WAY AND STRUCTURES	5.9	33	57	202	17	7	4	2	3	1	1	1	
IV.	MISCELLANEOUS CAUSES	17.8	100	196	379	45	15	10	14	7	6	1	5	
	GRAND TOTAL	100.0	561	751	3,327	344	86	69	75	50	38	23	43	

HANDLING FREIGHT CARS

Defts. Ex. No. 270 (Witness J. J. SULLIVAN)

PRIMARY CAUSE OF ACCIDENT INVESTIGATED								
	NEGLIGENCE OF EMPLOYES							
ALL OTHER CAUSES EXCEPT NEGLIGENCE (22)	CONDUCTORS & BRAKEMEN (23)	ENGINEERS & FIREMEN (24)	JOINT TRAINMEN & ENGINEMEN (25)	TRAIN DISPATCHERS & OPERATORS (26)	ALL OTHER EMPLOYES (27)	JOINT TWO OR MORE OTHER EMPLOYES (28)	NOT DEFINITELY DETERMINED OR QUESTIONABLE (29)	TOTAL ALL CAUSES (30)
3	2	1	4	-	1	-	-	16
4	-	3	1	-	-	2	1	13
3	2	2	1	-	-	-	1	14
2	3	1	6	1	2	-	-	19
12	7	7	12	1	3	2	2	62
1	4	8	7	-	-	2	1	26
-	-	2	-	-	-	-	2	8
3	1	2	3	-	1	-	1	12
6	1	2	5	-	1	2	-	21
10	6	14	15	-	2	4	4	67
2	3	3	2	1	-	2	-	13
3	-	-	2	-	1	-	-	9
1	1	1	2	-	1	1	-	9
5	-	3	4	1	-	-	-	15
11	4	7	10	2	2	3	-	46
4	1	5	2	-	-	-	-	15
5	-	3	5	1	-	-	-	17
1	1	4	2	-	-	-	-	9
1	-	3	6	-	-	-	-	10
11	2	15	15	1	-	-	-	51
96	56	128	121	14	18	12	14	561

NUMBER OF FREIGHT TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS, EXCLUSIVE OF CABOOSE									TOTAL			
									70 CARS AND LESS		OVER 70 CARS	
40 AND LESS (5)	41 TO 50 (6)	51 TO 60 (7)	61 TO 70 (8)	71 TO 80 (9)	81 TO 90 (10)	91 TO 100 (11)	OVER 100 (12)	TOTAL (13)	NO. (14)	PER CENT. (15)	NO. (16)	PER CENT. (17)
258	53	45	53	31	22	15	22	499	409	82.0	90	18.0
24	11	10	6	9	9	6	15	90	51	56.7	39	43.3
17	7	4	2	3	1	1	1	36	30	83.3	6	16.7
45	15	10	14	7	6	1	5	103	84	81.6	19	18.4
344	86	69	75	50	38	23	43	728	574	78.8	154	21.2

way and near the end of which barely reached standardization, with the second six years when the standard long-train program was an accomplished fact. The collision rate per million train miles dropped from .50 in the first period to .23 in the second, per million locomotive miles from .34 in the first period to .16 in the second, and the casualty rate correspondingly dropped from .26 per million train miles in the first period to .11 in the second, and from .18 per million locomotive miles to .08 in the second. These decreases were far greater, in percentage, than the decreases in the total number of train miles and locomotive miles from the first six-year period to the second six-year period (Columns c and d, lines 7 and 14, Sheet 1).

(e) COMMISSION'S INVESTIGATION OF TRAIN ACCIDENTS—NATIONAL (R. 3982-3983).

The first paragraph of this finding deals generally with the official investigations by the Bureau of Safety of the Interstate Commerce Commission, authorized by Section 3 of the Federal Accident Reports Acts. Mr. Sullivan presented two exhibits, analyzing the printed results of those investigations of freight-train accidents for the 12-year period, 1928-1939 (Exhibit 270, R. 3310-3335), and of passenger-train accidents for the six-year period, 1934-1939 (Exhibit 271, R. 3336-3348).

(1) Freight-Train Accidents (R. 3982-3983):

This sub-finding is based on Mr. Sullivan's Exhibit 270. This 26-sheet exhibit analyzes those investigations in great detail, so far as they are related to freight trains. For convenient reference we insert opposite this page a reproduction of sheet 2 of that exhibit, at the bottom of which there

is a summary of the exhibit. In addition to the statements made in the sub-finding, it will be seen that collisions accounted for 298 of the 561 accidents involving freight trains which were covered in that exhibit. Sheet 3 of the exhibit reproduces the statute which confers broad authority upon the Commission to investigate railroad accidents.

(2) Passenger-Train Accidents (R. 3983):

The companion exhibit to Exhibit 270 is Exhibit 271 which relates to the Interstate Commerce Commission investigation of passenger-train accidents for the years 1934 to 1939. It is a 13-sheet exhibit, sheet 1 of which we insert opposite this page for convenient reference. That summary sheet shows that 232 accidents involving passenger trains are tabulated and explained in the exhibit. Of that number 96 were due to collisions; and 112 of the total number which, of course, included some of the collisions, were due to negligence of employes. Nothing could show more clearly than Exhibits 270 and 271 that any law that requires a railroad to run more passenger-train miles and more freight-train miles than are necessary to handle its traffic, and consequently to increase the number of employees who may be negligent or forgetful, is distinctly a measure that will promote train and train-service accidents of all classes instead of diminishing them.

(f) ACCIDENT STATISTICS—DEFENDANT'S PACIFIC LINES (R. 3983-3985).

This sub-finding is divided into two sub-divisions which are practically self-explanatory:

TABULATION OF DATA
PUBLISHED IN QUARTERLY SUMMARIES OF ACCIDENT INVESTIGATION REPORTS
INTERSTATE COMMERCE COMMISSION - BUREAU OF SAFETY
IN SO FAR AS IT RELATES TO ACCIDENTS INVOLVING PASSENGER TRAINS
IN THE UNITED STATES

YEARS 1934 TO 1939

I. C. C. BUREAU OF SAFETY QUARTERLY SUMMARY OF ACCIDENT INVESTIGATION REPORTS NO.	PERIOD COVERED	TOTAL NO. OF ACCIDENTS, ALL KINDS OF TRAINS INVESTIGATED	NUMBER OF ACCIDENTS INVESTIGATED INVOLVING PASSENGER TRAINS: TOTAL NUMBER INVOLVING PASSENGER TRAINS	COLLISIONS	DERAILMENTS	MISCL.	PERSONS KILLED: PASSENGERS	EMPLOYES	ALL OTHERS	PERSONS INJURED: PASSENGERS	EMPLOYES	ALL OTHERS	TOTAL NUMBER OF PASSENGER TRAINS INVOLVED AS TO VARIOUS LENGTHS IN CARS: 5 AND LESS	6 TO 8	9 TO 11	12 TO 14	OVER 14	TOTAL	PRIMARY CAUSES OF ACCIDENT INVESTIGATED: DEFECTS IN OR FAILURES OF EQUIPMENT	DEFECTS IN OR IMPROPER MAINTENANCE OF WAY AND STRUCTURES	COLLISIONS WITH VEHICLES AT GRADE CROSSINGS	ALL OTHER CAUSES EXCEPT NEGLIGENCE	NEGLIGENCE OF EMPLOYES: CONDUCTORS AND BRAKEMEN	ENGINEMEN AND FIREMEN	JOINT TRAINMEN AND ENGINEMEN	DISPATCHERS AND OPERATORS	OTHER EMPLOYES	JOINT TWO OR MORE OTHER EMPLOYES	TOTAL NEGLIGENCE	NOT DEFINITELY DETERMINED
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)	(s)	(t)	(u)	(v)	(w)	(x)	(y)	(z)	(aa)	(bb)	(cc)	(dd)	(ee)
59	Jan to Mar 1934	24	12	3	9	-	9	14	4	62	35	10	7	6	1	1	-	15	1	-	-	5	1	-	3	2	-	-	-	5	-
60	Apr to June "	13	5	2	3	-	1	5	-	6	10	1	3	1	-	-	-	6	-	-	-	2	1	1	1	1	-	-	-	3	-
61	July to Sept "	17	11	1	8	-	1	12	8	167	19	18	5	1	4	2	-	12	-	-	-	4	3	1	2	1	-	-	-	4	-
62	Oct to Dec "	21	10	1	7	-	2	16	1	73	20	14	5	1	3	2	-	13	-	1	-	5	-	2	3	-	-	-	-	5	1
	TOTAL YEAR 1934	77	38	11	27	-	13	47	13	310	84	43	22	11	10	5	-	46	1	1	-	16	5	4	9	4	-	-	-	17	1
63	Jan to Mar 1935	16	9	4	4	1	-	5	2	238	49	24	3	4	1	1	1	10	1	-	1	1	1	3	2	-	-	-	6	-
64	Apr to June "	17	5	4	-	1	-	3	14	25	11	18	3	-	2	-	-	5	-	-	1	-	-	3	1	-	-	-	4	-
65	July to Sept "	22	6	2	3	1	6	7	3	76	38	13	3	1	1	-	1	6	-	-	2	1	-	1	1	-	1	-	3	-
66	Oct to Dec "	16	8	1	6	1	-	7	1	16	17	9	1	2	1	-	1	5	-	4	2	1	-	-	1	-	-	-	1	-
	TOTAL YEAR 1935	71	28	11	13	4	6	22	20	375	115	64	12	7	5	1	3	30	1	4	6	3	1	7	5	-	1	-	14	-
67	Jan to Mar 1936	28	12	6	5	1	2	12	11	135	43	23	6	6	1	3	-	16	-	1	2	3	-	4	2	-	-	-	6	-
68	Apr to June "	18	5	2	2	1	3	1	3	222	18	5	4	2	-	1	-	6	-	-	1	1	-	1	1	-	-	-	2	-
69	July to Sept "	28	8	4	3	1	-	10	4	97	31	9	5	2	1	1	-	9	-	-	2	3	-	3	2	-	-	-	5	-
70	Oct to Dec "	27	10	3	5	-	11	11	3	152	29	15	6	4	1	2	-	13	1	1	2	4	-	1	2	-	-	-	5	-
	TOTAL YEAR 1936	101	35	15	15	3	16	34	21	606	121	52	21	14	3	7	-	44	1	2	7	11	-	9	7	-	-	-	18	-
71	Jan to Mar 1937	36	11	2	7	2	-	9	3	110	28	11	5	1	4	1	-	11	1	-	4	3	1	1	1	-	-	-	3	-
72	Apr to June "	18	8	1	5	-	-	5	-	130	22	14	5	1	1	2	-	9	1	-	-	1	1	3	1	-	-	-	5	-
73	July to Sept "	17	6	2	2	-	-	3	-	242	29	1	1	1	1	2	-	7	-	1	-	1	1	1	1	-	-	-	3	-
74	Oct to Dec "	19	12	2	11	1	1	13	16	182	18	51	10	5	4	2	1	22	-	1	4	4	-	1	1	-	-	-	6	-
	TOTAL YEAR 1937	110	44	16	25	3	1	30	19	664	117	77	21	8	12	7	1	49	2	2	8	10	-	6	4	-	-	-	19	-
75	Jan to Mar 1938	22	12	7	5	-	3	14	3	110	29	12	7	4	2	2	-	15	-	-	3	-	-	1	4	2	1	-	1	9	-
76	Apr to June "	17	9	4	4	1	42	10	2	143	36	13	2	2	1	3	1	11	-	1	1	3	-	1	2	-	1	-	4	-
77	July to Sept "	17	9	5	4	-	9	9	2	209	51	14	1	5	1	3	-	12	1	-	1	3	1	-	2	-	1	-	4	-
78	Oct to Dec "	24	11	2	6	2	-	3	3	273	25	9	3	2	1	3	-	14	-	1	2	4	-	2	1	1	-	-	4	-
	TOTAL YEAR 1938	80	41	18	19	3	54	36	10	735	141	48	13	11	5	11	1	52	1	4	7	10	2	4	9	3	2	1	21	-
79	Jan to Mar 1939	20	10	5	4	1	-	9	2	120	20	17	5	1	3	1	-	10	-	1	-	3	1	1	1	-	-	1	6	-
80	Apr to June "	26	12	4	6	2	-	4	1	147	31	10	5	1	2	2	-	12	1	1	-	-	1	3	3	-	-	-	6	-
81	July to Sept "	17	11	5	6	-	10	19	-	492	67	21	5	-	4	1	1	11	-	1	-	1	1	2	3	-	1	-	7	-
82	Oct to Dec "	18	12	4	8	-	1	4	-	120	26	21	1	-	1	-	-	2	-	1	-	1	1	-	4	-	2	1	8	-
	TOTAL YEAR 1939	81	45	20	24	3	11	36	3	879	144	69	16	2	10	4	1	35	1	4	1	5	3	7	11	1	3	2	27	-
	GRAND TOTAL SIX YEARS	520	232	96	120	14	105	217	86	3 789	729	350	110	57	37	37	6	267	7	21	42	49	10	50	40	3	8	3	117	1

SUMMARY OF CAUSES OF ACCIDENTS INVESTIGATED, CASUALTIES, AND NUMBER OF PASSENGER TRAINS OF VARIOUS LENGTHS INVOLVED

	PER CENT OF TOTAL ACCIDENTS	NUMBER OF ACCIDENTS	PERSONS KILLED: PASSENGERS	EMPLOYES	ALL OTHERS	PERSONS INJURED: PASSENGERS	EMPLOYES	ALL OTHERS	TOTAL NO. OF PASSR. TRAINS OF VARIOUS LENGTHS IN CARS: 5 AND LESS	6 TO 8	9 TO 11	12 TO 14	OVER 14	TOTAL	TOTAL NUMBER OF TRAINS: 14 CARS AND LESS NUMBER	14 CARS AND LESS PER CENT	OVER 14 CARS NUMBER	OVER 14 CARS PER CENT
	(ff)	(gg)	(hh)	(ii)	(jj)	(kk)	(ll)	(mm)	(nn)	(oo)	(pp)	(qq)	(rr)	(ss)	(tt)	(uu)	(vv)	(ww)
I. Negligence of employes	68.3	232	44	93	7	2 504	449	162	62	30	31	16	3	142	139	97.9	3	2.1
II. Defects in or failures of equipment	3.0	7	1	-	2	108	10	9	2	2	1	2	-	7	7	100.0	-	-
III. Defects in or improper maintenance of way	9.1	21	3	10	3	384	49	37	9	3	7	4	-	23	23	100.0	-	-
IV. Collisions with vehicles at grade crossings	18.1	42	3	42	67	239	78	66	20	8	10	4	1	43	42	97.7	1	2.3
V. Miscellaneous	21.5	50	54	90	7	554	143	76	19	14	8	11	2	52	50	96.2	2	3.8
GRAND TOTAL	100.0	232	105	217	86	3 789	729	350	110	57	57	37	6	267	261	97.8	6	2.2

BRIEF DESCRIPTION OF ACCIDENTS INVOLVING TRAINS WHICH CONSISTED OF MORE THAN 14 CARS

I. C. C. INVESTIGATION NUMBER

1973 A freight train consisting of 41 cars and a caboose collided with the third car from the engine of a 17 car passenger train which was entering a siding. No fatalities resulted, but injury to 35 passengers and 4 Pullman employes occurred. The accident was caused by the failure of the enginemen of the freight train to control the speed of his train approaching the meeting point.

1993 The engine, its tender, and the first 8 cars of a 16 car passenger train were derailed, caused by a washout due to an unusually heavy local rainstorm. There were no fatalities; 18 passengers, 1 dining car employe, 1 train porter and 3 railroad employes were injured.

2016 The engine and first 2 cars of a 16 car passenger train were derailed when it collided with a motor truck at a grade crossing, caused by the motor truck being driven upon the railroad crossing directly in front of the approaching train. There were no fatalities; 9 passengers, 2 dining car employes, 1 Pullman employe, and the driver of the truck were injured.

2212 A 1 car passenger train collided with the 13th car from the engine of a 24 car milk and passenger train which was passing over a cross-over, caused by the failure properly to control the speed of the 5 car train when passing a grade signal and approaching a cross-over at the end of double track. There were no fatalities; the fireman and the baggageman of the milk train and the conductor and fireman of the 5-car train were injured.

2265 The engine and 5 first cars, which had been detached from a 29 car milk train, derailed one of the milk cars while backing into a siding, caused by the separation of a switch point from the stock rail due to the throw-lever of the switch stand being unlatched. The head brakeman was fatally injured.

2314 A 16 car passenger train collided with the side of a 10 car passenger train at a railroad crossing at grade, caused by failure of the enginemen to control the speed of a train in compliance with interlocking signals. One passenger and one employe were killed, and 16 passengers and 2 dining-car employes were injured.

(1) Employes on Duty—All Classes of Service—Train and Train-Service Accidents (R. 3984):

This sub-finding is based on Exhibit 272 (R. 3349). At pages 1985-1986 of the record, Mr. Sullivan explained the reason for the use of locomotive miles to obtain the casualty rate:

"The Court: Mr. Sullivan, I notice on Exhibit No. 262 that you computed your casualty rates on car miles, train miles, locomotive miles, and man hours, whereas on this exhibit the computation apparently is on locomotive miles?

A. It could have been calculated on the other bases, but as I explained before when you take all classes of employes on duty, it includes classes of services where train miles or car miles are not involved; they are not accumulated. I believe I explained my reason on Exhibit No. 262 for showing all of the various bases, not that they were appropriate in all cases but to give as complete a picture of the national showing as could be reflected. Now, the train miles and car miles and man hours can be calculated for Exhibit No. 272; but as to individual railroads the Interstate Commerce Commission statistics do not make all of the various segregations as they do for the railroads as a whole; so we are limited in our ability to draw off statistics by classes where we only use the accident bulletins themselves. . . .

The Court: Do I understand that the Interstate Commerce Commission uses the locomotive miles as their unit of computing these?

A. Locomotive miles and man hours, those two, but they make frequent reference to train miles and other statistics in comparisons.

Mr. Booth: Q. That is where they are considering all employes?

A. That is true.

Q. Train service and nontrain service?

A. I may explain the reason for not using the man hours among the other bases of measurement for a system showing. There are so many varied factors entering into it that rather discolor the comparisons. Various states have different full-crew laws. A considerable mileage of the Southern Pacific is in California and all of the casualty comparisons, either one state with another or even a system showing is distorted by the provisions of the California law."

The rates of decrease correspond favorably with the comparable national statistics.

(2) Trainmen on Duty—All Classes of Service (R. 3984-3985):

This sub-finding is based on Exhibit 273 (R. 3350), and covers Southern Pacific Company-Pacific Lines. The term "trainmen" there used is shown by the exhibit to include engineers, motormen, firemen and helpers, conductors, brakemen and flagmen engaged in passenger, freight, yard or work service; also train baggagemen, but not hostlers. The sources are the Annual Accident Bulletins of the Interstate Commerce Commission.

There is little to add to the finding. The percentages of decrease shown on lines 21, 22 and 23 of the exhibits are practically the same as for the comparable national statistics. The three bases used are locomotive miles, man hours, and car miles. Comparing the five-year period 1935-1939, with the six-year period 1923-1928, line 23 of

the exhibit shows that on the locomotive-mile basis there was a decrease in total casualties of 25.98 per cent; on the man-hour basis a decrease of 14.56 per cent, and on the car-mile basis of 38.16 per cent. An interesting comparison with those figures is afforded by lines 7 and 20, which show that in the year 1923, 51,136,000 locomotive miles were run in the handling of 875,630,000 car miles, while in 1939 but 45,299,000 locomotive miles were run to handle 1,113,826,000 car miles—this despite the inflationary effect on locomotive miles caused by the enforcement of the Arizona law.

(g) NEVADA AND ARIZONA CASUALTY STATISTICS (R. 3985-3996).

This sub-finding consists of nine subdivisions, all of which relate to the comparisons made by us between the accident and casualty results of train operations in Nevada and in Arizona, insofar as relevant to the issues in the case at bar.

For the purposes of this showing appellant used its own reports to the Interstate Commerce Commission of reportable train and train-service accidents and casualties as the basis of the statistical presentation; the appellee afterwards on rebuttal adopting similar source material. Practically speaking, the exhibits relating to the two states merely carry forward to and including the year 1940, the same statistical showings that were made by appellant, as plaintiff in the *First Arizona Train-Limit Case* and in the *Nevada Train-Limit Case*. If one takes the tables in evidence in this branch of the case and stops with 1929, the date when the trial of the *First Arizona Case* began, or

1935, when the casualty tables in the *Nevada Case* were closed, it will be seen that the twelve years which have elapsed since the first case, and the five since the other, have only served to confirm the conclusions drawn by the respective courts as to the weight and value of the Nevada-Arizona comparisons; the same may be said of the Santa Fe casualty statistics (Finding XII(k), R. 4004-4006), which were also on the same basis in each of the three cases. The reason is that the conclusions to be drawn from the comparisons are not mere matters of opinion, but are ultimate facts, and the only facts deducible from a mass of interrelated probative facts.

The tables dealt with in the nine subdivisions of sub finding (g) cover the eighteen years, 1923-1940, inclusive, in both Nevada and Arizona.

Ordinarily we would preface the discussion of their presentation by referring to the evidence offered in support of comparisons between Nevada and Arizona operations in all respects relevant to the issues in this case.

By reason of the arrangement of the findings that course is unnecessary to be followed in this section of the brief, and we respectfully refer the Court to Findings III(c) (R. 3896-3897), IV(c) (R. 3900-3901), and VII(a)(5) (R. 3914-3915).

(1) Propriety and Significance of the Comparison of Nevada-Arizona Statistics on Defendant's Line (R. 3985-3986):

The similarity of operations, traffic, construction, and all other conditions that might have any bearing on the validity of a comparison between Nevada and Arizona

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

COMPARISON OF CASUALTIES TO

ALL CLASSES OF EMPLOYES ON DUTY.
ALL CLASSES OF SERVICE.

SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS,
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
FOR THE YEARS 1923 TO 1940 INCLUSIVE

SOUTHERN PACIFIC LINES
STATES OF NEVADA AND ARIZONA

Year	TOTAL LOCOMOTIVE MILES (Thousands)		CASUALTIES TO ALL CLASSES OF EMPLOYES ON DUTY				TOTAL Casualties		CASUALTIES PER MILLION LOCOMOTIVE MILES	
			Killed		Injured					
	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
1923	4 777	3 782	2	1	65	63	67	64	14.03	17.45
1924	4 350	3 978	6	2	44	62	50	64	11.49	16.09
1925	4 577	5 729	3	1	40	98	43	99	9.39	17.28
1926	4 320	5 997	2	6	36	98	38	104	8.48	17.34
1927	4 466	6 121	2	2	19	58	21	60	4.70	9.80
1928	4 766	6 172	3	4	30	60	33	64	6.92	10.37
Total 1923-1928	27 236	31 779	18	16	224	441	242	457	Average 8.89	Average 14.38
1929	4 835	6 497	2	1	27	78	29	79	6.00	12.16
1930	4 485	5 666	4	2	20	53	24	55	5.35	9.71
1931	3 546	4 872	1	2	10	43	11	45	3.10	9.24
1932	3 045	3 907	1	2	14	34	15	36	4.93	9.21
1933	2 734	3 383	-	1	11	24	11	25	4.02	7.39
1934	3 020	3 660	-	2	14	29	14	31	4.64	8.47
Total 1929-1934	21 665	27 985	8	10	96	261	104	271	Average 4.80	Average 9.68
1935	3 114	4 249	-	1	8	43	8	44	2.57	10.36
1936	3 673	5 202	1	2	11	44	12	46	3.27	8.84
1937	4 000	5 883	1	1	18	66	19	67	4.75	11.39
1938	3 383	4 888	-	1	16	38	16	39	4.73	7.98
1939	3 654	5 230	* 14	2	* 21	43	* 35	43	9.58	8.22
1940	3 933	5 518	1	0	12	34	13	34	3.31	6.16
Total 1935-40	21 757	30 970	17	7	86	268	103	273	Average 4.73	Average 8.81
Total 18 Years	70 678	90 734	43	33	406	968	449	1 001	Average 6.35	Average 11.03

COMPARISON OF AVERAGE CASUALTY RATES DURING DIFFERENT PERIODS

		Nevada	Arizona
Period 1929-1934 compared with 1923-1928	- Decrease	45.9%	32.7%
Period 1935-1940 compared with 1923-1928	- Decrease	46.7%	38.7%
Period 1935-1940 compared with 1929-1934	- Decrease	1.5%	9.0%
Period 1935-1940 compared with 18 year average	- Decrease	25.5%	20.1%

* Includes 13 killed and 12 injured in derailment of streamliner CITY OF SAN FRANCISCO at Harney, Nevada, August 12, 1939, caused by malicious tampering with the track.

COMPARISON OF MAIN TRACK MILEAGE OPERATED AS OF DECEMBER 31, 1939	(miles)	(miles)
ARIZONA - Main line, California-Arizona line to Arizona-New Mexico line (via Gila and Bowie)	455.92	
Main line, Ballton to Picacho via Phoenix	260.42	
Main line, Tucson to Arizona-New Mexico line via Douglas	141.95	
Total main lines		808.29
Branch lines		464.96
Total		1,273.25
NEVADA - Main line, California-Nevada line to Nevada-Utah line	732.56	
Main line, California-Nevada line to Pereley	67.26	
Total main lines		819.82
Branch lines		353.60
Total		1,173.42

in this inquiry, was shown in detail and at great length. It is summarized in this sub-finding with references to the record and to the preceding Findings III(c), IV(c), and VII(a)(5).

For the general purpose of considering trends and comparing accident and casualty frequencies in Nevada with those in Arizona, the following special table, which is constructed by dividing the freight-train car miles, as shown in Exhibit 279 (R. 3374), by the freight-train miles, shown in the same exhibit, may be helpful in arriving at a conclusion. It appears that in 1923 and 1924 the average length of freight trains in Nevada was less than in Arizona, and that the most marked increase began in 1926.

AVERAGE FREIGHT TRAIN LENGTHS ARRIVED AT BY DIVIDING TOTAL FREIGHT-TRAIN CAR MILES BY TOTAL FREIGHT-TRAIN MILES (Data from Exhibit 279).

	Arizona	Nevada		Arizona	Nevada
1923	56.45	49.51	1932	54.73	73.33
1924	55.42	52.44	1933	55.85	76.73
1925	51.04	56.20	1934	56.84	80.71
1926	50.91	62.41	1935	56.48	77.39
1927	50.41	65.22	1936	54.04	75.01
1928	50.98	64.88	1937	53.40	75.42
1929	52.01	64.94	1938	56.52	79.74
1930	54.98	71.85	1939	55.81	79.44
1931	54.43	73.12	1940	56.28	80.39

(2) All Classes of Employes—All Classes of Service (R. 3986-3988):

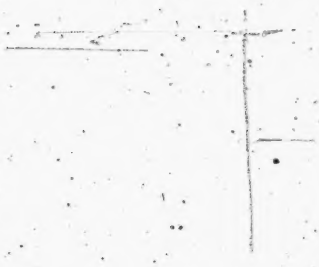
This sub-finding is based on Exhibit 276 (R. 3371), explained by Mr. Sullivan at pages 2000-2002 of the printed record. It presents a comparison of casualties to all classes of employes on duty, and in all classes of service, sustained in train and train-service accidents in Nevada and Arizona for the eighteen years, 1923-1940. Opposite this page we insert a copy of Exhibit 276. The frequency rates

are based on locomotive miles, because the exhibit includes a number of employes whose work cannot be measured in train miles or car miles.

The exhibit shows that the operations in Nevada, considered as a whole, have consistently been much safer, so far as train and train-service accidents were responsible for casualties, than the comparable operations in Arizona. The figures speak eloquently for themselves. While there has been some improvement in Arizona, comparing the first six-year period with the last six-year period, it has not been so great as that in Nevada, where the increase in the average length of freight trains has been marked and continuous. The exhibit includes of course all classes and lengths of trains.

(3) All Classes of Employes—Road Freight Trains (R. 3988-3989):

This sub-finding is based on Exhibit 277 (R. 3372), a copy of which we insert opposite this page. It compares casualties to all classes of employes on duty in road freight-train operation in Nevada, with those in Arizona. Here are shown the freight-train miles and the freight-car miles in each state for each of the 18 years, with the casualties related to that operation, on the million train-mile and 100 million car-mile bases. By this exhibit we begin to see a striking illustration, on the appellant's lines, of the advantages from a safety standpoint of the standard long-train method of operation. In considering this exhibit the Court should also examine the table of average freight train lengths which we submit above in commenting on sub-finding (1).



Superior Court, Pima Co., Arizona
State v. S.P. Co., No. 20087
Defts. Ex. No. ____ (Witness _____)

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

COMPARISON OF CASUALTIES TO

ALL CLASSES OF EMPLOYES ON DUTY, ROAD FREIGHT TRAIN OPERATION

SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
FOR YEARS 1923 TO 1940, INCLUSIVE

SOUTHERN PACIFIC LINES
STATES OF NEVADA AND ARIZONA

	Year	FREIGHT TRAIN MILES (Thousands)		FREIGHT TRAIN CAR MILES (Thousands)		CASUALTIES TO ALL EMPLOYES ON DUTY ROAD FREIGHT TRAIN OPERATION						CASUALTIES PER MILLION TRAIN MILES		CASUALTIES PER 100 MILLION CAR MILES	
						KILLED		INJURED		TOTAL CASUALTIES					
		Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)
(1)	1923	2 259	1 622	111 847	91 565	1	0	48	43	49	43	21.69	26.51	43.81	46.96
(2)	1924	2 035	1 777	106 707	98 490	3	0	27	34	30	34	14.74	19.13	28.11	34.52
(3)	1925	2 262	2 448	127 118	124 954	1	0	34	56	35	56	15.47	22.88	27.53	44.82
(4)	1926	2 077	2 704	129 622	137 660	1	5	18	45	19	50	9.15	18.49	14.66	36.32
(5)	1927	2 146	2 796	139 959	140 957	2	2	14	32	16	34	7.46	12.16	11.43	24.12
(6)	1928	2 418	2 850	156 869	145 287	2	3	23	36	25	39	10.34	13.68	15.94	26.84
(7)	Total 1923-28	13 197	14 197	772 122	738 913	10	10	164	246	174	256	Average 13.18	18.03	Average 22.54	34.65
(8)	1929	2 320	3 083	150 671	160 332	1	0	20	39	21	39	9.05	12.65	13.94	24.32
(9)	1930	2 057	2 574	147 802	141 512	2	2	15	33	17	35	8.26	13.60	11.50	24.73
(10)	1931	1 688	2 205	123 433	120 015	1	0	6	28	7	28	4.15	12.70	5.67	23.33
(11)	1932	1 514	1 849	111 024	101 195	0	1	11	21	11	22	7.27	11.90	9.91	21.74
(12)	1933	1 364	1 632	104 663	91 142	0	1	10	12	10	13	7.33	7.97	9.55	14.26
(13)	1934	1 512	1 800	122 026	102 303	0	1	12	15	12	16	7.94	8.89	9.83	15.64
(14)	Total 1929-34	10 455	13 143	759 619	716 499	4	5	74	148	78	153	Average 7.46	11.64	Average 10.27	21.35
(15)	1935	1 596	2 100	123 508	118 598	0	0	7	22	7	22	4.39	10.48	5.67	18.55
(16)	1936	1 929	2 452	144 689	132 505	0	2	8	20	8	22	4.15	8.97	5.53	16.60
(17)	1937	2 007	2 776	151 385	148 232	1	1	13	34	14	35	6.98	12.61	9.25	23.61
(18)	1938	1 647	2 301	131 331	130 053	0	1	11	19	11	20	6.68	8.69	8.38	15.38
(19)	1939	1 814	2 558	144 106	142 754	1	1	7	19	8	20	4.41	7.82	5.55	14.01
(20)	1940	2 024	2 770	164 482	155 909	1	0	7	18	8	18	3.91	6.50	4.86	11.55
(21)	Total 1935-40	11 039	14 957	859 501	828 051	3	5	53	132	56	137	Average 5.07	9.16	Average 6.52	16.54
(22)	Total 18 Years	34 691	42 297	2 391 242	2 283 463	17	20	291	526	308	546	Average 8.88	12.91	Average 12.88	23.91

		TRAIN MILE BASIS		CAR MILE BASIS	
	COMPARISON OF AVERAGE CASUALTY RATES DURING DIFFERENT PERIODS	Nevada	Arizona	Nevada	Arizona
(23)	Period 1929-1934 compared with 1923-1928 - Decrease	43.4%	35.4%	54.4%	38.4%
(24)	Period 1935-1940 compared with 1923-1928 - Decrease	61.5%	49.2%	71.1%	52.3%
(25)	Period 1935-1940 compared with 1929-1934 - Decrease	32.0%	21.3%	36.5%	22.5%
(26)	Period 1935-1940 compared with 18 year average - Decrease	42.9%	29.0%	49.4%	30.8%

SOUTHERN PACIFIC LINES
STATES OF NEVADA AND ARIZONA

	Year	FREIGHT TRAIN MILES (Thousands)		FREIGHT TRAIN CAR MILES (Thousands)		CASUALTIES TO ALL EMPLOYEES ON DUTY ROAD FREIGHT TRAIN OPERATION						CASUALTIES PER MILLION TRAIN MILES		CASUALTIES PER 100 MILLION CAR MILES	
						KILLED		INJURED		TOTAL CASUALTIES					
	(a)	Nevada (b)	Arizona (c)	Nevada (d)	Arizona (e)	Nevada (f)	Arizona (g)	Nevada (h)	Arizona (i)	Nevada (j)	Arizona (k)	Nevada (l)	Arizona (m)	Nevada (n)	Arizona (o)
(1)	1923	2 259	1 622	111 847	91 565	1	0	48	43	49	43	21.69	26.51	43.81	46.96
(2)	1924	2 035	1 777	106 707	98 490	3	0	27	34	30	34	14.74	19.13	28.11	34.52
(3)	1925	2 262	2 448	127 118	124 954	1	0	34	56	35	56	15.47	22.88	27.53	44.82
(4)	1926	2 077	2 704	129 622	137 660	1	5	18	45	19	50	9.15	18.49	14.66	36.32
(5)	1927	2 146	2 796	139 959	140 957	2	2	14	32	16	34	7.46	12.16	11.43	24.12
(6)	1928	2 418	2 850	156 869	145 287	2	3	23	36	25	39	10.34	13.68	15.94	26.84
(7)	Total 1923-28	13 197	14 197	772 122	738 913	10	10	164	246	174	256	Average 13.18	18.03	Average 22.54	34.65
(8)	1929	2 320	3 083	150 671	160 332	1	0	20	39	21	39	9.05	12.65	13.94	24.32
(9)	1930	2 057	2 574	147 802	143 512	2	2	15	33	17	35	8.26	13.60	11.50	24.73
(10)	1931	1 688	2 205	123 433	120 015	1	0	6	28	7	28	4.15	12.70	5.67	23.33
(11)	1932	1 514	1 849	111 024	101 195	0	1	11	21	11	22	7.27	11.90	9.91	21.74
(12)	1933	1 364	1 632	104 663	91 142	0	1	10	12	10	13	7.33	7.97	9.55	14.26
(13)	1934	1 512	1 800	122 026	102 303	0	1	12	15	12	16	7.94	8.89	9.83	15.64
(14)	Total 1929-34	10 455	13 143	759 619	716 499	4	5	74	148	78	153	Average 7.46	11.64	Average 10.27	21.35
(15)	1935	1 596	2 100	123 508	118 598	0	0	7	22	7	22	4.39	10.48	5.67	18.55
(16)	1936	1 929	2 452	144 689	132 505	0	2	8	20	8	22	4.15	8.97	5.53	16.60
(17)	1937	2 007	2 776	151 385	148 232	1	1	13	34	14	35	6.98	12.61	9.25	23.61
(18)	1938	1 647	2 301	131 351	130 053	0	1	11	19	11	20	6.68	8.69	8.38	15.38
(19)	1939	1 814	2 558	144 106	142 754	1	1	7	19	8	20	4.41	7.82	5.55	14.01
(20)	1940	2 046	2 770	164 482	155 909	1	0	7	18	8	18	3.91	6.50	4.86	11.55
(21)	Total 1935-40	11 039	14 957	859 501	828 051	3	5	53	132	56	137	Average 5.07	9.16	Average 6.52	16.54
(22)	Total 18 Years	34 691	42 297	2 391 242	2 283 463	17	20	294	526	308	546	Average 8.88	12.91	Average 12.88	23.91

		TRAIN MILE BASIS		CAR MILE BASIS	
		Nevada	Arizona	Nevada	Arizona
(23)	COMPARISON OF AVERAGE CASUALTY RATES DURING DIFFERENT PERIODS				
(24)	Period 1929-1934 compared with 1923-1928 - Decrease	43.4%	35.4%	54.4%	38.4%
(25)	Period 1935-1940 compared with 1923-1928 - Decrease	61.5%	49.2%	71.1%	52.3%
(26)	Period 1935-1940 compared with 1929-1934 - Decrease	32.0%	21.3%	36.5%	22.5%
(27)	Period 1935-1940 compared with 18 year average - Decrease	42.9%	29.0%	49.4%	30.8%

COMPARISON OF
MAIN TRACK MILEAGE OPERATED AS OF DECEMBER 31, 1939.

	(miles)	(miles)
ARIZONA - Main line, California-Arizona line to Arizona-New Mexico line (via Gila and Bowie)	455.92	
Main line, Wellton to Picacho via Phoenix	230.42	
Main line, Tucson to Arizona-New Mexico line via Douglas	141.95	
Total main lines		828.29
Branch lines		464.96
Total		1 273.25
NEVADA - Main line, California-Nevada line to Nevada-Utah line	752.56	
Main line, California-Nevada line to Fernley	67.26	
Total main lines		819.82
Branch lines		153.60
Total		973.42

During the six-year period 1923-1928 when, if all of the freight trains operated in those states during that period be considered, there was not a great amount of difference between the average lengths in Arizona and those in Nevada (Nevada, 58.51 cars per train; Arizona, 52.05 cars per train), the casualties on the million train-mile basis are shown to have been 13.18 in Nevada, and 18.03 in Arizona, and on the 100 million car-mile basis 22.54 in Nevada, and 34.65 in Arizona. Then in the second period of six years, 1929-1934, adding together the freight-train car miles in each state for those six years, and dividing the result by the total of the freight-train miles for the six years, we find an average of freight cars per train in Nevada of 72.66 and in Arizona of 54.52. The difference in casualty rates is striking—in Nevada on the train-mile basis 7.46, in Arizona 11.64. On the car-mile basis the comparison is still more significant as it directly bears out our argument that the long-train method of operation is far safer, considering all causes of accidents, than the short train method. On the car-mile basis for the second six-year period, Arizona's average was 21.35, and Nevada's practically one-half of that amount, or 10.27. The comparison between the two states in the third six-year period, 1935-1940, is again of great significance. Obtaining the average length of freight trains during that period by the same statistical method above described, we find for the six years an average length in Nevada of 77.86 cars, and in Arizona of 55.36 cars. On the train-mile basis the casualty rate in Nevada was 5.07 per million train miles, and in Arizona 9.16. On the car-mile basis the superiority of the long-train method of operation

from the safety standpoint is still more apparent, the Nevada rate, per 100 million car miles, being 6.52, and the Arizona rate 16.54. In view of the similarity of operating conditions above referred to, the substantial identity of character and volume of traffic, and all of the other conditions that justify the comparison between Nevada and Arizona, Exhibit 277 standing alone would, we believe, be a sufficient basis for finding that the Arizona law has decreased rather than promoted the safety of freight-train operation.

But we went further and refined the study by producing Exhibit 278 (R. 3373), as a breakdown of Exhibit 277. Exhibit 278 classified the casualties occurring during the 17 years, 1923-1939, by 15 causes, all of which are definitely recognized in the Interstate Commerce Commission classifications of casualties for the purpose of reporting accidents. The year 1940 was not included because when this exhibit was introduced on February 6, 1941 (R. 2002-2003), the 1940 figures were not fully available.

The comparison between Arizona and Nevada with respect to these causes further bears out our contention as to the advantage of long-train operation. Without going into great detail we call attention to the totals. During those 17 years there were, from the 15 causes there tabulated, 528 casualties in Arizona and 300 in Nevada (total car miles for the 17 years, in thousands: in Nevada, 2,226,760; in Arizona, 2,127,554). An analysis of the exhibit will show that as to all of the causes of casualties there shown, which may fairly be said to be related to the number of locomotives or number of train miles operated the Arizona showing is distinctly worse than that of Nevada.

Superior Court, Pima Co., Arizona
State v. S.P. Co. No. 20087
Deft's. Ex. No. 279 (Witness _____)

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

COMPARISON OF CASUALTIES TO

ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN ON DUTY

SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS
REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
FOR YEARS 1923 TO 1940, INCLUSIVE

SOUTHERN PACIFIC LINES
STATES OF NEVADA AND ARIZONA

		FREIGHT TRAIN MILES (Thousands)		FREIGHT TRAIN CAR MILES (Thousands)		CASUALTIES TO ROAD FREIGHT CONDUCTORS BRAKEMEN AND FLAGMEN ON DUTY						CASUALTIES PER MILLION TRAIN MILES		CASUALTIES PER 100 MILLION CAR MILES	
						KILLED		INJURED		TOTAL CASUALTIES					
	Year	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)
(1)	1923	2 259	1 622	111 847	91 565	1	0	43	32	44	32	19.48	19.73	39.34	34.95
(2)	1924	2 035	1 777	106 707	98 490	2	0	22	30	24	30	11.79	16.88	22.49	30.46
(3)	1925	2 262	2 448	127 118	124 954	1	0	31	48	32	48	14.15	19.61	25.17	38.41
(4)	1926	2 077	2 704	129 622	137 660	0	5	14	34	14	39	6.74	14.42	10.80	28.33
(5)	1927	2 146	2 796	139 959	140 957	2	1	13	32	15	33	6.99	11.80	10.72	23.41
(6)	1928	2 418	2 850	156 869	145 287	1	1	21	31	22	32	9.10	11.23	14.02	22.03
(7)	Total 1923-28	13 197	14 197	772 122	738 913	7	7	144	207	151	214	Average 11.44	Average 15.07	Average 19.56	Average 28.96
(8)	1929	2 320	3 083	150 671	160 332	1	0	15	32	16	32	6.90	10.38	10.62	19.96
(9)	1930	2 057	2 574	147 802	141 512	1	1	12	30	13	31	6.32	12.04	8.80	21.91
(10)	1931	1 688	2 205	123 433	120 015	0	0	5	19	5	19	2.96	8.62	4.05	15.83
(11)	1932	1 514	1 849	111 024	101 195	0	0	11	17	11	17	7.27	9.19	9.91	16.80
(12)	1933	1 364	1 632	104 663	91 142	0	1	9	11	9	12	6.60	7.35	8.60	13.17
(13)	1934	1 512	1 800	122 026	102 303	0	1	11	11	11	12	7.28	6.67	9.01	11.73
(14)	Total 1929-34	10 455	13 143	759 619	716 499	2	3	63	120	65	123	Average 6.22	Average 9.36	Average 8.56	Average 17.17
(15)	1935	1 996	2 100	123 508	118 598	0	0	7	17	7	17	4.39	8.10	5.67	14.33
(16)	1936	1 929	2 452	144 689	132 505	0	2	8	13	8	15	4.15	6.12	5.53	11.32
(17)	1937	2 007	2 776	151 385	148 232	1	1	13	31	14	32	6.98	11.53	9.25	21.59
(18)	1938	1 647	2 301	131 331	130 053	0	1	9	17	9	18	5.46	7.82	6.85	13.84
(19)	1939	1 814	2 558	144 106	142 754	1	1	6	14	7	15	3.86	5.86	4.86	10.51
(20)	1940	2 046	2 770	164 482	155 909	0	0	7	15	7	15	3.42	5.42	4.26	9.62
(21)	Total 1935-40	11 039	14 947	849 501	828 051	2	5	50	107	52	112	Average 4.71	Average 7.49	Average 6.09	Average 13.53
(22)	Total 18 Years	34 691	42 297	2 391 242	2 283 463	11	15	257	434	268	449	Average 7.73	Average 10.62	Average 11.21	Average 19.66

		TRAIN MILE BASIS		CAR MILE BASIS	
(23)	COMPARISON OF AVERAGE CASUALTY RATES DURING DIFFERENT PERIODS	Nevada	Arizona	Nevada	Arizona
(24)	Period 1929-1934 compared with 1923-1928 - Decrease	45.6%	37.9%	56.2%	40.7%
(25)	Period 1935-1940 compared with 1923-1928 - Decrease	58.8%	50.3%	69.1%	53.3%
(26)	Period 1935-1940 compared with 1929-1934 - Decrease	24.3%	20.0%	29.3%	21.2%
(27)	Period 1935-1940 compared with 18 year average - Decrease	39.1%	29.5%	46.0%	31.2%

STATES OF NEVADA AND ARIZONA

	Year	FREIGHT TRAIN MILES (Thousands)		FREIGHT TRAIN CAR MILES (Thousands)		CASUALTIES TO ROAD FREIGHT CONDUCTORS BRAKEMEN AND FLAGMEN ON DUTY						CASUALTIES PER MILLION TRAIN MILES		CASUALTIES PER 100 MILLION CAR MILES	
						KILLED		INJURED		TOTAL CASUALTIES					
		Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)
(1)	1923	2 259	1 622	111 847	91 565	1	0	43	32	44	32	19.48	19.73	39.34	34.95
(2)	1924	2 035	1 777	105 707	98 490	2	0	22	30	24	30	11.79	16.88	22.49	30.46
(3)	1925	2 262	2 448	127 118	124 954	1	0	31	48	32	48	14.15	19.61	25.17	38.41
(4)	1926	2 077	2 704	129 622	137 660	0	5	14	34	14	39	6.74	14.42	10.80	28.33
(5)	1927	2 146	2 796	139 959	140 957	2	1	13	32	15	33	6.99	11.80	10.72	23.41
(6)	1928	2 418	2 850	156 869	145 287	1	1	21	31	22	32	9.10	11.23	14.02	22.03
(7)	Total 1923-28	13 197	14 197	772 122	738 913	7	7	144	207	151	214	Average 11.44	Average 15.07	Average 19.56	Average 28.96
(8)	1929	2 320	3 083	150 671	160 332	1	0	15	32	16	32	6.90	10.38	10.62	19.96
(9)	1930	2 057	2 574	147 802	141 512	1	1	12	30	13	31	6.32	12.04	8.80	21.91
(10)	1931	1 688	2 205	123 433	120 015	0	0	5	19	5	19	2.96	8.62	4.05	15.83
(11)	1932	1 514	1 849	111 024	101 195	0	0	11	17	11	17	7.27	9.19	9.91	16 80
(12)	1933	1 364	1 632	104 663	91 142	0	1	9	11	9	12	6.60	7.35	8.60	13.17
(13)	1934	1 512	1 800	122 026	102 303	0	1	11	11	11	12	7.28	6.67	9.01	11.73
(14)	Total 1929-34	10 455	13 143	759 619	716 499	2	3	63	120	65	123	Average 6.22	Average 9.36	Average 8.56	Average 17.17
(15)	1935	1 596	2 100	123 508	118 598	0	0	7	17	7	17	4.39	8.10	5.67	14.33
(16)	1936	1 929	2 452	144 689	132 505	0	2	8	13	8	15	4.15	6.12	5.53	11.32
(17)	1937	2 007	2 776	151 385	148 232	1	1	13	31	14	32	6.98	11.53	9.25	21.59
(18)	1938	1 647	2 301	131 331	130 053	0	1	9	17	9	18	5.46	7.82	6.85	13.84
(19)	1939	1 814	2 558	144 106	142 754	1	1	6	14	7	15	3.86	5.86	4.86	10.51
(20)	1940	2 046	2 770	164 482	155 909	0	0	7	15	7	15	3.42	5.42	4.26	9.62
(21)	Total 1935-40	11 039	14 957	859 501	828 051	2	5	50	107	52	112	Average 4.71	Average 7.49	Average 6.05	Average 13.53
(22)	Total 18 Years	34 691	42 297	2 391 242	2 283 463	11	15	257	434	268	449	Average 7.73	Average 10.62	Average 11.21	Average 19.66

	COMPARISON OF AVERAGE CASUALTY RATES DURING DIFFERENT PERIODS	TRAIN MILE BASIS		CAR MILE BASIS	
		Nevada	Arizona	Nevada	Arizona
(24)	Period 1929-1934 compared with 1923-1928 - Decrease	45.6%	37.9%	56.2%	40.7%
(25)	Period 1935-1940 compared with 1923-1928 - Decrease	58.8%	50.3%	69.1%	53.3%
(26)	Period 1935-1940 compared with 1929-1934 - Decrease	24.3%	20.0%	29.3%	21.2%
(27)	Period 1935-1940 compared with 18 year average - Decrease	39.1%	29.5%	46.6%	31.2%

COMPARISON OF MAIN TRACK MILEAGE OPERATED, AS OF DECEMBER 31, 1939	(miles)	(miles)
ARIZONA - Main line, California-Arizona line to Arizona-New Mexico line (via Gila and Benio)	455.92	
Main line, Wellton to Phoenix via Phoenix	210.42	
Main line, Tucson to Arizona-New Mexico line via Douglas	141.95	
Total main lines		808.29
Branch lines		464.96
Total		1,273.25
NEVADA - Main line, California-Nevada line to Nevada-Utah line	752.56	
Main line, California-Nevada line to Fernley	67.26	
Total main lines		819.82
Branch lines		153.60
Total		973.42

(4) Road Freight Conductors, Brakemen and Flagmen (R. 3989-3990):

This sub-finding is based on Exhibit 279 (R. 3374), a copy of which we insert opposite this page; the exhibit having been prepared by Mr. Sullivan, who explained it, beginning at page 2007 of the printed record:

"The Court: Mr. Sullivan, from these various exhibits it would appear that as compared with the engineers and firemen the conductors, brakemen, and flagmen have a more hazardous occupation?

A. There are more injuries, that is true. Of course, there is an explanation that may be seen by an examination of exhibit No. 278. Engineers and firemen, except in unusual cases, are not required to couple or uncouple locomotives or cars or air hose or steam hose or safety chains. In the performance of their duties, they are always on the moving locomotive, they are not required to get on and off a moving locomotive. They are not required to operate hand brakes, and rarely are required to operate switches unless they are on a light engine, and it is seldom while they are on duty that they are exposed to the other type of injury, being struck or run over by locomotives or cars. As to engineers and firemen, they are exposed to one type of accident that only one member of the train crew is exposed to, and that is collisions, and the collisions and derailments resulting from striking vehicles at grade crossings.

Mr. Strouss: That does not include all collisions, does it, as classified by the Interstate Commerce Commission?

A. Yes, if they were injured, they would be included because this exhibit includes both train and train-service accidents.

Q. When you say 'collisions' that includes collisions between cars that may be switched or collisions of that sort as well as collisions between engines?

A. That is true, but head-on collisions invariably involve one or more locomotives and the engineer and fireman on those locomotives.

Q. Of course the trainman would be exposed if he were on cars that collided in switching?

A. Yes, and the trainmen are exposed to the rear-end collisions."

In addition to the analysis of Exhibit 279 made by the sub-finding, the same observations apply thereto as to Exhibit 277 in comparing one period with another on a train-length basis.

We here print a special table to illustrate that point.

CASUALTIES TO ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN ON DUTY: TRAIN AND TRAIN-SERVICE ACCIDENTS (Data from Exhibit 279).

	Average Cars per Freight Train		Casualties Per Million Train Miles		Casualties Per 100 Million Car Miles	
	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona
1923-1928	58.51	52.05	11.44	15.07	19.56	28.96
1929-1934	72.66	54.52	6.22	9.36	8.56	17.17
1935-1940	77.86	55.36	4.71	7.49	6.05	13.53
18 years	68.93	53.99	7.73	10.62	11.21	19.66

Even if the Arizona law is for the sole benefit of conductors, brakemen, and flagmen, it is apparent that it has entirely failed of its purpose, because it has compelled a method of operation which we show conclusively to be substantially less safe to them than the standard long-train method as defined in the findings.

Superior Court, Pima Co., Arizona
State v. S.P. Co. No. 20087
Defts. Ex. No. 280 (Witness _____)

SOUTHERN PACIFIC COMPANY
(Pacific Lines)

COMPARISON OF CASUALTIES TO

ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN ON DUTY

SUSTAINED IN TRAIN AND TRAIN SERVICE ACCIDENTS

CAUSED FROM SUDDEN STOPPING, STARTING, LURCH AND JERK OF TRAIN

REPORTABLE TO THE INTERSTATE COMMERCE COMMISSION
FOR THE YEARS 1923 TO 1940, INCLUSIVE

SOUTHERN PACIFIC LINES
STATES OF NEVADA AND ARIZONA

	Year	FREIGHT TRAIN MILES (Thousands)		FREIGHT TRAIN CAR MILES (Thousands)		CASUALTIES TO ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN ON DUTY						CASUALTIES PER MILLION TRAIN MILES		CASUALTIES PER 100 MILLION CAR MILES	
						Killed		Injured		Total Casualties					
		Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)
(1)	1923	2 299	1 622	111 847	91 565	0	0	18	7	18	7	7.97	4.32	16.09	7.64
(2)	1924	2 035	1 777	106 707	98 490	0	0	8	5	8	5	3.93	2.81	7.50	5.08
(3)	1925	2 262	2 448	127 118	124 954	0	0	8	7	8	7	3.54	2.86	6.29	5.60
(4)	1926	2 077	2 704	129 628	137 660	0	1	2	10	2	11	.96	4.07	1.54	7.99
(5)	1927	2 146	2 796	139 959	140 957	1	0	6	4	7	4	3.26	1.43	5.00	2.84
(6)	1928	2 418	2 850	156 869	145 287	0	0	14	7	14	7	5.79	2.46	8.92	4.82
(7)	Total 1923-28	13 197	14 197	772 122	738 913	1	1	56	40	57	41	Average 4.32	2.89	Average 7.38	5.55
(8)	1929	2 320	3 083	150 671	160 332	0	0	9	6	9	6	3.88	1.95	5.97	3.74
(9)	1930	2 057	2 574	147 802	141 512	0	0	9	11	9	11	4.38	4.27	6.09	7.77
(10)	1931	1 688	2 205	123 433	120 015	0	0	1	10	1	10	.99	4.54	.81	8.33
(11)	1932	1 514	1 849	111 024	101 195	0	0	6	6	6	6	3.96	3.24	5.40	5.93
(12)	1933	1 364	1 632	104 663	91 142	0	0	4	4	4	4	2.93	2.45	3.82	4.39
(13)	1934	1 512	1 800	122 026	102 303	0	0	5	1	5	1	3.31	.56	4.10	.98
(14)	Total 1929-34	10 455	13 143	759 619	716 499	0	0	34	38	34	38	Average 3.25	2.89	Average 4.48	5.30
(15)	1935	1 596	2 100	123 508	118 598	0	0	4	3	4	3	2.51	1.43	3.24	2.53
(16)	1936	1 929	2 452	144 689	132 505	0	0	6	3	6	3	3.11	1.22	4.15	2.26
(17)	1937	2 007	2 776	151 385	148 232	0	0	4	11	4	11	1.99	3.96	2.64	7.42
(18)	1938	1 647	2 301	131 331	130 053	0	0	6	2	6	2	3.64	.87	4.57	1.54
(19)	1939	1 814	2 555	144 186	142 754	0	0	3	4	3	4	1.65	1.56	2.08	2.80
(20)	1940	2 046	2 770	164 482	135 909	0	0	4	1	4	1	1.96	.36	2.43	.64
(21)	Total 1935-40	11 039	14 957	859 501	828 051	0	0	27	24	27	24	Average 2.45	1.60	Average 3.14	2.90
(22)	Total 18 Years	34 691	42 297	2 391 242	2 283 463	1	1	117	102	118	103	Average 3.40	2.44	Average 4.93	4.51

	COMPARISON OF AVERAGE CASUALTY RATES DURING DIFFERENT PERIODS	TRAIN MILE BASIS		CAR MILE BASIS	
		Nevada	Arizona	Nevada	Arizona
(24)	Period 1929 - 1934 compared with 1923-1928 - Decrease	24.8%	-	39.3%	4.5%
(25)	Period 1935 - 1940 compared with 1923-1928 - Decrease	43.3%	44.6%	57.5%	47.7%
(26)	Period 1935 - 1940 compared with 1929-1934 - Decrease	24.6%	44.6%	29.9%	45.3%
(27)	Period 1935 - 1940 compared with 18 year average - Decrease	27.9%	34.4%	36.3%	35.7%

FOR THE YEARS 1923 TO 1940, INCLUSIVE

SOUTHERN PACIFIC LINES
STATES OF NEVADA AND ARIZONA

	Year	FREIGHT TRAIN MILES (Thousands)		FREIGHT TRAIN CAR MILES (Thousands)		CASUALTIES TO ROAD FREIGHT CONDUCTORS, BRAKEMEN AND FLAGMEN ON DUTY						CASUALTIES PER MILLION TRAIN MILES		CASUALTIES PER 100 MILLION CAR MILES	
						Killed		Injured		Total Casualties					
		Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona	Nevada	Arizona
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)
(1)	1923	2 259	1 622	111 847	91 565	0	0	18	7	18	7	7.97	4.32	16.09	7.64
(2)	1924	2 035	1 777	106 707	98 490	0	0	8	5	8	5	3.93	2.81	7.50	5.08
(3)	1925	2 262	2 448	127 118	124 954	0	0	8	7	8	7	3.54	2.86	6.29	5.60
(4)	1926	2 077	2 704	129 622	137 660	0	1	2	10	2	11	.96	4.07	1.54	7.99
(5)	1927	2 146	2 796	139 999	140 957	1	0	6	4	7	4	3.26	1.43	5.00	2.84
(6)	1928	2 418	2 850	156 869	143 287	0	0	14	7	14	7	5.79	2.46	8.92	4.82
(7)	Total 1923-28	13 197	14 197	772 122	738 913	1	1	56	40	57	41	Average 4.32	2.89	Average 7.38	5.55
(8)	1929	2 320	3 083	150 671	160 332	0	0	9	6	9	6	3.88	1.95	5.97	3.74
(9)	1930	2 057	2 574	147 802	141 512	0	0	9	11	9	11	4.38	4.27	6.09	7.77
(10)	1931	1 688	2 205	123 433	120 015	0	0	1	10	1	10	.59	4.54	.81	8.33
(11)	1932	1 514	1 849	111 024	101 195	0	0	6	6	6	6	3.96	3.24	5.40	5.93
(12)	1933	1 364	1 632	104 663	91 142	0	0	4	4	4	4	2.93	2.45	3.82	4.39
(13)	1934	1 512	1 800	122 026	102 303	0	0	5	1	5	1	3.31	.56	4.10	.98
(14)	Total 1929-34	10 455	13 143	759 619	716 499	0	0	34	38	34	38	Average 3.25	2.89	Average 4.48	5.30
(15)	1935	1 596	2 100	123 508	118 598	0	0	4	3	4	3	2.51	1.43	3.24	2.53
(16)	1936	1 929	2 452	144 689	132 505	0	0	6	3	6	3	3.11	1.22	4.15	2.26
(17)	1937	2 007	2 776	151 385	148 232	0	0	4	11	4	11	1.99	3.96	2.64	7.42
(18)	1938	1 647	2 301	131 331	130 053	0	0	6	2	6	2	3.64	.87	4.57	1.54
(19)	1939	1 814	2 556	144 106	142 754	0	0	3	4	3	4	1.65	1.56	2.08	2.80
(20)	1940	2 046	2 770	164 482	155 909	0	0	4	1	4	1	1.96	.36	2.43	.64
(21)	Total 1935-40	11 039	14 957	859 501	828 051	0	0	27	24	27	24	Average 2.45	1.61	Average 3.14	2.90
(22)	Total 18 Years	34 691	42 297	2 391 242	2 283 463	1	1	117	102	118	103	Average 3.40	2.44	Average 4.93	4.51

		TRAIN MILE BASIS		CAR MILE BASIS	
		Nevada	Arizona	Nevada	Arizona
(23)	COMPARISON OF AVERAGE CASUALTY RATES DURING DIFFERENT PERIODS				
(24)	Period 1929 - 1934 compared with 1923-1928 - Decrease	24.8%	-	39.3%	4.7%
(25)	Period 1935 - 1940 compared with 1923-1928 - Decrease	43.3%	44.6%	57.5%	47.7%
(26)	Period 1935 - 1940 compared with 1929-1934 - Decrease	24.6%	44.6%	29.9%	45.3%
(27)	Period 1935 - 1940 compared with 18 year average - Decrease	27.9%	34.4%	36.3%	35.7%

COMPARISON OF MAIN TRACK MILEAGE OPERATED AS OF DECEMBER 31, 1939

	(miles)	(miles)
ARIZONA - Main line, California-Arizona line to Arizona-New Mexico line (via Gila and Bowie)	455.92	
Main line, Wellton to Picacho via Phoenix	210.42	
Main line, Tucson to Arizona-New Mexico line via Douglas	141.95	
Total main lines		808.29
Branch lines		464.96
Total		1,273.25
NEVADA - Main line, California-Nevada line to Nevada-Utah line	752.36	
Main line, California-Nevada line to Fernley	67.26	
Total main lines		819.82
Branch lines		153.60
Total		973.42

(5) Slack-Action Casualties to Trainmen—Nevada-Arizona (R. 3990-3993):

This sub-finding is based on Exhibit 280 (R. 3375), and also Nos. 274 and 275 (R. 3351-3370), which contain the detailed lists of all the reportable casualties to employes on duty, in Nevada and Arizona, sustained in train and train-service accidents 1923-1940, including those shown in Exhibit 280.

We insert opposite this page a copy of Exhibit 280. That exhibit covers the years 1923 to 1940 inclusive, and is confined to the states of Nevada and Arizona and to casualties to road freight conductors, brakemen and flagmen on duty, sustained in train and train-service accidents caused from sudden stopping, starting, lurch and jerk of trains—the so-called "slack-action" accidents—related to both train-mile and car-mile bases.

As pointed out in the sub-finding, the infrequency of occurrence of that type of casualty makes it difficult to make any adequate statistical presentation thereof. During the past six years, 1935-1940, appellant (line 21, Exhibit 280) operated over 11 million train miles in Nevada and very nearly 15 million in Arizona, and handled nearly 860 million freight-car miles in Nevada, and over 828 million in Arizona. Yet in neither of those states was there during that period any death attributable to slack-action, and but 27 reportable injuries in Nevada and 24 in Arizona; slightly more than 3 such casualties in Nevada per hundred million car miles, and slightly less than 3 in Arizona. This cannot fairly be called an exposure to any special hazard under present operating conditions and with the existing motive power and equipment. But as we have shown, the necessity for additional and unneces-

sary starting and stopping of trains is merely an added inducement to slack-action, which is at least as frequent train for train in short-train as in long-train operation.

Further considering this exhibit, it is obvious from what has been said before that the car-mile basis is the fair one to apply to this comparison; and the comparisons on that basis are fully analyzed in the finding.

(6) Caretakers in Cabooses—Nevada-Arizona (R. 3993):

This sub-finding is self-explanatory and is based on Exhibit 288 (R. 382) and the testimony (R. 2027-2029) shown in the annotation. Of course, persons riding on freight trains are equally entitled to protection with those operating them, and the evidence shows that the class of licensees described in the sub-finding has uniformly been safer in Nevada than in Arizona.

(7) Serious Casualties—Nevada-Arizona (R. 3994):

This sub-finding is annotated to the record (Exhibits 274, R. 3351; 275, R. 3364; 281, R. 3376), and requires no further comment.

(8) Casualties Classified—Nevada-Arizona (R. 3994-3995):

This sub-finding is based on the evidence and exhibits shown in the annotations thereto.

No matter what period or class of casualties is viewed in the summary table set forth in the finding, it is evident that the Nevada road freight-train operation has uniformly been substantially safer than that in Arizona. In the past six years, ending with the year 1940 (Exhibit 279, line 21; R. 3374), Nevada road freight trains handled 859,501,000 car miles with 11,039,000 train miles, while Arizona used

14,957,000 train miles to handle 828,051,000 car miles. The 3,918,000 additional and obviously unnecessary train miles used to handle an approximately 4 percent smaller volume of loaded and empty cars can fairly be held to have been responsible for the adverse Arizona showing made in the special table printed in this sub-finding (R. 3994): in Arizona total casualties to road freight conductors, brakemen, and flagmen, 112, in Nevada 52; in Arizona when operating hand brakes, 16, in Nevada 4; in Arizona, getting on or off cars or locomotives 27, in Nevada 9 (this classification is directly related to the stopping and starting of trains as well as to their handling while on the road); miscellaneous train and train-service accidents, 61 in Arizona and 35 in Nevada.

(9) Derailments Reportable as Train Accidents—Nevada-Arizona (R. 3995-3996):

This sub-finding is based on elaborate detailed exhibits (Exhibits 286, R. 3383; 287, R. 3384; 288, R. 3384; 389, R. 3565) which are referred to in the annotation, and a summary of which is printed as a special table in the finding. We refer again to the illustration we gave under finding (8) immediately preceding, in which we compared the train miles and car miles in Nevada and Arizona for the six-year period ending with 1940. In each of the six-year periods, as well as in the 18 years covered by the tables, the comparison is uniformly favorable to Nevada when the number of such derailments is considered on either the train-mile or car-mile basis; so it is as to damage to property, with two slight exceptions which are apparent from the table. And a very significant fact is, as stated in the proposed finding, that of the 70 derailments

in Nevada 35 occurred on long trains and 35 on short trains, with the result that, during the 18 years covered by the tables, 141 of the 176 derailments reported as train accidents in both states occurred to trains of 70 cars or less.

(h) COMPARISON OF SHORT AND LONG-TRAIN PERIODS IN NEVADA WITH EACH OTHER (R. 3996-3997).

This sub-finding is annotated to the record (see Exhibit 282, R. 3377, in particular), and is so explicit and illustrative that it seems to require no comment, except to say that the comparison between the three-year long-train period and the three-year short-train period in Nevada is entirely consistent with all of the other showings of the relative hazard in the two classes of operation. The year 1940 was not available at the time the exhibit was prepared on which this sub-finding is based, but the other exhibits show that its use would not have invalidated the comparison.

(1) Comparison Nevada with Arizona—Three-Year Periods (R. 3997-3998):

This sub-finding includes a special table made up from Exhibits 277 (R. 3372) and 282 (R. 3377), and compares Arizona and Nevada operations for the three years 1923-1925, and the three years 1938-1940, showing the number of casualties on road freight trains to all employes on duty in train and train-service accidents. The special table demonstrates that notwithstanding the improvement in roadbed, signals, equipment, etc., in both states, Nevada, whose average number of cars in freight trains increased from 52.73 to an average of 79.88, had a substantially better safety performance than Arizona, with a corresponding increase from 53.88 to but 56.19.

(i) CASUALTY STATISTICS—DEFENDANT'S LOS ANGELES DIVISION (R. 3999-4000).

It was not our intention to make a detailed showing of casualties on the Los Angeles Division and relate them to any accepted basis for ascertaining frequency rates. There was no more reason for us to select the Los Angeles Division for that purpose than any other of the California divisions, or the operations in Oregon. There is evidence in the record (R. 2166) that the California Full-Crew Law requires substantially more brakemen in freight-train operation than are required in either Nevada or Arizona. For that reason, as explained by Mr. Sullivan (R. 1985), statistics of reportable casualties to train crews would not be on a comparable basis. Each additional employe furnishes additional exposure to whatever hazard there may be incident to the operation of the particular train and additional opportunity for human failure. This is especially true as regards accidents to men in cabooses, where additional brakemen ride while the trains are under way. But in spite of our first intention, the Los Angeles Division came into the case and thus, despite its lack of entire comparability because of the full-crew law provisions just mentioned, there was considerable evidence produced regarding it, which is fully analyzed in the finding.

(j) ACCIDENT AND CASUALTY STATISTICS—DEFENDANT'S LINES IN NEW MEXICO (R. 4001-4004).

Standard long-train practice has never been fully adopted on appellant's lines in New Mexico, primarily because of the controlling extra-territorial influence of the Arizona law on appellant's operations between the eastern

boundary of Arizona and Lordsburg, and also because that compelled operation has a bearing-down effect on the length of freight and passenger trains between Lordsburg and El Paso. The result has been that in respect to the average length of trains, New Mexico operations have been between the standards of Arizona and those of Nevada, but very much closer to the former than to the latter. Results of those operations from a casualty as well as a train-accident standpoint are also between those attained in the two states, and serve in a measure as a check upon and confirmation of the individual statistics in those two states, and the preceding comparisons between them.

(1) Casualties to Persons—Freight-Train Operation (R. 4001-4003):

This sub-finding is annotated to eight exhibits (185, R. 3077; 277, R. 3372; 279, R. 3374; 280, R. 3375; 338, R. 3465; 364, R. 3518; 387, R. 3548-3557; and 397, R. 3578), the significant figures of which are put together in narrative form in the finding. Those exhibits confirm the position of the appellant that its operations can be more safely conducted by the standard long-train method of operation.

(2) Train Accidents—Freight-Train Operation (R. 4003-4004):

This sub-finding is annotated to the exhibits (Nos. 280, R. 3375; 289, R. 3386-3393; 290, R. 3399-3408; 340-349, R. 2680-2682; 388, R. 3558-3567) upon which it is based and completely self-explanatory.

(3) Passenger-Train Accidents and Casualties (R. 4004):

Appellant's passenger-train experience in New Mexico, as shown by Exhibits 362 (R. 3501) and 368 (R. 3527),

summarized in this sub-finding, is in further confirmation of our statement that no plausible theory can be seriously advanced in support of the limitation of passenger trains to the maximum of 14 cars.

(k) SANTA FE CASUALTY STATISTICS—COMPARING SHORT-TRAIN AND LONG-TRAIN OPERATIONS (R. 4004-4006).

This sub-finding is supported by the testimony and exhibits referred to in the annotation thereto. The statistical exhibits summarized in the tables printed in the finding are merely continuations on the same bases as those used by the same railroad in the *First Arizona Train-Limit Case*, and offered by the same witnesses and accepted by the court in the *Nevada Train-Limit Case*. They are strongly confirmatory of the position we have taken with respect to the safety of freight-train operation under the Arizona method, as contrasted with the method used in Nevada and generally throughout the nation. While the case did not call for as elaborate a showing of Santa Fe operations as of those of the appellant, we did, however, lay the foundation for its safety exhibits by detailed testimony of its operating and accounting officials.

We submit that the particular value of the Santa Fe safety showing is twofold. First, it is the only major railroad other than the appellant that operates in Arizona. Second, the trains considered in its safety tables are, so far as the through main-line trains are concerned, the same trains in the long-train as in the short-train territory shown in the table, carrying for the most part the same cars and commodities between California and states east of New Mexico in both east and west-bound move-

ment. The tables cover casualties resulting to road freight trainmen and enginemen on duty from the operation of the through, local and mixed road freight trains, and occurring while on or getting on or off road freight trains, as such casualties were reported to the Interstate Commerce Commission. That group of casualties includes all of the casualties classified under the various code numbers included within the general definition of sudden stop, lurch or jerk of car or train. They also include all or practically all of the accidents that may happen to road freight conductors and brakemen in the additional stopping and starting, signalling, and protection of trains incident to the multiplication of meets and passes by the running of unnecessary trains, additional to those which normally would be required to handle the same volume of traffic. The run of these through trains between Needles, California, and Gallup, New Mexico, is, of course, controlled by the Arizona law; that between Gallup and Belen is somewhat modified as to eastbound trains by the effect of the Arizona law, just as the appellant's operations east of Lordsburg, New Mexico, are modified. The operation between Belen and Clovis is an unrestricted and unmodified standard long-train operation. The average freight-train lengths of 72.69 cars in 1929, and 71.7 in 1939, indicate a very much higher average in through freight trains, as the averages just stated included local and mixed road freight trains. This conclusion is confirmed by the exhibit introduced by witness Weeks of the Santa Fe (Exhibit 138, R. 3007-3009), which for the ten-day typical period selected by him showed representative freight-train lengths in the New Mexico territory east of Gallup as follows: of a total of 263 trains, 113 were of 70 cars or

less; 123 were of 71 to 100 cars; and 27 were of 101 to 125 cars.

We do not suggest, and have not at any time suggested, that the findings of the Special Master or the three-judge court in either the *Nevada Case* or the *First Arizona Case* are binding in this action, even though they were upon the same general issues which are controlling here and based upon the same line of, and in many cases the identical, testimony now in the instant record. We have no more right to suggest compliance with those findings than the appellee has to insist that the *Oklahoma* opinion, based on affidavits submitted without the privilege of cross-examination, is controlling here. But the fact remains, for whatever it may be worth, that in the two similar cases to which this appellant has been a party two Special Masters and six Judges arrived at the same conclusion with respect to the ultimate facts, and did so upon practically the same statistical showings which are merely strengthened by being brought down to include the period which has intervened since those cases were decided. It can be said of the Santa Fe statistics that they clearly illustrate the fact that no matter how the theory of greater safety by long-train operation may be tested statistically, the same result is always obtained and the same conclusion follows.

Truth is always consistent.

(1) CHESAPEAKE & OHIO RAILWAY—CASUALTY STATISTICS (R. 4006-4007):

This sub-finding is based on the exhibits (Nos. 116-118, R. 2976-2978; 121-123, R. 2981-2983) and testimony (R.

867, 872-884) referred to in its footnote. In the body of the sub-findings we have inserted tables giving summaries of the Chesapeake & Ohio exhibits. That railroad was selected because of its outstanding character as an operator of long freight trains, and its highly successful record from a casualty standpoint. The tables are self-explanatory. They stop with 1938, because they were taken from the Annual Statistics and Annual Accident Bulletins of the Interstate Commerce Commission, the latest available at the time the testimony was given having been those for 1938. The testimony of its operating official, Mr. Beale, should leave no doubt of the admissibility of the results of these operations in arriving at findings on the general safety issue. Similar statistics from the Chesapeake & Ohio, brought down to the year 1934, were before the Master and Court in the *Nevada Train Limit Case*.

(m) DECREASE IN CASUALTIES—NEVADA COMPARED WITH ARIZONA (R. 4008-4009).

This sub-finding brings together in a convenient and graphic form the three important exhibits, Nos. 277 (R. 3372), 279 (R. 3374) and 280 (R. 3375), which relate to the reportable casualties in road freight-train operation shown in the three special tables printed in the sub-finding and which summarize those exhibits. These tables are wholly self-explanatory.

(n) CASUALTIES WHILE TRAIN STANDING (R. 4009-4010).

Obviously the occurrence of casualties happening while the train is standing cannot be related to the length of the train although the evidence shows, as abstracted in the finding, that 58 of 73 casualties of that character in Ne-

vada in 18 years occurred on short trains, and, of course, all of those accidents in Arizona were on short trains. It would seem to be evident that any unnecessary increase in the number of trains would have a tendency to increase the number of accidents that occur while trains are standing, particularly in freight service where brakemen are required to get off and on the train for the purpose of flagging. The increase of hazard is in proportion not merely to the additional number of trains but to the increased number of stops made necessary by the running of unnecessary trains.

(o) PASSENGER-TRAIN SAFETY (R. 4010-4013).

The showing of casualties under this subheading is divided between those occurring nationally and those occurring on appellant's lines in Nevada and Arizona. Back of that showing there is the testimony relating to the development of passenger-train locomotives and passenger cars which has been substantially uniform throughout the United States. There is also the testimony of Mr. Parke, Chief Engineer of The Pullman Company, showing the great development in Pullman equipment.

Under sub-finding "XII(e)(2) Passenger Train Accidents" (R. 3983) the discussion covers the Bureau of Safety Investigations of 320 passenger-train accidents during the six-year period 1934-1939, and refers to Exhibit 267 (R. 3305). Over 18 per cent of the passenger-train accidents so investigated were due to collisions with vehicles at grade crossings. The effect of an arbitrary limitation of the length of trains and the consequent increase in the hazard of grade-crossing accidents is discussed hereafter

under Sub-finding (p), "Grade-Crossing Accidents"; but it should be remembered, and the reports of the Bureau of Investigations show, that every collision at a grade crossing carries with it the hazard of the derailment of the locomotive and the following cars, so that whatever lessens the possibility of grade-crossing accidents increases the safety of the employes and passengers on the trains that may collide with the vehicles.

(1) Passenger Casualties—Class I Railroads of the United States (R. 4010):

This sub-finding is based on Exhibit 267 (R. 3305) and needs no amplification.

(2) Passenger Casualties—Nevada and Arizona (R. 4010-4013):

This sub-finding is based on Exhibits 291 and 292 (R. 3409-3421), and analyzes them in some detail. So far as safety is concerned, no form of transportation has made greater progress since 1912 than the passenger train. This is graphically shown by the testimony as well as by the exhibits showing chronologically the development of passenger-car equipment, including Pullman cars. The wooden passenger car is a thing of the past. The rules for reporting accidents are such that necessarily the one-day disability provision results in a great number of reportable accidents that, if they occurred to a pedestrian on the street, would never be reported to the police or find their way into newspaper columns. But they are reported by railroads nevertheless.

Although passenger-train operations, except for the average length of the train, are practically the same in Arizona as they are in Nevada, we find the showing of

casualties adverse to Arizona as related in the finding. Again we say that we are completely at a loss to imagine any even slightly plausible argument in favor of the limitation to fourteen cars as applied to the passenger train of today. If ever a litigant attacking a police power statute has succeeded in proving the "universal negative" to a moral certainty and beyond any reasonable doubt, the appellant has done so, we believe, in the case at bar with respect to the passenger-train limitation. The only individuals that can possibly benefit are those who are unnecessarily employed, and that is not a ground for sustaining an arbitrary regulation of common-carrier transportation.

(p) GRADE-CROSSING ACCIDENTS (R. 4013-4015).

This sub-finding is copiously annotated to the record. It would seem to be perfectly clear that whatever hazard may exist at grade crossings from the running of ten trains of any character across those crossings would be proportionately reduced by the running of but seven trains to handle the same cars and the same traffic. The police power of the State has been and constantly is invoked to compel separation of grades, automatic and manual signals, and other forms of protection to the joint users of grade crossings. But the statute under consideration makes no such attempt and could not be held to do so by indirection. Instead of decreasing hazards by affording fewer opportunities for collisions, it obviously and directly increases those hazards.

(q) FREIGHT-TRAIN DERAILMENTS—NEVADA, ARIZONA AND NEW MEXICO (R. 4015-4017).

Seven exhibits (Nos. 286-290, R. 3383-3408; 388, R. 3558-3564; and 389, R. 3565), bear on this subject. A train derailment is frequently but not always initiated by the derailment of a locomotive, as the detailed statistics show. And, of course, a forced increase in the number of locomotives would, other things being equal, result in a greater number of derailments. The improvements in roadbeds, roadway structures, motive power, signals and equipment have, as shown by the statistics, resulted in a marked decrease in the number of derailments, but notwithstanding those improvements Arizona, as in all other matters pertaining to safety, continues to lag behind. The conclusion is inescapable that this is directly due to the dead hand of the 1912 law.

(r) EMERGENCY APPLICATIONS OF AIR BY ENGINEER (R. 4017).

This sub-finding shows by citations to the evidence (R. 2804, 2817-2818) and exhibits (Nos. 274, 275; R. 3351-3370) that there is nothing whatever in the claim that such emergency applications can be prevented or the number reduced by limiting the cars in a train.

(s) HEAVIER GRADUATING SPRING (R. 4017-4018).

This sub-finding is on a point which was made mention of by the defense and the employe organizations in the *First Arizona Train-Limit Case*. As shown by the evidence, slack-action accidents on either long or short trains, due to weak graduating springs, are no longer to be considered a factor of any consequence in train operation.

(t) ARIZONA LONG-TRAIN OPERATIONS, 1940 (R. 4018-4019).

The operation in Arizona in March and April, 1940, of 62 long passenger trains with 15,587-train miles and 243,749 car miles, and 302 long freight trains with 37,257 train miles and 3,180,278 car miles (average length 85.36 cars) resulted in a striking confirmation of appellant's claim that greater safety of operation could be secured by adopting the standard long-train method of operation in Arizona; this in spite of the fact that primarily because of the shortness of the sidings and passing tracks, full standard long freight-train operation was not possible of accomplishment for the reasons stated by our witnesses.

Sullivan, R. 2053-2055, 2057-2059.
See also *Finding* IX(a) (R. 3947-3948).
Exhibits 246 (R. 3255), 294 (R. 3423), 295 (R. 3424).

We consider that this operation furnished a demonstration of the practicability of safer train operation *in Arizona* if the law is lifted. It added to and confirmed the uniform showing made by the casualty statistics—national, state, and division.

(u) EMPLOYES AFFECTED BY THE TRAIN-LIMIT LAW (R. 4019-4021).

This sub-finding assembles, brings together, and gives record references to the evidence relating to the question of just who are, or may be, affected by enforcement or disregard of the law. The Legislature of 1912 did not see fit to give in the title of the statute, or by way of recital or preamble, any specific reason for its enactment; nor did it describe any condition, the result of which the law was desired to prevent or minimize. But it

is common knowledge that laws of that character have been urged nationally, as well as in the Legislatures of most of the states, by the employe organizations usually referred to as the Train-Service Brotherhoods. Nearly always their primary argument has been that the limitation of the length of trains was necessary to prevent or minimize casualties and other occurrences resulting from slack-action shock.

Counsel for the appellee have adopted this theory; it was forecast in their arguments on objections to testimony and their questions on cross-examination, and formed the principal basis of their presentation of the safety issue to the State Supreme Court. That theory of the law results in the position that the Legislature, under some hidden theory or undeclared intention, may have legislated in behalf of a supposed greater freedom from a minor class of accident for a limited group of employes, regardless of the law's effect on the hazards to all classes of employes who may and occasionally do suffer casualties from the operation of freight and passenger trains, as well as on the hazards to the public, which we have endeavored to describe in the preceding discussion. This sub-finding puts in condensed and narrative form a description of the classes of employes who are adversely affected by the legislation. We have endeavored to show, and we have shown, that the employes for whose protection the law is ostensibly designed are really placed in a more precarious condition by compelled short-train operation, than if appellant were permitted to adopt and practice the standard long-train method of operation.

(v) INCREASE IN ACCIDENT AND CASUALTY HAZARD INHERENT IN INCREASE OF TRAIN UNITS (R. 4021-4022).

The evidence shows beyond any question or doubt that the enforced limitation of train lengths in Arizona has resulted in no decrease of hazard to any group of employes or persons from any recognized cause of reportable casualties; that it has prevented the improvements in roadbed, signals and equipment that have taken place since 1923 from having their full and intended effect and consequently has increased the hazard of train operation instead of lessening it. To illustrate this conclusion we now print a special series of comparisons taken from exhibits with which we have dealt separately under preceding sub-section heads.

COMPARISONS OF IMPROVEMENT PERCENTAGES IN CASUALTY RATES AS SHOWN BY APPELLANT'S STATISTICAL EXHIBITS

Class I Railroads of U. S. A.

Five-year period 1935-1939 compared with six-year period 1923-1928

		PERCENTAGES OF DECREASE BASES	
		Car Mile	Train Mile
Ex.	(Train and Train Service Accidents)		
262	All classes employes on duty	70.33%	66.99%
263	Road Trainmen and Enginemen on duty	69.21%	65.73%
264	Road Freight Trainmen and Enginemen on duty	69.32%	66.15%
265	Road Freight Conductors, Brakemen and Flagmen on duty (all R. R.'s U. S.)	66.21%	62.72%
266	Same employes as Ex. 265, "slack action" casualties	65.29%	61.82%

Nevada-Arizona

Six-year period 1935-1940 compared with six-year period 1923-1928

Ex.		PERCENTAGES OF DECREASE (Car Mile) Nev.	Ariz.	(Train Mile) Nev.	Ariz. (Loco. Miles)
	(Train and Train Service Accidents)				
276	All classes of employes on duty in all classes of service			46.7%	38.7%
277	All classes of employes on duty—Road Freight Train Operation	71.1%	52.3%	61.5%	49.2%
279	Road Freight Conductors, Brakemen, Flagmen on duty	69.1%	53.3%	58.8%	50.3%
280	Same classes as Ex. 279, "slack-action" casualties	57.5%	47.7%	43.3%	44.6%

This concluding sub-finding summarizes and puts in bold relief the additional opportunities for casualties afforded by requiring the appellant to operate additional and unnecessary trains. It concludes with the statement of an ultimate fact which we believe is fully supported by the evidence, and which we desire to repeat in closing our discussion of Chapter XII of the Findings:

> **"Thus the Arizona Train-Limit Law not only bears no reasonable relation to safety but, to the contrary does, and if enforced will continue to, impair and lessen substantially the safety of defendant's train operations in Arizona and the adjacent affected territory."**

XIII.

ANALYSIS OF CERTAIN CONTENTIONS ADVANCED BY PLAINTIFF (R. 4002-4032).

In the interest of a complete disposition of certain contentions suggested in appellee's rebuttal testimony, which

have not been separately treated in preceding findings, appellant as defendant proposed and the trial court adopted a series of findings upon the following emphasized points:

(s) THE CONTENTION THAT, WITH LONG-TRAIN OPERATION, TRAINS WOULD BE DELAYED AT MEETING AND PASSING POINTS BECAUSE OF INADEQUATE SIDING CAPACITIES (R. 4022-4023).

The contention covered by the finding captioned as above was suggested in the cross-examination of appellant's witness Herrell (R. 2203-2204), and also in the direct testimony of witness Fail (R. 2554). The point was not developed to any great extent, apparently for the reason that counsel became convinced that it was wholly untenable.

The fact is that the delay incident to the single or simple "saw-by", the only type referred to in appellee's rebuttal testimony, is comparatively slight, because the operation is not at all complicated. Even these minor delays would, however, be completely eliminated, and, if the siding extensions contemplated by appellant in connection with long-train operation were to be constructed, would not affect operations even in the territory east of Lordsburg where they now occasionally occur. As stated elsewhere (Finding IX-h, R. 3948-3950), appellant did not at the time contemplate any attempt at unrestricted long-train operation with present siding capacities, even if the law's restrictions should be removed in the near future; for the time being, long-train operation would be largely in one direction at one time. The practicability of such limited operation, pending the construction of the longer sidings, has been demonstrated by the experience of April,

1940. Even under the conditions then existing, and in spite of the fact that occasionally saw-by's were involved because some of the trains so operated were obliged to meet opposing trains at sidings where one of the trains exceeded the siding capacity, no serious delays were involved, and the operation as a whole was entirely successful.

(b) THE CONTENTION THAT TRAINS SHOULD BE LIMITED TO 70 CARS IN ORDER THAT THE MEMBERS OF THE CREWS MAY SEE AND INTERPRET SIGNALS MORE READILY (R 4023-4025).

The finding bearing the above title deals with a contention apparently considered to be of some importance by appellee's counsel, inasmuch as it was the subject of extended discussion in appellee's briefs to the courts below. It was apparently advanced in all seriousness, though a careful analysis demonstrates that even if it were true, the fact would be quite unimportant from the safety standpoint.

The facts themselves afford a conclusive answer to appellee's contention. The specific hazards against which the law is directed, according to the claim and contention of our opponents, can arise only while trains are in motion. It has not been claimed, nor is it possible to understand how it could be claimed, that the law prevents or minimizes any train or train-service accidents of the kinds which occur while trains are standing. So far as hand or lantern signals are concerned, there is no authorized signal which might be given while the train is in motion except the stop signal. If the members of the engine crew observe an attempted signal being given from the caboose

they cannot misunderstand; they know that it must be a stop signal. At night, if the signal from the caboose is not seen by the engine crew and the stop must be made, a red fusee may be used, and the stop signal thus conveyed is almost certain to be seen. However, if even that signal is not seen or complied with, then the conductor has both the right and duty to use the emergency valve in the caboose, and thus bring the train to a stop without any hazard at all of slack-action to persons riding in the caboose.

Durnil, R. 2377-2379, 2387-2394, 2404-2406; *Kennedy*, R. 2431-2436; *Cooper*, R. 2446; *Check*, R. 2480-2481; *Stevenson*, R. 2495-2497; *Ash*, R. 2574-2576; 2578-2580, 2599-2603; *Fail*, R. 2618-2622, 2625.

The casualty testimony in this record is very complete, and shows without contradiction that the use of the conductor's valve has not resulted in a casualty of any kind in either Nevada or Arizona, or elsewhere upon a long train, during the last 18 years. There is likewise an affirmative and uncontradicted showing that failure to receive or understand a hand or lantern signal, given while the train was moving, has not resulted in or contributed to a reportable accident or casualty in either Arizona or Nevada during the past 18 years, or in New Mexico or on the Los Angeles Division, California, during the past 11 years. The supposed hazard from failure to see or understand signals on long trains while in motion is purely imaginary.

Exhibits 274 (R. 3351-3363), 275 (R. 3364-3370), 289 (R. 3386-3398), 290 (R. 3399-3408), 386 (R. 3533-3547), 387 (R. 3548-3557).

The challenged law, to the extent that it is considered to be a purported safety regulation, having the purpose of permitting signals on moving trains to be given and received, is clearly unreasonable and arbitrary.

(c) THE CONTENTION THAT MEMBERS OF THE CREWS ON LONG TRAINS ARE IN CONSTANT FEAR OF INJURY, AND ARE THEREBY RENDERED LESS ALERT AND EFFICIENT IN THE PERFORMANCE OF THEIR DUTIES (R. 4025-4026).

Perhaps the most fanciful and illogical of all of the reasons for the law indicated by appellee is the suggestion that compulsory short-train operation eliminates apprehensions, and improves the efficiency, of trainmen who, in cabooses of long trains, are claimed to be in constant fear of injury; that the fixed limitation prevents the slack and slack-action which are alleged to cause such fear.

Whether or not a man suffers fear under any particular set of circumstances is largely determined by his personal reactions. Usually, however, fear is a wholly involuntary emotion, and arises because of circumstances which the individual would like to control but cannot. But the so-called fear testified to by appellee's witnesses is of an unusual and remarkable type: it seems to be easily controlled, and capable of being summoned or dismissed at will. If the contention of appellee is correct, and the testimony of its witnesses is to be accepted, trainmen in cabooses are fearful to the point of inefficiency when a train contains even one car more than 70; but they are largely if not wholly relieved of that fear when that one car is cut off. Fear of that type, manufactured to order for purposes of a particular situation, is too imaginary to be of moment. Indeed, the complete unreality of this

supposed fear is forcefully demonstrated by the fact that the two witnesses who principally made the suggestion have voluntarily elected to serve, for many years, as trainmen and conductors in the long-train territory between Lordsburg and El Paso, where approximately a quarter of all of the freight trains upon which they run are long trains, although each of them has ample seniority to permit him to obtain and hold equivalent positions in train service, in the short-train territory west of Lordsburg. It will be recalled that the entire main-line district between Yuma and El Paso constitutes a single seniority district, and that employes working between El Paso and Lordsburg have equal seniority rights in the remainder of the territory.

Stevenson, R. 2488-2489; *Ash*, R. 2566-2571; *Fail*, R. 2609-2615, 2629-2631.

Even if the fear really exists, there is still no logical basis for contending that it is diminished or eliminated by the restraints of the law. Comparing and combining Nevada and Arizona experiences, the frequency of slack-action casualties, over the past 18 years, has been about as great, if not greater, on short trains as on long trains. Such casualties have not been eliminated by the short-train statute; on the contrary, they have occurred at the rate of about 5 per year, during the last 12 years, upon Arizona short trains operated in full conformity with the law's requirements.

Exhibits 274 (R. 3351-3363), 275 (R. 3364-3370), 280 (R. 3375), 395 (R. 3571).

(d) THE CONTENTION THAT LONG TRAINS CANNOT BE PROPERLY INSPECTED OR SUPERVISED WHILE IN OPERATION, BUT THAT SHORT TRAINS CAN BE, AND THAT LONG-TRAIN OPERATION THEREFORE RESULTS IN GREATER HAZARDS (R. 4026-4029).

The finding bearing the above title relates to a subject which was also discussed at some length in the testimony of appellee's witnesses, and thereafter given considerable emphasis in appellee's presentation to the courts below. In that discussion, as in much of the other testimony relative to the asserted hazards of long-train operation, these witnesses were generally quite ready—even eager—to describe how accidents "might" happen as the result of the supposed impossibility of proper supervision of a moving long-train by the members of the train crew; but were also quite embarrassed and unresponsive when asked to cite specific instances.

The finding states, accurately reflecting the record, that no reportable accident or casualty was referred to, by any of these witnesses, as to which it was claimed or shown that the accident would have been avoided or minimized, if the law's restrictions had been complied with; particularly, that no accident or casualty was referred to, asserted to have been due to a defect in or failure of freight-car equipment on a long train, as to which it was claimed or shown that it was due to the inability of the crew to supervise the operation or that the supervision would have been effective to prevent the accident if the train had consisted of 70 cars or less.

The inspections of the freight cars and freight-car equipment, made by members of the train crews while at inspection or other stops, and equally the supervision

which they undertake from various points of observation along the train, including the engine and caboose, while the train is in motion, are for one primary purpose: to locate existing or possible defects in or failures of the equipment, which may lead to derailments or other accidents, with resulting casualties and damage. If the contentions of appellee's counsel and witnesses were correct, it should follow that in Nevada, where long-train operation predominates, and the other conditions permitting close supervision and inspection of trains are certainly no more favorable than in Arizona (the number of trainmen and other employes making up the crew on a train of over 50 cars is the same as in Arizona), accidents and casualties of this class should be more frequent in the aggregate, and particularly in relation to the traffic moved, than in Arizona; and, in particular, should be much more frequent on the Nevada long trains than on the Arizona short trains. The actual record of derailments due to these causes is the best evidence that long-train operation does not prevent effective supervision. The Nevada accident rates, for reportable derailments due to defects in or failures of freight-car equipment, are much lower than in Arizona; the total number of such derailments is considerably less than in Arizona; and of the Nevada derailments a substantial proportion were on short trains. For the 11-year period 1930-1940, there were only 31 such reportable derailments in Nevada, 11 on short trains; and the rate was 2.11 per 100 million car miles. The corresponding total for Arizona was 42, all on short trains; and the rate was 3.03 per 100 million car miles. Both the actual number and frequency rate of such derailments, were

about 59 per cent greater in Arizona during the six-year period 1935-1940. In New Mexico, where long-train operation takes place, although on a very much smaller scale than in Nevada, the frequency rate of such derailments was lower, during the 11-year period 1930-1940, than in Arizona; moreover, of the 29 derailments which took place in New Mexico, 23 were on short trains, and only 6 on long trains.

Direct comparison between long-train and short-train operation over the same territory, during the first six months of the year 1940, is also available in the record (Exhibit 397, R. 3572). This exhibit relates to operations between Lordsburg and El Paso during the period mentioned. The time returns and delay reports of the conductors who handled the freight trains over that district during that period contained references to 123 defects and occurrences having to do with the operation of freight cars in such freight trains, 88 of which defects and occurrences were detected and discovered on 1900 short freight trains and 35 on 562 long freight trains. Short trains constituted 74.4 per cent of the total; 71.6 per cent of the defects and occurrences were reported on such short trains. Long trains constituted 25.6 per cent of the total; and 28.4 per cent of the defects were reported on such trains. The long trains averaged 94 cars per train; the short trains 63.3 per train. The defects and occurrences thus reported were at the rate of one for each 202,860 car miles on the short trains; and one for each 260,000 car miles on the long trains.

There can be no doubt that inspections at terminals and en route, and the supervision of trains by members

of the train crew while the same are in motion, can be and are as properly and adequately performed on long trains as on short trains; and any claim or contention by appellee that the limitation is necessary for the purpose of permitting more complete inspection is wholly unfounded.

See annotations to *Finding* XIII(d): R. 4029-4303.

(e) THE CONTENTION THAT THE PRESENT TYPE OF AIR-BRAKE EQUIPMENT IS INADEQUATE TO CONTROL THE SPEED OF AND TO STOP LONG TRAINS, BUT IS MORE EFFICIENT AND ADEQUATE UPON SHORT TRAINS (R. 4030-4032).

Although appellee's counsel did not at the trial expressly declare their position to be that the present type of air brakes and their appurtenances are insufficient and inadequate to permit long trains to be adequately controlled and safely stopped, if operated in the affected territory, nevertheless it is impossible to ascribe any other purpose to their repeated questioning of their own witnesses, and as well of certain witnesses called by appellant, all having to do with the operation of air brakes, the methods employed by engineers in handling trains with the air brakes, and particularly their ability to control such trains while in operation. If it were not appellee's contention that the present types of air brakes are inadequate for long-train operation, then all of the testimony referred to would have been immaterial, and without apparent purpose in the case.

Indeed, appellee was virtually compelled either to take this position, or else concede that the law has no safety purpose or relation to safety at all. The briefs filed in the lower courts have sufficiently revealed that its contention is accurately described in the title to the finding,

The analysis of the testimony, set forth in the text of the finding above-captioned, is perhaps the best argument in its support and further extended review is unnecessary. We emphasize, however, that none of the engineers called by appellee was willing to testify that he had ever experienced an accident or casualty through failure to control his train, or that he could not adequately control any train which he might be called upon to handle in the affected territory. The engineer employes of appellant who testified for appellee expressly agreed that the controlling of long trains did not involve any greater *difficulty*, but simply required *more care*. Both of the engineer witnesses called by appellant, each of whom has had at least as much experience in train handling as any witness called by appellee, and possibly much more, testified directly that it is no more difficult to handle and control long trains than short trains; in fact, engineers who handle long trains as a regular practice frequently must take more care than usual, when occasionally called to handle short trains.

One of the best methods of proof is to resort to actual experience and in this case we have not only the experience of years on the system at large, but also the actual experience in the affected territory: the 302 long freight trains operated in Arizona in April, 1940. The finding states, and we here emphasize, that there is no evidence whatever that any of the engineers who handled these trains was unable to control or stop his train, or had any unusual or substantial difficulty in its operation. We are quite sure that if any difficulty or lack of control had developed, appellee's counsel and witnesses would have

made the most of it in evidence. However, as to many of said trains, the record affirmatively shows, from the testimony of the very men who handled or rode upon them, that no difficulty or other notable incident was encountered.

See annotations to *Finding* XII(e): R. 4032.

We do not, in this discussion, overlook the voluminous testimony of appellee's witness Cooper, who testified generally on the subject of air brakes and brake appliances in freight trains. This witness' experience is confined to the Santa Fe, but includes both long-train and short-train operations. His seniority extends into both California and Arizona and he stands sufficiently high on the seniority list in his district to be able to select the position of his choice in freight-train service. At present, and for some time past, he has held a position in long-train territory, where, if any train-control difficulties exist peculiar to long-train operation, he is certain to confront them sooner or later. He voluntarily does not choose to work in Arizona, although if the 70-car limitation removed the difficulties he could have that advantage.

Cooper, R. 2438, 2440.

Clearly there is no foundation whatsoever for any claim that engineers cannot safely control and stop long trains by the use of the present types of the air brakes and their appurtenances, and with no greater difficulty than in the case of short trains.

XIV.

EXTENT OF PENALTIES IMPOSED BY THE LAW (R. 4032).

In response to the issue tendered by paragraph 14 of Part III of the answer (R. 27-28) a specific finding was proposed and adopted showing the extent of the penalties imposed by the law. This finding is based upon computations from Exhibit 214 (R. 3198) and 246 (R. 3255). Exhibit 214 shows that in June and August, 1938, if appellant had disregarded the law entirely and had gone to long-train operation with extended sidings and heavier power, it would have operated some 1,386 long freight trains over the districts between Yuma and Lordsburg via Gila and Tucson, and between Tucson and the New Mexico-Arizona state line near Rodeo (the Douglas line). Expanding this figure to the annual basis, by dividing by 17.89 per cent, we derive a total of approximately 7,800 long freight trains which would thus have been operated during 1938. This figure takes into account an allowance for whatever long-train operation might also have taken place on the Phoenix main line. It is necessarily approximate, but is adequate for the purposes of the finding, which merely states in round figures the total amount of the penalties which the law would impose.

The figure for passenger-train operation is taken from Exhibit 246, which shows that in a period of slightly less than two months in 1940 defendant operated passenger trains of more than 14 cars in Arizona on 62 occasions. Multiplying this figure by six gives a total of approximately 360 long passenger trains per year.

Since the penalties imposed by Section 3 of the law are from $100.00 to $1,000.00 for each offense, a simple com-

putation results in the figures, $816,000 and $8,160,000, which represent the range in the total amount of cumulative penalties for which appellant would be liable, if it were to disregard the Train-Limit Law throughout an entire year.

XV.

THE PERMISSIBLE NUMBER OF CARS IN AN INTERSTATE TRAIN IS A SUBJECT OF NATIONAL AND NOT LOCAL CONCERN (R. 4032-4033).

We desire to preface the discussion of this and the succeeding findings of fact by the suggestion that in the preparation of findings of fact in an action such as the instant case it is somewhat difficult to distinguish between the finding of an ultimate fact and the conclusion of law which follows therefrom. We think it better practice, and such practice has been followed in suits where equitable issues are presented, to follow the course we here adopted and for which there is ample precedent. Moreover, general findings of the character of Findings XV to XX, inclusive, round out the more specific findings that have preceded, and unmistakably express the ultimate conclusions of the Court.

Finding XV is very similar to Finding No. XXIX of the Special Court for Nevada in the *Nevada Train-Limit Case;* and in the respects in which it may be regarded as a conclusion, we believe amply supported by controlling decisions to which we refer in the volume of our brief addressed to the law of the case. Nothing could more clearly illustrate the extra-territorial effect of a law limit-

ing the lengths of interstate trains which are entering or crossing the state in a continuous journey in interstate commerce, or leaving the state on such a journey, than the evidence in the instant case.

XVI.

FINANCIAL BURDEN IMPOSED BY THE LAW A FACTOR IN DETERMINING ITS UNREASONABLENESS (R. 4033-4034).

This finding relates to a consideration of the additional expense that is incurred by appellant in obeying the law, as a factor in passing on the question whether it is unreasonable and arbitrary. As we show in Volume I of this brief, this Court has held that "the matter of expense is an important criterion to be taken into view in determining the reasonableness" of a statute or order made pursuant to the police power. This finding has been carefully phrased so as to confine it within the limits of what we understand to be the weight to be given to expense of compliance, in considering that question.

XVII.

FURTHER ARBITRARY EFFECT OF THE LAW (R. 4034).

This finding should be read in connection with the discussion of Finding XI regarding the various factors that jointly contribute to slack action and slack-action shocks. The finding states an ultimate fact which is fully sustained by the evidence.

XVIII.

IMPAIRMENT OF DEFENDANT'S FACILITIES BY THE LAW (R. 4034).

The probative facts in support of this finding fully state the effect the law has upon the facilities devoted to and used by appellant in interstate commerce, in and adjacent to Arizona.

XIX.

FINANCIAL BURDEN ON INTERSTATE COMMERCE (R. 4034).

This finding is a necessary conclusion from the preceding finding in which the character of the traffic handled by appellant is fully described, and the extent of the annual expense of complying with the law is defined and substantiated. It is a conclusion of fact from these probative facts.

XX.

SUBSTANTIAL ALLEGATIONS SUSTAINED (R. 4034).

A general finding of this kind is customary as a conclusion to special findings of fact in a case where an equitable defense is presented or where a special defense in an action at law is offered, equivalent to an equitable defense.

CONCLUSION.

The findings adopted by the trial court, though quite detailed in certain respects, are no more so than necessary

in a case such as this. They present an accurate condensation and summary of testimony which, as reduced to print for the purposes of the record in this Court, with the exhibits, covers approximately 3545 pages (R. 33-3578).

We have no doubt that this Court, if it deems that the occasion requires it to go behind the trial court's findings and examine the record in detail, will conclude that the trial court has found the facts correctly in the light of the evidence; and will also conclude that the State Supreme Court, to the extent that it has undertaken to reverse the trial court's findings and by implication used that reversal as a basis for its decision, has erred to the prejudice of appellant: because it has in effect made findings, either of fact or mixed fact and law, which are without proper evidentiary support and contrary to the evidence of record.

Upon the facts, no less than upon the law, the decision and judgment of the Supreme Court of Arizona in this cause should be reversed.

Respectfully submitted,

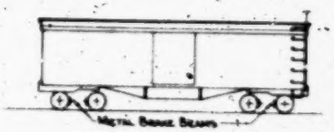
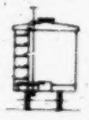
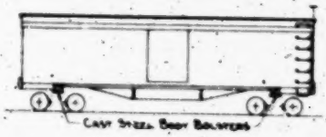
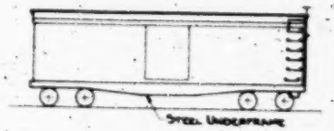
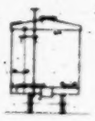
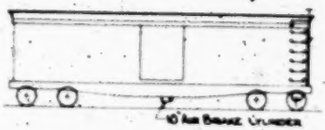
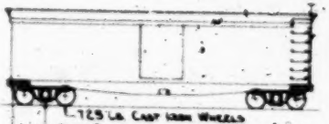
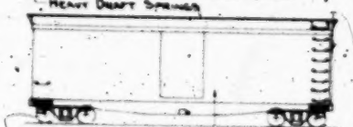
CLEON T. KNAPP,
C. W. DURBROW,
BURTON MASON,
Attorneys for Appellant.

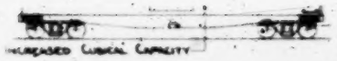
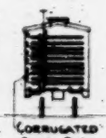
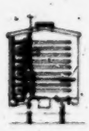
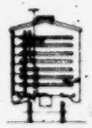
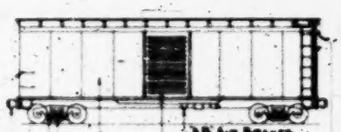
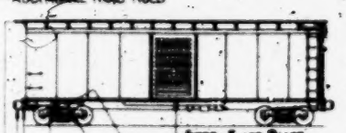
JAMES P. BOYLE,
B. G. THOMPSON,
Of Counsel.

Dated November 10, 1944.

SUPERIOR COURT, PIMA CO., ARIZONA
STATE v. SP CO. NO 20087
DEFTS EX NO 12 (WITNESS)

SOUTHERN PACIFIC COMPANY
PACIFIC LINES
CHRONOLOGY OF FREIGHT BOX CARS YEAR 1900 TO 1940
SHOWING DESIGN AND CAPACITY CHARACTERISTICS

Year	Side Elevation A	End Elevation B	New Features C	Carrying Capacity & Weight - Lbs D	Cubical Capacity - Cu Ft E	Cross Sectional Area - Center Sills - Sq Inches F
1900	 Metal Brake Beams		Metal Brake Beams	80 000 50 000	1946	
1901	 Cast Steel Body Bolsters		Cast Steel Body Bolsters	80 000 50 000	2326	
1906	 Steel Underframe		Steel Underframe	80 000 56 000	2448	14
1904	 10" Air Brake Cylinder		10" Air Brake Cylinder	126 000 45 000	2750	18
1909	 725 Lb Cast Iron Wheels Cast Steel Truck Side Frames Heavy Draft Springs		725 Lb Cast Iron Wheels Heavy Draft Springs Cast Steel Truck Side Frames	126 000 45 000	2750	18
1911	 Increased Cubical Capacity		Increased Cubical Capacity	125 000 44 000	3370	18
1913	K-2 Triple Valve Steel Superstructure Framing		Single Sheathed - Steel Superstructure Framing K-2 Triple Valve	127 000 42 000	3358	25
1916	Friction Draft Gears		Friction Draft Gears	127 000 42 000	3358	26
2						

	 INCREASED CUBICAL CAPACITY					
1913	K-2 TRIPLE VALVE STEEL SUPERSTRUCTURE FRAMING		SINGLE SHEATHED - STEEL SUPERSTRUCTURE FRAMING K-2 TRIPLE VALVE	127 000	42 000	3358	23
1916	FRICTION DRAFT GEARS		FRICTION DRAFT GEARS	127 000	42 000	3358	26
1919	CAST STEEL COUPLER YOKES TYPE 'D' COUPLERS	 CORRUGATED STEEL ENDS	TYPE 'D' COUPLERS CAST STEEL COUPLER YOKES CORRUGATED STEEL ENDS	125 000	46 000	3100	26
1924	STEEL ROOF 750 LB CAST IRON WHEELS		750 LB CAST IRON WHEELS STEEL ROOF	126 000	45 000	3435	26
1925	HEAVY GRADUATING SPRINGS AUXILIARY HAND BRAKE LEVER		HEAVY GRADUATING SPRINGS AUXILIARY HAND BRAKE LEVER	125 000	44 000	3158	29
1927	750 LB CAST IRON SINGLE PLATE WHEELS		750 LB CAST IRON SINGLE PLATE WHEELS	125 000	44 000	3138	29
1936 1937	 AB AIR BRAKES STEEL SIDE DOORS ALL STEEL, WOOD LINED POWER HAND BRAKE SNUBBER SPRINGS No 15 BRAKE BEAM, 1936 - No 3 BRAKE BEAM, 1937 TYPE 'E' COUPLERS ADDITIONAL HAND HOLD	BOTTOM ROD SUPPORTS BRAKE BEAM SAFETY GUARDS	ALL STEEL, WOOD LINED STEEL SIDE DOORS ADDITIONAL HAND HOLDS POWER HAND BRAKE 'AB' AIR BRAKES TYPE 'E' COUPLERS SNUBBER SPRINGS No 15 BRAKE BEAM, 1936 No 3 BRAKE BEAM, 1937 BRAKE BEAM SAFETY GUARDS BOTTOM ROD SUPPORTS	124 000	45 000	3712	213
1940	 STEEL FLOOR PLATE BRAKE PIPE ANCHORS BRAKE HANGER WEARING PLATES WINE BRAKE BALANCER COUPLER CENTERING DEVICE SWIVEL SHANK COUPLER METAL RUNNING BOARD	W-SECTION CORNER POSTS METAL BRAKE STEP	SWIVEL SHANK COUPLERS COUPLER CENTERING DEVICE METAL RUNNING BOARDS METAL BRAKE STEP W-SECTION CORNER POSTS STEEL FLOOR PLATE WINE BRAKE BALANCER BRAKE HANGER WEARING PLATES BRAKE PIPE ANCHORS	124 000	45 000	3712	213

SOUTHERN PACIFIC CO. PACIFIC LINES
COMPARISON OF FREIGHT CARS
ALL STEEL, STEEL UNDERFRAME AND OF OTHER CONSTRUCTION
YEARS 1903 TO 1939

SUPERIOR COURT, PIMA CO., ARIZONA
STATE V. S.P. CO. NO. 20087
DEFT'S. EX. NO. 3 (WITNESS _____)

NUMBER OF CARS	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
A	2891	3088	4330	5289	7380	9045	10203	13093	15871	16842	18975	22222	21969	21909	21621	25478	26294	28581	25659	26520	29662	26632	29910	32160	32179	37327	40268	39798	45422	49118	44570	50183	52155	46559	52164	53855	48361	53940	55335	49156	54730	55968	48963	54506	55599	48689	54454	55446	48730	54486	55455	44403	50140	50923	44083	49814	50594	41814	47406	48122	41560	47017	47696	42393	47018	47658	43471	46889	47457	41746	44127	44709	39490	40742	41299
B		

ALL STEEL, STEEL UNDERFRAME AND OF OTHER CONSTRUCTION
YEARS 1903 TO 1939

SUPERIOR COURT, PIMA CO., ARIZONA
STATE V. S.P. CO. NO. 20087
DEFTS. EX. NO. 3 (WITNESS _____)

	A	B	C
1903	2891		26575
1904	3088		26264
1905	4330		26743
1906	5289		25913
1907	7380		26621
1908	9045		26784
1909	10203		26578
1910	13093		27828
1911	15871		29853
1912	16842		30161
1913	18975		31492
1914	22282		34049
1915 June 30	21969		33126
1915 Dec. 31	21909		32475
1916	21621		30704
1917	25478	26294	34337
1918	25659	28581	35985
1919	26520	29662	36326
1920	26632	29910	35589
1921	26822	32160	36547
1922	26814	32179	35464
1923	31771	37327	40268
1924	39798	45422	49118
1925	44570	50183	52155
1926	46559	52164	53855
1927	48361	53948	55335
1928	49156	54730	55968
1929	48965	54506	55599
1930	48688	54454	55446
1931	48730	54486	55455
1932	44403	50140	50923
1933	44083	49814	50594
1934	41814	47406	48122
1935	41560	47017	47696
1936	42393	47018	47658
1937	43471	46889	47457
1938	41746	44127	44709
1939	39490	40742	41253

NUMBER OF CARS

55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0

DATA, 1903 TO JUNE 30, 1915 TAKEN FROM MOTIVE POWER ANNUAL REPORT AND EMBODIES ALL CARS OWNED INCLUDING NARROW GAUGE CARS AND CABOOSES

C- TOTAL CARS

A- STEEL AND STEEL UNDERFRAME CARS

B- STEEL, STEEL UNDERFRAME AND CARS WITH STEEL CENTER SILLS

DATA FOR 'TOTAL CARS' AND 'STEEL AND STEEL UNDERFRAME CARS', JUNE 30, 1915 TO DEC 31, 1939 TAKEN FROM SOUTHERN PACIFIC CO'S ANNUAL REPORT TO THE INTERSTATE COMMERCE COMMISSION SHOWING FREIGHT CARS AVAILABLE FOR SERVICE.

DATA FOR 'STEEL, STEEL UNDERFRAME AND CARS WITH STEEL CENTER SILLS' OBTAINED BY ADDING STEEL AND STEEL UNDERFRAME CARS TAKEN FROM SOUTHERN PACIFIC ANNUAL REPORT TO THE INTERSTATE COMMERCE COMMISSION, TO CARS WITH STEEL CENTER SILLS TAKEN FROM MOTIVE POWER ANNUAL REPORT 1917 TO 1934 AND FROM FORM L-2396 - SOUTHERN PACIFIC CO.-PACIFIC LINES- CAR EQUIPMENT OWNED 1935 TO 1939.

1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 1915 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939

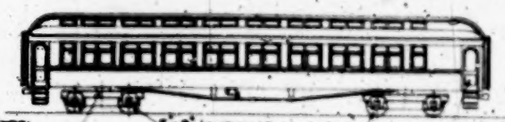
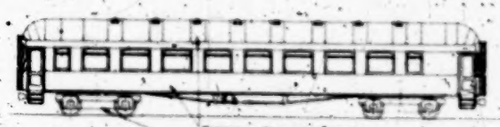
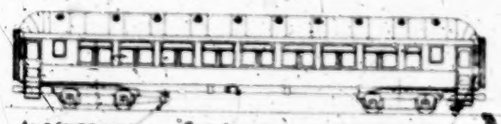
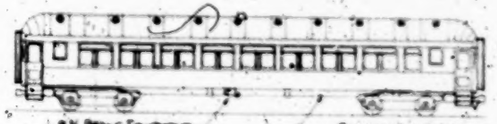
JUNE 30 DEC. 31

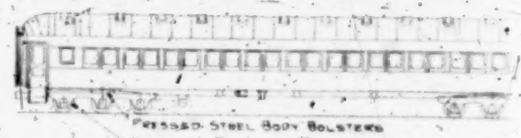
YEARS

SOUTHERN PACIFIC COMPANY

PACIFIC LINES

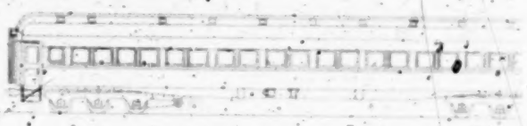
CHRONOLOGY OF PASSENGER COACH AND CHAIR CAR YEAR 1900 TO 1940 SHOWING DESIGN AND IMPROVEMENTS.

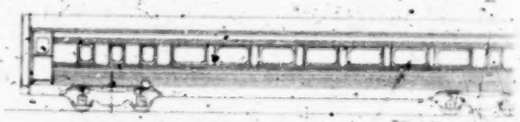
Side Elevation	Year	New Features	Length Over Platforms Coupled	Seating Capacity	Average Weight Lbs
 Cast Steel Body Bolsters; 5"x9" Journals 36" Solid Steel Wheels; Vestibule	1900	Length Increased Seating Capacity Increased Vestibules Air Signal Steam Heat Braking Ratio Increased To 80%	67'-8½"	70	89100
	1901	Gas Lights			
	1902	5"x9" Journals 36" Solid Steel Wheels			
	1903	Trussed Steel Brake Beams			
	1905	Cast Steel Body Bolsters Braking Ratio Increased To 90%			
 Steel Construction Steel Trucks	1906	First Steel Car Built In America Was Constructed In SP Coa. Shops At Sacramento Calif. All Steel Construction Except Inside Finish Which Is Wood Steel Trucks	67'-8½"	70	107000
Friction Draft Gear All Steel Construction Including Inside Finish	1909	All Steel Construction Including Inside Finish Friction Draft Gear Vapor Steam Heat 2 Steam Train Lines	67'-8½"	72	85000
L&N Brake Equipment; 15"40# I Beams; Sharon Coupler	1913	Size Of Center Sills Increased From 10"-25# I Beams To 15"-50# I Beams Sharon Couplers Applied In Place Of Janney Couplers L and N Brake Equipment - Type L Triple Valve and Type N Brake Cylinder Size Of Brake Cylinder Increased From 14"x12" To 16"x12" Comb Gas And Electric Lighting	67'-8½"	72	104000
 Axle Generator; End Construction Strengthened	1914	End Construction Strengthened Straight Electric Lighting Axle Generator	68'-3½"	72	107000

Side Elevation



Pressed Steel Body Bolsters
Integral Pedestal Type Trucks

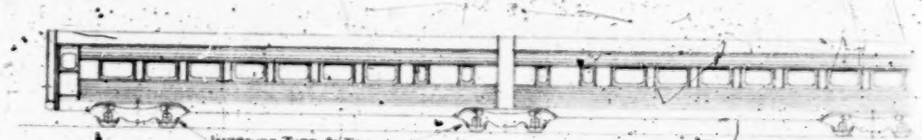
5½"x10" Journals





Outer Sash Tightly Sealed; Truck Mounted Brake Cylinders

SINGLE UNIT



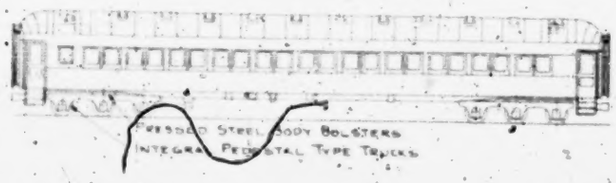
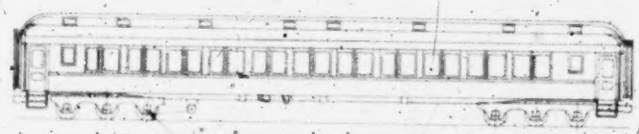
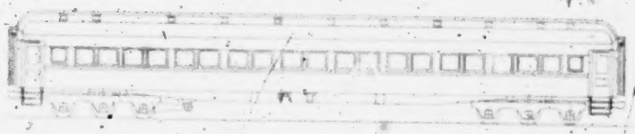
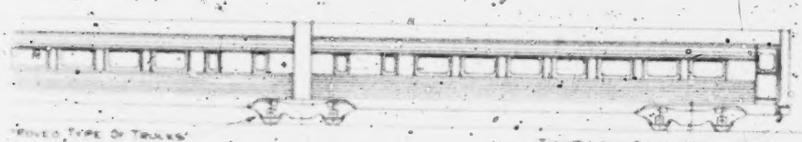
Improved Type 3" Trucks; Tight Lock Couplers And Improved Draft Gear

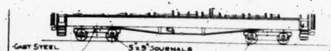
ARTICULATED UNIT

C COMPANY

D CHAIR CAR YEAR 1900 TO 1940
IMPROVEMENTS

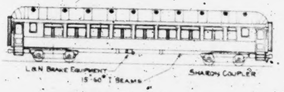
SUPERIOR COURT, PIMA CO., ARIZONA
STATE v. S.P.CO. NO 20087
DEFTS. EX NO. 4 (WITNESS LERICHE)

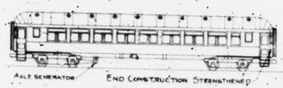
Side Elevation	Year	New Features	Length Over Platforms Coupled	Seating Capacity	Average Weight Lbs
 Pressed Steel Body Bolsters Integral Pedestal Type Trucks	1927	Pressed Steel Body Bolsters Integral Pedestal Type Trucks Locking Center Pins Thermostatic Heat Control Double Deck Spring Seats	80-5½"	90	140500
 5½" x 10" Journals	1928	Mens and Womens Wash Rooms Separate from Toilet Porcelain Wash Basins 5½" x 10" Journals 2 + 2 End Train Line Valves	82-2⅜"	88	150800
	1929	Mens and Womens Lounge Double Pan Hoppers	82-5½"	Body of Car 56 Womens Lounge 4 Mens Smoking Room 4 Total 64	165300
Outer Sash Tightly Sealed Truck Mounted Brake Cylinders Single Unit	1937	Streamlined Construction; Material- High Tensile and Stainless Steels Air Conditioned Outer Sash Tightly Sealed Tight Lock Couplers Improved Draft Gear Pressure Water System Indirect Lighting Seat Lights Individually Controlled Radio Rotating-Reclining Chairs with Sponge Rubber Seats Aluminum Floor Plates, Cork Flooring, Inlaid Linoleum Floor Covering Insulated Against Noise Compartments for Hand Luggage Electro Pneumatic High Speed Brake Equipment Improved Type of Trucks Provides Easier Riding Spring Pad Lubricators Journals Truck Mounted Brake Cylinders Steam Train Line Connection of 2" Flexible Metallic Conduit	79-2"	Body of Car 48 Womens Lounge 2 Mens Smoking Room 6 Total 56	104500
 Roller Type of Trucks Articulated Unit Tight Lock Couplers and Improved Draft Gear			132-2"	Body of Car 100 Womens Lounge 4 Mens Smoking Room 5 Total 109	170800



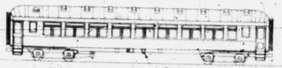
1901	GAS LIGHTS	67'-8½"	70	89100
1902	5 x 9 JOURNALS 36 SOLID STEEL WHEELS			
1903	TRUSSED STEEL BRAKE BEAMS			
1905	CAST STEEL BODY BOLSTERS BRAKING RATIO INCREASED TO 90%			

1908	FIRST STEEL CAR BUILT IN AMERICA WAS CONSTRUCTED IN SP CO'S SHOPS AT SACRAMENTO, CALIF. ALL STEEL CONSTRUCTION EXCEPT INSIDE FINISH WHICH IS WOOD STEEL TRUCKS	67'-8½"	70	107000

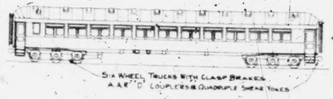
1909	ALL STEEL CONSTRUCTION INCLUDING INSIDE FINISH. FRICTION DRAFT GEAR. VAPOR STEAM HEAT. 2 STEAM TRAIN LINE	67'-8½"	72	85000

1913	SIZE OF BELTER SILLS INCREASED FROM 15"x 5" I BEAMS TO 15"x6" I BEAMS. SHARON COUPLERS APPLIED IN PLACE OF JANNEY COUPLERS. L-N-N. BRAKE EQUIPMENT - TYPE L TRIPLE VALVE AND TYPE N BRAKE CYLINDERS. SIZE OF BRAKE CYLINDER INCREASED FROM 14"x12" TO 16"x12". COMB. GAS AND ELECTRIC LIGHTING.	67'-8½"	72	104000



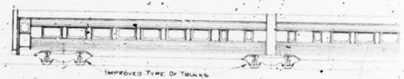
1914	END CONSTRUCTION STRENGTHENED. SEATING CAPACITY INCREASED. ELECTRIC LIGHTING AXLE GENERATOR	68'-6½"	72	107000

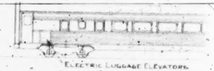


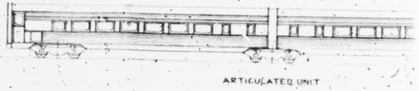
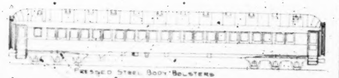
1921	IMPROVED BRAKE EQUIPMENT U-2 UNIVERSAL VALVE. FLUSH HOPPERS. ELECTRIC CEILING FANS	68'-6½"	72	107800



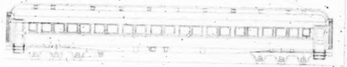
1925	LENGTH INCREASED. SEATING CAPACITY INCREASED. SIX WHEEL TRUCKS WITH CLASP BRAKE. A.A.R. 'D' COUPLER & QUADRUPLE SWEAR YOKES	80'-5½"	96	138600







1927	PRESSED STEEL BODY BOLSTERS. INTEGRAL PEDESTAL TYPE TRUCKS. LOCATING CENTER PINS. THERMOSTATIC HEAT CONTROL. DOUBLE DECK SPRING SEATS	80'-5½"	80	140300

1928	MENS AND WOMENS WASH ROOMS SEPARATE FROM TOILET. PORCELAIN WASH BASINS. 5½ x 10" JOURNALS. 2-2½" END TRAIN LINE VALVES.	82'-7⅛"	88	150300

1929	MENS AND WOMENS LOUNGE. DOUBLE PAN HOPPERS.	82'-5½"	BODY OF CAR 56 WOMENS LOUNGE 4 MENS SMOKING ROOM 6 TOTAL 66		165300

1937	STREAMLINED CONSTRUCTION. MATERIAL HIGH TENSILE AND STAINLESS STEELS. AIR CONDITIONED. OUTER SASH TIGHTLY SEALED. TIGHT LOCK COUPLERS. IMPROVED DRAFT GEAR. PRESSURE WATER SYSTEM. INDIRECT LIGHTING. SEAT LIGHTS INDIVIDUALLY CONTROLLED. RADIO. ROTATING RECLINING CHAIRS WITH SPONGE RUBBER SEATS. ALUMINUM FLOOR PLATES CORK FLOORING INLAID LINOLEUM FLOOR COVERING. INSULATED AGAINST NOISE. COMPARTMENTS FOR HAND LUGGAGE. ELECTRO PNEUMATIC HIGH SPEED BRAKE EQUIPMENT. IMPROVED TYPE OF TRUCKS PROVIDED. ROLLER BEARINGS. SPRING AND LUBRICATORS JOURNALS. TRUCK MOUNTED BRAKE CYLINDERS. STEAM TRAIN LINE CONNECTION OF 3" FLEXIBLE METALLIC CONDUIT.	79'-2"	BODY OF CAR 48 WOMENS LOUNGE 2 MENS SMOKING ROOM 4 TOTAL 54		194500

		132'-2"	BODY OF CAR 100 WOMENS LOUNGE 4 MENS SMOKING ROOM 4 TOTAL 108		170800

1939	FLUORESCENT LIGHTING. ELECTRIC LUGGAGE ELEVATORS. CENTER SILLS AND END FRAMING MEMBERS MADE OF SPECIAL CENTER SILL STEEL AND DESIGNED TO MEET A.A.R. COMMITTEE RECOMMENDATIONS. 36" DIAMETER WHEELS. INLAID RUBBER FLOOR COVERING. PUBLIC ADDRESS SYSTEM.	81'-0"	BODY OF CAR 44 WOMENS LOUNGE 2 MENS SMOKING ROOM 4 TOTAL 50		117800

		134'-0"	BODY OF CAR 92 WOMENS LOUNGE 2 MENS SMOKING ROOM 4 TOTAL 98		194500

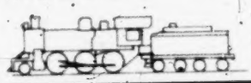
SOUTHERN PACIFIC COMPANY
PACIFIC LINES

CHRONOLOGY OF FREIGHT LOCOMOTIVES PACIFIC LINES
YEARS 1899 TO 1940
SHOWING IMPROVED DESIGN AND INCREASED TRACTIVE EFFORT

SUPERIOR COURT. PIMA CO. ARIZO
STATE v. S.P.CO. NO 20087
DEFTS EX NO. 5 (WITNESS

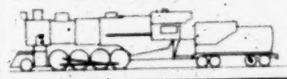
TYPE — WHEEL ARRANGEMENT (WHYTE SYSTEM)

MOGUL 2-6-0



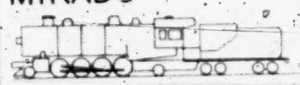
28,710 LBS

CONSOLIDATION 2-8-0



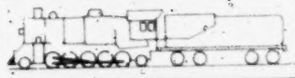
43,300 LBS

MIKADO 2-8-2



51,080 LBS

2-10-2 SMALL 2-10-2



65,300 LBS

2-10-2 LARGE* 2-10-2

75,150 LBS

SOUTHERN PACIFIC* 4-10-2

84,200 LBS

ARTICULATED CONSOLIDATION 4-8-8-2

116900 LBS

ARTICULATED CONSOLIDATION 4-8-8-2 AND 2-8-8-4

124,300 LBS

TYPE	CLASS	YEAR PUT IN SERVICE	NUMBER PURCHASED	AVERAGE PRICE EACH	TRACTIVE EFFORT LBS	WT. ON DRIVERS LBS	BOILER PRESSURE LBS
MOGUL	M-4	1899-1901	103	$14,000	28,710	126,000	190
CONSOLIDATION	C-9,10	1905-1911	172	17,500	43,300	187,000	200
MIKADO	MK-5,6	1913-1915	35	24,500	51,080	210,000	200
2-10-2 SMALL	F-1	1917-1919	52	68,000	65,300	273,000	200
2-10-2 LARGE*	F-4,5	1922-1924	101	84,000	75,150	306,000	200
SOUTHERN PACIFIC*	SP-1,2,3	1925-1927	49	90,000	84,200	317,000	225
ARTICULATED CONSOLIDATION	AC-4	1928	10	130,500	116,900	475,200	235
ARTICULATED CONSOLIDATION	AC-8	1939	28	183,000	124,300	531,700	250
ARTICULATED CONSOLIDATION	AC-9	1939	12	202,000	124,300	531,200	250

* BOOSTER EQUIPPED

PAN.Y

ES PACIFIC LINES
40
ED TRACTIVE EFFORT

SUPERIOR COURT, PIMA CO.: ARIZONA
STATE v. S P CO. NO. 20087
DEFTS EX. NO. 5 (WITNESS RUSSELL)

TYPE	CLASS	YEAR PUT IN SERVICE	NUMBER PURCHASED	AVERAGE PRICE EACH	TRACTIVE EFFORT LBS.	WT. ON DRIVERS LBS.	BOILER PRESSURE LBS.	TENDER CAPACITY OIL GALS.	TENDER CAPACITY WATER GALS.
OGUL	M-4	1899-1901	103	$ 14,000	28,710	126,000	190	2,990	4,500
ON SOLIDATION	C-9,10	1905-1911	172	17,500	43,300	187,000	200	2,940	7,000
IKADO	MK-5,6	1913-1915	35	24,500	51,080	210,000	200	2,940	9,000
-10-2 SMALL	F-1	1917-1919	52	68,000	65,300	273,000	200	3,120	10,030
-10-2 LARGE *	F-4,5	1922-1924	101	84,000	75,150	306,000	200	4,000	12,000
OUTHERN PACIFIC *	SP 1,2,3	1925-1927	49	90,000	84,200	317,000	225	4,912	12,150
RTICULATED CONSOLIDATION	AC-4	1928	10	130,500	116,900	475,200	235	4889	16,452
RTICULATED CONSOLIDATION	AC-8	1939	28	183,000	124,300	531,700	250	6400	21,900
RTICULATED CONSOLIDATION	AC-9	1939	12	202,000	124,300	531,200	250	28 TONS COAL	22,120

* BOOSTER EQUIPPED

SUPERIOR COURT, PIMA CO., ARIZON.
STATE v. S.P.CO. NO. 20087
DEFTS. EX. NO. 6 (WITNESS)

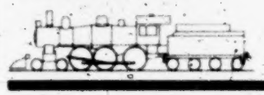
SOUTHERN PACIFIC COMPANY
PACIFIC LINES
CHRONOLOGY OF PASSENGER LOCOMOTIVES PACIFIC LINES
YEARS 1895 TO 1940
SHOWING IMPROVED DESIGN AND INCREASED TRACTIVE EFFORT

TYPE — WHEEL ARRANGEMENT (WHYTE SYSTEM)

TEN WHEEL 4-6-0

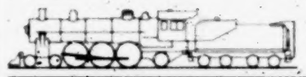
25260 LBS

TEN WHEEL 4-6-0



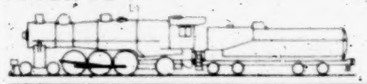
27590 LBS

PACIFIC 4-6-2



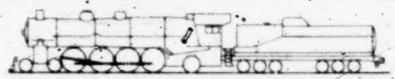
29920 LBS

PACIFIC 4-6-2



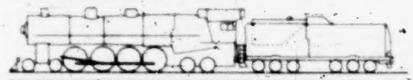
43660 LBS

MOUNTAIN * 4-8-2



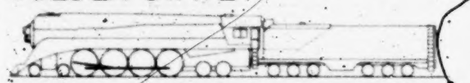
57510 LBS

GOLDEN STATE * 4-8-4



62200 LBS

GOLDEN STATE * 4-8-4



54800 LBS

TYPE	CLASS	YEAR PUT IN SERVICE	NUMBER PURCHASED	AVERAGE PRICE EACH	TRACTIVE EFFORT LBS	WT ON DRIVERS LBS	BOILER PRESSURE LBS	TENDER CAPACITY OIL GALS	TENDER CAPACITY WATER GALS
TEN WHEEL	T-1	1895-1897	39	$11,500	25,260	112,000	180	10.5 TONS COAL	4,000
TEN WHEEL	T-25	1901	8	14,000	27,590	134,000	200	10.5 TONS COAL	6,000
PACIFIC	P-5	1912	15	22,500	29920	141,000	200	2,940	7,900
PACIFIC	P-8	1921	15	72,500	43,660	180,000	200	4,000	12,000
MOUNTAIN *	M-1	1923-1924	28	82,000	57,510	246,000	210	4,000	12,000
GOLDEN STATE *	GS-1	1930	10	115,000	62,200	262,000	250	4,912	16,152
GOLDEN STATE *◆	GS-4	1940	20	173,000	64,800	276,000	300	6,275	23,500

* BOOSTER EQUIPPED
◆ PRICE AND WEIGHT OF THESE LOCOMOTIVES ESTIMATED BUT ADDED HERE FOR COMPARATIVE PURPOSES

MPANY

IVES PACIFIC LINES
940
ISED TRACTIVE EFFORT

SUPERIOR COURT, PIMA CO., ARIZONA
STATE v. S.P.CO. NO. 20087
DEFTS. EX. NO. 6 (WITNESS) RUSSELL

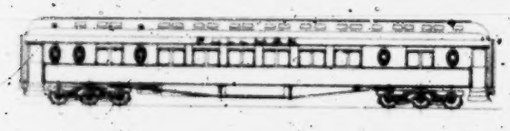
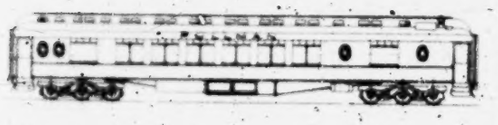
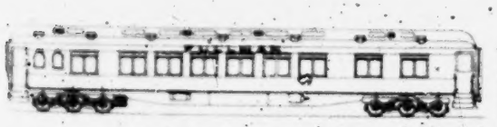
	CLASS	YEAR PUT IN SERVICE	NUMBER PURCHASED	AVERAGE PRICE EACH	TRACTIVE EFFORT LBS.	WT. ON DRIVERS LBS.	BOILER PRESSURE LBS.	TENDER CAPACITY OIL GALS.	TENDER CAPACITY WATER GALS.
	T-1	1895-1897	39	$11,500	25,260	112,000	180	10.5 TONS COAL	4000
	T-25	1901	8	14,000	27,590	134,000	200	10.5 TONS COAL	8000
	P-5	1912	15	22,500	29,920	141,000	200	2,940	7,000
	P-8	1921	15	72,500	43,660	180,000	200	4,000	12,000
	MT-1	1923-1924	28	82,000	57,510	216,000	210	4,000	12,000
ATE *	GS-1	1930	10	115,000	62,200	262,000	250	4,912	16,152
ATE *◆	GS-4	1940	20	173,000	64,800	276,000	300	6,275	23,500

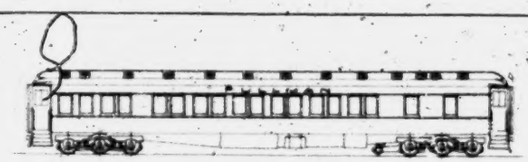
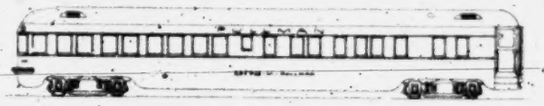
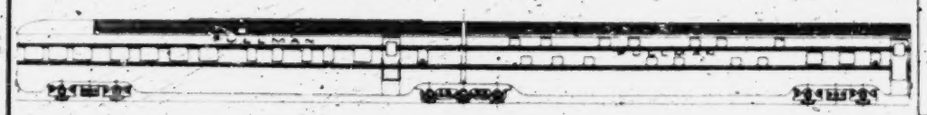
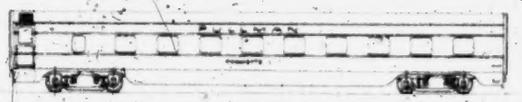
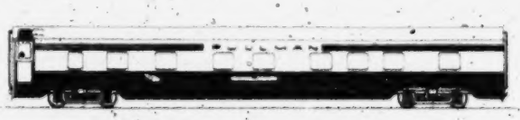
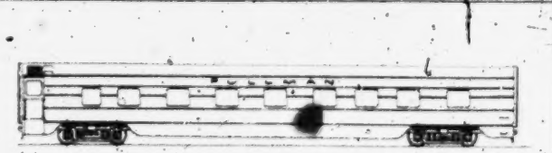
* BOOSTER EQUIPPED
◆ PRICE AND WEIGHT OF THESE LOCOMOTIVES ESTIMATED BUT ADDED HERE FOR COMPARATIVE PURPOSES

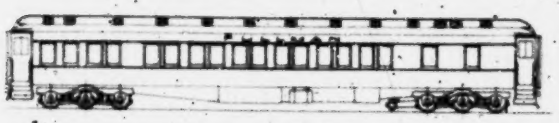
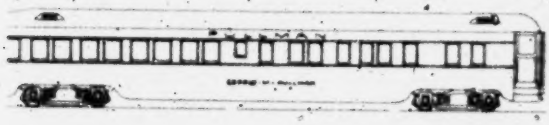
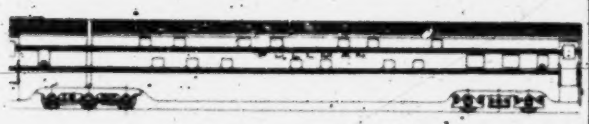
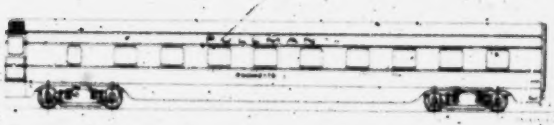
THE PULLMAN COMPANY

CHRONOLOGY OF ADVANCES IN SLEEPING CAR CONSTRUCTION

YEARS 1900 TO 1940

SIDE ELEVATION	YEAR	NEW FEATURES	LENGTH OVER PLATFORMS COUPLED	AVERAGE WEIGHT OF 6 TRUCKS	AVERAGE WEIGHT OF ONE TRUCK
	1900 1901 1902 1903	HELICAL SPRING DRAFT GEAR. NATIONAL COUPLERS WITH VERTICAL CENTERING DEVICE. WROUGHT IRON BODY BOLSTERS. WOOD & STEEL TRUSS RODS UNDERFRAME. WOOD BODY WITH WOOD & CANVAS ROOF & WOOD INTERIOR. WOOD FRAME VESTIBULE. P.M. BRAKE SCHEDULE ONE 14" CYLINDER BODY HUNG. M.C.B. 4 WHEEL TRUCK WOOD FRAME STEEL PLATES. TRIPLE BRAKES. 4½" x 8½" JOURNALS. HAND BRAKE BEAMS. PRESS PLATE STEEL WHEELS. 36"-24" "SAFETY" HOT WATER HEAT. PINTSCH GAS LIGHTING. 78" STEAM TRAINLINE.	78' - 10"	120,000 lbs	9,000 lbs
	1904	NATIONAL COUPLERS WITH CARRIER CENTERING DEVICE. P.M. BRAKE SCHEDULE ONE 8" CYLINDER BODY HUNG. M.C.B. 4 WHEEL TRUCK WOOD FRAME STEEL PLATES. TRIPLE BRAKES. 5" x 9" JOURNALS. DIAMOND SPECIAL FORGED STEEL BRAKE BEAMS.	80' - 9"	122,000 lbs	9,000 lbs
	1906	WESTINGHOUSE D-3 WEDGE TYPE FRICTION DRAFT GEAR. BUMPER & STEAM COUPLERS. CAST STEEL BODY BOLSTERS. WOOD & STEEL VESTIBULE. L.N. BRAKE SCHEDULE TWO 12" CYLINDERS. GAS & ELECTRIC LIGHTS WITH WOOD END ELECTRIC UNIT.	81' - 6"	124,000 lbs	19,000 lbs
	1907	FIRST ALL STEEL STRUCTURE PULLMAN CAR. TRUSS ROD STEEL UNDERFRAME WITH 10" I BEAM SILLS. STEEL BODY WITH STEEL PLATE EXTERIOR. STEEL ROOF. STEEL VESTIBULE. P.M. BRAKE SCHEDULE WITH ONE 12" CYLINDER. GAS & ELECTRIC LIGHTS WITH BATTERIES	80' - 5"	165639 lbs	20,300 lbs
	1910	BOD STEEL WITH INTERLOCKING STEEL SHEATHING. EXTERIOR STEEL ROOF & STEEL VESTIBULE. COMBINATION CAST STEEL PLATFORMS & BOLSTERS. BUILT UP STEEL CENTER SILLS & DEEP STEEL INTERIOR. M.C.B. CAST STEEL TRUCK 5½" JOURNALS TRIPLE BRAKES. P.T.T. COUPLERS "PARCE HEART". ELECTRIC LIGHTS WITH BELT DRIVEN GENERATOR.	81' - 10"	150,000 lbs	22,000 lbs
	1911	P.C. 30 = SCHEDULE WITH TWO 16" CYLINDERS	81' - 10"	150,300 lbs	22,000 lbs
	1912 1913	CARCO TRUSSED TYPE STEEL BRAKE BEAMS. VESTIBULE STEEL U-BEAM CONSTRUCTION. ROLLED STEEL WHEELS 36" DIA.	81' - 10"	151,100 lbs	22,000 lbs
	1918	BUILT UP STRUCTURAL STEEL BOLSTERS & PLATFORMS	81' - 10"	153,300 lbs	22,000 lbs
	1916	NEW STRUCTURAL STEEL FRAMING WITH STEEL PLATE EXTERIOR. M.C.B. BRAKE SCHEDULE WITH TWO 15" CYLINDERS OR ONE 18" CYLINDER.	81' - 10"	153,800 lbs	22,000 lbs
	1917	CLASP BRAKE SYSTEM FIRST APPLIED TO NEW TYPE 10 2440 CAST STEEL 6-WHEEL TRUCK. FORGED STEEL BRAKE BEAMS SIMPLEX TYPE.	81' - 10"	154,000 lbs	22,400 lbs
	1920 1921	WESTINGHOUSE TYPE H-2-A FRICTION PLATE DRAFT GEAR TYPE "D" COUPLERS QUADRUPLE SLEEPY HOLLOW. NEW NO.80 CAST STEEL TRUCK WITH CLASP BRAKES. STANDARD CLASP BRAKES. 2" STEAM TRAINLINE. WEIGHT OF CAR INCREASED.	81' - 11¾"	159,000 lbs	22,800 lbs

SIDE ELEVATION	YEAR	NEW FEATURES
	1923	LENGTH OF CARS INCREASED. WEIGHT OF CARS INCREASED.
	1927	NEW 2611 CAST STEEL TRUCK. WABCO FRICTION PLATES DRAFT GEAR. 2" STEAM TRAINLINE HEATING. FIRST MECHANICAL AIR CONDITIONING SYSTEM TRIED OUT ON EXISTING CAR.
	1929	FIRST TEST APPLICATION OF AIR CONDITIONING SYSTEM TO
	1933	FIRST ALL ALUMINUM LIGHT WEIGHT SPECIAL WABCO RUBBER TYPE DRAFT GEAR. SPECIAL TYPE "D" COUPLER BUILT UP STEEL CENTER SILLS. P.S.F. FORGED ALUMINUM ALLOY SIDE POSTS. U.C.B.C. BRAKE SCHEDULE 15" DIA. CYLINDERS. SPECIAL 4-WHEEL TRUCKS, LATER CHANGED TO 6-WHEEL CAST STEEL TRUCKS. ALUMINUM ALLOY UNDERFRAME.
		ALUMINUM ALLOY BODY, BOLSTERS, SIDE SILLS. ALUMINUM ALLOY ROOF. 2" STEAM TRAINLINE. ALUMINUM ALLOY VESTIBULE SHEATHING. VAPOR HEAT. AIR CONDITIONING.
	1934	ALL ALUMINUM ARTICULATED STREAMLINED "CITY OF PORTLAND". ALUMINUM
	1935	AXLES WITH LARGER WHEEL SEATS. ENTRANCE DOOR FOR CONVENTIONAL CAR.
	1936	LIGHT WEIGHT TWIN CAR UNIT. SHORTER CLEAR TYPE HIGH TENSILE COUPLERS. SPECIAL WABCO RUBBER HAT DRAFT GEAR. U.C. BRAKES WITH TRUCK HUNG CYLINDERS. TRUCKS TWO 4-WHEEL TRIPLE BOLSTER. ONE 6-WHEEL DOUBLE BOLSTER. ROLLER BEARING JOURNALS 3½" DIA. WHEELS UNIVERSAL BODY BOLSTER. HIGH TENSILE STEEL. BUILT UP ALLOY STEEL VESTIBULE.
	1936	CITY OF LOS ANGELES. STREAMLINED. CITY OF SAN FRANCISCO STREAMLINED. CITY OF DENVER. STREAMLINED.
	1937	FIRST WELDED GIRDER TYPE STEEL CAR STRUCTURE. WABCO RUBBER HATT DRAFT GEAR. M.S.C. BRAKE SCHEDULE WITH TRUCK HUNG CYLINDERS. HEAT TREATED 3½" DIA. STEEL AXLES. 2½" STEAM TRAINLINE. TRUCKS 4 WHEEL NICKEL STEEL. AIR CONDITIONED.
	1938	NEW LIGHT WEIGHT HIGH TENSILE STRUCTURE WITH TRUSS FRAME. STAINLESS STEEL EXTERIOR ALLOY. BRAKES M.S.C. SCHEDULE WITH 14" BORE CYLINDERS. TRUCKS 83.K. 4 WHEEL TRIPLE HIGH TENSILE STEEL FRAMING. EXTERIOR. 6½" x 10" JOURNALS.
	1939	WABCO THIN TYPE RUBBER DRAFT GEAR. TRUCKS 6 AND 4-WHEEL STOCK. HELICAL BOLSTER SPRINGS AND 2 STAY RODS.

SIDE ELEVATION	YEAR	NEW FEATURES	LENGTH OVER PLATFORMS COUPLED	AVERAGE WEIGHT CAR & TRUCKS	AVERAGE WEIGHT ON ONE TRUCK
	1923	LENGTH OF CARS INCREASED. WEIGHT OF CARS INCREASED.	82'-11⅝"	161 700 lbs.	22 800 lbs.
	1927	NEW 2811 CAST STEEL TRUCK. WABCO FRICTION PLATES DRAFT GEAR. 2" STEAM TRAINLINE METAL CONNECTORS. FIRST MECHANICAL AIR CONDITIONING SYSTEM TRIED OUT ON EXISTING CARS.	82'-11⅝"	170 000 lbs.	24 000 lbs.
	1929	FIRST TEST APPLICATION OF ICE ACTUATED AIR CONDITIONING SYSTEM TO EXISTING CARS.			
	1933	FIRST ALL ALUMINUM LIGHT WEIGHT PULLMAN CAR. SPECIAL WABCO RUBBER TYPE DRAFT GEAR. SPECIAL TYPE 'D' COUPLER. ROLLED STEEL WHEELS. U.S.S. FORGED ALUMINUM ALLOY BRAKE BEAMS. U.C.B.C. BRAKE SCHEDULE 16" DIA CYLINDER. SPECIAL 4-WHEEL TRUCKS, LATER CHANGED TO STD. 6-WHEEL CAST STEEL TRUCKS. ALUMINUM ALLOY UNDERFRAME AND BODY. ALUMINUM ALLOY BODY BOLSTERS BUILT UP TYPE ALUMINUM ALLOY ROOF. 2" STEAM TRAINLINE. ALUMINUM ALLOY VESTIBULE SPECIAL. VAPOR HEAT. AIR CONDITIONED.	84'-3"	119700 lbs.	
	1934	ALL ALUMINUM ARTICULATED STREAMLINER 'CITY OF PORTLAND' ALUMINUM CONSTRUCTION.	64'-6"	63 690 lbs.	6 200 lbs.
	1935	AXLES WITH LARGER WHEEL SEATS AND CENTERS INTRODUCED FOR CONVENTIONAL & LIGHT WEIGHT CARS.			
	1936	LIGHT WEIGHT TWIN CAR UNIT. QUARTER GIRDER TYPE HIGH TENSILE STEEL CAR STRUCTURE. SPECIAL WABCO RUBBER HAT DRAFT GEAR. TIGHT LOCK COUPLER. U.C. BRAKES WITH TRUCK HUNG CYLINDERS & 16" CYLINDER. TRUCKS: TWO 4-WHEEL TRIPLE BOLSTER. ONE 6-WHEEL DOUBLE BOLSTER. ROLLER BEARING JOURNALS: 36⅛" DIA ROLLED STEEL WHEELS. UNDERFRAME, BODY, BODY BOLSTERS & END HIGH TENSILE STEEL. AIR CONDITIONED. BUILT UP ALLOY STEEL VESTIBULE.	153'-0"	COMPLETE CAR 223 200 lbs.	4 WHEEL 19 600 lbs. 6 WHEEL 25 400 lbs.
	1936	CITY OF LOS ANGELES' STREAMLINER CITY OF SAN FRANCISCO' STREAMLINER CITY OF DENVER' STREAMLINER	ALUMINUM 64'-10⅝" CONSTRUCTION 64'-10⅝" 69'-6"	70 434 lbs. 69 660 lbs. 70 980 lbs.	18 738 lbs. 18 434 lbs. 19 666 lbs.
	1937	FIRST WELDED GIRDER TYPE HIGH TENSILE STEEL CAR STRUCTURE. WABCO RUBBER HATT DRAFT GEAR. H-5-C BRAKE SCHEDULE WITH FOUR 12" TRUCK HUNG CYLINDERS. HEAT TREATED 36⅛" DIA STEEL WHEELS. 2½" STEAM TRAINLINE. TRUCKS 4 WHEEL NICKEL STEEL TRIPLE BOLSTER AIR CONDITIONED.	84'-6"	130 690 lbs.	18 850 lbs.
	1938	NEW LIGHT WEIGHT HIGH TENSILE STEEL CAR STRUCTURE WITH TRUSS FRAME & CORRUGATED STAINLESS STEEL EXTERIOR ROOF & SIDE WINDOWS. BRAKES H.S.C. SCHEDULE WITH FOUR 12" TRUCK HUNG BRAKE CYLINDERS. TRUCKS 4'-0" 4-WHEEL TRIPLE BOLSTER. HIGH TENSILE STEEL FRAMING STAINLESS STEEL EXTERIOR. 5½"x10" JOURNALS	84'-6"	116 000 lbs.	18 400 lbs.
	1938	WABCO THIN TYPE RUBBER DRAFT GEAR TRUCKS 4'-0" 4 WHEEL DROP EQUALIZER. HELICAL BOLSTER SPRINGS. SHOCK ABSORBERS & STAY RODS.	84'-6"	126 800 lbs.	19 000 lbs.

BRAKE SCHEDULES.

P.M. EMERGENCY BRAKING RATIO 127% REDUCED DURING STOPPING TIME.

L.N. EMERGENCY BRAKING RATIO 150% MAINTAINED THROUGHOUT STOP.

P.C. EMERGENCY BRAKING RATIO 180% WITH EMERGENCY AFTER LIGHT SERVICE APPLICATION DESIGNED FOR 110 lbs. TRAIN LINE PRESSURE.

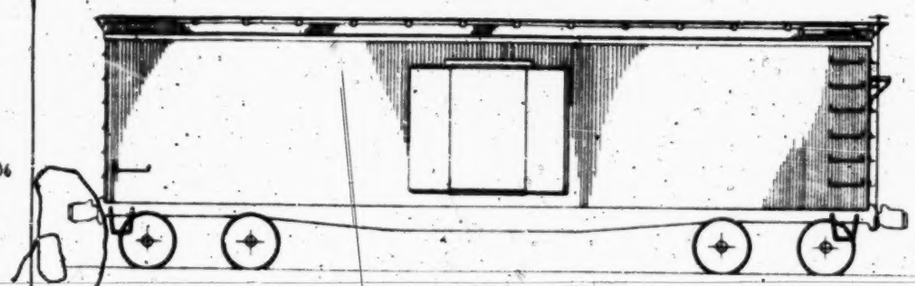
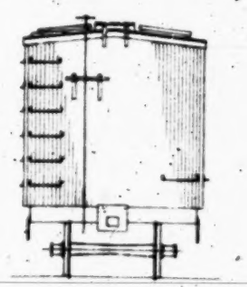
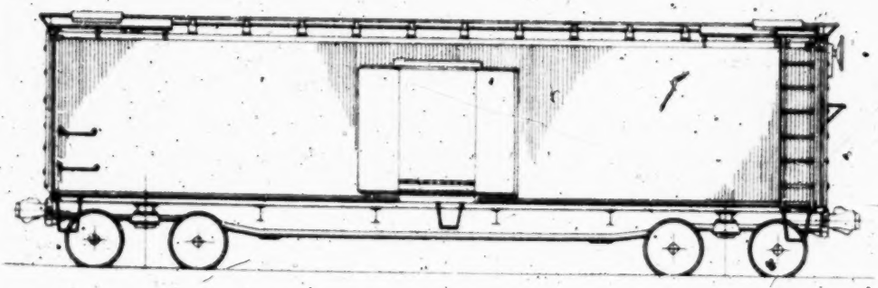
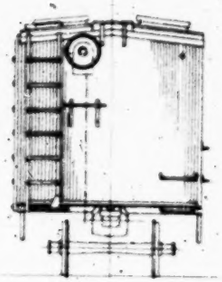
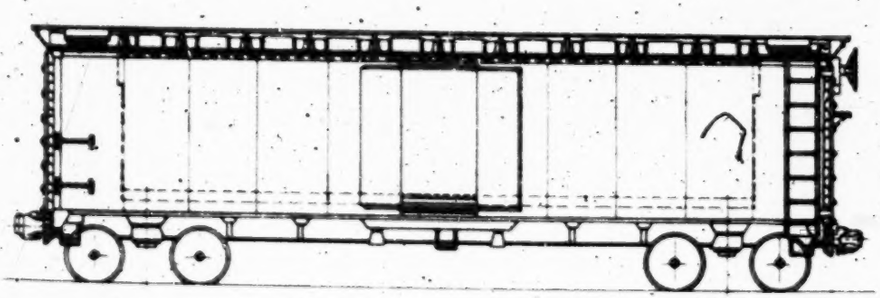
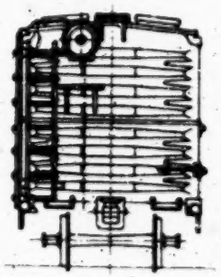
U.C. SAME AS P.C. EXCEPT IT CAN OPERATE AT ANY BRAKE PRESSURE.

H.S.C. OPERATES SAME AS U.C. CAN BE CONNECTED FOR HIGHER BRAKING PRESSURES & ELECTRO PNEUMATIC CONTROL.

THE PULLMAN COMPANY
OFFICE OF CHIEF ENGINEER
PULLMAN BLDG. CHICAGO, ILL.

Superior Court, Pima Co., Arizona
State v. S.P. Co. No. 20087
Defts. Ex. No. 4.2 (Witness

CHRONOLOGY OF PACIFIC FRUIT EXPRESS FREIGHT REFRIGERATOR CARS
YEARS 1906 - 1936
SHOWING DESIGN AND CAPACITY CHARACTERISTICS

YEAR	A SIDE ELEVATION	B END ELEVATION	C NEW FEATURES	D CARRYING CAPACITY & WEIGHT LBS.	E CUBICAL CAPACITY CU.FT.	C
1906			10" Air Brake Cylinder Triple Valve B-1 Brake Beam 1" Truss Rod Pressed Steel Underframe Arch Bar Trucks 4-1/4" x 8" Journals Cast Steel Coupler 5" x 7" MCB Shank Carmer Release Rigging Tandem Spring Draft Rigging Drop Forged Coupler Yoke Simplex Truck Bolster Wheels Cast Iron Wood Superstructure " Roof	60000 44500	1964	
1930			Triple Valve K-2 Struct. Steel Built up Underframe Cast Steel Truck Side Frames 5" x 9" Journals Brake Beam Safety Supports Bottom Rod Safety Guard Cast Steel Truck Bolster Type "D" Coupler 6" x 8" Shank Coupler Centering Device Improved Cast Iron Wheels (Single plate) Friction Draft Gears Cast Steel Coupler Yokes Rotary Coupler Release Rigging No. 24 Brake Beam 1-1/4" Truss Rod Additional Handhold Side and End Ladders Metal Brake Steps Power Hand Brakes Steel Superstructure Flexible Metal Roof	80000 52500	1988	
1936			AB Brakes Steel Underframe with Corten Steel Center Sill Double Truss Spring Plankless Truck Loop Type Brake Hangers and Wear Plates Type "E" Coupler Truck Snubber Springs No. 3 Brake Beam 1-3/8" Truss Rod Steel Sheathing and Framing Steel Ends Solid Steel Roof	80000 53100	1988	

Superior Court, Pima Co., Arizona
State v. S.P. Co. No. 20087

Defts. Ex. No. ____ (Witness _____)

D CARRYING CAPACITY & WEIGHT LBS.		E CUBICAL CAPACITY CU.FT.	F CROSS SECTIONAL AREA CENTER SILL - SQ. IN.
60000	44500	1964	20.81
80000	52500	1988	28.44
80000	53100	1988	18.40

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In the Supreme Court of the United States

OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY, a corporation,
Appellant,

vs.

STATE OF ARIZONA ex rel. JOE CONWAY,
Attorney General of the State of Arizona,
Appellee.

APPELLANT'S REPLY BRIEF

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vs.

STATE OF ARIZONA ex rel. JOE CONWAY, Attorney General of the State of Arizona, *Appellee*.

APPELLANT'S REPLY BRIEF

FOREWORD

Following the plan of our Opening Brief, this Reply is in two sections: the first addressed to those portions of appellee's brief which undertake to deal with the legal principles involved; the second to those portions wherein the facts are discussed.

I.

THE LEGAL ISSUES

1. THE EXCLUSIVE NATIONAL FIELD

(Appellee's Brief, pp. 20-41)

At the outset of its discussion of the "exclusive national field" appellee quotes from pages 82-83 of Volume I of appellant's Opening Brief, and then asserts that our position is based upon certain assumptions: (1) that the challenged law has a real relation to the safety of those within the state, and operates in a field not occupied by Congress; (2) that the right of the state to exercise its reserved police power depends upon a judicial determination whether the subject matter is of such exclusive national concern, that *as a matter of policy* it should be regulated by Congress and not by a state legislature; and (3) that in making this judicial determination this Court is "prohibited" from considering whether the state statute has a safety purpose. From these premises appellee concludes that we have contended that the validity of a state law, admittedly having a safety purpose and otherwise valid as an exercise of police power, would be made subject to the opinion of the Court as to whether the protection should be by federal or state legislation.

Appellee has misconceived our position upon the exclusive national field issue. We do not "assume" that the Train-Limit law was either enacted in the interest of safety, or has any relation to that asserted purpose; for we know the contrary to be true. Neither do we "assume" that the right of the state to legislate in the interest of safety, but upon a subject matter falling within the exclusive national field, is dependent upon considerations of policy to be de-

termined by this Court; for we know that in such a case the "policy" is that laid down by the Commerce Clause.

While we believe that our position is accurately stated in our opening brief (Vol. I, pp. 81-82, 155-156), it is desirable, in view of appellee's misconception, again to set it forth in precise language. It is our contention that the grant of power to Congress by the Commerce Clause, of its own force and without action by Congress, established the essential immunity of interstate commerce from direct control of the states with respect to those subjects which are of such nature as to demand that, if regulated at all, their regulation should be prescribed by a single authority; that as to those subjects which require a general system or uniformity of regulation, the power of Congress is exclusive. It is our further contention, supported by both unchallenged fact and abundant authority, that the length and consist of interstate railroad trains is a subject of such nature as to demand regulation by a single authority, and therefore within the exclusive national field.

We assert also that, as a necessary consequence of these principles, in considering the validity of the challenged law as an invasion of this exclusive national field the question of its *purpose*—i.e., whether it is a police-power measure, in the interest of safety or otherwise—need not and should not be considered. For if the subject matter falls within the national field, then the power of the national government is exclusive; the state cannot regulate for any purpose, or under any guise or pretext; and any purposes, whether of safety or otherwise, ascribed or claimed for attempted action by the state in the exclusive field, are wholly immaterial. It is only after the determina-

tion has been made that the subject-matter is not within the exclusive field, but instead within the concurrent or permissive field, that consideration need be given whether the asserted police power of the state has been properly exercised.

The determination whether the subject-matter is of exclusive national concern, and *as such*, within the exclusive national field, is not a determination of policy, but of law, to be made upon the basis of the facts developed by the record or judicially known to the Court, and in the light of applicable principles. This determination is one which the Court must make for itself (*LaCoste v. Dept. of Conservation*, 263 U.S. 545, 550), by looking to practical considerations (*Foster Fountain Packing Co. v. Haydel*, 278 U.S. 1, 10); and it will answer the question whether a challenged regulation is a direct burden upon and an obstruction to interstate commerce and therefore prohibited, or merely incidental and therefore permissible, by weighing the *nature* of the activities regulated and the propriety of local regulation of them, as disclosed by the record (*Milk Control Board v. Eisenberg*, 306 U.S. 346, 352); i.e., the question will be determined "upon a consideration of all the relevant facts and circumstances" (*Parker v. Brown*, 317 U.S. 341, 362-363). The "question of policy" has been settled by the Constitution, in that the Commerce Clause confers upon Congress the exclusive power to regulate those subject matters which, by their nature, are determined to be of exclusive national concern.

Appellee in this discussion takes the position that the law, because assertedly enacted in the interest of safety,

does not infringe the exclusive field, but instead is within the so-called joint or concurrent field, in which the states may regulate matters of local concern even though commerce is affected, and provided that Congress has not acted; for, according to appellee, "protection against accidents is a local matter or problem" (its brief, p. 40). From this premise appellee proceeds to the conclusion that in determining whether the law invades the exclusive national field, it must *first* be determined whether it is unreasonable or passes beyond the bounds of suitable local protection; for only if this is shown, appellee argues (its brief, p. 23), can it be concluded that the law *directly* regulates interstate commerce and so violates the Commerce Clause.

The fundamental fallacy of appellee's argument lies in its failure to distinguish between the *purpose* to which the challenged law is allegedly addressed, and the *subject-matter* regulated. The claimed *purpose* of the law is the protection of employees and others from dangers alleged to be peculiar to long-train operation, i.e., greater safety; but "safety" is *not* the subject-matter regulated. This is shown by the text of the law itself. Neither the word "safety," nor any word or phrase of similar connotation, appears therein. The title of the law declares it to be "An Act limiting the number of cars in a train"; the phraseology of the statute refers only to the operation of railroad freight and passenger trains. The subject-matter of the law is therefore the length and consist of railroad trains and, in its application to the present case, of trains operated by an interstate railroad in the transportation of interstate commerce.

Many decisions of this Court make clear the point that the claimed or stated purpose of a challenged law does not determine whether it invades the exclusive national field. That determination rests upon the nature of the subject-matter regulated and the incidence of the regulation upon interstate commerce. Thus, in the *Minnesota Rate Cases*, 230 U.S. 352, in the very portions quoted by appellee, the Court declared (p. 400) that the power of Congress is exclusive, and the states are deprived of power to regulate directly "under any guise," with respect to "those *subjects* . . . which are of such a nature as to demand that, if regulated at all, their regulation should be prescribed by a single authority"; i.e., "those subjects which require a general system or uniformity of regulation." In *Shafer v. Farmers Grain Co.*, 268 U.S. 189, 199, the Court pointed out that "a state statute which by its necessary operation directly interferes with or burdens such (interstate) commerce is a prohibited regulation and invalid, regardless of the *purpose* with which it was enacted." In *Union Brokerage Co. v. Jensen*, 322 U.S. 202, 210, it was said that "the incidence of the particular state enactment must determine whether it has transgressed the power left to the states"; i.e., whether it has invaded the exclusive national field; and in *Parker v. Brown*, 317 U.S. 341, 362, the Court repeatedly referred to the necessity of a consideration of all the relevant facts and circumstances, in order to determine whether a challenged regulation controls *matters of local concern*, which were declared to be appropriate subjects for local regulation, provided the national interest is not impaired nor the free flow of commerce obstructed.

Appellee asserts (its brief, pp. 25-26) that this Court has consistently held that state police-power legislation in a field not occupied by Congress comes within the permissive field and, if otherwise valid, is valid under the Commerce Clause until superseded by federal legislation. This is not a correct statement of the effect of the decisions of this Court, for it is equivalent to declaring that the Court has held that a state statute enacted for the purpose of health or safety or public welfare is always in the joint field, no matter whether directed at and directly regulating interstate commerce, and regardless of its effects upon that commerce. Contrary to appellee's contention, "the decisions of this Court have recognized that there is scope" for the operation of the Commerce Clause to strike down state legislation, when such legislation, though "nominally of local concern, is *in point of fact* aimed at interstate commerce, or by its necessary operation is a means of gaining a local benefit by throwing the attendant burdens on those without the state" (*South Carolina Highway Dept. v. Barnwell Bros.*, 303 U.S. 177, 185-186). Conspicuous examples of decisions of this type include those particularly cited at pages 105-109, 120-121, and 188-189 of Volume I of appellant's opening brief: e.g., *Kansas City Southern Ry. v. Kaw Valley Drainage Dist.*, 233 U.S. 75; *Seaboard Airline Ry. Co. v. Blackwell*, 244 U.S. 310; *Edwards v. California*, 314 U.S. 160; *South Covington R. Co. v. Covington*, 235 U.S. 537; *M. K. & T. R. Co. v. Texas*, 245 U.S. 484; and *St. Louis Southwestern Ry. Co. v. Arkansas*, 217 U.S. 136. In the *Kansas City Southern* and *Edwards Cases*, state regulations having an obvious relation to the public welfare were set aside under

the Commerce Clause, despite attempts to defend them "by invoking the convenient apologetics of the police power," because they directly obstructed the free movement of persons and property in interstate commerce. In the *Blackwell Case* a state regulation, plainly in the interest of safety because it would have greatly reduced if not entirely eliminated hazards at grade crossings, was set aside under the Commerce Clause because of the direct burden and interference with interstate commerce. In the *M. K. & T. Ry. Case*, a state regulation intended to promote the convenience of passengers, and thus a clear exercise of the police power, was set aside because it directly regulated the operation of interstate passenger trains. In the *Covington Case* a city ordinance intended to promote the comfort and convenience of passengers, and having an obvious relation to that purpose, was set aside because by limiting the number of passengers which could be carried in a car it would have compelled a street car company operating in and between adjoining cities in different states to run more cars, not only within Covington, but also across the state boundary, and in the neighboring city of Cincinnati. On the facts it was held that this was a direct regulation of interstate commerce in the exclusive national field.

It is apparent from these examples that the mere *purpose* claimed for a state regulation, or even a showing of reasonable relation to that purpose, is not sufficient to place it within the permissive field if *in fact* the subject-matter is within the exclusive national field and the effect is to regulate commerce directly. In such cases, particularly if the subject is one "demanding uniformity of regula-

tion . . . state action is altogether inadmissible." The Constitution itself occupies the field, even if there is no federal legislation (*Kelly v. Washington*, 302 U.S. 1, 9).

Apparently realizing that the question whether the *subject-matter* is of *national*, rather than *local* concern (and not the claimed purpose of the law), is determinative of the "national field" issue, appellee has attempted, in its references to the facts (its brief, pp. 7-8, 39, 131-132) to make it appear that there are special local conditions in Arizona which warrant separate treatment and indicate that because of the practical difficulties involved, the subject-matter cannot receive adequate attention from Congress. Thus it has been recognized that this question is one for judicial determination, upon the facts developed by the record or judicially known to the Court.

The special findings of the trial court (Findings VI(c), VII(b)(2); R. 3908, 3919) show that there are no special local conditions in Arizona which render the regulation of the length and consist of interstate trains operated in that state a matter peculiarly of *local*, as distinguished from *national*, concern, in the sense intended by this Court's decisions: e.g., *South Carolina Highway Dept. v. Barnwell Bros.*, supra; *California v. Thompson*, 313 U.S. 109, and *Parker v. Brown*, supra. Rather, the facts show that this subject-matter is not one admitting of diversity of treatment; that no practical difficulties are involved, such as to prevent adequate treatment by Congress; that it is outstandingly of national concern, for a variety of controlling reasons:

First, the traffic carried in the interstate trains regulated by the Arizona law is almost wholly interstate and

not local in character. These trains move in a continuous course in interstate commerce over lines (in Arizona) which are an integral and inseparable part of appellant's railroad, the latter in its turn being equally an essential and inseparable part of the entire national transportation system.

Second, the law imposes physical obstructions to the free flow and movement of interstate commerce amounting, if not to an absolute barrier, to at least a very effective hindrance, such that, as stated by the trial court (R. 4048), "practically . . . Arizona operations create a bottleneck." Even in times of light traffic these obstructions materially impede the free flow of commerce; but in times of heavy traffic and urgent demand such as have continued ever since the commencement of this case, their effects are much more serious, because they actually limit the traffic capacity of the appellant's railroad plant.

Third, if Arizona may validly regulate the length of interstate trains, so may all the other states; and such regulations need not be the same as in Arizona or confined, as is the Arizona law, to a maximum length. It is just as competent, and in the light of this record would be considerably more logical in the interest of safety, for a state to provide by law that trains *below* a specified *minimum* length should not be operated for the handling of through interstate traffic. The handicaps imposed by attempting to comply with even varying *maximum* limitations sufficiently show, however, that the subject-matter is one requiring a national and uniform system of regulation, if any be necessary.

Fourth, there are the inevitable and unchallenged extra-territorial effects of the law. Appellee makes no attempt to deny that the law can be fully observed *within* Arizona, only by complying with the limitations for substantial distances outside; that it is impossible to provide exactly at the state boundary lines the terminal and other facilities required to make the necessary changes in train lengths.

Fifth, the law effectively prevents the attainment of the improved efficiency, economy, safety, and adequacy of interstate transportation service by rail, especially declared by Congress in the preamble to the Transportation Act 1940 to be a national transportation policy, to be promoted, as Congress said, to the end of developing, coordinating, and preserving a national transportation system adequate to meet the needs of commerce and of the national defense.

Sixth, the subject-matter is of immediate and pressing national interest at the present time; because the law, though temporarily suspended, has interfered and still interferes with and obstructs the speedy and efficient use of equipment and manpower in the national defense, causes congestion, delay, and waste, and actually limits the transportation capacities of the affected lines. These are the specific findings of the Interstate Commerce Commission in the recitals of Service Order No. 85, affirmed when the order was sustained: *Ex Parte No. 156*, 256 I.C.C. 523.

Although the nature of the subject-matter regulated completely determines whether the exclusive national field

is invaded; we do not contend that the claimed or stated purpose of the challenged statute is not to be considered. If the facts show that the regulation has no legitimate purpose, it cannot be sustained even though the subject-matter is of local rather than national concern. It is for this reason that in many decisions, examples of which are among those cited by appellee, the safety or other correlative purpose has been so carefully set forth. This mention does not support appellee's erroneous theory that the claimed or intended purpose is one and the same with the subject-matter regulated; or that the purpose, though declared or apparent, constitutes any criterion whether the exclusive national field is invaded.—The purpose may be wholly legitimate, as in the *Kansas City Southern, Blackwell, South Carrington,* and *Edwards Cases,* for example; and yet the law will fall as a violation of the Commerce Clause.

Moreover, in the case at bar appellee's attempted emphasis on purpose is misplaced. The text of the law pointedly omits any reference to the safety purpose now claimed. There are no facts shown of record, nor any factual circumstances which the Court may judicially notice, which support appellee's theory that the law has or ever had a safety purpose. The evidence shows that when it was enacted the legislative purpose was quite different (R. 1107-1108; Exs. 149, 150, 182, 213). There was no contemporaneous long-train operation in Arizona, hence there could not have been any purpose to forbid an operating practice known or suspected to be unsafe. The law in fact made no change in operations as then conducted. The selection of the 70-car limit, at the time the effective oper-

ating maximum for Southern Pacific freight trains in Arizona because of prevailing siding capacities on its single track line, demonstrates that the purpose was to maintain employment levels by freezing the operations in the mold of 1912; so that, whatever might be future improvements in road, equipment, and railroad practice generally, permitting the operation of fewer and longer trains, the Arizona railroads would still be compelled to continue to operate many more trains and employ many more train and engine men than otherwise necessary. Certainly this is the sole effective result of the law, and the only purpose which can logically be assigned.

Appellee asserts (brief, p. 35) that the determination whether a challenged regulation imposes too severe a burden upon interstate commerce is for Congress and not for this Court, the function being assertedly legislative and not judicial; citing in particular, *California v. Thompson*, *Parker v. Brown*, and *South Carolina Highway Dept. v. Barnwell Bros.*, supra, and quoting at length from the latter (303 U.S., at pp. 189-190). This argument was anticipated, and is largely answered in Volume I of our opening brief, at pp. 97, 147-154, 169, 197.

This Court, while it has employed the expressions quoted by appellee, has carefully limited the effect of the doctrine stated to those regulations which fall within the concurrent or permissive field, as distinguished from the exclusive national field. Thus in the *Barnwell* opinion, in the paragraphs immediately preceding that from which appellee quotes (see 303 U.S., at pp. 187-189), the Court especially stated that the subject-matter of the regulation there challenged was peculiarly of local concern; and in

that respect, since it involved the use of local highways, quite unlike the regulation of railroad operations.

Appellee has omitted, from the quotation of this opinion at pp. 36-37 of its brief, the phrase "otherwise permissible," and thus overlooked its significance as applied to those state regulations concerning which the legislative rather than the judicial function is to be invoked. A state regulation of a matter of national concern, requiring a uniform standard and system of regulation, is not "otherwise permissible." In such a case the Commerce Clause itself, as applied by the Court, constitutes the prohibition which invalidates the attempted state action, and the exercise of the congressional function becomes unnecessary. In *California v. Thompson*, and *Parker v. Brown*, the emphasis was likewise upon the question of the validity of regulations "of matters of local concern," which also operate as regulations of interstate commerce; and there is no statement by the Court which indicates that as to matters of *national* concern the remedy lies only in the legislative branch.

To support this argument appellee also asserts (its brief, pp. 31-32) that "no real problem is presented as to how Congress may enter the field and thus exclude the states." Appellee then cites examples whereby state enactments in the *joint field* have been set aside: a wholly distinct situation, since the subject-matter of the Train-Limit law is of exclusive *national concern*. "In that class of cases the Constitution itself occupies the field, even if there is no federal legislation" (*Kelly v. Washington*, 302 U.S. 1, 9); the grant of power by the Commerce Clause having itself "established the immunity of interstate commerce from

the control of the states respecting all those subjects" which demand uniform regulation (*Milk Control Board v. Eisenberg Farm Products*, 306 U.S. 346, 351; *Edwards v. California*, 314 U.S. 160, 176). In this field, silence or inaction by Congress is equivalent to a declaration that interstate commerce shall be untrammeled (*Welton v. Missouri*, 91 U.S. 275, 282; *Hall v. De Cuir*, 95 U.S. 485, 489; *Missouri v. Kansas Natural Gas Co.*, 265 U.S. 298, 310; *Graves v. O'Keefe*, 306 U.S. 466, 479, n. 1). The fact that Congress has indeed refused several times (R. 184-185) to pass legislation directly imposing fixed maximum limits upon interstate trains clearly shows its conviction that no further regulation of this type is needed. It is therefore improper, as well as unnecessary, for those interested in removing the state restriction to address themselves to Congress. They are properly seeking relief in the courts, whose paramount duty is to interpret and apply the Constitution.

It is conceded by appellee (its brief, p. 21) that a state may not, under the guise of the police power or otherwise, *directly* regulate commerce. While this Court has indicated (*Parker v. Brown*, supra, 317 U.S., p. 362; compare *Di Santo v. Pennsylvania*, 273 U.S. 34, 44) that the terms "direct" and "indirect" are not wholly satisfactory for the purpose of characterizing the effects of a challenged state regulation, nevertheless they are quite significant in this case. This statute cannot be described as other than a *direct* regulation of the length and consist of interstate trains, and thus of interstate commerce. It has no other result. Every one of appellant's main line trains in Ari-

zona upon which this statute operates is an interstate train. About 93% of the traffic handled is interstate commerce; and some 65% thereof in the case of freight, and 75% thereof in the case of passengers, is moving between points outside of Arizona, as to which Arizona is simply a "bridge." Thus the statute, though claimed to be ("nominally") of "local concern, is in point of fact aimed at interstate commerce," and by necessary operation is a means of gaining a local benefit (of artificially increased employment) "by throwing the burdens on those without the state"; i.e., upon those who patronize the interstate trains crossing Arizona: compare *South Carolina, etc. v. Barnwell Bros.*, supra, 303 U.S., pp. 185-186.

2. THE EXTRA-TERRITORIAL EFFECT OF THE LAW
(Appellee's Brief, pp. 52-57)

Appellee's discussion of the extra-territorial point is very limited, apparently because it has no effective answer grounded in either law or fact.

Its principal reliance is upon decisions upholding state regulation of trucks on state highways (*South Carolina Highway Dept. v. Barnwell Bros.*, supra, 303 U.S. 177; *Maurer v. Hamilton*, 309 U.S. 598; *Sproles v. Binford*, 286 U.S. 374); and it asserts, though without factual support, that the regulations considered in those cases "probably" imposed far greater extra-territorial burdens upon interstate commerce than the Train-Limit Law. In our discussion of these cases in our Opening Brief (Vol. I, at pp. 147-154, 169-171), we pointed out that no questions of extra-territorial effect were involved. This Court remarked, however, in a footnote to the *Barnwell* opinion

(303 U.S., at p. 185), that "state regulations affecting interstate commerce, whose purpose or *effect* is . . . to *burden those out of the state*, without any corresponding advantage to those within, have been thought to impinge upon the constitutional prohibition (the Commerce Clause) even though Congress has not acted." (Emphasis supplied.) *Hall v. DeCuir*, 95 U.S. 485; *Bowman v. C. & N. W. Ry. Co.*, 125 U.S. 465; and *Baldwin v. Seelig*, 294 U.S. 511, cases upon which we rely in our extra-territorial argument (our brief, Vol. I, pp. 160-166), were cited with apparent approval.

The *Barnwell* opinion indicates also, and the *Maurer* opinion confirms, that there is a substantial distinction, in the mind of the Court, between state regulation of interstate railroads, operating upon their own rights of way, and similar regulation of the use of the state-owned highways. "*Unlike the railroads*, local highways are built, owned and maintained by the state or its municipal subdivisions. The state has a primary and immediate concern in their safe and economical administration" (*Barnwell* opinion, 303 U.S., p. 187). The regulatory problems involved in the regulation of motor vehicle traffic bear *little resemblance* to those of other systems of transportation; "our most extensive experience had been in the national regulation of rail carriers, operating over roads and with rolling stock privately owned and controlled, with standards of roadbed, operation, and equipment substantially uniform throughout the country, and with the movement of traffic on each road subject to a single unified control. *Regulation of vehicular traffic over the highways of the United States involves a far more varied and complex*

undertaking." (*Maurer* opinion, 309 U.S. 598, 609; emphasis supplied.)

While states may act *within* their respective jurisdictions, according to the special requirements of local conditions, by the same token "one state cannot establish standards which would derogate from the equal power of other states to make regulations of their own." (*Sproles* opinion, 286 U.S., p. 390). The Arizona law has exactly these effects: admittedly, it cannot be observed within Arizona, in its application to interstate trains in continuous movement, without also controlling train lengths in California and New Mexico, and thus derogating from the equal power of those states to make corresponding regulations of their own.

Cases cited by appellee relating to railroad operations include: *N. Y. H. & H. R. Co. v. New York*, 165 U.S. 628; *Atlantic Coast Line R. Co. v. Georgia*, 234 U.S. 280; the *Arkansas Full Crew Cases*, 219 U.S. 453, 283 U.S. 249; and *Terminal Railroad Assn. v. Brotherhood*, 318 U.S. 1. In each of these, other than the *Terminal Railroad Case*, certain changes in railroad crews or equipment were apparently required at state lines; but none involved a regulation which by inevitable effect controlled interstate commerce far beyond the boundary. There was no actual claim of substantial extra-territorial effect, but only that interstate operations would be "inconvenienced" *at the boundaries*. Here it is conceded that the law directly controls the operations for considerable distances beyond the boundaries, and the changes compelled are not and cannot be effected at the state line.

In the *Terminal Railroad Case* the only extra-territorial effect resulted from a requirement for the use of cabooses in interyard or transfer movements, including those crossing the Mississippi between St. Louis and East St. Louis. The actual extra-territorial effect thus caused would be comparatively slight, and could well be termed inconsequential. There is a vast difference between hauling a caboose attached to a cut of cars, for a few hundred yards from the state boundary to the first point where it may be detached, and the compelled operation of short trains for substantial distances beyond the boundary.

Moreover, the *Terminal Railroad Case* should be read in the light of *South Covington R. Co. v. Covington*, 235 U.S. 537, cited in footnote 16, 318 U.S., p. 9. In the *Covington Case*, the extra-territorial effect of a local regulation was clearly involved and, in fact, was a primary reason for holding it invalid.

The law is plainly a regulation aimed at interstate commerce, one of whose principal effects is to impose burdens upon and obstructions to commerce, as carried on *outside of Arizona*. This Court's decisions establish that a law which inevitably imposes such extra-territorial burdens and obstructions is invalid under the Commerce Clause, whether or not it be called a "local" regulation.

3. "THE OCCUPIED FIELD"
(Appellee's Brief, pp. 57-78)

Appellee's argument upon the above topic has been generally anticipated and largely covered in the section of our Opening Brief devoted to this issue (Vol. I, pp. 209-254).

Appellee attempts to establish a lack of conflict between Sections 1 and 9 of the Federal Safety Appliance Act and Section 25 of the Interstate Commerce Act, on the one hand, and the Train Limit Law on the other, by asserting (its brief, pp. 61-64) that the only purpose or effect of the federal statutes is to prescribe the brake equipment and other appliances, required for the control and stopping of trains, to be used on the cars and trains of interstate railroads; and infers that these statutes are not concerned with the effectiveness of these appliances in actually controlling trains, but only with the application of a sufficient number and proportion, in working order. Appellee then says (its brief, p. 66) that the Train Limit Law is not concerned with ("does not regulate") mechanical equipment, but occupies only the field of "the number of cars which may be run in a train."

This argument fails to give any weight to the long-standing construction of the Safety Appliance Act. In *Virginian Railway Co. v. U. S.* (C.C.A. 4), 223 Fed. 748 (approved by this Court through subsequent citation: *New York Central R. Co. v. United States*, 265 U.S. 41, 46), the railroad was convicted of violating the Act by having operated trains fully equipped with all of the power-brakes and appliances required by law and the order of the Interstate Commerce Commission, admittedly in good working order: because these trains were so *long* and so *heavy* that, "in the circumstances of their operation" (i. e., in consideration of the grades, etc. encountered) they could not be adequately controlled by the engineers in charge, by use of those brakes. It was shown in the case that *shorter* trains, equipped with the same

brakes, and indeed composed of the same cars, could be and were properly controlled in their operation over the same lines. Thus the Safety Appliance Act was construed as requiring not merely the presence of air brakes on the cars, but also that they be *adequate* to control trains *safely*, and as *limiting* their *lengths* to that number of cars which, in all the circumstances of operation, could be *safely* controlled thereby.

The Safety Appliance Act as thus construed is clearly a "train-limit" law; but (as contrasted with the Arizona law) is reasonable and logical because the limit may vary according to circumstances, and is to be determined by a *trial court* by an *analysis of the facts* when and if, as in the *Virginian Case*, a railroad is prosecuted for operating a train claimed to be too long for safe control.

The Safety Appliance Act has been supplemented since 1920, and especially since 1937, by the Safety Section (now Section 25) of the Interstate Commerce Act, which gives the Commission the power and duty (among others) to investigate and determine the effectiveness of appliances used for controlling and stopping railroad trains. Under this section the Commission has quite recently (July 29 and October 19, 1944) issued and amended its order (presently tentative, but expected shortly to be made final) prescribing specifications for brakes on freight cars, and in particular that such brakes shall be operative on ("based upon") *trains of 150 cars* (see pp. 7 and 9 of the Appendix to Vol. I of our brief).

The principal justification attempted for the Arizona law is that because of slack action freight trains of more

than 70 cars cannot be safely handled and controlled in motion or stopped, with the present type of air brakes, even though these have been greatly improved.[1]

This was the burden of the oral testimony of appellee's witnesses, and is the conclusion which it seeks to draw from the lengthy excerpts from the air-brake instruction books (Exhibits 152, 319; R. 3445-3640), quoted in its argument upon the safety issue (its brief, pp. 91-93).

The effect of the law is thus to impose an arbitrary limit, assertedly required because longer trains cannot be safely controlled, and made to apply to all trains regardless of conditions; this although the federal statutes and orders contemplate that trains may be operated up to any length at which the air brakes will function to control the train adequately, due consideration being given to the relevant circumstances. Thus, Arizona has substituted its legislative fiat, not based upon a showing of the actual limit at which the air brakes properly function (but instead upon the siding capacities prevailing in 1912 on the appellant's main line), in place of the limit which might be found proper by a federal court or jury, in the

[1]It is true that appellee assigns (its brief, pp. 65, 73, 74, 106-111, 146) other alleged dangers of long-train operation as reasons for the law: e. g., the supposed difficulty of passing signals and observing defects; the alleged loss of efficiency due to fear; and the increased responsibility of members of the crew. Appellee fails, however, to refer to any accident or casualty in Arizona or Nevada, or elsewhere upon appellant's lines, occurring on a long train, and shown to be due to any of these causes, or as to which it was or could reasonably be claimed by any witness that the accident would not have happened on a short train, or, if happening, would have been less severe. The trial court found (R. 4023-4032) that these alleged hazards, as well as those supposed to arise from the asserted greater difficulty of controlling long trains, are largely imaginary.

light of the proof adduced in a prosecution under the Safety Appliance Act for operating a train which allegedly could not be safely controlled.

Clearly this constitutes a direct conflict between the federal and state statutes, forcefully exemplified by the Arizona long-train operations of 1940. Appellant operated 302 long freight trains and 62 long passenger trains in the state during March and April of that year. There is no testimony that any difficulty was met in handling, controlling, or stopping any of these trains. There is positive testimony from engineers who handled or rode upon some of these trains that there were no such difficulties (R. 2435, 2815). The fact that no casualties of any kind occurred on any of these long trains while in motion indicates that there was no lack of proper control. Every one of these trains was therefore lawful under the federal acts. Equally, every one of them was unlawful and forbidden by the state act. The conflict therefore was and is direct and complete.

Although this particular example of conflict is cited in our Opening Brief (Vol. I, p. 240), appellee offers no comment in its reply. There is no effective answer.

Appellee also argues (its brief, pp. 74-76) that absence of conflict between the state and federal laws is shown by the asserted lack of power in the Commission to issue an order limiting train lengths. Whether or not the Commission has such power is immaterial to the present issue. The Safety Appliance Act, as construed in the *Virginian Case*, supra, 223 Fed. 748, itself prohibits the operation of any train which, even though equipped throughout with

functioning brakes, is so long that it cannot be adequately controlled. No order of the Commission was required in 1912, or would now be required, to support a prosecution for operating a train which because of length could not be controlled. The Arizona law is nothing less than a direct attempt to modify or supplement the federal statutes, which as construed act upon the same subject matter —the length and consist of interstate trains—and for the same purpose—safety—and impose limitations which conflict and are inconsistent with the arbitrary limitation imposed by the state.

4. THE UNREASONABLENESS OF THE LAW AS A PURPORTED SAFETY MEASURE

(Appellee's brief, pp. 78-93)

In this portion of its brief, appellee argues the proposition that the validity of the law rests solely upon the determination whether, upon the whole record, it is possible to say that the law is without rational basis in safety, asserting that it has a rational basis and is therefore valid.

This entire argument depends upon the premise that the nature of the subject-matter regulated can be wholly disregarded; or, alternatively, that the subject-matter is of local concern and involves no national interest. We have shown that each of these premises is untenable.

Appellee's initial argument (its brief, pp. 80-84) is that the extent of the *burden* on interstate commerce need not be considered by the Court in determining the law's reasonableness under either the Commerce or the Due-Process Clauses. So far as concerns the Commerce Clause, this

argument is predicated upon appellee's view of the significance to be given certain expressions quoted from *South Carolina Highway Dept. v. Barnwell Bros.*, supra, (303 U.S., pp. 189-190). As already pointed out, in stating that it is a legislative and not a judicial function to determine whether the burdens imposed upon interstate commerce by state regulation are too great and should therefore be curtailed, the Court was careful to confine its reference to state regulations "otherwise permissible". It did not say that the courts might not consider the burdens imposed by state regulations operating in the exclusive national field, or which, though nominally of local concern, are in point of fact aimed at interstate commerce, or seek to subordinate the efficiency and convenience of interstate traffic to local requirements, or otherwise impose unnecessarily harsh restrictions. Since any regulation which directly burdens or impedes interstate commerce or substantially impairs the usefulness of the carriers' facilities employed in such commerce is invalid, it is clearly a judicial function to determine the nature and extent of the burden imposed and whether it falls within these descriptions. Such is precisely what this Court has declared that it must do, and has done, in cases arising both before and since the *Barnwell Case:* e. g., *Milk Control Board v. Eisenberg,* 306 U.S. 346, 352; *Parker v. Brown,* 317 U.S. 341, 362; *Terminal R. Assn. v. Brotherhood,* 318 U.S. 1, 8-9.

Appellee asserts (its brief, p. 80) that it differs greatly with appellant concerning the conclusion to be drawn from the evidence as to the extent of the burden shown, including the cost of compliance and the interference with opera-

tions. It also differs in this respect from both of the courts below. The trial court specifically found that in 1938 the direct money cost of compliance with the law was $394,900, of which $94,600 was incurred extra-territorially (R. 3968). The state supreme court apparently accepted this finding: for in its opinion (R. 4062), it stated that appellant is compelled "to expend great sums of money in order to comply with the restriction." That there is delay, congestion, and interference, and thus a substantial physical obstruction to the free movement of the interstate traffic carried in the affected territory, is also fully established, and would indeed be obvious: for the compelled operation of 28% more trains than necessary to carry the traffic inevitably multiplies the interferences due to meets and passes; while the necessary reconsisting of trains at and beyond the border cannot but result in serious delays.

In its argument respecting the consideration to be given to the burden due to the obstruction and cost of compliance, appellee relies upon *Erie R. R. Co. v. Board of Commissioners*, 254 U.S. 294, as later modified, so appellee says, by *Lehigh Valley R. Co. v. Board of Commissioners*, 278 U.S. 24. It disregards more recent decisions: *Missouri-Pacific R. R. Co. v. Norwood*, 283 U.S. 249, 255; *A. T. & S. F. Ry. Co. v. Railroad Commission*, 283 U.S. 380, 395, 396, in which, with the citation of earlier cases upon which we rely, this Court has declared that the cost of complying with state laws enacted to promote safety is an element properly to be taken into account in determining whether such laws are arbitrary and repugnant to the Due Process Clause.

The comment in the *Lehigh Valley Case*, apparently limiting the effect of the earlier *Erie R. R. Case*, should not be interpreted as setting forth the *only* circumstances in which cost of compliance may be considered, but rather as describing one method of proving the unreasonableness of a regulation involving heavy cost. If the object may be achieved by other means but at much less expense, then a regulation compelling heavy expenditures is demonstrably unreasonable. But this is not to say, and we do not understand that the Court has said, that a regulation imposing relatively heavy expense and burden, for the sake of a comparatively minor safety advantage (or, as in this case, without such advantage but with actual detrimental effects), cannot be held unreasonable even though there is no alternative cheaper means of obtaining the desired result.

Appellee concludes upon this point by asserting (its brief, p. 83) that the object of the law is to protect against the dangers incident to the increase in train length, and that no other method has been shown which will accomplish this object. This assertion is without factual support and indeed wholly erroneous. Assuming, however, for argument's sake, in spite of the evidence to the contrary, that the object of the law is to increase railroad safety, as against supposed dangers from long-train operation: it is shown that other methods are available which do not involve the enormous dislocation of and burden upon through interstate transportation attendant upon the law, and which will accomplish, and in fact elsewhere in the United States have accomplished, all the claimed objects of the law. The substantial reductions (nearly 70%) in

the frequency of accidents and casualties to railroad employees, whether all classes be considered or only the more restricted groups claimed to be the principal beneficiaries of the law, which have attended the growth and development of the long-train operating practice, and the many improvements in the cars, locomotives, and fixed structures, and particularly in the brakes, couplers, signals and other mechanical devices and appliances especially connected with safety, eloquently attest the availability and effectiveness of these other methods; particularly when it is realized that the improvement in Arizona has been substantially less than nationally, or in the adjacent state of Nevada where substantially similar conditions, other than those created by or incident to the enforcement of the law, have existed through this same period (i. e., since about 1923).

If it can be said that the object of the law is to reduce the number and frequency of "slack-action" casualties, without considering others (and this appears to be appellee's argument, although obviously other casualties cannot be disregarded, because their frequency is directly affected by the law), the record still shows that this objective can be and has been attained by other means not involving the cost and burden imposed by the law. For in Nevada appellant, by the use of improved equipment and other facilities and the adoption of modern operating methods, has reduced the frequency of slack-action casualties, in their relation to traffic handled, by more than 57%, comparing the earlier period of predominant short-train operation (1923-1928), with the latest period for which statistics were available (1935-1940):

whereas in Arizona, although conditions were substantially the same and the same improved equipment and appliances were in use, but modern operating methods could not be developed because of the law, the corresponding reduction in the frequency of these casualties has been but 47.7%. In Nevada, during the most recent 12-year period (1929-1940), with about five per cent more traffic volume than Arizona, there were on the average only 5.08 such casualties per year; in Arizona the average was 5.17 per year. It is apparent that without the law somewhat better results have been obtained, even considering only this class of casualties, than by observance of the law in Arizona. This, however, is without regard to other classes of casualties, although the number and frequency of these is greatly affected and, as the trial court has found (R. 4021-4022), substantially *increased* by the law, because of the greater exposure of men, and the greater opportunity for accidents, created by the compelled operation of additional and unnecessary trains.

The operating methods used elsewhere, in territory not affected by the law, have accomplished more fully and more cheaply the object of reducing the number and frequency of railroad casualties, even including the particular type claimed to be the special object of the law; so that even by appellee's test, the law is wholly unreasonable under the Due-Process Clause.

II.

THE FACTUAL ISSUES

1. THE SIGNIFICANCE OF THE TRIAL COURT'S FINDINGS AND THE STATE SUPREME COURT'S REFERENCE THERETO

(Appellee's Brief, pp. 11-13, 149-151)

Appellee's discussion of "the Trial Court's Findings and Judgment" (appellee's brief, pp. 11-13), and of the state supreme court's reference (R. 4067-4068) thereto in its opinion (appellee's brief, pp. 149-151) covers two phases of the same topic. Its position is rather equivocal, in that it appears to contend that the state supreme court, in reversing the trial court, at most set aside only those portions of the findings which are of "ultimate" facts; but it fails to specify which portions are, in its view, "ultimate", and which are "evidentiary", and, as it says, therefore "improper" (though *not* reversed).

When appellee took its appeal to the state supreme court, it did not assert that any of the findings were erroneous because "evidentiary" rather than "ultimate"; but specifically because each of the findings complained of was, as it said in its assignments, "based upon incompetent, irrelevant, immaterial, and inadmissible evidence, improperly admitted and considered by the trial court, contrary to and not supported by the evidence, and upon an immaterial issue." Thus appellee conceded that the findings, if supported by legal evidence and upon a proper issue, were not otherwise objectionable because of so-called "evidentiary" content. Many findings which contain "evidentiary" material (as we understand appellee's use of the term) were not objected to: e. g., Findings III(a), III(b) (1), III(b) (2) (except in part), III(b) (3),

III(b) (4), IV(a), IV(b), VI(a) (except in part), VI(b) (except in part), VI(c) (except in part), VII(a) (1), VII(a) (2), VII(a) (3) (except in part), VII(a) (4) (except in part), XI(a), XI(b), XI(c), XI(d) (except in part), XII(a), XII(b), and XII(c) (1) (R. 3890, 3891, 3893, 3895, 3896, 3897, 3898, 3902, 3904, 3907, 3909, 3911, 3912, 3913, 3969, 3970, 3971, 3974, 3976, 4010).

As stated in our Opening Brief (Vol. I, pp. 12-14, 315-322), we believe that the expression of the state supreme court (R. 4067-4068), holding the findings and judgment of the trial court to be in error, cannot be construed as a blanket reversal of the trial court's detailed findings of fact. Certainly there was not, even upon appellee's theory, a disapproval of any findings other than those termed "ultimate" by appellee. In so far as the findings state the specific facts shown by the evidence, they are therefore unimpaired, and so may be accepted as a complete and adequate analysis of the testimony.

We do not subscribe to appellee's apparent view that even the so-called "ultimate" findings were intended to be reversed by the state supreme court. All of the findings are supported by the principle, embodied alike in the Arizona Rules of Practice (Sec. 21-1028, *Arizona Annotated Code,* 1939), and the federal rules (Rule 52(a)), that findings of fact shall not be set aside unless clearly erroneous, due regard being given to the opportunity of the trial court to judge the credibility of witnesses. The state supreme court pointedly failed to indicate any intention to depart from that rule. This Court has accorded great weight to such findings, especially when not modified or reversed in terms by the inter-

mediate court: *Butte & Superior Copper Co. v. Clark-Montana Realty Co.*, 249 U.S. 12, 30; *District of Columbia v. Pace*, 320 U.S. 698; and compare *Commissioner v. Scottish-American Inv. Co.*, No. 52, etc., Oct. Term, 1944 (Dec. 4, 1944).

Appellee also suggests (its brief, pp. 12-13, 151) that even if the findings were not set aside this Court is not bound by them but will examine the whole record upon the pertinent issues, citing *South Carolina Highway Dept. v. Barnwell Bros.*, 303 U.S. 177; *Clark v. Gray*, 306 U.S. 583. Neither of these decisions indicates that this Court will make an exception, in a case such as this, to the established principle of accepting the trial court's findings when supported by substantial evidence. In other similar cases, decided both before and since the *Barnwell Case*, this Court has held that such findings will not be disturbed: *Borden's Farm Products Co. v. Ten Eyck*, 297 U.S. 251, 261; *Atlantic, etc. Tea Co. v. Grosjean*, 301 U.S. 412, 420; *Alabama Power Co. v. Ickes*, 302 U.S. 464, 477; *Milk Wagon Drivers Union v. Meadowmoor Dairies*, 312 U.S. 287, 293; except that this Court, in the performance of its constitutional duty, will examine the record when it is properly asserted that a private litigant has been deprived of constitutional rights by reason of findings made by a state court claimed to be unsupported by and contrary to the evidence: the point presented by appellant's assignments Nos. 7 and 8 (our brief, Vol. I, pp. 322-330). Appellee apparently agrees (its brief, p. 151) that if the lower court's opinion, in spite of the apparently controlling reasons for a contrary view set forth in our brief (Vol. I, pp. 315-322), is to be interpreted

as a reversal of the trial court's findings of fact (not of law), appellant is entitled to a review of the evidence by this Court: compare its citation of *Truax v. Corrigan*, 257 U.S. 312, and *Norfolk and Western R. Co. v. Conley*, 236 U.S. 605. But neither these cases, nor any other decisions of this Court, conflict with the principle that findings of the trial court, if supported by substantial evidence, will be accepted as conclusive. These cases simply recognize an exception to that rule, when a *private litigant* claims a deprivation of federal right *by a state* because of "insubstantial findings screening reality" made by a state court. The state—the appellee here—cannot invoke that exception. It is available only to appellant; and it is invoked by appellant only if, and to the extent that, the state supreme court's opinion may be construed as a "finding of fact" differing from and contrary to the trial court's findings of fact, and therefore, as we insist, contrary to and unsupported by the testimony of record. Otherwise, and at all events from the standpoint of the state, the trial court's findings are complete, conclusive, and not now open to question.

Appellant therefore does not, as appellee asserts, complain that the state court failed to discuss the evidence or point out specifically the error as to each finding of fact. On the contrary, as appears very clearly from our Opening Brief (Vol. I, pp. 13, 329), we believe that the state court's opinion plainly shows that it did not consider the findings of fact to be in any respect an erroneous reflection of the facts developed by the evidence; that on the contrary, and in line with its own long-standing rule and the usual practice of appellate courts generally,

it accepted the factual findings since no error was clearly shown. It simply concluded, *as a matter of law and in spite of the facts,* that the challenged statute, which it held to have been enacted for the purpose of safety, was fortified by a presumption of reasonableness so strong as to render unnecessary any consideration of the facts as found.

Since it is not disputed, but on the contrary is clearly shown, that each of the trial court's findings is supported by substantial evidence and in practically every instance by evidence which is wholly unchallenged, they should and we are confident that they will afford the factual basis for the consideration and judgment of this Court.

2. "LOCAL CONDITIONS"
(Appellee's Brief, pp. 7-8, 39-40)

Commencing at page 7 of its brief, under the heading "Local Conditions", appellee attempts by reference to the record to support the argument that appellant's lines in Arizona are subject to local conditions affecting the operation of its trains, which differ from those obtaining in other states. Somewhat the same argument is also made at pages 39 and 40, where it is asserted that the "safety of long-train operation" (apparently believed to be the subject-matter of the law) depends to a considerable extent upon local conditions, "curves, grades, hogbacks, dips, sandstorms, and the like."

The facts, as found by the trial court (R. 3891-3897, 3902-3915, 3945-3946), and not challenged in or disputed by the state supreme court, show that appellant's lines in Arizona are not subject to any peculiar local conditions

affecting train operations, or any that differ substantially from those on the railroads in the other western states, except that the conditions in Arizona are in many respects more favorable to long-train operation.

While there is nothing in the record to show that the principal main lines of railroad in Kansas are "comparatively curveless", as appellee suggests, they cannot in this respect be much more favorable, if at all, than appellant's Arizona lines. The finding of the trial court is to the effect that in Arizona "curvatures are light, and curves are comparatively infrequent." 84% of the mileage on the principal main line in Arizona is straight track and, of the 16% which is curved, all but about 1% consists of curves of less than 6° (R. 3894-3895). On the alternate main line through Phoenix, 91% of the mileage consists of straight track. On the alternate main line through Douglas to El Paso, 82.5% is straight track (R. 3895). By contrast, only 75.5% of the Nevada main-line mileage is straight track, 24.5% being curved (R. 3897).

Moreover, all of these curves, where they occur in grade territory, are "compensated", so that they offer no more resistance to the movement of trains ascending the grades than results from the grade alone upon adjacent stretches of straight track. But such curvature, far from being a handicap to long-train operation, is actually a help; when trains pass around curves, the members of the crew in the engine and caboose can more readily obtain a complete view of the moving train, and on descending grades the resistance to wheel movement helps in controlling the speed.

The helper districts in Arizona, where additional engines must be used to move trains, are neither lengthy nor characterized by heavy grades. The maximum ruling grade upon any of the Arizona main lines is 1.4%, or slightly less than the maximum (1.5%) on the main line in Nevada. The clearness of the atmosphere, the general lack of foliage along the tracks, the absence of fog and smoke, and the normally mild winter weather, all make for relatively favorable conditions in Arizona. These conditions likewise prevail in Nevada (except that the winters there are more severe) and, as the Court will notice judicially, in those portions of New Mexico, western Texas, and southern California adjacent to Arizona.

The record shows, and the trial court found (R. 3915, 3937-3938, 3942), that long-train operation is being successfully conducted as a common, standard, daily practice, not only in the states adjacent to Arizona and in other western states, but throughout the United States generally, over railroads where the grades are more severe and the climatic and other conditions more arduous than any encountered upon appellant's Arizona lines. Ruling grades in California, upon certain of the main lines over which long trains are continually operated, are from 2% to 2.5%; the curvatures are at least as severe as any in Arizona (R. 2194-2197). Ruling grades on main lines in Arkansas (R. 2874), Montana (R. 2894), New Mexico (R. 2986), Pennsylvania and New York (R. 2862, 2933), Massachusetts (R. 2942), and West Virginia (R. 875), as to which specific testimony of long-train operation appears in the record, are about as heavy as in Arizona, and in many cases somewhat heavier. These grades evidently do not seriously impede long-train operation.

The extent of the grade territory in Arizona is not described by appellee, obviously because it is of such small importance. There are only 41.2 miles (32.2 opposed to eastward, and 9.0 opposed to westward traffic) upon the principal main line where the ruling grade of 1.4% applies. Elsewhere the heaviest ruling grade is 1.1%, and even this district is only 12 miles long. There are other short grades of approximately 1%; but by far the greater part of the lines, including all of the alternate main lines via Phoenix and Douglas, are in level territory, or with ruling grades not exceeding 0.6% in the case of the Phoenix line, and 0.8% in the case of the Douglas line (Finding III(b) (2), R. 3893-3895).

Appellee also speaks of "elevations" crossed by the Arizona lines; but the record (Ex. 155, 156; R. 3029, 3030) shows that the maximum elevation upon appellant's Arizona lines is approximately 4700 feet: much less than the maximum elevation upon the line in New Mexico east of El Paso (6600 feet), or in California (7000 feet), or Nevada (6300 feet). The greater portion of the Arizona line is below 3000 feet elevation. The line lies, for the most part, in comparatively level, desert territory where operating conditions are favorable. The other railroad lines which cross the continent through the states north of Arizona, upon which long-train operation is the customary practice, attain much higher elevations and are in generally less favorable territory.

Appellee also says (brief, pp. 7, 39) that Arizona is subject to sandstorms and strong wind conditions, asserted not to be present, at least to the same degree, in Nevada. The record does not show that sandstorms are

unusually frequent in Arizona, or that when they do occur they offer substantial hindrance to train operation, any more than in Nevada and other nearby states. Sandstorms and high winds are at least equally frequent in the adjacent desert portions of southern California and New Mexico, as well as in Nevada. The same traffic which, under the law, must be handled in short trains across Arizona, is handled in long trains, despite these sandstorms and high winds, in the adjoining districts in California and New Mexico.

It is true, and properly a matter of judicial notice, that Arizona's population is not as great as in many other states, although greater than in Nevada; but it is not shown of record, and is certainly not a matter of judicial notice, that Arizona's highways in the neighborhood of its larger cities (particularly Tucson and Phoenix, through which appellant's main lines pass) are any less heavily traveled than in many other states, or that the density of the traffic thereon is any greater or less than on the main highways crossing Nevada. There are several interstate highways crossing each state, which in normal times carry a large volume of through interstate automobile traffic, as well as considerable local traffic. The density of the traffic upon these highways is not controlled by and to some extent is independent of the density of the local population.

The local conditions in Arizona, so far as concerns appellant's train operations, are essentially similar to those encountered on the main lines of railroads throughout the United States. To the extent that there are differences they favor Arizona rather than otherwise.

Appellee refers (brief, pp. 39, 75, 102) to an accident occurring at Manor, Pennsylvania, on March 27, 1936 (R. 2213, 3329), as an example of an accident caused by a "local condition". In that accident a car in a train "buckled" and fell across an adjacent track; and the wreckage was struck by a passenger train moving on that track, resulting in 14 casualties. Accidents in which cars are buckled or otherwise thrown aside so as to foul adjacent tracks are not peculiar to long trains, as appellee seeks to infer, but also occur, and with at least equal frequency, on short trains (Ex. 312, R. 2266-2267). Moreover, this particular type of accident is exceedingly unlikely on appellant's lines in Arizona under either long- or short-train operations. Only 65.6 miles of the 808 miles of appellant's main lines in Arizona are double track; and of this total, the 39.7 miles between Tucson and Mescal consists of alternate, non-adjacent tracks, which are separated from each other considerable distances. Thus the extent of adjacent double track main line is but 25.9 miles, or about 3.2% of the total main line mileage.

Appellee's attempted emphasis upon the effect of local conditions upon the safety of operation demonstrates very forcefully the essential unreasonableness of the Train Limit Law. The law takes no account of any variation in conditions, either as between different sections of the line, or as between different periods of railroad development. It imposes a single fixed and arbitrary limit throughout the state, automatically violated if a longer train crosses the state boundary, or operates anywhere within the state. Changes in the conditions affecting train operations do not occur merely because the state

line is crossed. As appellee suggests (its brief, p. 39), a limit which might have some appearance of reasonableness in a difficult mountainous district could not be justified for application to through interstate trains operating under favorable conditions characteristic of appellant's Arizona lines. For similar reasons, this law, presumably addressed to conditions prevailing in 1912, is utterly unreasonable today because it fails to recognize the revolutionary changes in operating methods taking place since, as the result of improvements in locomotives, cars, and fixed properties, and the general progressive evolution of the railroad industry.

3. "BURDEN ON INTERSTATE COMMERCE"
(Appellee's Brief, pp. 8-10, 42-52)

At pages 8-10 of its brief, appellee summarizes its factual argument relative to the burden upon interstate commerce imposed by the law; this argument is elaborated at pages 42-52.

We emphasize again that, in attempting to show that enforced compliance does not impose substantial financial burdens, appellee disagrees with not only the trial court's finding (Finding X(d), R. 3968), but also the state supreme court's inferential adoption and approval thereof (R. 4062-4063). Upon this question there are thus affirmative "concurrent findings of the courts below" (*Just v. Chambers*, 312 U.S. 383, 385; *Texas & New Orleans R. Co. v. Railway Clerks*, 281 U.S. 548, 558, and cases cited); so that appellee's attempt to raise the point again in this Court is foreclosed.

(a) The Comparisons of Train-Length and Efficiency Trends (Appellee's Brief, pp. 42-47).

Appellee argues (brief, pp. 8-9, 42-46) that there is no evidentiary value to our showing of operating and transportation expenses for the years 1922-1939, wherein the trends are contrasted with those upon the Class I railroads of the United States as a group, upon various representative major systems separately, and upon appellant's system, and its lines in Nevada; because 1922, 1923, and 1924 were included in the base period 1922-1925, against which the improvements (decreases) in unit expenses in later years were computed. Its particular criticism is that the appellant's Arizona lines were greatly changed on November 1, 1924, by the acquisition of the El Paso & Southwestern and Arizona Eastern properties, so that the inclusion of the operating results for these lines in the Arizona totals after that date, but not before, produces an incomplete showing.

The comparisons in this series of exhibits are of *trends* of *unit* costs: i. e., *average* operating and transportation expenses per thousand revenue ton-miles; so that the criticism would be tenable only if the acquired lines were actually dissimilar, having operating and traffic conditions so widely different as to produce substantial disparities in unit costs. The fact is quite otherwise. These other lines are all in Arizona, and generally in the same districts, serving in fact many of the same localities, and subject to the same conditions of climate and terrain, and particularly to the train-limit restrictions. Operating conditions, from the standpoint of grades, curvatures, elevations, helper districts, etc., are somewhat

more favorable. On the former EP&SW line (now the alternate main line through Douglas), the ruling grade was and is 0.8%, and there are no helper districts (R. 3894, 3896). On the Arizona Eastern (now a part of the alternate line through Phoenix) the maximum grade is 1%, and the grades in general do not exceed 0.6% (R. 3894). Curvature was and is comparatively light. In general, the conditions on these lines resemble those prevailing on the former (and present) Southern Pacific lines west of Mescal, and particularly west of Tucson, and thus did not include even the slightly more adverse conditions on a part of the line east of Mescal.

Comparisons of operating results, in terms of unit costs, on the Southern Pacific in Arizona before and after the acquisition, show that appellee's criticism is without substance. The following is taken from Exhibit 160 (R. 3034):

Years	Revenue ton miles (in freight and mixed trains)	Freight Operating Expenses	Freight Transportation Expenses	Averages for 1000 Revenue Ton-Miles: Freight Operating Expenses	Averages for 1000 Revenue Ton-Miles: Freight Transportation Expenses
1925-1928	6,292,063,760	46,337,346	20,606,596	$7.38	$3.28
1922-1924	2,994,341,655	21,996,747	9,162,381	7.34	3.06
Per cent increase 1925-1928 over 1922-1924				0.54	7.19

Appellee's willingness to be bound by trend showings based upon results during the years 1925-1928 (see pp. 44-46 of its brief) is explained by the fact that commencing in 1923, and as soon as 1928, many railroads had substantially accomplished the inauguration of their long-train programs and achieved the attendant operating economies. For instance, as to those roads selected by appellee, we have:

	Ex. No.		1922	1924	1926	1928
S. P., Nevada	150	Average cars per train	48.9	54.4	66.1	68.5
	161	Transportation expense per 1000 revenue ton miles	$3.45	$3.07	$2.53	$2.61
C. B. & Q.	103	Average cars per train	41.5	44.5	48.5	50.9
	102	Transportation expense per 1000 revenue ton miles	$3.96	$3.48	$3.17	$3.02
Erie	56	Average cars per train	49.8	55.0	57.4	68.0
	54	Transportation expense per 1000 revenue ton miles	$4.68	$3.70	$3.71	$3.59

While the comparisons of operating results in Arizona with other parts of appellant's system, and with other lines, are perhaps not *ideal*, reason does not permit us to close our eyes to developments elsewhere, and decline to seek to determine what might happen in Arizona if the restraint of the law were removed. When the same results are noted in separate instances, but in the presence of the same common factor, those results should logically be ascribed to that factor. The following tabulation affords an example of the operation of that principle; and far from indicating, as appellee contends, that improvements in efficiency and unit costs are unaffected by increases in train length, it shows precisely how that factor has operated:

TABLE A

Exhibit Nos.		Railroad Company	Train Length—Cars					Average Freight Transportation Expenses Per 1000 Revenue Ton Miles				
			1922	1930-1932		1939	Percent Increase 1939 over 1922	1922-1925	1930-1932		1936-1939	Percent Decrease 1936-9 under 1922-5
28	29	Illinois Central	42.7	44.6	40.0	46.1	8.0	3.26	3.31	3.16	3.14	3.5
130	131	Santa Fe	41.5	51.3	44.4	45.9	10.6	4.00	3.20	3.24	3.48	13.0
102	103	Burlington	41.5	51.5	43.2	46.3	11.6	3.63	3.00	3.18	2.86	21.2
11	12	New York Central	49.0	57.4	53.6	55.2	12.7	4.31	4.00	3.71	3.41	20.9
94	95	Milwaukee	37.8	46.7	41.6	45.8	21.2	4.16	3.65	3.59	3.39	18.5
59	60	St. Louis Southwestern	36.9	45.4	39.5	45.1	22.2	4.19	3.79	3.95	3.20	23.6
51	52	Rock Island	32.4	41.8	37.8	39.9	23.1	5.03	3.90	3.86	3.43	31.8
48	49	Northern Pacific	39.5	46.9	42.1	49.9	26.3	3.94	3.77	4.24	3.30	16.2
20	22	Class I—U. S.	38.4	48.9	44.8	49.1	27.9	4.16	3.52	3.48	3.18	23.6
24	25	Missouri Pacific	35.2	47.9	41.9	46.6	32.4	4.35	3.22	3.52	3.04	30.1
78	79	U [illegible] Pacific	28.1	53.2	50.2	50.5	32.5	3.90	3.23	3.43	2.99	23.3
54	56	Erie	49.8	71.9	67.4	67.4	35.3	3.93	3.52	3.26	3.32	15.5
46	47	Great Northern	41.0	53.4	42.4	56.0	36.6	3.78	2.85	3.35	2.64	30.2
63	64	Chicago Northwestern	33.4	42.6	39.0	47.5	42.2	5.18	4.52	4.97	4.13	20.3
120	121	Chesapeake and Ohio	51.9	66.2	73.6	79.5	53.2	2.06	1.43	1.21	1.29	37.4
67	68	Pennsylvania	40.8	58.0	55.4	63.5	55.6	4.35	3.63	3.22	3.12	28.3
86	87	Boston and Maine	31.3	49.7	48.2	51.1	63.3	7.64	5.79	5.52	5.06	33.8
		(For Comparison)										
151	162	Southern Pacific	43.4	52.5	49.5	54.6	25.8	5.03	4.40	4.34	3.95	21.5
150	161	Southern Pacific—Nevada	48.9	77.2	81.0	78.5	30.4	3.12	2.59	2.26	2.36	24.4
149	160	Southern Pacific—Arizona	55.8	56.4	56.8	54.8	1.3 Dec.	3.22	3.11	3.40	3.00	6.8

This tabulation summarizes and briefs the train-length and expense exhibits, and compares appellant's Arizona lines with other lines and railroads, the several roads being shown in ascending order of percentage increases in train length, 1939 over 1922. Average train lengths increased substantially during the period between 1922 and the years 1930-1932, and during that period the cost indices showed marked improvement; while since 1930-1932 train lengths have shown considerably less fluctuation, and the same indices have shown correspondingly less improvement.

The tabulated figures very definitely establish, *first*, that freight transportation expenses vary inversely with train lengths, and, *second*, that reductions in freight transportation expenses, and increases in efficiency, as measured by performance, have occurred on other railroads, outside of Arizona, coincident with and as a result of increases in train lengths, but such improvements have not occurred in Arizona.

At page 46 of its brief appellee presents excerpts from another series of exhibits, showing the efficiency index "gross ton miles per freight train hour" for Arizona, in contrast with four other western railroads. As with the cost exhibits, appellee's selection is favorable to its position because its base year is 1930, when the long-train program was well established on the other roads, but of course not in Arizona, although operations there could and did receive the benefit of practically all the other improvements in facilities and practices applied during those years. The following is a summary of *all* of this

group of exhibits, which compares the trend of the Arizona performance (in gross ton miles per train hour) with the same 16 other railroads shown above, the Class I roads of the United States as a group, the appellant's system, and its lines in Nevada:

TABLE B

Exhibits	Railroad Company	Train Lengths—Cars				Gross Ton Miles Per Freight Train Hour			
		1924	1930-1932	1939	% Increase 1924-1939	1924	1930-1932	1939	% Increase 1924-1939
130, 131	Santa Fe	46.6	51.3-44.4	45.9	—	22,887	31,115-29,492	35,471	55
28, 29	Illinois Central	44.7	44.6-40.0	46.1	3	20,319	24,963-24,411	29,934	47
102, 103	Burlington	44.5	51.5-43.2	46.3	4	20,239	26,140-24,048	32,145	59
11, 12	New York Central	51.3	57.4-53.6	55.2	8	22,471	31,155-32,099	37,184	65
94, 95	Milwaukee	41.8	46.7-41.6	45.8	10	17,492	23,458-23,470	29,770	70
78, 79	Union Pacific	45.0	53.2-50.2	50.5	12	23,804	33,267-33,539	43,006	81
51, 52	Rock Island	35.7	41.8-37.8	39.9	12	15,813	22,051-22,049	28,131	78
48, 49	Northern Pacific	34.4	46.9-42.1	49.9	15	20,961	24,848-24,311	32,408	55
20, 22	Class 1—U. S.	41.7	48.9-44.8	49.1	18	18,257	25,837-26,042	32,808	80
24, 25	Missouri Pacific	39.6	47.9-41.9	46.6	18	16,714	26,722-26,403	33,356	100
46, 47	Great Northern	47.6	53.4-42.4	56.0	18	20,748	28,021-24,991	35,462	71
59, 60	St. Louis Southwestern	38.2	43.4-39.5	45.1	18	16,968	24,614-24,227	32,745	93
54, 56	Erie	55.0	71.9-67.4	67.4	23	24,239	36,906-38,730	45,742	89
63, 64	Chicago & North Western	36.7	42.6-39.0	47.5	29	15,502	20,775-20,772	29,642	91
67, 68	Pennsylvania	43.5	58.0-55.4	63.5	46	18,150	29,661-30,942	39,244	116
86, 87	Boston & Maine	34.8	49.7-48.2	51.1	49	12,575	21,993-23,031	27,186	116
120, 121	Chesapeake & Ohio	53.5	66.2-73.6	79.5	49	22,366	39,020-46,689	54,855	145
	(For Comparison)								
180, 193	S. P.—Tucson Division*	58.8	61.0-60.7	59.8	2	33,836	41,952-38,787	47,680	41
180, 193	Southern Pacific—Pac. Lines*	52.0	58.5-55.9	60.1	16	23,506	32,088-34,005	41,886	78
180, 193	S. P.—Salt Lake Division*	57.6	78.1-81.0	85.4	48	34,058	53,046-58,669	72,955	114

(*) (Main Line only—All freight trains.)

This summary differs slightly from the preceding, for 1924 is the base year, 1922 statistics not being available for the Southern Pacific divisions necessarily used; and the Tucson and Salt Lake divisions are used instead of the states of Arizona and Nevada. The Tucson Division lies almost wholly within Arizona and includes a large percentage of the Arizona mileage. Its operations are completely governed by the law. The Salt Lake Division includes practically all of appellant's lines in Nevada, and extends to Ogden, Utah. Statistics are for *main line* operations only, on the three Southern Pacific showings; but there can be no criticism on this score, because the exclusion of branch line operations for the Tucson Division (Arizona) showing produces a result slightly more favorable to appellee's contention.

Here again the dominant, controlling factor is revealed to be train length. Increasing efficiency goes hand in hand with increasing train length. The periods of long-train development as to certain lines are pronounced, and so are the corresponding improvements in efficiency. The showing is consistent, cohesive, persuasive, and unimpeachable that increasing train lengths are largely responsible for increasing efficiency on other lines, but the law places a permanent barrier against ever achieving comparable improvements in efficiency in Arizona.

The acquisition of the EP&SW and Arizona Eastern in November, 1924, becomes wholly immaterial when *Tucson Division* statistics are used, because the division accounts for 1924 were "restated" when the 1925 figures were compiled, so as to cover the same lines as in 1925.

and only these 1924 "restated" figures are used in the summary.

Appellee's brief (pp. 46, 47) presents the following tabulation and observation:

Railroad	"Gross ton mile per freight train hour 1930	1939	% Increase
Great Northern	28021	35462	26.5
Northern Pacific	24848	32408	30.4
Union Pacific	33267	43006	29.3
Santa Fe System	31115	35471	14.0
S. P.—Arizona	35087	45026	28.3

"The increase in gross ton miles per freight train hours—the yardstick of efficiency—is seen to be comparable to that on other western roads."

Appellee's purpose is to show that appellant in Arizona can register as good a performance as other western railroads not affected by the law, and thus to prove indirectly that the law is not a deterrent, efficiency-wise. This analysis has its place in the consideration of this case, but appellee's conclusion is completely erroneous. The reason for the parallelism between the Arizona lines and the other railroads is that these roads, having effectuated their long-train programs prior to 1930, were influenced by forces also active in Arizona, and the results were similar. The average cars per train for these lines, excerpted from preceding tabulations, were as follows:

	Train Lengths—Cars 1930	1939
Great Northern	53.4	56.0
Northern Pacific	46.9	49.9
Union Pacific	53.2	50.0
Santa Fe System	51.3	45.9
S. P.—Arizona	56.4	54.8

As pointed out heretofore, the Arizona lines do respond to and are affected by other economic influences and stimuli, which also make themselves felt in the other parts of the nation's railroad system.

Appellee's meager showing only emphasizes the situation presented in full by the two summaries above set forth, based upon *all* of the expense and efficiency exhibits which compare the Arizona lines with other lines and railroads. Appellee's own reasoning likewise negatives its contention that conditions in Arizona are so different, or on the lines acquired in 1924 (the EP&SW and Arizona Eastern) were so different, as to render comparisons with other railroads of no value, or support the view that the law itself responds to some distinctive "local condition". An opposite conclusion must be drawn: specifically, that controlling conditions on the Arizona lines, and on other lines, are so much alike that all lines in the country, both in Arizona and in the other states, respond to the same stimuli, and are truly comparable as to those situations which are pertinent and worthy of serious consideration. Any differences which may exist between Arizona and other lines are trivial and inconsequential, and asserted by appellee only for the sake of argument: for there are no special "local conditions" (apart from the challenged law) which distinguish railroad operations in Arizona from those in other states, for any purpose of this case.

(b) The Redispatching Studies (Appellee's Brief, pp. 47-52).

At pages 47-52 of its brief, appellee criticizes the redispatching studies presented by appellant, and accepted

(as noted) by both the courts below as showing the recurring annual out-of-pocket expense of compliance with the law. Appellee asserts that whatever savings are shown by the redispatching study could have been realized regardless of the law, by merely substituting larger power (400 or AC-type engines) for the smaller engines actually used on the short trains run. Appellee is correct, *but only in part;* for it does not develop all that its argument implies.

At this point a brief review of appellant's "burden" showing is desirable. *First,* by comparison of cost and efficiency indices, appellant has shown that the Arizona lines lag far behind rail lines elsewhere in the country in reductions in cost and increases in efficiency. These benefits are still attainable in Arizona by removal of the law's restrictions. *Second,* by an entirely independent avenue, appellant made an accurate determination of the savings which could have been realized in the years 1938 and 1940. This was the result of the redispatching studies, which developed how many less trains, train miles, and locomotive miles would be required to move the same business, and applied known cost figures to the operational savings thus determined. By these two separate approaches—independent, yet each confirming the other—appellant has presented a balanced and integrated showing of burden which is conclusive and inescapable.

Appellee, at pages 47-48, attacks one detail of the redispatching study: the substitution of larger power on the redispatched (long) trains, for the smaller power actually used on the short trains. The essential place that larger power has in the long-train program was

developed by appellant's witness, Dr. Parmelee (R. 189-190):

> "Railroad executives of Class I railways in the spring of 1923 formulated and inaugurated a continuing program designed to rehabilitate and modernize the entire rail plant. *This involved* not only the physical fitness of the plant but also *an increase in the unit output of rail facilities.* The primary objective of the program was to provide equipment and facilities capable of handling mass transportation with the smallest possible number of units, that is, cars and trains. *To that end railroads installed new locomotives and cars of modern design and greater unit hauling and carrying capacity.* They retired obsolete equipment units from service. They laid millions of tons of heavier rail. They renewed and strengthened roadbeds. They reduced curves and grades. They rebuilt or replaced bridges, trestles and culverts. They greatly extended signalling systems and safety devices. *In every way they remodelled the rail plant to permit, where conditions were favorable, use of trains of greater carrying capacity and moving at a greater average speed between terminals.* During the first year of the improvement program, 1923, more than $1,000,000,000 of gross expenditure was made on capital account. During the 17 years ending with 1939 the total was approximately $9,000,000,000." (Emphasis supplied.)

The place that this larger power would have in long-train operation in Arizona is stated in Finding IX(b) (R. 3949):

> ". . . In order to conduct long freight-train operations in the affected territory with greater efficiency and economy, and with due regard for schedule re-

quirements, and to realize thereby a larger degree of use and usefulness of its entire railroad plant in said territory, defendant plans and intends to provide and assign to such freight-train operation an adequate number of locomotives having sufficient tractive power more readily to handle long freight trains in both directions in said territory. Such locomotives, when so assigned, will replace certain of the other locomotives now in use in said territory. Of all of the types of locomotives owned and operated by defendant, the Articulated-Consolidation type is most suitable to such long-train operation. Locomotives of class 8 of the Articulated-Consolidation type, for brevity known as AC-8 locomotives, have been in service on various portions of defendant's lines since 1939. . . . In order to handle, in long-train operation, the same volume of freight traffic actually handled in the affected territory in 1938, defendant will be required to assign some thirty AC-8 locomotives to said service . . ."

Appellee points to certain data on Exhibit 198 (R. 3115), and then proceeds to draw wholly unwarranted conclusions, primarily based upon its understanding of appellant's statement that Exhibit 198 is "representative" of the 900 work sheets which together contain the details of the 1938 redispatching study. Appellee's observations in this respect are a mixture of misunderstanding and unwarranted assumption. Exhibit 198 is only a sample, *representing the form* of the work sheets, and shows how the arithmetic was developed on each of the 900, so as to obtain the daily totals of locomotive miles, train miles, cars, and wages for actual and redispatched operations. It indicates the methods by which were solved the

other 899 problems of making long trains out of shor
However, it covers *only eastbound* trains moving o
June 18, 1938, over the district from Tucson to Lordsbur
and so does *not* reflect actual conditions on the othe
districts involved (Yuma-Gila, Gila-Tucson, and Lord
burg-El Paso), or present any of the details appearin
on the 600 or more work sheets covering those district

No railroad with due regard for efficiency and economi
would consider using AC-8 locomotives on short trains i
the districts west of Tucson or east of Lordsburg; no
was such use contemplated in the redispatching study
An AC-8 locomotive, without helper, could handle th
short train Y-311 efficiently over the 1.4% ruling grade
between Tucson and Lordsburg, but it would be a gros
waste of power to use it on that train, under the 70-ca
restriction, over the 1.02% ruling grades between Yum
and Tucson, or the 1.0% ruling grades between Lordsbur
and El Paso (Ex. 155, R. 3029).

Appellee argues at length (its brief, p. 48) that if AC-
locomotives had been used on the actual trains show
on Exhibit 198, substantial savings in wages for th
engine crews, and in locomotive fuel, maintenance, repairs
and other expenses would have been realized, as well a
the elimination of delays necessary to cutting in and cut
ting out helpers and certain delays at water stops, and
contends that the entire saving claimed by appellan
could have been made simply by the use of these larger
locomotives upon the short trains actually operated in
conformity with the law.

An analysis of appellee's claims with regard to wages
alone demonstrates that they are quite unfounded. From

Exhibits 198 and 209 (R. 3193) the results of its plan may be compared with the results of the redispatching study, as follows:

	Actual	Redispatch	Appellee's Plan
Wages of Train Enginemen 9 x $29.22	$237.49	$206.05	$262.98
Wages of Double Header Enginemen	26.22		26.22
Wages of Helper Enginemen 4 x $15.01	187.58	133.05	60.04
Wages of Train Crews	401.67	312.67	401.67
Wages of Flagmen	27.29	6.57	—
Deadheading	29.86	—	29.86
	$910.11	$658.34	$780.75
Saving		251.77	129.36

Thus appellee's plan would be, *as to wages only*, about half as effective in the Tucson-Lordsburg district where helpers are used.

Appellee concedes that the use of larger locomotives would save delays because of fewer stops for water and to cut helpers in and out, and would also save locomotive fuel, maintenance, repairs, and other expenses, but insists that none of these savings may be credited to long-train operation. It cannot avoid the fact, however, that the wage expense is by far the largest direct expense associated with the train operation; and that the operation of fewer trains means a corresponding reduction in this item of expense. It likewise cannot avoid the fact that the substitution of larger locomotives, if trains are limited by law so that the same number must be run, will result in increased wage expense for engine crews, because their wages are based upon the size of the locomotives operated (Exhibits 198, 209); but if fewer trains are operated and fewer locomotives run, this expense is cut down even though the locomotives are somewhat larger.

In fact, as demonstrated by Exhibit 198, a comparatively small wage saving might be realized by substituting larger power for the smaller now used *in helper territory*, where such substitution would reduce total locomotive mileage; and exactly the same character of saving, but in much greater measure, could be achieved by reducing the locomotive mileage in *all* of the affected territory, through the operation of fewer and longer trains. In *non-helper territory*, there would be no saving in wages of engine crews, if short-train operation were continued but with larger power, because no engine mileage would be saved. There would be no saving in wages of train crews, because no train mileage would be eliminated; and there would be absolute losses in locomotive-repair and fuel-consumption expense, because of the inefficiency of operating the large engines at a fraction of their capacity.

At pages 51-55 of its brief, appellee attacks our fuel saving figures, and particularly the estimated 10 per cent saving which was applied against June and August, 1938, fuel consumption between Yuma and Lordsburg to produce a part of the $400,000 per year cost of compliance (see pp. 121-122 of Vol. II of our opening brief).

There is no inference or speculation involved in the fact that long-train operation reduces the number of trains operated and increases the ton-mile production per locomotive. Experience elsewhere in the United States, on appellant's lines in Nevada, and upon the system, indicates the approximate measure by which fuel consumption is reduced when locomotive output is increased. It is impossible to conclude that similar additional fuel economies could not also be achieved in Arizona.

Appellant objects, however, that the showing of savings in fuel expense is to some extent based upon comparisons which relate to the period prior to 1930, and claims that because of the change in the Tucson Division limits in that year, prior experience is of no value. But practical common sense and judgment cannot be circumscribed by such narrow criticism.

Between 1924 and 1930 there were substantial increases in train lengths, and in tonnages handled by locomotives, on the Salt Lake Division, accompanied by marked reductions in average fuel consumption per unit handled. Over the same period there were slight but noticeable reductions in average train lengths, and in tonnage per locomotive, on the Tucson Division. The decrease in average fuel consumption was very much less than on the Salt Lake Division, which result can only be due to appellant's inability to increase the output per locomotive on the Tucson Division. Efforts to increase the train loading on the Salt Lake Division continued after 1930 and up to the present, with corresponding decreases in fuel consumption. The Tucson Division operation in 1930 and thereafter was still restricted by the Train Limit Law; and its improvement in fuel consumption per unit handled was less than on the Salt Lake Division, in this second period (1930-1939), as well. The technical improvements in locomotive construction in the period 1924-1939, as well as other improved methods of railroad operation, resulted in reductions of average fuel consumption on both divisions; but there still remains to be realized, on the Tucson Division, fuel economy comparable to that already achieved, on the Salt Lake Division, as a result of the increases in train length and locomotive loading.

The percentage of the improvement in fuel economy thus available was quite accurately determined, by comparing the Tucson Division performance in each of the two periods with the corresponding performance on the Salt Lake Division. This method eliminates any change in Tucson Division performances incident to the change of division limits in 1930. It also, incidentally, makes use of the Tucson Division figures as *restated* for 1924, thus eliminating any disturbing effect caused by the acquisition of the El Paso and Southwestern and Arizona Eastern properties.

The change in division limits in 1930, which added to the division approximately 160 miles of railroad between Tucson and Lordsburg, cannot change the fact that in Arizona there had been no increase in train length, and no resulting reduction in average fuel consumption, in the six years immediately preceding. That change does not cancel out the fact that there had been a considerable increase in train length and locomotive loading, and a considerable decrease in fuel consumption, on the Salt Lake Division over the same period. Appellee in Arizona has never had an opportunity to increase its train lengths and locomotive loadings; and these improvements in efficiency, with resulting decreases in fuel consumption, are still to be realized. The possible fuel saving has been conservatively estimated to be at least 10 per cent of the fuel consumed under the short-train restriction.

Appellee asserts that the paired track arrangement with the Western Pacific in Nevada, begun in 1925, is one reason for casting out this comparison, because the reduction in train stops results in fuel economy not attainable

in Arizona. If the law were to be set aside, a large percentage of train stops would be eliminated in Arizona also, due to the smaller number of trains operated, so that corresponding fuel economy would be attainable (Finding X(b), R. 3953-3962).

Appellee points to inequalities assertedly appearing in fuel consumption rates when set beside average train lengths on the Salt Lake Division, claiming that there is no consistency in the showing. A single year's results may be unsatisfactory for a variety of reasons—weather, to mention only one—and appellant has consistently followed the practice of averaging two or more years for comparative purposes in order to eliminate, so far as possible, such periodic inequalities. However, appellee cannot successfully maintain that there has not been a definite long-time trend downward in the rate of fuel consumption on the Salt Lake Division, side by side with increasing train length.

Appellee ascribes a part of the Salt Lake Division fuel economy to abandonment of 151.85 miles of branch line between 1936 and 1939. There were also branch line abandonments in Arizona, during the period of the fuel studies (Exhibit 171, R. 3045); but it cannot seriously be contended that the amount of fuel used on branch lines, later abandoned, would materially affect the *rate* of fuel consumption.

We call attention to Exhibit 249 (R. 3258) showing that the difference between percentages of decrease on the Tucson and Salt Lake divisions is 13.44. To be conservative, appellant used 10%, recognizing that the information developed had been affected by a variety of factors;

among which, however, train length had played the dominant role. Appellant did not rely upon the Salt Lake Division showing alone for establishment of a fuel economy percentage; for the system's fuel economy during the same years had exceeded that on the Tucson Division by 9.76%.

Finally, as a test of appellee's sincerity in contending that improved economy does not follow from adoption of long-train operation, consideration should be given to the following paragraph (p. 51 of its brief):

> "Also it will be noted that the average tractive power on the Salt Lake Division was increased from 55162 tons in 1936 to 62423 in 1939, an increase of 7261 tons.[1] The use of these heavier locomotives, such as the 4100 or A.C. type, was a material aid in the decrease in fuel per 100 gross ton miles—first by eliminating the necessity of many helper engines, and, second, by reason of the larger water capacity of their tender they can run further without the necessity of stopping for water."

From 1936 to 1939, the average freight cars per train on the Salt Lake Division increased from 72.9 to 79.8, all the efficiency factors showed improvement, and this was all apparently due (as appellee concedes) to the assignment of heavier power, and the resulting further expansion of the long-train program (R. 3038). There is no possible reason for believing that the same results would not follow in Arizona.

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[1]The *figures* in this sentence are correctly quoted from line 5 of Ex. 164, R. 3038; but the unit should be *pounds*, not *tons* as stated by appellee. The largest locomotive operated by appellant (the AC-9 class: Ex. 5, R. 2855) has a tractive power of about 62 *tons* (124,300 pounds).

4. THE TRAIN LIMIT LAW HAS NO RATIONAL BASIS AS A SAFETY MEASURE

(Appellee's Brief, pp. 10-11, 93-148)

Appellee's "safety" discussion extends from pages 93 to 147 of its brief, being summarized at pp. 10-11, and again at pp. 147-148. It consists principally of an attempted analysis of certain portions of appellant's testimony, with some references to appellee's own showing, and a great deal of comment which is either contrary to the evidence or has no relation at all to the record.

Appellee's treatment of the safety issues is noteworthy because *first*, it disregards, so far as possible, all types of accidents and casualties except the so-called "slack-action" group: i.e., those ascribed to "sudden stop, start, lurch, or jerk of the train or car"; *second*, it attempts to minimize even slack-action casualties, unless occurring upon "long" trains; and *third*, it contains almost no references to the detailed safety findings of the trial court (Findings XI, XII, XIII; R. 3969-4032).

Apparently it is appellee's position that the law, as a claimed safety measure, is concerned with casualties of only one type ("slack-action"), and even with those only when occurring on "long" trains; and that the trial court's safety findings, though not in terms reversed or set aside by the state supreme court, should now be disregarded.

The claimed safety purpose of the law cannot be so narrowly confined. As a purported safety statute it has no standing if it is merely a "slack-action" prevention law, and at the same time actually increases other hazards of railroad operation. Appellee, at the outset of its dis-

cussion, declares that the purpose and effect of the law are "to protect against the dangers incident to the increase of the number of cars in trains operated." But it is not claimed that the law prevents, or even measurably reduces, the *frequency* of *any* class of accidents or casualties; or that, *all* hazards considered, its observance results in greater safety of railroad operation; nor does appellee now deny or challenge the conclusion stated by the trial court, and independently presented by other parties now appearing in this case (i.e., the United States, and the Association of American Railroads, as amici curiae) as well as appellant, that the restricted operation under the law is *more* hazardous, all casualties considered, than if the same traffic were handled in an unrestricted—i.e., "long-train"—operation. On the facts that argument could not be maintained; and for this reason apparently, appellee stakes its whole case upon slack-action and attempts to dismiss from consideration as many of the other classes of hazards and casualties as possible, asserting that they are not affected by train length, or otherwise are immaterial.

As anticipated, appellee emphasizes its theory that from the standpoint of safety the essential question is whether accidents are more frequent and serious on long than on short trains. We have already pointed out (our opening brief, Vol. I, pp. 203-204, 312), that the issue cannot be thus restricted. As the trial court said (R. 4052):

> "Essentially the question is not whether a given number of long trains may be operated with fewer casualties than an equal number of short trains, but rather whether the long-train method of moving the entire volume of traffic results in fewer casualties,

of all classes, than the movement of the traffic in a larger number of trains of restricted length."

The testimony establishes and, as we emphasize, appellee offers no serious challenge, that that method of operation which permits the traffic to be handled with as few train units as consistent with economy and efficiency, and therefore exposes as few employees as possible, creates far less hazard and causes many fewer casualties than does the restricted operation; or, as the trial court said (R. 4052-4053), when the "overall result in casualties of the entire operation" is considered it is clear "that the law not only does not increase safety of train operations in Arizona, but that as a matter of cold fact it makes these short train operations more dangerous"; hence, the "law not only bears no reasonable relation to safety, but to the contrary does, and if enforced will continue to impair and lessen substantially the safety of (appellant's) train operations in Arizona and the adjacent affected territory."

(a) "Slack-Action Accidents and Injuries" (Appellee's Brief, pp. 93-99).

Even as a purported slack-action prevention measure, the law has no real merit or true relation to safety; for in this field it takes into account only one of the numerous factors which control the occurrence and severity of the slack-action shocks experienced in train operation and wholly disregards the others, although these are in most cases of much greater consequence.

Appellee would have the Court believe that the length of the train, and that factor alone, determines whether a slack-action shock will be sufficiently severe to cause dam-

age or injury. The evidence, however, shows, and the trial court found, in a finding (No. XI(d), R. 3971-3972) not heretofore or presently challenged by appellee in these particulars, that the occurrence and severity of slack action depend also, and in much greater degree, on: (1) the *speed* of the train at the time; (2) whether it is *accelerating* from a start, or *slowing down*, or proceeding at *normal speed;* (3) the *grade* upon which it is moving; (4) whether it is going *with* or *against* the grade; (5) whether the cars in the train are *loaded* or *empty;* and (6) if partly loaded and partly empty, the *placement* of the loads and empties with relation to each other.

The trial court also found (R. 3973) that the extent and amount of slack action in a freight train are to a large degree within the control of the engineer, through the use of air brakes and the engine power; and that it was not true, as appellee had apparently contended (and now contends: its brief, pp. 93-96) that the amount and severity of slack action occurring in a train depend solely upon the number of cars. That contention, said the trial court, fails to take into account any of the other factors affecting slack-action shocks and the severity thereof; particularly, "grades, speed of trains, consist of trains, whether the cars therein are loaded or empty, and if loaded, the weight of the loads, and the control exercised and exercisable by the engineer" (R. 3973).

Appellee quotes (its brief, pp. 93-96) from the air brake instruction books, issued by appellant and the Santa Fe to engine service employees, asserting (p. 96) that by these instructions definite and distinct recognition is given to the danger from slack action in train operations, and

that this danger increases with train length; that the longer the train the greater the care required, "because the greater the difficulty in controlling the slack"; that the law is based upon the very proposition stated by the railroads themselves, that as the length of the train increases the care required to control the slack increases, and therefore the danger from slack action; but as appellee alleges (its brief, p. 100), the law "says that with over 70 cars in the train the care required becomes too great for safe operation."

This argument has no substantial foundation. These instruction books tell the employees that greater *care* is required in handling longer trains with heavier locomotives, and instruct the engineers how to exercise that care and employ the air brakes and the engine power to obtain safe control. The instruction books likewise recognize, although appellee apparently does not, that effective control of the train, including the slack and the slack action, can be obtained by the engineer, through the use of the brakes and the engine power, if the instructions are fully followed; that the *weight* of the train and the *grades* over which it travels, are factors determining the extent and severity of the slack action.

Neither of these books declares, either in terms or by reasonable inference, that there is any greater *difficulty* in handling of a long train, provided adequate *care* is exercised. Appellee's suggestion to this effect is not supported by the testimony of its own witnesses. None of the engineers called by appellee asserted that he had ever handled a train, either long or short, that he could not control. Engineer Kennedy admitted that he had had no

difficulty in controlling the long trains operated by him over the grade territory in Arizona during April, 1940; that he had accomplished this handling without any trouble because he had intended to do so (R. 2434-2435). Engineer Cooper, who is employed by the Santa Fe and has seniority permitting him to run in freight service, according to choice, in either Arizona (short train territory) or California (long train territory), voluntarily elected the latter, apparently because he preferred the job (R. 2438-2440). Engineer Stevenson, employed by the Southern Pacific, has the same election as between Arizona and New Mexico, but for many years has by preference operated in the latter territory (R. 2488-2489). Appellant's engineer witnesses (Messrs. Fifield and Menzies), who had long experience in train handling and the observation and supervision of other engineers, showed by their testimony that appellant's engineers generally have no difficulty in handling freight and passenger trains of all lengths, including those much longer than 70 or 14 cars, and that long trains are not more difficult to handle and control than short trains; in fact, engineers who as a regular practice handle long trains will frequently take more care than usual when occasionally called upon to handle short trains (R. 2785-2806, 2814-2817).

A complete answer to appellee's suggestion is found in the actual operations of April, 1940, when 302 long freight trains were operated on appellant's lines in Arizona, and wholly without any difficulty of handling so far as the record shows. If the engineers on any of these trains had experienced any difficulty or lack of control, appellee would have made the most of it in evidence. As

to certain of these trains the testimony affirmatively shows, by the statements of the very men who handled or rode upon them, that no such difficulties were experienced (R. 2435, 2815). No reportable accident or casualty attributed to either slack action or any other cause, occurred upon any of these long trains while in motion.

Appellee argues (pp. 97-99) that the trial court erred in finding (R. 3991) that slack-action casualties are of infrequent occurrence, and (R. 3993) a minor factor in determining whether the law is reasonable. During the 18 years 1923-1940, inclusive, there were 103 of these casualties in Arizona and 118 in Nevada (Exhibits 274, 275, 280, R. 3351, 3364, 3375). Of these, 101 occurred on short trains in Arizona, and 24 on short trains in Nevada; so that combining the two states there were 125 short train slack-action casualties. There were 96 of these casualties on long trains; 2 in Arizona and 94 in Nevada. During the last 12 years of this period, when long-train operation predominated in Nevada, there were 61 such casualties in that state and 62 in Arizona; an average of about five per year in each state. The "frequency" in Nevada was 3.77 per hundred million car-miles, or about one such casualty for every 26,525,000 car-miles operated. This rate is slightly less than the corresponding frequency rate in Arizona for the same period: 4.01 per hundred million car-miles, or about one for each 25,000,000 operated. Either "frequency" is so low as to warrant completely the observation that these casualties are indeed *infrequent*.

It is also clear that observance of the law in Arizona has not prevented or even reduced the frequency of these casualties, while unrestricted operation in Nevada, under

similar conditions, has not increased their frequency. In fact, the Nevada improvement over the 18-year period (57.5%, in the car-mile rates) is greater than in Arizona (47.7%); and this improvement comparison is particularly pertinent because in the earlier years, 1923-1926, short-train operation predominated in Nevada, whereas since 1929 long-train operation has greatly predominated.

Appellee attempts to build up the relative importance of these casualties by asserting (its brief, pp. 97-98) that casualties to employees occurring on passenger trains, in yard operations, on standing freight trains, or in other circumstances where train length has (according to appellee) no influence, should be excluded; that only those accidents and casualties which occur on trains while in motion should be taken into account. The influence of the law in causing additional trains to be run, and thus creating additional exposure to hazard, is not confined to those accidents occurring on moving trains. Accidents while trains are standing, or which result from pinched fingers, sand in eyes, and the like, are definitely related to the number of men exposed and thus to the number of trains run. Accidents to employees in yards or on passenger trains are likewise due to exposure, which again is directly proportionate to the number of men employed and thus to the number of trains run. Moreover, an increase in the number of freight trains operated increases the hazard to passenger trains arising from train interferences or collisions. Thus, it is entirely proper to relate the slack-action accidents, not merely to those occurring on freight trains while in motion, but to all of the various accidents to which employees are exposed and to which *more* em-

ployees must be exposed if the law is obeyed. While it is true that slack action can occur only when the train is in motion, it is not true that accidents on moving trains are the only ones whose frequency is influenced by the law.

(b) Train Length Is Not the Sole or Controlling Factor in Slack-Action Accidents (Appellee's Brief, pp. 99-102).

At pages 99-100, appellee repeats its argument that the difficulty of controlling the slack and the severity of the slack-action shock increases as the train length increases; thus again disregarding all the other factors which influence the degree of control and determine the severity of the shock when slack action takes place. It is particularly *not* true that the *difficulty* of train handling and train control, with special reference to slack action, increases with train length. While greater *care* is required with larger and heavier trains, complete control can be and is obtained when ordinary care is used (R. 2435-2436, 2490, 2502, 2787, 2801, 2817).

Appellee argues, however, that in Nevada of the 48 slack-action accidents occurring during the 12-year period 1929-1940, all but one were on long trains and that exception was on a 69-car train; while in Arizona during the same period, out of 55 slack-action accidents, 42 were on trains of 65 or more cars (one on a long train) and only 13 on trains of less than 65 cars. Appellee thus confesses the complete unreasonableness of the law. By selecting 70 cars as the supposed safe operating maximum, the law has committed appellee to that figure. The supposed safe limit is not 65 or 60 cars, or something less; and to argue

that a train of that length is safe, but a 70-car train is not (the practical and logical deduction from appellee's discussion), is to admit that the law has no merit, even with relation to its supposed purpose of preventing slack-action casualties.

There is a complete explanation for the fact that these accidents occurred principally on trains of more than 65 cars. Since 1929 long-train operation has prevailed in Nevada; which means that comparatively few short trains have been operated, and those largely on branch lines or for short distances on main lines. In Arizona during the same period, while the law was generally observed, appellant endeavored to operate as near that limit as possible, and most of its through trains came within the 61-70-car bracket. Exhibit 214 (R. 3198) shows that in June and August, 1938 (the two typical months analyzed in the redispatching study) 85% of the trains actually operated were within the 61-70-car bracket, and only about 2% had less than 51 cars. Thus as in Nevada there was less opportunity for accidents on short trains, because being used largely for local or branch line service, or short main line runs, there was much less exposure.

The argument is presented (appellee's brief, pp. 100-102) and apparently greatly relied upon, that the severity of the injuries sustained in slack-action accidents is directly related to train length. To support this argument appellee presents a purported analysis of the slack-action casualties occurring in both Arizona and Nevada during the 12 years 1929-1940, contrasting a computed "average disability" in days from such casualties on long trains with a corresponding average for the casualties on short trains.

This comparison is misleading because it fails to take into account, *first,* various other controlling factors already mentioned, beside train length, which determine the extent and severity of the slack-action shock (and thus, to some degree, of the injury sustained); *second,* the variations in the individuals concerned, which play their part in determining the length of the disability of each; and *third,* the impossibility of deriving any true "rule of relative severity" from the comparatively small number of casualties reviewed.

This is particularly illustrated by the variation in the length of disability when two or more men are injured in the same accident, or when the same man is injured in different accidents. For example, in the accident shown in line 255, sheet 6, Exhibit 274 (R. 3356), a conductor and a brakeman were both injured because of a sudden stop of a 65-car train at Harqua, Arizona. The conductor's disability was only ten days, but the brakeman's was 74. Again, in the accident shown in line 352, sheet 8, of the same exhibit (R. 3358), due to the sudden stop of a 67-car train at Wymola, Arizona, three men were injured, the conductor suffering 41 days' disability, while the two brakemen were off duty, one for six and the other for five days. In the accident shown in line 287, sheet 7, Exhibit 274 (R. 3357), a brakeman on a 68-car train suffered a permanent disability, while in the accident shown in line 289 of the same exhibit, occurring less than three weeks later on a 70-car train, the brakeman suffered only eight days' disability. The two accidents were apparently quite similar. In the accident shown in line 210, sheet 5, Exhibit 275 (R. 3368), at Moor, Nevada, on a 100-car

train, the conductor suffered 306 days of disability while the brakeman was disabled for only 32 days. The same two men were injured in the accident shown in line 224, sheet 6, of the same exhibit (R. 3369), occurring at Avenel, Nevada, on a train of 111 cars; but upon this occasion the conductor was disabled for 20 days and the brakeman for 26. In the accident occurring at Hazen, Nevada, on March 1, 1935 (line 235, sheet 6, Exhibit 275, R. 3369) two men were injured by the sudden stop of an 82-car train, one suffering 44 days' and the other 7 days' disability; and in an exactly similar accident taking place a few months later at Carlin, Nevada (line 237 on the same page), a brakeman on a train of 131 cars suffered only 12 days' disability.

Appellee makes much of the accident occurring on November 19, 1938, at Reno, Nevada, in which five men were injured on an 85-car train, suffering disabilities ranging from 51 days up to 286 days; but the impossibility of deriving any rule from train length is illustrated by the exactly similar accident occurring at Reno on October 4, 1936 (line 245, sheet 7, Exhibit 275, R. 3369A), when the conductor on an 85-car train suffered a disability of only ten days.

The facts, as properly found by the trial court (R. 3973) are:

> "It is not true, as apparently contended by plaintiff, that the amount and severity of slack-action occurring in a freight train depends solely upon the number of cars in a train * * *.
>
> "It is likewise not true that the Train-Limit Law, by restricting the lengths of freight trains, either

eliminates or substantially reduces the number or severity of the casualties attributable to slack-action shocks in cabooses or other cars at or near the rear end of trains. The evidence indicates that in the operation of long trains, there have been many instances of severe jerks and jolts occurring at the rear end of the train because of slack-action, and that injuries have been suffered by brakemen and conductors as a result thereof. The record contains many similar instances occurring in connection with the operation of short trains. It is also shown that emergency stops of long trains have taken place, without causing any severe slack-action shocks to the caboose or injuries to the occupants thereof. Emergency stops of short trains have occurred, accompanied by severe slack-action shocks to the caboose and injury to the occupants thereof. The evidence shows that these different results, as herein indicated, on long and short trains arise because of the presence or absence, in the particular operation of the factors directly contributing to and controlling the severity of the slack-action."

The averages shown by appellee (its brief, pp. 101-102) are misleading in a statistical sense. In obtaining the figures for the averages of the long-train disabilities, appellee has included disabilities ranging from four days (the minimum reportable) up to a maximum of 663. Similarly, in obtaining the short-train average the minimum is four days and the maximum 180. While it is possible to compute a mathematical average of figures so widely apart as these, the result does not present an accurate picture. For example, one might compute an average of the height of the buildings in a particular block in which one was 40

stories high and all the rest three, but that average would hardly present an accurate picture of the block. The mere average of the wealth of 15 men, one of whom has a million dollars and the other fourteen five thousand apiece, does not present a true story of their composite prosperity. An average, to be fully representative, must be predicated upon individual figures which are not extremely far from the mean.

There is still another and more serious defect in appellee's computation. It has included in the long-train accidents a number which in reality are not of that character because of the circumstances of their occurrence. Thus, for example, it has included the accident at Moor, Nevada, shown in line 233, sheet 6, Exhibit 275 (R. 3369) in which a conductor suffered disability of 663 days because of an undesired emergency due to the failure of the train line in the 66th car from the head end of the train. While this was a train of 100 cars, the effect was the same as if the failure had taken place on the 36th car of a 70-car train; for there were but 34 cars between the point of the failure and the caboose in which the conductor was injured. In the *Nevada Train Limit Case* (*Southern Pacific Company v. Mashburn*, 18 Fed. Supp. 393), the court found,[1] with respect to those slack-action accidents caused by a break-in-two or other failure in the middle of the train, that:

> "The number of cars between the caboose and the point where the train separates and not the total number of cars in the train is the factor to be considered

[1]The findings of the Court in the *Nevada Case* are reproduced in the record of the hearing before the House Committee on Interstate and Foreign Commerce, 75th Congress, Third Session, on S-69, at pages 475-521. The quotation is from page 511.

together with other slack-action producing factors in determining the severity of the slack-action shock, if any, to the rear end or at any point behind the break. The number of cars ahead of the break has nothing to do with the shock experienced at the caboose or at any point behind the break.

"Casualties which the evidence shows were due to slack action from this cause would not be related to the number of car units operating in the train on which the accident occurred."

In other words, this accident is to be classed as a short-train accident, for the effect was the same as if there had been an emergency stop of a 34-car train. The accident on August 29, 1932, at Moor, Nevada (line 210, sheet 5, Exhibit 275, R. 3368), also included by appellee, in which the conductor suffered 306 days' disability and the brakeman 32 days, is of the same character, having been caused by a burst air hose on the 31st car of a 100-car train; so that there could not have been a "run-in" of slack of more than 69 cars between the point of the break and the caboose. If only these *two* accidents (and there are at least *four* others of the same kind) are transferred to the "short-train" side of appellee's comparison, where they properly belong, the average disability from short-train accidents becomes 38 days, and from long-train accidents 34 days; and it again appears, as the trial court properly found (R. 3973-3991), that the law does not, by restricting the length of freight trains, either eliminate or substantially reduce the number *or severity* of the casualties attributable to slack-action shocks in cabooses or other cars at or near the rear end of trains, and is not reason-

ably effective in the prevention or minimization of slack-action accidents and incident casualties.

(c) There Is No Actual and Substantial Hazard to the Public From Slack-Action on Freight Trains on Appellant's Lines in Arizona (Appellee's Brief, pp. 102-105).

At pages 102-105 of its brief appellee argues that there is a danger to the public from slack action, asserted to have a direct relation to the number of cars in a train. The alleged danger is that arising from the buckling of cars in freight trains when moving in multiple-track territory, or in yards where passenger trains are passed; and appellee again stresses the accident occurring on the Pennsylvania Railroad near Manor, Pa., on March 27, 1936 (Item 45, Exhibit 270, R. 3329).

If there is any such hazard—and even nationally it appears to be very slight, appellee having been able to cite only three such accidents during the entire period covered by the record (1923-1939), in only one of which slack action appears to have been a factor—clearly the Arizona law is not directed towards its elimination, at least so far as appellant's lines are concerned. Upon the more than 808 miles of appellant's main line in Arizona, there are but 29.5 miles of "adjacent" double track, the balance of the double track being non-adjacent. There is no record of any accident or hazard of accident from this cause in Arizona, either disclosed by the exhibits or otherwise referred to in the testimony.

Moreover, the hazard of collision on double track because of wreckage from an adjoining track being struck is not peculiar to long-train operation. Exhibit 312 (R. 2265-

2267) contains reports of the Safety Bureau of the Interstate Commerce Commission covering five such accidents, all involving short trains, in which wreckage from one track fouled an adjacent track and was there struck by another train.

From this standpoint the law clearly has no rational safety basis, particularly as applied to appellant's Arizona operations.

(d) The Law Increases Rather Than Reduces the Hazards Due to Defects in or Failures of Freight-Car Equipment (Appellee's Brief, pp. 106-108).

At pages 106-108 appellee argues that the law reduces the hazards incident to failure of freight car equipment, because it reduces the "strains on the weak parts," said to increase in quantity and quality as cars are added. This argument is based wholly upon theory and not on fact; for appellee errs in stating that there is no evidence from which a comparison of accidents on short and long trains from defects or failures of equipment, per train operated, can be made. Appellee has overlooked Exhibits 286, 287, 288, 389, and 397 (R. 3383-3385, 3565, 3578), which compare the derailments due to defects in or failures of freight car equipment, including particularly those due to weaknesses in the draft gears, draw bars and other portions subjected to strain, as they have occurred in Nevada, Arizona and New Mexico, and demonstrate that appellee's argument has no foundation. If appellee were correct, these derailments and the resulting casualties should have been much more frequent in Nevada, and somewhat more frequent in New Mexico, than in Arizona,

simply because of the long-train operation in the first two states. The fact is that in Nevada, in 18 years, there were 70 such derailments whereas there were 106 in Arizona, the rates per million train miles (i.e., on a "train-operated" basis) having been 2.02 for Nevada and 2.51 for Arizona, and per hundred-million car miles, 2.93 for Nevada and 4.64 for Arizona. Moreover, of the 70 Nevada derailments only 35 were on long trains. Thus out of the total of 176 derailments in both states, 141 (106 in Arizona, 35 in Nevada) were on short trains.

In New Mexico, during the 11-year period 1930-1940, there were 29 derailments of this type, 23 on short trains. During the same period there were in Arizona 42 such derailments, all on short trains; in Nevada 31, of which 11 were on short trains. It will be recalled that from 1926 on there has been a substantial long-train operation in Nevada, and since 1929 long-train operation has predominated.

Bearing in mind that the *same* types of equipment are operated in all three states under the *same* operating rules and under operating conditions which, except for the law, are at least as favorable in Arizona, it is obvious that the law does not reduce any hazard associated with the alleged strain upon weak parts of freight car equipment, but on the contrary greatly increases the opportunity for this as for most, if not all, other types of accidents. The reason is that the law, by arbitrarily increasing the number of trains, greatly increases the amount of switching involved in making up and breaking up trains, and the number of starts and stops involved in running between terminals, because of the disproportionate increase in the

meets and passes required. Weaknesses leading to failures are largely developed in switching, starting, and stopping; and the results are evident in the larger number of derailments due to these failures in Arizona.

(e) The Alleged Difficulty of Seeing or Understanding Signals on Long Trains Does Not Result in Any Measurable Hazard (Appellee's Brief, pp. 108-109).

At pages 108-109 of its brief appellee asserts that as the length of the train increases it becomes more difficult for the employees on the train to communicate with each other by signals, and infers that this gives rise to additional hazard. This contention, like many others made by appellee, is completely disposed of by an express finding of the trial court (Finding XIII(b), R. 4023-4025). The testimony of appellee's own witnesses shows that when a train is in motion there is only one signal that need be given, and that is the stop signal. If for any reason that signal is not seen by the engineer the conductor's valve in the caboose may be used to stop the train. This valve applies the brakes throughout the train, but they apply first in the caboose and then in succession forward to the engine. There can be no severe slack-action shock in the caboose in these circumstances. There is no evidence that any reportable long-train casualty has occurred in Nevada, or Arizona, or New Mexico, or on the Los Angeles Division in California, during the period covered by the testimony, due to the use of the conductor's valve; nor has any reportable casualty occurred in any of this territory while the train was in motion, asserted to have been due to failure to observe or interpret signals properly, where the

train length was claimed to have had any effect. There was one accident, without casualties, occurring from failure to see or understand a signal; but it involved the movement of a helper engine, with two cars and a caboose, the remainder of the train being at a standstill at the time. A supposed hazard which has not resulted in any casualty over a long period of years and extensive operation can hardly be said to have real existence.

Obviously there is no hazard from inability to see or understand signals while the train is standing; if signals are given and not understood, they can be repeated, or one of the men at the caboose can go forward until the signal can be seen.

Experience thus shows that the law is wholly unnecessary as a safeguard against the alleged hazards created by the supposed difficulty of seeing or interpreting signals on long trains.

(f) **The Alleged Hazard From Failure to Detect Defects on Cars of Long Trains Is Likewise Unsubstantial (Appellee's Brief, pp. 109-111).**

At pages 109-111 appellee argues that long-train operation is more hazardous, because of the supposed inability of members of the train crew to observe and detect defects in the cars of the train while in motion, and thus to prevent derailments or other accidents.

This contention is likewise covered by an express finding (Finding XIII(d), R. 4026-4029). The argument has no foundation, so far as concerns operations in Arizona and the adjacent territory, especially when Arizona operations are contrasted with those in neighboring states. If appellee's argument were sound, and there really were

greater difficulties in making inspection and observation upon long trains, there would follow a much greater frequency of derailments due to defects in or failures of freight car equipment, in long-train as compared to short-train operations; for the inspections at stops and the observance of the trains while in motion are for the primary purpose of detecting these failures before the accident occurs. However, these accidents have been more frequent in the short-train operation in Arizona than in the partial long-train operation in New Mexico, and much more frequent than in the long-train operation in Nevada. In both actual number and car-mile frequency, there were about 50% more derailments due to these causes in Arizona than in Nevada during the six years ending in 1940, and the Arizona rates were much higher throughout the 18 years 1923-1940 (Exhibit 288, R. 3385). The survey of long- and short-train operations between Lordsburg and El Paso (i.e., in New Mexico) during the first six months of 1940 (Exhibit 397, R. 3578) shows that in that territory inspection was just as effective on long as on short trains. The fact that derailments have occurred in Arizona, in greater number and with greater frequency on short trains, than in long-train operation in Nevada and New Mexico, indicates that there is no greater difficulty of effective observation on long trains, and that the alleged increased hazard of which appellee speaks is purely imaginary. No long-train accident of this kind was referred to by any witness, as to which a claim was or could have been made by the witness that it would have been prevented or lessened by inspection or observation if the train had been short.

(g) The Alleged "Fear of Long Trains" Is Unfounded (Appellee's Brief, p. 111).

At page 111, appellee argues that fear of injury is increased with increases in train lengths, thus reducing the efficiency of trainmen. This argument, like the preceding, is also covered by an express finding (Finding XIII(c), R. 4025-4026).

Since the evidence shows that the law does not eliminate accidents of any kind, least of all slack-action accidents, it is hard to see how the operation of short trains exclusively could eliminate any fear in the minds of the trainmen riding in the cabooses of such trains. If such fear results in inefficiency, it is apparently greater in short-train than in long-train territory; for there were 106 derailments due to defects in or failure of freight car equipment in Arizona, in 18 years, all on short trains, as compared to 70 in Nevada during the same years, only 35 of which were on long trains. Since it may fairly be argued that many of these derailments might have been prevented if the trainmen had detected the defects or failures in time, the greater number in Arizona can be properly ascribed to inefficiency of the crews, because all other conditions were either substantially the same or more favorable in Arizona.

The trial court found (R. 4206) that this alleged fear of long trains is unsubstantial and without foundation. Appellee's witnesses who testified along these lines were conductors who by preference work between El Paso and Lordsburg, where long-train operations are frequent, although they have seniority to hold equivalent positions in short-train territory west of Lordsburg. If fear of long

trains were of real consequence, it would be difficult to understand their long years of continuance in long-train territory.

Appellee's argument is based principally upon its analysis of the Arizona and Nevada slack-action casualties and resulting disabilities, already discussed. It is difficult to believe that a type of casualty which occurs as infrequently as do those from slack action in Nevada (in the six years 1935-1940, on the average slightly more than four times per year: once for every 31,850,000 car miles operated) produces any real apprehension leading to inefficiency, especially since the employees know that train limitation does not remove this class of accidents, but instead increases the frequency and severity of all other hazards and casualties.

(h) By Increasing the Number of Trains and the Number of Employees Required, the Law Increases the Hazard of Accidents Due to Employee Negligence (Appellee's Brief, pp. 112-114).

Appellee next addresses its argument to the proposition that "long trains will not reduce the casualties due to negligence of employees." The topic suggested by this contention is likewise covered by a specific finding of the trial court (Finding XII(v), R. 4021-4022), stating that the operation of additional and unnecessary trains to handle the same volume of traffic which might be handled in longer and fewer trains, because it requires more employees and also more train orders and messages, increases the hazard of accidents resulting from misunderstanding or forgetfulness, or other kinds of negligence of employees.

It is obvious from ordinary experience that if more operations are required, and more men are employed to perform them, there are more opportunities for individual negligence or forgetfulness, and thus more accidents due to such negligence.

Appellee attempts, however, to support its argument by comparing the number of accidents on all Class I railroads caused by negligence of employees, which were investigated by the Bureau of Safety, with average train lengths during the same series of years, and then by a series of single-year comparisons attempts to show that in years when train lengths were greater there were also more of these accidents. The comparison is incomplete and meaningless; but even taken at face value it leads to no such deduction as appellee attempts. For example, in 1928, when the average train length was 48.1 cars, there were 23 such accidents investigated; but in 1932, when train lengths had declined to 44.8 cars, there were 24. In 1930, when the average train length was 48.9, there were 34 such accidents, but in 1939, when the average train length was 49.1 cars, there were 33. In 1932, when the average train length was the shortest (44.8 cars) of any of the years shown, the number of such accidents was 24, but with an increase in average train length to 46.2 cars in 1934, the number of accidents decreased to 23. There was also an increase in train length between 1936 and 1938 (46.4 to 47.7), and again the number of such accidents went down (32 to 28).

At pages 113 and 114 of its brief, as part of this argument appellee asserts that since the average train lengths for Class I railroads were 20 to 25 cars less than the 70

permitted by the law, there must have been at least ten short trains run for every long train. This is pure assumption, and in any event immaterial. The exposure of men and trains to accident and casualty does not depend upon mere numbers of trains operated, but upon the number of train miles made by those trains. Short trains may be relatively much more numerous, but if each runs only a few miles, it produces a comparatively slight exposure. Long trains are, however, seldom used in local or turn-around service or on branch lines, or for similar short runs. They are principally used in the longer through runs from terminal to terminal. Consequently the proportion of the train miles made by long trains, and thus of exposure incident to their operation, is much greater than the one-to-ten relationship assumed by appellee. While the record does not indicate what that relationship may be, it was testified on behalf of the railroads, in the proceedings before the House Committee on Interstate Commerce, 75th Congress, in connection with S. 69, that about 43% of the total freight car miles operated in 1936 were in trains of more than 70 cars (p. 851 of the Report of the Committee Hearings). Since long trains were only 18% of the trains involved in the 349 accidents to freight trains caused by negligence of employees, investigated by the Bureau of Safety during the period 1928-1939, it would appear that from this standpoint as well as all others, long-train operation is relatively safer.

(i) **The Law Greatly Increases the Hazard of Grade-Crossing Accidents (Appellee's Brief, pp. 114-118).**

At pages 114-118 of its brief, appellee argues at length that the law does not increase, but on the contrary reduces

the hazard of grade crossing accidents, asserting that the evidence supports this contention.

Appellee's initial argument is that train lengths have little effect upon the opportunity for accidents, because, so it says, with a larger number of shorter trains the addition of the engines and cabooses will cause only a slight increase in the total length of time that the grade crossings are occupied, which will be offset by the faster speed of the short trains. Like much of appellee's other argument, this is pure theory which has no factual foundation. There are, as appellee says, two principal types of grade crossing accidents: those in which the engine strikes the automobile or other vehicle, and those in which the vehicle strikes the side of the train. The latter type constituted about 34.6% of the total grade crossing accidents occurring during the years 1935-1939. Whichever type be considered, however, the danger is bound to be greater if more trains are operated. Assuming the volume of the automobile traffic over a particular crossing to be constant, the hazard of automobiles being struck by trains, or of automobiles striking trains on that crossing increases directly with the number of trains operated over it. This is the essential conclusion to be drawn from the fact that, in the United States at large, the frequency of grade-crossing casualties is almost the same year after year, as measured against train miles operated. An increase in the number of trains, and thus in the number of train miles, produces a proportionate increase in the number of casualties at the rate of about 6.45 per million train miles. The experience has been too consistent and too complete to permit any other conclusion.

The Interstate Commerce Commission recognizes that the volume of rail traffic, measured in train miles, is one of the essential bases to be employed in calculating the frequency of grade-crossing accidents (R. 1966, 2168), having said that it is necessary to know the volume of the rail, as well as the highway, traffic passing over grade crossings. Naturally, if the highway traffic increases in volume the likelihood of accidents at that crossing increases; but if the automobile traffic remains constant, and the number of trains over the crossing increases, the likelihood of accident likewise increases.

It is particularly pertinent to note that while the rate per million train miles of grade crossing casualties throughout the years since 1923 has remained practically constant, average train lengths have increased substantially, as also the number of long trains operated. This shows that the grade crossing casualty *rates* are independent of train length. While the *rate* does not rise with an increase in trains operated, the *aggregate number* of casualties increases in direct proportion. Arizona, by compelling an artificial increase of about 28% in the total number of trains operated, has created the opportunity for and the probability of a 28% increase in the *number* of grade crossing casualties, even though the *rate* per train mile is not affected.

Appellee places great emphasis upon the exhibits (Nos. 293, R. 3422; 334, R. 3461; and 335, R. 3462) showing the grade crossing casualties per 10,000 automobiles registered, in Arizona, Nevada, and New Mexico. These exhibits obviously have no relation to the question of the effect of the law upon this type of accident. The law

neither increases nor reduces the number of automobiles registered, and so does not affect the number of automobiles using grade crossings in Arizona. But, as appellee recognizes, the use of the grade crossings *by automobiles* is only one of the two factors which cooperate to produce grade-crossing accidents. The law does directly affect the other factor—the frequency of use of those crossings *by trains*—and by artificially increasing the number of trains, increases the hazard in direct ratio.

Appellee's argument (its brief, p. 118) that the more frequent operation of trains over grade crossings is beneficial because of producing "a greater awareness" of danger on the part of automobile drivers hardly merits reply: the sum total of ordinary experience points to an exactly opposite conclusion. It is common knowledge that wig-wags, flashing signals, and other devices designed to warn the motorist of the presence of railroad grade crossings are placed, *not* at crossings where train movements are relatively infrequent, but upon those where such movements are most frequent and the dangers therefore acknowledged to be greatest. At the little used crossing the ordinary fixed wooden crossing sign is usually deemed sufficient. The number of trains or of movements over the crossing is invariably the factor which determines the degree of warning protection to be provided; and the number of trains is the controllable factor of crossing hazard which the law unnecessarily and avoidably increases.

5. APPELLANT'S SAFETY EVIDENCE
(Appellee's Brief, pp. 121-143)

(a) "The National Evidence" (Appellee's Brief, pp. 121-135).

Under the above sub-title appellee argues that our showing, based upon accidents and casualties of railroads of the United States generally, has no evidentiary value and fails to support any findings or conclusions with respect to safety of train operations insofar as any issue in this case is concerned. Appellee includes in this argument certain criticisms also of the Arizona-Nevada comparisons (see, for example, pp. 126, 131-135), although these are also made the subject of additional comment (at pp. 135-138) under a separate subheading.

Appellee first asserts (p. 122) that the conceded "very substantial decrease" in accident and casualty rates over the period 1923-1939 is not in any way due or related to the length of trains operated; by which it presumably means to contend that there is nothing to show that this improvement was due to the adoption and development of the long-train operating practice and the resulting widespread operation of long trains. It is certainly the fact, which appellee cannot challenge, that during this period there was a substantial increase in average train lengths and a continued expansion of the long-train operating practice, except in Arizona; and that in Arizona the improvement in casualty frequency was considerably less than the national improvement, no matter what basis of measurement be taken. All of the other factors mentioned by appellee, to which it attributes the improvement in casualties, had full opportunity to operate in Arizona; that is to say, the improvements in equipment (e.g., the

elimination of weak graduating springs in air brake triple valves, and of arch-bar trucks), road bed, block signals, and operating methods; the grade-crossing eliminations, etc. The record shows, and appellee accepted largely without challenge the finding, that these same improvements all occurred in Arizona (Finding VI, R. 3902-3908). The only fair conclusion is that the compelled short-train operation, the only differentiating factor, has prevented the safety improvements achieved elsewhere. This is confirmed by the results in Nevada, where conditions are practically identical with those in Arizona, except for the more severe winters, and the improvement in casualty frequency is substantially as great as nationally, and much greater than in Arizona.

Appellee argues, however, that the exhibits presenting the national showing (Nos. 262-271, R. 3300-3366) are of no value because they include the combined operations of both long and short trains, there being no separation between purely long-train and purely short-train operations. This is appellee's stock argument, by which it undertakes to shape and restate the issues to suit its own purposes, and has already been discussed in both our opening brief (Vol. I, p. 203), and this reply (ante, p. 62).

The merits of the law as a safety measure can be measured properly only by contrasting the complete operation which it compels with the complete operation which would be conducted if it were not in effect: i.e., by comparing the Arizona short-train operation with a standard long-train operation which includes the use of trains of all lengths, in accordance with the traffic demands and as may

be consistent with speed, economy, and safety. No purpose is served by comparing the operation of one or a number of long trains, with an equal number of short trains, because that comparison would not reflect an actual condition, or contrast equivalent performances or exposures.

At page 123 of its brief appellee undertakes to summarize appellant's argument based upon the casualty comparisons. All of the factors contributing to greater safety of railroad operation have been available in Arizona, to the same extent as in other states and upon other railroads; but the reduction in the number and frequency of accidents and casualties in Arizona has been much less than elsewhere. The only real differentiating factor is the Arizona law, which has not permitted the development of the safer long-train operating practice. Our contention is, therefore, not only that the operation of long trains outside of Arizona, in conjunction with all of the other improvements in equipment and methods, has caused the improvement in casualty frequencies; but also, as appellee fails to note, that the continuance of the Arizona restriction has prevented a similar improvement in Arizona, in spite of the use there of the same improved equipment and the presence of other favorable conditions.

Appellee asserts (its brief, pp. 123-128) that the exhibits showing the national casualty results are not properly comparable to those covering Arizona, and draws attention particularly to Exhibits 262 and 276 (R. 3300, 3371). In the tabulation at pages 191 and 192 of Volume II of our opening brief, we contrasted the national improvement with the Nevada and Arizona improvements in casualty rates to various classes of employees and from

various classes of accidents; and in using these two exhibits, which present the number and rates of casualties to all classes of employees on duty in all classes of service, we used the improvements in the rate per million locomotive miles for Nevada and Arizona, contrasting them with the improvements in the car-mile and train-mile casualty rates nationally. The casualty rate per million locomotive miles is also available nationally. On this basis the casualty rate to all classes of employees on duty in the five years 1935-1939, was *66.74% less* than in 1923-1928. The corresponding improvement on the train-mile basis was 66.99%. These improvements compare with the Arizona improvement, contrasting the six years 1935-1940 with the six years 1923-1928, of 38.7%. These exhibits also show that the use of the locomotive-mile basis presents no substantial variation in trend from the train-mile basis. Appellee's objection is obviously untenable.

Appellee also argues (its brief, pp. 124-127) that the Arizona figures are meaningless because the first period, 1923-1928, includes the years 1923 and 1924, and that the El Paso and Southwestern and Arizona Eastern lines were acquired on November 1, 1924, resulting in an increase in the Arizona operated mileage. It then says that if the casualty rates were substantially higher on the acquired territory than on the original territory, the rates on the combined operation would be higher than on the original operation. Mere acquisition of mileage will not change casualty rates calculated upon the basis of traffic moved (car miles), or train units employed (train miles); nor will it produce any substantial disturbance unless the acquired mileage is quite different in its characteristics

from the mileage owned prior to the acquisition. There was no substantial change in casualty rates as a result of the acquisition, as may be seen by comparing the Arizona rates for the year 1923 with those for 1925, the first full year following the acquisition. The 1925 rates were somewhat higher than for 1924, but slightly lower than for 1923 (Exhibits 276-280, R. 3371-3375); and after 1925 there was generally a moderate downward trend. Thus it is apparent that the acquisition had no disturbing effect. This result is quite natural, for these lines were in the same general territory, encountering the same operating conditions, and subject to the same restrictions as the lines to which they were added.

At pages 127 and 128 of its brief appellee argues, as a further reason for disregarding the national comparisons, that work-train miles are included in the basis against which the rates are computed upon the national exhibits, but not upon the Arizona and Nevada showings. This criticism is wholly beside the point, because all of these showings are for the purpose of determining the *trend*, by years and groups of years throughout the period studied; and since the same basis of total performance is used each year for the national showing, the trend is accurately indicated. The national accident totals include accidents and casualties on work trains, because the Interstate Commerce Commission statistics are prepared in that way. The train miles and car miles accumulated upon the work trains upon which these accidents took place are therefore properly used in calculating the frequency. Since work trains are always short trains, the showing properly reflects whatever increased safety may have been due to

that factor. In the Nevada-Arizona exhibits a segregation of the work-train accidents and work-train car miles and train miles was possible and was therefore made. Since, however, the essential purpose of the exhibits is to show trends, and the same basis is used throughout these exhibits, appellee's criticism is clearly without foundation. These statistics are of the same type and source which this Court has called "incontrovertible" (*Railroad Retirement Board v. Alton R. Co.*, 295 U.S. 330, 364).

At pages 128-131 of its brief appellee presents a list of the detail of the casualties to road freight conductors, brakemen and flagmen on duty, occurring during the year 1937 in Arizona and Nevada. It will be noted that this list is confined to accidents to this restricted class of individuals, and does not include accidents to other classes of employees on duty, occurring in road freight train operation, or any accidents occurring in any other classes of service. The showing, therefore, while correct so far as it goes, is incomplete as an attempted comparison between Arizona and Nevada from the standpoint of relative safety of railroad operations.

Following this listing appellee emphasizes that there were two accidents in Arizona due to sand or particles in the employees' eyes, compared to none in Nevada. This limited comparison does not establish, as appellee contends, that there is any peculiar local condition in Arizona, such as sand storms, not encountered in Nevada. It is noteworthy that there has been no casualty of this kind reported in Arizona since 1938. These casualties are very unimportant, and certainly do not indicate by their presence or absence any real difference in operating condi-

tions. They are significant only because, by their greater frequency in Arizona, they show the effect of the added exposure due to the unnecessary employment of men on account of the law.

Appellee also compares the casualties occurring in the operation of hand brakes, and asserts that this is due to a difference in operations in the two states. Appellee is mistaken in its statement of the purposes for which hand brakes are used; they are used not only to insure that a detached car remains in place after being spotted on a siding for loading or unloading, but also to control and stop cars in switching movements ("flying switches" or "drops"), or to "tie down" a train when stopped on the main line, if the engine is detached to do other work. The only difference in operating conditions which might lead to a greater use of hand brakes, and thus a greater number of hand brake accidents in Arizona, is directly attributable to the law. Because of its effects, trains must be remade, and more trains operated, so that there is more switching in making up and breaking up trains, and more use of the hand brakes. The difference in the volume of local traffic, to which appellee refers, has but little effect upon their use. It is so small in either state, by comparison with the total amount of the traffic, as to be relatively unimportant. It should also be noted that these hand-brake casualties occur either at low speeds or while trains are standing; and as the trial court found (R. 1009), nearly all of these standing accidents occur on short trains and are increased by the number of trains operated. So far as concerns the brake appliances and the cars themselves, and their use, these are the same in both

states, and there is no difference in the conditions under which they are used.

Appellee also refers (its brief, p. 133) to the casualties caused by stepping on or stumbling over rocks in the road bed, or by being thrown by jerk or jar in switching movements. These stumbling accidents occur mostly at meeting points, where brakemen must run ahead of or after their trains, in order to open or after closing switches. The greater number of trains operated in Arizona, in proportion to traffic handled, greatly increases the number of meets and passes, and thus the opportunity for these accidents. Thus the difference in operating conditions alleged by appellee is really due to the law itself.

Appellee refers (its brief, p. 133) to certain other classes of casualties asserted to have no relation to the length of the train. It appears to claim, in this connection, that there is some burden upon appellant to show that these accidents would have been prevented or minimized if long trains had been operated in place of short trains. These accidents are important in the consideration of the case because they are the result of the exposure of men to the hazards incident to railroad operation. While possibly not directly related to the length of the trains upon which they occur, they are related to the limitation because that factor compels more trains to be operated and thus more men to be exposed.

At best, appellee's argument only shows that the restriction has no effect at all to reduce or minimize these and the other classes of accidents and casualties. Even if this were true, appellee's cause would not be aided. A costly and obstructive restriction, which actually accom-

plishes no improvement in safety, is just as unreasonable as one which increases the hazards. However, as demonstrated by the entire showing, the law is not only of no positive benefit, but instead substantially *increases* hazards and resulting casualties.

At page 134 appellee asserts that in 1937 there were nine "slack-action" casualties (in seven accidents) in Arizona, and only four in Nevada; and that this sustains its contention that conditions (such as dips, hog-backs, grades, and curves) which produced slack-action are more prevalent in Arizona. Actually there were 11 casualties due to "sudden stops, etc.," in Arizona in 1937, appellee having omitted the casualties shown in lines 449 and 470 on sheet 11 of Exhibit 274 (R. 3361), although these are mentioned in the list at pages 129 and 130 of its brief. Consideration of the individual Arizona accidents shows that none of them was due to the effect of any of the conditions mentioned by appellee. The two accidents at Yuma occurred within yard limits, on level track, and were due to undesired emergency applications while the trains were either stopping or starting. The accident at Jaynes occurred just outside the Tucson yard limits, where the track is straight and grade about 0.8%. This accident was also due to an undesired emergency, thus resembling the Yuma accidents. A fourth accident occurred at Bowie when the train was making the station stop. A fifth took place at Picacho where the track is straight and practically level for many miles. A sixth accident occurred at Tucson, within yard limits, and was due to a break-in-two while the train was being backed at a speed of about eight miles per hour. At Tucson the grade is less than

one percent, and there is no curvature which would have affected the movement. A seventh occurred at Benson, when the train broke in two because of a defective draw-bar. The two accidents omitted by appellee occurred, one at Calumet, near Douglas, and was caused by a sudden stop during a switching move; the other at Coolidge, when the caboose, previously detached from the train, made a hard coupling with standing cars, and the injured brakeman was thrown to the ground. This was also during a switching move. At this point the track is straight and level."

If the presence of hog-backs, dips, grades, etc., were frequently productive of this type of accident, one would expect that in the years preceding and following 1937 there would be similar accidents at the same points and with about the same frequency. Actually in 1936 there were only three "sudden-stop" accidents and casualties and in 1938 only two; and all of these, except one occurring in 1936, took place at points other than those where the eleven casualties occurred in 1937. That one exception was at Tucson (line 433, R. 3360) when the slack ran out as a westbound train arriving at Tucson was coming to a stop.

Appellee also presents at this point (its brief, p. 134) a comparison of disability resulting from the long and short train slack-action casualties in the two states in 1937, and attempts to derive from these thirteen casualties which it mentions a rule as to the relative severity of the shock and the resulting injury, with relation to train length. We have already commented upon this type of comparison. The number of casualties used as the basis is so limited as to be clearly inadequate to support ap-

pellee's theory. In fact, by the selection of casualties in other years an entirely different picture could be presented. In 1926 (Exhibit 274, pp. 3-4, R. 3353-3354), there were in Arizona 11 slack-action casualties, all on short trains, one of which was fatal, while in another the injured employee died. In 1927 there were five slack-action casualties and one of these was fatal (R. 3354-3355). In 1929 there were six such casualties (R. 3356-3357), one a permanent disability. Appellee's argument demonstrates nothing except its own care in making its selections.

The tabulation presented by appellee (its brief, p. 135) fails entirely to support its argument. It is merely a set of selected comparisons, which, so far as concerns average train lengths, are on the single-year basis, although where casualties are concerned groups of years have been taken. Appellee appears to recognize that there has been a general downward trend in the casualty rates, but attempts to show that it has no relation to the growth of long-train operation, because in some selected year a downward trend in average train length was nevertheless accompanied by a continuing decline in the casualty rates. It is quite true that by careful selection such variations in trends can be discovered; but the general downward trend over the 18 years covered by appellant's exhibits is not at all disturbed by these highly selective comparisons. That trend is particularly portrayed, for Arizona and Nevada, in the table printed at page 174 of Volume II of appellant's opening brief; and the percentage trends are shown at pages 191 and 192 of that brief, in a tabulation which covers Class I railroads as well.

It will be observed that in the tabulations at page 174 we have taken into account average train lengths over a group of years, corresponding to the groups of years for which casualty frequencies are shown. If appellee had followed this same method, it would have shown that while the rates of improvement vary, dependent upon the type of casualty studied and the periods selected, nevertheless casualty rates tend to improve materially with increases in train lengths, especially if such increases are substantial; while if train lengths are not increased the casualty improvement is less, and if train lengths decline the improvement comes to a standstill. Exhibit 264 (R. 3302) and 282 (R. 3377) furnish good examples of these results.

(b) The Arizona-Nevada Comparisons (Appellee's Brief, pp. 135-138).

At pages 135-138 of its brief appellee renews its criticism of the Arizona-Nevada casualty comparisons (Exhibits 274-294, R. 3310-3421; 389, R. 3565; 391, R. 3567; and 392, R. 3568). Nearly all of appellee's criticisms have already been discussed, such as the inclusion in the showing of the Arizona operations prior to the acquisition of the El Paso and Southwestern and Arizona Eastern, the supposedly heavier local traffc in Arizona, and the greater number of casualties in that state due to sand or particles in the eye.

At page 137 of its brief appellee presents another selective single-year comparison of average train lengths and slack-action casualty rates, the latter being on the train-mile basis. This tabulation is meaningless because, first

of all, it does not include all of the years, but only alternate years, and excludes entirely the years prior to 1926 which preceded the development of long-train operation, both nationally and in Nevada. Furthermore, as a single-year comparison it is obviously defective so far as concerns slack-action casualties, because of the infrequency of this type of casualties and the consequent disturbing effect of only one or two such casualties in a particular year. What appellee has done is to select the years which are most favorable to Arizona and omit the other years. For example, in 1931, which appellee omits from the table, there was only one slack-action casualty in Nevada but 10 in Arizona; in 1937, also omitted, there were four slack-action casualties in Nevada but 11 in Arizona. In 1923-1925, years of predominant *short*-train operation in Nevada, there were 34 slack-action casualties. There is no need, however, for the Court to be misled by the parfial picture presented by appellee. The full showing with respect to slack action appears on Exhibit 266 (R. 3304), which presents the national picture for each of the 17 years 1923-1939, and by presenting both train-mile and car-mile totals affords a basis from which may be computed, year by year, the average length of all the trains operated in the services in which these casualties occurred; and for Arizona and Nevada on Exhibit 280 (R. 3375), which presents a corresponding showing, but includes also the year 1940.

Appellee renews its argument that the operating conditions, as shown by the profile maps covering the Arizona and Nevada lines, are substantially more severe in Arizona. At the risk of repetition we point out again that

the differences between the two states are very slight and in most respects actually favor the Arizona operations. The maximum ruling grades in the latter state are slightly less than in Nevada. While the maximum curvature on the Arizona main lines is 10°, there are comparatively few such curves, and these not only do not handicap the operation of long trains but actually assist. In general, the grade conditions in both states are very favorable because the lines lie for the most part in level, desert territory where there are no obstructions to efficient long-train operation. It would be difficult, and indeed appellee has not suggested that it is possible, to find two territories more nearly alike, for the purposes of this case, than appellant's Nevada and Arizona lines. Three trial courts have agreed that there is a close similarity (the federal courts for Arizona in the *First Arizona Train Limit Case*, 2 Fed. Supp. 855, and Nevada in the *Nevada Train Limit Case*, 18 Fed. Supp. 393; and the trial court in the present case). The trial court's findings (Findings III(c), R. 3896-3897; IV(c), R. 3900; and VII(a)(5), R. 3914-3915, in particular) fully cover this point: and since they apparrently are not classed by appellee as "ultimate" findings, they are not, even in its view, disturbed by the decision of the state supreme court.

(c) Los Angeles Division Casualty Statistics (Appellee's Brief, pp. 138-140).

At pages 138-140 appellee comments upon the casualty statistics for appellant's Los Angeles Division. Its first objection is that it can find no testimony of record as to the percentage of long and short trains operated there.

The trial court's finding respecting the percentage of long trains on certain main lines of that Division during four typical months of 1939 is predicated upon Exhibits 154 (R. 3028) and 185 (R. 3077). The latter shows (lines 34-38) that on certain lines forming a part of the Los Angeles Division the indicated numbers of long and short trains were operated. By a simple mathematical computation the percentage of long trains to the total can be derived. Appellee simply failed to examine the record before it drafted its argument.

The objection is made that the train count is incorrect, because a train is classified as "long" if at any time during its operation it had more than 70 cars. In making the count reproduced on Exhibit 185, appellant used the test which the law itself provides.

While it is true that on the Los Angeles Division the casualty rates to employees, to occupants of motor vehicles, and to non-trespassers generally show some small increase in the five-year period 1936-1940, as compared to the six-year period 1930-1935, the variations are not so substantial as to warrant any particular conclusion. The total number of casualties in any one year, in any one classification, is so small that the occurrence of two or three more casualties per year in the earlier six-year period, or of two or three less in the later five-year period, would have altered the picture completely. Exhibit 386 does show, however, that the greatest hazard to the public from train operation is at grade crossings: of the total of 252 casualties to non-trespassers in the 11 years, 236 were to occupants of motor vehicles. The number of these casualties increased substantially with the increase in the

number of train miles operated in the later five-year period, 1936-1940; thus showing again that an increase in the number of trains operated will be accompanied by a substantial increase in the number of grade crossing accidents, even though other factors remained unchanged.

(d) New Mexico Casualty Statistics (Appellee's Brief, pp. 140-142).

At pages 140-142 appellee presents its criticisms of the Arizona-New Mexico casualty comparisons. This argument is somewhat peculiar, because appellee itself first undertook to make a showing for appellant's New Mexico lines (its Exhibits 338, 340, 349, 362, 364 and 368; R. 3465, 3501, 3518, 3527). Appellant simply met this testimony by taking the casualty showing *appearing upon appellee's exhibits*, and presenting it together with a showing for Nevada and Arizona, so as to give a complete picture for all three states for similar classes of accidents and casualties (appellant's Exhibits 387-389, R. 3548-3565). Appellee is therefore in no position to argue a lack of similarity as between New Mexico and Arizona. However, there is an adequate showing to support these comparisons. Exhibits 165 (R. 3039), 186 (R. 3042), and 218 (R. 3206) cover the traffic and operating conditions, in addition to which there is oral testimony showing that the same traffic, both eastward and westward, which moves across Arizona, also moves across New Mexico.

So far as concerns appellee's attempted analysis of Exhibit 387 (R. 3549-3557), it is sufficient to point out again, as with the corresponding exhibit covering the Los Angeles Division (No. 386, R. 3533), that the number of accidents or casualties in any year is so small as not to warrant any

dogmatic conclusion, in the light of the comparatively slight variations in train length shown for the state. The addition of two or three casualties in any one of the groups or years would have modified the showing materially, and permitted a deduction completely contrary to that now attempted by appellee.

The striking feature of appellee's argument is, however, that it seeks to emphaize, as usual, only the slack-action accidents, and in this instance only those occurring on trains of 65 cars or more. This argument again confesses the complete unreasonableness of the law, even as a slack-action prevention measure. The law has set 70 and not 65 cars as the presumed safe limit, and this argument demonstrates that that limit has no true relation to safety from even this particular type of accident.

(c) Santa Fe and Chesapeake & Ohio Casualty Statistics (Appellee's Brief, pp. 142-143).

At pages 142-143, appellee discusses the Santa Fe and Chesapeake and Ohio casualty showings covered by separate sub-paragraphs in the trial court's findings (paragraphs (k) and (l) of Finding XII, R. 4004-4008). The relevant facts are carefully set forth in the findings, but largely overlooked in appellee's discussion. Contrary to appellee's assertion, Exhibit 126 (R. 2986), which summarizes operating conditions on the Santa Fe main lines, shows that operating conditions in the territory between Needles, California and Gallup, New Mexico (where the Arizona restriction is completely effective), are generally as favorable as between Gallup and Clovis, New Mexico. Between Needles and Belen the operation is entirely double

track; whereas the operation is all single track between Belen, New Mexico and Clovis. Appellee has asserted (its brief, p. 138) that the double-track operation in Nevada makes for a more favorable condition in that state; and to whatever extent this is true, it is also true of the Santa Fe operation in Arizona and New Mexico west of Belen.

The traffic carried is predominantly through or overhead traffic, and in fact largely the same traffic, carried across New Mexico either before or after it crosses Arizona (R. 1856-1857, 1876, 1882). The comparison is between the Arizona operation under the 70-car restriction, and an operation in part affected by that restriction, although not entirely controlled (between Gallup and Belen), and in part a standard long-train operation (between Belen and Clovis). The number and frequency of the casualties to all train service employees, and particularly trainmen (as a separate group from enginemen), are much less in the New Mexico districts than in Arizona, although because of the absence of the restriction the average train length is much greater.

There is no record foundation for appellee's assertion that any of these accidents were caused by the so-called "purely local conditions" to which it refers; nor is there, in particular, any possible or plausible foundation for its contention that the Arizona casualties from setting or releasing brakes, or picking up or setting out local traffic, are more numerous than in New Mexico. If, however, this is true, it is solely because the Arizona restriction compels more trains to be operated and more men to be employed, and thus increases the exposure.

The Santa Fe Arizona-New Mexico casualty comparisons are convincing evidence that the 70-car restriction bears no relation to safety whatever, but on the contrary increases the hazards substantially.

Appellee attacks the Chesapeake & Ohio comparisons because, *first*, the traffic of this railroad consists largely of coal; *second*, it has accomplished a considerable amount of grade and curve elimination which, according to appellee, has greatly improved safety conditions; and *third*, the showing relates to all classes of service, both freight and passenger. The first objection is wholly without merit. Coal is a heavy-loading commodity, the gross weight of a car with its contents amounting to about 75 tons; so that a train of 160 cars, the normal operation on most districts of the Chesapeake & Ohio main line, has a total gross weight of about 12,000 tons (R. 881-884, 915). If there were any merit to appellee's contention that longer and heavier trains are more difficult to control, with consequent greater hazards, casualty results on the C&O would be more unfavorable than elsewhere, particularly in Arizona, where a maximum train of 70 cars of the usual weight handled does not exceed 4500 tons; and the average is much less. Thus the difference pointed out by appellee, if it means anything, indicates more arduous conditions on the C&O, in spite of which that carrier has achieved a remarkable safety record.

The evidence, while indicating that the Chesapeake & Ohio has made extensive improvements, does not show that these have been any greater in character or degree than upon appellant's lines in Arizona. Finding VI(a) (R. 3902-3904) describes the details of these improve-

ments, and in these respects has not been challenged by appellee.

Appellee's final criticism is completely untenable. There is both a national and an Arizona-Nevada showing of casualties to all classes of employees on duty in train and train-service accidents; the national showing (Exhibit 262, R. 3300) includes both the car-mile frequency (the basis employed in the C&O showing: Exhibit 122, R. 2982), and as well the train-mile and locomotive-mile rates. The Arizona-Nevada comparison (Exhibit 276, R. 3371) shows rates and improvement trends in casualties to all classes of employees, based upon locomotive-mile rates; and while the basis is slightly different, there is no lack of a proper comparison since the purpose of these exhibits is primarily to show *trends* in accident *frequencies* rather than merely total *numbers* of accidents or casualties, year by year. The trend of the accident rates on the Chesapeake & Ohio, whether all employees or only train and engine-service employees be considered, shows a substantial decline over the period studied (1924-1938), approximately the same as the national trend, and considerably more than in either Nevada or Arizona. It cannot be doubted that this favorable result is due in large part, if not entirely, to the adoption and use of the long-train practice by the Chesapeake & Ohio, which is, as stated, one of the outstanding "long-train" railroads of the country.

6. ALLEGED PASSENGER TRAIN HAZARDS
(Appellee's Brief, pp. 144-147)

In this portion of its discussion appellee again presents arguments for which virtually no evidence is cited, and

which are in fact not supported by the record. There is a complete showing of passenger train casualties to employees in Nevada and Arizona for the period 1923-1939 (Exhibits 291, 292; R. 3409-3421). Appellee's own Exhibits 362 and 368 (R. 3501-3506, 3527) purport to be a complete showing of passenger train accidents in New Mexico for the period 1930-1940; and its Exhibits 363 (R. 3507-3517) and 370 (R. 3529) purport to show similar casualties on the Los Angeles Division during the same period. There is no showing of any slack-action casualty in Nevada, Arizona, or New Mexico, occurring on a passenger train of more than 14 cars, or in fact any casualty of any kind involving a long train, as to which it could be reasonably argued that train length had anything to do with the accident. On the Los Angeles Division four casualties are shown, occurring on trains of 16 and 17 cars, in which the injured persons were claimed to have been thrown off balance by emergency stops; but these four are matched by many others, occurring upon trains of as few as nine cars, where exactly the same causes are assigned. None of these casualties involved any serious or lengthy disabilities.

Appellee refers to the greater weight of passenger cars, and the greater number of persons exposed to hazards of slack action on passenger trains. If the greater weight or the greater exposure resulted in any real and substantial hazard, it should be capable of expression in a casualty rate based upon passenger miles or train miles. Actually the hazard from this cause (slack action) is so slight that no such casualty rate was attempted to be computed by either appellee or appellant. The fact is that there is no

substantial hazard; nor is there any such hazard peculiar to long trains, which does not also exist upon trains much shorter than the Arizona maximum.

There is particularly no support for appellee's contention that passengers are subjected to hazards of slack action while walking through moving trains en route to diners or at stations where platforms are too short to accommodate a long train. Appellee fails to refer to any accident of this character occurring upon a passenger train where the train length had any influence, or contributed in any way.

There is likewise no record support for the contention that passengers on long trains must be detrained at places where the footing is unsafe, or that that condition would not equally exist with short trains. It is obvious that in southern Arizona snowfall, or snow on the ground, such as appellee mentions, are very unlikely ever to interfere with passengers detraining from or boarding appellant's passenger trains, whether or not long trains are operated. The suggestion that passengers walking through moving trains may be knocked down, because of slack action, more frequently on long than on short trains, is wholly imaginary.

The argument on page 146 of appellee's brief, relating to the results of increased weight of the train by reason of the addition of cars, is equally without support in the evidence. There is no showing that a train of more than 14 passenger cars cannot be stopped in emergency just as readily as a shorter train. The addition of cars to the train may add to its gross tonnage, but the braking power is also proportionately increased (R. 2475).

It is idle to argue that an increase in passenger-train length increases the probability of highway grade crossing accidents. The increase in number of passenger trains run by reason of the limitation actually multiplies the grade crossing hazard and the resulting casualties. In a grade crossing collision involving a passenger train the number of cars behind the locomotive obviously cuts no figure; the damage is done when the engine collides with the automobile, and the weight of the additional cars adds little to the destructive striking force of the engine itself.

The ultimate test of increased hazard in long passenger train operation is to be found in actual experience. The Arizona-Nevada comparisons (Exhibit 293, R. 3413) show clearly that appellee's argument has no basis. Even taking into account the many casualties involved in the malicious derailment of the Streamliner at Harney, Nevada, in August, 1939, the casualty rates in Arizona are nearly twice the Nevada rates, the same relationship prevailing whether the frequencies are computed on the basis of passengers carried, passenger miles made, or passenger train-miles operated.

The argument that employees have less time to look after the safety of passengers on long than on short trains, and that safety is therefore impaired, is likewise answered by the statistics showing actual results. Long passenger train operation is the customary and usual practice all over the United States except in Arizona; and insofar as concerns the ability of employees to attend to passengers and to their other duties, the conditions are no different than in Arizona. If safety were impaired

for this reason in long passenger train operation, the results would quickly appear in the casualty statistics.

Furthermore, the addition of cars to passenger trains does not always result in more passengers, as appellee asserts. In many cases express or baggage cars are added which, though increasing the train length, do not increase the number of passengers. Other types such as dining cars, lounge cars, club cars, and railroad business cars, when added to passenger trains likewise do not add to the number of passengers carried. When sleeping cars are added, additional employees are also added (Pullman conductors and porters), whose duty it is to look after the care and comfort of the passengers.

Appellee's argument is thus unsound in both fact and theory.

7. "SUMMARY OF SAFETY ARGUMENT"
(Appellee's Brief, pp. 147-148)

Under the above heading appellee presents a summary of its safety argument which repeats in a few short paragraphs some of the points argued in its previous discussion.

A conspicuous feature of appellee's safety argument is its omission of all reference to the safety results of appellant's long-train operations in Arizona during March and April, 1940. At the risk of repetition, inasmuch as this experience was discussed in our opening brief (e.g., at pp. 205 and 240 of Vol. I; p. 189 of Vol. II) and was made the subject of a special finding by the trial court (Finding XII(t), R. 4018-4019), we point out again that appellee can apparently find no means of criticizing the

facts or challenging the conclusion. During this period 62 long passenger trains were operated, producing 15,587 train-miles and 243,749 car-miles. There were no accidents or casualties on any of these 62 trains. The only accidents or casualties in appellant's passenger train operations in Arizona during March and April, 1940, were on trains operated in full conformity with the law.

There were likewise operated 302 long freight trains, producing 37,257 train-miles and 3,180,278 car-miles; but during the period of their operation (April 3-30, 1940), while there were *six* accidents upon or in connection with the operation of short trains, there was only *one* upon a long train—and that accident took place when a brakeman fell, upon alighting from a caboose which at the time was detached from the standing train, and being handled alone by the engine.

Appellant has not claimed and does not claim that this experience conclusively shows that long-train operation in Arizona would or will be free of accidents or casualties; but clearly it does show that long-train operation is practicable, and certainly no more dangerous than the restricted operation, and thus confirms the conclusion stated by the Commission in its opinion relative to Service Order 85 (*Ex parte 156*, 256 I.C.C., at p. 536):

> "The fact that freight trains in excess of 70 cars or passenger trains in excess of 14 cars are operated in other states is convincing evidence of its safety, except where unusual operating conditions exist."

A fair analysis of the testimony of record, as presented by the safety findings of the trial court (Findings

Nos. XI, XII, and XIII, R. 3969-4032) leads definitely to the conclusion that the law "bears no reasonable relation to safety, but to the contrary . . . impairs and lessens substantially the safety of appellant's train operations in Arizona and the adjacent affected territory" (Finding No. XII(v), R. 4022); and that the "legislative choice" here under review is entirely without any possible rational basis.

CONCLUSION

Appellee, in its brief, adopts the extreme position that a state statute regulating interstate commerce, if claimed to have been enacted under the police power for the purpose of safety, cannot be held invalid, no matter what its actual effect upon commerce, unless it is possible upon the whole record for the court to say that it has no rational basis as a police power ("safety") measure.

We submit that appellee's position is untenable. Under controlling decisions of this Court, a state statute defended as an exercise of the police power will be held invalid if it falls within any of the following classifications:

(1) If it regulates a subject-matter plainly of national concern, where a uniform system of regulation is essential if any be required;

(2) If, in the guise of promoting a claimed local interest or meeting a claimed local demand, it substantially and materially burdens, obstructs, and interferes with the free flow of interstate commerce;

(3) If it directly infringes upon or conflicts with federal legislation having the same or similar purposes; or

(4) If it bears no reasonable relation to a legitimate police power purpose.

The issue under any one of these tests is not dependent upon the determination under any other, as appellee appears to contend. Each in itself presents a separate and sufficient ground of invalidity.

The Arizona Train Limit Law, however, is invalid upon each and all of these grounds. It invades the *exclusive national field* by regulating a subject-matter (the lengths of interstate trains) of the highest national concern, where a uniform system is plainly essential. It imposes *material and substantial obstructions, burdens, and interferences* upon the free flow of commerce and thus impairs the national interest, and all without any plausible or reasonable excuse from the safety standpoint. It *infringes upon*, conflicts with, and unlawfully attempts to supplement *the federal safety statutes* which have the same purposes claimed for the state law and act upon the same ultimate subject-matter. *It bears no reasonable or any relation to safety* because it compels a method of operation under which the hazards, and the resulting accidents and casualties, are greatly increased rather than reduced.

All of the controlling facts of the case are before this Court in the trial court's findings; and the legal principles to be applied are clear. The judgment of the state supreme court should be reversed, with instructions to enter judg-

ment holding the law invalid under the Constitution of the United States.

Respectfully submitted,

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IN THE

Supreme Court of the United States

OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY, a corporation,

Appellant,

vs.

STATE OF ARIZONA, ex rel JOE CONWAY, Attorney General of the State of Arizona,

Appellee.

BRIEF FOR APPELLEE.

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IN THE

Supreme Court of the United States

OCTOBER TERM, 1944.

No. 56

SOUTHERN PACIFIC COMPANY, a corporation,

Appellant,

vs.

STATE OF ARIZONA, ex rel. JOE CONWAY, Attorney General of the State of Arizona,

Appellee.

BRIEF FOR APPELLEE.

I.

OPINIONS BELOW.

The opinion of the Supreme Court of Arizona [R. 4055-4068] is reported in 145 Pac. (2d) 540; the separate dissenting opinion of Honorable Henry D. Ross, a judge of that court [R. 4068-4071], is reported in 145 Pac. (2d) 536. The official (Arizona State) report is not yet in print.

The Memorandum Opinion of the trial court (the Superior Court of Arizona, in and for the County of Pima) is reproduced in the printed record [R. 4042-4054], but is not officially reported.

II.

JURISDICTION.

Issues under the Constitution and laws of the United States (viz., the Commerce Clause, and the Due-Process Clause of the 14th Amendment; and the Safety Appliance and Interstate Commerce Acts) were duly presented to the Superior Court of Arizona, in a suit brought in that court by the State of Arizona (the present appellee), for the recovery of penalties for alleged violations of the Arizona Train Limit Law, the statute hereinafter quoted in full. That court ruled in favor of appellant upon such issues, holding that the Train Limit Law is invalid because in violation of said constitutional provisions and statutes, and rendered its judgment for appellant accordingly, February 11, 1942 [R. 4039-4041].

Upon appeal by the State to the Supreme Court of Arizona (the highest court of that state), the judgment of the Superior Court was reversed, the State Supreme Court (one judge dissenting) holding, on December 23, 1943, that the challenged statute is valid under the Federal Constitution and laws. Final judgment upon the mandate [R. 4072-4073] of the State Supreme Court was thereupon entered February 5, 1944 [R. 4073-4074]. The present appeal from said judgment was duly presented and allowed March 7, 1944 [R. 4081-4082]. Jurisdiction of this Court is invoked under Section 237(a) of the Judicial Code (28 U. S. C. 344(a)).

The order of this Court noting probable jurisdiction herein was entered May 1, 1944 [R. 4088].

III.

STATEMENT OF THE CASE.

1. The State Statute.

The Arizona Train Limit Law* was enacted by the Arizona Legislature in 1912, and approved by a vote of the electors of the State at a referendum election on November 5, 1912.

The Train Limit Law reads as follows:

"An Act limiting the numbers of cars in a train.

"Section 1. It shall be unlawful for any person, firm, association, company or corporation, operating any railroad in the State of Arizona, to run, or permit to be run, over his, their, or its line of road, or any portion thereof, any train consisting of more than seventy freight, or other cars, exclusive of caboose.

"Section 2. It shall be unlawful for any person, firm, association, company or corporation, operating any railroad in the State of Arizona, to run, or permit to be run, over his, their or its line of road, or any portion thereof, any passenger train consisting of more than fourteen cars.

"Section 3. Any person, firm, association, company, or corporation, operating any railroad in the State of Arizona, who shall willfully violate any of the provisions of this act, shall be liable to the State of Arizona for a penalty of not less than one hundred dollars, nor more than one thousand dollars, for each offense; and such penalty shall be recovered, and

*Hereafter referred to throughout this brief for convenience, as the "Train Limit Law".

suits therefor brought by the attorney general, or under his direction, in the name of the State of Arizona, in any county through which such railroad may be run or operated, provided, however, that this act shall not apply in cases of engine failures between terminals.

"Section 4. All acts and parts of acts in conflict with the provisions of this act are hereby repealed."

2. The Present Suit.

The present suit was begun by a complaint filed by the Attorney General of the State of Arizona [R. 1-4] in the Superior Court of Arizona, in and for the County of Pima, in which complaint the State was named as plaintiff and the Appellant as defendant. The complaint alleged that in Pima County, Arizona, on March 2, 1940, Appellant operated a long* passenger train, and a long freight train on April 4, 1940, in violation of the Train Limit Law, and prayed judgment for the statutory penalties.

On May 9, 1940, Appellant filed its answer [R. 5-32], in which, after admitting the operation of the two trains named in the complaint, it alleged that each of said trains consisted in large part of cars moving in interstate commerce and carrying interstate traffic, and denied that either of said operations was willful violation of the law.

For a further separate and affirmative defense to the complaint, Appellant alleged that the law was and is void, invalid and unconstitutional, because in violation of the

*Throughout this brief trains of more than 70 cars exclusive of caboose, and passenger trains of more than 14 cars (the limits fixed by the Train Limit Law) are called "long" trains; trains conforming to these limits are called short trains.

Commerce Clause (Article I, Section 8, par. 3) of the Constitution of the United States, the Due-Process Clause of Section 1 of the 14th Amendment to the Constitution of the United States, and the corresponding Due-Process Clause set forth in Article II, Section 4, of the Constitution of Arizona, in that: (a) the law undertakes to regulate a subject-matter of national concern which, if required to be regulated at all, is subject to regulation only by Congress pursuant to the powers granted by the Commerce Clause; (b) the necessary effect of the law is to regulate Appellant's train operations extra-territorially, that is to say, beyond the boundaries of Arizona; (c) the law directly and substantially interferes with, delays, and regulates Appellant's interstate train operations in Arizona and the adjacent states; (d) the law imposes direct and substantial burdens upon the Appellant's interstate train operations; (e) the law, to the extent that it has, or is intended or claimed to have, the effect of limiting the number of cars in a train to that number which can be safely and effectively controlled or stopped by the use of air brakes and other appurtenances now in use on such trains, is in conflict with and an infringement upon existing Federal legislation having the same or similar purposes, enacted by Congress pursuant to its powers under the Commerce Clause; (f) the law deprives Appellant of its property unreasonably and arbitrarily in violation of the due-process clauses of the State and Federal Constitutions above referred to, for the reason, among others, that it bears no reasonable relation to health or safety, and does not eliminate or reduce any present hazard, but on the contrary creates certain hazards which would not otherwise exist, and increases other hazards of railroad operation in numerous respects.

At the time the complaint was filed, an order was entered by the Superior Court staying all other prosecutions under the law, pending final determination of the present suit [R. 5].

The trial of the cause commenced on November 19, 1940, and, with numerous recesses, continued to and including May 1, 1941. Evidence consisting of oral testimony and of exhibits was presented by both the Appellant and the Appellee.

Many of the ultimate facts in the case are in dispute. The evidence offered by Appellant largely consisted of statistical exhibits and explanatory testimony. Although the data underlying these exhibits were mostly reports made by the carriers to the I. C. C. and the exhibits generally are not challenged as being incorrect reproductions or summaries of such government reports (except where they incompletely or inaccurately summarize or catalogue certain accident reports), certain of the inferences and ultimate facts drawn therefrom by the Appellant are challenged here. Oral testimony in addition to that aforementioned was offered by Appellant and also Appellee. This testimony for the most part dealt with certain phases of railroad operation, including such subjects as operation of brakes, slack and slack action, accidents and the duties and experiences of employees. There is disagreement between the parties as to what ultimate facts are proved by much of the evidence.

In the ensuing statement we summarize certain of the ultimate facts, upon which our contentions are based and which we think will be found upon review of the record by this Court.

Local Conditions

Appellant's lines in Arizona are subject to local conditions affecting the operation of its trains which are different from the conditions obtaining in many other states. While there are stretches of tangent (straight) track, there are many sectors where curves are frequent and severe. [Exhibits 309, 310; R. 2209, 2210]. The railroad also crosses a number of elevations, some being parts of mountain ranges. There are five "helper districts" on Appellant's lines in Arizona, i. e., localities where the grades are so steep that the locomotive or locomotives pulling a train must be "helped" by use of an additional locomotive in such district. [Ex. 175, R. 1284]. The operation is mainly single-track operation, although there are sections of double track eastward from Yuma, and from Tucson. Duplication of east-west lines over much of the territory make possible the use of "alternate" routes whereby, for example, the preponderance of west bound traffic may be routed over the so called E. P. & S. W. route from El Paso via Douglas to Mescal and Picacho via Phoenix to Yuma, and east bound traffic may be routed from Yuma via Gila Bend, and Lordsburg to El Paso. In comparison, curves and grades in Nevada are not nearly as severe, and the operation is essentially double tracked. [Ex's. 306, 307, 308, 175; R. 2187, 1284]. Arizona is subject to sand storms and strong wind conditions not present at least to the same degree, in Nevada. It will be judicially noticed that the population of Arizona is not as great, and the number of highways are not so numerous or as densely traveled, as in many other states, although the population, and density of highways and traffic thereon is not as great in Nevada as in Arizona.

These local conditions are not encountered at all in many places in the United States, as in the flat western country or water level routes, and in territory where the traffic is essentially transfer and terminal business. The location and characteristics of highways of commerce are bound to differ in different states or areas, and each such state or area produces varying kinds and degrees of hazard. It has long been recognized that the control and regulation of such highways, including railroad operations and rights of way, are matters of local concern which the states may regulate in the absence of congressional occupation. *Atlantic C. L. R. Co. v. Georgia*, 234 U. S. 280.

The Effect of the State Law on Interstate Commerce.

The evidence presented followed two principal channels, the first going to the question of the burden imposed on interstate commerce by the Train Limit Law, and the second going to the question of the protection of the safety of the public and the employees resulting from the Train Limit Law.

In relation to the first question the Appellant introduced oral testimony and exhibits showing for the period 1922 to 1939 (1) the improvements in equipment, appliances, tracks and the operating plants as a whole of all Class I railroads, the Pacific Lines of the Southern Pacific, the Southern Pacific Lines in Nevada and the Southern Pacific Lines in Arizona; [Ex's. 2 to 7 incl.; R. 2852 to 2857 incl.; Ex's. 157-8-9; R. 3031-3] (2) the operating and transportation expenses of these roads by years over the period 1922 to 1939; [Ex's. 20, 151, 160, 161; R. 2868, 3027, 3034, 3035] and (3) by comparing the average of these expenses for the four year period 1936-1939 with the average for the four year period 1922-1925, the percentage of improvement 1936-1939 over 1922-1925. In

the Arizona exhibits for the years 1922, 1923 and the first 10 months of 1924 of the first four year period, only the operations on the Southern Pacific before consolidated with the E. P. & S. W. and the Arizona Eastern were included [Ex. 149, R. 3025]. By the consolidation approximately 200 miles of main line trackage and approximately 500 miles of branch line trackage were added to Appellant's lines in Arizona [Ex. 305, R. 3430], the added territory presenting more difficult operating conditions and increasing expenses on the lines in the state as a whole. Comparing 1936-1939 with the first four years following consolidation the percentage of improvement in Arizona compares favorably with that on other railroads.

Evidence was also introduced showing the operating averages on Class I railroads, the Pacific Lines of the Southern Pacific, the Salt Lake Division and the Tucson Division. [Ex's. 22, 162, 163, 164; R. 2870, 3036-3038]. Here again, when the periods used for comparison are *since* the territory in Arizona was constituted as it is now constituted, the improvement in efficiency in Arizona compares favorably with the other railroads.

Appellant also presented a redispatch or assumed operation of the trains actually operated in certain periods in 1938 and 1940, to represent how trains would have been operated had the Train Limit Law not been in effect [Ex. 198; R. 3115]. From this redispatch or assumed operation and a comparison of fuel used on the Salt Lake and the Tucson Division the Appellant then presented evidence to show the savings by long train operations in expense, in the number of trains operated, and in interference with and delays to interstate commerce [Ex's. 226, 249, 250; R. 3215, 3258-3262]. The exhibits, in truth, show these savings were all, or substantially all, due to the use of

equipment, such as 4100 class engines, in the redispatch or assumed operation, not used in the actual, and by the failure to take into consideration the change during the period in the territory included in the Tucson Division, and the joint-track operation agreement on the Salt Lake Division.

The Facts Respecting Safety.

This evidence fails to show the presence of any substantial burdens upon, or interference with, interstate commerce resulting from the enforcement of the Arizona law. Other facts and aspects of this question will be stated in the course of our argument.

The evidence going to the second question—the protection of the safety of the public and employees resulting from the Train Limit Law shows:

The Train Limit Law protects the public and employees from the hazards of slack action on long trains. The air-brake instruction books of the Appellant and of the Santa Fe recognize the dangers from slack action in train operations and that these dangers increase as the number of cars in a train increase [Ex's. 152, 319, 327, 328; R. 1099, 2289, 3445, 3454]. This is also shown on the exhibits showing casualties on Class I railroads, on Appellant's lines in Nevada, and on Appellant's lines in Arizona. During the 12 year period 1929-1940, 39.6% of the accidents and 45.7% of the casualties, train and train service accidents, in Nevada, were in slack action accidents, and 51.6% of the accidents and 57.5% of the casualties on trains *in motion* were from slack action. In Arizona during the same period 40% of the accidents and 44% of the casualties on trains in motion were from slack action. All but one of the accidents in Nevada were on long trains.

the one short train having 69 cars. In the two states, 46.6% of these accidents were on long trains and 87% on trains of over 65 cars. [Ex's. 274, 275; R. 3351, 3364].

The severity of the injuries resulting from slack action also increases with the number of cars in a train. In slack action accidents in Nevada during the above 12 years, on long trains two men were permanently injured and 58 were disabled for an aggregate of 2830 days, an average disability of 48.8 days, while on short trains one man was disabled for 20 days. For Arizona and Nevada combined, on long trains 3 men were permanently disabled and 59 were disabled with an average disability of 49.3 days, while on short trains one man was permanently disabled (on a 68 car train) and 60 men were disabled for 1393 days with an average disability of 23.2 days. [Ex's. 274, 275; R. 3351, 3364].

A danger to the public was shown due to slack action in long trains buckling and throwing cars out of the train and onto parallel tracks in front of passenger trains. In the 12 year period 1928-1939 three such accidents resulting in 4 deaths and 42 injured were investigated by the Interstate Commerce Commission. [Ex. 270; R. 3310].

Long trains were shown to create a hazard by reason of the inability to pass signals, or to observe defects in the train while in motion, the increased difficulty in inspecting the train while standing, and the fear and strain on the trainmen which reduces their efficiency.

The Trial Court's Findings and Judgment

After the taking of evidence was closed in the trial court and the case was submitted, the Appellant and the Appellee each filed briefs and presented to the trial court suggested Findings of Fact, Conclusions of Law and a form of Judg-

ment. The Findings of Fact and Conclusions of Law presented by Appellant were accepted and adopted by the trial Court without a single change therein so far as we are aware. The Findings of Fact cover *147 pages* of the printed record herein [R. 3887-4034, inclusive]. At least 90% of the trial court's findings relate to evidentiary, not ultimate, facts. Such ultimate facts as are found are distributed throughout these 147 pages, except for those contained in Findings Nos. XVI to XIX [R. 4032-34] referred to by Appellant as "possibly" being findings to the effect that the State law is invalid (Appellant's brief, Vol. I, p. 321). As Appellant states in its brief (Vol. I, p. 11), the Appellee presented assignments of error to the State Supreme Court asserting that the trial court had erred in making specified findings of fact, including the greater part of those adopted by the trial court. In reversing the trial court, the Supreme Court in its opinion stated [R. 4067-8]:

> "The opinion, condensed as it is in the foregoing pages, expresses our reason for holding that the findings and judgment of the trial court to the effect that the Train Limit Law is unconstitutional were in error."

It is Appellee's position that this holding constituted a reversal and setting aside of the ultimate facts contained in the findings of the trial court upon which its decision in favor of constitutionality was based. In view of the improper content of the great mass of the findings, we believe the Supreme Court's disposition of this matter was proper and sufficient.

However, even if the trial court's findings of fact were not set aside by the Supreme Court's decision, it is clear

that this Court is not bound by them, and will examine the whole record upon the pertinent issues. *South Carolina Hy. Dept. v. Barnwell Bros.*, 303 U. S. 177; *Clark v. Gray*, 306 U. S. 583.

On February 11, 1942, the trial court, adopting the findings, conclusions of law and form of judgment proposed by Appellant, filed its findings of fact, conclusions of law, and judgment [R. 3887-4045]. The judgment adjudged the Train Limit Law invalid on all grounds stated in Appellant's answer.

The Appeal to the State Supreme Court

On April 9, 1942, the Appellant filed notice of appeal [R. 4054] to the Supreme Court of Arizona from the judgment of the Superior Court dated February 11, 1942.

The appeal was submitted to the State Supreme Court on briefs and oral argument. The decision of the Supreme Court of Arizona, concurred in by two judges (the third Judge dissenting) was announced on December 23, 1943, and reversed the judgment of the Superior Court [R. 4055-4068]. A motion for rehearing duly filed by Appellant on January 7, 1944, was denied by the court on January 13, 1944; on the same date the dissenting opinion [R. 4068-4071] was filed. The court thereupon issued its mandate [R. 4072-4073] dated January 14, 1944, ordering the judgment to be reversed. In obedience to said mandate, the trial court, on February 5, 1944, entered judgment [R. 4073-4074] declaring the law constitutional, and assessing against Appellant a penalty of $250.00 for each of the two violations alleged in the complaint.

The appeal to this Court is from the above opinion and decision of the Supreme Court of Arizona.

IV.

SUMMARY OF ARGUMENT.

1. The Train Limit Law Does Not Invade an Exclusive National Field of Legislation.

In determining the constitutionality of the Train Limit Law it is necessary for this Court "to ascertain upon the whole record whether it is possible to say" that the law "is without rational basis" in safety, *South Carolina Hy. Dept. v. Barnwell Bros.*, 303 U. S. 177; *Clark v. Paul Gray*, 306 U. S. 583; *New York, N. H. & H. R. Co. v. New York*, 165 U. S. 628; *Smith v. Alabama*, 124 U. S. 465; *Atlantic Coast Line v. Georgia*, 234 U. S. 280; *Minnesota Rate Cases*, 230 U. S. 352. A state statute enacted in the exercise of the state's police power is in the permissible or concurrent field, and not in the exclusive national field, of legislation under the Commerce Clause. *South Carolina Hy. Dept. v. Barnwell Bros.*, 303 U. S. 177; *Clark v. Paul Gray*, 306 U. S. 583; *Minnesota Rate Cases*, 230 U. S. 352; *Gibbons v. Ogden*, 9 Wheat 1; *Missouri K. T. & R. v. Haber*, 169 U. S. 613; *New York, N. H. & H. R. Co. v. New York*, 165 U. S. 628; *Smith v. Alabama*, 124 U. S. 465; *Nashville etc. R. Co. v. Alabama*, 128 U. S. 96; *Atlantic C. L. R. Co. v. Georgia*, 234 U. S. 280; *Terminal R. Assn. v. Brotherhood of R. Trainmen*, 318 U. S. 1.

The determination as to whether the burden imposed on interstate commerce by a state statute enacted in the exercise of the state's police power is too great in relation to

the national interest in interstate commerce is a legislative, and not a judicial, function. *South Carolina Hy. Dept. v. Barnwell Bros.*, 303 U. S. 177; *Clark v. Paul Gray*, 306 U. S. 583; *Minnesota Rate Cases*, 230 U. S. 352; *Gibbons v. Ogden*, 9 Wheat 1; *Missouri K. T. & R. v. Haber*, 169 U. S. 613; *New York, N. H. & H. R. Co. v. New York*, 165 U. S. 628; *Smith v. Alabama*, 124 U. S. 465; *Nashville etc. R. Co. v. Alabama*, 128 U. S. 96; *Atlantic C. L. R. Co. v. Georgia*, 234 U. S. 280; *Terminal R. Assn. v. Brotherhood of R. Trainmen*, 318 U. S. 1.

Protection of the public and of employees against those hazards which are related to the length of a train is a matter of local concern. *Bradley v. Ohio*, 289 U. S. 92; *Nashville etc. R. Co. v. Alabama*, 128 U. S. 96; *Smith v. Alabama*, 124 U. S. 465; *Atlantic C. L. R. Co. v. Georgia*, 234 U. S. 280.

No sufficient reason appears why the regulation of train lengths should be limited to national regulation.

2. Extra-territorial Effect and Burden on Interstate Commerce are one and the same thing.

The extra-territorial effect on interstate commerce is but one phase of the burden on interstate commerce which may result from state police power regulations. Where a state police measure affects interstate commerce, such effect must in every case, to some extent at least, be extra-territorial. The determination as to whether the burden imposed on interstate commerce by such a state statute is too great is, nevertheless, a legislative, and not a judicial,

function. *Terminal R. Ass'n. v. Brotherhood of R. Trainmen*, 318 U. S. 1; *New York, N. H. & H. R. Co. v. New York*, 165 U. S. 628; *Atlantic Coast Line v. Georgia*, 234 U. S. 280; *Chicago, R. I. & P. R. Co. v. Arkansas*, 219 U. S. 453; *Missouri P. R. Co. v. Norwood*, 283 U. S. 249; *South Carolina Hy. Dept. v. Barnwell Bros.*, 303 U. S. 177; *Mauer v. Hamilton*, 309 U. S. 598; *Sproles v. Binford*, 286 U. S. 284.

The extra-territorial effect of the Arizona Law does not render the law unconstitutional.

3. The Train Limit Law Does Not Invade a Field Already Occupied by Congress by Sections 1 and 9 of the Safety Appliance Act or by Section 25, Part I of the Interstate Commerce Act.

The fields occupied by the Federal Statutes (sections 1 and 9 of the Safety Appliance Act and section 25, Part I of the Interstate Commerce Act are different from that occupied by the Train Limit Law.

Sections 1 and 9 of the Safety Appliance Act and section 25, Part I of the Interstate Commerce Act deal only with the mechanical appliances to be used in railroad operations, and in no way enter the field of regulating the length of trains. *Johnson v. Southern Pacific Company*, 196 U. S. 1; *United States v. California*, 297 U. S. 175; *Napier v. Atlantic Coast Lines*, 272 U. S. 605; *Missouri Pac. R. Co. v. Norwood*, 283 U. S. 249; *Power Brake Investigation Case*, 91 I. C. C. 481.

The Train Limit Law deals only with the number of cars which may be operated in a train and in no way enters the field of regulating the mechanical appliances which may be used in railroad operations. No intention can be attributed to Congress in enacting the Federal statutes to occupy the field of regulating train lengths. *Savage v. Jones*, 225 U. S. 501; *Kelly v. Washington*, 302 U. S. 1; *Atlantic Coast Line R. Co. v. Georgia*, 234 U. S. 280; *Peoria Ry. Co. v. United States*, 263 U. S. 528; *International R. Co. v. Railroad Comm. of Texas*, 281 S. W. 1084 (aff. 275 U. S. 503); *Terminal R. Assn. v. Brotherhood of R. Trainmen*, 318 U. S. 1.

There is no conflict between the Federal statutes and the Arizona Law. *Parker v. Brown*, 317 U. S. 341, 359; *Cloverleaf Butter Co. v. Patterson*, 315 U. S. 148; *Missouri etc. Co. v. Haber*, 169 U. S. 613; *Kelly v. Washington*, 302 U. S. 1; *New York C. R. Co. v. United States*, 265 U. S. 41; *United States v. Grand Rapids & I. Ry. v. United States*, 244 Fed. 609.

4. The Determination of the Validity of the Train Limit Law Rests Solely Upon the Determination of Whether Upon the Whole Record it is Possible to Say That the Law is Without Rational Basis in Safety. The Train Limit Law Has a Rational Basis in Safety.

The extent of the burden, if any, imposed on interstate commerce may not be considered by the Court in determining the reasonableness of a state law enacted in the exercise of the police power. Under the Commerce Clause the determination as to whether the burden imposed upon interstate commerce by a state police statute is too great is always a legislative function (see cases cited under I. above). Under the Fourteenth Amendment it becomes a matter of judicial determination only when a method of regulation is shown which will accomplish the identical object or purpose of the law in question at less cost. *Erie R. R. Co. v. Board of Comm.*, 254 U. S. 294; *Lehigh Valley R. Co. v. Board of Comm.*, 278 U. S. 24; *South Carolina Hy. Dept. v. Barnwell Bros., supra*; *Nashville, C. & St. L. R. Co. v. White*, 276 U. S. 456; *Missouri P. R. Co. v. Omaha*, 235 U. S. 131; *Chicago & A. R. Co. v. Tranbarger*, 238 U. S. 67.

Under both the Commerce Clause and the Fourteenth Amendment the judicial function stops with inquiry whether the state has acted within its province, and whether the means of regulation chosen are reasonably adapted to the ends sought. *South Carolina Hy. Dept. v. Barnwell Bros., supra.* Here the first inquiry has been resolved in favor of the state regulation by decisions of this Court. *Smith v. Alabama*, 124 U. S. 465; *Nashville C. & St. L. R. Co. v. Alabama*, 128 U. S. 96; *New York, N. H. & H. R. Co. v. New York*, 165 U. S. 628; *Atlantic*

C. L. R. Co. v. Georgia, 234 U. S. 280; *Chicago, R. I & P. R. Co. v. Arkansas*, 219 U. S. 453; *Terminal R. Assn. v. Brotherhood of R. Trainmen*, 318 U. S. 1. In resolving the second inquiry the Court looks to the record, not to see whether the findings below are supported by the evidence, but to ascertain from the whole record whether it is possible to say that the legislative choice is without rational basis. *South Carolina Hy. Dept. v. Barnwell Bros., supra*; *Clark v. Paul Gray*, 306 U. S. 583; *Erie R. R. Co. v. Williams*, 233 U. S. 685; *Stephenson v. Binford*, 287 U. S. 251; *Nashville etc. Co. v. White*, 278 U. S. 456. The Train Limit Law has a rational basis in the protection of the public and employees from accidents and injuries due to the increase in the number of cars in a train, and is valid.

5. The Decision of the State Supreme Court, in Reversing the Trial Court, Did Not Deny to Appellant Any Federal Right to Which, on the Evidence, Appellant Is Entitled.

Findings of fact should find only ultimate facts. *Wilson v. Merchants' L. & T. Co.*, 113 U. S. 121. The decision and opinion of the State Supreme Court reversing the trial court is a reversal of the trial court's finding upon the ultimate fact (it is impossible to say that the law has no rational basis in safety). The ultimate fact to be determined is so interwoven with the question of law as to be in substance a decision of the latter.

The state rules and decisions upon the effects to be given to findings have no application in a case arising under the Constitution of the United States. *Truax v. Corrigan*, 257 U. S. 312, 324; *Norfolk & W. R. Co. v. Conley*, 236 U. S. 605, 609.

ARGUMENT.

1. The Train Limit Law Does Not Invade an Exclusive National Field of Legislation [Reply to Assignment of Error No. 1].

The Appellant's position upon this proposition is stated in its brief (Vol. I, pp. 82-83) as follows:

> "We emphasize that, in considering this point, it is unnecessary for this Court to take into account whether the challenged law is really, or merely ostensibly, a safety statute; or whether it is unreasonable, arbitrary or otherwise in violation of the Due-Process Clause of the XIV Amendment. It is likewise unnecessary to consider whether the law imposes financial burdens upon, or interferes physically with, interstate commerce. The mere fact of entry into a forbidden field, reserved to the federal power, where national regulation is indispensable if any is to be attempted, is sufficient to invalidate the action of the State, irrespective of the actual effects upon interstate commerce."

This contention assumes that the state law—here the Train Limit Law—has a real relation to the safety and the protection of the life and limbs of those people who are within the borders of the state and is in a field not occupied by Congress. It further assumes that the right of a state to exercise the police power reserved to it under the Constitution where it affects interstate commerce, but in a field not occupied by the Federal government, is made to depend upon a *judicial* determination as to whether or not the subject of the state legislation is of such a nature that, if regulated at all, it should be by national and not by state legislation—a matter of policy and for Congress, the legislative branch of government. And in making this

judicial determination the Court, under Appellant's contention, is prohibited from any consideration as to whether or not the state statute has for its purpose the safety and protection of the lives of its people. The validity of state legislation, *admittedly* having for its purpose the protection of the life, health and safety of its inhabitants, and otherwise valid as an exercise of the police power reserved to the states, is, by Appellant's contention, made subject to the opinion of the Court as to whether such protection should be by Federal or state legislation.

This is not the law, and is, we believe, contrary to a long line of decisions of this Court.

We recognize that a state may not, under the guise of the police power or otherwise, *directly* regulate interstate commerce. But this does not prohibit the enactment of legislation by a state under its police power although such legislation indirectly affects interstate commerce. A statute having a real relation to the safety and protection of the people of the state, and otherwise valid under the police power of the state, is not invalid because it indirectly burdens interstate commerce, the Federal government not having occupied the field. In this we are supported by a long line of decisions of this Court.

In the state court, as here, the Appellant quoted at length from, and placed great reliance on, the decision of this Court in the *Minnesota Rate Cases*, 230 U. S. 352. We will consider this case first.

In its quotation from the decision in the *Minnesota Rate Cases* in its brief herein (Vol. I, p. 98) the Appellant placed particular emphasis upon the following statement therein:

> "The grant in the Constitution of its own force, that is, without action by Congress, established the

essential immunity of interstate commercial intercourse from the *direct* control of the states with respect to those subjects embraced within the grant which are of such a nature as to demand that, if regulated at all, their regulation should be prescribed by a single authority. It has repeatedly been declared by this court that as to those subjects which require a general system or uniformity of regulation, the power of Congress is exclusive. In other matters, admitting of diversity of treatment according to the special requirements of local conditions; the states may act within their respective jurisdictions until Congress sees fit to act; and, when Congress does act, the exercise of its authority overrides all conflicting state legislation." (Citing cases.) (Emphasis ours.)

This statement in the *Minnesota Rate Cases* does not in truth support the Appellant's contention. By this statement the Court limits the class of legislation which is within the "exclusive field" to that which *directly* controls interstate commerce. That this is true is clearly shown by the statement which immediately follows that quoted above:

"The principle which determines this classification underlies the doctrine that the states cannot, under any guise, impose direct burdens upon interstate commerce. For this is but to hold that the states are not permitted *directly* to regulate or restrain that which, from its nature, should be under the control of a one authority, and be free from restriction, save as it is governed in the manner that the national legislature constitutionally ordains." (Emphasis ours.)

230 U. S. at 400.

The following examples are then given by the Court of legislation prohibited to the states (that is, within the exclusive power of Congress):

The states cannot: tax interstate commerce; "prohibit interstate trade in legitimate articles of commerce"; "discriminate against the products of other states"; "exclude from the limits of the state corporations or others engaged in interstate commerce," or "fetter by conditions this right to carry it on"; "prescribe rates to be charged for transportation from one state to another"; or "subject the operations of carriers in the course of such transportation to requirements that are unreasonable or pass beyond the bounds of suitable local protection."

Each example given by the Court is one of *direct* regulation. And the last example, statutes regulating the operations of carriers in interstate transportation, places in the "exclusive field" only such of those statutes "as are unreasonable or pass beyond the bounds of suitable local protection." It follows that those statutes of this character that are reasonable and within the bounds of suitable local protection are not in the exclusive but in the permissible field. And such is the holding of the Court in that part of the opinion immediately following (230 U. S. at 402):

> "But within these limitations there necessarily remains to the states until Congress acts, a wide range for permissible exercise of power appropriate to their territorial jurisdiction although interstate commerce may be affected. It extends to those matters of a local nature as to which it is impossible to derive from the constitutional grant an intention that they should go uncontrolled pending Federal intervention."

The Court then pointed out that there are subjects which, since the foundation of government, the states have regulated, because of the necessity that they should not remain unregulated, until Congress supersedes (230 U. S. 402):

> "Further, it is competent for a state to govern its internal commerce, to provide local improvements, to create and regulate local facilities, *to adopt protective measures of a reasonable character in the interest of the health, safety, morals and welfare of its people, although interstate commerce may incidentally or indirectly be involved.* * * * In such case, Congress must be the judge of the necessity of Federal action. Its paramount authority always enables it to intervene at its discretion for the complete and effective government of that which has been committed to its care, and, for this purpose and to this extent, in response to a conviction of national need, to displace local laws by substituting laws of its own. The successful working of our constitutional system has thus been made possible." (Emphasis ours.)

Illustrations given of the exercise of the powers by the state within this permissible field are: the enactment of pilotage laws; the improvement of harbors, bays and streams, and the construction of dams and bridges across navigable streams; quarantine regulations; state inspection laws; statutes for the protection of game and the food supply; statutes providing for misfeasance, nonfeasance, injuries and death received by employees in interstate commerce; statutes creating and enforcing liens against property used in interstate commerce; and "legislation of the states, safeguarding life and property and promoting comfort and convenience within its jurisdiction, may extend incidentally to the operations of the carrier in the conduct

of interstate business, provided it does not subject that business to unreasonable demands, and is not opposed to Federal legislation." Many cases are cited by the Court in support of these propositions.

This Court has consistently held that state legislation enacted under the police power reserved to the states and in a field not occupied by Congress comes within the permissible field under the commerce clause, and, if otherwise valid, it is valid under the commerce clause until superseded by legislation enacted by Congress under its paramount power.

Applying the language of the *Minnesota Rate Cases*, is there any "exercise of power" more "appropriate to the territorial jurisdiction" of a state than the exercise of the power to protect the lives, limbs, health and property of those within its territorial limits—the exercise of its police power? If there are any powers "as to which it is impossible to derive from the constitutional grant an intention that they should go uncontrolled pending Federal intervention," isn't the power to protect the lives, limbs, health and property of its inhabitants one of such powers? If there are certain subjects which, irrespective of their obvious and direct relation to interstate commerce, nevertheless, with the acquiescence of Congress, have been controlled by state legislation "because of the necessity that they should not remain unregulated," isn't the protection of the life, limb, health and property of the state's inhabitants one of such subjects?

> "It is competent for a state * * * to adopt protective measures of a reasonable character in the interest of the health, safety, morals and welfare of its people, although interstate commerce may incidentally or indirectly be involved."

This principle of law is stated by Mr. Justice Johnson in *Gibbons v. Ogden*, 9 Wheat. 1, 235, and quoted with approval in *Missouri K. & T. R. Co. v. Haber*, 169 U. S. 613, 627, as follows:

> "The same bale of goods, the same cask of provisions, or the same ship, that may be the subject of commercial regulation, may also be the vehicle of disease, and the health laws that require them to be stopped and ventilated are no more intended as regulations on commerce than the laws which permit their importation are intended to innoculate the community with disease. Their different purposes marks the distinction between the powers brought into action, and, while frankly exercised, they can produce no serious collision."

It has been repeatedly held by this Court that the protection of life, health, safety and property is a local problem and primarily the function of the states.

> "Protection against accidents, as against crime, presents ordinarily a local problem. Regulation to insure safety is an exercise of the police power. It is primarily a state function, whether the *locus* be private property or the public highways. Congress has not dealt with the subject. Hence, even where the motor cars are used exclusively in interstate commerce, a state may freely exact registration of the vehicle and an operator's license. * * *".
>
> *Bradley v. Ohio*, 289 U. S. 92, at 95.

> "It is conceded that the power of Congress to regulate interstate commerce is plenary; that as incident to it, Congress may legislate as to the qualifications, duties, and liabilities of employes and others on railway trains engaged in that commerce; and that such

legislation will supersede any state action on the subject. *But until such legislation is had, it is clearly within the competency of the states to provide against accidents on trains whilst within their limits. Indeed, it is a principle fully recognized by decisions of State and Federal Courts, that wherever there is any business in which, either from the products created or the instrumentalities used, there is danger to life or property, it is not only within the power of the states, but it is among their plain duties, to make provision against accidents likely to follow in such business, so that the dangers attending it may be guarded against so far as is practicable.*" (Emphasis ours.)

Nashville etc. R. Co. v. Alabama, 128 U. S. 96, 99, 100.

"The rules prescribed for their (railroads) construction and for their management and operation, designed to protect persons and property, otherwise endangered by their use, *are strictly within the limits of the local law.*" (Emphasis ours.)

Smith v. Alabama, 124 U. S. 465, 482.

Quoted with approval in *Atlantic C. L. R. Co. v. Georgia*, 234 U. S. 280, 292.

"In each of these cases regulation involves a burden on interstate commerce. But so long as the state action does not discriminate, the burden is one which the Constitution *permits because* it is an inseparable incident of the exercise of a legislative authority, which under the Constitution has been left to the states." (Emphasis ours.)

South Carolina Hy. Dept. v. Barnwell Bros., 303 U. S. 177, 189.

The cases of *Buck v. Kuykendall*, 267 U. S. 307, and *Bush v. Malloy*, 267 U. S. 317, are cited by Appellant (Brief, Vol. I, pp. 95-6) as supporting Appellant's contention. In truth, the statutes involved in those cases had no purpose in safety, presented no question as to the exercise of the police power of the states, but were examples of attempted *direct* regulation of interstate commerce by the state. This was expressly pointed out by this Court in *Bradley v. Ohio, supra* (289 U. S. at 95):

> "In those cases safety was doubtless promoted when the certificate was denied, because intensification of traffic was thereby prevented. * * * But there promotion of safety was merely an incident of the denial. Its purpose was to prevent competition deemed undesirable. The test employed was the adequacy of existing transportation facilities; and since the transportation in question was interstate, denial of the certificate invaded the province of Congress. In the case at bar, *the purpose of the denial was to promote safety*, and the test employed was congestion of the highway. The effect of the denial upon interstate commerce *was merely an incident*." (Emphasis ours.)

The Appellee's contention has been sustained by this Court in a number of decisions sustaining the constitutionality of state laws affecting railroad transportation enacted in the exercise of the state's police power.

In *New York, N. H. & H. R. Co. v. New York*, 165 U. S. 628, the constitutionality of a New York statute regulating the heating of passenger cars operated within the state was in question in so far as it applied to inter-

state operations. In sustaining the constitutionality of the statute this Court said (165 U. S. at 634):

> "While the laws of the state must yield to acts of congress passed in execution of the powers conferred upon it by the Constitution * * *, the mere grant to Congress of the power to regulate commerce with foreign nations and among the states *did not, of itself and without legislation by Congress*, impair the authority of the states to esablish such reasonable regulations as were appropriate for the protection of the health, the lives, and the safety of their people." (Emphasis ours.)

This Court there stated the law to be exactly as we here contend. And in *Nashville etc. R. Co. v. Alabama*, 128 U. S. 96, 99, 100, this Court said:

> "It is conceded that the power of Congress to regulate interstate commerce is plenary; that as incident to it, Congress may legislate as to the qualifications, duties and liabilities of employees and others on railway trains engaged in that commerce; and that such legislation will supersede any state action on the subject. *But until such legislation is had, it is clearly within the competency of the states to provide against accidents on trains whilst within their limits. Indeed, it is a principle fully recognized by decisions of State and Federal Courts, that wherever there is any business in which, either from the products created or the instrumentalities used, there is danger to life or property, it is not only within the power of the States, but it is among their plain duties to make provision against accidents likely to follow in such business, so that the danger attending it may be guarded against so far as is practicable.*" (Emphasis ours.)

And see:

Hennington v. Georgia, 163 U. S. 299;

Chicago, R. I. & P. R. Co. v. Arkansas, 219 U. S. 453;

St. Louis, I. M. & S. R. Co. v. Arkansas, 240 U. S. 518;

Missouri P. R. Co. v. Norwood, 283 U. S. 249;

Missouri, K. & T. R. Co. v. Haber, 169 U. S. 613;

Smith v. Alabama, 124 U. S. 465;

Atlantic C. L. R. Co. v. Georgia, 234 U. S. 280;

Terminal R. Ass'n v. Bro. of R. Trainmen, 318 U. S. 1.

As this Court in these and many other cases has recognized, this right on the part of the states, in a field not occupied by Congress, to protect the life, health and safety of its people, is in no way inconsistent with the purpose of the commerce clause to place in Congress the supreme control over interstate commerce and to prevent the states from creating barriers to interstate commerce, since the paramount authority of Congress "always enables it to intervene at its discretion." (*Minnesota Rate Cases, supra.*) On the contrary, it is in keeping with the purpose of the commerce clause to give to Congress the supreme control over interstate commerce, and to place in Congress, and not the court, the power and authority to "determine whether the burdens imposed on it (interstate commerce) by state regulation, otherwise permissible, are too great" and by legislation curtail the state's regulatory power, and this whether these burdens arise by reason of the lack of uniformity of regulation; that is, the lack of a national system of regulation.

"Congress, in the exercise of its plenary power to regulate interstate commerce, may determine whether the burdens imposed on it by state regulation, otherwise permissible, are too great, and may, by legislation designed to secure uniformity or in other respects to protect the national interest in the commerce, curtail to some extent the state's regulatory power. But that is a legislative, not a judicial, function, to be performed in the light of the congressional judgment of what is appropriate regulation of interstate commerce, *and the extent to which, in that field, state power and local interests should be required to yield to the national authority and interest.* * * * In resolving the second, *court do not* sit as Legislatures, either state or national. *They cannot* act as Congress does when, after weighing all the conflicting interests, state and national, it *determines when and how much the state regulatory power shall yield to the larger interests of a national commerce.*" (Emphasis ours.)

South Carolina Hy. Dept. v. Barnwell Bros., 303 U. S. 177, 190.

"But these considerations are for the practical judgment of Congress in determining the extent of the regulation necessary under existing conditions of transportation to conserve and promote the interest of interstate commerce. * * * It is the function of this court to interpret and apply the law already enacted, but not, under the guise of construction, to provide *a more comprehensive scheme of regulation than Congress has decided upon.* Nor, in the absence of Federal action, may we deny effect of the laws of the state enacted within the field which it is entitled to occupy until its authority is limited through the exertion by Congress of its paramount constitutional power." (Emphasis ours.)

Minnesota Rate Cases, 230 U. S. at 432.

This proposition—that the commerce clause has placed in *Congress* the power and authority to determine whether the burdens imposed on interstate commerce by state regulation, otherwise permissible are too great—*does not*, as Appellant argues (App. Br., Vol. I, p. 115), lose sight of realities. No real problem is presented as to how Congress may enter the field and thus exclude the states. It is neither necessary, as Appellant suggests, that Congress pass a resolution declaring no regulation is necessary nor that Congress pass affirmative legislation fixing a limit on the number of cars that may be operated in a train.

A few examples will illustrate how Congress has performed this function. Congress excluded the states from the field of quarantine regulations affecting interstate commerce by delegating to the Secretary of Agriculture the power to determine when quarantines were necessary and to declare such quarantines. But until Congress thus occupied the field the validity of state regulations was uniformly sustained notwithstanding the burdens imposed upon interstate commerce.

Oregon-Washington R. & N. Co. v. Washington, 270 U. S. 87.

The Boiler Inspection Act delegates to the Interstate Commerce Commission authority to prescribe the use of safety equipment upon locomotive and all parts and appurtenances thereof. This statute constitutes an occupation of the entire field of such equipment whether or not the Commission has acted respecting a given device, and the states are ousted from regulating such devices. *Napier v. Atlantic Coast Line*, 272 U. S. 605, 613. But prior to the time when the Commission was given jurisdiction over

locomotive appurtenances, state regulations requiring such appurtenances were sustained, notwithstanding they may have burdened interstate commerce. *Atlantic Coast Line R. Co. v. Georgia*, 234 U. S. 280.

The protection of the safety and health of those within the boundaries of a state is always a matter of *local concern*, and a proper subject for the exercise of the state's police power. When regulatory measures affect interstate commerce, it becomes a question of policy for Congress, the legislative body entrusted by the Commerce Clause with the paramount power over such commerce, to determine whether the regulation shall be local or national.

To exclude the state and state regulation here Congress need only delegate to the Interstate Commerce Commission (or some other appropriate Federal department) the exclusive power and authority to investigate the number of cars which may be operated in a train with safety, and, when such investigation shows a limitation to be necessary and proper in the interest of safety, to fix a limit on the number of cars to be operated in a train. It then becomes a subject of exclusive national regulation, and there will be no limitation unless the Interstate Commerce Commission after investigation should find it necessary. The state regulation becomes void and of no effect but a Federal agency has been provided with experience in the field and with authority to investigate and control the matter where control is found necessary. This, we believe, is the intent of the Commerce Clause. As stated in the *Minnesota Rate Cases*, *supra*, the Constitution never intended that matters of a local nature (and certainly the protection of citizens of a state is a matter of local concern) should go uncontrolled pending Federal intervention.

California v. Thompson, 313 U. S. 109, and *Parker v. Brown*, 317 U. S. 341, cited by the Appellant, are in accord with this contention or proposition. The determination of the question as to whether or not the subject of regulation is one which if regulated at all it should be by national legislation and not by state, the "balancing of local and national interest", in final analysis is in every instance based upon the extent of the burden imposed on commerce by the state regulation. Of necessity in determining that the regulation should be by national authority, the question reduces to the effect of local regulation on national commerce. That is, is the burden imposed by the state regulation too great? The argument of the Appellant and of the Solicitor General herein reduces down to the proposition that the constitutionality under the Commerce Clause of a state statute, *admittedly a police regulation*, is to be determined by a consideration of the extent of the burden imposed on interstate commerce by the state statute, by "balancing the local and national interest"—in other words, by determining whether in the light of the national interest the burden imposed upon interstate commerce is too great—and that such is the holding of this Court in *California v. Thompson*, *supra*, and in *Parker v. Brown*, *supra*. The Appellee contends that whether the burden on interstate commerce by reason of the statute *is too great* is a legislative, and not a judicial, question, and that *California v. Thompson* and *Parker v. Brown*, are in accord with Appellee's contention.

In *California v. Thompson*, the Court cited with approval, among others, *South Carolina Hy. Dept. v. Barnwell Bros.*, 303 U. S. 177, 185-191; *Smith v. Alabama*, 124 U. S. 465; *Nashville, C. & St. L. R. Co. v. Alabama*,

128 U. S. 96; *Chicago, R. I. & P. R. Co. v. Arkansas*, 219 U. S. 453; *Missouri Pac. R. Co. v. Norwood*, 283 U. S. 249; *New York, N. H. & H. R. Co. v. New York*, 165 U. S. 628, and the *Minnesota Rate Cases*, 230 U. S. 352, 398-412. *Parker v. Brown, supra*, cited with approval, among others, *South Carolina Hy. Dept. v. Barnwell Bros., supra; California v. Thompson, supra*, and *Minnesota Rate Cases, supra.*

As we have heretofore pointed out, the Court in those cited cases, and in conformity with a long line of cases, has held that the Constitution placed in Congress the power and authority to "*determine* whether the burdens imposed on it (interstate commerce) by state regulation * * * *are too great.*" (Emphasis ours.) *South Carolina Hy. Dept. v. Barnwell Bros., supra:*

> "But that is a *legislative*, not a judicial, function, to be performed in the light of Congressional judgment of what is appropriate regulation of interstate commerce, and the extent to which, in that field, state power and local interest should be required to yield to the national authority and interest. * * * In resolving the second, courts *do not* sit as Legislatures, either state or national. *They cannot* act as Congress does when, after weighing all the conflicting interests, state and national, *it determines when and how much the state regulatory power shall yield to the larger interests of a national commerce.*"
>
> *South Carolina Hy. Dept. v. Barnwell Bros., supra.*

In effect the Appellant argues that this Court, by its decisions in *California v. Thompson* and *Parker v. Brown*, has transferred or taken to itself the power and authority which in the *Barnwell* and other cases it held was

legislative, and by the Constitution placed in Congress. We do not so read the *Thompson* and *Parker* decisions. We understand these cases to hold, in accordance with the *Barnwell* and other cases cited, that where a statute has a rational basis in safety *the extent* of the burden it imposes on interstate commerce—whether it is *too great* in relation to the national interest—is a *legislative* question.

As we have said, the national interest in interstate commerce is not, as Appellant seems to infer, left unprotected by this construction or interpretation. The simple remedy lies with Congress which "in the exercise of its plenary power to regulate interstate commerce, may determine * * * what is appropriate regulation of interstate commerce, *and the extent* to which, in that field, state power and local interests *should be required to yield to national authority and interest.*" (Emphasis ours.) *South Carolina Hy. Dept. v. Barnwell Bros.*, 303 U. S. 177, 189-190. To exclude the state legislation Congress need only authorize the Interstate Commerce Commission to investigate, and where found necessary fix the number of cars to be operated in a train. The state law becomes invalid but in its place a Federal Agency is provided with authority to investigate and, if and when found necessary, fix a limit on the number of cars to be operated in a train. If no limit is necessary, none will be fixed.

> "* * * there is a simple remedy; and it cannot be assumed that it will not be readily applied if there be real occasion for it. That remedy does not rest in a denial to the state, in the absence of conflicting Federal action, of its power to protect life and property within its borders, but it does lie in the exercise of the paramount authority of Congress in its control of interstate commerce, to establish such

regulations as in its judgment, may be deemed appropriate and sufficient. Congress, when it pleases, may give the rule and make the standard to be observed on the interstate highway."

Atlantic C. L. R. Co. v. Georgia, 234 U. S. 280, 292;

Oregon-Washington R. & N. Co. v. Washington, 270 U. S. 87;

Napier v. Atlantic C. L. R. Co., 272 U. S. 605, 607.

Kansas Southern Ry. v. Kaw Valley District, 233 U. S. 75, and *Seaboard Air Line Ry. v. Blackwell*, 244 U. S. 310, do not support the Appellant's contention. In the *Kansas Southern Ry.* case, purporting to act under a state statute, the drainage district ordered the railroad to raise to a specified height its bridges across the Kansas river, a navigable stream. The State Supreme Court, recognizing that the bridges could not be raised without the consent of the Secretary of War, and seeking to do indirectly what could not be done directly, ordered the railroad to clear the channel to the specified height. This would have required the removal of the bridges and would have prohibited and entirely destroyed interstate commerce. It was "not pretended that local welfare needs the removal of the defendant's bridges at the expense of the dominant requirements of commerce with other states, but merely that it would be helped by raising them." 233 U. S. at 79. The state statute was not in fact a police measure.

In *Seaboard Air Line Ry. v. Blackwell*, the state statute which required trains approaching crossings to reduce speed so as to be able to stop if necessary to avoid an accident was held invalid, not by balancing local and national interest, but because to *indiscriminately* require

trains to slow up at *all* crossings, whether or not the crossing presented a hazard greater than the ordinary crossing hazard, "would be practically destructive of the successful operation of interstate passenger trains" and therefore "might not only be a direct burden on interstate commerce." 244 U. S. at 315. There is a clear distinction between a police measure which as an incidental effect *regulates* interstate commerce, and a measure the effect of which is to *prohibit* or *destroy* interstate commerce. The latter *directly* regulates interstate commerce. *Seaboard Air Line Ry. v. Blackwell, supra*, is such a case. And see: *Hannibal & St. J. R. Co. v. Husen*, 95 U. S. 465; *Scholienberger v. Pennsylvania*, 171 U. S. 1; *West v. Kansas Natural Gas Co.*, 221 U. S. 229.

Nor do the numerous other cases cited by Appellant and by the Solicitor General support the Appellant's contention on this proposition. Upon examination it will be found that the basis of the decision upon the validity of the state statute involved was either that *the field was already occupied* by Congress, or that *the state statute was direct regulation and not a police measure.*

Oregon-Washington R. & N. Co. v. Washington, 270 U. S. 87, is typical of the first class of decisions. In that case this Court held the state quarantine statute invalid, not because it invaded the "exclusive" national field, but because Congress, by giving to the Secretary of Agriculture the power to establish quarantines whenever and wherever he found necessary, had occupied the field of quarantines (see 270 U. S. at 99).

Lempke v. Farmers Grain Co., 258 U. S. 50, is typical of the second class of decisions. In the *Lempke* case the state statute was adjudged invalid because this Court held

that, in providing a system which enabled state officials to fix the profits which could be made in dealing with subjects in interstate commerce, the statute directly regulated interstate commerce; and that the police provisions of the state were so "essential and vital" to the general plan of the statute that the statute was inseparable and invalid *in toto*. (258 U. S. at 59, 60.).

The whole argument of Appellant that the Train Limit Law invades the "exclusive national" field is that the burden imposed on interstate commerce by the law *is too great* to permit of local regulation—a legislative question. No *other* argument is made by Appellant and there is no evidence in the record to support the contention that the subject matter of the Train Limit Law is one of national, and not local, concern. The record in fact refutes the Appellant's contention that the subject is of national and not of local concern. The safety of long train operation depends to considerable extent on local conditions, curves, grades, hogbacks, dips, sand storms and the like. It is improbable that the same limit would be made for *flat*, comparatively curveless trackage such as in Kansas, as would be applied where there are hogbacks, dips, curves and grades. Nor is it probable that a limit for Kansas or Arizona would be applicable to terminal operations such as in the Chicago territory.

If the Interstate Commerce Commission had the power and authority to fix train lengths, it would of necessity investigate local conditions. Its determination of the number of cars to be operated in a train would depend to a large extent on local conditions. The accident on the Pennsylvania near Manor, Penn. [Ex. 311, R. 2213], where three were killed and eleven injured when the run-in of slack on a long train, passing through a dip, buckled and threw a

car out of the train in front of a passenger train, was due to a local condition—a dip or sag. The local character of the subject matter under this law is far greater than in the statutes sustained in the *Georgia Headlight* case and in *California v. Thompson, supra.* In the *Georgia Headlight* case, a Federal statute could have taken care of the subject (as it later did) without thought to local conditions. There could be no local condition which would affect the headlight. Likewise, in *California v. Thompson*, a national statute could regulate ticket brokers without consideration of local matters. Federal legislation, however, as to the number of cars in a train would not, in all probability, be uniform throughout the United States but would vary depending on local conditions.

Protection against accidents is a *local* matter or problem. This has been the consistent holding of this Court.

Bradley v. Ohio, 289 U. S. 92, 95;

Smith v. Alabama, 124 U. S. 465, 481, 482;

Atlantic C. L. R. Co. v. Georgia, 234 U. S. 280, 292.

New York, N. H. & H. R. Co. v. New York, 165 U. S. 628, 631.

Protective legislation is in the permissible field under the commerce clause. The burden on interstate commerce involved in such legislation "is one which the Constitution permits because it is the inseparable incident of the exercise of legislative authority, which, under the Constitution, has been left to the states." (303 U. S. at 189.) Congress may determine whether the burdens imposed by the state legislation are too great, and, to protect the national interest in commerce, curtail the state's power. "But that is a legislative not a judicial function, to be

performed, in the light of the Congressional judgment of what is appropriate regulation of interstate commerce, and the extent to which, in that field, state power and local interest should be required to yield to the national authority and interest. * * * courts do not sit as Legislatures, state or national. They cannot act as Congress does when, after weighing all the conflicting interests, state and national, it determines when and how much the state regulatory power shall yield to the larger interests of a national commerce." (303 U. S. at 190.)

"* * * there is a simple remedy; and it cannot be assumed that it will not be readily applied if there be real occasion for it. That remedy does not rest in a denial to the state, in the absence of conflicting Federal action, of its power to protect life and property within its borders, but it does lie in the exercise of the paramount authority of Congress in its control of interstate commerce to establish such regulations as in its judgment may be deemed appropriate and sufficient." (234 U. S. at 292.)

We respectfully submit that, as this Court has stated in *New York, N. H. & H. R. Co. v. New York, supra*, (165 U. S. at 631) the mere grant to Congress of the power to regulate interstate commerce "did not of itself and without legislation by Congress, impair the authority of the states to establish such reasonable regulations as were appropriate for the protection of the health, the lives, and the safety of their people," and that the Arizona Train Limit Law cannot be adjudged unconstitutional unless it is determined that this law is not a safety measure, or that it invades a field already occupied by Congress, or that it violates the 14th Amendment to the Constitution of the United States.

Appellant's Burden Evidence.

In our discussion of this proposition we have not discussed the evidence presented by the Appellant for the purpose of showing the extent of the burden imposed on interstate commerce by the Train Limit Law. As our argument discloses, we do not believe that the extent of the burden is a matter to be considered by the Court in determining the constitutionality of the law. This should not be taken to mean, however, that we concede that the law imposes such burdens as Appellant concludes from the evidence or as the trial court found—or that it imposes any substantial burden. We, in fact, deny that the law imposes any substantial burden on interstate commerce. While we will not go into the burden evidence to any great extent, believing that whether the burden is too great is a legislative, and not judicial, question, we will point out a few parts of the evidence to illustrate why we believe the conclusions of the Appellant and of the trial court, with respect to the extent of the burden, are erroneous.

Exhibits were placed in evidence by the Appellant showing the operating and transportation expenses by years 1922 to 1939, inclusive, for (a) all Class I railroads, (b) some 16 railroads, each separately, and (c) separately, Southern Pacific Company, Pacific Lines, Southern Pacific Company lines in Arizona and S. P. lines in Nevada. The purpose was to show a comparison of trends in the percentage of decrease or improvement in these expenses. From this Appellant argues and the trial court found that the Appellant was unable to achieve the same decrease or percentage of improvement in the territory affected by the Train Limit Law as was achieved in other territory, and this because of the train limit law. The exhibits present no basis for such conclusion.

It is necessary to show one factor only (and there are others) entering into the comparison to show its fallacy. The comparison of percentage of improvement made by Appellant and accepted by the trial court includes the years 1922, 1923 and 1924 in the first four year period. Any comparison with the Southern Pacific Company lines in Arizona which includes the years 1922, 1923 and 1924 is impossible because of the consolidation of the E. P. & S. W. and the Arizona Eastern with the Southern Pacific Company *in November, 1924* [Ex. 149, R. 3025.]. The Southern Pacific Lines in Arizona before consolidation consisted of 399.95 miles of main line trackage and 144.93 miles of branch line trackage, or a total of 544.88 miles of trackage, and after consolidation it consisted of 574.81 miles of main line trackage and 647.98 miles of branch line trackage, or a total of 1222.79 miles of trackage. [Ex. 305, R. 3430.]. The line before consolidation was an entirely different railroad from that after consolidation and could not be taken as a basis for determining the percentage of improvement *on the latter*. If there were no other reason the large amount of branch line added is sufficient to make these expenses in 1922, 1923 and 1924 impossible as a basis for determining the percentage of improvement. By the consolidation 503.05 miles of branch line were added to the 144.93 operated prior. The *higher cost of branch line operations* would *increase* these expenses *after the consolidation* and distort any percentage of improvement based upon the years 1922, 1923 and 1924. Yet these three years constitute practically 75% of the first four year period (1922-1925) *used by the Appellant and the trial court* in determining the percentage of improvement on the *present* Southern Pacific lines in Arizona.

	% Increase Cars Per Train 1939 over 1924	Operating Expense 1925-8	Operating Expense 1936-9	Operating Expense % Decrease	Transportation Expense 1925-8	Transportation Expense 1936-9	Transportation Expense % Decrease
Class I	18	7.80	6.49	16.8	3.68	3.18	13.6
N. Y. C.	8	8.38	6.73	19.7	4.01	3.41	14.9
Mo. Pac.	18	7.83	6.43	17.8	3.69	3.04	17.6
Ill. C.	3	6.67	6.08	8.8	3.11	3.14	
Gr. N.	18	6.24	5.22	16.3	3.13	2.64	15.8
N. Pac.	15	7.30	6.83	6.9	3.50	3.30	7.0
Rock Isl.	12	8.65	7.07	18.3	4.27	3.43	19.7
Erie	23	7.55	6.49	14.0	3.72	3.32	10.8
St. L. & S. W.	18	9.80	7.22	26.3	3.79	3.20	15.5
C. & N. W.	29	9.50	8.85	6.9	4.70	4.13	14.2
Penn.	46	8.01	6.07	24.2	3.87	3.12	16.7
U. Pac.	12	7.46	6.07	18.8	3.24	2.99	7.7
B. & M.	49	12.97	9.77	24.7	6.44	5.06	21.4
C. M. & S. P.	10	7.76	6.99	9.9	3.60	3.39	7.3
C. B. & Q.	4	6.77	5.78	14.6	3.19	2.86	10.3
C. & O.	49	4.10	3.16	22.9	1.63	1.29	20.8
Santa Fe		7.91	7.74	2.2	3.38	3.48	
S. P. Pac. Lines	17	8.93	7.15	19.9	4.50	3.95	12.2
S. P. Nev.	44	5.23	4.28	18.1	2.65	2.36	10.9
S. P. Ariz.		7.36	5.97	18.8	3.27	3.00	8.5

On the page opposite this, using *the first four years following consolidation* (1925-1928) as the first period, we show for the several railroads the percentage of improvement and the percentage of increase in cars per train. We submit that it requires supreme imagination to conclude from the percentages shown *that the Train Limit Law has prevented* the Appellant in the least iota from achieving the same improvement that has been achieved in territory where there is no train limit law. For example consider:

	% increase in cars	% decrease Trans. expense
S.P. Ariz.	....	8.7
S.P. Nev.	44	10.9
C.B. & Q.	4	10.3
Erie	23	10.8

The decrease in operating expense was 2.2% greater in Nevada than in Arizona with a 44% increase in cars per train in Nevada and no increase in Arizona. But with a 40% *greater* increase in cars per train in Nevada than on the C. B. & Q. the decrease in operating expense was only 6% greater. This showing presents no possible basis for holding that the Train Limit Law has prevented the Appellant from achieving the same percentage of improvement achieved in territory where train lengths are not limited. Many factors enter into the improvement in these unit costs. *Increased traffic* will reduce the unit operating cost [R. 202, 203]. Likewise grade and curve elimination will reduce fuel costs and increase speed. Abandonment of costly branch line operations, as has occurred in many sections of the country where trucks have

taken over short hauls, reduces unit costs. These and other factors other than train lengths have brought about the improvement. It will be noticed that the improvement has been greater on *eastern* roads than on western, probably due to a greater increase in traffic on eastern roads. Arizona will be found to compare very favorably with the other *western* roads.

Road	% improvement oper. expense	% improvement trans. expense
Great Northern	16.3	15.8
Northern Pacific	6.9	7.0
Union Pacific	18.8	7.7
Santa Fe System	2.2	.....
S. P. Arizona	18.8	8.5

Mr. Wright of the New York Central testified in substance that gross ton miles per freight train hour is the yardstick for determining efficiency in operations [R. 262, 263]. For the same western railroads the percentage of increase in gross ton miles per freight train hours, 1939 over 1930 (as to this item, no year earlier than 1930 is shown for Arizona in any exhibit) is:

Railroad	Gross ton mile per freight train hour 1930	1939	% increase
Great Northern	28021	35462	26.5
Northern Pacific	24848	32408	30.4
Union Pacific	33267	43006	29.3
Santa Fe System	31115	35471	14.0
S. P.-Arizona	35087	45026	28.3

[Exs. 47, 49, 79, 131, 163; R. 2898, 2900, 2931, 2993, 3037.]

The increase in gross ton miles per freight train hours —the yardstick of efficiency—is seen to be comparable to that on other western roads.

The Appellant contends and the trial court found that Appellant would save approximately $400,000 a year if long trains were operated in Arizona. The contention and finding are based almost entirely, if not entirely, upon the assumed operation or redispatch presented by Appellant. Nine hundred sheets covering the different operations during the period were introduced. Exhibit 198 is a typical sheet [R. 3115]. From this it is seen:

4100 type locomotives were used in the assumed operation while *none* of this type locomotive were used in the *actual*. The tonnages of the trains actually operated were as follows [R. 2225]:

(Tonnage given is in M's or 1000 pounds)

Train	Out of Terminal	Into Terminal
Y310	6356 M's	6406 M's
Y311	5850 "	5850
CY412	5840 "	5135
C413	6150 "	6150
C414	6550 "	6550
CY414	5200 "	5535
C415	6630 "	6630
Y312	6058 "	6058
Y313	6114 "	6114

The tonnage rating of a 4100 type locomotive, Tucson to Lordsburg, is 6220 M's [R. 2220]. In the *assumed operation* a 4100 type locomotive handled train Y312 with

6150 M's from *Tucson to Lordsburg without a helper*. The tonnage of *six* of the nine *actual* trains shown in exhibit 198 was *6150* M's or less, and all six could have been handled by a 4100 type locomotive in actual operations without helpers. They are trains ~~Y311, Y312~~, Y313, ~~CY412, C413~~ and CY414. *All six* used 5000 type engines and *all* required helpers. *Had* 4100 type locomotives been used, *no* helper would have been needed. Thus by merely changing the type of engine used *all these helpers* used in the actual operations would be eliminated. The other three trains in the actual operations were double headers, using 5000 type locomotives. By using 4100 type locomotives helpers would be required for only a short period. (Benson to Dragoon, 21.4 miles; San Simon to Steins, 14.7 miles. Compare engine ratings, page 15, Tucson Division, time table, exhibit 175 [R. 1284].) The savings as to *all nine* of the trains was due to the use of 4100 or A.C. type locomotives in the *assumed* and *not in the actual*. Eleven helper engines *were used* in the actual operations. Not over four would have been necessary had the 4100 or A.C. type locomotive been used on the trains.

In addition to the savings in wages of enginemen and the saving on fuel, there would have been savings in repairs and maintenance of the unnecessary helper engines; savings in time due to the heavier engine handling the train with greater speed. Also the larger tender on the 4100 type engine enables it to go farther before taking water and so have few delays. Time would be gained by not having to couple helpers in and out. These things show that the purported cost of compliance of $400,000 per year is not due to the Train Limit Law but is due to

the change in power, to the use of 4100 or A.C. type engines in the assumed operation and not in the actual.

Again, Appellant's claimed fuel savings (accepted by the trial court in its findings) is based primarily upon Exhibit 249 [R. 3258]. The exhibit purports to show the fuel consumption and percentage of decrease in pounds of fuel per 1000 gross ton miles on the Southern Pacific lines, Tucson Division in Arizona, Salt Lake Division in Nevada, and the Pacific Lines, 1924 to 1939, inclusive. The percentage decrease for the period is shown on page 1 of the exhibit as follows:

Tucson Division	Pacific Lines	Salt Lake Division
12.62%	22.38%	26.06%

That these percentages are fallacious and without any logical basis whatsoever must immediately appear upon examination of sheet 2 of the exhibit [R. 3259]. From this it will be seen that on the Tucson Division in 1924 the fuel used per 1000 gross ton miles was 101 pounds, while in 1939 it was 108 pounds. Thus the exhibit shows an *increase* over the period, *not* a decrease. The reason for this is that from 1924 to 1930 the Tucson Division covered only the territory between Yuma, Arizona, and Tucson, Arizona. In 1930 the Division was extended east to Lordsburg, New Mexico. Since 1930 the Tucson Division has included the territory from Yuma to Lordsburg [R. 1212]. In 1929 on the Tucson Division the fuel per 1000 gross ton miles was 98 pounds. With the extension of the division to Lordsburg, New Mexico, the fuel per 1000 gross ton miles used on the division became 117 pounds—an increase of 19 pounds per 1000 gross ton miles. One outstanding reason for this is the grades and

curves on the territory between Tucson and Lordsburg, shown on the profile maps [Exs. 309, 310, R. 2210]. Also the branch line operation from Bowie, Arizona, to Globe and Miami, Arizona, which came into the division with the extension to Lordsburg [Ex. 154, R. 3028].

The percentages shown by Appellant on sheet 1 of Exhibit 249 were accomplished by determining the percentage of decrease on each division 1928-1929 over 1924-1925 and 1938-1939 over 1930-1931. These two percentages were *added together* and the total taken as representing the percentage of improvement over the entire period. With respect to the Tucson Division the percentages added were for *two different and distinct territories*—for the first period the territory Yuma to Tucson and for the second period the territory Yuma to Lordsburg. This could not possibly show the improvement on the *Yuma-Lordsburg* territory for the entire period.

Also, in the first period the percentage on the Salt Lake Division is colored by reason of the joint track agreement entered into August 1, 1924, between the Southern Pacific and the Western Pacific [R. 2155]. By this agreement a considerable mileage of single track operations, with the necessary stopping for meets and passes, were eliminated in Nevada. The effect of this is seen in the decrease in pounds of fuel per gross ton miles in the years 1925 (7 pounds) and 1926 (9 pounds) [R. 3261]. The total decrease 1927-1939, inclusive, was 11 pounds per 1000 gross ton miles as compared to the 16 pounds decrease in the two years 1925 and 1926. During the 12-year period 1927 to 1939 the decrease in pounds per 1000 gross ton miles in no sense corresponded with the increase in cars per train. If anything, the contrary appears. In 1927

the cars per train was 65.8 and the use of fuel was 81 pounds per 1000 gross ton miles [R. 3261]. In 1932 the cars per train had increased to 73.4 but the fuel *had also increased* to 85 pounds per 1000 gross ton miles. In 1934 with 79.7 cars per train the fuel used was 80 pounds per gross ton mile. But in 1937 with 73.8 cars per train, a *decrease* of 5.9 cars per train, the fuel remained at 80 pounds per 1000 gross ton mile. In 1938 and 1939 with cars per train 78.6 and 81.2, respectively, the fuel used was 75 and 73 pounds per 1000 gross ton miles respectively. However, in other exhibits will be found other factors which brought about the decreases in these two years. For example, from Exhibit 164, item 1 [R. 3038], it will be seen that the miles of line operated in freight service on the Salt Lake Division in 1936 was 1230.17 miles, while in 1938 it was 1091.09 and 1939 it was 1078.32—a total reduction of 151.85. Unquestionably this reduction in mileage was by reason of the abandonment of *unprofitable branch line mileage*. The abandonment of such mileage would have a material effect in decreasing pounds of fuel per 1000 gross ton miles.

Also it will be noted that the average tractive power on the Salt Lake Division was increased from 55162 tons in 1936 to 62423 in 1939, an increase of 7261 tons. The use of these heavier locomotives, such as the 4100 or A.C. type, was material aid in the decrease in fuel per 1000 gross ton miles—first by eliminating the necessity of many helper engines, and, second, by reason of the larger water capacity of their tender they can run further without the necessity of stopping for water.

We submit that the evidence presented by Appellant presents no logical basis whatsoever for the conclusions

and findings as to savings in fuel as shown on Exhibit 250 [R. 3262]. The percentage of decrease (10%) in fuel in the redispatch used in this exhibit, derived from Exhibit 249, is utterly without logical basis.

We have presented these examples of what we believe are erroneous conclusions and findings drawn from the evidence with respect to the purported burden on interstate commerce resulting from the Train Limit Law (and we could give many others) in order, as we have said, that we may not be understood to concede the burdens claimed by the Appellant, or that any substantial burden results from the Train Limit Law. However, as we have argued, we believe the question of the extent of the burden—whether it is too great—is for Congress and not for the Court.

2. Extra-territorial Effect and Burden on Interstate Commerce Are One and the Same Thing. (Reply to Assignment of Error No. 2.)

The Appellant contends that the Arizona Train Limit Law is invalid because its necessary effect is to regulate and control the length and consist of interstate trains extra-territorially, that is, beyond the boundaries of the State of Arizona.

While appearing to present a new and distinct question, the legal question presented under this assignment of error is, in fact, identical with or included in the question presented under Assignment of Error No. 1. To state that a necessary effect of the statute is to regulate extra-territorially is only to contend, by different language, that the statute imposed a *direct* burden on interstate commerce. It would seem that wherever a burden is imposed on interstate commerce it affects that commerce as a whole, and

there is always an extra-territorial effect. But as we have shown by our argument under Assignment of Error No. 1, the burden imposed by a state statute enacted under the police power reserved to the states and in a field not occupied by Congress, if otherwise valid, is valid under the Commerce Clause because "the burden is one which the Constitution permits because it is an inseparable incident of the exercise of a legislative authority which, under the Constitution, has been left to the states." (303 U. S. at p. 190.) (*South Carolina Hy. Dept. v. Barnwell Bros., supra.*) The protection of the national interest in the commerce is in Congress, which may determine whether the burden imposed by a state statute is too great and "by legislation designed to secure uniformity * * * curtail to some extent the state's regulatory power." This Court has in numerous decisions held contrary to Appellant's contention.

State statutes regulating the operation of motor vehicles are typical. In *South Carolina Hy. Dept. v. Barnwell Bros., supra*, a statute prohibiting the use on the highways of South Carolina of motor trucks exceeding 90 inches in width or 20,000 pounds in weight with load, was in question; in *Mauer v. Hamilton*, 309 U. S. 598, a Pennsylvania statute prohibited the operation on the state highway of any vehicle carrying any other vehicle above the cab of the carrier vehicle or over the head of the operator of the carrier vehicle; and in *Sproles v. Binford*, 286 U. S. 374, the state statute limited the net load of trucks operating over the highway. In these and similar cases the same contention as to extra-territorial effect was made as the Appellant presents here. It is probable that the requirements of those laws as to the width, the length, the

weight, the number of trailers, or as to vehicles over the cab of the carrier-vehicle impose a far greater extra-territorial regulation and burden on interstate commerce than the Arizona Train Limit Law because with different laws in various states the carrier is required to have his equipment constructed to meet the *most restrictive* law or change equipment at each state line. But this Court has consistently held that the burden imposed by such statutes is indirect and is incidental to the exercise of the state's police power.

Likewise the same argument has been made in numerous cases before this Court involving the question of the validity of state laws regulating railroad transportation, and the decisions of the Court refute Appellant's argument here. In *New York, N. H. & H. R. Co. v. New York, supra*, the statute regulated the method of heating passenger cars; in *Atlantic Coast Lines R. Co. v. Georgia*, 234 U. S. 280, the state statute required the use of electric headlights; in *Chicago, R. I. & P. R. Co. v. Arkansas*, 219 U. S. 453, and in *Missouri P. R. Co. v. Norwood*, 283 U. S. 249, the operation of a train with less than a designated number in the crew was prohibited; and in *Terminal R. Assn. v. Bro. of R. Trainmen*, 318 U. S. 1, the operation of trains without a caboose was prohibited. In these and similar cases the same contention as Appellant here makes was made as to the extra-territorial effect of the law and this Court held *against* the contention.

In *New York, N. H. & H. R. Co. v. New York*, 165 U. S. 628 (commonly known as the New York car-heating case), the extra-territorial effect of the New York car-heating statute was argued to the Court:

> "Counsel for the railroad suggests that a conflict between state regulations in respect of the heating of

passenger cars used in interstate commerce would make safe and rapid transportation impossible; that to stop an express train on its way from New York to Boston at the Connecticut line in order that passengers may leave the cars heated as required by New York, and get into other cars heated in a different mode in conformity with the laws of Connecticut, and then at the Massachusetts line to get into cars heated by still another mode as required by the laws of that Commonwealth, would be a hardship on travel that could not be endured." (165 U. S. at 632.)

The Court answered by saying:

"These possible inconveniences cannot affect the question of power in each State to make such reasonable regulations for the safety of passengers on interstate trains as in its judgment, all things considered, is appropriate and effective. Inconveniences of this character cannot be avoided so long as each State has plenary authority within its territorial limits to provide for the safety of the public, according to its own views of necessity and public policy, *and so long as Congress deems it wise not to establish regulations on the subject that would displace any inconsistent regulations of the States covering the same ground.*" (Emphasis ours.) (165 U. S. at 632-633.)

In *Atlantic Coast Line v. Georgia*, 234 U. S. 280, the same argument was advanced in objection to a state statute which required an electric headlight of a certain type on each locomotive, including locomotives engaged in interstate commerce.

"It is argued that if Georgia may prescribe an electric headlight, other States through which the road runs may require headlights of a different sort; that,

for example, some may demand the use of acetylene and that others may require oil; and that, if state requirements conflict, it will be necessary to carry additional apparatus and to make various adjustments at state lines which would delay and inconvenience interstate traffic." (234 U. S. at 290.)

Completely answering this the Court said:

"If there is a conflict in such local regulations, by which interstate commerce may be inconvenienced—if there appears to be need of standardization of safety appliances and of providing rules of operation which will govern the entire interstate road irrespective of state boundaries—there is a simple remedy; and it cannot be assumed that it will not be readily applied if there be real occasion for it. That remedy does not rest in a denial to the State, in the absence of conflicting Federal action of its power to protect life and property within its borders, but it does lie in the exercise of the paramount authority of Congress in its control of interstate commerce to establish such regulations as in its judgment may be deemed appropriate and sufficient. *Congress, when it pleases, may give the rule and make the standard to be observed on the interstate highway.*" (Emphasis ours.) (234 U. S. at 292.)

The recent opinion in *Terminal R. Assn. v. Bro. of R. Trainmen, supra*, is typical of these decisions and would seem to be conclusive against Appellant's contention (318 U. S. 8, 9):

"* * * Appellant contends, and we assume however, that there do not exist, and that it is not reasonably practicable to install, facilities for taking on and dropping off cabooses at the points where the

trains cross the state line; and that the practical consequence of the order is that if cabooses are to be used in Illinois on runs of the second sort they must also be used at least as far as the nearest switching point in Missouri.

"As to both classes of runs; the effect of the order is in some measure to retard and increase the cost of movements in interstate commerce. This is not to say, however, that the order is necessarily invalid. In the absence of controlling federal legislation this Court has sustained a wide variety of state regulations of railroad trains moving in interstate commerce having such effect. * * *

"If lack of facilities at the state line requires as a practical matter that in order to provide cabooses in Illinois appellant must also provide them for some distance in Missouri, that fact does not preclude Illinois from regulating the operation to the limits of its territory. * * *"

3. **The Train Limit Law Does Not Invade the Field Already Occupied by Congress by Sections 1 and 9 of the Safety Appliance Act or by Section 25, Part I, of the Interstate Commerce Act.** (Reply to Assignment of Error No. 5.)

It is, of course, recognized that a state law which invades a field already occupied by Congress is void and of no effect.

The Appellant under Assignment of Error No. 5 contends that the Train Limit Law invades a field already occupied by Sections 1 and 9 of the Safety Appliance Act (45 U. S. C. 1 and 9) and by Section 25, Part I, of the Interstate Commerce Act (49 U. S. C. 25). This contention is without merit for a number of reasons.

A. The Fields Occupied by the Federal Statutes Are Different From That Occupied by the Arizona Law.

(1) THE FIELD OCCUPIED BY THE SAFETY APPLIANCE ACT.

The Safety Appliance Act (45 U. S. C. 1-16), as the name implies, deals with the subject of mechanical appliances which are required in the operation of locomotives, cars and trains by railroads engaged in interstate commerce. Section 1 requires the use of (a) power driving-wheel brakes on locomotives and appliances on locomotives for operating the train-brake system, and (b) power brakes on cars in a train. Section 9 provides for the minimum number and "association" of cars in a train which shall be equipped with power brakes. Other sections of the Act prescribe the use of automatic couplers (sec. 2); grab irons (sec. 4); standard drawbars (sec. 5); and sill steps, hand brakes, ladders, running boards and hand holds, as designated by the Interstate Commerce Commission (secs. 11-12).[1]

The preamble of Section 1,[2] referred to in *Johnson v. Southern Pac. Co.*, 196 U. S. 1, 15, as declaring the intention of Congress, reads:

> "An act to promote the safety of employees and travelers upon railroads *by compelling common carriers engaged in interstate commerce to equip* their

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[1] Comparable statutes not a part of the Safety Appliance Act include the Safety Ash Pan Act (45 U. S. C. 17-22); the Boiler Inspection Act (45 U. S. C. 22-34); and the provisions of Sec. 25 of Part I of the Interstate Commerce Act (49 U. S. C. 25), relating to signal systems, train control devices, etc. which are considered under our next heading.

[2] (Act of Mar. 2, 1893, c. 196, 27 Stat. 531).

cars with automatic couplers and continuous brakes and their locomotives with driving-wheel brakes, and for other purposes." (Emphasis supplied.)

In *United States v. State of California*, 297 U. S. 175, 185, this Court stated:

"* * * The Federal Safety Appliance Act is remedial, to protect employees and the public from injury *because of defective railway appliances*, Swinson v. Chicago, St. Paul, M. & O. Ry. Co., 294 U. S. 529; Fairport, P. & E. R. Co. v. Meredith, 292 U. S. 589, 594; Johnson v. Southern Pacific Co., 196 U. S. 1, 17, and to safeguard interstate commerce itself from obstruction and injury *due to defective appliances* upon locomotives and cars used on the highways of interstate commerce. * * *." (Emphasis supplied.)

Thus it clearly appears that the purpose of the Act is the promotion of safety by the compulsory use of specified mechanical devices. The field occupied is that of *regulating designated equipment* of locomotives, cars and trains, specifically, as to Sections 1 and 9, the power brake mechanism. *Cf. Napier v. Atlantic Coast Line R. Co.*, 272 U. S. 605, 607.

This construction of the Safety Appliance Act is confirmed by its legislative history. The bill from which the Act of March 2, 1893 was derived was H. R. 9350, introduced in the 52nd Congress, 1st Session. The report of the House Committee on Interstate and Foreign Commerce on this bill[1] traces the history of the movement to

[1] House Report No. 1678; 52nd Cong. 1st Sess.

relieve the perils due to the use of hand brakes and non-uniform and unsafe couplers. After stating the nature and frequency of the accidents to which railway employees were exposed the report continues (p. 3):

"REMEDY SUGGESTED.

"It is the judgment of this committee that all cars and locomotives should be equipped with automatic couplers, obviating the necessity of men going between the cars, and continuous train brakes that can be operated from the locomotive and dispense with the use of men on the tops of the cars; that the locomotive should be provided with power driving wheels rendering them easy of control."

The Senate Committee's report on the bill is to the same effect.[2]

The language of Sec. 1 which is relied on by Appellant came into the bill by Senate amendment. In explaining the amendment to the Senate, Senator Cullom, who was in charge of the bill, stated (24 Cong. Rec. 1273):

"I will state that the first section of the amendment reported by the Committee as a substitute for the House bill simply provides that after the first of January, 1895, it shall be unlawful for a common carrier engaged in interstate commerce by railroad to use on its lines locomotive engines in moving interstate traffic not equipped with power driving-wheel brakes and appliances for operating the trains, etc., the section requiring only a sufficient number of cars to be so equipped as will enable the engineer to control the train.

[2]Senate Report No. 1049, 52nd Cong. 1st Sess.

"There is nothing in the section that has any reference to the Interstate Commerce Commission or to any board outside in determining anything about it. The naked proposition is that it shall be unlawful after a given date to run locomotives not equipped with power brakes, or to run any train in interstate traffic which has not a sufficient number of cars in it so equipped with power brakes that the engineer can control it."

The amendment of March 2, 1903 (32 Stat. 943) was designed "to make more clear and effective" the provisions of the 1893 Act.[1] One of its purposes was to "make certain that which was uncertain" in the requirements of section 1 relating to the use and amount of power or train brakes. *United States v. Baltimore and O. R. Co.*, 176 Fed. 114, 116. It accomplished this purpose by including in the Act what is now section 9, providing, among other things, that when any train is operated with power or train brakes not less than 50 percent of the cars in such train shall have their brakes used and operated by the engineer (authority being given the Interstate Commerce Commission to increase the minimum percentage). The amendment thus was a restatement of the amount or proportion of power brakes required to be used.

Section 1 is now to be read and construed with the modifying and explanatory act of 1903. *United States v. Pere Marquette R. Co.*, 211 Fed. 220, 223. When so construed it is clear that the subject of the provisions of the Act here under discussion is the regulation and use of the brake appliances.

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[1] House Report No. 15144, 57th Cong. 1st Sess.

(2) THE FIELD OCCUPIED BY SECTION 25 OF PART I OF THE INTERSTATE COMMERCE ACT.

Sub-section (b) of section 25 (49 U. S. C. 25(b)) reads:

> "* * * the commission may, after investigation, if found necessary in the public interest, order any carrier * * * to install the block signal system; interlocking, automatic train stop, train control, and/or cab-signal devices and/or other similar appliances, methods, and systems intended to promote the safety of railroad operation, which comply with specifications and requirements prescribed by the commission, * * *."

The preamble of the Act of August 26, 1937 (c. 818, 50 Stat. 835) amending Sec. 25 to its present content, reads:

> "AN ACT TO require common carriers by railroad to install and maintain certain appliances, methods, and systems intended to promote the safety of employees and travelers on railroads, and for other purposes."

As in the case of the Safety Appliance Act, the field carved out by the provisions of this section is specific. It is the requirement and maintenance of the mechanical equipment thus designated. As Appellant concedes (Br. Vol. I, p. 221), under settled rules of statutory construction, the words "other similar appliances, methods, and systems" refer to devices of the same general nature as those specifically named. *Cf. Missouri Pac. R. Co. v. Norwood*, 283 U. S. 249; 257.

The legislative history of Sec. 25 supports this construction. The section as first enacted (Sec. 441 of the Transportation Act, 1920; 41 Stat. 498) dealt with the requirement of "automatic train-stop or train-control devices or other safety devices". The committee reports upon the measure show that what Congress had in mind was a provision which would hasten the use of these mechanical devices which had been under experimentation for many years. Thus the report of the House Committee on H. R. 10453 state:[1]

"AUTOMATIC TRAIN CONTROL.

"Section 439 gives the commission after investigation authority to order any carrier by railroad to install automatic train-stop or train-control devices, which comply with specifications and requirements prescribed by the commission. Automatic train-control devices have passed the experimental stage and in the interest of the public as well as the safety of employees, your committee believes that some action should be taken by Congress which would hasten the installation of such safety devices. * * *"

The Conference Report on H. R. 10453[2] which reported out the section in the form in which it became law stated, in the explanation of the Managers on behalf of the House, that the conference bill contained the House provision respecting the requirement of train-stop or control devices, adding a similar power in the commission as to "other safety devices".

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[1]House Report No. 456, 66th Cong. 1st Sess., p. 22.

[2]House Report No. 650, 66th Cong. 2nd Sess., p. 70.

There had been in effect since 1906 a statute (45 U.S.C. 35) which empowered the Commission to investigate and report upon the use and necessity for block signal systems and appliances for the automatic control of railway trains, and since 1908 an additional statute (45 U. S. C. 36) which authorized the Commission to investigate, test experimentally, and report upon the use and need of "any appliances or systems intended to promote the safety of railway operation which may be furnished in completed shape to such commission for such investigation and test * * *."

It was after years of such investigation and experience that the section under consideration was adopted, and it is in this setting that the statute is to be understood and construed.[1]

Section 25 was amended to its present content by the Act of August 26, 1937 (50 Stat. 835). This amendment extended the authority of the Commission to include block signal systems, interlocking devices and cab-signal systems. Again the committee reports on the amendment speak only of mechanical devices and systems as the subject of the legislation.[2]

Reference to the full text of the section demonstrates that it is intended to occupy only the field of requiring and regulating the specified mechanical devices. Sub-

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[1]See *Delaware & H. Co. v. United States*, 5 F. 2d 831, for a description of automatic train-stop or train-control devices and Commission orders entered under present Sec. 25. And see also 1 *Sharfman, The Interstate Commerce Commission*, p.275ff., for an explanation of the circumstances surrounding the enactment of the section.

[2]Senate Report No. 245, 75th Cong. 1st Sess.; House Report No. 456, 75th Cong. 1st Sess.

secs. (c), (d) and (e) implement sub-sec. (a). Sub-sec. (c) requires each railroad to file with the commission its rules for the installation, inspection, maintenance and repair of the systems, devices and appliances covered by this section. Sub-sec. (d) authorizes the commission to inspect and test them; and Sub-sec. (e), stating the requirement of obedience to commission orders, provides that it shall be unlawful for any carrier to use such sysetems, etc. unless such *apparatus* is in proper condition and safe to operate.

There is no evidence that the Interstate Commerce Commission understands that this section affords it jurisdiction to do more than to regulate the designated appliances. Its conception of the powers conferred upon it is stated in the *Power Brake Investigation Case*, 91 I. C. C. 481, (quoted at pp. 221-2, Vol. I, of Appellant's brief) as follows:

> "This is a proceeding instituted by us on our own motion under Section 26 [now Section 25] of the Interstate Commerce Act, which authorizes us, after investigation, to *order the installation of automatic train-stop or train-control devices, or other safety devices*, which comply with specifications and requirements prescribed by us, * * *." (Emphasis ours.)

Nowhere in that report, or in the subsequent reports in that proceeding (see Appendix to Appellant's Brief, Vol. I) is there any finding, order, or requirement made respecting the regulation of train lengths. We understand that the Commission has never entered any order limiting the number of cars in a train, or made any investigation or recommendation concerning the latter subject.

(3) THE FIELD OCCUPIED BY THE ARIZONA LAW.

This field is, of course, the number of cars which may be run in a train. It does not regulate the mechanical equipment or appurtenances upon cars, locomotives or trains. Its purpose is to protect against hazards due to the number of cars in, or the length of, trains. These hazards include, among others, those due to "slack" and slack "action", including those wherein the functioning of the brakes is not a factor; dangers wherein employees are prevented from properly giving or receiving signals or communications or from observing defects in the train; hazards caused by loss of efficiency of employees due to fear of danger and to increased responsibility and difficulty in the performance of duty.

B. No Intention Can Be Attributed to Congress in Enacting the Federal Statutes to Occupy the Field of Regulating Train Lengths.

It is true that the purpose of both the federal and state statutes here under considerations is to promote safety. Assuming for the moment the field of safety to be one generic field of regulation, it is of course recognized that Congress may limit its occupation to only a part of such field, and thus leave the remainder open for action by a state. *Savage v. Jones*, 225 U. S. 501, 533; *Kelly v. Washington*, 302 U. S. 1, 10. Under this rule, it is clear that Congress, in selecting the field of safety appliances and equipment as the object of regulation, has occupied only the portion of the general field of safety regulation thus selected.

The specific nature of the requirement of these federal laws emphasizes the intent to confine their application to

the subjects designated. *Atlantic Coast Line v. Georgia*, 234 U. S. 280. And the very detail in which the subjects of the federal regulation have been specified precludes the statutes extention to other subjects by implication. *Cf. Peoria Ry. Co. v. United States*, 263 U. S. 528, 534. We suggest that *Atlantic Coast Line v. Georgia* applies with special force here. Even though the device required by the Georgia law, the electric headlight, was a mechanical appliance, this Court held that Congress by enacting the Safety Appliance Act had not intended or decided to legislate with respect to headlights, and that the state was free to legislate on the subject. And see also *International etc. R. Co. v. Railroad Comm. of Texas*, 281 S. W. 1084 (affirmed 275 U. S. 503) where, prior to the amendment of present Sec. 25 of Part I of the Interstate Commerce Act to cover interlocking devices, it was held that the right of a state to require such devices had not been ousted by this section. *A fortiori* where, as in our case, the matters dealt with by the state and federal statutes are so different in nature, the intention of Congress to leave the former free of regulation appears clear. In this connection, it may be noted that in *Terminal R. Assn. v. Brotherhood of R. Trainmen*, 318 U. S. 1, 4, this Court expressed its understanding that neither the Safety Appliance Act nor the Interstate Commerce Act by themselves and unimplemented by Commission action lay down any requirement respecting the use of cabooses on the runs in question, saying that at least in the absence of Comission action these Acts do not themselves preclude the state order. It was added that the court found it unnecessary to decide what might be the extent of the Commission's power under such Acts. In our case, as in this one, the

Commission has not made any order on the subject covered by the state statute.

From the analysis made above it is quite clear that the federal and state statutes occupy different fields. They accomplish their regulation by wholly different means, and operate on entirely different objects. The situation here is the reverse of that presented in the *Napier* case where the Court, in holding that federal and state statutes occupied the same field, observed that:

> "The federal and the state statutes are directed to the same subject—the equipment of locomotives. They operate upon the same object." (272 U. S. at p. 612.)

In view of the differences thus shown, we submit that the federal statutes do not occupy the field covered by the Arizona law, and that no intention can be attributed to Congress to exclude or displace the state act. This is particularly plain when the federal statutes are construed in accord with the recognized rule that the intention of Congress to exclude or supersede state legislation—particularly where the state measure has been enacted to preserve public safety—must be definitely expressed and clearly manifested, and is not to be lightly inferred.

Mauer v. Hamilton, 309 U. S. 598, 614;

H. P. Welch Co. v. New Hampshire, 306 U. S. 79, 85, and cases there cited;

Missouri Pac. R. Co. v. Norwood, 283 U. S. 249, 257;

Cf. Cloverleaf Butter Co. v. Patterson, 315 U. S. 148, 156.

C. There Is No Conflict Between the Federal Statutes and the Arizona Law.

The test of whether there is conflict between federal and state statutes is an important aid in resolving the point under consideration. Unless such conflict is shown, the sovereign power of the state to enact legislation under its reserved police power will be sustained. *Parker v. Brown*, 317 U. S. 341, 359. *Cf. Cloverleaf Butter Co. v. Patterson, supra.* The yardstick to be used in determining the question of such conflict is stated by this Court as follows:

> "May not the statutory provisions stand without obstructing or embarrassing the execution of the act of Congress? This question must, of course, be determined with reference to the settled rule that, a statute enacted in execution of a reserved power of the state is not to be regarded as inconsistent with an act of Congress passed in the execution of a clear power under the Constitution, unless *the repugnance or conflict is so direct and positive that the two acts cannot be reconciled or stand together.*" (Emphasis ours.)
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> *Missouri etc. R. Co. v. Haber*, 169 U. S. 613, 623.

> "The principle is thoroughly established that the exercise *by the state of its police power, which would be valid if not superseded by federal action, is superseded only where the repugnance or conflict is so 'direct and positive' that the two acts cannot be 'reconciled or consistently stand together.'* (Emphasis ours.)
>
> *Kelly v. Washington*, 302 U. S. 1, 10.

In applying this yardstick in the instant case, a consideration of the history of these several statutes would seem to be sufficient to show the fallacy of the Appellant's contention.

Section 1 of the Safety Appliance Act was enacted by Congress in 1893, Section 9 in 1903, and Section 25, Part I, of the Interstate Commerce Act in 1920. The Train Limit Law was enacted by a vote of the people of Arizona in 1912.

Continuously since the enactment of the Train Limit Law in 1912, the Arizona Train Limit Law and Sections 1 and 9 have stood together in full force and effect. Continuously since 1912, Sections 1 and 9 of the Safety Appliance Act have been fully and completely enforced in Arizona. Brake appliances and changes in brake appliances have been approved by the Interstate Commerce Commission and increases in the percentage of cars in a train required to be operated by power brakes have been ordered by the commission. Continuously since 1912, the railroads have complied in Arizona, just as elsewhere, with the provisions and requirements of said Sections 1 and 9. At no time has the Train Limit Law in any manner or to any extent obstructed or embarrassed the enforcement or execution of said Sections 1 and 9. Not the slightest difference has resulted by reason of the Train Limit Law in the execution and enforcement of Sections 1 and 9 in Arizona from their enforcement and execution in other states.

Likewise, Section 25, Part I, of the Interstate Commerce Act, since its enactment in 1920, and the Train Limit Law have stood together. Section 25 of the Interstate Commerce Act has been fully and completely en-

forced in Arizona, just as elsewhere, and complied with by the railroads. At no time has the Train Limit Law obstructed or embarrassed the enforcement or execution of said Section 25.

The fact that the Train Limit Law has operated side by side with Sections 1 and 9 of the Safety Appliance Act for approximately thirty years, and side by side with Section 25, Part I, of the Interstate Commerce Act for approximately twenty years without in the least iota obstructing or embarrassing the enforcement or execution of these federal statutes, or either of them, constitutes conclusive evidence, we believe, under the decisions of this Court cited *supra*, that the Train Limit Law does not invade a field already occupied by these federal statutes.

There is, of course, a plain reason why these statutes operate without conflict. The Safety Appliance Act and requirements issued under Section 25 regulate the brake equipment to be used on a train, not the number of cars therein. The Arizona law regulates the number of cars without reference to brake equipment. Thus the Federal statutes require adequate power brakes (*i. e.*, power brakes on a specified proportion of the cars in a train) without regard to the length of the train. This requirement is the *same* whether *5 or 100* cars be operated in a train. Indeed, a carrier may have as many cars in a train as it pleases, be it 5 or 500, so long as the brake equipment meets the federal standards.

Appellant's contention (brief, Vol. I, p. 215 *et seq.*) that Section 1 of the Safety Appliance Act should be construed to regulate the length of trains is without substance. This contention is based upon the language of the section that

no train shall be run "that has not a sufficient number of cars in it so equipped with power or train brakes that the engineer * * * can control its speed without requiring brakemen to use the common hand brake for that purpose.

This provision should be construed in the light of its purpose. It was enacted to obviate the dangers involved in the use of hand brakes. *New York Central R. Co. v. United States*, 265 U. S. 41, 44-5; *United States v. Grand Rapids & I. Ry.*, 244 Fed. 609, 612; *Virginian Ry. Co. v. United States*, 223 Fed. 748, 751. This purpose was accomplished *by requiring the substitution of an improved and safe mechanical device* (power brakes) for an unsafe or defective one (hand brakes). *United States v. State of California*, 297 U. S. 175, 185. The regulation does not go to the number of cars that might be run in a train, but goes only to the number which shall be equipped with power brakes, *i. e.*, a number sufficient to make the use of hand brakes unnecessary.

It is undoubtedly true, as Appellant states, that there must be some limit to the effectiveness of any air brake. And when that limit is passed the power brake provision of the Safety Appliance Act may tend to regulate the number of cars which may be operated. But if such is the effect of this provision, it certainly does not show the "positive or direct" conflict or repugnance which is required to supersede the state police measure. *Kelly v. Washington*, quoted *supra*. Indeed, there is no conflict at all, because the practical limit of the effectiveness of air brakes may operate as a natural law without disturbing the enforcement of the state law, and *vice versa*. At most this effect is but the indirect and incidental result of the

regulation of the braking equipment required by the federal law. The carrier may have as many cars in the train as it pleases, so long as the brake equipment meets the requirement of this section.

This, we submit, is the holding of the courts in *Virginian Ry. Co. v. U. S.*, 223 Fed. 748; *New York C. R. Co. v. U. S.*, 265 U. S. 41; *U. S. v. Great Northern R. Co.*, 229 Fed. 927; *U. S. v. Grand R. & I. R. Co.*, 244 Fed. 609; and *Pennsylvania Co. v. U. S.*, 241 Fed. 824.

The Appellant, in an endeavor to create conflict between the state and federal statutes, argues that the purpose and effect of the Train Limit Law is to regulate with respect to the brakes used in train operations, and that Appellee has admitted or recognized this by the introduction of evidence with respect to air brakes and their operation. (Br., Vol. I, p. 233, *et seq.*) This argument is ingenious but fallacious.

This argument assumes that the hazards resulting from slack action, and particularly from slack action resulting from the use of air brakes, is the only hazard protected against by the Train Limit Law. In our argument upon the Safety Evidence, beginning at page 93 of this brief (to which we refer to save repetition), we show that in addition to the hazard due to slack action the Train Limit Law protects against hazards in no way related to slack action or to the brake equipment on a train. We also show with respect to slack action that serious slack action accidents occur at times when the brakes are not being operated and therefore without any relation or connection to the brakes. Where a train is operated in territory where there are hog-backs and dips, the head-end of the train may be on an upgrade which retards its speed while the rear-end

is on a downgrade, causing the slack to run-in. Or the speed of the head-end of a train may be reduced by the resistance of a curve and the run-in of the slack from the rear-end cause an accident without the brakes being touched. Example of these two types of accidents are found in item 45, Record, page 3329, and item 36, Record, page 3328. A more complete discussion of these and similar accidents appears beginning at page 102 of this brief, to which we refer to save repetition.

The Appellant overlooks the purpose of Appellee's evidence respecting air brakes. Appellant contended below, and is contending here (Br., Vol. I, p. 270 *et seq.*), that the Train Limit Law is invalid because of changes in conditions since its enactment. It was to meet this contention and show that the hazard resulting from slack action in long trains has not been removed by improvement in air brakes, that the evidence as to air brakes and their operation was presented by the Appellee. It requires only a reading of the Train Limit Law to see that it in no way regulates or has relation to air brakes or other appliances. It limits the length of freight trains to 70 cars and passenger trains to 14 cars, *regardless of the type or character of brakes used, or their efficiency or inefficiency*. Certainly there is no regulation of brake equipment or other appliance there.

That the Safety Appliance Act and Sec. 25 of the Interstate Commerce Act do not conflict with the state law may be further demonstrated by the fact that the former neither provide for, or by implication reach, the kind of regulation contemplated by the latter or the results accomplished by it. Assume the Interstate Commerce Commission in an investigation should find and determine that

freight trains with more than 70 cars and passenger trains with more than 14 cars cannot be operated safely. Where in the Safety Appliance Act or in Sec. 25 of the Interstate Commerce Act is there any power or authority given to the Commission *to order that no trains be operated with the number of cars in excess of the limit fixed by the Commission?* Or suppose a Commission investigation shows a territory or stretch of track with a sag or dip; that the brakes are never required, nor could they be used, in operating over this territory; that there is usually slack action in trains passing across this dip due to the slack running in from the rear as the speed of the head-end of the train is slowed down coming up out of the dip; that accidents with many casualties are *frequent* on *long* trains but rarely, if ever, occur on *short* trains [compare item 45, R. 3329—the I. C. C. report of this accident on the Pennsylvania R. R. at Manor, Pa., is a part of Ex. 311]. Since the brakes are not used in operating over the territory, the accidents were not due in any respect to the brake equipment—nor to any other appliance. It would seem that the only logical finding that the Commission could make would be that the accidents were caused by the severity of the slack action due to the length of the train. An order requiring certain brake equipment would not remedy the situation because the brakes were not involved in the accident. The only order which would prevent the accidents and resulting casualties would be an order limiting the length of trains operated over the territory. *But where would the Commission find the power or authority to enter such an order?* Certainly not under the Safety Appliance Act or Sec. 25 of the Interstate Commerce Act because they grant to the Commission *only power and authority to order the use of specified standards*

of brakes or other appliances. The situations may be multiplied wherein factors not involving the brake mechanism or any mechanical appliance may require regulation of train lengths in the interest of safety. No power or authority is given the Commission in these situations or any other to limit the number of cars that may be operated in a train.

In summary, the Arizona Train Limit Law, which Appellant contends invades a field already occupied by Congress by reason of the aforesaid federal statutes, deals *only* with the *number* of cars permitted in trains operated in the State of Arizona. It in no way deals with, relates to or is concerned with the brake equipment, signal system, train control, or any other appliance used in the operation of the trains. The Arizona law is violated only when a train is operated within the state with more cars than the law permits. There can be no possible repugnance or conflict between the Arizona Train Limit Law and the federal statutes named because the Train Limit Law can in no possible way obstruct or embarrass the enforcement or execution of those statutes, or any of them, and because the state statute and the federal statutes deal with entirely different and unconnected subjects. State regulation of the number of cars in a train does not and cannot, in any possible way, affect or conflict with the federal regulation of the brake equipment, signal system, train control or other appliances used.

D. Assuming Arguendo That Section 25 of Part I of the Interstate Commerce Act Contemplates Authority in the Commission to Regulate Train Lengths, Occupancy of This Field Has Not Occurred.

Where Congress delegates to an administrative agency authority to regulate in a given field, two questions arise in determining whether state authority is thereby ousted: (1) whether the agency has acted in pursuance of such authority, and (2) whether Congress intended the legislation to occupy the field unimplemented by Commission action. This rule, among others, governs the applicability of Sec. 25 of Part I of the Interstate Commerce Act in the instant case.

It will be conceded, we take it, that the Commission has made no order limiting train lengths under this section.

As to the intention of Congress to occupy the field in the absence of administrative action, we believe (again assuming administrative authority to have been conferred) the situation here to be like that in *H. P. Welch Co. v. New Hampshire*, 306 U. S. 79. There this Court decided that Congress did not intend the state safety measure to be nullified before the federal agency had prescribed regulations on the matter. As one of the factors making clear the intention of Congress, the Court pointed out that the federal statute (Sec. 204(a) of the Motor Carrier Act), although imposing upon the Commission the duty to "regulate", *merely authorized* it to establish reasonable requirements with respect to the matter dealt with by the state law, *viz.*, maximum hours of service of drivers of motor vehicles. (306 U. S. at p. 84.)

In our case, all Section 25(b) does is to authorize the Commission to order the use of the designated devices—

and this only after investigation discloses the necessity therefore. The section does not go as far as the Motor Carrier Act, for it does not impose a "duty" to "regulate", as does the latter Act.[1] Moreover, the authority of the Commission to regulate train lengths (assumed *arguendo*) would have to be based upon a construction of the statutory language which, to say the least, is far-fetched and not readily ascertained from the language itself. Thus, where regulation is so plainly dependent upon prior investigation and the exercise of administrative discretion as a condition precedent to its imposition, and also upon a strained construction of the statutory language, we submit that it cannot be said that Congress had manifested its clear intention to displace the Arizona law by the mere enactment of the enabling legislation set forth in Sec. 25.

4. The Arizona Law Is Not Unconstitutional Because of Claimed Burden Upon, or Interference With, Interstate Commerce, or Because of Alleged Unreasonableness as a Safety Regulation.

Assignments of Error 3, 4 and 6 charge, in substance, that the Supreme Court of the State of Arizona erred in failing to hold the Train Limit Law

(3 and 4) unconstitutional and in violation of the Commerce Clause because its necessary and inevitable effect is to interfere with, delay, obstruct and regulate, directly, substantially and reasonably the operation and movement of interstate trains and to impose direct, substantial and

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[1] It will be observed that in the *Welch Co.* case such duty to regulate was not considered to be of controlling significance in view of the permissive nature of the authority to act.

unreasonable financial burdens upon the interstate commerce carried on by Appellant.

(6) in violation of the Commerce Clause and the Due Process Clause of the Fourteenth Amendment because it operates arbitrarily and unreasonably to deprive Appellant of its property without due process of law and bears no reasonable relation to health or safety.

We are considering these assignments together because in the final analysis each presents the identically same questions.

These assignments of error present two propositions, namely:

1. The extent of the burden imposed by the Train Limit Law is so great that, notwithstanding it has a rational relation to safety, it imposes an unreasonable burden on interstate commerce in violation of the Commerce Clause and of the Fourteenth Amendment to the Constitution.

2. The Train Limit Law has no rational relation to safety.

The Appellee contends:

1. The *extent* of the burden on interstate commerce, if any, by reason of the Train Limit Law may not be considered by the Court in determining the reasonableness of the law.

2. The Train Limit Law has a rational relation to and basis in safety and is therefore a proper exercise of the state's police power and is constitutional.

A. The Extent of the Burden on Interstate Commerce, if Any, by Reason of the Train Limit Law May Not Be Considered by the Court in Determining the Reasonableness of the Law.

In considering this proposition *it must be assumed* that the Train Limit Law has a rational relation to safety. If the law has no rational relation to safety, the burden on interstate commerce resulting by reason of the law is, as we have conceded in our discussion of Assignment of Error I, *direct* and the law is unconstitutional because it is a *direct* regulation of interstate commerce. Where the state regulation is *direct* the extent of the burden, whether it is great or small, has no bearing upon the question of the constitutionality of the law. The law is unconstitutional *regardless* of the extent of the burden on interstate commerce.

A substantial part of the evidence presented by the Appellant in the trial court was presented for the purpose of showing the burden imposed upon interstate commerce by the Train Limit Law. As we have heretofore pointed out (p. 42, *supra*), we differ greatly with Appellant concerning the conclusions to be drawn from the evidence as to the extent of the burden shown, the cost of compliance, the interference with operations and the like. However, we present no argument or discussion, other than heretofore presented, on this question for the reason that we believe that, under the decisions of this Court, while the evidence was admissible to show *a burden* on interstate commerce resulted from the operation of the law, the extent of the burden is *not* a question or element to be considered by the Court in determining the constitutionality of the Train Limit Law.

(a) Under the Commerce Clause.

The question as to whether *under the Commerce Clause*, in determining the validity of a state statute enacted under the state's police power, the consideration of the extent of the burden imposed on interstate commerce—whether it *is too great* with relation to the national interest in commerce—is a legislative or judicial function has been fully discussed in our argument concerning the so-called "exclusive national field" of regulation of interstate commerce. The Appellant's contention here that the extent of the burden may be considered by the Court, in determining the "reasonableness" of the state law under the Commerce Clause, is merely a repetition, dressed in different clothes, of Appellant's argument as to the "exclusive national field" of regulation of interstate commerce. The reasonableness, in this respect, of a state police statute *under the Commerce Clause* can only be measured by its effect on interstate commerce—whether the burden imposed on interstate commerce is *too great*. The determination of that question is, as we have pointed out, a legislative, and not a judicial, function.

(b) Under the Fourteenth Amendment.

In considering the constitutionality of state police statute under the Fourteenth Amendment, the cost of compliance or the extent of the burden resulting from the state regulation *becomes a matter of judicial consideration only* when a method of regulation is shown, other than that adopted by the law in question, which will accomplish the identical object or purpose of the law in question. This applies to both the Commerce Clause and the Fourteenth Amendment.

In *Erie R. R. Co. v. B'r'd of Comm.*, 254 U. S. 394, 410, in sustaining the constitutionality of a state law requiring a separation of grades where a railroad crossed a highway, this Court said:

> "Being places to which the public is invited, and that it necessarily frequents, the state, in the care of which this interest is, and from which, ultimately, the railroads derive their right to occupy the land, has a constitutional right to insist that they shall not be made dangerous to the public, *whatever may be the cost to the parties introducing the danger.* That is one of the most obvious cases of the police power, or to put the same proposition in another form, the authority of the railroads to project their moving masses across thoroughfares must be taken to be subject to the implied limitation that it may be cut down whenever and so far as the safety of the public requires. It is said that if the same requirement were made for the other grade crossings of the road it would soon be bankrupt. That the states might be so foolish as to kill a goose that lays golden eggs for them, has no bearing on their constitutional rights. If it reasonably can be said that safety requires the change, it is for them to say whether they will insist upon it, and neither prospective bankruptcy nor engagement in interstate commerce can take away this fundamental right of the sovereign of the soil." (Emphasis ours.)

In *Lehigh V. R. Co. v. B'r'd of Comm.*, 278 U. S. 24, 34, the italicized part of the above quotation was modified by the following statement:

> "This is not to be construed as meaning that danger to the public will justify great expenditures, unrea-

sonable burdening the railroad, *when less expenditure can reasonably accomplish the object of the improvements and avoid the danger.*" (Emphasis ours.)

In *South Carolina Hy. Dept. v. Barnwell, Bros., supra,* the Court said (303 U. S. at 190):

"In the absence of such legislation (Congressional legislation) the judicial function under the Commerce Clause * * * as well as the Fourteenth Amendment, stops with the inquiry whether the state legislature in adopting regulations such as the present *has acted within its province, and whether the means of regulation chosen are reasonably adapted to the end sought* * * *." (Parenthesis and emphasis ours.)

In other words, the holding of the Court in the *Erie R. R. Co.* case, that cost of compliance may not be considered by the Court in determining the constitutionality of state police power regulation, was modified *only* with respect to situations where it was shown that the object of the state regulation in question could be accomplished at less expense *by other methods* of regulation.

And see:

Nashville C. & St. L. R. Co. v. White, 278 U. S. 456;

Missouri P. R. Co. v. Omaha, 235 U. S. 121;

C. & R. Co. v. Tranbarger, 238 U. S. 67.

No such situation is shown in the record herein. The object of the Train Limit Law is to protect against the dangers which are incident to the increase in the length of a train. No method, other than that adopted by the Train Limit Law, has been shown which will accomplish this object, and the exception or modification stated in the *Lehigh V. R. Co.* case has no application here.

(c) Under the Commerce Clause and the Fourteenth Amendment.

When the constitutionality of a state statute enacted under the state's police power is in question, in the absence of Congressional legislation on the subject, "the judicial function under the commerce clause * * * as well as the Fourteenth Amendment, stops with the inquiry whether the state legislature in adopting regulations such as the present has acted within its province, and whether the means of regulation chosen are reasonably adapted to the end sought." (303 U. S. at 190.)

That the Legislature and the people of the State of Arizona acted within their province in adopting the Train Limit Law has been established by the decisions of this Court. Paraphrasing the language of Mr. Chief Justice Stone in *South Carolina Hy. Dept. v. Barnwell Bros.*, 303 U. S. at 190. Here the first inquiry has already been resolved by the decisions of this Court that a state may impose nondiscriminatory restrictions with respect to the operation of railroads engaged in interstate commerce as a safety measure. Among the cases which have so resolved are the following:

Smith v. Alabama, 124 U. S. 465;

Nashville C. & St. L. R. Co. v. Alabama, 128 U. S. 96;

New York, N. H. & H. R. Co. v. New York, 165 U. S. 628;

Chicago, R. I. & P. R. Co. v. Arkansas, 219 U. S. 453;

St. Louis M. & S. R. Co. v. Arkansas, 240 U. S. 518;

Hennington v. Georgia, 163 U. S. 299;
Missouri P. R. Co. v. Norwood, 283 U. S. 249;
Erie R. R. Co. v. B'd of Comm., 254 U. S. 394;
Lehigh V. R. Co. v. B'd of Comm., 278 U. S. 24;
Missouri K. & T. R. Co. v. Haber, 169 U. S. 613;
Atlantic C. L. R. Co. v. Georgia, 234 U. S. 280;
Terminal R. Ass'n. v. Bro. of R. T., 318 U. S. 1.

In resolving the second inquiry "courts do not sit as Legislatures, either state or national. They cannot act as Congress does when, after weighing all the conflicting interests, state and national, it determines when and how much the state regulatory power shall yield to the larger interests of a national commerce. * * * a court is not called upon as are state Legislatures, to determine what, in its judgment, is the most suitable restriction to be applied of those that are possible, or to choose that one which in its opinion is best adapted to all the diverse interests affected. (Citing cases.) When the action of a Legislature is within the scope of its power, fairly debatable questions as to its reasonableness, wisdom and propriety are not for the determination of the courts, but for the legislative body on which rests the duty and responsibility of decision. (Citing many cases.) * * * This is equally the case when the legislative power is one which may legitimately place an incidental burden on interstate commerce. It is not any the less a legislative power committed to the states because it affects interstate commerce, and courts are not any the more entitled, because interstate commerce is affected, to substitute their own for the legislative judgment. (Citing many cases.)" (303 U. S. at 190, 191.)

The Solicitor General suggests that the test as to whether or not the state police statute is reasonably adapted to the end sought is not the same under the Commerce Clause as under the Fourteenth Amendment. We have found no decision by this Court which supports this suggestion, except in the situation referred to in *Lehigh Valley R. Co. v. Bd. of Comm., supra.* On the contrary, in those cases where the validity of a state police statute has been brought in question under both the Commerce Clause and the Fourteenth Amendment, as in *South Carolina Hy. Dept. v. Barnwell Bros., supra, one and the same test* has been applied under the Commerce Clause and under the Fourteenth Amendment in determining whether the statute was "reasonably adapted to the end sought."

The test or yardstick to be used by the Court has been variously stated in the decisions of the Court.

> "Being a legislative judgment it is presumed to be supported by facts known to the legislature unless facts judicially known or proved precluded that possibility. Hence, in reviewing the present determination, we examine the record *not to see whether the findings of the court below are supported by the evidence, but to ascertain upon the whole record whether it is possible to say that the legislative choice is without rational basis.*" (Emphasis ours.)
>
> *South Carolina Hy. Dept. v. Barnwell Bros.*, 303 U. S. at 191.

> "Hence, in passing on the validity of the present classification, it is not the province of a court to hear and examine evidence for the purpose of deciding

again a question which the legislature has already decided. *Its function is only to determine whether it is possible to say that the legislative decision is without rational basis.*" (Emphasis ours.)

Clark v. Paul Gray, 306 U. S. 583, 594.

"The legislature is, in the first instance the judge of what is necessary for the public welfare, and a judicial review of its judgment is limited. *The earnest conflict of serious opinion* does not suffice to bring it within the range of judicial cognizance." (Emphasis ours.)

Erie R. Co. v. Williams, 233 U. S. 685, 699.

"* * * The extent to which, as means, they conduce to that end, the degree of their efficiency, the closeness of their relation to the end sought to be attained, are matters addressed to the judgment of the legislature, and not to that of the courts. *It is enough if it can be seen that in any degree, or under any reasonably conceivable circumstances, there is an actual relation between the means and the end.*" (Emphasis ours.)

Stephenson v. Binford, 287 U. S. 251, 272.

And see:

Nashville etc. R. Co. v. White, 278 U. S. 456;

McLean v. Arkansas, 211 U. S. 539;

Tanner v. Little, 240 U. S. 369;

Chicago, Burlington & Quincy Railroad Co. v. McGuire, 219 U. S. 549;

Arizona Copper Co. v. Hammer, 250 U. S. 400;

Erie R. Co. v. Williams, 233 U. S. 685;

Standard Oil Co. v. Marysville, 279 U. S. 582;
Stephenson v. Binford, 287 U. S. 521;
Gant v. Oklahoma City, 289 U. S. 98;
Bayside Fish Flour Co. v. Gentry, 297 U. S. 422.

In all these cases where the constitutionality of a state *police measure* was in question under both the Commerce Clause and the Fourteenth Amendment *one and the same test* was applied in determining whether the state statute was reasonably adapted to the end sought. We have found no case to the contrary. And we can see no logical reason why, in determining whether a state police measure is reasonably adapted to the ends sought, one test should be used under one constitutional provision and another test be used under another constitutional provision. It is difficult to understand how a state statute could be held reasonably adapted to the purpose of safety under the Commerce Clause and the same statute held not reasonably adapted to that purpose under the Fourteenth Amendment —or vice versa.

Under both the Commerce Clause and the Fourteenth Amendment to the Constitution the question as to whether or not the burdens upon interstate commerce resulting from state police power regulation are too great is legislative and for Congress, which may protect the national interest by legislation curtailing the state's power.

We believe under the decisions of this Court hereinbefore cited, the determination of the validity of the Train Limit Law rests *entirely* upon correctness of the contention that the law has a rational basis in safety. If the contention that the law has a rational basis in safety is supported by the record, the law is valid. If this conten

tion is not supported by the record, then the law is a direct regulation of interstate commerce and invalid.

Before presenting our discussion of the record, and replying to argument presented beginning page 270, Volume I, of Appellant's brief, we refer to certain further legal principles, often stated by this Court, to be applied when determining whether or not state regulation of interstate commerce is valid as a proper exercise of the state's police power.

It is not essential to the validity of a state statute enacted under the police power that the purpose of the statute be stated. The necessary effect of the statute and not its stated purpose determines its validity.

> "The question whether a state law deprives a party of rights secured by the Federal Constitution depends not upon how it is characterized, but upon its practical operation and effect.
>
> *Mountain Timber Co. v. Washington*, 243 U. S. 219, 237.

And see:

Standard Oil Co. v. Graves, 249 U. S. 389;

Ludwig v. Western Union Co., 216 U. S. 146, 162.

It is presumed that the legislature intended to act within the scope of its lawful authority.

Ex parte Young, 209 U. S. 123, 165-166;

Erie R. Co. v. Williams, 233 U. S. 685, 699;

Mountain Timber Co. v. Washington, 243 U. S. 219, 237-238;

United States v. Butler, 297 U. S. 1, 67.

While a law valid when enacted may become invalid by reason of changed conditions.

United States v. Carolene Products Co., 304 U. S. 144, 153,

every legislative enactment is presumed to be valid and constitutional, and the burden of proof is on those who seek to overthrow it. One who relies on changed conditions to invalidate a statute has the burden of proving that by reason of the changed conditions it is now possible to say, upon the whole record, "that the legislative choice is without rational basis."

South Carolina Hy. Dept. v. Barnwell Bros., 303 U. S. 177, 192;

Ex parte Young, supra;

Erie R. Co. v. Williams, supra;

Mountain Timber Co. v. Washington, supra.

The legislative judgment is presumed to be supported by facts known to it unless facts judicially known or proved preclude that possibility.

Clark v. Paul Gray, 306 U. S. 583, 594;

South Carolina Hy. Dept. v. Barnwell Bros., supra.

The appellant urges that in determining the validity of the Train Limit Law the Court may give consideration to the "common belief" that the law is unreasonable, and that this "common belief" is shown by the refusal of Congress and all but four states to enact a train limit law, and by the Interstate Commerce Commission Order No. 85, suspending all train limit laws during the war.

The refusal of a state legislature to enact such law is no indication of a "common belief" the law is unreason-

able. State legislatures determine state policy based upon *conditions within the state.* The most that can be said concerning the refusal of a state legislature to enact such a law is that the legislature considered it unnecessary in *that particular state.* And the measure may have prevailed in the lower house of the legislature and have been defeated by one vote in the senate, in which event the "common belief" would seem to be that the law was reasonable and desirable, although not enacted. As Appellant states (Appellant's Br., Vol. I, p. 299), employees through their organizations have appeared in support of proposed measures. But likewise representatives of the management have appeared in opposition. Legislative action or inaction is no indication of "common belief." As this Court said in *Adkins v. Children's Hospital*, 261 U. S. 525, 559-560:

> "We are asked, upon the one hand, to consider the fact that several states have adopted similar statutes, and we are invited, upon the other hand, to give weight to the fact that three times as many states, presumably as well informed and as anxious to promote the health and morals of the people, have refrained from enacting such legislation. We have also been furnished with a large number of printed opinions approving the policy of the minimum wage, and our own reading has disclosed a large number to the contrary. These are all proper enough for the consideration of the law-making bodies, since their tendency is to establish the desirability or undesirability of the legislation; *but they reflect no legitimate light upon the question of its validity, and that is what we are called upon to decide. The elucidation of that question cannot be aided by counting heads.*" (Emphasis ours.)

Likewise, the most that can be said concerning the refusal of Congress to pass a train limit law is that it considered a *national law* limiting the number of cars in a train was unnecessary. It is no indication of a "common belief" that *local or state regulation* was unnecessary or unreasonable.

Neither has the Interstate Commerce Commission by Service Order No. 85 indicated a belief on the part of the commission that state train limit laws are unnecessary or unreasonable. Service Order No. 85 in part provides [Par. 95,2, App. p. 2]:

> "This order, being based upon conditions of war emergency, shall not constitute a precedent for peacetime operations."

This indicates a belief that, while train limit laws should give way to the war emergency, they are a reasonable and proper regulation in peacetime operations.

"Belief" imports knowledge or information, at least to a degree sufficient to cause or form an opinion. It imports thought and consideration with respect to the matter in question. Very few people other than those connected with the operation of trains, give a thought to the manner in which trains are operated or whether one type of operation is more dangerous than another. They have no knowledge or information concerning the effect of train lengths on train operations, and therefore give no thought to and have no beliefs concerning the reasonableness of laws limiting train lengths. Of those connected with train operations, the *greater* number (the employees) believe the Train Limit Law is reasonable, proper and necessary. "Common belief", if there is such in relation to the Train Limit Law, *is in favor of the law.*

B. The Arizona Train Limit Law Has a Rational Relation to Safety.

The purpose and effect of the Arizona Train Limit Law is to protect against the dangers incident to the increase in the number of cars in trains operated. These dangers are real, and the Train Limit has a real basis in safety and is a proper exercise of the state's police power.

(a) Slack Action Accidents and Injuries Related to Train Lengths.

One of the dangers to both railroad employees and the public in train operations is slack action. Slack is the "play" or movement between cars. Slack action is the accumulated effect of that movement throughout the train in train operation. The total slack between two cars averages approximately seven and one-half inches. Slack is necessary because a rigid train could not turn curves, go over hills or through dips, and because locomotives could not start a rigid train of considerable length. Each additional car in a train increases the slack in the train by approximately seven and one-half inches.

The air-brake instructions printed and published by the Appellant and those printed and published by the Atchison, Topeka & Santa Fe are in evidence. Excerpts from these instructions are printed in the record [R. 3445-3461]. These instructions definitely recognize the danger in train operations from slack action and definitely recognize that those dangers *increase as the number of cars in a train increases*. We quote from these (emphasis ours):

> "Smooth train handling depends on the *ability to control the slack* and how to prevent it from running in or out harshly. Where so controlled, no draft gear in fair to good condition will be damaged. *Slack*

action cannot be prevented, but by acquiring knowledge of the various causes for it, and exercising forethought in the use of steam, train brakes, independent engine brake and sand it can be controlled, even to the extent of avoiding further injury to damaged draft gear. The heavier the engine and *the longer the train the greater is the care required.*

"When slack runs in or out one part of the train gradually attains a lower speed than the other and the shock is the result of draft gears having suddenly to make the speed uniform on the instant slack is all in or out. How heavy the shock will be depends mainly on *the difference in speed that must instantly be made uniform and on the weight that must suddenly be altered in speed.*" [Ex. 319, S. P. Air Brake Book, pp. 8-9; R. 3454. Ex. 152, Santa Fe Green Book, pp. 32-33; R. 3452.]

"At how low speeds brakes can be released without liability of damages depends on how heavily they are applied, the amount of main reservoir pressure, *the length of train*, whether slack is in or out, lightly or heavily, and on whether track conditions (sags, humps and curves) favor releasing. Engineers must exercise judgment in this, but taking all chances on the side of stopping." [Ex. 152, Green Book, p. 35; R. 1099.]

"Shocks are caused by the *difference in holding power* and speed throughout the train and to *consequent running of* the slack. The *longer the train* the greater may these differences become." [R. 3447. Ex. 152, Santa Fe Green Book, p. 17; R. 1099.]

"It follows from the foregoing that the nearer brakes are applied to full service application the more

promptly will they commence to release. Also that as a light reduction results in less excess, it is more liable to be followed by brakes failing to release. Where made from standard pressure it is also likely to be followed by overcharging in the attempt to insure release. *This becomes more pronounced the longer the train.* Therefore, it is undesirable as a general rule to attempt a release following a light reduction from standard pressure." [Ex. 152, Santa Fe Green Book, p. 28; R. 3447.]

"The difference in grade over which the train may be passing when the brakes are applied—for example, one portion of the train may be on an ascending grade, when the grade would assist the brake in stopping the cars; and another portion of the train may be on a descending grade, in which case the grade would oppose the effort of the brake to stop the cars. Such a condition requires care and judgment on the part of the engineman as regards the time and manner of operating the brake to prevent as far as possible severe shocks and strains due to the action of the slack in the train." [Ex. 152, Santa Fe Green Book, p. 16; R. 3446.]

"Shocks are caused by the difference in holding power and speed throughout the train and to consequent running of the slack. The *longer the train* the greater may these differences become. If the brakes are applied while the slack is stretched it will run toward the engine and the lower the speed and the heavier the application, the greater will be the shock, while if the brakes are released on a moving train the slack will run out unless some means is at hand for preventing it (see 'ET Equipment' and 'K Triple Valve') and will result in pulling strains on the draft

gear which will be aggravated by low speed and heavy brake pipe reduction. Parts of the train being on different *grades at the same time*, and car loading are among the causes for one portion of the train slowing down more rapidly than another. These are conditions that have to be met, and enginemen and trainmen are expected to understand them and exercise such judgment as will prevent damaging shocks." [Ex. 152, Santa Fe Green Book, p. 16; R. 3446.]

While these instructions refer to damage to equipment, certainly a shock sufficient to damage equipment would be dangerous to persons riding thereon—and very apt to "damage" such persons.

"Smooth train handling depends upon the ability to control the slack * * *. The heavier the engine and *the longer the train* the greater is the care required." "Shocks are caused by the difference in holding power and speed throughout the train and to consequent running of the slack. The *longer the train* the greater may these differences become." These statements definitely and distinctly recognize the danger from slack action in train operations and that this danger increases with the increase in the length of the train. The longer the train, the greater may be the differences in holding power and speed throughout the train, and the consequent running of slack, *and the greater the shock*. The longer the train the greater the care required because the greater the difficulty in controlling the slack—and so the greater the danger. These railroads in their instructions to their employees are calling attention to and warning the employees with respect to the very dangers against which the purpose of the Train Limit Law is to protect.

While it may be true that only 6% of *all* casualties to *all* employees on duty in *all* classes of service are due to slack action, it must be remembered that: 1. *All casualties*, of course, includes sand in the eye, pinched finger, accidents while the train is standing, and the like. 2. *All classes of service* includes *passenger* trains, yard operations and the like. Of course, it is clear from the record that by far the greater number of these accidents occur in road freight train operations. And, finally, all employees *excludes* accidents to the *public* caused by slack action. When these factors are considered the percentage shown has little significance.

The existence of these dangers from slack action is definitely and conclusively shown by the evidence. The trial court found that slack action accidents are "of comparatively infrequent occurrence" and a minor factor in determining the validity of the Train Limit Law. The fallacy of this is seen from the following facts taken from exhibits placed in evidence by the Appellant.

Exhibits 274 and 275 [R. 3351 and 3364] give the details of *all* casualties to *all* classes of *employees* on duty sustained in train and train service accidents, road freight train operations reportable to the Interstate Commerce Commission, years 1923 to 1939, inclusive, in the states of Arizona and Nevada, respectively.

For Nevada this detail for the twelve years shown, 1929 to 1940, inclusive, appears in the Record at pages 3367 to 3370, inclusive. From this detail it will be seen that during this period there were in Nevada 121 train and train service accidents to such employees with 134 casualties. Forty-eight, or 39.6%, of the 121 accidents were *slack action* accidents, and 61, or 45.7%, of the 134 casual-

ties occurred *in slack action accidents*. That is, approximately *two out of every five* accidents during the period were *slack action accidents*. Twenty-seven of the 121 accidents occurred while the trains were standing and one was sand or a particle in the eye. These 28 accidents could have no possible relation to the length of the train. Slack action can occur only when a train is in motion, and should be considered only in relation to accidents which occur while a train is in motion. Eliminating the standing and sand in the eye accident, there were in Nevada during this period, 93 train and train service accidents, to employees on duty, on trains *in motion*, with 106 casualties. Forty-eight, or 51.6%, of such accidents, and 61, or 57.5%, of the casualties *on trains in motion* were from *slack action*. In other words, the train and train service accidents *on trains in motion* to employees on duty resulting from slack action were greater than *from all other causes combined*. It can hardly be said, then, that slack action accidents are "of comparatively infrequent occurrence" or are "a minor factor."

In Arizona during the same period [R. 3350 to 3363, incl.] there was a total of 281 train and train service accidents to employees on duty, with 290 casualties. Of this total, 103 of the accidents were on standing trains and 15 were sand or a particle in the eye. On trains *in motion* there were 163 train and train service accidents to employees on duty, with 172 casualties. Of these 55, or 33.7%, of the accidents and 62, or 36%, of the casualties were from *slack action*.

In the two states there was a total of 256 train and train service accidents on *trains in motion*, employees on duty, and a total of 278 casualties. One hundred and three, or 40%, of these accidents, and 123, or 44%, of

the casualties were the result of slack action. Certainly then such accidents constitute more than a minor factor in considering safety.

These exhibits show conclusively that the frequency of slack action accidents and the severity of resulting injuries are directly related to the number of cars in a train.

(b) Slack Action Accidents Are Directly Related to the Number of Cars in a Train.

In our discussion of slack action accidents we are not to be understood as contending that such accidents do not occur on trains with less than 70 cars. They can, and sometimes do, occur on trains of 40, 30, 20 or even less, cars. But slack action accidents on these short trains are unusual. The amount of the slack in these trains is such that it can usually be controlled or, even if not controlled, there is not enough slack in the train to cause a shock sufficient to bring about an accident. But as cars are added, adding slack to the train, *both* the *difficulty in controlling* the slack and the *severity of the shock* resulting from slack action increase. As we have pointed out heretofore, both the Appellant, Southern Pacific Company, and Atchison, Topeka and Santa Fe Railroad Company in their air brake instruction books warn employees that as the length of the train increases *greater care* is required to handle the slack. In other words, as the length of the train increases, the difficulty in handling slack increases—and so the probability of and danger from slack action increases. The Train Limit Law in its relation to slack action is based upon this very proposition (stated by the railroads themselves) that as the length of the train increases the care required to control the slack increases (and therefore the

danger from slack action) but says that with over seventy cars in the train the care required becomes too great for safe operation. It is based upon the railroads' own statement of a fact. The soundness of it is borne out by the following facts taken from exhibits 274 and 275 [R. 3356-3363, 3367-3370, all inclusive] and for the same period just considered.

In Nevada for the period 1929-1940, inclusive, there were 48 slack action accidents. Forty-seven were on trains of over 70 cars. *Only one* was on a train of 70 cars or under, a 69-car train.

In Arizona, where the 70 car limit applied, during the same period there were 55 slack action accidents. One was on a train of over 70 cars. Forty-two were on trains of 65 cars or over. Only 13 were on trains of less than 65 cars.

In the two states combined there were 103 slack action accidents. Forty-eight were on trains of over 70 cars. Ninety, or 87% were on trains of 65 cars or more. There can hardly be any doubt from these figures that as the length of a train increases, the care required, and the difficulty, in handling slack becomes so great that a real hazard from slack action accidents arises and a rational reason exists for limiting the number of cars in a train.

(c) The Severity of Injuries Resulting From Slack Action Have a Direct Relation to the Number of Cars in a Train.

These same exhibits show a further sound and rational basis for the train limit law—the increased severity of the injuries received from slack action accidents as the number of cars in the train increases.

In Nevada during this period there were, as we have stated, 48 slack action accidents with 61 casualties. Forty-seven of the accidents and 60 of the casualties were on trains of *over* 70 cars. One was on a train of 69 cars. Two of the 60 men injured on the trains over 70 cars were *permanently* injured. The other 58 had a total disability of 2830 days, or an average disability of 48.8 days. The one man injured on the 69 car train was disabled for 20 days.

In Arizona there were 55 slack action accidents with 62 casualties. One accident and two casualties were on a train of over 70 cars, one man being *permanently* disabled and the other disabled for 80 days. In the other 54 accidents (42 being on trains of 65 or more cars) 60 men were injured, one *permanently* (on a 68 car train), the other 59 having a total disability of 1373 days, or an average disability of 23.3 days.

For both states combined there were:

On trains of *over* 70 cars:

48 slack action accidents

62 casualties with 3 *permanently* disabled and the other 59 having an aggregate disability of 2910 days, and an average of 49.3 days.

On trains of 70 cars or less:

55 slack action accidents (42 on trains of 65 cars or more)

61 casualties with one permanently disabled (on a 68 car train) and the other 60 having an aggregate disability of 1393 days and an average of 23.2 days.

Three were *permanently* injured on *long* trains against *one* on trains of 70 cars or less (and the one was on a 68 car train).

Where the disability was not permanent, the period of disability of those injured on *long trains* was more than twice that of those injured on trains of 70 cars or less. Certainly this shows that the probability of permanent or serious injury is greater on trains of over 70 cars. Surely this is a rational basis for limit the length of a train to 70 cars.

(d) THE DANGER TO THE PUBLIC FROM SLACK ACTION HAS A DIRECT RELATION TO THE NUMBER OF CARS IN A TRAIN.

We have heretofore discussed only the danger from slack action to railroad employees on duty. Slack action on long trains also presents a real danger to the traveling public, especially in parallel track territory or in yards where passenger trains are passed. As the length of the train increases, the amount of slack, with the weight of the train, develops slack action of sufficient force to *buckle* a car, throwing it out of the train onto and fouling parallel track. If a passenger train is approaching on the parallel track a wreck with death and injury to passengers and employees results. The Interstate Commerce Commission, report of an accident on the Pennsylvania Railroad on March 27, 1936, near Manor, Pa. [Ex. 311; R. 3329, item 45, Ex. 270] describes such an accident.

As the 101 car freight train westbound was approaching Manor a refrigerator car was buckled out of the middle of the train, due to severe slack action, fouling the adjacent track directly in front of an approaching eastbound passenger train, wrecking the passenger train. *Three* persons were *killed* and *eleven* were *injured*.

Considerable force is required to buckle a car and throw it out of a train. This type of accident demonstrates the tremendous force and shock developed by the slack and weight of a long train.

"Shocks are caused by the difference in holding power and speed throughout the train and to the consequent running of slack. The *longer the train* the greater may these differences become." (Emphasis ours.) [R. 3446, Santa Fe Green Book.]

"The critical time in regard to train damage from brake applications is while slack is running in or out, as trains are not pulled in two, or *buckled* from steady pulling or pushing strains * * *." (Emphasis ours.) [R. 2287; S. P. Air Brake Instructions, page 12, Ex. 319.]

"When slack runs in or out one part of the train gradually attains a lower speed than the other and the shock is the result of draft gears having suddenly to make the speed uniform on the instant slack is all in or out. *How heavy the shock will be* depends mainly on the difference in *speed* that must instantly be made uniform and on the *weight* that must suddenly be altered in speed." (Emphasis ours.) [R. 3454, S. P. Air Brake Instructions.]

The danger from cars being thrown on parallel tracks due to slack action buckling cars in long trains in recognized by the Director of Safety of the Interstate Commerce Commission in his report of an accident on the Western Maryland Railway at Oldtown, Maryland, February 9, 1937, where it is stated [Ex. 311, R. 2213, page 15 of report]:

"The break-in-two and consequent buckling of *long trains*, such as twice occurred in this train, is a

hazard which *calls for remedial action* on any line, but the hazard to life and property is *greatly increased* when such defective cars are hauled on double or multiple-track lines with trains travelling on adjacent parallel tracks." (Emphasis ours.)

In this accident the slack action was the result of a break-in-two due to a low coupler. But we submit that the severity of the slack action, sufficient to buckle a car, was due to the length of the train. (162 cars.)

That this danger from cars buckled and thrown out of a train due to slack action is one incident and peculiar to long trains is shown as a fact by Exhibit 270 [R 3310] introduced in evidence by the Appellant.

Exhibit 270 is a tabulation of data shown in summaries of the accident investigation reports of the Interstate Commerce Commission, years 1928 to 1939, inclusive, in so far as the reports relate to accidents involving freight trains, including mixed trains handling freight cars. During the 12 year period a total of 561 such accidents are shown as investigated by the I. C. C. The 33 accidents shown in Class III and 95 of the 100 accidents shown in Class IV, or a total of 128 accidents, have no relation whatever to train lengths.

For example, the accidents shown in Class III were due to collapsed bridges, broken rails, defective switches, poor track and the like. Ninety-five of the 100 accidents shown in Class IV were caused by wash-outs, rocks or other objects on the track, switches or tracks being tampered with, land slides and the like. In these accidents there can be no possible relation between the cause of the accident and the length of the train involved. In five

of the accidents in Class IV (items 36, 45, 47, 72 and 75) the cause or contributing cause was the slack action in the train. Four were on trains of over 70 cars.

In 349 of the accidents (Class I) negligence of employees is shown as the cause of the accident. (In passing we note that *only one* of these latter occurred in Arizona where the Train Limit Law was in effect—item 142 R. 3321, "Failure to operate under proper control within yard limits." A. T. & S. F. R. Co., Kingman, Arizona, November, 1936, R. 3333, Investigation Report No. 2117. More will be said about this later in our brief. Eighty-four of the total of 561 accidents were due to causes other than negligence of employees—collapsed bridges, defective tracks, washouts and the like. Of these 84 accidents, 25 were caused by the failure of arch bar trucks, a type of truck not now permitted in interchange [Ex. 304, p. 22, rule 3). They were due entirely to the type of truck used and had no relation to train length. Of the remaining 59 accidents, 3 were caused by cars *buckled and thrown out of the train fouling adjacent tracks in front of approaching passenger trains* killing 4 and injuring 42. These three accidents are shown on the exhibit as follows:

Record p.	I.C.C. Rep. No.	Killed	Injured
3326	1575	1	25
3329	2055	3	11
3330	2316	–	6

The second of these accidents is one at Manor, Pa., referred to heretofore. *All 3 of these accidents were on trains with over 70 cars. No such accident is shown on a train of 70 cars or less.*

A rational basis in safety in the enactment of the Arizona Train Limit Law is shown by the record in the protection of both the public and the employees from the dangers incident to slack action.

(e) Strains on Weak Parts Increase in Quantity and Quality as Each Car Is Added (Accidents Due to Failure of Equipment).

The average weight of an empty freight car is 27 tons and of a loaded freight car 45 tons [Ex. 2, R. 2852]. Every car added to a train adds from 27 to 45 tons to the pull on the draft gear, drawbars, couplings, knuckles, etc., of the cars ahead. If ten cars are added, the added weight to be pulled is from 270 to 450 tons. This pull is exerted whenever the slack is stretched as by the engine in starting or pulling up a grade, or the rear cars pulling back on up grade. The force and quantity of the pull increases as the length of the train increases, because the greater the length of the train the more weight and slack, and the greater the speed that the engine and head cars may attain before the rear cars begin to move.

In starting a long heavy train the slack is first bunched, then each car is started as the slack is pulled out. The longer the train the *greater the speed* the head end will attain before the rear cars begin to move.

> "How heavy the shock will be depends mainly on the difference in speed that must instantly be made uniform and on the weight that must suddenly be altered in speed." [Santa Fe Green Book, Ex. 152; R. 3452.]

Likewise, with each car added there is an additional 27 to 45 tons to *run in* on the cars ahead when the slack

runs in, as on a down grade, in stopping, backing up or in any operation where the slack is bunched. This added weight and strain may be enough to break or injure draft gear, drawbars, couplings, etc., or where already defective, to cause it to break and cause an accident.

There is *no* evidence in the record from which a comparison of accidents on short and long trains from defects or failure of equipment, per train operated, can be made. There are exhibits showing accidents due to such defects or failure during certain periods. Exhibit 270 shows that of the 79 accidents from this cause involving 90 trains investigated by the I.C.C. during the 12 year period 39 of the trains were over 70 cars and 51 were 70 cars or less. But it does not show, nor does the record anywhere show, the total number of short trains or the total number of long trains operated.

Exhibit 270 covers the period 1928 to 1939, inclusive. Exhibit 22 [R. 2870] shows the average cars per *freight* train for Class I railroads during this period as follows:

Year	1928	1930	1932	1934	1936	1938	1939
Av. cars	48.1	48.9	44.8	46.2	46.4	47.7	49.1

It will be seen from this that the average cars per freight train operated on all Class I railroads during the period was from 20.1 to 25.2 *below* the limit under the Train Limit Law. To accomplish these averages it would seem probable that *at least 10 short trains* were operated to one long train. Certainly this must be true when it is considered that in Arizona, *where practically every train operated was a short train*, the *lowest* average cars per train for the same years was 52.04 (1928) [Ex. 149, R. 3025], *3.01 more cars per train* than the *highest* average cars per train on Class I railroads for the years shown.

With at least 10 short trains operated to every one long train, this type of accident on short trains per train operated then would be small compared to long trains, and the percentages shown at the bottom of page 3311 of the Record are meaningless.

There *is*, however, evidence in the record from which a comparison can be made of the *severity* of this type of accident and the resulting casualties, on *long* and *short* trains.

Exhibit 270 [R. 3311] shows that of the 90 trains involved in this type of accident 51 or 56.7% were short trains and 39 or 43.3% were long trains. There was a total of *426* casualties in the 79 accidents. *Three hundred and eighteen* of these casualties were in accidents in which the *39 long trains* were involved, or an average of *8.2 casualty per train. One hundred and eight* of the casualties were in the accidents in which the *51 short trains* were involved, or *2.1* casualty *per train*. In other words, *the casualties per train* where trains of *over 70 cars* were involved was nearly *four times* that *per train* where trains of *70 cars or less* were involved. This again shows trains of over 70 cars present a greater hazard and a rational basis for the enactment of the Arizona Train Limit Law.

(f) Increase in Difficulty of Communications Between Employees as the Length of the Train Increases.

Communications between employees on different parts of a freight train is by hand signals during the day and by use of lights at night. It is obvious as the distance between the employees increases the more difficult it will be to see and interpret these signals. Exhibit 118 [R. 2978] is a picture of a train with 150 cars operated on the Chesapeake & Ohio Railroad. It is improbable that the

men on the engine of that train can even see a man on the caboose, let alone see and interpert signals.

When a train is in motion men are on top of the train only in case of emergency, and signals ordinarily would be passed direct from the rear to the head. The dangers to men on top of a train in motion are well known, and were recognized in the adoption by Congress of the air-brake provision of the Safety Appliance Act.

Virginian R.R. Co. v. U. S., 223 U. S. 748.

An instance where the ability to give a "stop" signal is important is where a hot box is noted by the trainmen in the caboose [see rule 16, p. 28; Ex. 319; R. 2287]. An instance where the ability to give a "reduce speed" signal is important is where an engineman fails to observe a slow board and is moving at a dangerous speed. In either of these instances, if the length of the train is such that a hand signal cannot be seen, the conductor must either send a man over the top of the train, if time permits, or stop the train by the use of the conductor's valve in the caboose. Either method adopted would create a danger.

(g) The Ability to Observe Defects in the Train Decreases as the Length of the Train Increases.

While a train is in motion it is the duty of the trainmen to watch and observe the train, from the caboose and the runway of the engine, for the purpose of detecting any defects that might arise—such as hot boxes, broken wheels and the like—in order that the train may be stopped in time to prevent an accident. The serious consequences of a failure to detect a defect in a train is seen in the report

of the accident on the Rock Island at La Salle, Illinois, March 6, 1936 [Ex. 311; R. 2213]. There, for something over a mile, the crew failed to detect a *derailed* truck, which finally resulted in the car under which the derailed truck was located, and several other cars, derailing and fouling the adjacent track, wrecking a train moving on that track. Four were injured. In that case the failure to detect the defect—the derailed truck—was due to smoke following along the train after coming through a tunnel. But the length of the train can also prevent the crew from observing such a defect. With cars averaging 45 feet in length, each car would add 45 feet to the length of the train. The more cars there are in a train, the farther the trainmen will be from any defect which may develop in the middle of the train. It is just plain common sense that the further one is away from an object the more difficult it is to see and detect such object.

On pages 3324 and 3325 of the Record appears a tabulation of data from summaries of Interstate Commerce Commission investigation reports of freight train accidents caused by defective equipment, years 1928 to 1939. There are a total of 79 accidents. Twenty-five of those listed under "Trucks" on page 3324 are shown as caused by broken arch bars. These accidents were due entirely to the type of truck used—a type *no longer permitted* in interchange—and can have no relation to train lengths. The remaining 59 accidents involved 60 trains with a total of 344 casualties. Thirty-three of the trains were *over* 70 cars and in these there were *244 casualties*. These accidents were, for the most part, caused by broken wheels, broken journals, defective couplings, and the like.

It is only reasonable to expect that had some of those long trains been shorter the trainmen might have discovered the defect in time to stop the train and prevent the accidents—and preventing many casualties.

(h). Fear of Injury Reduces the Efficiency of Trainmen.

Witnesses for the Appellee testified to the fear of injury which increases with the increase in train lengths [R. 2546, 2563]. That this fear is not fanciful is seen from the facts, hereinbefore pointed out, that in Arizona and Nevada for the 12 year period 1929 to 1940, inclusive, there were 48 slack action accidents on trains of *over 70 cars* with *62 casualties, 3 permanently injured* and the other 59 with an *aggregate disability of 2910 days*, while on the trains of 70 cars or less there were 55 slack accidents with *61 casualties, one permanently disabled (on a train of 68 cars) and an aggregate disability of 1393 days for the other 60.* In other words, *on long* trains *3* were *permanently* disabled to *one* on the short trains, and the average disability of those not permanently disabled was *more than twice* as great on *long* trains as on short trains.

And we call attention to the report of the investigation by the Interstate Commerce Commission of the accident on Appellant's lines at Reno, Nevada, November 19, 1938 [Ex. 304], where *five men* were sent to the hospital by an accident due to slack action on an 85 car train, and to the accident on Appellant's lines in Yuma, Arizona, October 21, 1937 [item 466, R. p. 3361], where one man was *permanently* injured and another disabled for 80 days when the slack ran in on a train with 122 cars. Men working under conditions which cause strain and fear of injury cannot be as efficient as men working where such conditions do not exist.

(i) Long Trains Will Not Reduce the Casualties Due to Negligence of Employees.

The Appellant argued below that accidents caused by negligence of employees have a relation to train lengths because shorter trains require more employees and present more opportunities for accidents from this cause. The record does not bear out the contention that more accidents result from this cause with shorter trains.

The cars per freight train as shown by Exhibit 22, and the number of accidents *investigated* by the Bureau of Safety caused by the negligence of employees, all Class I railroads, years 1928, 1930, 1932, 1934, 1936, 1938, 1939, are as follows [Ex. 22 and 270; R. 2870, 3310]:

	1928	1930	1932	1934	1936	1938	1939
Cars per Train	48.1	48.9	44.8	46.2	46.4	47.7	49.1
Accidents	23	34	24	23	32	28	33

It will be seen that there was an *increase* in cars per train, 1930 over 1928, of .8 cars and *also an increase of eleven accidents caused by negligence of employees;* for 1932 over 1930 a *decrease* of 4.1 cars per train and a *decrease* of *ten* accidents caused by negligence of employees; for 1936 over 1934 an *increase* of .2 cars per train and an *increase* of nine such accidents; for 1938 over 1936 an *increase* of 1.3 cars per train and a *decrease* of four such accidents; and for 1939 over 1938 an *increase* of 1.4 cars per train and an *increase* of 5 such accidents.

Somewhat similar results will be found if accidents caused by negligence of employees shown on Exhibit 270 [R. 3310] and the man-hours shown on Exhibit 262 [R. 3300] for the different years are compared. For ex-

ample, in 1928 the man-hours worked were 4,200,547,000 and the accidents from this cause investigated by the Bureau numbered 23, or 5.47 accidents per billion man-hours; in 1929 the man-hours worked were 4,234,000 and the accidents from this cause investigated were 58, or 13.69 accidents per billion man-hours; and in 1937 the man-hours worked were 2,646,909,000 and the accidents from this cause investigated were 41, or 15.5 accidents per billion man-hours. In other words, with approximately the same man-hours worked in 1928 and 1939, the accidents from this cause investigated in 1929 were more than twice as great per billion man-hours as those in 1928; and in 1937 with approximately one-third less man-hours worked the accidents from this cause investigated were nearly three times as great as in 1928 and greater than in 1929. This certainly refutes the contention of Appellant that short trains, by increasing the number of employees and the man-hours worked, increase the number of accidents caused by negligence of employees and thus increase hazards.

The Appellant has pointed out that 349 accidents are shown as caused by negligence of employees, with 499 freight trains involved, and that 409, or 82%, were short trains, and 90, or 18%, long trains. Appellant then argues that this shows long train operations to be safer. The argument is erroneous because, first, as we have pointed out above, when the accidents are considered by years it is apparent that there is no relation between this type of accident and the length of trains operated or man-hours worked; and, second, as we have heretofore pointed out, the average cars per freight train operated during this period was from 20.1 to 25.04 cars per train *less* than the 70 cars permitted under the Train Limit Law (see p. 107,

of this brief) and thus *at least 10 short trains* must have been operated to one long train. With 10 short trains operated to one long train, this showing of only 4 short trains involved in these accidents to one long train is certainly *favorable* to short train operation. There is nothing to show the train miles, car miles or man-hours accumulated in short and long train operations respectively during the period; and so no accurate basis for comparing this type of accident in the two operations.

And we point out that only *one* of these 349 accidents and *none* of 112 accidents of the same type involving passenger trains [R. 3336] occurred in Arizona, where the number of cars in a train is limited. All the other 460 such accidents occurred in territory where, Appellant contends, long train operation is the normal practice. Certainly this does not show that the limitation on the number of cars per train brings about more accidents due to negligence of employees. In fact, it shows just the contrary.

The *one* accident in Arizona due to negligence of employees during the 12 year period involved two trains of from 61 to 70 cars. The cause of the accident is shown as "Failure to operate under proper control within yard limits" [Item 142, R. 3321; I.C.C. Inv. No. 2117, R. 3333].

(j) Grade Crossing Accidents.

The appellant contends that the Train Limit Law increases the hazard of grade crossing accidents because short trains will require more trains and increase the opportunity for such accidents. The evidence does not support this contention, in fact is to the contrary.

The two principle factors in relation to the question of opportunity for grade crossing accidents are the time

the crossing is occupied by trains and the number of automobiles using the crossing.

The length of the trains operated will have little effect upon the opportunity for accidents. There are just so many cars to be moved across a given crossing and, if the speed of the trains are the same, those cars will occupy the crossing for exactly the same period of time regardless of whether they are in a long train or a short train. With short trains there may be a few more engines and cabooses. But the additional time these engines and cabooses would occupy the crossing will, in all probability, be more than offset by the faster speed of the short trains.

Crossing accidents generally are of two types: those where the train and the automobile run into each other, and those where the automobile runs into the side of the train.

The first type of accident is usually the result of the driver of the automobile trying to beat the train over the crossing. There is a greater danger of this type of accident in long train than in short train operations. In many of these situations the engineer may become aware of the danger and slow down or stop the train. Because of the weight of the train it is more difficult and takes longer to slow down or stop a long train. There is then in long train operations less chance on the part of the engineer to prevent the accident. Also the engineer is fully aware that the large amount of slack in a long train may damage the train and injure employees if the brakes are applied with the slack stretched [R. 3454, 5 P. Co. Air-brake instructions], and will hesitate and delay longer before applying the brakes.

The second type of these accidents are more apt to occur at night and the length of the train can be an im-

portant factor. With the middle of a long train occupying the crossing the lights of the engine and the caboose will be so far away on either side of the crossing as to be impossible to be seen by an approaching automobile. These lights are so far away that they are not observed by the driver of the automobile and he comes up to the crossing without warning that it is occupied by the train. With short trains the probabilities are greater that the engine or caboose lights will be seen by and will warn the driver of the automobile and prevent an accident.

From the exhibits introduced in evidence it will also be seen that short trains do *not* increase grade crossing accidents.

Exhibit 268 [R. 3306] shows the casualties, and the casualty rate per million train miles and per 10,000 automobiles registered, grade crossing accidents in which automobiles were involved, all steam railroads in the United States, 1923 to 1938, inclusive. The exhibit shows that casualties declined in absolute number and in proportion to the number of automobiles registered, during the period 1923-1939.

The only evidence in the record as to a casualty rate in grade crossing accidents, other than the rate per 10,000 automobiles registered, is the per million train mile basis shown in this Exhibit 268. This certainly does not sustain a finding that grade crossing accidents increase in proportion with the number of trains using the crossing. On the contrary, it shows that the casualty rate per train mile has remained relatively constant. If we were to consider only the length of trains operated over the period we would find [Exhibit 22, R. 2870] that the average cars per train increased from 1923 to 1930, then decreased until 1934,

when they again began to increase. And we would also find [Exhibit 268, R. 3306] that the grade crossing casualty rate per million train miles varied somewhat the same.

By Exhibit 293 [R. 3422] appellant showed by years for the period 1923-1938, inclusive, the number of grade crossing accidents and casualties on the Southern Pacific Company lines and on all railroads in Arizona, and the casualty rate per 10,000 automobiles registered for Arizona and for the entire United States. The comparison of the rate per 10,000 automobiles registered, Arizona with the United States as a whole, will be found favorable to the appellee. While the average rate for the entire period is not shown, by totaling the casualties in Arizona and the automobiles registered, it will be found to be 2.39 in Arizona as against 2.77 per 10,000 registered automobiles for the entire United States.

Exhibits 200 [R. 3149] and 201 [R. 3150] show the number of grade crossings on appellant's lines in Arizona and in Nevada, respectively, in each of the years 1930 to 1939 inclusive. The exhibits show that for each of the years there were more than *three times* as many grade crossings on appellant's lines in Arizona than on appellant's lines in Nevada. For example, in the year 1939 in Arizona there were 654, while in Nevada there were 211.

Exhibit 334 [R. 3461] gives a comparison of grade crossing accidents per 10,000 automobiles registered involving automobiles 1929-1939, inclusive, states of Arizona, Nevada and New Mexico. Exhibit 335 [R. 3462] is a similar comparison of all grade crossing accidents for these states in those years. The basis used in these ex-

hibits is the identical basis used by the appellant in Exhibits 268 and 293. The data was taken from tables in the reports of the Interstate Commerce Commission, showing that the Commission considers such basis as a proper yardstick for measuring this type of accident.

Exhibit 334 [R. 3461] shows the casualty rate per 10,000 registered automobile grade crossing accidents involving automobiles as follows: Arizona 1.13, New Mexico 1.22, Nevada 1.29.

And Exhibit 335 [R. 3462—all grade crossing accidents: Arizona 1.23, New Mexico 1.35, Nevada 1.6.

And this notwithstanding that, on appellant's lines, there were *three times* as many grade crossings in Arizona as in Nevada.

It appears from the trial court's finding that the trial court assumed as a fact that an increase in the number of trains operated over a grade crossing necessarily increases the hazard and the probability of an accident at such crossing. There is absolutely no basis for such an assumption and we deny that such is the fact. On the contrary, a more frequent operation of trains over a grade crossing creates a greater awareness on the part of drivers of motor vehicles that trains may be passing over such crossing, a greater alertness in approaching such crossing, greater caution and care. It is at crossings over which trains pass only infrequently that the greatest hazards exist by reason of the fact that the driver of the motor vehicle, forgetting, because of the infrequency of the trains, that trains pass over the crossing, becomes careless in approaching the crossing.

(k) Interstate Commerce Commission Service Order No 85.

At several places in its brief the Appellant has referred to Service Order No. 85 issued by the Interstate Commerce Commission effective September 15, 1942. This order is set out at page 1 of the Appendix to this brief. The Commission states that the order was issued under the authority of sub-sections (10)-(17) of section 1 of the Interstate Commerce Act (49 U.S.C. 1 (10)-(17)).

Neither the validity of Service Order No. 85 nor the authority of the Interstate Commerce Commission under sub-sections (10)-(17), section 1 of the Interstate Commerce Act are before this Court in this appeal. The authority of the Interstate Commerce Commission under these provisions of the Interstate Commerce Act was not brought in question in the trial court. Consequently no opportunity has been given to the Appellee to make a record upon which the Appellee's contention on this question could be presented. The judgment was filed in the trial court February 11, 1942 [R. 4039]. Service Order No. 85 was not issued until approximately seven months thereafter. While some argument with respect to the validity of Service Order No. 85 was presented in the briefs in the State Supreme Court, upon oral argument before the court it was recognized that, upon the record before the Court and in the absence of the Interstate Commerce Commission as a party, the question could not be considered or determined. The majority opinion in the State Supreme Court gives no consideration to these provisions of the Interstate Commerce Act nor to Service Order No. 85. The dissenting opinion of Judge Ross refers to the decision of the Interstate Commerce Commission in *Ex Parte*

No. 156 issued November 8, 1943, approximately seven months after the argument in the State Supreme Court. (The case was argued in the state court April 12-13, 1943.) No assignment of error herein brings in question the validity of Service Order No. 85 nor the authority of the Interstate Commerce Commission under sub-sections (10)-(17), section 1 of the Interstate Commerce Act.

This statement is made so that the limited purposes for which reference is made to Service Order No. 58 may be clearly understood, and not in reply to any contentions by the Appellant in its brief. The Appellant, in fact, has presented no argument with respect to either the validity of Service Order No. 85 nor the authority of the Interstate Commerce Commission under sub-sections (10)-(17), section 1 of the Interstate Commerce Act, and seemingly agrees that those questions are not presented in this appeal.

The references in Appellant's brief to Service Order No. 85 are in connection with the contention that this order indicates a belief on the part of the Interstate Commerce Commission, and is a declaration by that Commission, that state train limit laws are unnecessary, and unreasonably burden interstate commerce. We do not believe the order supports this interpretation. The order in part provides:

> "This order, being based upon conditions of war emergency, shall not constitute a precedent for peacetime operations."

The Commission very carefully and specifically points out that the suspension of the train limit laws is based "upon conditions of war emergency". During the war they are to give way to this greatest of public concern, the war emergency. And the Commission then carefully and specifically provides that the order "shall not consti-

tute a precedent for peacetime operations". This, we submit, indicates a belief on the part of the Commission that these train limit laws are proper and reasonable in normal peacetime operations and are only suspended because winning the war is a matter of greater public welfare.

In this connection it will be noted that mere temporary suspension of the operation of a state statute by the intervention of federal authority will not permanently oust the state of its right of regulation, and such regulation may be resumed by the state without reenactment of its statute when the effective period of the federal regulation has ended.

Missouri Pac. R. Co. v. Boone, 270 U. S. 466, 468.

C. The Appellant's Safety Evidence.

(a) The National Evidence.

The Appellant's safety evidence consisted almost entirely of exhibits based upon accidents and casualties reported by the various Class I railroads to the Interstate Commerce Commission. These begin with Exhibit 262 [R. 3300] and for the most part cover the period 1923 to 1940, inclusive. Accidents and casualties on Class I railroads are classified under these exhibits (the so-called "national exhibits) as accidents and casualties, (1) to *all classes of employees* in *all classes of service* [Ex. 262, R. 3300]; (2) to *road trainmen and enginemen on duty* in all classes of service [Ex. 263, R. 3301]; (3) to road *freight* trainmen and enginemen on duty [Ex. 264, R. 3302]; (4) to road *freight conductors, brakemen and flagmen* on duty [Ex. 265, R. 3303]; (5) to road freight conductors, brakemen and flagmen on duty *caused by slack action*

[Ex. 266, R. 3304]; (6) to passengers [Ex. 267, R. 3305]; (7) at crossings [Ex. 268, R. 3306]; (8) classified as to cause [Ex. 269, R. 3307]; and (9), investigated by the Interstate Commerce Commission [Exs. 270, 271, R. 3310, 3336]. These exhibits have *no* evidentiary value whatsoever upon the question before the Court. It is true that they show a very substantial decrease in accidents and casualties over the period both as to train miles and car miles operated. But it is nowhere shown that this improvement is in any way due or related to the length of trains operated. On the contrary the record shows a number of other causes, in no way related to the number of cars in a train, which have brought about the improvement with respect to accidents and casualties. We call attention to some of these. In the early part of the period covered by the exhibits there were numerous accidents caused by undesired emergency application of the air-brakes due to the triple valves sticking. In the middle 20's the graduating spring in the triple valve was made heavier. This practically eliminated these accidents. In the early part of the period many accidents were caused by the failure of arch bar trucks [Ex. 270, R. 3310]. Arch bar trucks have been eliminated by the Rules of Interchange since January 1, 1941 [R. 3185]. During the period equipment has been strengthened, rails made heavier and ballast improved [R. 194, 195]; block signals have been improved; grades and curves have been eliminated and many grade crossings have been eliminated by a separation of grades. *These are the causes* for the improvement in casualties and they have no relation to the length of a train. It is pure speculation to say from this evidence what, if any, effect train lengths had or did not have on the "improvement" in casualties.

The exhibits include the *combined operations* of both short and long trains. There is *no* separation whatsoever of long and short train operations. It is therefore *impossible to compare* the casualties, or the rate of improvement therein, between short and long trains. So far as the evidence shows, 90% of the improvement in casualties may have been on *short* trains and *only 10%* on long trains.

The Appellant contends, however, that by a comparison with exhibits covering operations in Arizona, these exhibits do show that increased train lengths contributed to the improvement in casualties; that all the other factors affecting the improvements in casualties and accidents were present in Arizona, and if a greater improvement is shown on the national exhibits, the cause must be the operation of long trains outside of Arizona. But this contention is erroneous because:

First, the national casualties exhibits are not comparable with the casualties exhibits as to Arizona. This is readily apparent from a consideration of the comparison Appellant seeks to make at pages 191 and 192, Volume II, of its Brief: For the purpose of comparing the improvement percentages of casualty rates as to Class I railroads the five-year period 1935-1939 is compared with the six-year period 1923-1928 and as to Nevada and Arizona the six-year period 1935-1940 is compared with the six-year period 1923-1928.

The first comparison is with respect to casualties to All Classes of Employees on Duty, All Classes of Service [Exs. 262, 276, R. 3300, 3371]. For Class I railroads the percentage of improvement shown in the comparison is on a *car mile and train mile basis*. For Arizona and Nevada it is on a *locomotive mile basis*. The basis for

percentage of improvement used as to Class I railroads is not comparable to that used as to Arizona and Nevada and the comparison is meaningless. Exhibit 262 shows the percentage of improvement as to Class I railroads based upon *locomotive miles* was 66.74%. Why this was not used by Appellant we do not know.

There is another very important reason why this comparison is valueless. The first period, 1923-1928, includes the years 1923 and 1924. In November, 1924, the E. P. & S. W. and the Arizona Eastern railroads were consolidated with the Appellant, Southern Pacific Company [Ex. 141, Note (a), R. 3017]. Before consolidation Appellant operated in Arizona 399.95 miles of main line trackage and 144.93 miles of branch line trackage, or a total of 544.88 miles of trackage. After consolidation it operated in Arizona *574.81* miles of main line trackage and 647.98 miles of branch line trackage, or a total of 1222.79 miles of trackage [Ex. 305, R. 3430]. The first period used in Appellant's comparison includes *almost two years* in which operations were on *only the 544.88 miles* of trackage operated before consolidation. But Appellant attempts to compare the casualties in the later period, 1935-1940, on *1222.79 miles of track operated* with the casualties on *544.88 miles* of track operated in the earlier period to determine the percentage of improvement on the 1222.79 miles of track now operated. It is like comparing present operations in Arizona with the combined Arizona-Nevada operations to determine the percentage of improvement in Arizona. It can't be done. But the Court will find that the Appellant included 1923-1924 as a part of the earlier period in making its comparisons, not only as to Exhibits 262 and 270 but *as to all exhibits.*

The effect of including 1923 and 1924 is shown by excluding in the Arizona-Nevada exhibit these years from the earlier period and determining the percentage of improvement. The figures for the period 1925-1928 are:

Total locomotive miles		Total Casualties		Casualties per million loco. miles	
Nevada	Arizona	Nevada	Arizona	Nevada	Arizona
18129	24019	125	327	6.89	13.61

[From Exhibit 276, R. 3371.]

For the period 1935-1940 [Ex. 276]:

21757	30970	103	273	4.73	8.81

The percentage of improvement 1935-1940 over 1925-1928 is:

Nevada 31.35% Arizona 35.26%

On Exhibit 276 with 1923 and 1924 *included* the improvement 1935-1940 over 1923-1928 is:

Nevada 46.7% Arizona 38.7%

And this last, the percentage of improvement with 1923 and 1924, included, *is used in the comparison set out in Appellant's brief.*

The Appellant argues that this increase in miles of trackage operated cannot affect the comparison made on a train or car miles basis. That this argument is erroneous must be readily apparent. If the casualty rate per car and per train mile was substantially higher on the acquired territory than on the original territory, it would cause the per car and train mile casualty rate on the combined operation *to be higher than on the original operation.* A comparison of subsequent rates with those on the

original mileage will not give the rate of improvement on the original territory nor on the consolidated territory.

For further illustration we refer to Exhibit 279 [R. 3374]. This exhibit is a comparison of casualties to road freight conductors, brakemen and flagmen on duty, Arizona and Nevada, 1923 to 1940. For comparison of improvement in casualties the total period is broken up into three 6-year periods. It shows the following percentage improvement on a train mile basis in the two states:

Period	Arizona	Nevada
1929-34 over 1923-1938—decrease	37.9%	45.6%
1935-40 over 1929-1934— "	20.0%	24.3%
1935-40 over 1923-1928— "	50.3%	58.8%

A year and ten months of the period 1923-1928 was before consolidation. If we eliminate the years 1923 and 1924, and divide the remaining 16 years into periods of six, five and five years, the percentage of improvement on a train mile basis is as follows:

Period	Arizona	Nevada
1931-35 over 1925-1930—decrease	38.8%	33.6%
1936-40 over 1931-1935— "	7.97%	15. %
1936-40 over 1925-1930— "	43.7%	43.6%

In other words, during the period since consolidation, when the territory and mileage operated in Arizona has remained substantially the same, the percentage of improvement in the two states is comparable. This shows the fallacy of including the years before consolidation. It is the same as combining two different territories to get the percentage of improvement on one.

The absurdity of such a comparison stands out in Appellant's comparison of the three-year periods 1938-40 and

1923-1925 (Appellant's Br. Vol. II, p. 178.) Over 22 months of the period 1923-1925 was before consolidation when the trackage operated was only 544.88 miles. Only 14 months was after consolidation. Yet Appellant determines the percentage of improvement on the *1222.79 miles* of track now operated by comparing the experience on *this trackage* for the period 1938-1940 with the experience on 544.88 miles for *22* months and 1222.79 miles for 14 months.

In Appellant's comparison (App. Br., Vol. II, pp. 191-192) no Arizona-Nevada exhibits are shown comparable to Class I railroads Exhibits *263* and *264*, and no Class I railroad exhibit is shown comparable to Arizona-Nevada Exhibit *277*—and there are none.

National Exhibits *265* and *266* are represented as comparable to Arizona-Nevada Exhibits *279* and *280*. There is no basis for comparison, first, because of the consolidation of the Southern Pacific Company and the E. P. & S. W. in November, 1924, referred to above and, second, because the percentage of improvement in the national exhibits is based upon car miles and train miles of *freight train and work train* operations while the Arizona-Nevada exhibits are based upon car miles and train miles of *freight train operations only*.

In columns (b) and (c), Exhibits *264*, *265* and *266* [R. 3302-4], which give the national casualties, the car miles and train miles used are those for freight trains *and work trains*. In Exhibits *276*, *277* and *279*, which present the casualties as to Arizona, the car and train miles used are those for freight trains *only*. *Work train* car miles, train miles and casualties *are not included in the Arizona exhibits*. It is impossible to know how the failure to include

work train operations in the Arizona exhibits affects the percentage of improvement in Arizona and the comparison with the national casualties. It is shown in the record that the period 1923 to 1930 was one of reconstruction following the return of the railroads to the owners following government ownership. The average expenditures for roadway and structures was for those years approximately *three times as great* as for the following years. [Ex. 15, R. 2863.] This certainly would mean the operation of *a great many more work trains in those years* than in the later years. If the casualty rate was high in work train operations, then the reduction in work train operations *would have a material effect upon the percentage of improvement in casualties* on the national exhibit but *would not be reflected in the Arizona* exhibits because work train miles *are not* included in the Arizona exhibits.

Second, the comparison fails to consider, and is impossible because of, differences in local conditions affecting the casualties, such as wind and sand, differences in traffic and the like. For example, Exhibit 279 shows 32 casualties in Arizona in the year 1937, an unusually large number in comparison with other years in this third period, and materially affecting the percentage of improvement for this period. The following detail as to the casualties to employees on duty in Arizona and Nevada for the year 1937 is taken from Exhibit 274 [R. 3361] and Exhibit 275 [R. 3369A]:

ARIZONA.

Item No.	Description of Accident.
(441)	Thrown against cupola steps when train was stopping.
(442)	Slipped off edge of car roof to ground.

(443) Slipped and fell on frosty car roof while releasing hand brake.

(444) Thrown against rear door of caboose by undesired emergency application of brakes.

(445) Particle of sand in eye.

(446) Caught finger between piece of freight and door frame.

(447) Fell on slippery load of piling.

(448) Back of hand struck by brake club while releasing hand brake.

(449) Thrown against end ladder by sudden stop during switching move.

(450) Lost balance and fell to ground releasing hand brake.

(452) Stepped on small rock and sprained ankle.

(453) Fell from moving train.

(454) Fell from steps of caboose when slack ran out.

(456) Fell from top of car in moving train.

(457) Thrown against inside frame of cupola by undesired emergency.

(458) Fell from top of moving train.

(459) Stepped on rock and sprained ankle detraining from caboose.

(460) Slipped on small rock and fell, spraining arm and shoulder, when boarding caboose.

(461) Fell from car to ground when brake wheel unexpectedly released due to defect.

(463) Stepped off end of car and fell to ground.

(464) Finger caught between brake club and truck frame while wiring up brake beam.

(465) Foot struck by rebounding running board.

(466) Thrown in caboose on account of undesired emergency as train was being brought to a stop.

(467) Lost balance and fell from top of a water car to ground.

(468) Stumbled and fell on highway crossing detraining from caboose.

(469) Struck by flying brake club while releasing hand brake.

(470) Thrown to ground from caboose when it made hard coupling with standing cars.

(471) Foreign object in eye.

(472) Trainmen thrown in caboose by sudden stop caused by train parting due to defective draw bar.

(473) Thrown from side of car when train backing up broke-in-two.

NEVADA.

Item No.	Description of Accident.
(247)	Fell against cupola steps when jerk occurred as train was stopping.
(248)	Slipped on side ladder of car and fell to ground.
(249)	Finger broken when hand came in contact with coupler while separating air hose.
(250)	Fell from gangway of moving engine while detached from train and struck by truck structure of tender.
(251)	Sprained ankle alighting from train.
(252)	Hand caught between brake lever and stop on end of car.
(253)	Lost balance and fell against load machinery 21st car from engine when slight jerk of train occurred stopping.
(254)	Fell from car when foot slipped while preparing to set hand brake.

(255) Sudden stop due to undesired emergency.

(256) Fell to ground when hand slipped off hand rail while getting on running board of engine.

(257) Fell to ground detraining from gangway ladder of locomotive.

(258) Lost hold on side ladder of car and fell to ground.

(259) Lost balance on caboose and fell to ground when reaching down to raise lock block of coupler.

(260) Lost hold and fell to ground from caboose step when jerk of train occurred while stopping.

These casualties shown under these items segregated according to the cause shown will appear as follows:

Cause	Number of Casualties Arizona	Nevada
Slack action	9	4
Sand or particle in eye	2	0
Operating hand brake	4	1
Slipped off top of car—train standing	2	0
Fell from moving train	5	6
Pinched finger	2	2
Slipped on rock or other obstacle	4	1
Thrown by jar or jerk in switching	2	0
Rebounding running board injured trainman	1	0
Brakeman fell on slippery load of piling	1	0
	32	14

Two of the accident *in Arizona* were *sand or particle in the employee's eye*, while there were *no such accidents in Nevada*. And it will further be found upon examining

Exhibits 274 and 275 that there were *40 of this type of accidents in Arizona* during the 18 years 1923 to 1940, inclusive, and *only 2 in Nevada*, one of which occurred while *sanding out the engine*. These accidents are clearly due to local conditions—the sand and dust in the air in Arizona.

Similarly the greater number of casualties in Arizona (4 in Arizona, 1 in Nevada), which occurred *in the operation of hand brakes*, is traced to the difference in operations or operating conditions in the two states. The total number of cars of revenue freight originating and terminating in Arizona for the year 1939 was 147,408 [Ex. 167, R. 3041], while in Nevada for the same year the number of such cars was 19,559. In other words, the number of cars of revenue freight which originated or terminated in Arizona was *7.5 times that in Nevada*. This traffic requires a substantial amount of switching, placing or spotting of cars, and picking up cars. It requires trainmen to get on and off moving trains in opening and closing switches, to walk along the train in spotting and picking up cars, to open and close the couplers in setting out cars, and to set and release hand brakes in picking up and setting out cars. The Federal Safety Appliance Act *prohibits* the use of hand brakes *on moving trains*. They are used *only* to insure that the car remains in place after the car is placed or spotted and is detached from the locomotive or train. When a car is spotted the hand brakes are set and when it is picked up the hand brakes are released. This is true whether the car is moved to its place of destination in Arizona, or from its place of origin in Arizona, in a 50-train or in a train of 100 cars. In other words, the same number of hand brakes must be set and the same number of hand brakes released regardless of the number

of cars in the trains operated. With the percentage of traffic originating and terminating in Arizona 7.5 times that as in Nevada, it is not surprising that the casualties resulting from the use of hand brakes is four times that in Nevada. It is the result of the difference in traffic handled.

The same is true with respect to those accidents caused by stepping on or stumbling over a rock or other object (4 in Arizona, 1 in Nevada) and those caused by being thrown by a jerk or jar in a switching movement (2 in Arizona, 0 in Nevada). With the percentage of traffic originating and terminating in Arizona 7.5 times that in Nevada, necessarily many more men are required to be on the ground in spotting and picking up cars, many more switches must be opened and closed and many more cars must be coupled onto with the possibility of jars or jerks which will throw men on the car. But this is the result of the difference in traffic in the two states.

The casualties resulting from falling off the top of a standing car (Arizona 2, Nevada 0), falling from a moving train (Arizona 5, Nevada 6), and pinched fingers (Arizona 2, Nevada 2) really have no relation whatsoever to the length of the train. The total of these for the states is substantially the same (Arizona 9, Nevada 8).

Likewise the casualties resulting from slipping on slippery load of piling (Arizona 1, Nevada 0), and rebounding running board striking foot (Arizona 1, Nevada 0), have no relation to the number of cars in the train. Placing the load of piling, or the car with the defective running board, in an 80-car train would not have prevented the brakeman from slipping on the piling or the running board from striking the trainman. One was due to the

character of the load, the other to a defective running board.

There were seven slack action accidents with 9 casualties in Arizona, and 4 slack action accidents and 4 casualties in Nevada. This indicates and sustains the Appellee's contention that conditions (such as dips, hog-backs, grades and curves) which produce slack action are more prevalent in Arizona than Nevada. It also sustains the Appellee's contention that the probability of slack action with resulting casualties, and the severity thereof, increases as the length of the train increases.

All the trains on which slack action causing injury occurred in Nevada were *over 75* cars in length, and in Arizona the trains were 63 cars or over in length. It will also be noticed that in the two states combined there were five such accidents *on trains of over 70 cars*, with six casualties; and with respect to the six casualties, two were permanently injured, one was disabled for 137 days, and one for 80 days. Of the six casualties on long trains *two* were *permanently disabled*, and the remaining *four* were disabled for an aggregate of *249 days*. The seven injured on *short trains* were disabled for an aggregate period of *94 days*. This clearly demonstrates that the probability of slack action causing casualties arises, for the most part, and increases as the length of the trains exceed 60 cars, and that the severity of the shock and the resulting injuries increase as the length of the train increases.

Third, the exhibits themselves rebut any contention that the trend in improvement in casualties is caused or affected by train lengths. This is seen from a consideration for the different periods of the percentage of increase in cars per train [Ex. 22, R. 2870] in relation to the percentage

in decrease in casualties Class I railroads [Ex. 262, R. 3300], S. P.-Pac. Lines [Ex. 272, R. 3349], Arizona and Nevada [Ex. 276, R. 3371]:

	Class I Railroads	S. P.-Pac. Lines	Arizona	Nevada
% Increase				
Cars per train 1939 over 1934	6.3%	3.6%	4.0% decrease	9.4% decrease
% Decrease				
Casualties 1935-1939 over 1929-1934	26.08%	10.00% increase	9.00%	1.5% decrease
% Increase				
Cars per train 1934 over 1928	3.9% decrease	5.2%	5.1%	28.4%
% Decrease				
Casualties 1929-1934 over 1923-1928	55.00%	33.5%	32.7%	45.9%
% Increase				
Cars per train 1939 over 1922	27.9%	25.8%	1.7% decrease	60.39%
% Decrease				
Casualties 1935-1939 over 1923-1928	66.74%	26.86%	38.7%	46.7%

This clearly shows that there is no similarity in or relation between the trend in increase in cars per train and the decrease in casualties.

(b) The Arizona-Nevada Comparison.

What we have said concerning the national comparison applies equally to any attempted comparison between Arizona and Nevada. We particularly refer to our discussions of comparisons which *include* the operations in Arizona before consolidation of the E. P. & S. W. and Arizona Eastern with the Southern Pacific and to the discussion of local conditions.

Concerning local conditions, as pointed out, the exhibits show that there are *20* casualties in Arizona, due to sand or particle in eye, to *one* in Nevada. These casualties are due to more sand and dust in the air in Arizona than in Nevada.

There is 7.5 times as much local traffic in Arizona as in Nevada. This requires switching, men on the ground to open and close switches, setting out and picking up cars, setting and releasing of hand brakes, more stops and starts and jerks and jars. As we have shown, the accidents in Arizona related to handling *local traffic* were at least 5 in Arizona to one in Nevada. This was due entirely to the fact that local traffic in Arizona is 7.5 times that in Nevada. It has no relation to the number of cars in a train. Yet in the Appellant's comparison of casualties, except slack action casualties, these sand in the eye casualties and those due to the difference in traffic are included. Such a comparison can give no possible information in respect to the relative safety of short and long trains.

The slack action accidents clearly show a greater hazard in long train operations as we have pointed out in our discussion of slack action accidents. In addition to the evidence we have heretofore pointed out in this connection, we call attention to the average cars per train and slack action accidents per million car miles, Class I railroads, Arizona and Nevada. The years shown are those where the cars per train Class I railroads is shown on Exhibit 22 introduced by Appellant [R. 2870].

	Average Cars Per Train			Casualties, Conductors, Brakemen, Flagmen on Duty—Slack Action Per Million Train Miles		
	National	Nevada	Arizona	National	Nevada	Arizona
Exhibit No.	22	150	149	266	280	280
1926	45.2	66.11	52.3	2.88	.96	4.07
1928	48	68.54	52.04	2.48	5.79	2.46
1930	48.9	77.18	56.39	1.73	4.38	4.27
1932	44.4	81.06	56.76	1.26	3.96	3.24
1934	46.2	86.67	57.33	1.14	3.31	.56
1936	46.4	74.03	53.	1.35	3.11	1.22
1938	47.7	78.77	55.5	1.74	3.64	.87
1939	49.1	78.46	54.8	.86	1.65	1.56

We have heretofore shown that the *severity* of the casualties from slack action increases with the increase in the number of cars in a train. The foregoing shows that the number of such casualties also increases.

The profile maps of Appellant's lines through Arizona and through Nevada are in evidence [Exs. 306 to 308, R. 2186; Exs. 309, 310, R. 2240]. A consideration of these profile maps will disclose to the Court that Arizona is a territory with many hogbacks and dips and that both grade and curve conditions are substantially more severe in Arizona than in Nevada. The Court will find that in the Nevada territory the curves are for the most part gradual, seldom ranging over two degrees, and usually occur on level track or only slight grades, while in Arizona the curves are, for the most part sharper, ranging from two to ten degrees, and usually occur on a substantial grade. On Exhibit 302 [R. 2101] a photostatic copy of the profile of Appellant's line in Arizona between mile post 1006.3 and mile post 1011.1, Station Irene (a distance of less than five miles) will be found *no less than twenty* curves ranging from *six degrees to ten degrees*, all on

grades ranging from 0.5% to 1%. We also direct the Court's attention to the profile maps showing the territory in Arizona between Mobile and Yuma, between Tucson and Steins on the north line, and between Tucson and Rodeo on the south line. *On the entire lines across the State of Nevada only four curves with as much as six degrees curvature are found*—three of six degrees and one of eight degrees [Kirkbride testimony, R. 2181, 2185].

Another difference in the two territories is in the amount of double track operated. Over 71% of the line through *Nevada is double track* or double track operation while only 15% of the line through Arizona is double track or double track operation [Salt Lake Division and Tucson Division time tables, Ex. 175].

These differences make comparison of operations in the two states impossible.

Los Angeles Division Casualty Statistics.

The Appellant contended below that approximately 25.8 percent of the trains run on certain main lines of that division during four typical months of 1939, were long trains. The record nowhere shows the total number of trains operated on this division nor the relative number of short and long trains operated.

Exhibit 185 [R. 3077] shows *by states* and in specific districts but not by divisions, a summary of main line freight trains operated in January, April, July and October, 1939. If this exhibit is the basis of the Appellant's contention, it does not support the contention.

First, the trains are not shown by division. For the *State of California* the percent of long trains operated is shown as 21.74, not 25.8.

Second, the formula used in preparing the exhibit will not support the contention. *If at any time* in its movement a train had *over* 70 cars it was *taken as a long train* —if in only one mile out of a 100-mile movement it had over 70 cars, it was counted a long train. If the formula had been reversed—that is, *if at any time* in its movement a train had *less* than 70 cars it was counted as a short train, the number of long trains would probably have been greatly reduced. If in a part of its movement it had less than 70 cars and in a part over 70 cars, there was just as much reason to count it as a short train as a long train.

Further, a percentage as to *main line operations only* would have no meaning because the accidents and casualties are for *all operations* on the division, *both main and branch* line. If 25.8 percent of main line trains were long trains (and there is nothing to sustain such contention), with the many short trains in branch line operations were considered, the percentage would probably be reduced substantially. Considering the volume of local traffic and pick-up trains handled around Los Angeles, we doubt that ten percent of all trains on the Los Angeles Division are long trains.

On sheet one of Exhibit 386 [R. 3533] appears a summary of the casualties to employees on duty and non-trespassers during the eleven year period, the average cars per train each year, and the casualties per million train and car mile. The eleven year period is divided into two periods, 1930-1935 and 1936-1940.

The average cars per train for the period 1930-1935 is 52.42, and for the period 1936-1940 is 57.81, an *increase* of 5.39 cars per train 1936-1940 over 1930-1935. The casualty rate for "Occupants of Motor Vehicles" was

12.09 per million freight train miles and 23.07 per million freight car miles for the *period 1930-1935*. For the period 1936-1940 it was 15.17 per million freight train miles and 26.24 per mililon freight car miles—an *increase* of 3.08 casualties per million freight train miles and 3.17 casualties per million freight car miles. For *all* non-trespassers the *increase* was 3.07 casualties per million train miles and 2.98 casualties per million car miles. There was also an *increase* in casualties to employees of 3.49 casualties per million train miles and 3.24 casualties per million car miles. In other words, with the *increase* in the average cars per train there was also *an increase* in casualties to both the *public* and to *employees*.

We further call to this Court's attention that 70 of the 460 accidents were "slack action" accidents. Fifty of these "slack action" accidents were on *long* trains and only 20 were on *short* trains, although probably better than 80 percent of the trains operated were *short* trains.

(d) New Mexico Casualty Statistics.

The record presents no basis for a comparison of accidents and casualties in Arizona and New Mexico. There is no showing of similarity of conditions sufficient to give probative value to the evidence. There is no showing as to the miles of railroad operated, the main and branch lines, the amount of traffic originating and terminating in New Mexico, and the like. It is shown that the grade and curve conditions in New Mexico are more favorable than in Arizona and that freight trains can be operated between Lordsburg and El Paso without once touching the automatic or air brake [R. 2456]. Without these conditions being shown to be similar, the comparison is meaningless.

But we direct the Court's attention to the data as to operations of long and short trains *in the same territory* —New Mexico.

From Exhibit 387 [R. 3548] showing casualties to employees on duty and non-trespassers 1930-1940; it will be seen that for the period 1936-1940 over 1930-1935 there was an increase in average cars per train of 2.83, an *increase* in casualties to Occupants of Motor Vehicles of .36 per million freight train miles and .59 per million freight car miles, an *increase* of casualties to all non-trespassers of .26 per million freight train miles and .39 per million freight car miles, an *increase* in casualties to conductors and brakemen of .91 per million freight train miles and 1.17 casualties per million freight car miles but a *decrease* of .42 per million freight car miles and 1.43 per million freight car miles for all employees and for casualties to all persons a *decrease* of .17 per million freight train miles and 1.03 per million freight car miles. In 1940, with an *increase* of 6.85 in the average cars per train over the previous year, the casualties to all employees *increased* 8.01 casualties per million freight train miles and 11.55 casualties per million freight car miles—and to all persons 8.61 casualties per million freight train miles and 12.46 per million freight car miles.

From the exhibit (sheet 9) it will be seen that there were 139 accidents during the 11 year period. Sheet 4 of the exhibits shows that 29 of these were "slack action" accidents. Eighteen were on *long* trains and 11 were on *short* trains. Five of the *short* trains *had 70 cars*. Only 3 of the short trains were *less than 65 cars in length*. Sheet 3 shows that there was a total of 145 casualties to all

persons, 34, or 23.46%, of which were on *long* trains, although probably *not 10 percent* of all trains operated were long trains.

SANTA FE CASUALTY STATISTICS.

Exhibits 126 [R. 2986] and 300 [R. 2093] and the testimony in connection therewith show that, as to grades and curves, the conditions in Arizona and New Mexico are *not* similar. There is evidence as to the types of traffic but upon the important question of the relative bridge traffic and traffic originating and terminating in the state there is *no* evidence. Exhibit 296 [R 3425] shows the casualties in totals by years, on the territory between Clovis, New Mexico, and Gallup, New Mexico, and between Gallup and Needles, California. There were 10 killed in the New Mexico territory to 4 in the Arizona territory. Detail of the cause of these accidents is shown, probably to show they were not due to long trains. But no detail is given from which the cause of the accident or accidents causing injuries can be determined—that is, whether they are caused by purely local conditions such as wash-outs, bridges giving away or washed out, melting snow causing track to give way, and the like. No similarity in the two territories in this respect was shown. And yet any accident occurring from these causes on a train while in operation would be included in the casualty data although due solely to local conditions. Casualties in Arizona from setting or releasing brakes, and picking up, setting out and switching local track are undoubtedly greater than in New Mexico. Although not shown in the record, undoubtedly local traffic is much heavier in Arizona than in New Mexico. Consequently more accidents of this type would be expected.

There can be no comparison of casualties per train or car miles unless *all* facts and factors relating thereto are shown.

CHESAPEAKE & OHIO CASUALTY STATISTICS.

In addition to the failure to show the necessary similarity of conditions as a basis for and to give probative value to the evidence, pointed out in our above discussion of the Santa Fe evidence—and which applies equally to the Chesapeake & Ohio evidence—we point out two important *differences* shown by the evidence.

First, it is shown by the evidence that the greater part of the Chesapeake & Ohio traffic is *coal*, thus differing entirely from the traffic on Appellant's lines in Arizona.

Second, it appears from the evidence that, during the period covered by the exhibits, a great amount of *grade and curve elimination* took place on the Chesapeake & Ohio. An example of this is seen in the fill on which the train shown in Exhibit 160 [R. 3034] is standing. The elimination of grades and curves would have a substantial effect upon the reduction of accidents. No such elimination of grades and curves is shown on Appellee's lines in Arizona.

Further, the casualties and derailments shown are those which occurred in *all classes of service*—that is, in the *combined freight and passenger operations*. It cannot be used as a basis of comparison with operations on Appellant's lines in Arizona or with operations on any other railroad because *there is no similar evidence* as to operations on the Appellant's lines in Arizona nor as to any other railroad. As to all other railroads, including Appellant's lines in Arizona, *the freight and passenger casualties were segregated.*

D. Hazards of Passenger Train Operation:

(a) SLACK ACTION INCREASES AS THE LENGTH OF THE TRAIN INCREASES.

Slack action produces severe shocks and serious injuries to passengers and trainmen. The dangers from slack action, which we have discussed in detail *supra* under hazards in freight train operation, are also present in passenger train operations. While the slack on passenger trains is less per car and the brake equipment is better, these are more than offset by other factors which enter into the consideration of the dangers from slack action in passenger trains:

1. The weight of passenger cars is from 80 to 100 tons while the average weight of freight cars is from 27 tons (empty) to 45 tons (loaded) [Exhibits 2, 4]. While the slack in a passenger car is less than that of a freight car, the weight of the passenger car is twice that of a freight car. The impact will consequently be greater in the passenger train operation.

While the brake equipment on passenger trains is better than that on freight trains, the distance the passenger car travels before the impact—the amount of slack to be taken up—is less, and the time for the brakes to apply before the impact occurs is shorter.

2. The number of persons who may be injured as a result of slack action is many times greater on a passenger train than on a freight train. On freight trains only the crew and such caretakers or deadheading employees as may be riding the train—seldom exceeding 2 or 3—are exposed to the dangers of slack action. On passenger trains in addition to the train crew and pullman employees, the passengers—perhaps 200 or 300, increasing in numbers

as the length of the train increases—are liable to injuries from slack action.

3. The passengers on passenger trains are ignorant of the dangers from slack action, ignorant of the places where and the conditions under which slack action may occur, ignorant of how to protect themselves, and in the case of old people and children, physically unable to protect themselves from slack action.

4. The distance passengers are required to travel through a moving train when en route to the diner or to get off at stations where the platforms are not of sufficient length to accommodate the length of the train increases as each car is added. This causes discomfort and inconvenience to passengers and exposes the passenger to the danger of being knocked down and injured by slack action.

(b) Lack of Necessary Station Facilities for Handling Passenger Trains Without Public Discomfort, Inconvenience and Risk of Injury.

At stations where platforms are not sufficient to accommodate long passenger trains passengers are subjected to additional hazards, because (1) they must be discharged at places where the footing is unsafe; and if after night fall, in the dark; and if in inclement weather, in snow and mud; or (2) they must walk a long distance through the moving train with the possibility of being knocked down by slack action; or (3) a second stop must be made, requiring stretching and bunching of the slack, and giving an additional opportunity for injury from slack action.

(c) The Increased Weight of the Train—Which Increases With Each Car Added—Increases the Hazard of Passenger Train Operation.

Each car added to a passenger train adds from 80 to 100 tons to the train. There is then 80 to 100 tons added to pile up on the cars ahead in case of derailment, thus increasing the possibility of serious injuries to passengers. Each car added increases the number who may be injured in case of a derailment or other accident to the train.

Long trains add to the danger to the public and to employees where it is necessary to make an emergency stop, because as the length of the train increases the difficulties of stopping in case of emergency increase. There is greater probability of injuring or killing persons at highway crossings, etc., with the probable derailment of the train and injury or death to passengers and employees. The length and weight of the train must influence the engineer in exercising his judgment. Where a crossing accident appears probable, he is compelled to choose between the possibility of injury to passengers by an emergency application of the brakes, and injuries to persons approaching the crossing. As the length of the train increases, the probability of injury to passengers on the train from an emergency application of the brakes increases.

(d) The Time Which Employees Have to Give to the Care and Attention of the Train Decreases as the Length of the Train Increases.

Every car that is added to a passenger train gives added duties and responsibility to the employees which take them away from giving their care and attention to the operation of the train. Each car adds passengers whose tickets

must be taken up by the conductor. Each car adds passengers, perhaps children, women or old people, whose comforts and conveniences must be looked out for and taken care of by the trainmen. These duties require time, and such time is taken and can only be taken from the time the trainmen give to looking after the safety of the train—observing train for defects, checking signals, checking to see that engineer is observing schedule, and similar duties in protecting the safety of the train. As these duties of the trainmen to look after passengers increase, his ability to protect the *safety* of the train decreases.

E. Summary of Safety Argument.

The record presents an abundance of evidence to support the proposition that the Train Limit Law is reasonably adopted to the ends sought (303 U. S. 177, 190) and thus to sustain validity of the law as a proper exercise of the state's police power for the protection of the safety of the public and of employees. The airbrake instructions of both the Southern Pacific Company and the Santa Fe recognize the hazard due to slack action in train operations and that this hazard increases as the number of cars in a train increases; and that this is true both as to the number of casualties and the severity of the casualties.

Increased hazards are shown in train operations, due to the increase in the number of cars in a train, by reason of (1) the increase in the quantity and quality of strains on weak parts in equipment, and the consequent probability of accidents due to failure of equipment, (2) the increase in difficulty of communication between the employees, (3) the increase in the difficulty in observing de-

fects in the train while in motion, and (4) the increase in fear of injury and strain upon the trainmen which reduces their efficiency.

The appellant's contention that short trains increase the hazard of crossing accidents and accidents due to negligence of employees is shown to be without support in the evidence; in fact, it appears the contrary is true.

The appellant's "national" and Nevada evidence has little evidentiary value. On the whole the "national" evidence presents no basis for comparison with operations in Arizona. Where a fair comparison is possible it is favorable to Arizona operations. Also, the exhibits combine long and short train operations, making a comparison between the short and long trains impossible.

In Nevada appellant appears to have selected its most favorable operating territory when traffic, grades, curves, double tracking and the like are considered. But difference in these and other local conditions make any comparison with Arizona operations impossible. The evidence as to Nevada operations, however, also shows that the hazards of operation increase with the increase in number of cars in the train.

Certainly, upon the records here, it is *not* "possible to say that the legislative choice is without rational basis."

South Carolina Highway Dept. v. Barnwell Bros., 303 U.S. 177, 191.

5. The Decision of the State Supreme Court, in Reversing the Trial Court, Did Not Deny to Appellant Any Federal Right to Which, on the Evidence, Appellant Is Entitled.

The Appellant complains that the State Supreme Court in its opinion did not discuss the evidence and specifically point out the error as to each Finding of Fact.

After the taking of evidence was closed in the trial court and the case was submitted, the Appellant and the Appellee each presented to the trial court suggested Findings of Fact, Conclusions of Law and a form of judgment. The Findings of Fact and Conclusions of Law presented by Appellant were accepted and adopted by the trial court without a single change therein so far as we are aware. The Findings of Fact cover *147 pages* of the printed record herein [R. 3887-4034, incl.]

Findings of Fact should *not* state or set out the evidence, or evidentiary or subordinate facts, but should find only the ultimate facts.

Wilson v. Merchants Loan & T. Co., 113 U.S. 121.

At least 90% of the trial court's findings here are in relation to evidentiary facts. As Appellant states (App. Br. Vol. I, p. 327): "No pertinent evidence introduced by either party has been disregarded". The inclusion of this evidentiary matter in the findings of fact could not impose on the Supreme Court of Arizona or this Court the burden of reviewing all the evidence.

Upon the question as to whether or not the Train Limit Law is valid as a safety measure, the ultimate fact to be determined was whether upon the whole record "it is possible to say that the legislative choice is without rational basis".

South Carolina Hy. Dept. v. Barnwell Bros., supra.

The State Supreme Court in its opinion determined "that the *findings* and judgment of the trial court *to the effect* that the Train Limit Law is unconstitutional were in error" [R. 4067-4068]. (emphasis ours). A finding by the trial court that the Train Limit Law has no rational basis in safety is "in effect" a finding that the law is unconstitutional. If upon the whole record it is impossible to say that the Train Limit Law has a rational basis in safety, then it is a direct regulation of interstate commerce and invalid under the Commerce Clause of the Federal Constitution. The ultimate fact to be determined is whether upon the whole record it is possible to say that the Train Limit Law is without rational basis. *So Carolina Hy. Dept. v. Barnwell Bros., supra*, is so interwoven with the question of law as to be in substance a decision of the latter.

Norfolk & W. R. Co. v. Conley, 236 U.S. 605, 609;

Truax v. Corrigan, 257 U.S. 312, 324-325.

The State Supreme Court has determined that the trial court erred in its finding upon this ultimate fact.

Section 21-1028, Arizona Code, 1939, stating the effect to be given to findings of fact, and the decisions of the State Supreme Court cited at pages 316-319, Volume I of Appellant's brief have no application here. This section of the Arizona Code and the cases cited have to do with the ordinary civil action arising under the *state laws*. They have no application to the determination of a Federal question arising under the Federal Constitution. The determination of such Federal question is governed by the decisions of this Court.

> "When a state court has wrongly denied a Federal right, finding that the asserted Federal right has no basis in point of *fact*.
>
> "This court, as an incident of its power to determine whether a Federal right has been wrongly denied, may go behind the finding to see whether it is without substantial support. *If the rule were otherwise, it almost always would be within the power of a state court practically to prevent a review here.*" (Emphasis ours.)

Truax v. Corrigan, supra, 257 U.S. at page 325.

And see:

Norfolk & W. R. Co. v. Conley, supra, and cases cited Appellant's brief, Vol. I, p. 236.

And the same rule or principle applies in a state Supreme Court's review of a trial court judgment. Certainly this Court will not apply one rule or principle to the review of the state Supreme Court's decision and apply another and different rule to the review by the state Supreme Court of the trial court's decision.

Conclusion.

The record clearly shows that the Train Limit Law has a rational basis in the protection of the safety of the public and of employees, and is a proper exercise of the police power of the state. It is in the permissible or concurrent field of legislation and in a field not occupied by Congress. No Federal rights of the Appellant have been denied by the decision of the State Supreme Court. We respectfully submit that the decision of the Supreme Court of the State of Arizona should be affirmed.

Respectfully submitted,

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APPENDIX.

SERVICE ORDER NO. 85.

Part 95—Car Service

Length of Trains

At a session of the Interstate Commerce Commission, Division 3, held at its office in Washington, D. C., on the 11th day of September, A. D. 1942.

The Commission having under consideration operating rules, regulations, and State laws limiting the length of railroad freight and passenger trains, the Commission is of the opinion that, due to the existing state of war, an emergency exists requiring immediate action within the meaning of section 1, paragraphs (10) to (17), inclusive, of the Interstate Commerce Act.

It appearing that certain rules, regulations, practices, and laws are now in effect and are being enforced in certain states limiting the length of railroad freight trains to not more than one-half mile and limiting the number of freight cars in a railroad freight train to 70 cars, and limiting the number of cars in a railroad passenger train to 14 or 16, and that compliance by railroads subject to the Interstate Commerce Act with such rules, regulations, practices, and laws, during the present emergency, may result in congestion of tracks and terminals, wasteful use of locomotives, and interference with the free flow of traffic necessary in the present emergency; and that railroad freight trains exceeding one-half mile in length, or exceeding 70 cars in length, and railroad passenger trains

exceeding 14 or 16 cars in length may be operated in accordance with safety standards now applicable, during the present emergency, in and through such states, and that such operation will facilitate the free flow of traffic necessary during the present emergency;

Therefore, it is ordered, that:

Sec.

95.1 Length of trains

95.2 Effective period; emergency character.

AUTHORITY: §§95.1 and 95.2 issued under 40 Stat. 101, 41 Stat. 476, 49 Stat. 543, 54 Stat. 901; 49 U.S.C. 1 (10)-(17).

§95.1 *Length of trains.* From and after September 15, 1942, carriers by railroad subject to the Interstate Commerce Act shall operate their trains, when necessary for the prompt movement of freight and the clearing or avoidance of congestion by either freight or passenger trains, without regard to any rules, regulations, practices or laws now in effect and being enforced in the various states limiting the length of freight trains to not more than one-half mile and limiting the number of cars in a railroad freight train to 70 cars or limiting the number of cars in a railroad passenger train to 14 or 16.

§95.2 *Effective period; emergency character.* This order shall remain in effect during the war in which the United States is now engaged, unless sooner terminated by subsequent order of the Commission; and that this or-

der, being based upon conditions of war emergency, shall not constitute a precedent for peacetime operations.

It is further ordered, That this order shall be served upon each common carrier by railroad subject to the Interstate Commerce Act and upon each State railroad commission, and that notice of this order be given to the general public by depositing a copy thereof in the office of the Secretary of the Commission at Washington, D. C., and by filing it with the Director of the Division of the Federal Register, The National Archives.

By the Commission, division 3.

(Seal)

W. P. BARTEL,
Secretary.

Safety Appliance Act

Section 1

It shall be unlawful for any common carrier engaged in interstate commerce by railroad to use on its line any locomotive engine in moving interstate traffic not equipped with a power driving-wheel brake and appliances for operating the train-brake system, or to run any train in such traffic after said date that has not a sufficient number of cars in it so equipped with power or train brakes that the engineer on the locomotive drawing such train can control its speed without requiring brakemen to use the common hand brake for that purpose.

Section 9

Whenever, as provided in sections 1-7 of this title, any train is operated with power or train brakes not less than 50 per centum of the cars in such train shall have their brakes used and operated by the engineer of the locomotive drawing such train; and all power-braked cars in such train which are associated together with said 50 per centum shall have their brakes so used and operated; and, to more fully carry into effect the objects of said sections, the Interstate Commerce Commission may, from time to time, after full hearing, increase the minimum percentage of cars in any train required to be operated with power or train brakes which must have their brakes used and operated as aforesaid; and failure to comply with any such requirement of the said Interstate Commerce Commission shall be subject to the like penalty as failure to comply with any requirement of this section.

INTERSTATE COMMERCE ACT

Section 25, Part I

(In part)

The Commission may, after investigation, if found necessary in the public interest, order any carrier within a time specified in the order, to install the block signal system, interlocking, automatic train stop, train control and/or cab-signal devices, and/or other similar appliances, methods, and systems intended to promote the safety of railroad operation, which comply with specifications and requirements prescribed by the Commission, upon the whole or any part of its railroad, such order to be issued and published a reasonable time (as determined by the Commission) in advance of the date for its fulfillment.

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No. 56

In the Supreme Court of the United States

OCTOBER TERM, 1944

SOUTHERN PACIFIC COMPANY, APPELLANT

v.

STATE OF ARIZONA, EX REL. JOE CONWAY, ATTORNEY GENERAL OF THE STATE OF ARIZONA

APPEAL FROM THE SUPREME COURT OF THE STATE OF ARIZONA

BRIEF FOR THE UNITED STATES AS AMICUS CURIAE

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In the Supreme Court of the United States

OCTOBER TERM, 1944

No. 56

SOUTHERN PACIFIC COMPANY, APPELLANT

v.

STATE OF ARIZONA, EX REL. JOE CONWAY, ATTORNEY GENERAL OF THE STATE OF ARIZONA

APPEAL FROM THE SUPREME COURT OF THE STATE OF ARIZONA

BRIEF FOR THE UNITED STATES AS AMICUS CURIAE

OPINIONS BELOW

The opinion of the Arizona Supreme Court (R. 4055–4071) is reported in 145 Pac. (2d) 530. The unreported opinion of the Arizona Superior Court may be found in the jurisdictional statement (pp. 22–34) and at R. 4042–4054; the findings of fact and conclusions of law of that court may be found at R. 3879–4039.

QUESTIONS PRESENTED

The questions considered in this brief are:

1. Whether Congress has manifested any specific intention as to the validity of state train

length legislation, and in particular whether Section 1, paragraphs 10–17 of the Interstate Commerce Act authorizes the Interstate Commerce Commission to regulate the subject of train lengths and, if so, whether state limitations are valid during the period before the Commission acted.

2. Whether, assuming the absence of any specific federal legislation on the subject, the Arizona statute contravenes the Commerce Clause.

STATUTES INVOLVED

The statutes involved are the Arizona Train Limit Law (Arizona Code Ann. 1939, Sec. 69–119), and the policy section and Section 1 (10)–(17) of the Interstate Commerce Act (49 U. S. C., Sec. 1 (10)–(17), which are printed in the Appendix, *infra*, pp. 90–98).

STATEMENT

On April 19, 1940, the State of Arizona brought suit against the Southern Pacific Co. for statutory penalties for operating two trains, one passenger and one freight, in violation of the law providing that passenger trains shall not consist of more than fourteen cars and freight trains of more than seventeen (R. 1–4). The carrier answered, admitting the violations but contending that the statute violated the commerce clause and the due process clause of the United States Constitution (R. 5–32). The case was tried in the Arizona

Superior Court, sitting without a jury. After a long trial devoted to the constitutional issues, the trial court entered judgment for the defendant railroad. The evidence and findings are discussed in some detail at the appropriate point in the Argument (*infra*, pp. 21–44). They are accurately summarized in the following excerpts from the trial court's opinion.

The court found that (R. 4046) the

> * * * evidence clearly establishes that "long-train" operating practice is the customary and ordinary practice throughout the United States and that improvements in efficiency, economy and safety are an accomplishment and necessary result of the adoption of that practice. This type of operation is unquestionably more economical and efficient than "short-train" operations. Freight train expenses vary inversely with train length. Furthermore, long-train operations permit improved schedules and performance by elimination of short-train interference.

With respect to the effect on commerce, the court stated (R. 4048–4049):

> The record here also amply discloses that the law causes real interference with, and delay to, interstate commerce, practically to the extent that Arizona operations create a bottle-neck. Actually ninety-three percent of the freight traffic and ninety-five of the passenger business of the defendant in Arizona is interstate commerce. Fur-

thermore, the law certainly imposes a great, substantial and wholly unreasonable burden of expense upon this interstate traffic. To hold in this case that interstate commerce was only incidentally or indirectly involved would be less than realistic, for the interference and regulation is *substantial, continuous, direct and unavoidable,* as is pointed out in detail in the findings of fact. What is even more serious from the standpoint of those who seek to uphold the Act is its extra-territorial effect. The challenged law lays hands upon interstate commerce moving over defendant's lines long before it reaches the physical boundaries of Arizona, and continues directly to affect and regulate that commerce long after it has left Arizona. As a practical matter, it nearly controls the length of passenger trains from Los Angeles to El Paso, and of freight trains from Yuma to Lordsburg, the latter point being twenty-three miles East of the State line, and frequently on to El Paso, 171 miles beyond Arizona's boundary.

The court concluded not only that the Arizona statute imposed an unconstitutional burden upon interstate commerce, but also that the "subject of the length of trains in interstate traffic" falls within the field "exclusively reserved to the National Government" (R. 4047),

> * * * for the reason that the subject matter is national in its character, requir-

> ing uniformity of regulation by a single authority. If each state was at liberty to regulate the conduct of carriers while within its jurisdiction, the confusion likely to follow could not but be productive of great inconvenience and unnecessary hardship. The very purpose of the commerce clause was to insure uniformity of regulation of interstate commerce against conflicting and discriminating state legislation, such as the law in question. The absence of any act of Congress on the subject of train lengths is equal to its declaration that commerce in that matter shall be free.

The court then turned to the State's contention that the statute was a valid exercise of the police power because designed to add to the safety of railroad operations. Basing its finding on accident statistics in Arizona and other states where longer trains were operated, which showed that casualty rates were much higher in Arizona, the court stated with respect to the limitation on passenger trains (R. 4050):

> From the standpoint of the safety of persons and property, slack and slack-action casualties on passenger trains are of no significance whatever.
>
> Long-train method of operation prevails in passenger service all over the United States, except in Arizona, and the statistics demonstrate, from the safety angle, that the fourteen-car limit has no logical or reasonable basis. Furthermore, long pas-

senger-train operations in Arizona are entirely practicable and would result in greater efficiency, economy and safety.

Hence, certainly as applied to passenger-train operations, the challenged law bears no reasonable relation to its claimed object of safety, and instead of promoting that object actually increases many hazards, and creates many others which would not exist if the law were not enforced.

The same conclusion was reached as to freight trains. On this point the court said (R. 4051):

> The frequency of train and train-service accidents, which includes grade-crossing accidents, appears to be directly related to the number of train units operated and that when more train units are run than are necessary to handle a given amount of traffic, the hazard or accidents in the handling of such traffic is correspondingly increased. When one considers that in the year 1938, for instance, that 30.8% or 4,304 more freight trains were operated between Yuma and El Paso than were actually necessary if it had not been for this law, it becomes apparent why the casualty rate is higher in Arizona.
>
> * * * * * *
>
> * * * it appears very definitely that there are more accidents and they occurred more frequently in proportion to trains handled or traffic moved in short-train territory than in long-train territory.

The court then considered the relationship of the length of trains to "slack accidents" as follows (R. 4052–3):

> A certain amount of slack is absolutely necessary to train operations. It cannot be denied that the addition of each car to a train adds just that much more potential slack, which must be effectively handled by the engineer if serious accidents are to be avoided. To the credit of the locomotive engineers of the United States, be it said that they have, with the improved equipment and devices furnished them, manifested greater skill and exercised more care in handling these longer trains with their heavier locomotives to the extent that over a seventeen-year period (1923–1939) only six per cent of the over-all casualties were caused by this type of accident. It must also be remembered that there are many factors besides length of train causing slack-action casualties, such as: grades, speed of train, consist of train and whether loaded or empty. The record shows many severe casualties of this type on short trains. Limiting trains to the Arizona maxima has had no perceptible limiting effect on even that class of accidents, * * *
>
> * * * * *
>
> In determining then whether the law bears any reasonable relation to safety, only the over-all result in casualties of the entire operation should be considered and when thus weighed it is clear that the law

> not only does not increase safety of train operations in Arizona, but that as a matter of cold fact it makes these short-train operations more dangerous.

The court's final conclusion was that the Act was void as in conflict with both the commerce and the due process clauses (R. 4053–4054).

This judgment was reversed by the Arizona Supreme Court, one judge dissenting (R. 4055–4071). The latter court did not overturn any of the facts found by the trial judge, whose findings, under the state rules of civil procedure, were not to be set aside "unless clearly erroneous."[1] Indeed it did not mention the facts or the findings at any point in its opinion. Its reasoning was that the law was passed for the purpose of protecting the safety of railroad employees and the traveling public (R. 4058), that debatable questions as to the reasonableness of legislation were not for it to decide (R. 4059–4067), and that (R. 4063)

> A state is free in the exertion of its police power to enact reasonable measures in the interest of the health, safety and welfare of its people, including employees of railroads, passengers on trains, and others, even though interstate commerce may be incidentally or indirectly involved. * * *

[1] Rule 52 (a) of the Arizona Rules of Civil Procedure is identical with the same rule in the Federal Rules of Civil Procedure.

[2] The above passage is from a quotation from *M.-K.-T. R. Co.* v. *Williamson*, 36 F. Supp. 607 (W. D. Okla.).

There was no analysis of the facts to show the basis for the conclusion, unexpressed but implicit in the opinion, that the law was reasonably related to the public safety and only incidentally or indirectly affected interstate commerce. As to the claim that the Safety Appliance Act and various sections of the Interstate Commerce Act had occupied the field, the court was of the opinion that they had not until the Interstate Commerce Commission acted.

The carrier appealed from this judgment. In noting probable jurisdiction, this Court called the case to the attention of the Solicitor General.

On September 11, 1942, after the decision of the trial court but before that of the Arizona Supreme Court, the Interstate Commerce Commission issued an order suspending state train limit laws for the duration of the war. The history and pertinence of that order are discussed, *infra*, pp. 60–62, 67–89.

SUMMARY OF ARGUMENT

I

1. The Arizona law regulates the length of trains the vast majority of which are in interstate commerce. The effect of such a limitation in a single state is to require trains to be reconstituted when they enter and leave the state. Since this generally cannot be done at the state border, the law in operation controls the length

of trains without as well as within the state. If other states enacted similar laws, prescribing various maximum train limits, as has been proposed and as would be within their power if the Arizona law is valid, the lack of uniformity in itself would impede the flow of commerce throughout the nation.

2. The Arizona statute obstructs commerce inasmuch as it slows down the movement of interstate traffic. This results both from the terminal delays when trains are reconstituted, and from the additional "meets" and "passes" caused by the running of more trains on a single track line. The train limit law also prevents the Arizona railroads from engaging in the method of railroad operations which is prevalent in the United States today. The operation of freight trains of over seventy and passenger of over fourteen cars is a regular practice on the main lines of the railroads, including the Southern Pacific on its lines outside Arizona. The effect of the law is to require 30% more trains to be operated in Arizona than would otherwise be the case. This substantially increases the cost of transportation, as is shown by comparison of Arizona costs with those of comparable lines elsewhere. This is expensive not only to the carriers but to the public which ultimately bears the cost of transportation. The law also has the effect in time of heavy transportation demands, such as the present, of diminishing the total

amount of traffic which can be carried, inasmuch as more locomotives and more manpower are required to haul traffic in short trains than in long ones. Even if the operation of the state law be suspended during such periods, its effect is not undone inasmuch as the absence of adequate sidings and locomotives interferes with the conversion of the road from short to long train operations.

3. The train length limitation cannot be justified as a safety measure. Experience proves that the slack accident casualties at which it is directed are infrequent, averaging five per year in Arizona, that the law has had a negligible effect in preventing them, and that the increase in the number of trains operated increases the number of other types of accidents which vary in proportion to the number of trains run. The accident rates in Arizona under short train operations, even as to the trainmen whom the law was designed to protect, are much higher than in comparable states.

4. In determining whether a state law contravenes the commerce clause this Court has been concerned with whether the subject of regulation requires national uniformity and with the extent of the burden on commerce. In applying these tests the Court has been guided largely by the practical effect of the statute in interfering with commerce, as compared with the local benefits derived from it. Application of these principles to the Arizona Train Limit Law demonstrates that

it is invalid. A lack of uniformity in regulation of this subject in itself interferes with the flow of commerce. The movement of interstate trains is obstructed and retarded. The carriers are prevented from employing the method of transportation customarily used by railroads throughout the nation, and are compelled to adopt a means more costly to the public. The effect of the law in reducing accidents is too slight, if it exists at all, to outweigh the interference with the national commerce.

II

Congress has not manifested any specific intention one way or the other as to the validity of state train length bills. No conclusion either way can be drawn from the history of the train length bills introduced in Congress but which failed to pass. And although, in our opinion, the Interstate Commerce Commission is empowered by Section 1, paragraphs 10–17 of the Interstate Commerce Act, to regulate train lengths in certain circumstances, this case involves the period before the Commission acted. We do not believe that any inference can be drawn from the federal legislative history that Congress intended Section 1 either to deprive the states of any power over the subject of train lengths which they might otherwise have had or to expand their constitutional authority to matters which under this Court's decisions they could not otherwise reach.

ARGUMENT

Preliminary Analysis

This brief will deal only with two subjects: (1) whether Congress has manifested any specific intention as to the validity of state train length legislation, and in particular whether it has authorized the Interstate Commerce Commission to regulate the subject of train lengths in Section 1, paragraphs 10–17 of the Interstate Commerce Act, and, if so, whether state limitations are valid during the period before the Commission acted, and (2) whether, assuming the absence of any specific federal legislation or action on the subject, the Arizona statute contravenes the Commerce Clause.

The authority of the Commission over the subject is currently being challenged in *Johnston* v. *United States*,[3] now pending before a three-judge district court in Oklahoma. That case involves the Commission's 1942 order suspending train length limitations during the war, which, of course, does not apply to the 1940 operations for which appellant has been penalized here. The ultimate question with which we are concerned, however, is not the authority of the Commission, but the intention of Congress as to the validity of

[3] W. D. Okla., Civil Action 1408. Proceedings in the case have been postponed until the final determination of the instant case by this Court.

state legislation prior to the time the Commission first sought to exercise its authority. As will appear, we have concluded, in the absence of any specific manifestation as to what Congress actually intended, that the car service provisions of the Interstate Commerce Act neither added to nor subtracted from the preexisting constitutional power of the states over the subject of train lengths. Clearly those provisions did not expand the authority of the states over interstate commerce. An argument can be made that if the Interstate Commerce Act authorized the Commission to regulate train lengths, it occupied that field and thereby made it exclusively federal. But we think it unlikely that in fact Congress would have regarded those provisions as in themselves depriving the states of any power over train lengths which they possessed without action by the Commission.

If this analysis is correct, the case turns upon the validity of the state law under the commerce clause, without regard for any specific delegation to the Commission. Accordingly we shall deal with that problem in Point I, and then consider in Point II (pp. 63–89) whether Congress has manifested any specific intention with respect to the validity of state train length legislation.

I

THE ARIZONA TRAIN LIMIT LAW CONTRAVENES THE COMMERCE CLAUSE

A. THE UNDERLYING PRINCIPLES

Since *Gibbons* v. *Ogden,* 9 Wheat. 1, and *Cooley* v. *Board of Port Wardens,* 12 How. 299, it has been established that under the commerce clause some subjects of regulation are within the exclusive power of Congress, and that even in the absence of a showing of congressional intention some types of state laws are invalid. This has not meant that the states were deprived by the commerce clause of their power to enact measures affecting, or even directly regulating, interstate commerce. But at some point, when the national, as distinct from the local, interest in the subject was sufficient, when the practical burden on interstate commerce became sufficiently clear, the Court has always drawn a line beyond which the states could not go.

The test applied in drawing this line has been expressed in various ways. In the first authoritative formulation of the accepted doctrine (*Cooley* v. *Board of Port Wardens, supra*), the Court declared (p. 319):

> Now the power to regulate commerce, embraces a vast field, containing not only many, but exceedingly various subjects, quite unlike in their nature; some impera-

> tively demanding a single uniform rule, operating equally on the commerce of the United States in every port; and some, like the subject now in question, as imperatively demanding that diversity, which alone can meet the local necessities of navigation.
>
> Either absolutely to affirm, or deny that the nature of this power requires exclusive legislation by Congress, is to lose sight of the nature of the subjects of this power, and to assert concerning all of them, what is really applicable but to a part. Whatever subjects of this power are in their nature national, or admit only of one uniform system, or plan of regulation, may justly be said to be of such a nature as to require exclusive legislation by Congress.

In some opinions, the doctrine of the *Cooley* case has been thought to have been based on the legislative intention to be implied from the silence of Congress in the particular case. "The failure of Congress to regulate interstate commerce has generally been taken to signify a Congressional purpose to leave undisturbed the authority of the states to make regulations affecting the commerce in matters of peculiarly local concern, but to withhold from them authority to make regulations affecting those phases of it which, because of the need of a national uniformity, demand that their regulation, if any, be prescribed by a single authority." *Graves* v. *O'Keefe,* 306 U. S. 466,

479, n. and cases cited.[4] But whether or not the rule is predicated upon implications from the commerce clause itself or upon the presumed intention of Congress where Congress has been silent, the result is the same.

Many cases, while not abandoning the "necessity for national uniformity" test, have spoken in terms of "direct" or "indirect" burdens on interstate commerce. Although the words "direct" and "indirect" are in themselves of little assistance, the emphasis in the cases adopting this formula has been on the practical interference with commerce produced by the state law. The commerce clause was designed to reach state legislation which "practically obstructs" commerce as well as that which expresses "hostility" toward it. *Union Brokerage Co.* v. *Jensen,* 322 U. S. 202, 209. Consideration is to be given to "all the facts and circumstances, such as the nature of the regulation, its function, the character of the business involved and the actual effect on the flow of commerce * * *." *Di Santo* v. *Pennsylvania,* 273 U. S. 34, 44 (Mr. Justice Stone, dis-

[4] See Dowling, *Interstate Commerce and State Power* (1940), 27 Va. Law Rev. 1, 20; Powell, *The Validity of State Regulation under the Webb-Kenyon Law* (1917), 2 Southern Law Quarterly 112, 3 Selected Essays on Constitutional Law 880, 898 (Association of American Law Schools, 1938); Sholley, *The Negative Implications of the Commerce Clause,* 3 University of Chicago Law Review 556; 3 Selected Essays on Constitutional Law 933 (Association of American Law Schools 1938).

senting). See also *Minnesota Rate Cases*, 230 U. S. 352, 400.

Both of these principles—sometimes separately and sometimes as if they were interrelated—have found recognition in the recent cases. That the commerce clause establishes "the immunity of interstate commerce from the control of the states respecting all those subjects embraced within the grant which are of such a nature as to demand that, if regulated at all, their regulation must be prescribed by a single authority" was recognized in *Milk Control Board* v. *Eisenberg Farm Products*, 306 U. S. 346, 351, *Edwards* v. *California*, 314 U. S. 160, 176, and *Kelly* v. *Washington*, 302 U. S. 1, 14. Local regulation is to be upheld if it does not impair the "uniformity of control of the national commerce in matters of national concern" or "materially obstruct * * * the free flow of commerce which were the principal objects sought to be secured by the Commerce Clause". *California* v. *Thompson*, 313 U. S. 109, 113; *Parker* v. *Brown*, 317 U. S. 341, 363. And *Union Brokerage Co.* v. *Jensen*, 322 U. S. 202, 211, emphasizes that "the fate of state legislation" has been determined "by the weight of the circumstances and the practical and experienced judgment in applying these generalities to the particular instances".

Whether a state statute "unduly" burdens interstate commerce is to be determined by bal-

ancing "the interest of the state in the present regulation * * * against the effect of such control on the commerce in the national aspect". *Illinois Nat. Gas Co.* v. *Central Ill. Pub. Serv. Co.*, 314 U. S. 498, 506. In summary, as said by the Court in *Parker* v. *Brown, supra*, at 362:

> * * * When Congress has not exerted its power under the Commerce Clause, and state regulation of matters of local concern is so related to interstate commerce that it also operates as a regulation of that commerce, the reconciliation of the power thus granted with that reserved to the state is to be attained by the accommodation of the competing demands of the state and national interests involved.

It has been urged by appellee that these general principles are inapplicable to a law enacted in the interest of safety and health, that as to such matters the states have complete freedom irrespective of the effect upon commerce of the local regulation. Neither reason nor authority supports this contention, as we show at pp. 53–60, *infra*.

B. APPLICATION OF THESE PRINCIPLES

Application of the above principles to the instant case demonstrates, in our opinion, that the Arizona law is invalid. The length of trains in interstate commerce is a subject which in the national interest requires uniformity of regulation, as distinct from a diversity of local controls. And a state law which prevents railroads from

transporting freight and passengers in trains of the length customarily operated throughout the United States unduly interferes with and obstructs the free flow of interstate commerce. The effect of the law as a safety measure, in reducing accidents and casualties, is too slight, if existent at all, to outweigh the interference with the national commerce.

The following discussion of the facts is based in the main on the findings of fact of the trial court (R. 3887–4034). Although many of the findings referred to have been attacked by the appellee, they were not set aside by the State Supreme Court, and are, in our opinion, proved by the evidence to be correct.[5] Indeed many of the

[5] Citations (in folio numbers) to the supporting evidence are at the end of each finding.

This Court is not bound by the findings of a state court in cases involving a federal right. *United Gas Public Service Co.* v. *Texas*, 303 U. S. 123, 143; *Great Northern Ry. Co.* v. *Washington*, 300 U. S. 154, 165–166; *Norris* v. *Alabama*, 294 U. S. 587, 590; *Fiske* v. *Kansas*, 274 U. S. 380, 385–386; *Aetna Life Ins. Co.* v. *Dunken*, 266 U. S. 389, 394. Accordingly, if the decree of the Arizona Supreme Court be regarded as overturning the findings of the trial court, this Court could still look to the evidence to see if the original findings were correct. And although, by the same token, this Court would not be bound by the trial court's findings, they are entitled to the respect normally given the findings of the judge who has heard the testimony. We submit that the opinion of the trial judge (R. 4042–4054), as well as the findings, manifests the painstaking consideration he gave to his factual conclusions in contrast to the failure of the State Supreme Court to refer to the facts at all.

most important of them are either so obvious or so inherently probable as to be subject to judicial notice.

1. *The Subject of Train Lengths is one Requiring National Uniformity*

The predominantly interstate character of railroad operations in the United States is well known to the Court. Relatively few trains carry only goods or persons which remain within a single state. And the proportion of the trains and cars which cross state lines is very great. In Arizona approximately 93 percent of the freight traffic and 95 percent of the passenger were interstate in character. (R. 3897–8.)[6] Indeed, about two-thirds of the freight and almost three-fourths of the passenger traffic crosses Arizona in the course of travel between other states (R. 3898). Although Arizona may be exceptional in this respect, in view of its location and small population, unquestionably railroading is an industry organized and operated on an interstate basis to a greater extent than almost any other.

With railroad operations largely involving the running of trains across state lines, the confusing effect of permitting the various states to establish limitations on train lengths is easy to demonstrate. Trains crossing the country would have to be broken up and reconstituted as they cross the lines

[6] Whether measured by quantity or by revenue.

of states imposing different limitations. Whenever a long train was about to enter a state with a shorter maximum it would have to be broken up. When the train passed into a state with no restriction, or with a higher one, there would be a new rearrangement. The alternative would be that the carrier would be obliged to conform to the shortest limitation of any of the states through which the train passed.

These possibilities of interference with operations through diverse requirements are not merely theoretical. Although the 70-car maximum for freight trains is the one most commonly proposed, the various bills introduced in state legislatures would have established maximum freight train lengths at from 50 to 125 cars and maximum passenger train lengths at from 10 to 18 cars.[7] If these laws had passed, a freight train running from Virginia to Michigan might have proceeded through states with a 75 car maximum (Virginia), a 125 car maximum (West Virginia), a 3000 foot maximum (Ohio), and a 70 car limit (Michigan). A train from Arkansas to Wisconsin might have been subjected to a 50 car maximum (Arkansas), one-half mile (Missouri), 3000 feet (Iowa), one and one-half miles (Minnesota), and 3300 feet

[7] See table listing and summarizing the train limit bills which were introduced in state legislatures but failed of enactment between 1927 and 1937, Hearings before the House Committee on Interstate and Foreign Commerce on S. 69, *Train Lengths*, 75th Cong., 3rd Sess., p. 447.

(Wisconsin). A train running from Nebraska to California might have been subjected to a 60, 75 or 85 maximum in Nebraska, to a limit fixed by a commission in Kansas, to a 65-car limit in Colorado, to a 75-car limit in New Mexico, to a 70-car limit in Arizona, and to a 74-car limit in California. A passenger train might have been limited to 14 cars in New Jersey, 10 in Pennsylvania, and 18 in West Virginia. If we assume, as would have been the fact, that there were also many states which would have had no limitation upon train lengths interspersed along the routes, the confusion in railroad operations which would have resulted from complying with variegated state regulations is even more apparent.

The present situation is simpler than that described above inasmuch as only three of the 164 train-length bills introduced in 36 state legislatures since 1920 have become law,[8] and the en-

[8] In Nevada, Louisiana and Oklahoma; the Arizona law involved in this case was enacted in 1912. Of the remaining bills, 62 were never reported out of committee, four were withdrawn by their authors, 21 were reported unfavorably by legislative committees and nine without recommendation, 22 died on the legislative calendar after preliminary consideration, four passed one house but were not reported out of committee in the second, 29 were defeated by vote on the floor, and one was vetoed. (The above figures do not include nine bills introduced in New Mexico, which did not pass; we have been unable to discover at what stage of the legislative process they were defeated.) The California and Nevada legislatures have memorialized Congress to pass train length legislation. In Appendix D, *infra*, pp. 103–112, we have

forcement of two of these has been enjoined as unconstitutional.[9] At present 70-car laws are enforced only in Arizona and Oklahoma, with a 14-car passenger limit in Arizona. These affect the flow of through traffic to and from the Pacific Coast, as well as through Oklahoma in other directions. The present record, which is concerned,

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listed the references to the above bills and to the legislative journals disclosing their disposition.

In his veto message of April 17, 1935 Governor Merriam of California stated (Cal. Sen. Journ., 51st sess., 1935, p. 1226):

"The chief and compelling objection to Senate Bill No. 24 is found in the fact that it seeks to establish within the borders of California by State law certain practices and regulations which can be effectively and equitably set up only by Federal statutes which shall be applicable not in one or two, but in all of the 48 States.

* * * * * *

"It is proper, however, that you should know that I have become convinced that this proposed law involves certain probable conflicts with the provisions of the Federal Constitution, indicating the likelihood of nullification of the proposed law in the event of a review by the Supreme Court of the United States."

[9] The 70-car laws in Nevada and Louisiana were held unconstitutional and never enforced. *Southern Pacific Co.* v. *Mashburn*, 18 F. Supp. 393 (D. Nev.); *Texas and New Orleans R. Co.* v. *Martin* (No. 428—Eq. E. D. La.), 1936, unreported. The Arizona law was also held unconstitutional in *Atchison, T. & S. F. Ry. Co.* v. *La Prade*, 2 F. Supp. 855 (D. Ariz.), reversed because of the substitution of a new attorney general who refused to threaten to enforce the law, in *Ex Parte La Prade*, 289 U. S. 444. As to the unsuccessful efforts of the carriers in Arizona to obtain the cooperation of the State Attorney General in bringing a test case between the time of the *La Prade* case and the present litigation, see Hearings, *supra*, note 7, pp. 429–446.

of course, only with the Arizona statute, shows that it results in freight trains being broken up and reformed at the California border and in New Mexico some distance from the Arizona line. Frequently it is not feasible to operate a new train from the New Mexico yard nearest to Arizona, with the result that the Arizona limitation governs the flow of traffic as far east as El Paso, Texas. As to passenger traffic, the Arizona law often controls the length of passenger trains all the way from Los Angeles to El Paso. (R. 4049, 3957, 3959.)

The situation in Oklahoma is more complicated, inasmuch as many railroads pass through the state in various directions.[10] The Chicago, R. I. & P. line from Chicago and Kansas City to the West runs through Oklahoma for 60 miles between Kansas and Texas, and the Santa Fe line between Chicago and California crosses Oklahoma for 117 miles between Kansas and Texas. The Kansas City Southern line from Kansas City, Missouri, to Port Arthur, Texas, crosses from Arkansas into Oklahoma and back to Arkansas again after running through Oklahoma for 143 miles. Neither Kansas nor Texas nor any

[10] The Oklahoma picture appears from any railroad map of the United States, and specifically in a map submitted to the Interstate Commerce Commission in *In the Matter of Service Order No. 85*. See the appendix to the brief submitted by the railroads to the Interstate Commerce Commission in that case.

other state through which the traffic passes (except Arizona) restricts train lengths in any way. On the contrary, proposed bills for limiting train lengths failed of passage in many of the adjoining states.[11] The effect of the Oklahoma law, however, is to require through trains to be broken up for the short distance they pass through that state, as well as for substantial distances on either side between

[11] See Appendix D, *infra*, pp. 103–112. The Kansas Public Service Commission, which was vested with power to regulate train lengths, refused to do so on the ground that—

"It is impracticable to direct that trains engaged in interstate commerce should, when arriving at the Kansas state line, divide into two or more portions, each portion to be attached to an engine and caboose and manned with sufficient employees to conduct it as a train across the state. To do so would not be in the interest of economy. * * * The operation of a greater number of trains would perforce increase the hazard to the public at large at grade crossings, and accidents of this character constitute a large per cent of the serious railroad accidents of today.

"The evidence introduced herein does not, by a preponderance thereof, show that accidents to employees, incurred by reason of operation of trains in Kansas, have unduly increased during the past few years solely because of the increase in length of trains. Neither has it been shown that accidents to passengers riding on such long trains have increased. * * *

"Practically all of the trains operated by respondents in Kansas are engaged to some extent in interstate commerce. The commission recognizes that it has no jurisdiction or authority to issue any order that would cast an undue burden upon such commerce."

The above excerpts are taken from the findings of the Commission as reported in *State ex rel. Public Service Commission* v. *Atchison, T. & S. F. Ry. Co.*, 125 Kans. 586, 588–589, 264 Pac. 1056 (1928).

the Oklahoma line and the nearest terminal in the adjacent state at which trains can be assembled.

The above illustrations of the operation of a state train length law show that lack of national uniformity in the regulation of this subject in itself impedes the flow of commerce through the nation.

If one state may regulate the train length, so may all the others, and they need not prescribe the same maximum limitation. If many endeavored to do so, the confusion resulting from the two state laws now in effect would be many times compounded.

The facts recited also show the effect of the state train length limitation upon operations in other states. To a certain extent the state with the lowest limit governs transportation operations in its part of the nation. For the longer trains must be broken up before they reach that state, thus extending the effect of the law at least to the nearest terminal points in adjoining states. And often, as the record shows, it is impracticable to reassemble trains, so that the short train operation is extended over a wider territory.

It thus appears both that the Arizona train limitation statute has its principal impact upon interstate commerce, and that its effect extends far beyond the control of operations within the regulating state. In such circumstances to permit state regulation will lead to the very kind of con-

fusion and interference which the commerce clause was designed to prevent. The advantages to the national interest of national regulation of such a subject are patent.

2. *The Burden on Interstate Commerce*

A. THE OBSTRUCTION TO TRAFFIC

Inasmuch as, where no legal restrictions prevail, through traffic is generally carried in long trains, many freight trains approaching Arizona are longer than seventy cars in length (R. 3915–6). Such trains must be broken up and reconstituted at the terminals when they enter Arizona. The train which is being reduced in length is delayed during this operation (R. 3953–7). The cars which are cut out of the train are delayed even longer, for they must be taken off the main track and stored for later movement until another train comes along or can be made up (*ibid.*). When a train leaves Arizona the converse takes place, except that often it is not feasible to consolidate eastbound trains at Lordsburg, New Mexico, with the result that the short-train operation continues to El Paso (R. 3957). Where the trains are consolidated in order to secure the advantages of long-train operation, cars are delayed until a long train can be made up (*ibid.*). The length of these delays varies from train to train and from car to car so that no definite figure can be given, but the trial court found the time to be substantial. (R. 3953–3956, 3961.)

These terminal delays are not the only time lost. The use of shorter trains results in more trains running in each direction. In single-track operation, which predominates in the West and in Arizona, when a train meets another going in the opposite direction, one must stop on a siding until the other has passed. This occurs also whenever one train must pass another bound in the same direction. The delays due to these "meets" and "passes" increase with the number of trains. Indeed the number of "meets" alone increases in proportion to the square of the number of trains in movement.[12] This, of course, serves to retard operations, the exact amount of the delay depending upon the length of time trains are required to wait on sidings in the particular case. (R. 3958.)

These effects of the Arizona law upon interstate transportation are readily apparent.[13] The record and findings reveal, however, that a train limitation such as Arizona's has an even deeper and more pervasive effect upon railroad operations.

B. THE EFFECT UPON RAILROAD METHODS OF OPERATION

Long-train operation is the standard operating technique of railroads in the United States today.

[12] Thus seven trains of a hundred cars in each direction would have 49 "meets", while 10 trains of 70 cars would have a hundred "meets".

[13] The law not only delays passenger operations in the ways indicated (Ex. 199, R. 3116–3148), but also has caused the Southern Pacific to cut out passenger cars and crowd the

This does not mean, of course, that all trains are over seventy cars in length. Judging by number, which includes local and branch line trains, most are not. But freight trains ranging from 125 to 160 cars are regularly operated, and the standard length of through freight trains on some systems is over 100 cars and on many others over 70. The operation of trains of over 70 cars in length is a regular and daily practice on the main lines of the railroads. (R. 3937–8.) On many railroads passenger trains of over 17 cars are commonly operated (R. 3938). Outside of Arizona the Southern Pacific runs a substantial proportion of long trains. In 1939 on its comparable route for through traffic through Utah and Nevada, from 66 to 85 percent of the freight trains were over 70 cars in length, and over 43 percent of the passenger trains over 14 cars (R. 3916).[14] As to the practice on other railroads, see Ex. 13, 26, 30, 43, 44, 73, 74, 75, 81, 83, 89, 91, 97, 100, 117, 138,

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passengers into fewer cars when entering Arizona (R. 1307–1308). The Santa Fe has found it necessary to limit the consist of its passenger trains between Chicago and Los Angeles to 14 cars, which handicaps it in competing with lines not so restricted and running longer trains (R. 1049–1053).

[14] The trial court found, and this hardly can be doubted, that conditions on these two lines of the same railroad, both through sparsely-settled western country, were similar and suitable for comparison (R. 3914–5, 3896–7, 3900). Apart from features effected by the Arizona law itself, such as length of sidings and size of locomotives, operations on the two lines were conducted in the same manner.

R. 2861, 2874, 2878, 2894, 2895, 2924–2927, 2933, 2935, 2942, 2944, 2050, 2953, 2977, 3007.

The railroads have adopted the long-train method of operation because it is less costly. Because of the train limit law, the Southern Pacific was required to haul over 30 percent more trains in Arizona than would otherwise have been necessary. (R. 3919, 3963–4.) The record shows a definite relationship between operating expenses and the length of trains (R. 3924–3934).[15]

This additional cost of operation, which for the two Arizona railroads together amounts to about $1,000,000 a year,[16] is of significance not merely because of the expense to them but because of the burden on the public from whom the cost must be recouped. Such an additional cost to those engaged in interstate commerce has always been regarded as a burden upon such commerce in the constitutional sense. Cf. *Colorado v. United States*, 271 U. S. 153, 163.

The burden on commerce imposed by the state law is more than merely financial. More locomotives and more manpower are required to haul traffic in short trains than in long ones. This, together with the congestion at terminals and the delay caused by the statute, diminishes the amount

[15] See particularly Ex. 177, 178, 179, R. 3066–3071.

[16] The trial judge estimated the cost to the Southern Pacific to be approximately $400,000 per year (R. 3966). The annual cost to the Santa Fe was estimated to be $600,000 in the *La Prade* case (2 F. Supp. at 862).

of traffic which can be carried if short trains are used. In times of heavy traffic, where the carriers are strained to haul as large a load as possible, the law thus impedes the amount which can be transported.

And even if the operation of the state law can be suspended in time of emergency, as it eventually was by the Interstate Commerce Commission, the interference with traffic does not disappear, for a railroad line which has not been equipped to handle long trains cannot be easily converted from short to long train operation. As the record shows, because of the train limit law, the sidings in Arizona are long enough only to hold trains of the length which the law permits (R. 3947–8). Engines suitable for the hauling of longer trains were not in service in the state (*ibid*). Even when the statute was suspended, the carrier could operate only with the sidings and locomotives available. The short sidings alone prevent long-train operation in more than one direction at a time.[17] Unless the road is to some extent rebuilt and larger locomotives obtained during the emergency, it can operate long trains only to a limited degree.

This effect of the train limit law upon operations in times of traffic congestion is not merely

[17] During the test period of long-train operations in 1940, the carrier was able to operate long trains only in one direction at a time (R. 3947).

speculative or hypothetical, for that is exactly what has happened since December 1941. The interference with transportation caused by the law was responsible for the order of the Interstate Commerce Commission suspending it (see pp. 67–68, *infra*), but even suspension does not eliminate its harmful effects. Such a statute, which thus impedes commerce at a time when efficient operations are of the most vital importance, conflicts with the national transportation policy to develop a "national transportation system * * * adequate to meet the needs of the commerce of the United States * * * and of the national defense." Interstate Commerce Act, preceding Sec. 1, 54 Stat. 899.

3. *The Effect of the Law as a Safety Measure*

We assume that there can be little doubt that a state statute interfering with interstate commerce in the ways described above would be invalid if it did not purport to be a safety measure.

With respect to the safety character of the law the trial court, after taking extensive testimony, found not only that the Arizona law had no reasonable relation to safety but that it made train operations more dangerous (R. 4050–3, 4021–2). The opinion of the State Supreme Court (R. 4055–68) contains no discussion of the facts upon which the trial court relied, but seems to hold—at most—that the state law has a rational relation-

ship to safety and that if this is so the exercise of legislative judgment must be upheld.

Where the question is whether the national interest in commerce is unduly burdened by a state statute, the test is not whether the state law has a rational relationship, however slight, to safety and health, but whether the local interest in safety is so great as to outweigh the interference with commerce (see pp. 15–19, *supra*, and 53–60, *infra*). When examined from this point of view it seems clear that the state law does not result in sufficient protection to the health and well-being of its citizens, including railroad workmen, to warrant the burden upon commerce. The pertinent facts on this issue are set forth at length in the findings (R. 3974–4032).

In brief they show that although the shock which may result from slack action is undoubtedly greater as the length of a train increases (R. 4052), the number of casualties due to slack action is quite small, averaging about five per year both in Arizona and in Nevada (R. 3991; Ex. 280, R. 3375).[18] Since such accidents result from many

[18] Slack action and its causes are described in detail in the findings at R. 3969–74. The number of slack accident casualties referred to on this and the following pages is based upon casualties resulting from sudden applications of brakes and "sudden stopping, starting, lurch, or jerk * * * not elsewhere provided for" (R. 3990, 1951–1952). Inasmuch as all such sudden stops, etc., are not the consequence of slack action (R. 2159), the number of slack accident casualties given may be too large. It should be noted that the discussion of slack accident casualties relates to freight trains only; as to passenger trains, see pp. 39–40, *infra*.

other causes than the length of the train (R. 4052, 3971), the number attributable to the train being unduly long is necessarily considerably less. A comparison of the number of slack accidents in Arizona and Nevada indicates that with approximately the same amount of traffic (R. 3900), the number was substantially the same under long and short train operations (R. 3991).

The possible effect of a train length law in reducing slack accidents, however, is not the whole story. For there must also be thrown into the scales the effect of the Train Limit Law in *increasing* the number of railroad accidents and casualties generally. If a given amount of traffic is to be carried, the shorter the trains are, the more trains must be run. The result of the Arizona law was to require Southern Pacific to operate 30.8%, or 4,304, more freight trains in 1938 than otherwise would have been necessary (R. 4051, 3964). The record indicates that the frequency of accidents is directly related to the number of trains run (R. 4021–2).

That the number of accidents due to grade crossing collisions between trains and motor vehicles (R. 4013–4), to collisions between trains (R. 4020–4022), and to collisions between trains and pedestrians (R. 4020) will vary in proportion to the number of trains is obvious. Inasmuch as the number of locomotives increases with the number of trains run, accidents due to locomotive failure

will also increase with the number of trains (R. 4020, 4022). In 1939 the number of slack accident casualties in the United States—399—was only 6% of the number of train and train-service casualties to railroad employees—6,713. (Exhibits 262, 266, R. 3300, 3304.) The relative importance from the viewpoint of the public safety of slack accidents and grade crossing accidents alone is shown by the fact that in 1939 in the entire United States there were 399 slack accident casualties, 3 of which were fatal (R. 3979), whereas the average number of grade crossing casualties per year from 1935 to 1939 was 5,718, a large number of which were fatal (R. 4014).[19] And, as we have seen (p. 34, note 18), not all of the so-called slack accident casualties resulted from slack action, and many of those that did would not have been averted if the train had been reduced to the length required by the Arizona law.

In addition, the running of more trains means that there will be more starts and stops of freight trains, more meets and passes, more switching movements. Accidents frequently result from each of these operations (R. 4021–2). The result is that an increase in the number of trains used to carry a given amount of traffic increases the likelihood of injury not only to the men operat-

[19] In 1939 in the United States, 1,398 persons were killed and 3,999 injured in highway grade crossing accidents. (Interstate Commerce Commission, Bureau of Statistics, Accident Bulletin, No. 108, pp. 22–23.)

ing the train[20] but to other railroad employees, passengers, and any of the public likely to be injured by train operations.

The record indicates that this is what has actually occurred. However measured, whether absolutely, proportionally, or by trend, and whether in relation to all railroad casualties or just those affecting the trainmen whom the train limit is supposed to protect, the accident rate in Arizona is much higher than on comparable lines elsewhere. This is shown not only by comparison of Southern Pacific operations in Arizona with those in Nevada,[21] but also by comparing operations of the Southern Pacific and of the

[20] The Train Limit Law is designed to protect the conductors and brakemen at the rear of the train.

[21] During the six-year period 1935–1940, the casualties in Arizona to all employees sustained in train and train-service accidents in road freight train operations were two and one-half times as many as in Nevada (R. 3988), although the total volume of freight traffic was slightly greater in the latter state (R. 3990). The result on a car mile basis, which takes into account the amount of traffic handled, is substantially the same (R. 3989). Although there was a substantial decrease in the accident rate in both states since 1923, the decrease for 1935–1940 over 1923–1928 was 71.1 per cent in Nevada as compared with 52.3 per cent in Arizona (R. 4008). With respect to the freight conductors, brakemen, and flagmen whom the Train Limit Law was designed to protect, the total number of casualties to such employees from all causes, including slack accidents, between 1923 and 1940 was 1.69 times heavier in Arizona—449 to 268 in Nevada. On a car mile basis the casualty rate for 1935–1940 for such employees was 2.2 times as high in Arizona as in Nevada, and the rate of improvement in Arizona after 1923 was also considerably lower. (R. 3989–90.) See Ex. 277–279, R. 3372–3374.

Santa Fe in Arizona with those of the same roads in New Mexico (R. 4001–6).

On a national basis the record and findings show that while the national accident rate per 100,000,000 car miles for all railroad employees (R. 3977; Ex. 262, R. 3300) and for trainmen [22] (R. 3979; Ex. 265, R. 3303) decreased 70 per cent and 66 per cent respectively between 1923–1928 and 1935–1940, the rate for the Southern Pacific in Arizona declined 52.3 and 53.3 per cent (R. 4008). The rate for the Southern Pacific line in Nevada decreased 71.1 per cent and 69.1 per cent, slightly better than the national record (R. 4008).[23] We do not suggest that the difference in train lengths is alone responsible for the greater number and rate of accidents in Arizona.[24] But the growth in Nevada's advantage over Arizona as the disparity in average train length increased, without any other adequate explanation, would seem to indicate that the train length limitation has had the effect of causing accidents instead of preventing them.[25]

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[22] Freight conductors, brakemen, and flagmen.

[23] The decline in slack accidents was 65 per cent nationally (R. 3979; Ex. 266, R. 3304), 57.5 per cent in Nevada (R. 4009; Ex. 280, R. 3375), and 47.7 per cent in Arizona (*ibid.*).

[24] Arizona's rate was higher in 1924, when the average train length in Nevada was slightly less than in Arizona. Cf. Ex. 178, R. 3067 with Exs. 277, 279, R. 3372, 3374.

[25] This is the case even if the years 1923 and 1924 are eliminated from consideration and the comparison begun with 1925. Exs. 277, 279, R. 3372, 3374. In 1924 the Southern Pacific acquired lines in Arizona which appellee has contended makes comparison with the years prior to the acquisition inappropriate.

The Arizona law limits the length of passenger as well as of freight trains. The total number of casualties on passenger trains is almost too small for statistical analysis to be meaningful (R. 4010); a single serious wreck may overbalance the experience of a number of years. Nevertheless, comparison between appellant's lines in Arizona and Nevada (where many long trains are run) shows that passenger casualties are considerably less in the latter state (R. 4010–13; Exs. 291–292, R. 3409–21). With passenger traffic in Nevada 78 percent as heavy as in Arizona, from 1923–1938 239 casualties were caused to persons other than trespassers by passenger trains in Arizona and 109 in Nevada—the latter figure including 53 persons killed or injured in a single wreck apparently caused by external malicious tampering with the track (*ibid.*). Inasmuch as passenger trains are much shorter than freight trains and have superior brakes which set almost simultaneously (R. 2484–5, 2474, 795–6, 2731), the portion of the small number of total casualties attributable to slack action would obviously be minute. The record shows only that between 1923 and 1939 five persons in Nevada and fourteen in Arizona were injured by sudden stops, starts or jerks on passenger trains, none of which in either state exceeded fourteen cars in length (Ex. 291–292, R. 3409–3411, 3414–3421); it does not indicate whether or not any of these accidents resulted from slack action or was affected by the

length of the train.[26] In any event the number of casualties from these causes in each State averaged under one per year, and was much less in the State in which longer trains were operated.

The fact that there are relatively few slack accidents, that their number is just as great under a train limit law, and that they are outweighed in the harm they cause the public by the increase in the accident rate which results from running a greater number of trains than necessary does not mean that steps should not be taken to eliminate them. But more effective remedies are already available to reduce the dangers and difficulties of long train operation without forcing the carriers to abandon it.

Slack accidents are commonly caused in large part by the progressive, rather than the simultaneous, setting of the brakes in a train. Since 1933 as a result of tests previously conducted by the American Railroad Association with the old K type brake and experimental models, a new type of air-brake, the AB brake, has been developed which sets the brakes throughout the train much more evenly.[27] This brake greatly reduces the

[26] Sudden stops or starts or jerks may, of course, occur entirely apart from slack action, as they do on busses or streetcars.

[27] The facts set forth in this paragraph have been obtained from the Bureau of Safety of the Interstate Commerce Commission. They are also disclosed in the testimony of Mr. F. C. MacDonald, of the Bureau of Safety before a subcom-

shock resulting from slack action, and when installed on all equipment should decrease accidents from this cause. All new freight cars since 1933 have been supplied with AB brakes and at the present time about one-half of the freight cars for interchange service are so equipped. On July 29, 1944 the Interstate Commerce Commission ordered the railroads to show cause why all freight cars should not be so equipped by January 1, 1946; the specifications provided for apparatus "based upon * * * train length of 150 cars".[28] A hearing was held on December 19, 1944, at which time the carriers sought an extension of time for installation but did not otherwise oppose the general provisions of the order.[29] On passen-

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mittee of the Senate Committee on Interstate Commerce (Hearings on S. 2625, 73rd Cong., 2d sess., *Limiting the Car Length of Trains*, pp. 156–161), the statement submitted by G. H. Wood, Chairman of the Brake Committee of the American Railroad Association (*id.*, pp. 229–231), and the testimony of E. Von Bergen, of the Illinois Central System before the House Committee on Interstate and Foreign Commerce (Hearings on S. 69, 75th Cong., 3d sess., *Train Lengths*, pp. 1009–1011. See also American Railway Association, *Report of Road Tests with Type AB Freight Brake Equipment* (1933) (mimeographed); R. 991, 1005.

[28] See *Interstate Commerce Commission, Investigation of Power Brakes and Appliances for Operating Power-Brake Systems*, No. 13528, Order of July 29, 1944, printed in full in the appendix to Volume I of the appellant's brief. The Order contains a recital of many of the facts referred to in the text of this brief.

[29] See the notice of hearing and summary of pre-hearing conference, issued by the Interstate Commerce Commission in No. 13528, *supra*, October 19, 1944. At the hearing, the

ger trains brakes even superior to the AB and other devices, such as an improved draft gear in conventional equipment, and the completely integrated train, which has no slack, have largely eliminated the likelihood of injury from slack action. See p. 39, *supra*.

The appellee also has referred to the difficulty of signalling between the engine and the caboose of a long train. The trial court found that only one accident (on a train with 2 cars and a caboose) and no casualties had resulted from inability to observe or interpret signals in Arizona and Nevada during the 18-year period ending in 1940 (R. 4024–5).[30] Moreover, the problem of signalling can also be solved without resorting to a reduction in the length of trains by the installation of radio communication between the front and rear of trains.[31] The Interstate Commerce Commission has already approved an ap-

Brotherhood of Railroad Trainmen objected to the specifications as not sufficiently stringent. Briefs have not as yet been filed, and no final decision has been reached. An additional hearing is to be held on April 17, 1945.

[30] With respect to the inability to see signals, the court found that the only signal given from the rear of the train while it was moving was the stop signal, that if this were missed the conductor could and would stop the train through using the rear brake valve on the caboose, and that in 18 years no reportable casualty had resulted from the use of the valve. While the train is standing still a missed signal to proceed results only in repetition of the signal until the engineer sees it before he starts the train (R. 4023–5).

[31] The feasibility of radio communication for the railroads is disclosed in the Hearings before the Kilgore Subcommittee of the Senate Committee on Military Affairs. Part 13 of the

plication of the Pennsylvania Railroad to install a system of communication between trains and the wires alongside the track on a part of its main line.[32] The Federal Communications Commission has been advised that 40 railroads, representing 66.8 percent of the total mileage, will use end-to-end radio communication if frequencies are allocated to them.[33] In a recent report the Commission has approved the railroad use of radio and tentatively allotted frequencies substantially as requested.[34]

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printed report of the Hearings contains a discussion and compilation of the material dealing with this problem. See Hearings before Subcommittee of the Senate Committee on Military Affairs pursuant to S. Res. 107 and on S. 702, 78th Cong., 2d sess., *Scientific and Technical Mobilization—Use of Radio for Railroad Communication and Signaling*, pp. 1559–1653.

[32] Interstate Commerce Commission, *In the Matter of Application for Approval of Proposed Modifications of Systems or Devices Under Paragraph (b) Section 25 of the Interstate Commerce Act as amended, The Pennsylvania Railroad Company*, BS–Ap–No. 6729, Order of December 2, 1944. A similar application from the Atlantic Coast Line is pending before the Commission.

[33] Federal Communications Commission, *In the Matter of: Allocation of Frequencies to the Various Classes of Non-Governmental Services in the Radio Spectrum from Ten Kilocycles to Thirty Million Kilocycles*, Docket No. 6651, Exhibit 481, pp. 4–5.

[34] *Id., Report of Proposed Allocation from Twenty-five Thousand Kilocycles to Thirty Million Kilocycles* (January 1945, pp. 149–170). At the close of hearings held in a related proceeding (Federal Communications Commission, *In the Matter of Investigation of the Establishment and Use of Radiocommunications Systems in Railroad Operations*,

These methods of eliminating the factors which make long train operations slightly more difficult do not require a departure from the modern method of train operations or increase the likelihood of injury from other causes. Inasmuch as the safety problem can be and is being solved in other ways, the burden on commerce imposed by the Arizona law is not justified.

4. *The Burden upon Commerce Imposed by the Train Length Limitation So Outweighs Its Value, If Any, in Preventing Accidents as to Require that it be Held Unconstitutional*

The effects of a state train length limitation, as disclosed in the preceding discussion, are to impede and delay interstate transportation, to require carriers to abandon the method of operations prevalent throughout the country, and to increase railroad accidents and casualties generally without decreasing the number of those resulting from slack action alone. The lack of uniformity in regulation which state control over this subject creates is in itself a primary cause of the interference with commerce.

Many decisions which this Court has rendered with respect to the validity of state laws affecting interstate commerce indicate that, whatever the method of expression or the result, the Court is guided largely by the practical effects of a statute

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Docket No. 6593), Commissioner Walker stated (transcript, p. 989): "I think the testimony will clearly show the present utility and practicability of radio in yard operations and for front to rear communication in freight train service."

from the viewpoint both of its interference with national commerce and of the local benefit which will be derived from it. See pp. 15–19, *supra*. Each case stands on its own facts. There is none in which the relationship of a statute to commerce and to the public safety is precisely the same as in the case at bar. The cases are thus important because of the principles for which they stand, and not because any are controlling or directly in point.

The Court has both sustained and invalidated state laws regulating the construction, equipment and operation of vehicles or vessels engaged in interstate commerce. In the interest of safety statutes have been upheld requiring railroad passenger cars to be equipped with certain types of heaters (*New York, N. H. & H. R. Co.* v. *New York*, 165 U. S. 628), locomotives to be supplied with electric headlights (*Atlantic Coast Line R. Co.* v. *Georgia*, 234 U. S. 280), and freight trains to be equipped with cabooses (*Terminal Railroad Association* v. *Brotherhood of Railroad Trainmen*, 318 U. S. 1). In *South Covington & Cincinnati Railway Co.* v. *Covington*, 235 U. S. 537, the Court upheld the provisions of a Covington ordinance requiring an interstate street railway to keep its cars clean and fumigated and to prohibit passengers from riding on the front and rear platforms unless certain rails were provided. But in the same case the Court set aside other provisions of the ordinance prohibiting standing passengers in excess of one-third of the car seat-

ing capacity, and requiring the company to operate enough cars to accommodate the public on this basis. Such regulations, determining both the manner of carrying passengers and the number of cars to be operated between Covington and Cincinnati, governed car loadings and impeded traffic in the latter city and required more cars to be operated than Cincinnati permitted. With respect to these provisions the Court said (pp. 547–548):

> If Covington can regulate these matters, certainly Cincinnati can, and interstate business might be impeded by conflicting and varying regulations in this respect, with which it might be impossible to comply. On one side of the river one set of regulations might be enforced, and on the other side quite a different set, and both seeking to control a practically continuous movement of cars. As was said in *Hall* v. *De Cuir*, 95 U. S. 485, 489, "commerce cannot flourish in the midst of such embarrassments."

The benefit from the point of view of safety of the limitation upon overcrowding in cars was not sufficient to sustain these provisions, in view of the effect of the ordinance on the number of cars to be operated and the danger of diverse state regulations on that subject.[35] The *Covington*

[35] The Court also invalidated a provision of the ordinance requiring car temperature to be maintained at 50° Fahrenheit or above on the ground that this was impossible owing to the opening and closing of doors. 235 U. S., at 548–549.

case is important because it clearly recognizes the principle underlying the cases sustaining state police regulations relating to safety, because the effect of the ordinance in increasing the number of cars to be operated is analogous to that of the Arizona law, and because it shows the practical limits imposed upon a state's authority even when exercising its police powers.

Kelly v. *Washington*, 302 U. S. 1, sustained a state statute in so far as it provided for the inspection of the hulls and machinery of certain vessels; but the opinion definitely indicates that other portions of the state code establishing "standards and designs for the structure and equipment of vessels" and prescribing "rules for their operation * * * could not properly be left to the diverse action of the States" (p. 15). On this point the opinion further declared (*ibid.*):

> If, however, the State goes farther and attempts to impose particular standards as to structure, design, equipment and operation which in the judgment of its authorities may be desirable but pass beyond what is plainly essential to safety and seaworthiness, the State will encounter the principle that such requirements, if imposed at all, must be through the action of Congress which can establish a uniform rule. Whether the State in a particular matter goes too far must be left to be determined when the precise question arises.

The opinion thus stands for the proposition that state regulation of the "design, equipment and operation" of instrumentalities of interstate transportation cannot go beyond what is plainly essential to safety. The mere fact that the regulation is "desirable" "in the judgment of its [the state's] authorities" is not sufficient.

The same principle is illustrated by the decisions involving other types of state police regulations. *Erb* v. *Morasch*, 177 U. S. 584, upheld a local ordinance limiting the speed of interstate trains within city limits. But when the State of Georgia sought to require all trains so to check their speed at highway crossings as to stop in time should any person or thing be crossing the track it was held that this so impeded interstate commerce as to be beyond the state's power. *Seaboard Air Line Ry.* v. *Blackwell*, 244 U. S. 310. Each statute was a measure which, from the point of view of safety, was reasonably adapted to the public interest. But the actual interference with commerce resulting from requiring trains almost to stop at all grade crossings was regarded as outweighing the local interest in safety.

The same balancing of local and national interests has served as a guide to the decisions on state statutes requiring interstate trains to stop at small towns or county seats.[36] The Court has recog-

[36] *Illinois Central R. Co.* v. *Illinois*, 163 U. S. 142; *Gladson* v. *Minnesota*, 166 U. S. 427; *Lake Shore & M. S. Ry. Co.* v.

nized that the states may appropriately require carriers to maintain reasonable passenger service for such communities. But as long as other adequate service is provided, the courts will not permit the states to require interstate through trains to make local stops. It should be noted that the local laws involved in these cases were held to burden commerce because of their effect in slowing down interstate through service.

Some of the earlier cases in the groups just discussed seem to assume that if a statute is an exercise of the state police power, it cannot constitute a direct or undue burden on interstate commerce.[37] Although these decisions can be justified on their facts, the assumption is obviously not correct, as the *Blackwell* case demonstrates. In setting aside a state order that an interstate railroad bridge be removed in order to prevent overflows of flood waters into Kansas City, the Court, speaking through Mr. Justice Holmes, declared

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Ohio ex rel. Lawrence, 173 U. S. 285; *Cleveland, C., C. & St. L. Ry. Co.* v. *Illinois*, 177 U. S. 514; *Mississippi Railroad Comm'n* v. *Illinois Central R. Co.*, 203 U. S. 335; *Atlantic Coast Line R. Co.* v. *Wharton*, 207 U. S. 328; *Herndon* v. *Chicago, R. I. & P. Ry. Co.*, 218 U. S. 135; *Chicago, B. & Q. R. Co.* v. *Railroad Commission*, 237 U. S. 220; *Gulf, C. & S. F. Ry. Co.* v. *Texas*, 246 U. S. 58; *St. Louis & San Francisco Ry. Co.* v. *Public Service Comm'n*, 254 U. S. 535; *St. Louis-San Francisco Railway Co.* v. *Public Service Comm'n*, 261 U. S. 369.

[37] E. g., *New York, N. H. & H. R. Co.* v. *New York*, 165 U. S. 628.

(*Kansas Southern Ry.* v. *Kaw Valley Dist.*, 233 U. S. 75, 79):

> The decisions also show that a State cannot avoid the operation of this rule by simply invoking the convenient apologetics of the police power. It repeatedly has been said or implied that a direct interference with commerce among the States could not be justified in this way.

The Court's recent decisions in *Parker* v. *Brown*, 317 U. S. 341, *Illinois Nat. Gas Co.* v. *Central Ill. Pub. Serv. Co.*, 314 U. S. 498, *California* v. *Thompson*, 313 U. S. 109, and *Terminal Railroad Association* v. *Brotherhood of Railroad Trainmen*, 318 U. S. 1, have been more explicit than the earlier cases in their recognition that the validity of state laws regulating interstate commerce is to be determined "by the accommodation of the competing demands of the state and national interests involved" (*Parker* v. *Brown*, 317 U. S., at 362). See pp. 18–19, *supra*.

In none of the cases previously discussed in which state laws have been held valid was any actual interference with interstate commerce such as is disclosed by the present record shown to exist. Nor in any of them was there reason to doubt that the local regulation would be beneficial to the health and safety of the community.

Terminal Railroad Association v. *Brotherhood of Railroad Trainmen*, *supra*, and *South Carolina Highway Department* v. *Barnwell Bros.*, 303

U. S. 177, are entirely consistent with the suggested conclusion that state train length legislation is invalid. The former case indicates that states may, in the interest of safety, regulate the composition of interstate trains to some extent, even where the necessary effect may extend a short distance into adjoining states. But in upholding the Illinois caboose order, the Court was properly influenced by the "obvious relation [of the order] to the health and safety of local workers", and by the fact that the practice of requiring cabooses at the end of trains had been voluntarily adopted by nearby railroads without legal compulsion. 318 U. S., at 8. The opinion indicates that the cost to commerce must be weighed against the cost to health and safety, and that the absence of practical interference with customary methods of railroading will count heavily in the scales. The case thus shows that both in determining whether the subject requires uniformity of regulation in the national interest and whether interstate commerce is unduly burdened, the Court is guided largely by practical considerations.

A similar approach to the present case will, we believe, lead to the opposite conclusion. The extra-territorial effect of the Illinois order was trivial as compared to that of the Arizona train limitation. Here the actual obstruction to interstate commerce is serious, the limitation of train lengths prevents the uses of the methods of transportation which generally prevail throughout the

nation, and is not justified by its value in protecting the public safety.

The *Barnwell Bros.* case stressed the long-recognized power of the states and localities over the highways which they build, own and maintain, specifically contrasting the position of the highways with that of the railroads (303 U. S., at 186–187). Since the states maintain the highways, it is appropriate for them to determine what traffic can safely be carried. Furthermore, although interstate motor traffic is undoubtedly extensive, the proportion of local highway traffic is clearly much greater than on the railroads. The impact of state highway regulation on local trucking, which serves as a restraint upon legislative action, is relatively much heavier than that of the Arizona statute upon intrastate rail operations. Since control of the highways from the viewpoint of safety has long been left to the states it is an appropriate field for state action and perhaps for application of a rule that any rational legislative judgment will be given effect. But the Court's citation of *Seaboard Air Line Ry.* v. *Blackwell*, which involved a law undoubtedly relating to safety, indicates that it recognizes that the power of the states over the railroads cannot be tested in the same way.[38]

[38] The *Barnwell* opinion contained the following passage applicable to railroads (303 U. S., 186–187):

"The commerce clause has also been thought to set its own limitation upon state control of interstate rail carriers

Appellee's position is that the validity of the state law depends "entirely" on whether it has "a rational basis in safety" (Br., p. 88). If it "has no rational relation to safety, the burden on interstate commerce * * * is * * * *direct* and the law is unconstitutional" (Br., pp. 80, 88–89). But "a statute having a real relation" to safety only "indirectly burdens interstate commerce" and is therefore not invalid (Br., p. 21). Appellee candidly admits that under this theory "the extent of the burden [on interstate commerce] is *not* a question or element to be considered by the Court * * *" (pp. 80, 18). Once the rational relationship to safety appears, whether the state law burdens commerce and how much is said to be a matter solely for legislative, not judicial, consideration (Br., p. 81); the test of the validity of the commerce clause is said to be identical with that of the Fourteenth Amendment. Stated in another way, the proposition is that no matter how greatly interstate commerce is impeded, a state law en-

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so as to preclude the subordination of the efficiency and convenience of interstate traffic to local service requirements.'" "* * * Although the states have usually been allowed to impose burdens on interstate railroads in the interest of local safety, *Smith* v. *Alabama*, 124 U. S. 465; *Nashville, C. & St. L. R. Co.* v. *Alabama*, 128 U. S. 96; *New York, N. H. & H. R. Co.* v. *New York*, 165 U. S. 628; *Chicago, R. I. & P. R. Co.* v. *Arkansas* 219 U. S. 453; *St. Louis, I. M. & S. R. Co.* v. *Arkansas*, 219 U. S. 518; cf. *Henningtón* v. *Georgia*, 163 U. S. 299, an unnecessarily harsh restriction, even though it is in the interest of safety, has been held to be unconstitutional. *Seaboard Air Line Ry.* v. *Blackwell*, 244 U. S. 310."

acted in the interest of safety is of local concern and valid so long as rational.

This Court's decisions have not turned on any such mechanical dialectic. The suggestion that in determining whether a state law—relating to safety or anything else—contravenes the commerce clause this Court must completely disregard its effect on interstate commerce is a novel one. Appellee does not deny that outside of the field of "police" or "safety" regulations this Court balances the national and local interests, including, of course, the burden on commerce, in determining validity. *South Carolina Highway Department* v. *Barnwell Bros.*, 303 U. S. 177, and earlier cases are cited, however, to show that this test may not be applied to safety measures. But the more recent statement of the controlling principle in *Parker* v. *Brown*, 317 U. S. 341, 362–363, which appellee claims is inapplicable here, cites the *Barnwell* case as one of the supporting authorities without differentiation between decisions involving safety and other cases. And *Terminal Railroad Association* v. *Brotherhood of Railroad Trainmen*, 318 U. S. 1, which unquestionably involved a state regulation of safety, declared that "the governing principles were recently stated in *Parker* v. *Brown*" (p. 8), and then proceeded to apply them.

Appellee's argument that the standard of rationality from the viewpoint of safety which has

been applied in determining validity under the Fourteenth Amendment is identical with the test under the commerce clause is predicated upon the soundness of its contention that the extent of the burden on interstate commerce is irrelevant. In a Fourteenth Amendment case the latter factor, of course, is not material. But if the effect on commerce is a factor of consequence in dealing with commerce problems—as we think must be clear—the nature of the question necessarily becomes different from that considered under the Fourteenth Amendment. The issue is not whether a legislature has acted arbitrarily or irrationally with respect to individual rights in life, liberty or property, but whether the impingement upon the national interest in commerce is too great to be warranted by the local benefits derived from the state law.

Appellee asserts (Br., pp. 86, 88) that it has found no cases supporting the view that the criteria under the two constitutional provisions are not the same. The point has probably been too obvious to elicit much comment. *Seaboard Air Line Railway* v. *Blackwell*, 244 U. S. 310 (*supra*, p. 48), and *South Covington & Cincinnati Ry. Co.* v. *Covington*, 235 U. S. 537 (*supra*, pp. 45–47), constitute square holdings that a state law rational from the standpoint of safety may still be unconstitutional under the commerce clause. As has been pointed out, *Termin Rail-*

road Association v. *Brotherhood of Railroad Trainmen* weighed the "costs to commerce * * * against the cost to * * * health and safety" of the order there involved, in a manner definitely inconsistent with appellee's position. And in his separate opinion in *International Harvester Co.* v. *Department of Treasury;* 322 U. S. 340, 353, Mr. Justice Rutledge recently said, in dealing with a similar problem:

> There may be more than sufficient factual connections, with economic and legal effects, between the transaction and the taxing state to sustain the tax as against due process objections. Yet it may fall because of its burdening effect upon the commerce.

Compare also *Schollenberger* v. *Pennsylvania,* 171 U. S. 1, 15–17, with *Powell* v. *Pennsylvania,* 127 U. S. 678, and *Leisy* v. *Hardin,* 135 U. S. 100, 121–124, with *Mugler* v. *Kansas,* 123 U. S. 623.[39]

Appellee asserts (Br., p. 34) that "whether the burden on interstate commerce by reason of the statute *is too great* is a legislative, and not a judicial question". This cannot mean that a state legislature is to be the final authority as to the validity of an interference with interstate

[39] See the excellent discussion in Dowling, *Interstate Commerce and State Power* (1940), 27 Va. Law Rev. 1, 21, in which the author states: "The test of reasonableness in interstate commerce cases is not the same as, for example, in due process cases."

commerce, even if limited by the requirement that it not act irrationally. The argument apparently is that only Congress can determine that an interference with commerce is so great as to require the invalidating of a state law. But in hundreds of decisions stemming from *Gibbons* v. *Ogden*, 9 Wheat. 1, this Court has been committed to the doctrine that the commerce clause, of its own force and in the absence of congressional action, precludes the states from interfering unduly with the national interest in the free flow of commerce. Although there may have been differences of opinion both as to the principle and its application, we do not think it necessary on this occasion to enter into a defense of so well established a doctrine. To the extent that appellee's argument rests on the supremacy of congressional power, it overlooks the effect of the long-established doctrine itself in furnishing a setting for determining the will of Congress. In view of the fact that matters of national concern demanding uniformity of regulation have for almost a century been treated as invalid except where Congress has indicated otherwise, Congress would normally assume that it was unnecessary for it to negative state legislation of that character.

In the light of these established principles appellee apparently limits its argument that the courts have no authority to look to the extent of

interference with interstate commerce to state laws relating to public safety. These are said invariably to be matters of peculiarly local concern. Although this may normally be true, it certainly does not inevitably follow. The law requiring stopping at grade crossings would, as the *Blackwell* case indicates, have more than doubled railroad running time. Indeed, a state might completely prohibit all railroad operations or air transportation on the ground that such a course would prevent accidents, a conclusion which certainly would be rational. Or a state might, with complete rationality from the viewpoint of safety, find that broader gauge cars and locomotives would not be overturned as easily as those presently used, and order that all railroads within the state widen their tracks and rolling equipment. Although such a regulation would bear a rational relationship to safety, it would completely disrupt the movement of interstate rail traffic through a state. To say that because such laws were reasonably related to the public safety they were of local rather than national significance would be to establish a fictitious standard entirely divorced from the hard-headed practicality embodied in the commerce clause. One cannot decide whether a matter is of national concern or demanding national uniformity if one looks only to its local impact and ignores all the facts which show its effect on the nation's commerce. As the

cases cited, *supra*, pp. 55–56, demonstrate, this Court has adopted no such automatic or inflexible formula in cases involving the public safety any more than elsewhere.

The alternative to a rigid formula is that the Court exercise a policy judgment. But this is implicit in the doctrine enunciated in *Parker* v. *Brown* that the national and local interests must be accommodated. This cannot be avoided unless the Court should take either the position that all state regulations of interstate commerce are bad, or that all are valid until Congress declares otherwise, extremes which have long been abandoned.[49]

The principle for which the cases as a whole stand is that a state safety regulation, even when applicable to interstate vehicles, is normally to be upheld, unless the actual interference with commerce resulting from it will be serious. In the cases which sustain state regulations there has always been a reasonably clear showing—if it was not obvious on the face of the statute—that the

[49] Even if, as has been suggested, the clause were regarded as invalidating only state laws which in some way discriminate against interstate commerce—

> the Court must make the same sort of value judgment that it has been making in performing its broader protective function. Discrimination exists or not, depending upon whether there is an economic justification for the difference in treatment which the state accords interstate commerce. Only by an evaluation of all the facts and circumstances can such an issue be decided by the Court. (Dowling, *supra*, p. 56 n., at p. 16.)

law bore a close relation to safety, and there was no burden upon commerce comparable to that demonstrated here. The latter alone, we think, would suffice to invalidate the Arizona statute. But in addition this is the first case in which it has definitely been proved that a state police regulation is not essential to protect health and safety. In such circumstances even less interference with interstate commerce should be permissible than would otherwise be the case.

In this connection it is important to note that our argument does not depend on whether the evidence affirmatively establishes that the effect of the train limitation is to increase railroad accidents generally, or that the limitation does not to some extent reduce the number of slack accidents. For if, instead of having the harmful effect on the public safety found by the trial court, the law had no effect one way or the other or even a slightly beneficial one—and that is certainly the most which can be said for it—this would not be sufficient to outweigh the interference with interstate commerce which results from state regulation of the subject of train lengths.

Our conclusion that the Arizona statute should be held to impose an undue burden upon commerce and to operate in a field exclusively reserved for Congress is supported by the only pertinent opinion of the Interstate Commerce Commission, which suspended the state train limit

statutes for the duration of the war. *In the Matter of Service Order No. 85*, 256 I. C. C. 523.[41] The Commission forbore from expressing an opinion on the legal question as to the validity of the state regulations. But its conclusions of fact—as well as the substance of its discussion—clearly indicate that it regards such laws as seriously burdening commerce. The following passages from the Commission's report speak for themselves (pp. 524, 530–531, 534, 536):

> Service Order No. 85 became effective September 15, 1942. It was designed to save manpower, motive power, engine-miles, and train-miles; to avoid delay in the movement of trains; to increase the efficient use

[41] The opinions of the lower courts, including that in the instant case, are evenly divided. We do not read the opinions of the court below in this case or of the federal district court in *M.-K.-T. R. Co.* v. *Williamson*, 36 F. Supp. 607 (W. D. Okla.), as contraverting any of the facts found by the trial court in the present case or the federal district courts in *Atchison, T. & S. F. Ry. Co.* v. *La Prade*, 2 F. Supp. 855 (D. Ariz.) and *Southern Pacific Co.* v. *Mashburn*, 18 F. Supp. 393 (D. Nev.). The three decisions last cited held that the subject of train lengths was one upon which uniformity in regulation was essential in the national interest; that the state limitation would seriously interfere with interstate rail operations, and that the statute could not be justified as a safety measure because in fact it would not tend to reduce the number of accidents. The same view was expressed by the Kansas Public Service Commission, quoted at p. 26, n. 11, *supra*. The opinion of the Arizona Supreme Court below and that in the *Williamson* case, on which it relies, proceed on the assumption that any state regulation reasonably related to safety must be held valid, irrespective of other considerations.

of locomotives and cars and to augment the available supply thereof; and to relieve congestion at terminals caused by setting out and picking up cars on each side of the train-limit law States.

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If State laws limiting the number of cars in trains are to be held valid (a question we do not decide), it would be possible for each State to set a different number of cars as the maximum to be hauled in a train. A State might even limit the length of trains to one car, although such a law would be clearly arbitrary and unreasonable. Higher limits might be set by States and found reasonable, *but lack of uniformity would place a serious burden on interstate commerce.*

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This language [from *California* v. *Thompson*] is significant because train-limit laws are not matters of local concern and the regulation of the number of cars which may be put in a train does infringe the national interest in maintaining the free flow of commerce under the present emergency war conditions.

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* * * The fact that freight trains in excess of 70 cars and passenger trains in excess of 14 cars are safely operated in other States is convincing evidence of its safety, except where unusual operating conditions exist. * * * [Italics supplied.]

II

The Specific Intention of Congress as to State Train Length Legislation

The validity of state legislation regulating interstate commerce depends in the first instance on whether there has been any expression of congressional intention with respect to it. If Congress has enacted inconsistent legislation or "occupied the field" in such manner as to manifest an intention that state regulation of the subject be excluded, state regulation falls even though it would be valid in the absence of such congressional action.[42] If, on the other hand, Congress has manifested its intention to permit certain state regulations, the latter may be valid even though the field were otherwise subject to exclusive Federal control.[43] It is necessary to determine whether the state regulation contravenes the commerce clause in the silence of Congress only when Congress has not spoken.

Unsuccessful efforts have been made to procure the enactment of a Federal train limit law. In addition, the Interstate Commerce Act has been construed by the Interstate Commerce Commission as giving it authority, at least in some circumstances, to suspend state train-length lim-

[42] *Cloverleaf Butter Co.* v. *Patterson*, 315 U. S. 148, and cases cited.

[43] *In re Rahrer*, 140 U. S. 545; *Whitfield* v. *Ohio*, 297 U. S. 431; *Parker* v. *Brown*, 317 U. S. 341.

itations. Our analysis of these matters has led us to the conclusion that no positive inference can be drawn from them that Congress had an intention one way or the other as to whether state legislation shall stand. We shall, however, summarize the pertinent material for the information of the Court.

A. FEDERAL TRAIN LENGTH BILLS

A number of bills for the limitation of train lengths were introduced in Congress between 1934 and 1937.[44] Hearings were held by subcommittees of the Senate Committee on Interstate Commerce in 1934 and 1935,[45] but the bills were not reported by the Committee. In 1937, on the basis of the prior hearings, the Senate Committee reported a seventy-car bill favorably[46] on the ground that such a limitation was conducive to safety, and would result in greater frequency of trains and thus improve transportation service; it was also noted (p. 9) that the "measure might result in some reemployment" of railway labor. The bill passed the Senate,[47] and was referred to the House

[44] S. 2625, H. R. 7399 and H. R. 7401 (73rd Cong., 2nd sess.); S. 27, S. 344, and H. R. 169 (74th Cong., 1st sess.); S. 69, S. 1108, and H. R. 147 (75th Cong., 1st sess.).

[45] Hearings before Subcommittee of Senate Committee on Interstate Commerce, 73rd Cong., 2d sess., S. 2625, *Limiting the Car Lengths of Trains;* Hearings before Subcommittee of Senate Committee on Interstate Commerce, 74th Cong., 1st sess., S. 27 and S. 344, *To Limit Length of Trains in Interstate Commerce.*

[46] S. Rep. No. 416, 75th Cong., 1st sess.

[47] 81 Cong. Rec. 7596.

Committee on Interstate and Foreign Commerce.[48] Extensive hearings, totalling over 1100 pages in print, were then held by the House Committee.[49] Railway labor organizations introduced evidence as to the number of trainmen injured on long trains.[50] Railroad management countered with voluminous evidence, similar to that in the present record, minimizing the number of such accidents and to the effect that more accidents proportionally occurred where carriers were subjected to train length limitations than on comparable lines.[51] The Committee failed to report the bill, and it was not passed.

The attention of the committees was called to the history of state train length limitation statutes.[52] The experience of the carriers in Arizona, which up to that time was the only state in which such a law had been in operation, provided the basis for comparison with that where longer trains were operated.[53] The attention of the committees was also called to the fact that the state laws had

[48] *Id.*, 7711.

[49] Hearings before House Committee on Interstate and Foreign Commerce, 75th Cong., 3d sess., S. 69, Train Lengths.

[50] *Id.*, pp. 204–205, and *Supplement to Hearings*.

[51] *Id.*, at pp. 360–654, 827–888, 894–926, 947–1011.

[52] Hearings on S. 27 and S. 344, *supra*, n. 45, pp. 148, 163, 166, 173, 207, 235, 275, 281; Hearings on S. 69, *supra*, n. 49, pp. 374, 376–80, 421–537.

[53] Hearings on S. 27 and S. 344, pp. 247, 275–81; Hearings on S. 69, pp. 374, 376–80, 421–537.

been held unconstitutional by each of the courts which had, up to that time, passed on their validity on the merits,[54] as well as to the fact that the carriers were making efforts to test the Arizona Act again in this Court.[55] In the two of these cases in which opinions were rendered, the courts had held that the subject of train length limitations was one requiring national uniformity and within the sphere of exclusive Federal regulation.[56]

The history of these bills does not, we think, afford the basis for deducing that Congress had any intention at all with respect to the validity of *state* train length legislation. No committee and no member of Congress expressed any views on that subject. The most that can be said is that Congress was informed that Arizona had such a law, that there was a question as to its constitutionality, and that some Congressmen favored a similar Federal regulation and that others apparently did not.

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[54] *Atchison, T. & S. F. Ry. Co. v. La Prade*, 2 F. Supp. 855 (D. Ariz.), reversed on jurisdictional grounds in *Ex parte La Prade*, 289 U. S. 444; *Southern Pacific Co.* v. *Mashburn*, 18 F. Supp. 393 (D. Nev.); *Texas & N. O. R. Co.* v. *Martin*, *No. 428—Equity* (E. D. La., unreported). Contrary decisions were not rendered until the decision in the Oklahoma case (*M.-K.-T. R. Co.* v. *Williamson*, 36 F. Supp. 607 (W. D. Okla.) in 1941.

[55] See Hearings on S. 69, *supra*, at pp. 429–446.

[56] See note 41, *supra*, p. 61.

B. SECTION 1, PARAGRAPHS 10–17 OF THE INTERSTATE COMMERCE ACT

On September 11, 1942, the Interstate Commerce Commission issued Service Order No. 85,[57] which Order required the carriers to—

> operate their trains, when necessary for the prompt movement of freight and the clearing or avoidance of congestion by either freight or passenger trains, without regard to any rules, regulations, practices, or laws now in effect and being enforced in the various States limiting the length of freight trains to not more than one-half mile and limiting the number of cars in a railroad freight train to 70 cars, or limiting the number of cars in a railroad passenger train to 14 or 16.

The Order recited that—

> This order shall remain in effect during the war in which the United States is now engaged, unless sooner terminated by subsequent order of the Commission; and that this order, being based upon conditions of war emergency, shall not constitute a precedent for peace time operations.

The Order also recited briefly the facts upon which it was based, as follows—

> * * * compliance by railroads subject to the Interstate Commerce Act with such rules, regulations, practices, and laws, dur-

[57] 7 Fed. Reg. 7258. The Order is printed in full in Appendix C, pp. [redacted], *infra*.

99-101

ing the present emergency, may result in congestion of tracks and terminals, wasteful use of locomotives, and interference with the free flow of traffic necessary in the present emergency; and that railroad freight trains exceeding one-half mile in length, or exceeding 70 cars in length, and railroad passenger trains exceeding 14 or 16 cars in length may be operated in accordance with safety standards now applicable, during the present emergency, in and through such States, and that such operation will facilitate the free flow of traffic necessary during the present emergency.

The Order was entered without a hearing, as an emergency war measure, as permitted under Section 1 (15) of the Interstate Commerce Act.[58]

The four train service brotherhoods, representing engineers, firemen, conductors and brakemen, petitioned for a rehearing before the Commission. They indicated that they were not requesting that evidence be taken but only wished to file briefs attacking the legal authority of the Commission to make the Order.[59] After the filing of briefs by interested parties, including the Secretary of War in support of the Order, the Commission on November 18, 1943, issued a report (*In the Matter of Service Order No. 85*, 256 I.

[58] There were informal conferences with representatives of the States and of the railroad brotherhoods. 256 I. C. C., at 524.

[59] *Ibid.*

C. C. 523), in which it denied the application to set aside the Order.

The Commission found that the Order was authorized by Section 1, paragraphs 10–17 of the Interstate Commerce Act,[60] interpreted as required by the policy section. The harmful consequences of compliance with the Arizona and Oklahoma train length laws, as recited in the Commission's original order (*supra*, pp. 67–68), which had not been denied by the petitioning brotherhoods, were reaffirmed. In sustaining its own jurisdiction to suspend the operation of the state laws, the Commission found it unnecessary to decide whether the state laws were otherwise valid

[60] Paragraphs 14 and 15 permit the Commission to establish after a hearing, or in time of emergency to suspend without hearing, "rules, regulations and practices with respect to car service". Paragraph 10 defines car service as including "the use, control, supply, movement * * * of locomotives, cars, and other vehicles used in the transportation of property, * * * and the supply of trains". Paragraph 16 provides that:

"Whenever the Commission is of opinion that any carrier by railroad subject to this part is for any reason unable to transport the traffic offered it so as properly to serve the public, it may, upon the same procedure as provided in paragraph (15), make such just and reasonable directions with respect to the handling, routing, and movement of the traffic of such carrier and its distribution over other lines of roads, as in the opinion of the Commission will best promote the service in the interest of the public and the commerce of the people, and upon such terms as between the carriers as they may agree upon, or, in the event of their disagreement, as the Commission may after subsequent hearing find to be just and reasonable."

or whether Congress had occupied the field of legislation with respect to the operation and length of trains, (256 I. C. C., at 530, 539). But see pp. 61–62, *supra*.

The Commission's Order, issued in 1942, was not, of course, in effect in 1940 when the present suit was brought against the Southern Pacific for violation of the state law during that year. Thus, in so far as this case is concerned, there is no conflict between the state law and an exercise of jurisdiction by the Interstate Commerce Commission. The question here is whether the grant of power by Congress to the Commission, prior to such exercise, supersedes state legislation.

A question may be raised as to whether the Interstate Commerce Act does vest the Commission with the power it exercised in Service Order No. 85. That Order is currently under attack by the railroad brotherhoods in *Johnston* v. *United States*, Civil Action No. 1408, pending in the Western District of Oklahoma. This Court, of course, need not determine whether and to what extent the car service provisions of the Interstate Commerce Act have "occupied the field" unless the Commission is correct in concluding that the Act does reach the subject of train lengths. To that question we now turn.

1. *The Authority of the Commission*

Paragraphs 10–15 of Section 1 of the Inter-

state Commerce Act, *infra*, pp. [redacted]–97 deal with car service, and the Commission is empowered to make or suspend rules, regulations or practices "with respect to car service". "Car service" is defined in Paragraph 10 (*infra*, p. [redacted]) as including "the use, control, supply, movement, distribution, exchange, interchange, and return" of locomotives and cars, and the "supply of trains". A rule or practice whereby the operation of over a certain number of cars in a train is prohibited is one governing the "use" of locomotives and cars, as well as perhaps their "control" and "movement". In addition, since the regulation as to the number of cars permitted in a train determines the number of locomotives and trains required to move a given amount of traffic, the subject is one relating to the *"supply"* of locomotives and trains within the meaning of the definition. The language of these paragraphs is thus broad enough to enable the Commission to reach the subject of train lengths.

The Act contains its own criterion for the construction of its provisions. In the Transportation Act of 1940 Congress enacted the introductory section to the Interstate Commerce Act, already referred to (p. 33), which declared it

> to be the national transportation policy of the Congress * * * to promote safe, adequate, economical, and efficient service and foster sound economic conditions in transportation and among the several car-

> riers; * * * all to the end of developing, coordinating, and preserving a national transportation system by water, highway, and rail, as well as other means, adequate to meet the needs of the commerce of the United States, * * * and of the national defense:

The section then states that:

> All of the provisions of this Act shall be administered and enforced with a view to carrying out the above declaration of policy.

The facts upon which the Commission's order was based, which were not disputed and are confirmed by the present record, warranted the Commission in concluding that "adequate" and "efficient" transportation service will be promoted by a construction of the Act as empowering the Commission to suspend state train length limitations. Indeed, at the present time, "the needs of the commerce of the United States * * * and of the national defense" cannot be filled in time of war or emergency if train length limitations are in effect and obeyed. This appears from the uncontroverted facts upon which Service Order No. 85 was based; when traffic is at a maximum, the limitation wastes manpower and motive power, and causes delay and congestion. A construction of the Act which will enable the Commission to deal with such limitations, as it has, in periods of crisis, is thus in accord

with the basic purposes of the Act as expressed by Congress.

A similar conclusion can be reached with respect to paragraph 16 of Section 1, which provides that when a carrier is unable to transport the traffic offered it so as properly to serve the public, the Commission may make just and reasonable directions "with respect to the handling, routing, and movement of the traffic of such carrier and its distribution over other lines of roads, as in the opinion of the Commission will best promote the service in the interest of the public and the commerce of the people". Certainly an order relating to the number of cars in a train has to do with the "handling" and "movement" of the traffic. The reference to the distribution of such traffic over other lines of road is not a limitation upon what precedes it, but a specific authorization of one kind of order which the Commission may enter when necessary. The latter may well have been required in order to give the Commission power to render that type of relief. The language of paragraph 16 in itself, apart from the general policy section of the Transportation Act, imports that it be construed so as to accomplish its objective of eliminating obstructions to traffic in the interests of the public and of commerce. Even if the section can be more narrowly interpreted, it should be construed in the manner most consistent with these vital national interests.

As against these considerations it has been argued that paragraphs 10–17 of the Interstate Commerce Act cannot be construed as permitting the control of train length practices because this was not the evil at which those paragraphs were directed when they were passed. The contention is that Congress had in mind only rules, regulations and practices governing the interchange of cars between railroads and related matters, which are the subjects customarily treated in car service rules. It is true that there is no indication in the legislative history of either the original Car Service Act of 1917 (40 Stat. 101) or the amendments of 1920 (41 Stat. 476) that Congress was concerned as to the number of cars in a train. At that time the long-train method of operation was not generally prevalent, and although Arizona had its train limit statute the law might not then have been regarded as an impediment to commerce. The 1917 Act was prompted by a freight car shortage resulting in part from the misuse of interchanged cars, which often deprived the owning lines of necessary equipment for unduly long periods.[81] But other factors contributing to the shortage, as noted in the House Report,[82] were

[81] See H. Rep. No. 18, 65th Cong., 1st sess.; S. Rep. No. 43, 65th Cong., 1st sess.; Interstate Commerce Commission, Annual Report, 1916, p. 73; *Car Supply Investigation*, 42 I.C.C. 657.

[82] H. Rep. No. 18, *supra*, at p. 3.

insufficient trackage, cars and motive power and inefficient operations.

The original 1917 Act gave the Commission full power to deal with the interchange and distribution of cars between railroads. The "car service" which it subjected to the Commission's jurisdiction was defined as including "the movement, distribution, exchange, interchange and return of cars used in the transportation of property". All of these words except perhaps "movement" were concerned with the abuses responsible for the legislation, and the Act applied only to freight cars. But the Transportation Act of 1920 amended the car service provision by adding the words "use," "control," and "supply" to the definition, by making it applicable to locomotives as well as cars, and also by including "the supply of trains." 41 Stat. 476. Paragraph 16, which does not deal with car service at all, was also added at that time. 41 Stat. 477.

The House Report and debates state only that the amendment to the definition of "car service" was intended to give the Commission power to compel a carrier to supply itself with cars.[63] This would not, however, account for all of the changes, inasmuch as the words "use" and "control" were added in addition to the word "supply". A further amplification of what was in-

[63] H. Rep. No. 456, 66th Cong., 1st sess., p. 17; 58 Cong. Rec. 8315–8316.

tended appears in the statement of Commissioner Clark of the Interstate Commerce Commission at the hearing on the Bill.[64] He stated that the new language would enable the Commission to require the carriers to provide themselves with cars and locomotives, and also that "The use and supply of cars are new terms in the definition of 'car service,' and they largely expand the jurisdiction of the act and of the commission thereunder." With respect to the phrase "supply of trains" (which at that stage also included the words "movement" and "operation"),[65] he stated:

> The other new provision in this definition of "car service" is the extension of the jurisdiction to the supply, movement, and operation of trains. That, as will appear later, will come into play in times of emergency, car shortage, etc., and in connection with the common use of tracks or terminals, when the public interest demands such use.

The brief references to these changes made in 1920 are not sufficient to explain all of the new words added, such as the "use" and "control" of cars and locomotives; nor are the explanations at all clear as to the meaning of "supply of trains". Since these are broad terms incorporated in a statute designed to deal with emergencies, it would

[64] Hearings before H. Committee on Interstate and Foreign Commerce on H.R. 4378, 66th Cong., 1st sess., pp. 11-12.

[65] No explanation was made as to the reason why the conference committee deleted these words.

not seem that Congress intended them to be restricted, contrary to their literal meaning, to apply only to the exact kind of difficulty which had previously occurred. Congress was concerned with the basic problem of shortage of cars, locomotives and trains in time of emergency,[66] as the opening clauses of paragraph 15 plainly show. It is consistent with this purpose, as well as with the principles that all the words of a statute should be given effect and their normal meaning, that the Act not be limited in its scope to the causes of shortage envisaged by Congress at that time. "If Congress has made a choice of language which fairly brings a given situation within a statute, it is unimportant that the particular application may not have been contemplated by the legislators." *Barr* v. *United States*, No. 287, this Term, decided February 5, 1945 (slipsheet p. 5); *Dartmouth College* v. *Woodward*, 4 Wheat. 518, 644;[67] *Puerto Rico* v. *Shell Co.*, 302 U. S. 253, 257;

[66] Although the Commission's power was not limited to periods of emergency (Section 1 (14)), Congress was thinking in terms of emergency.

[67] In the *Dartmouth College* case, the Court declared with respect to a question of constitutional interpretation, in which the case before it seems to come within the words used (4 Wheat., at 644–645):

> It is not enough to say, that this particular case was not in the mind of the Convention, when the article was framed, nor of the American people, when it was adopted. It is necessary to go farther, and to say that, had this particular case been suggested, the language would have been so varied, as to exclude it, or it would have been made a special exception. The case being

Browder v. *United States*, 312 U. S. 335, 339; *Ozawa* v. *United States*, 260 U. S. 178, 195–196; *Pickhardt* v. *Merritt*, 132 U. S. 252, 257. If a shortage of locomotives and trains results from a train length limitation instead of from maldistribution of cars as between carriers, the Act will accomplish its objective if it permits the Commission to take steps to see that the shortage is overcome, not if it is limited to the difficulties confronting the nation and the carriers in 1917.

Paragraph 16 was added to the Interstate Commerce Act in 1920. The legislative history of the Act contains little or no mention of the paragraph, but we think it can be assumed that Congress had in mind the transportation of traffic by other roads when a carrier was unable properly to haul the traffic offered to it. But the object of the paragraph was to insure the movement of the traffic. This object might be attained by an order directing that the obstacle be removed by other means than requiring the traffic to be handled by other roads. Particularly would this be true when, as at the present time, the other roads are also operating to capacity; unless the Commission could in such instances use orders improving the handling by the road responsible for

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within the words of the rule, must be within its operation likewise, unless there be something in the literal construction so obviously absurd, or mischievous, or repugnant to the general spirit of the instrument, as to justify those who expound the constitution in making it an exception.

the difficulty, the interference would not be overcome and the total carrying capacity of the nation would be impaired. Since a literal reading of the paragraph enables it to be construed broadly so as to achieve its underlying purpose, it should not be limited in its scope to the particular type of obstruction to commerce with which Congress was then familiar.

There are statements in several of this Court's opinions which support a narrower construction of the Act. In *Peoria & Pekin Union Ry. Co.* v. *United States*, 263 U. S. 528, the Court held that the definition of "car service" did not encompass the requirement that one railroad switch cars for another, saying (p. 533):

> * * * But "car service" connotes the use to which the vehicles of transportation are put; not the transportation service rendered by means of them. Cars and locomotives, like tracks and terminals, are the instrumentalities. To make these instrumentalities available in emergencies to a carrier other than the owner was the sole purpose of subparagraphs a, b, and c.

But this decision was limited in *United States* v. *Michigan Cement Co.*, 270 U. S. 521, which upheld a service order under paragraph 15 providing that coal was to be delivered to certain classes of consumers ahead of others. This order could not be sustained if the Court had followed the statement in the *Peoria & Pekin* case that "car service" included only rules relating to the exchange of

equipment between carriers, inasmuch as the service order in the *Cement* case governed the control of cars by the carriers without regard for any interchange. In upholding this order the Court limited the *Peoria & Pekin* decision to the facts there involved. (270 U. S., at 527.)

Railroad Commission of California v. *Southern Pacific Company*, 264 U. S. 331, 343, contains a brief summary of the car service provisions as related to distribution and exchange of cars and equipment, and states that "Paragraph 16 authorizes the Commission to provide transportation by other carriers if one carrier is unable to handle its traffic on terms fixed by the Commission". But these statements did not on their face purport to be exclusive, and they mention only those phases of the statute which were pertinent to the problem then before the Court, whether California could compel the carriers to build a union station in Los Angeles without the approval of the Commission under paragraphs 18–21 of Section 1. The portions of the opinion referred to were clearly dicta, and obviously were not intended to express an opinion on the general scope of the car service provisions.

A broad construction of the car service provisions is supported by the Commission's decision in 1926 in *Train Service on Northern Pacific*, 112 I. C. C. 191, where it held that it had jurisdiction to regulate a single carrier's supply of freight

trains for use on its own line—a subject having nothing to do with the interchange or distribution of equipment as between carriers. In addition the three-judge district court in the first Arizona train length case (*Atchison, T. and S. F. Ry. Co. v. La Prade*, 2 F. Supp. 855, 860 (D. Ariz.))[68] specifically held

> The power conferred by Congress upon the Interstate Commerce Commission to regulate the supply of trains must necessarily include authority to prescribe the number of interstate trains to be operated by the carrier. * * *

The conclusion we draw from the above analysis is that the Interstate Commerce Act does grant the Commission power over rules and practices which limit the number of cars in a train. But this conclusion does not determine the validity of state train length limitations before the Commission has acted. There remains to be considered the extent, if any, to which the Interstate Commerce Act has excluded the states from the field.

2. *Whether Section 1 (10)–(17) of the Interstate Commerce Act Has Occupied the Field*

The problem as to whether paragraphs 10–17 of Section 1 of the Interstate Commerce Act have "occupied the field" so as to exclude state train length legislation arises only if these paragraphs

[68] Reversed in this Court on jurisdictional grounds. *Ex parte La Prade*, 289 U. S. 444.

reach that subject. It will not arise, of course, if the Court should reject the construction of those paragraphs which we have advanced (*supra*, pp. 70–81) and should hold that the Commission does not possess the power which it has exercised. The validity of the state law would then be determined without regard for the Interstate Commerce Act, and would depend upon whether the statute contravened the limitations imposed by the commerce clause itself (see Point I). The remainder of the discussion here, therefore, will assume that Section 1 of the Interstate Commerce Act does authorize the Commission to control the subject of car lengths.

It is also necessary to assume for present purposes, contrary to the position we have taken in Point I, that the state law would be valid apart from the Interstate Commerce Act. For the problem of "occupation of the field" presupposes a state law which would be constitutional if there were no conflicting or superseding Federal statute. Except in rare instances, such as the Wilson and Hawes-Cooper Acts, Federal legislation does not enlarge the powers of the states, and this is clearly true here. Whether or not Congress intended the car service provisions to supersede state laws, nothing in their language or history even remotely suggests that Congress was expanding state authority over the subject beyond that previously allowable under the commerce clause. Indeed a proviso at the end of paragraph 17 (a) (considered, *infra*, pp. 85–86), which preserves the

right of the states as to *intrastate* matters—except where inconsistent with Commission orders—demonstrates that Congress was not preserving, and certainly not enlarging, state authority over interstate transactions.

In our discussion as to whether the Federal Act has superseded the state law we shall therefore assume, *arguendo,* both that the former should be construed as we have suggested and that the latter is otherwise constitutional.

There is no question, of course, as to the invalidity of state legislation affecting commerce where there is an inconsistent Federal statute. The problem as to whether Congress has occupied the field so as to preclude its regulation by the states presents difficulties when the Federal law regulates only in part and the state law deals with a different portion of the same subject.[69] The question in such cases is as to the extent of the field which Congress intended to occupy. Here we have no such problem, since by hypothesis paragraphs 10–17 of Section 1 do reach the subject of train lengths. The question here is as to the effect of a Federal regulation which requires administrative implementation before becoming operative.

Whether a federal regulation of commerce delegating to administrative officials authority which

[69] As in *New York Central R. Co.* v. *Winfield*, 244 U. S. 147; *Adams Express Company* v. *Croninger*, 226 U. S. 491; *Texas & Pacific Ry. Co.* v. *Abilene Cotton Oil Co.*, 204 U. S 426.

has not been exercised supersedes a state law depends upon the intention of Congress. If it was intended that the federal administrative agency be given exclusive authority over the subject,—that it go unregulated except when the agency found it necessary to act—the states may not establish a regulatory system of their own. If, on the contrary, Congress did not intend the subject to go unregulated in the absence of federal administrative action, state laws applicable to the subject are valid.

These principles have been frequently applied. In *Napier* v. *Atlantic Coast Line Railroad Co.*, 272 U. S. 605, the Court held that the states could not supplement the Federal Boiler Inspection Act, which authorized the Interstate Commerce Commission to require locomotives to be equipped with devices essential to safety, by compelling the use of safety devices in addition to those required by the Commission. See to the same effect *Oregon-Washington R. & Nav. Co.* v. *Washington*, 270 U. S. 87; *Alabama and V. Ry.* v. *Jackson and E. Ry.*, 271 U. S. 244; *Missouri Pacific R. Co.* v. *Porter*, 273 U. S. 341; *Northern Pacific Ry. Co.* v. *Washington*, 222 U. S. 370. On the other hand, in *Welch Co.* v. *New Hampshire*, 306 U. S. 79, the Court upheld a state maximum hours law for drivers of motor vehicles in the absence of action by the Interstate Commerce Commission under Section 204 of the Motor Carrier Act, on the ground that Congress did not intend state safety measures to be nullified before

the federal agency prescribed regulations on the subject. See to the same effect *Eicholtz* v. *Public Service Commission*, 306 U. S. 268; *Mintz* v. *Baldwin*, 289 U. S. 346; *Northwestern Bell Telephone Co.* v. *Nebraska State Ry. Commission*, 297 U. S. 471. Cf. *Allen-Bradley Local No. 1111* v. *Wisconsin Employment Relations Board*, 315 U. S. 740.

In determining the congressional intention as to state control over the subjects covered by the car service provisions, we are aided by a proviso, added to paragraph 17 (a) of Section 1 in 1920:

> *Provided, however,* That nothing in this Act shall impair or affect the right of a State, in the exercise of its police power, to require just and reasonable freight and passenger service for intrastate business, except in so far as such requirement is inconsistent with any lawful order of the Commission made under the provisions of this Act.

The Conference Committee Report [79] shows the deletion from the House bill, after the words "freight and passenger service", of the phrase "and the fair exchange and distribution of equipment", and the addition of the last clause, beginning with "except". This proviso is significant in three respects: (1) most obviously, since it preserves the state's right to regulate only intrastate business, it carries a strong negative implication that state authority was not to extend

[79] House Report No. 650, 66th Cong., 2d sess., p. 62.

to interstate matters and that the latter would be governed exclusively by Federal law; (2) the express provision that as to intrastate business the states must bow when the Commission acted inconsistently implies that as to interstate matters it is immaterial whether the Commission has taken affirmative action; (3) the deletion of the phrase "and the fair exchange and distribution of equipment" suggests that even as to intrastate commerce Congress may not have intended to give the states control over subjects requiring nationally uniform railroad practices.

The conclusion to be drawn from this proviso [71] closely confining the power of the states over car service is that Congress did not intend them to regulate car service in interstate commerce, whether or not the Commission had acted. This result is supported by the nature of the subject, which would seem to be one requiring national uniformity, and by decisions of this Court both preceding and following the enactment of the proviso. In *Chicago, R. I. & P. Ry. Co.* v. *Hardwick Elevator Co.*, 226 U. S. 426, the Court had held invalid a Minnesota requirement as to prompt car service to shippers on the ground that it infringed upon provisions of the Hepburn Act (now Interstate Commerce Act, Section 1 (4)) much more general than the subsequently enacted

[71] We have found nothing else in the Act or its history which throws any specific light on the intent of Congress as to the relevant state laws.

car service paragraphs.[72] In *Missouri Pac. R. Co. v. Stroud*, 267 U. S. 404, the Court held that a Missouri statute prohibiting discrimination in car service could not be applied to interstate shipments inasmuch as "Congress has enacted laws for the regulation of the furnishing of cars to shippers," citing paragraphs 10–14 of Section 1 of the Interstate Commerce Act, *inter alia*. It thus seems to have been the understanding both of Congress and of this Court that the field of car service regulation has been occupied by the Federal Government to the exclusion of the states.

We do not believe that it can be said, however, that this understanding necessarily extends to all the matters susceptible of regulation under paragraphs 10–17. These include, as we have shown, *supra*, pp. 70–81, both the subjects long covered in car service rules, such as arrangements for the interchange of cars, and also sweeping emergency powers to be exercised in periods of "shortage of equipment, congestion of traffic, or other emergency requiring immediate action" (Section 1 (15)), with respect to the use, control, supply and movement of equipment under paragraphs 10–15, and even broader powers under paragraph 16, which is not, strictly speaking, a car service regulation. These provisions would

[72] The *Hardwick* case was followed in *Hampton* v. *St. Louis, Iron Mountain & S. Ry.*, 227 U. S. 456; *Yazoo & Mississippi Valley R. Co.* v. *Greenwood Grocery Co.*, 227 U. S. 1; *St. Louis, Iron Mountain & Southern Ry. Co.* v. *Edwards*, 227 U. S. 265. See also *St. Louis Southwestern Railway Co.* v. *Arkansas*, 217 U. S. 136.

seem to have been intended to permit the Commission to cope with emergencies as best befitted the situation before it, and irrespective of whether the particular difficulty or the solution to it had been specifically contemplated by Congress when it passed the law. Although we think that Congress had a definite intention that power over the familiar types of car service regulation was to be reserved to the Federal Government exclusively, we doubt that it had a specific intention one way or the other as to other kinds of orders which the Commission might find necessary in dealing with the future contingencies capable of being reached under the broad language of the statute.

Congress undoubtedly did not, and probably could not, foresee what particular measures would have to be adopted under these powers.[73] We do not think that it can be assumed in the abstract that all steps which the Interstate Commerce Commission might take under such powers deal with subjects which the states could not previously have regulated. Thus, while in some circumstances the states may require an adequate supply of trains, including interstate trains, to meet local needs,[74] the Interstate Commerce Commission may supersede the state regulation in view of its authority to control the "supply of trains".

[73] See *Train Service on Northern Pacific Railway*, 112 I. C. C. 191, in which the Commission permitted the substitution of tri-weekly for daily mixed train service on an interstate branch line of the Northern Pacific Railway, contrary to a North Dakota statute.

[74] See cases cited, pp. 48–49, n. 36.

It is unlikely that Congress either intended the car service provisions to deprive the states of these powers prior to action by the Commission, or to expand their constitutional authority on the subject to matters which under this Court's decisions they could not otherwise have reached.

We do not suggest that the Commission's authority to issue orders with respect to the length of trains falls within the class of car service regulations specifically envisaged by Congress when the 1917 and 1920 Acts were passed. Accordingly, as to this subject, it cannot be said that Congress had an intention to supersede state laws apart from any steps taken by the Commission. In the absence of a showing that such an intention existed, the Federal statute by itself would not occupy the field. The validity of the state law would then depend upon its standing under the commerce clause, on the assumption that Congress had not specifically spoken.

CONCLUSION

For the reasons set forth in Point I of this brief, it is respectfully submitted that the judgment below should be reversed and the Arizona law held unconstitutional.

CHARLES FAHY,
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ROBERT L. STERN,
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CAROLYN R. JUST,
Special Attorney.

FEBRUARY 1945.

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[15] *Train Service on Northern Pacific Railway, supra.*

APPENDIX A

Arizona Train Limit Law

Arizona Laws, Act of May 16, 1912.

AN ACT LIMITING THE NUMBER OF CARS IN A TRAIN

Be it enacted by the Legislature of the State of Arizona:

Section 1. It shall be unlawful for any person, firm, association, company or corporation, operating any railroad in the State of Arizona, to run, or permit to be run, over his, their, or its line of road, or any portion thereof, any train consisting of more than seventy freight, or other cars, exclusive of caboose.

Section 2. It shall be unlawful for any person, firm, association, company or corporation, operating any railroad in the State of Arizona, to run, or permit to be run, over his, their, or its line or road, or any portion thereof, any passenger train consisting of more than fourteen cars.

Section 3. Any person, firm, association, company or corporation, operating any railroad in the State of Arizona, who shall wilfully violate any of the provisions of this act, shall be liable to the State of Arizona for a penalty of not less than one hundred dollars, nor more than one thousand dollars, for each offense; and such penalty shall be recovered, and suits therefor brought by the Attorney General, or under his direction,

in the name of the State of Arizona, in any county through which such railway may be run or operated, provided, however, that this act shall not apply in cases of engine failures between terminals.

SECTION 4. All acts and parts of acts in conflict with the provisions of this act are hereby repealed.

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APPENDIX B

Pertinent Provisions of the Interstate Commerce Act

The National Transportation Policy declared by the Transportation Act of 1940 (54 Stat. 899) provides:

> It is hereby declared to be the national transportation policy of the Congress to provide for fair and impartial regulation of all modes of transportation subject to the provisions of this Act, so administered as to recognize and preserve the inherent advantages of each; to promote safe, adequate, economical, and efficient service and foster sound economic conditions in transportation and among the several carriers; to encourage the establishment and maintenance of reasonable charges for transportation services, without unjust discriminations, undue preferences or advantages, or unfair or destructive competitive practices; to cooperate with the several States and the duly authorized officials thereof; and to encourage fair wages and equitable working conditions;—all to the end of developing, coordinating, and preserving a national transportation system by water, highway, and rail, as well as other means, adequate to meet the needs of the commerce of the United States, of the Postal Service, and of the national defense. All of the provisions of this Act shall be administered and enforced with a view to carrying out the above declaration of policy.

Section 1 of the Interstate Commerce Act, Part I, provides in part:

* * * * *

(10) The term "car service" in this part shall include the use, control, supply, movement, distribution, exchange, interchange, and return of locomotives, cars, and other vehicles used in the transportation of property, including special types of equipment, and the supply of trains, by any carrier by railroad subject to this part.

(11) It shall be the duty of every carrier by railroad subject to this part to furnish safe and adequate car service and to establish, observe, and enforce just and reasonable rules, regulations, and practices with respect to car service; and every unjust and unreasonable rule, regulation, and practice with respect to car service is prohibited and declared to be unlawful.

(12) It shall also be the duty of every carrier by railroad to make just and reasonable distribution of cars for transportation of coal among the coal mines served by it, whether located upon its line or lines or customarily dependent upon it for car supply. During any period when the supply of cars available for such service does not equal the requirements of such mines it shall be the duty of the carrier to maintain and apply just and reasonable ratings of such mines and to count each and every car furnished to or used by any such mine for transportation of coal against the mine. Failure or refusal so to do shall be unlawful, and in respect of each car not so counted shall be deemed a separate offense, and the carrier, receiver, or operating trustee so failing or refusing shall forfeit

to the United States the sum of $100 for each offense, which may be recovered in a civil action brought by the United States.

(13) The Commission is hereby authorized by general or special orders to require all carriers by railroad subject to this part, or any of them, to file with it from time to time their rules and regulations with respect to car service, and the Commission may, in its discretion, direct that such rules and regulations shall be incorporated in their schedules showing rates, fares, and charges for transportation, and be subject to any or all of the provisions of this part relating thereto.

(14) (a) The Commission may, after hearing, on a complaint or upon its own initiative without complaint, establish reasonable rules, regulations, and practices with respect to car service by common carriers by railroad subject to this part, including the compensation to be paid and other terms of any contract, agreement, or arrangement for the use of any locomotive, car, or other vehicle not owned by the carrier using it (and whether or not owned by another carrier), and the penalties or other sanctions for nonobservance of such rules, regulations, or practices.

(b) It shall be unlawful for any common carrier by railroad or express company, subject to this part, to make or enter into any contract, agreement, or arrangement with any person for the furnishing to or on behalf of such carrier or express company of protective service against heat or cold to property transported or to be transported in interstate or foreign commerce, or for any such carrier or express company to continue after April 1, 1941, as a party

to any such contract, agreement, or arrangement unless and until such contract, agreement, or arrangement has been submitted to and approved by the Commission as just, reasonable, and consistent with the public interest: *Provided,* That if the Commission is unable to make its determination with respect to any such contract, agreement, or arrangement prior to said date, it may extend it to not later than October 1, 1941.

(15) Whenever the Commission is of opinion that shortage of equipment, congestion of traffic, or other emergency requiring immediate action exists in any section of the country, the Commission shall have, and it is hereby given, authority, either upon complaint or upon its own initiative without complaint, at once, if it so orders, without answer or other formal pleading by the interested carrier or carriers, and with or without notice, hearing, or the making or filing of a report, according as the Commission may determine: (a) to suspend the operation of any or all rules, regulations, or practices then established with respect to car service for such time as may be determined by the Commission; (b) to make such just and reasonable directions with respect to car service without regard to the ownership as between carriers of locomotives, cars, and other vehicles, during such emergency as in its opinion will best promote the service in the interest of the public and the commerce of the people, upon such terms of compensation as between the carriers as they may agree upon, or, in the event of their disagreement, as the Commission may after subsequent hearing find to be just and reasonable; (c)

to require such joint or common use of terminals, including main-line track or tracks for a reasonable distance outside of such terminals, as in its opinion will best meet the emergency and serve the public interest, and upon such terms as between the carriers as they may agree upon, or, in the event of their disagreement, as the Commission may after subsequent hearing find to be just and reasonable; and (d) to give directions for preference or priority in transportation, embargoes, or movement of traffic under permits, at such time and for such periods as it may determine, and to modify, change, suspend, or annul them. In time of war or threatened war the President may certify to the Commission that it is essential to the national defense and security that certain traffic shall have preference or priority in transportation, and the Commission shall, under the power herein conferred, direct that such preference or priority be afforded.

(16) Whenever the Commission is of opinion that any carrier by railroad subject to this part is for any reason unable to transport the traffic offered it so as properly to serve the public, it may, upon the same procedure as provided in paragraph (15), make such just and reasonable directions with respect to the handling, routing, and movement of the traffic of such carrier and its distribution over other lines of roads, as in the opinion of the Commission will best promote the service in the interest of the public and the commerce of the people, and upon such terms as between the carriers as they may agree upon, or, in the event of their disagreement, as the

Commission may after subsequent hearing find to be just and reasonable.

(17) (a) The directions of the Commission as to car service and to the matters referred to in paragraphs (15) and (16) may be made through and by such agents or agencies as the Commission shall designate and appoint for that purpose. It shall be the duty of all carriers by railroad subject to this part, and of their officers, agents, and employees, to obey strictly and conform promptly to such orders or directions of the Commission, and in case of failure or refusal on the part of any carrier, receiver, or operating trustee to comply with any such order or direction such carrier, receiver, or trustee shall be liable to a penalty of not less than $100 nor more than $500 for each such offense and $50 for each and every day of the continuance of such offense, which shall accrue to the United States and may be recovered in a civil action brought by the United States: *Provided, however,* That nothing in this part shall impair or affect the right of a State, in the exercise of its police power, to require just and reasonable freight and passenger service for intrastate business, except in so far as such requirement is inconsistent with any lawful order of the Commission made under the provisions of this part.

(b) It shall be unlawful for any person to offer or give or cause or procure to be offered or given, directly or indirectly, any money, property, or thing of value, or bribe in any other form whatsoever, to any person acting for or employed by any carrier by railroad subject to this part with intent to influence his decision or action, or because

of his decision or action, with respect to the supply, distribution, or movement of cars or other vehicles, or vessels, used in the transportation of property. It shall be unlawful for any person acting for or employed by any carrier by railroad subject to this part to solicit, accept, or receive, directly or indirectly, any money, property, or thing of value, or bribe in any other form whatsoever, with intent to be influenced thereby in his decision or action, or because of his decision or action, with respect to the supply, distribution, or movement of cars or other vehicles, or vessels, used in the transportation of property. Any person who violates the provisions of this subparagraph shall be deemed guilty of a misdemeanor and be subject for each offense to a fine of not more than $1,000, or imprisonment in the penitentiary for a term of not more than two years, or both such fine and imprisonment.

APPENDIX C

SERVICE ORDER NO. 85

At a Session of the Interstate Commerce Commission, Division 3, held at its office in Washington, D. C., on the 11th day of September, A. D. 1942.

The Commission having under consideration operating rules, regulations, and State laws limiting the length of railroad freight and passenger trains, the Commission is of the opinion that, due to the existing state of war, an emergency exists requiring immediate action within the meaning of Section 1, paragraphs (10) to (17), inclusive, of the Interstate Commerce Act.

It appearing that certain rules, regulations, practices, and laws are now in effect and are being enforced in certain States limiting the length of railroad freight trains to not more than one-half mile and limiting the number of freight cars in a railroad freight train to 70 cars, and limiting the number of cars in a railroad passenger train to 14 or 16, and that compliance by railroads subject to the Interstate Commerce Act with such rules, regulations, practices, and laws, during the present emergency, may result in congestion of tracks and terminals, wasteful use of locomotives, and interference with the free flow of traffic necessary in the present emergency; and that railroad freight trains exceeding one-half mile in length, or exceeding 70 cars in length, and railroad passenger

trains exceeding 14 or 16 cars in length may be operated in accordance with safety standards now applicable, during the present emergency, in and through such States, and that such operation will facilitate the free flow of traffic necessary during the present emergency;

Therefore, it is ordered, That:

Title 49—Transportation and Railroads.

Chapter I—Interstate Commerce Commission.

Subchapter A—General Rules and Regulations:

Part 95—Car Service

See.

95.1 Length of trains.

95.2 Effective period; emergency character.

Authority: §§ 95.1 and 95.2, issued under authority of 40 Stat. 101, 41 Stat. 476, 49 Stat. 543, 54 Stat. 901; 49 U. S. C. 1 (10)–(17).

§ 95.1. *Length of trains.*—From and after September 15, 1942, carriers by railroad subject to the Interstate Commerce Act shall operate their trains, when necessary for the prompt movement of freight and the clearing or avoidance of congestion by either freight or passenger trains, without regard to any rules, regulations, practices, or laws now in effect and being enforced in the various States limiting the length of freight trains to not more than one-half mile, and limiting the number of cars in a railroad freight train to 70 cars, or limiting the number of cars in a railroad passenger train to 14 or 16.

§ 95.2. *Effective period; emergency character.*—This order shall remain in effect during the war

in which the United States is now engaged, unless sooner terminated by subsequent order of the Commission; and that this order, being based upon conditions of war emergency, shall not constitute a precedent for peace-time operations.

It is further ordered, That this order shall be served upon each common carrier by railroad subject to the Interstate Commerce Act and upon each State railroad commission, and that notice of this order be given to the general public by depositing a copy thereof in the office of the Secretary of the Commission at Washington, D. C., and by filing it with the Director of the Division of the Federal Register, The National Archives.

By the Commission, division 3.

[SEAL] W. P. BARTEL,
Secretary.

APPENDIX D

Disposition of the 164 Train-Length Bills Introduced in 36 State Legislatures Since 1920.

A. STATUTES PASSED

1. La., 5 La. Gen. Stat. (Dart, 1939) sec. 8150.1–8150.10.
2. Nev., 3 Nevada Compiled Laws (Hillyer, 1929; 1938 Pocket Part), sec. 6357.01–6357.04.
3. Okla., 66 Okla. Stat. (1941) sec. 102.

B. BILLS NEVER REPORTED OUT OF COMMITTEE

1. Colo., H. B. 141, Colo. House Journ. 1929, p. 1054.
2. S. B. 368, Colo. Sen. Journ. 1937, p. 245.
3. S. B. 399, Colo. Sen. Journ. 1941, p. 158.
4. Idaho, H. B. 300, Ida. House Journ. 1933, p. 404.
5. Ill., H. B. 450, Ill. House Journ. 1929, p. 1173.
6. H. B. 276, Ill. House Journ. 1931, p. 1503.
7. H. B. 707, Ill. House Journ. 1931, p. 1503.
8. Kans., S. B. 336, Kans. Sen. Journ. 1939, p. 266.
9. Ky., S. B. 54, Ky. Sen. Journ. 1930, p. 110.
10. H. B. 134, Ky. House Journ. 1932, p. 111.

11. S. B. 122, Ky. Sen. Journ. 1934, p. 269.
12. S. B. 78, Ky. Sen. Journ. 1940, p. 754.
13. H. B. 217, Ky. House Journ. 1940, p. 4181.
14. Md., S. B. 168, Md. Sen. Journ. 1935, p. 191.
15. H. B. 614, Md. House Journ. 1937, p. 1082.
16. S. B. 199, Md. Sen. Journ. 1941, p. 168.
17. Mich., H. B. 251, Mich. House Journ. 1935, p. 335.
18. H. B. 163, Mich. House Journ. 1937, p. 209.
19. Minn., H. File 571, Minn. House Journ. 1929, p. 332.
20. H. File 270, Minn. House Journ. 1939, p. 136.
21. Miss., S. B. 457, Miss. Sen. Journ., 1936, p. 335.
22. Neb., S. File 172, Neb. Sen. Journ. 1929, p. 1326.
23. N. J., Assembly Bill 515, N. J. Minutes of the Assembly, 1924, p. 190.
24. Assembly Bill 113, N. J. Minutes of the Assembly, 1925, p. 372.
25. Assembly Bill 268, N. J. Minutes of the Assembly, 1927, p. 455.
26. Assembly Bill 162, N. J. Minutes of the Assembly, 1927, p. 455.
27. Senate Bill 117, N. J. Senate Journ. 1933, p. 141.
28. Assembly Bill 148, N. J. Minutes of the Assembly, 1933, p. 568.
29. Senate Bill 75, N. J. Senate Journ. 1934, p. 137.

30. Assembly Bill 133, N. J. Minutes of the Assembly, 1938, p. 163.
31. Assembly Bill 94, N. J. Minutes of the Assembly, 1939, p. 118.
32. Assembly Bill 140, N. J. Minutes of the Assembly, 1940, p. 172.
33. N. Y., Assembly Int. 1035, Print 1151, N. Y. Assembly Journ. 1920, p. 566.
34. Ohio, H. B. 463, Ohio House Journ. 1931, p. 267.
35. H. B. 466, Ohio House Journ. 1933, p. 332.
36. S. B. 10, Ohio Senate Journ. 1933, p. 28.
37. H. B. 428, Ohio House Journ. 1935, p. 355.
38. H. B. 373, Ohio House Journ. 1935, p. 336.
39. H. B. 97, Ohio House Journ. 1937, p. 130.
40. S. B. 22, Ohio Senate Journ. 1937, p. 52.
41. Pa., H. B. 215, Pa. Legislative Journal—House, 1923, p. 172.
42. H. B. 616, Pa. Legislative Journal—House, 1925, p. 255.
43. H. B. 1702, Pa. Legislative Journal—House, 1929, p. 1514.
44. H. B. 1322, Pa. Legislative Journal—House, 1931, p. 1296.
45. H. B. 737, Pa. Legislative Journal—House, 1933, p. 2944.
46. S. B. 32, Pa. Legislative Journal (Extraordinary Session) 1933, p. 117.
47. H. B. 59, Pa. Legislative Journal (Extraordinary Session) 1933, p. 493.
48. S. B. 194, Pa. Legislative Journal 1935, p. 308.

49. S. B. 204, Pa. Legislative Journal 1937, p. 401.
50. H. B. 1107, Pa. Legislative Journal 1939, p. 1160.
51. R. I., H. B. 866, R. I. House Journal, April 20, 1933, p. 31.
52. H. B. 687, R. I. House Journal, April 30, 1936, p. 34.
53. Texas, H. B. 605, Texas House Journal, 1941, p. 761.
54. S. B. 195, Texas Senate Journal, 1941, p. 342.
55. Va., H. B. 246, Va. House Journ. 1936, p. 201.
56. Wash., S. B. 270, Wash. Sen. Journ. 1933, p. 566.
57. W. Va., S. B. 43, W. Va. Sen. Journ. 1933, p. 58.
58. S. B. 16, W. Va. Sen. Journ. 1935, p. 34.
59. S. B. 96, W. Va. Sen. Journ. 1935, p. 144.
60. H. B. 142, W. Va. Journ. of House of Delegates. 1937, p. 615.
61. S. B. 89, W. Va. Senate Journ. 1937, p. 121.
62. H. B. 110, W. Va. Journ. of House of Delegates, p. 161.

C. BILLS WITHDRAWN BY THEIR SPONSORS

1. Fla., H. B. 672, Fla. House Journ. 1925, p. 1523, after unfavorable committee report, p. 1294.
2. La., H. B. 210, La. H. of R. Official Calendar, 1936, p. 113, after favorable committee report.

3. Minn., Sen. File 363, Minn. Sen. Journ., 1927, p. 728 (before committee had acted).
4. Wis., Assembly Bill 661, Wis. House Journal, 1931, p. 1374 (before committee had acted).

D. BILLS REPORTED UNFAVORABLY BY LEGISLATIVE COMMITTEES, WITH RESPECT TO WHICH NO FURTHER ACTION WAS TAKEN

1. Ark., H. B. 418, Ark. House Journ. 1931, p. 794.
2. Calif., S. B. 113, Calif. Sen. Journ. 1927, p. 2342.
3. S. B. 213, Calif. Sen. Journ. 1927, p. 2342.
4. Colo., S. B. 359, Colo. Sen. Journ. 1923, p. 1270.
5. H. B. 288, Colo. House Journ. 1925, p. 1317.
6. H. B. 774, Colo. House Journ. 1937, p. 1739.
7. Kans., H. B. 584, Kans. House Journ. 1921, p. 454.
8. H. B. 255, Kans. House Journ. 1923, p. 226.
9. H. J. R. 5, Kans. House Journ. 1925, p. 235.
10. S. J. R. 5, Kans. Sen. Journ. 1925, p. 212.
11. Ky., S. B. 99, Ky. Sen. Journ. 1938, p. 1537.
12. Miss., H. B. 116, Miss. House Journ. 1940, p. 579.
13. Mo., H. B. 70, Mo. House Journ. 1923, p. 397.
14. H. B. 897, Mo. House Journ. 1929, p. 1287.

15. Mont., H. B. 44, Mont. House Journ. 1921, p. 273.
16. Neb., H. Roll 113, Neb. House Journ. 1923, p. 405.
17. H. Roll 298, Neb. House Journ. 1931, p. 625.
18. Sen. File 57, Neb. Sen. Journ. 1933, p. 666.
19. Tenn., H. B. 837, Tenn. House Journ. 1925, p. 787.
20. Texas, H. B. 138, Texas House Journ. 1923, p. 535.
21. Utah, H. B. 143, Utah House Journ. 1931, p. 395.

E. BILLS REPORTED WITHOUT RECOMMENDATION BY LEGISLATIVE COMMITTEE, WITHOUT FURTHER ACTION BEING TAKEN

1. Ark., H. B. 299, Ark. House Journ. 1933, p. 923.
2. Calif., Assembly Bill 235, Calif. Journ. of the Assembly, 1925, p. 2597.
3. Assembly Bill 290, Calif. Journ. of the Assembly, 1929, p. 2897.
4. Assembly Bill 481, Calif. Journ. of the Assembly, 1931, p. 3931.
5. Assembly Bill 1276, Calif. Journ. of the Assembly, 1931, p. 3931.
6. Assembly Bill 2363, Calif. Journ. of the Assembly, 1933, p. 2363.
7. Kansas, S. B. 274, Kans. Senate Journ. 1923, p. 329.
8. Ky., H. B. 47, Ky. House Journ. 1930, p. 978.

After having passed one house:

9. Calif., Assembly Bill 71, Calif. Journ. of the Assembly, 1937, p. 3864.

F. DIED ON THE LEGISLATIVE CALENDAR AFTER PRELIMINARY CONSIDERATION

1. Fla., S. B. 488, Fla. Sen. Journ. 1939, p. 587.
2. Ida., S. B. 162, Ida. Sen. Journ. 1935, p. 349.
3. Ill., H. B. 80, Ill. House Journ. 1923, p. 1270.
4. Ill., H. B. 57, Ill. House Journ, 1925, p. 970.
5. Iowa, H. File 386, Iowa House Journ. 1933, p. 887.
6. S. File 299, Iowa Sen. Journ. 1933, p. 667.
7. S. File 43, Iowa Sen. Journ. 1935, p. 963.
8. H. File 62, Iowa House Journ, 1935, p. 1070.
9. Ky., H. B. 47, Ky. House Journ. 1930, p. 1117.
10. H. B. 167, Ky. House Journ. 1936, p. 2105.
11. H. B. 168, Ky. House Journ. 1938, p. 3018.
12. Miss., H. B 385, Miss. House Journ. 1936, p. 388.
13. Mo., H. B. 81, Mo. House Journ. 1933, p. 922.
14. N. J., Assembly B. 90, N. J. Minutes of the Assembly, 1937, p. 531.
15. Ohio S. B. 22, Ohio Senate Journal, 1931, p. 319.
16. S. B. 29, Ohio Senate Journal, 1935, p. 285.
17. Texas, S. B. 173, Texas Senate Journal, 1937, p. 986.
18. H. B. 425, Texas House Journal, 1939, p. 3911.

19. Wash., S. B. 80, Wash. Senate Journ. 1935, p. 258.
20. W. Va., H. B. 241, W. Va. Journ. of House of Delegates, 1935, p. 1261.

After having passed one house;

21. Colo., S. B. 497, Colo. Sen. Journ. 1935, p. 348, Sen. Journ. 1935, p. 499.
22. H. B. 467, Colo. House Journ. 1935, p. 877, Sen. Journ. 1935, p. 978.

G. PASSED ONE HOUSE BUT NOT REPORTED OUT OF COMMITTEE IN THE SECOND

1. Nev., Assembly Bill 2, Nev. Assembly Journ. 1935, p. 34, Senate Journ. p. 111.
2. Pa., H. B. 311, Pa. Legislative Journ. 1935, pp. 356, 5074.
3. H. B. 75, Pa. Legislative Journ. 1937, p. 2394.
4. Wash., H. B. 333, Wash. House Journ. 1937, p. 412, Sen. Journ. p. 658.

H. DEFEATED BY VOTE ON LEGISLATIVE FLOOR

(This includes votes on whether the bill should pass, on whether to uphold a committee report rejecting a bill, and on whether to table or indefinitely postpone a bill.)

1. Calif., S. B. 136, Calif. Sen. Journ. 1925, p. 1614.
2. Assembly B. 17, Calif. Journ. of the Assembly, 1935, p. 4811.
3. Colo., H. B. 203, Colo. House Journ. 1931, p. 939.
4. Conn., S. B. 23, Conn. Sen. Journ. 1933, p. 1846, House Journ. 1933, p. 1903.
5. H. B. 343, Conn. House Journ. 1937, p. 1467.

6. Idaho, H. B. 116, Ida. House Journ. 1937, p. 555.
7. Illinois, S. B. 299, Ill. Senate Journ. 1923, p. 915.
8. Indiana, S. B. 95, Ind. Senate Journ. 1929, p. 761.
9. H. B. 203, Ind. House Journ. 1931, p. 496.
10. H. B. 119, Ind. House Journ. 1933, p. 725.
11. H. B. 171, Ind. House Journ. 1935, p. 1044.
12. Ky., H. B. 257, Ky. House Journ. 1934, p. 1776.
13. Md., H. B. 56, Md. House Journ. 1937, p. 725.
14. Minn., H. File 207, Minn. House Journ. 1935, p. 1083.
15. Mont., S. B. 3, Mont. Sen. Journ. 1935, p. 221.
16. H. B. 376, Mont. House Journ. 1935, p. 716.
17. N. H., H. B. 193, N. H. House Journ. 1937, p. 268.
18. Oregon, S. B. 161, Ore. Senate and House Journals, 1931, p. 110.
19. H. B. 207, Ore. Senate and House Journals, 1935, p. 455.
20. Texas, H. B. 368, Texas House Journal, 1933, p. 2299.
21. Utah, H. B. 37, Utah House Journal, 1933, p. 564.
22. S. B. 18, Utah Senate Journal, 1937, p. 424.
23. W. Va., H. B. 148, W. Va. Journ. of House of Delegates, 1933, p. 531.
24. Wis., S. B. 129, Wis. Senate Journal, 1925, p. 692.

25. S. B. 70, Wis. Senate Journal, 1923, p. 519.

After having passed one house:

26. Minn., H. File 141, Minn. House Journ. p. 738, Senate Journ. 1937, p. 957.
27. Mont., H. B. 13, Mont. House Journ. 1937, p. 113, Sen. Journ. p. 209.
28. Texas, H. B. 347, Texas House Journal, 1937, p. 848, Sen. Journ. p. 2214.
29. Utah, H. B. 63, Utah House Journal, 1935, p. 315, Sen. Journ. p. 660.

I. VETOED

1. Calif., S. B. 24, Calif. Sen. Journ. 1935, p. 1296.

J. NEW MEXICO: BILLS INTRODUCED BUT NOT PASSED

We have been unable to ascertain the disposition of these bills apart from the fact that they did not pass.

1. House Bill No. 8, 1923.
2. House Bill No. 265, 1923.
3. House Bill No. 169, 1927.
4. House Bill No. 347, 1929.
5. House Bill No. 33, 1931.
6. House Bill No. 23, 1933.
7. House Bill No. 92, 1937.
8. House Joint Memorial No. 2, 1937.
9. House Bill No. 55, 1939.

MEMORIALS TO CONGRESS

1. Calif., Assembly J. R. 31, Statutes & Amendments to the Codes, 1937, c. 60, p. 2816.
2. Calif., Assembly J. R. 13, Statutes & Amendments to the Codes, 1939, p. 3217.
3. Nevada, Statutes 1935, p. 431.

U. S. GOVERNMENT PRINTING OFFICE: 1943

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MAR 13 1945
CHARLES ELMORE CROPLEY
CLERK

IN THE

Supreme Court of the United States

OCTOBER TERM, 1944.

No. 56.

SOUTHERN PACIFIC COMPANY, a corporation, *Appellant*,

v.

STATE OF ARIZONA *ex rel.* JOE CONWAY, Attorney General of the State of Arizona, *Appellee*.

BRIEF FOR THE ASSOCIATION OF AMERICAN RAILROADS AS AMICUS CURIAE.

J. CARTER FORT,
THOMAS REED POWELL,
CHAUNCEY G. AUSTIN, JR.,
Attorneys for the Association of American Railroads.

Washington, D. C.,
March 8, 1945.

PRESS OF BYRON S. ADAMS, WASHINGTON, D. C.

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IN THE

Supreme Court of the United States

OCTOBER TERM, 1944.

No. 56.

SOUTHERN PACIFIC COMPANY, a corporation, *Appellant*,

v.

STATE OF ARIZONA *ex rel.* JOE CONWAY, Attorney General of the State of Arizona, *Appellee*.

BRIEF FOR THE ASSOCIATION OF AMERICAN RAILROADS AS AMICUS CURIAE.

I.

SUMMARY STATEMENT OF INTEREST, POSITION AND ARGUMENT.

With consent of the parties, this brief is filed for the Association of American Railroads, as *amicus curiae*, in support of the position that the Arizona Train-Limit Law[1] is unconstitutional. That statute makes it unlawful to operate in the State of Arizona a freight train of more than 70 cars, exclusive of caboose, or a passenger train of more

[1] "An Act Limiting the Number of Cars in a Train." Section 69-119, Arizona Code Annotated, 1939.

than 14 cars, and provides a penalty of not less than $100, or more than $1,000, for each violation.

This brief should be regarded as supplementary to the comprehensive, detailed and closely documented brief of appellant, Southern Pacific Company. It will not deal with all features of the case but will confine itself to certain aspects of particular significance with respect to the national interest in safe, efficient and economical rail transportation, the national policy concerning such transportation as established and declared by Congress, and the conflict between that interest and policy, on the one hand, and drastic limitation of train lengths by state regulation, on the other.

The Association of American Railroads is a voluntary association whose members operate approximately 99 per cent of the mileage of Class I railroads,[2] and 95 per cent of the mileage of all railroads in the United States. The Association has to do with matters of general interest to the railroad industry. In important respects the operations of all railroads are interrelated and coordinated, and this gives rise to problems which fall within the special field of the Association.

As illustrating the coordination of railroad operations throughout the United States, it is familiar knowledge that established railroad routes and rates are available between all points in the country. Transportation over such routes often involves the use of lines and services of a large number of different railroads. The freight cars of one railroad are not restricted to its line but move freely over all lines throughout the Nation. There is also a considerable interchange of locomotives, passenger coaches and Pullman cars, mail, express, and other cars assigned to the passenger and allied services. If it were otherwise, "the efficacious carrying on of interstate commerce" would be impossible.[3]

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[2] A Class I railroad, under the classification of the Interstate Commerce Commission, is one with an annual gross operating revenue of $1,000,000 or more.

[3] *St. Louis S. W. Ry.* v. *Arkansas*, 217 U. S. 136, 149.

Two members of the Association, appellant, Southern Pacific Company, and The Atchison, Topeka and Santa Fe Railway Company, conduct substantial railroad operations in Arizona and are subject to the full impact of the Arizona Train-Limit Law, except insofar as it may be suspended or set aside. All members of the Association participate in through transportation under through rates, which is performed in part through the State of Arizona, and all, therefore, are affected by the Arizona prohibition. If a railroad line in Arizona becomes congested or blocked, every route of which that line is a link becomes congested or blocked so that the movement of freight from coast to coast may be affected. An increase in the cost of performing transportation in Arizona means an increase in the cost of performing through transportation which moves across that state. Moreover, if the State of Arizona has the power to interfere with, obstruct, and seriously burden railroad operations by the prescribed limitations of train length, other states must possess like powers.

In all parts of the United States, with the exception of Arizona, and recently of Oklahoma, long-train operation is general and standard railroad practice. When we speak of long trains, we mean freight trains of more than 70 cars and passenger trains of more than 14 cars. When we speak of long-train operation,[1] we mean a method of operation which involves the use of long trains when they are justified by available traffic, service requirements, physical conditions, and other considerations, and the use of short trains when there is not sufficient traffic for long trains or when the operation of long trains is not indicated for other reasons. Long trains are used to a greater extent on lines of heavy traffic density than on lines of light density.

The obvious and fundamental fact with respect to long-train operation is that it permits the movement of a given volume of traffic in fewer trains than would otherwise be

[1] See the definition of "standard long-train operation" in the trial court's findings of fact. (R. 3888)

needed. As a result of fewer trains on the road, there are fewer meets and passes[5] and less interference and congestion. Fewer locomotives are required. The volume of freight which can be transported over a given track is increased and in this way track capacity is enlarged. These results bring about safer, more efficient, and more economical operation, and faster, more reliable and better service to the public.

During the first World War and the period immediately following, the capacity of the railroads of this country was overtaxed. Assurance was needed that the railroads would be able to meet the future requirements of commerce and of national defense. Both Congress and the railroads recognized this need, and took steps to meet it.

Prior to 1920, the policy of Congress concerning the railroads had been directed mainly to the correction of abuses, particularly those arising from unreasonable or discriminatory rates. But in the Transportation Act 1920,[6] new and important objectives were recognized. Emphasis was placed upon the public interest in adequate, economical and efficient railroad service.

Beginning in 1923, the railroads undertook and carried out a broad and continuing program for improvement of the national railroad plant. Vast expenditures were made for additions and betterments to facilities, which enabled the railroads to improve their operating methods and to develop practices now in general use, of which an important feature is long-train operation, and in that way to give better and cheaper service and to operate with much greater safety. Operating costs have been reduced, train speeds have been increased, and striking progress has been made toward safer operation, while at the same time the

[5] When two trains bound in opposite directions pass in single track operation, that is said to be a "meet." When one train passes another bound in the same direction, that is said to be a "pass."

[6] 41 Stat. 456, 474.

number of long trains and the average number of cars per train have increased. This progress in efficiency, economy and safety has been due in substantial part to long-train operation.

Severe state restrictions on train length, such as those in Arizona, to the extent they should become effective, would deprive the railroads of the most advantageous use of the facilities which they have provided at enormous expense and would reestablish outmoded, wasteful, and relatively hazardous operating practices. Service to the public would be slower and less dependable; costs of performing the service, which must ultimately fall upon the public, would pyramid; the financial stability of the national railway transportation system would be threatened; and the physical adequacy of that system to meet the needs of the national commerce and of the national defense would be endangered.

During the present war period, the railroads have made an outstanding record. But they have been under heavy strain as a result of the unprecedented volume of traffic. Problems of manpower and of motive power have been particularly urgent. Had it been necessary to run more trains to carry the same volume of traffic, more crews would have been required to man the trains and more locomotives to haul them, as well as more track space to accommodate them.

It is difficult to escape the conclusion that there would have been a physical collapse in transportation during this critical war period, with grave consequences to our national security, if train-length limitations, similar to the Arizona restriction, had been effective in a substantial number of states.

In order to avoid repetition and duplication, so far as possible, we shall not parallel the presentation in the Southern Pacific brief. There it is argued that the Arizona law is unconstitutional for the following reasons:

1. It is in conflict with the Commerce Clause because it invades the field of exclusive national regulation. The length and consist of interstate railroad trains is a subject of national and not local concern, as to which a national and uniform system of regulation is necessary, if any regulation should be desirable.

2. It is in conflict with the Commerce Clause because it necessarily, practically, and inevitably regulates and controls the length and consist of interstate trains, and other railroad operations, not only within Arizona but also with extraterritorial effect in adjoining states and for substantial distances beyond the boundary lines of Arizona.

3. It is in conflict with the Commerce Clause for the reason that, even if it should be considered that the regulation of length of interstate trains falls within the "concurrent" field of regulation, the Train-Limit Law, because it imposes direct and substantial burdens and restrictions upon, and directly and materially obstructs and interferes with, the free flow of interstate commerce, goes far beyond any powers which the state may have in the concurrent field.

4. It is in conflict with the Commerce Clause because, if considered as an attempted limitation of the length of trains for the sake of proper handling and safe control, the Train-Limit Law conflicts with, and attempts to supplement, existing federal legislation,[7] having the same or similar purposes.

5. It is in conflict with the Due Process Clause of the Fourteenth Amendment because it is arbitrary and unreasonable, has no rational basis as a police power regulation, and bears no reasonable relation to health and safety.

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[7] Safety Appliance Act of March 7, 1893, Sec. 1; 27 Stat. 531; 45 U. S. C., Sec. 1. Amendatory Act of March 2, 1903, Sec. 2; 32 Stat. 943; 45 U. S. C., Sec. 9. Interstate Commerce Act, Sec. 25; 49 U. S. C., Sec. 26.

We are in entire accord with the contentions of appellant, as above outlined, but our discussion of the law will be confined to a much narrower compass.

We readily recognize, of course, that, in the absence of occupation of the field by Congress, there is open to the states, in the exercise of their police powers, a wide range of action which may affect interstate commerce. But it is equally clear that there are limitations upon state action of this character. As a broad rule, the validity of a state law is to be tested by the extent and degree of its consistency or inconsistency with "the principal objects sought to be secured by the Commerce Clause," which have been described as "the uniformity of control of the national commerce in matters of national concern and * * * the free flow of commerce."

A state can not prescribe a regulation affecting interstate commerce if the nature of the subject matter regulated and the nature of the regulation are such that "superior fitness and propriety" require uniformity of control by a single national authority rather than diversity of control by local, state authorities. The single, national control may, of course, take the form of affirmative regulation or the form of inaction. This field of regulation, having to do with matters primarily of national and not of local concern, is exclusively for the national government and within it a state can not assume authority under any condition.

Even as to regulation which falls outside the exclusive national field and into what is sometimes called the concurrent field, the Commerce Clause prohibits state action in contravention of well settled principles. The traditional test invokes the distinction between indirect and incidental effects on interstate commerce, which are permissible, and direct and substantial effects, which are forbidden. This test has disclosed difficulties of application in some cases and in recent years new guides, or guides stated in new language, have been formulated. It has been held that a state statute

is invalid if it infringes upon the national interest in commerce. And it has been held that the validity of a state law may be judged by weighing the competing demands of the national and state interests involved. If the burden upon or interference with interstate commerce is disproportionately heavy compared with the local benefits, the state law falls because irreconcilable with the Commerce Clause. It has also been held that state regulations affecting interstate commerce, whose purpose or effect is to gain for those within the state an advantage at the expense of those without, or to burden those out of the state without corresponding advantages to those within, impinge upon the constitutional provision even though Congress has not acted.[8]

The Arizona law fails to survive any of the tests above suggested.

It deals with a subject predominantly of national rather than local concern and one which requires uniform regulation, if any should be needed. Varying train-length limitations in different states could result only in obstructive and costly divergence and confusion in railroad operation and in obstructions to the free flow of interstate commerce.

The law strikes at the physical operation of railroads and interferes with and hampers that operation. Its effect on interstate commerce is not incidental or indirect but is direct, immediate, unavoidable, and serious. It demands that the railroads remove from freight trains entering the state all cars in excess of 70 and from passenger trains all cars in excess of 14. It requires the remaking of trains at points outside the state. It requires the running of additional trains within the state and for considerable distances in other states. It results in delays at terminals incident to the remaking of trains and the removal of cars from one train for hauling by a later train. It results in delays in road movement by reason of congestion and interference due to the operation of additional trains.

[8] *S. C. Hwy. Dept.* v. *Barnwell Bros.*, 303 U. S. 177, 185, and cases cited.

It places an exorbitant burden of expense on railroad transportation which must ultimately fall upon shippers and passengers, the great majority of whom are outside of the state; and it diminishes the capacity of railroad lines within the state and far beyond its borders, and thus imperils their ability to meet transportation requirements.

The Arizona law serves no local interest or objective which justifies the burden which it casts upon interstate commerce. The local purpose which it is claimed to serve is one of safety, but the record conclusively shows that it does not serve this purpose. On the contrary, the law has an adverse effect on safety. Even if it be assumed, however, that the law has sufficient relationship to safety to give it a rational basis as an exercise of police power, there can be no doubt that, at most, the local safety benefits are dubious and inconsequential. In contrast, the burden upon interstate commerce is great and continuous.

The state law impinges in a violent manner upon the national interest in commerce. This is apparent from what has been said concerning the nature and extent of the burden which it places upon interstate railroad transportation and upon the instrumentalities of such transportation. This burden is of special significance when viewed in the light of the part played by these great carriers in the life of the Nation and in the light of the National Transportation Policy manifested and expressly stated by Congress.

The railroads transport the bulk of the Nation's traffic. At all times they are indispensable, and in war time the failure of the railroads would imperil the Nation. It is almost impossible to overstate the importance of railroad transportation to the national well-being. The railroad system "is the most important single element in our social and economic life. * * * Both security and material welfare are involved in its continued efficient existence."[9] Again it has been said that "If our railroads fail, our en-

[9] Report of the National Transportation Committee, February 13, 1933, page 8.

tire world-wide military effort fails. We might suffer military reverses and still win this war—but we can't avoid defeat should our railroads fail."[10]

It follows that the efficiency and economy of railroad operation are matters of profound national concern. This has been expressly recognized by Congress. As amended by the Transportation Act of 1940,[11] the Interstate Commerce Act contains, preceding Part I, a specific declaration that it is the "National Transportation Policy"—

> "to promote safe, adequate, economical, and efficient service and foster sound economic conditions in transportation * * *."

This was a reaffirmation of the policy which has guided Congress since 1920 and which has been considered by this Court in a number of cases where it was pointed out that "avoidance of waste, in interstate transportation, as well as maintenance of service, has become a direct concern of the public,"[12] and that the public interest has "direct relation to adequacy of transportation service, to its essential conditions of economy, and to appropriate provision and best use of transportation facilities."[13]

The Arizona law is, therefore, squarely in conflict with the National Transportation Policy, and for that reason, cannot be upheld. There is a marked distinction between a state regulation which is in conflict with the national policy and one which is in accord with and in furtherance of the national policy.[14]

It has been said that even in the "joint field" of regulation, a state can take action which affects interstate com-

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[10] Colonel J. Monroe Johnson, member of Interstate Commerce Commission and now Director, Office of Defense Transportation, in a radio broadcast from Station WRC over the National Broadcasting Company network, May 8, 1943.

[11] 54 Stat. 898, 899.

[12] *Davis* v. *Farmers Co-operative Co.*, 262 U. S. 312, 317.

[13] *N. Y. Central Securities Co.* v. *U. S.*, 287 U. S. 12, 25.

[14] *Parker* v. *Brown*, 317 U. S. 341, 367-8.

merce only under circumstances from which it can be reasonably inferred that Congress, by not occupying the field has "tacitly authorized"[15] such action, or has indicated its "acquiescence"[16] therein.

Whether or not such tacit authority or acquiescence is fairly to be inferred in a particular case must be gathered from all surrounding circumstances, including the nature of the subject matter which is regulated and the national interest in and policy concerning such subject matter, and including the effect of the regulation upon interstate commerce and upon any local, state interest which it may purport to serve.

In this case, a consideration of all surrounding circumstances negatives any possibility that the fact that Congress has not entered the field of train-length regulation, which fact we assume for purposes of argument, could be regarded as a tacit authorization for the State of Arizona arbitrarily to regulate the length of interstate trains with the results above outlined.

This Court has upheld many state statutes which affected interstate commerce, but none, so far as we can ascertain, which has placed so heavy a burden on such commerce as the statute now under consideration, and none which has infringed so deeply upon the national interest in transportation or conflicted so sharply with the National Transportation Policy. Nor has this Court upheld any state regulation which placed a burden on interstate commerce so grossly disproportionate to any possible local good to be accomplished. Indeed, the Court has struck down state statutes, as violative of the Commerce Clause, the effects of which on interstate commerce were much less obstructive and burdensome than those of the Arizona law.

In closing this summary, it should be said that the Supreme Court of Arizona failed to apply the governing prin-

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[15] *Chi., R. I. & c. Ry. v. Hardwick Elevator Co.*, 226 U. S. 426, 435.

[16] *The Minnesota Rate Cases*, 230 U. S. 352, 402; *Graves v. N. Y. ex rel. O'Keefe*, 306 U. S. 466, 479.

ciples of law in that it wholly failed to consider or give weight to the findings of fact of the trial court or to the evidence of record, both of which show beyond dispute that the statute places a heavy burden on interstate commerce and serves no substantial purpose of local safety. It did not modify those findings of fact or set them aside, but seemed to proceed on the erroneous view that a state requirement claimed to be based upon considerations of local safety is protected by a presumption of validity which cannot be overthrown by any showing, even including the showing that no local safety benefits are actually involved and that interstate commerce is grievously burdened, contrary to the national interest and in conflict with the National Transportation Policy.

II.

IMPORTANCE OF THE RAILROAD TRANSPORTATION SYSTEM TO THE NATIONAL INTEREST.

In considering whether the subject matter regulated by the Arizona law, or by any similar state law restricting the length of trains, is one predominantly of national rather than of local concern, and one which should be regulated by a single authority, if at all, there must be taken into account the vital importance of railroad transportation, and of its adequacy and efficiency, to the Nation as a whole, and to those purposes, objectives and activities for which the responsibility rests with the Federal Government and not with the states.

This is also a factor of great significance in weighing the nature and extent of the burden imposed upon interstate commerce by a state regulation of train length which interferes with and obstructs railroad operation, impairs its efficiency, and threatens the adequacy of railroad service.

The railroads occupy a place in our national life too well known to require extended discussion. They are the principal instrumentality of transportation. They carry the bulk

of all goods which are moved. Their activities are preponderately interstate. Their lines extend and their trains operate to and from every part of the Nation without regard to state boundaries. They are indispensable to our economic life, our political unity, and our defense against foreign enemies. Their ability to perform well their great task is a matter of profound national concern.

All this has been stated repeatedly by the highest authorities of the Federal Government, as well as by others informed upon the subject of transportation. A few representative statements, selected from a large number, may be of interest to the Court.

President Franklin D. Roosevelt, then Governor of New York, in a public address at Salt Lake City on September 17, 1932, declared:[17]

> "The problem of the railroads is the problem of each and every one of us. No single economic activity enters into the life of every individual as much as do these great carriers. (p. 713.)
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> The individual railroads should be regarded as parts of a national transportation service. (p. 717.)
>
> • • •
>
> The economy and efficiency of railroad operations will depend upon the capacity of railroad management and its freedom from undue burdens and restraints when this is balanced by acceptance of public responsibilities. (p. 721.)
>
> • • •
>
> Every great economic interest in the Nation requires the continuous, efficient operation of the railroads. • • • So the constant improvement in the economy and efficiency of transportation is a matter of ever-present national concern. (p. 721.)
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> • • •
>
> The railroad mesh is the warp on which our economic web is largely fashioned. It has made a continent into a Nation. It has saved us from splitting,

[17] The Public Papers and Addresses of Franklin D. Roosevelt, Random House, New York, 1938, Vol. I, pp. 711-723.

like Europe, into small, clashing, warring units. It made possible the rise of the West. It is our service of supply. These are not matters of private concern." (p. 722.)

The National Transportation Committee, composed of Calvin Coolidge, Chairman; Bernard M. Baruch, Vice-Chairman; Alfred E. Smith; Alexander Legge; and Clark Howell, made a report, under date of February 13, 1933, in which it was stated:[18]

> "At the foundation of our system of communication is the railroad web. It is the most important single element in our social and economic life. Its rapid extension enabled us to cover the greater habitable part of a continent with a cohesive form of liberal government of 125,000,000 people united in a common language, purpose and ideal and to maintain National solidarity through periods of stress. Both security and material welfare are involved in its continued efficient existence. The public interest is deeper than its investment or its need of good service. We are addressing a matter of National concern of the first magnitude. The railroad system must be continued and its efficiency preserved because of National necessity—economic, social and defensive."

Lieutenant General Brehon Somervell, Commanding General of the Army Service Forces, pointed out in a radio broadcast on July 17, 1944:[19]

> "Even though our own country is thousands of miles from the actual theaters of operation, the success or failure of our transportation system right here at home might mean the difference between success or failure in France or in the South Pacific. We in the armed forces of the United States think of transportation as a military tool—a weapon as important as the very

[18] Report of the National Transportation Committee, February 13, 1933, page 8.

[19] Broadcast from Station WRC, Washington, D. C., over National Broadcasting Company network.

tank or gun it transports from factory to fighting front. It is no exaggeration to say that railroads are war roads."

Major General Charles P. Gross, Chief, Transportation Corps, U. S. Army, in a radio broadcast on June 21, 1944, expressed the judgment that,[20]

> "Global war would be impossible without our modern means of transportation. Without the railroads, the war might of our country could not be mobilized."

The late Joseph B. Eastman, then a member of the Interstate Commerce Commission and Director of the Office of Defense Transportation, said on May 13, 1942, in an address at Chicago:[21]

> "Never in the history of the railroads has there been a time when efficient operation was of such prime importance, not only to the railroads but to the Nation and even to the world. * * *
>
> In modern production and even in modern battle, there is no factor which is of more vital and all-persuasive importance than adequate and efficient transportation. * * * We cannot fight without transportation, and we cannot do our best fighting unless the transportation is adequate and efficient."

In his 1934 report to the Congress as Federal Coordinator of Transportation, Mr. Eastman made the following statement:[22]

> "The railroads are still an essential, and by far the most important, form of public transportation, and the prospects are that they will continue so to be."

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[20] Broadcast from Station WOL, Washington, D. C., over Mutual Broadcasting System.

[21] Joseph B. Eastman, "Problems of War Transportation," Proceedings of American Association of Railroad Superintendents, Chicago, Illinois, May 12-14, 1942, pp. 177-178.

[22] Joseph B. Eastman, Report of the Federal Coordinator of Transportation on Transportation Legislation, 74th Congress, 1st session, House Document No. 89, 1934, page 5.

Colonel J. Monroe Johnson, then a member of the Interstate Commerce Commission and now Director, Office of Defense Transportation, in a radio speech on May 9, 1943, stated:[23]

> "We might suffer military reverses and still win the war, but we cannot avoid defeat should our railroads fail."

The Honorable Henry L. Stimson, Secretary of War, in a radio speech on December 28, 1943, said:[24]

> "The American nation has taken the greatest pride in the patriotic devotion which railroad men and women have displayed under unprecedented demands which this war has placed upon them. During the present emergency, the railroads have been bearing more than 90 per cent of the burden of all transportation. * * * The armed forces cannot discharge their responsibility for the national safety without the assistance of the railroads."

The Honorable Edward R. Stettinius, Jr., then Administrator, Office of Lend-Lease, and now Secretary of State, said in July, 1943:[25]

> "America is accustomed to efficient service from its railroads, but in this, our greatest emergency, the roads have written their brightest chapter. They have come through with a performance that sets a new mark for railroading. They are making a major contribution to our united war effort."

In its report of December 15, 1943, a special committee of the Senate investigating the national defense program, pursuant to S. Res. 71, 77th Congress, and S. Res. 6, 78th Congress, stated:[26]

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[23] Broadcast from Station WRC, Washington, D. C., over National Broadcasting Company network.

[24] Broadcast from Station WRC, Washington, D. C., over National Broadcasting Company network.

[25] Railway Age, July 24, 1943, page 130.

[26] Report No. 10, Part 13.

"A break-down, or even a diminution in transportation service, would have incalculable repercussions on our war effort. (page 1.)

* * *

Transportation is so vital and a break-down would be so disastrous that we cannot afford to run the risk of even approaching the breaking point. (page 5.)

* * *

* * * the increased load of traffic in the war years has fallen most heavily upon the railroads." (page 6.)

The Honorable Oren Harris, of Arkansas, in a speech before the House of Representatives on May 23, 1944, said:[27]

"The railroad industry is one of the greatest. It has made and is making a tremendous contribution to the welfare of this great country. Its real worth has again been shown during this war."

III.

THE NATIONAL TRANSPORTATION POLICY.

In the light of what has been said, the deep, pervading national interest in the adequacy, efficiency and economy of rail transportation is self-evident. On this subject Congress has expressed itself in unmistakable terms. The Transportation Act of 1940[28] amended the Interstate Commerce Act by adding, immediately preceding Part I, a declaration of "National Transportation Policy", from which the following is quoted:

"It is hereby declared to be the national transportation policy of the Congress to provide for fair and impartial regulation of all modes of transportation * * *; to promote *safe, adequate, economical, and efficient service and foster sound economic conditions in transportation* * * *; to encourage the establishment

[27] Congressional Record, May 23, 1944, page 4998.

[28] 54 Stat. 899.

and maintenance of reasonable charges for transportation services, * * *;—all to the end of developing, coordinating, and preserving a national transportation system by water, highway, and rail, as well as other means, *adequate to meet the needs of the commerce of the United States, of the Postal Service, and of the national defense.* All of the provisions of this act shall be administered and enforced with a view to carrying out the above declaration of policy." (Emphasis supplied.)

The amendment of 1940 did not change but merely confirmed and strengthened the policy of Congress concerning railroads, which had been reflected in the Interstate Commerce Act since the amendments embodied in the Transportation Act of 1920.[20]

On many occasions this Court has been called upon to consider the policy of Congress concerning transportation. In *McLean Trucking Co.* v. *U. S.*, 321 U. S. 67, 80-81, it was pointed out that the National Transportation Policy is the product of a long history of trial and error by Congress in the regulation of the Nation's transportation facilities, beginning with the Interstate Commerce Act of 1887; that the Transportation Act of 1920 marked a sharp change in policies and objectives embodied in such regulation; that, theretofore, the efforts of Congress had been directed mainly to the prevention of abuses, but that the act of 1920 added "a new and important object to previous interstate commerce legislation" in seeking "affirmatively to build up a system of railroads prepared to handle promptly all the interstate traffic of the country". It was pointed out further that the objectives of the policy of Congress included "adequacy of transportation service . . . its essential conditions of economy and efficiency, and . . . appropriate provision and best use of transportation facilities."

In *Purcell* v. *United States*, 315 U. S. 381, 385, it was said:

[20] 41 Stat. 474.

> "This Court has recognized that operation of the national railway system without waste was one of the purposes the Transportation Act of 1920 was intended to further."

In *Texas* v. *United States*, 292 U. S. 522, 530, the Court stated that the Transportation Act of 1920 introduced into the federal legislation a new railroad policy:

> "* * * seeking to insure an adequate transportation service. To attain that end new rights, new obligations, new machinery were created. [citations omitted] It is a primary aim of that policy to secure the avoidance of waste. That avoidance, as well as the maintenance of service, is viewed as a direct concern of the public."

The railroads are under a "federal duty * * * efficiently to render transportation services in interstate commerce." *Colorado* v. *United States*, 271 U. S. 153, 165. It is the policy of Congress to prevent "an injurious waste" and to secure "more efficient transportation service." *N. Y. Central Securities Co.* v. *U. S.*, 287 U. S. 12, 26. That policy "recognized that preservation of the earning capacity, and conservation of the financial resources, of individual carriers is a matter of national concern", *Texas & Pac. Ry.* v. *Gulf, Etc. Ry.*, 270 U. S. 266, 277; and that "the public and the carriers are alike interested in maintaining adequate, uninterrupted transportation service at reasonable cost." See also *Davis* v. *Farmers Co-operative Co.*, 262 U. S. 312, 317; *Wisconsin R. R. Comm.* v. *C. B. & Q. R. R. Co.*, 257 U. S. 563, 585; *New England Divisions Case*, 261 U. S. 184, 189-192; *Dayton-Goose Creek Ry.* v. *U. S.*, 263 U. S. 456, 477-478; and *Florida* v. *United States*, 292 U. S. 1, 6-8.

The *Colorado* case, *supra* (271 U. S. 153), dealt with the abandonment, as respects both intrastate and interstate commerce, of an unprofitable branch line of railroad lying wholly within the state of the owning company's incorporation. The unified and interdependent character of interstate and intrastate railroad operations appear strikingly from a statement, at page 163, that harmful effects

upon interstate commerce may be caused "by excessive expenditures from the common fund in the local interest, thereby lessening the ability of the carrier properly to serve interstate commerce."

One of the burdensome features of the Arizona law is that it requires excessive expenditures for a purported local interest by railroads whose lines run through many states and whose activities are chiefly interstate.

If it should be contended that the National Transportation Policy has no purpose or effect except in connection with the administration of the Interstate Commerce Act, a ready and final answer is afforded by *Davis* v. *Farmers Co-operative Co., supra* (262 U. S. 312), and *Lehigh Valley R. R.* v. *Commissioners*, 278 U. S. 24, 35. In the *Davis* case, it was held that a Minnesota statute was invalid and obnoxious to the Commerce Clause, in its application to the particular facts presented, because it imposed a serious burden on interstate commerce, which unduly interfered with the policy of Congress as manifested in the Interstate Commerce Act. The statute under scrutiny in that case provided that any foreign corporation having an agent in the state for the solicitation of freight and passenger traffic over lines outside the state might be served with summons by delivering a copy thereof to such agent.

The issue in the case was the constitutionality of applying the statute in an action brought against a railroad company which neither owned nor operated a railroad within the state, by a plaintiff who did not reside there, upon a cause of action which arose elsewhere out of a transaction entered into elsewhere. The Court took judicial notice of the fact that there is a large volume of litigation against interstate carriers on personal injury and freight claims, and that a heavy expense, with a corresponding impairment of the carriers' efficiency, is involved when such litigation is conducted in jurisdictions remote from where the cause of action arose. The Court held that such expenses would involve waste in interstate transportation contrary to the purposes and objectives of Congress as reflected in

the Transportation Act of 1920, and that the state law, as applied by the state court, was accordingly invalid because it unreasonably obstructed and unduly burdened interstate commerce. The following quotation is from page 317 of the opinion (262 U. S. 312):

> "The public and the carriers are alike interested in maintaining adequate, uninterrupted transportation service at reasonable cost. This common interest is emphasized by Transportation Act, 1920, which authorizes rate increases necessary to ensure to carriers efficiently operated a fair return on property devoted to the public use. See *Railroad Commission of Wisconsin* v. *Chicago, Burlington & Quincy R. R. Co.*, 257 U. S. 563; *New England Divisions Case*, 261 U. S. 184. Avoidance of waste, in interstate transportation, as well as maintenance of service, has become a direct concern of the public. With these ends the Minnesota statute, as here applied, unduly interferes. By requiring from interstate carriers general submission to suit, it unreasonably obstructs, and unduly burdens, interstate commerce."

In view of the policy of Congress, as reflected in the Interstate Commerce Act since 1920, and as explicitly stated in that Act after the amendments of 1940, with respect to the adequacy, efficiency and economy of railroad transportation, the avoidance of waste, the interest of the public in reasonable rates, and the conservation of railroad resources, it would seem little less than fantastic to impute to Congress an intent to leave states free to enforce a burdensome, oppressive and improvident regulation of interstate commerce such as the Arizona Train-Limit Law.

On this point *Parker* v. *Brown*, 317 U. S. 341, throws light. That case involved the validity of a prorating marketing program under the California Agricultural Prorate Act, adopted by the state for regulating the handling, disposition and prices of raisins produced in California, a large part of which go in interstate commerce. The Court held that the state action dealt with a problem local in character, which urgently demanded state action.

for the economic protection of those engaged in one of its important industries. It held further that such effect as the operation of the California prorate program might have on interstate commerce was one "which it has been the policy of Congress to aid and encourage" (page 368), and that, therefore, it could not be said "that the effect of the state program on interstate commerce is one which conflicts with Congressional policy * * *." The reasons which led the Court to sustain the California marketing statute would lead to the conclusion that the Arizona Train-Limit Law should be set aside.

IV.

THE EFFECT OF THE ARIZONA LAW ON THE SAFETY OF RAILROAD OPERATION.

The effect of the Arizona law upon safety is discussed at length in the brief for appellant, Southern Pacific Company (Volume I, pp. 27-50; 202-205; 263-269. Volume II, pp. 125-203; and in the brief for the United States as *amicus curiae*, pp. 34-44). Accordingly, we shall restrict our discussion to certain outstanding features.

We think there is no doubt that a stringent train-length limitation, such as that of Arizona, is an affirmative, anti-safety measure which greatly increases the hazards incident to train operation. This is one of the reasons for the opposition by the railroads to a regulation of this character. Since the first World War extraordinary progress has been made in the field of railroad safety. Further progress should not be hampered, and even less should the progress already accomplished be sacrificed.

There are many causes of casualties[30] to persons incident to train operation. The only serious claim which has been

[30] Casualties include injuries and fatalities. Under the classification of the Interstate Commerce Commission an injury which incapacitates an employee for his ordinary work for more than three days, or incapacitates a person other than an employee for more than one day, is a reportable casualty. (R. 3975)

advanced in support of the Arizona law is that it has a beneficial effect with respect to slack-action casualties to employees.

The nature and cause of slack-action are dealt with at length in the findings of the trial court. (R. 3969-74) With respect to slack-action casualties the court found (R. 3990-1):

> "Plaintiff bases its contention that the train-limit law is a safety statute almost entirely on the theory that it will minimize or greatly lessen the so-called 'slack-action' or 'slack-surge' accident—a form of accident classified by the Interstate Commerce Commission as being caused by a shock incident to a sudden starting, stopping, lurch or jerk of the train. Casualties resulting from this type of accident are confined almost entirely to road freight conductors, brakemen and flagmen on duty, occur most frequently when they are in the caboose, occasionally when on top of the train, and infrequently when they are on the side of a car or caboose, or attempting to board or leave a car or caboose."

When we speak of slack-action casualties hereinafter it should be understood that the reference is to casualties of this character to road freight conductors, brakemen and flagmen on duty.

It seems plain that the Arizona law must be scrutinized in the light of its net effect on all hazards attendant upon train operation and not with reference to only one hazard, in disregard of the others.

From the findings and the evidence, the following facts stand out: Slack-action casualties are of relatively minor importance when compared with other classes of casualties incident to train operation. The Arizona law has no appreciable or perceptible beneficial effect even with respect to slack-action casualties. It has an extremely harmful effect with respect to practically all other classes of casualties, including those of the most serious character. The net effect of the law is to increase substantially the hazards of railroad operation.

The reason why casualties of practically all kinds are increased by restrictive train-length regulation is that they are related to the number of trains run. Casualties of some classes tend to increase in direct proportion to the number of trains run. (Examples are highway grade-crossing casualties, and casualties to persons struck and run over by engines or trains at places other than grade crossings.) Casualties of certain other classes tend to increase in greater proportion than the number of trains, because train meets and passes are a contributing factor to these casualties. We have seen that meets and passes multiply as the number of trains increases.[31] (Examples are casualties due to collisions between trains and casualties due to employees getting off and on trains.)

A. Slack-Action Casualties are of Relatively Minor Importance.

The trial court found that slack-action accidents are "of comparatively infrequent occurrence." (R. 3991) It also found that the "relative unimportance" of slack-action casualties was shown by a comparison of such casualties to employees with all casualties to employees; that in the period 1923-1939 slack-action casualties on all railroads in the United States represented only six per cent of all casualties to all employees; and that slack-action fatalities to employees amounted to less than one per cent of the total employee fatalities. (R. 3979, 3980, 4052. See also R. 3304) The trial court stated in its memorandum opinion that "slack-action casualties on passenger trains are of no significance whatever." (R. 4050)

The casualty figures referred to above relate only to railroad employees, but casualties incident to train

[31] As a result of the Arizona law it was necessary in 1938 to run 28 per cent more trains (4,304 more freight trains and 33 more passenger trains) between Yuma and El Paso than would have been necessary otherwise, but this increased the number of train meets and passes by 63 per cent or 16,500. (R. 3958, 3964-5, 4021, 4051)

operations occur to others as well. The relative unimportance of slack-action casualties to employees in the field of railroad accidents becomes unmistakable when such casualties are compared with all casualties to all persons incident to train operation. In the period 1935-1939, the number of slack-action casualties to employees on all Class I railroads was only 2.3 per cent of the number of casualties to all persons, and the number of employee fatalities from slack-action was less than one-tenth of one per cent (0.07%) of the number of all fatalities.[32]

Another sharp reminder of the comparatively minor importance of slack-action casualties is the fact that on all railroads in the United States during the period 1935-1939, the number of grade-crossing casualties alone was 11½ times the number of slack-surge casualties and the number of grade-crossing fatalities was considerably more than 400 times the number of slack-action fatalities. (R. 3304, 3306) In this connection, it will be recalled that "'long-train' operating practice is the customary and ordinary practice throughout the United States," as stated in the memorandum opinion of the trial court (R. 4046), and that the slack-action casualties and fatalities referred to above reflect operation of that character. (Neither will it be overlooked that a train-limit regulation results in more trains and in a corresponding increase in grade-crossing fatalities and injuries, as we shall show later in more detail.

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[32] Statistics showing casualties to all persons in accidents incident to train operation are not in the record. They were taken from Accident Bulletin Nos. 104 through 108, published by the Interstate Commerce Commission and covering the years 1935 through 1939, respectively. The data appear in Table No. 55 of each issue of the Accident Bulletin, page 24 of Bulletin No. 104, page 26 of Bulletin No. 105, page 30 of Bulletin Nos. 106 and 107, and page 32 of Bulletin No. 108. They represent the "Grand total, non-trespassers and trespassers", killed and injured in "train accidents" and in "train service accidents", for Class I railways. The number of slack-action casualties is taken from the findings of the trial court. (R. 3980. See also R. 3304.)

B. Even with Respect to Slack-Action Casualties the Arizona Train Limitation Has No Perceptible or Appreciable Beneficial Effect.

In the memorandum opinion of the trial court, it was stated (R. 4052):

> "It must also be remembered that there are many factors besides length of train causing slack-action casualties, such as: grades, speed of train, consist of train and whether loaded or empty. The record shows many severe casualties of this type on short trains. *Limiting trains to the Arizona maxima has had no perceptible limiting effect on even that class of accidents,* * * *" (Emphasis supplied.)

The trial court found (R. 3973):

> "It is likewise not true that the Train-Limit Law, by restricting the lengths of freight trains, either eliminates or substantially reduces the number or severity of the casualties attributable to slack-action shocks in cabooses or other cars at or near the rear end of trains. The evidence indicates that in the operation of long trains, there have been many instances of severe jerks and jolts occurring at the rear end of the train because of slack-action, and that injuries have been suffered by brakemen and conductors as a result thereof. The record contains many similar instances occurring in connection with the operation of short trains."

The trial court also found (R. 3986):

> "It clearly appears that the enforcement of the Arizona Train-Limit Law has not been accompanied by any measurable decrease in so-called slack-action casualties, as compared with the standard long-train method of operation, but has been accompanied by a greater proportion or ratio of casualties to passengers, and to all employes, as well as to freight-train employes, from all causes that lead to train and train-service accidents."

The trial court further found (R. 3991):

> "The train-limit law has been observed long enough, and under such circumstances, as to afford a fair basis for judging whether a law limiting the length of a freight train to 70 cars, exclusive of caboose, can be said to be reasonably effective in the prevention or minimization of slack accidents and incident casualties. It clearly appears, and it is hereby found, that said law has not had that effect in Arizona, as to the defendant's freight-train operations in that state, either when they alone are considered, or when they are compared with defendant's freight-train operations in Nevada."

During the period 1923 to 1939, while there was an increase in the proportion of long trains operated in the United States, there was a very pronounced decrease in the number of slack-action accidents. The employee casualty rate per million train-miles for the period 1923-1928, for this type of accident, was 2.75, and for the period 1935-1939, it was 1.05. (R. 3979, 3304) For the year 1923, the rate was 2.88 and for the year 1939, 0.86. The average length of freight trains in the United States in 1922 was 38.4 cars; in 1926, 45.2 cars; in 1930, 48.9 cars; in 1934, 46.2 cars; in 1938, 47.7 cars, and in 1939, 49.1 cars. (R. 3937) The increase in average train length reflects only to a limited extent the increase in the relative number of long trains.

In Nevada, the Southern Pacific operates a large number of long freight trains in proportion to the total number of trains. During four representative months of 1939, 66.2 per cent of the Southern Pacific freight trains in Nevada were long trains. (R. 3916) The proportion of long trains so operated and the average number of cars per freight train have increased sharply since 1922. In that year there were 48.92 cars per train; in 1927, 69.17 cars; in 1932, 81.06 cars; in 1937, 74.43 cars; in 1938, 78.77 cars; and in 1939, 78.46 cars. (R. 3917)

In 1923 there were 7.97 slack-action casualties to employees per million train-miles on the Southern Pacific in Nevada, and in 1940 the rate was only 1.96. For the period 1923-1928, when the average number of cars per freight train on the Southern Pacific in Nevada was 58.51, the number of slack-action casualties to employees per million train-miles was 4.32; for the period 1929-1934, when the average number of cars per freight train in Nevada was 72.66, the number of slack-action casualties to employees per million train-miles was 3.25; and for the period 1935-1940, when the average number of cars per freight train in Nevada was 77.86, the number of slack-action casualties to employees per million train-miles was 2.45. (R. 3375) *It is highly significant that in the entire period from 1923 to 1940 there was only one employee fatality from slack-action on the Southern Pacific in Nevada, where long trains predominate, and that this occurred in 1927 on a short train of 60 cars.* (R. 3367, 3375, 3991) *During the same period there was also one employee fatality from slack-action in Arizona, where only short trains were run, and this occurred in 1926.* (R. 3375)

In a later section, dealing with the burden which the Arizona law imposes upon interstate commerce, we shall discuss Service Order No. 85 of the Interstate Commerce Commission, entered September 11, 1942, (7 Fed. Reg. 7258) and the subsequent report of the Commission with respect to that order, *In the Matter of Service Order No. 85*, 256 I. C. C. 523. The service order suspended state regulations limiting train length during the period of the war. At this time we wish merely to refer to a statement in the Commission's report concerning safety. At page 536 it was said:

> "The fact that freight trains in excess of 70 cars and passenger trains in excess of 14 cars are safely operated in other States is convincing evidence of its safety, except where unusual operating conditions exist."

The Interstate Commerce Commission is fully and currently informed about accidents and casualties incident to train operation. For many years, pursuant to the Accidents Report Act,[33] it has required monthly reports of such accidents and casualties on forms prescribed by it and filed under oath by the carriers. (R. 3974) Moreover, the Commission conducts investigations through its own representatives of serious accidents, including 90 per cent of those resulting in fatalities. As stated by the trial court in its memorandum opinion, "It is rather significant that they [the Commission] have failed to find or report in any one year that the length of trains had anything to do with the number of casualties." (R. 4051)

C. The Arizona Train-Limit Law Increases the Hazard of Practically All Kinds of Accidents and the Net Result of the Law is to Make Train Operation Much More Hazardous.

In the memorandum opinion of the trial court it was stated (R. 4052-3):

> "Thus the Arizona Train-Limit Law not only bears no reasonable relation to safety, but to the contrary, does, and if enforced will continue to, impair and lessen substantially the safety of defendant's train operations in Arizona and the adjacent affected territory."

In the memorandum opinion it was also stated (R. 4051):

> "Furthermore, this record contains exhibits comparing the defendant's freight-train operations in Arizona with its operations in Nevada and New Mexico, as well as the Class I roads of America. The element of speculation, as to the result of long and short-train operations, is therefore largely eliminated. From all of which it appears very definitely that there are more accidents and they occurred more frequently in pro-

[33] 36 Stat. 350, U. S. C., Title 45, Sec. 38 et seq.

portion to trains handled or traffic moved in short-train territory than in long-train territory. Reference is made to the findings of fact for details to support this statement."

The trial court found (R. 3981):

> "Although during the period 1923-1939, covered by the National statistics in evidence, there have been substantial improvements in the road-bed and equipment of American railroads, it is clear from a consideration of all of the evidence in the case that *a considerable part of the improvement in casualty rates on those railroads during the same period is directly attributable to the adoption and growth of the standard long-train method of handling freight and passenger traffic*, because thereby a substantially less number of train units was operated than would have been operated for the same volume of traffic had not the long-train policy been followed." (Emphasis supplied.)

The notable progress which the railroads have made in improving safety conditions for employees is clear from the statistics. In 1923, there were 32.15 casualties to all classes of employees per million train-miles on all Class I railroads, and in 1939 only 7.87. For the period 1923-1928, there were 26.02 employee casualties per million train-miles; for the period 1929-1934, the rate was 11.53; and for the period 1935-1939, the rate was only 8.59. (R. 3300)

With respect to certain important classes of casualties which are increased by train-length limitation and the resulting necessity of running more trains, the Court found (R. 4020):

> "Insofar as concerns safety of employment, all said train service employes, and as well all employes whose duties require them to be or go upon the tracks, are affected by the law; in that by increasing the relative number of trains run, said law increases the hazards of train and train-service accidents to which such employes are subject, and particularly (among others) the following hazards: (1) of being struck and run down while on or near the tracks in the course of duty,

(2) of being involved and injured in head and rear-end collisions; (3) of being involved in locomotive accidents; (4) of being injured in grade-crossing accidents; (5) of slipping or falling while getting on or off trains."

The trial court particularly pointed out in its findings the major importance of grade-crossing casualties and the relationship of such casualties to the number of trains run. It stated that during the period 1923-1939 there were 112,207 casualties on all railroads in the United States due to grade-crossing accidents and that 24.8 per cent, or 27,792, were fatal. It also pointed out that over the 17-year period the average rate of grade-crossing casualties per million train-miles was 6.45 and that in no year was there any substantial variation from this average.[34] (R. 4014) It is obvious that a substantial increase in the number of train-miles, as a result of the arbitrary limitation of train length, would result in a heavy increase in the number of grade-crossing fatalities.

The record shows that for the year 1937 the number of fatalities in the United States from grade-crossing accidents was 1,607 and that the total number of train-miles was 933,219,000. The rate of fatalities per million train-miles was 1.72. (R. 3306) At hearings on S. 69 before the Committee on Interstate and Foreign Commerce, House of Representatives, which were held from January 11 to March 18, 1938, 75th Congress, it was estimated by railroad spokesmen that a federal train limitation of 70 cars would have increased the train-miles in 1937 by more than 60,000,000.[35] On the basis of the statistical relationship above set forth, such an increase in train-miles would have

[34] The constant rate is presumably the result of two forces working in opposite directions: first, an increase in the number of automobiles which tended to increase the rate; and second, elimination of some crossings and improved protection at others which tended to reduce the rate.

[35] Printed transcript of hearings, pp. 370, 852.

increased fatalities from grade-crossing accidents in the United States by 103 during that year.

Grade crossings constitute a serious hazard in Arizona. In the period 1923 to 1939, there were 384 grade-crossing casualties in that state, of which 82 were fatalities and 302 were injuries. (R. 3422) It also appears that the Arizona Train-Limit Law resulted in 28.4 per cent excess freight and passenger trains in 1938. (R. 3958) This would seem to leave no doubt, in view of the relationship between the number of trains operated and the number of grade-crossing accidents, that the Arizona law has been responsible for a large number of deaths and injuries.

Among other important classes of casualties with respect to which train-length limitations are directly contributory is that of "casualties to persons struck or run over by cars or locomotives at places other than highway grade crossings." Casualties of this kind include a very high percentage of fatalities. In 1939, on all Class I railroads in the United States there were 2,347 such casualties, of which 1,536, or 65.4 per cent, were fatalities. Casualties of this kind, as would be expected, bear a very close relationship to the number of train-miles. During the period 1923-1939 there were 3.28 such casualties per million train-miles. For the year 1937, there were 3.08 casualties of this kind per million train-miles, of which 62.1 per cent were fatalities. It will be seen that if 60,000,000 additional train-miles had been run in 1937 approximately 185 additional struck-or-run-over casualties, including 115 fatalities, could have been expected.[36]

[36] Statistics showing casualties to persons struck or run over by cars or locomotives at places other than highway grade crossings are not in the record. They were taken from Accident Bulletins Nos. 92 through 108, published by the Interstate Commerce Commission, covering the years 1923 through 1939. The data appear in Table No. 55 of each issue of the Accident Bulletin. They represent the "Grand total, nontrespassers and trespassers", killed and injured in "train-service" accidents from the above-described cause for railroads of all classes. Train-miles used to compute the rate of such accidents were taken from exhibits in the record. (R. 3300)

D. If Any Beneficial Effects with Respect to Slack-Action Casualties Can Be Attributed to the Arizona Train-Length Limitations, They Are Overwhelmingly Offset by the Injurious Effects With Respect to Much More Important Classes of Casualties.

We have shown that, at most, any beneficial effects upon slack-action casualties of train-length limitations are inconsequential; that such casualties are of relatively minor importance; and that train-length limitations substantially increase the danger of practically all other kinds of casualties.

Among such other kinds of casualties are those from grade-crossing accidents, which included on all railroads an average of 1,413 fatalities per year for the period 1935-1939, and those to persons struck or run over by trains and engines at places other than grade crossings, which included on all Class I railroads an average of 1,712 fatalities per year, for the same period. *In contrast, slack-action casualties to road freight conductors, brakemen, and flagmen, during this period on all Class I railroads in the United States included an average of only three fatalities per year.* The number of grade-crossing casualties, and struck-or-run-over casualties, increases in close relationship to the increase in the number of trains. The conclusion cannot be avoided that, if train-length limitations, like those in Arizona, had been in effect generally during the period 1935-1939, there would have been a large increase in fatalities and injuries. On the basis of figures, to which attention has been called, the additional fatalities would have amounted to more than 200 per year.

It should be said that railroad employees, as well as others, are subject to grade-crossing casualties and to casualties from being struck or run over. During the period 1935-1939, the average number of railroad employees killed per year in grade-crossing accidents in the United States

was 21, and the average number of employees killed per year by being struck-or-run-over was 141.[37]

E. The Bearing of the Safety Feature on This Case.

The findings and evidence show that considerations of safety afford no rational basis for the Arizona law and that the effects of the law have not been and would not be to reduce hazards but greatly to increase them. But this conclusion is not necessary to a judgment that that law is invalid as in conflict with the Commerce Clause. Under the doctrine of balancing interests, national and state, it is necessary to weigh the local benefits against the burden upon interstate commerce. The fact that a state law might have some beneficial relationship to safety is not enough, therefore, to establish its validity. The question is one of the relative weight of the competing factors. Thus, if the state benefits are of little consequence and the burden upon commerce is heavy, the state law falls. We have discussed in this section the alleged state benefits and in the next we shall discuss the burden on interstate commerce.

There is one other consideration to which reference should be made before leaving the safety feature. In the brief for the Southern Pacific (pp. 209-233) it is argued, and we think soundly, that the Arizona law is unconstitutional because it operates in a field which has been occupied by Congress as a result of legislation and as a result of administrative action by the Interstate Commerce Commission. There it is shown that federal action relating to train control has been extensive. The point we wish to make here is that this federal action is a factor for consideration, insofar as it has the effect of eliminating or minimizing any state need for, or benefit from, train limitation.

[37] Statistics showing fatalities to employees in grade-crossing and struck-or-run-over accidents are not in the record. They were taken from Accident Bulletin Nos. 104 through 108, published by the Interstate Commerce Commission, covering the years 1935 through 1939. The data appear in Table No. 55 of each issue of the Accident Bulletin.

even if it should be thought that it falls short of an "occupation of the field" in a technical sense.

It is not without interest and significance that the Federal Government and the State of Arizona have been guided by wholly different and opposing philosophies. The action of the Federal Government looks to progress in the art of railroad operation and to improving safety conditions by improving facilities and devices. The state action, on the contrary, seeks to accomplish its purpose by freezing railroad practices and preventing or impeding progress.

V.

THE BURDEN ON INTERSTATE COMMERCE RESULTING FROM THE ARIZONA LAW.

The burden on interstate commerce resulting from drastic state regulation of train lengths is due to the interferferences with, and obstructions to, railroad transportation caused by such limitations. It follows that the importance of railroad transportation to interstate commerce and to the national interest is a factor always to be borne in mind in considering the degree and extent of the burden on interstate commerce. Under another heading, we have already discussed the place occupied by the railroads, as carriers, in the national life.

If the states have authority to limit train lengths, as Arizona has attempted to do, they have authority to interfere directly with the physical operation of railroads in their conduct of interstate transportation, in such a way as to make such operation more hazardous, less efficient and more costly, and to threaten the adequacy of railroad service in periods of heavy traffic. They have authority to do all this in the face of the National Transportation Policy declared by Congress, which emphasizes the national interest in the safety, efficiency and economy of rail transportation, and in spite of the fact that no local, state interests of safety, or other state interests, are served.

In the preceding section we have dealt with the effect of train-length limitations, such as those prescribed in Arizona, upon the safety of train operations. In this section, we shall discuss briefly the adverse effect of limitations of this kind upon the economy and efficiency of railroad operation, the free flow of interstate commerce, and the adequacy of railroad service.

There are two approaches to the subject. In the first place, consideration must be given to the actual effects of the Arizona limitations as shown by the long experience of the Southern Pacific in its operation under those limitations. In the second place, consideration must be given to the experience of railroads generally, including the Southern Pacific, in operations elsewhere, which have not been hampered by these or similar limitations.

The obstructive and oppressive effects of the Arizona law upon the operations of the Southern Pacific Company are discussed at length in the brief filed on behalf of that company. (Volume I, pp. 15-27, 110-113, 156-160, 197-202; Volume II, pp. 49-69, 85-125.) There is, accordingly, no occasion for a detailed discussion here of the Arizona situation.

With reference to the burden imposed upon the Southern Pacific operations by the Arizona law, the trial court, in its memorandum opinion stated (R. 4048-9):

> "The record here also amply discloses that the law causes real interference with, and delay to, interstate commerce, practically to the extent that Arizona operations create a bottle-neck. Actually ninety-three per cent of the freight traffic and ninety-five per cent of the passenger business of the defendant in Arizona is interstate commerce. Furthermore, the law certainly imposes a great, substantial and wholly unreasonable burden of expense upon this interstate traffic. To hold in this case that interstate commerce was only incidentally or indirectly involved would be less than realistic, for the interference and regulation is *substantial, continuous, direct and unavoidable*; as is pointed out in detail in the findings of fact. What is even more serious from

the standpoint of those who seek to uphold the Act is its extra-territorial effect. The challenged law lays hands upon interstate commerce moving over defendant's lines long before it reaches the physical boundaries of Arizona, and continues directly to affect and regulate that commerce long after it has left Arizona. As a practical matter, it nearly controls the length of passenger trains from Los Angeles to El Paso, and of freight trains from Yuma to Lordsburg, the latter point being twenty-three miles East of the State line, and frequently on to El Paso, 171 miles beyond Arizona's boundary."

In its memorandum opinion, the trial court stated further (R. 4051):

"Also it is clear that the reason defendant is unable to effect improvement in the efficiency and economy of its freight-train operations in Arizona comparable to those achieved in neighboring states, or upon its system generally, is primarily due to the restrictions imposed by the Arizona law."

The following is quoted from the findings of fact of the trial court (R. 3953):

"The enforcement of the train-limit law against defendant results and will continue to result in delay to and interference with the handling and movement of defendant's interstate trains, both freight and passenger, operated in the affected territory, and with the transportation and movement of the interstate passengers, cars and commerce contained therein, both within and without the boundaries of Arizona.

Such delays and interferences arise and will continue to arise in the following ways: (1) interferences with and delays to cars and trains at terminals, (2) delays to individual cars, as distinguished from trains, at terminals and other stations, and (3) interferences with and delays to trains while on the line between terminals."

The trial court also found (R. 3961):

> "The effect of the aforesaid delays and interferences occasioned by the law are and will continue to be directly, substantially and seriously to impede the prompt and efficient handling of the interstate freight and passenger traffic carried in the trains operating over defendant's lines in the affected territory, and to hamper seriously, and in many cases to prevent, the on-time delivery of said traffic at destinations and/or points of interchange with defendant's connections."

There was a further finding of fact by the trial court that the expenses incurred by the Southern Pacific in performing transportation services (almost wholly interstate) were increased as a result of the requirements of the Arizona law by $394,900[38] per year, of which $94,600 was incurred outside of the state by reason of the extraterritorial operation of the law. (R. 3966-8) The added costs reflected in these figures resulted in large part from the necessity of running unnecessary additional trains and of performing unnecessary additional switching.

The lines of the Southern Pacific in Arizona, as well as those of other railroad companies operating in that state, are links in the national railroad transportation system. Approximately 93 per cent of the freight traffic and 95 per cent of the passenger traffic of the Southern Pacific in Arizona is moving in interstate commerce. Approximately 68 per cent of the freight traffic and 74 per cent of the passenger traffic is "overhead" or "bridge" traffic, that is to say, traffic which originates outside of the state and moves across the state to destinations beyond. (R. 3897-9) Thus, it will be seen that the additional costs of operation due to

[38] This estimate was based on operations in 1938, a year of very light traffic. In a year of heavier traffic, the cost would, of course, be greater. The Atchison, Topeka and Santa Fe Railway Company also is engaged in railroad operation in Arizona. In *Atchison, T. & S. F. Ry. Co. v. LaPrade*, 2 Fed. Supp. 855, 862, decided in 1933, it appeared that the Arizona law increased the expenses of that company by more than $600,000 per year.

the Arizona Train-Limit Law, regardless of where they are incurred, fall in very large part on those outside of the state.

Delays and congestions on the railroad lines within Arizona, or the affected territory, mean, of course, delays and congestions on every through railroad route of which these lines form a part. Such routes extend from coast to coast and, indeed, from every part of the United States to every other part of the United States. Increased cost of railroad transportation in Arizona results in increased cost of transportation over all routes passing through that state. If railroad transportation in Arizona is blocked, transportation over all routes which include Arizona lines is blocked.

For many years the Southern Pacific has followed the practice of long-train operation on its entire system, with the exception of its lines in Arizona and the adjacent affected territory. Approximately 27 per cent of the total number of freight trains run by this company, excluding its operations in Arizona, are more than 70 cars in length. In Nevada, where conditions are closely similar to those in Arizona, except in so far as they are affected in the latter state by the Train-Limit Law, more than 66 per cent of the freight trains operated by the Southern Pacific are long trains. The Southern Pacific also operates a substantial number of long passenger trains—trains in excess of 14 cars—on its lines which are not affected by the Arizona law. On some routes more than 43 per cent of the passenger trains are long trains. (R. 3915-6) Long trains would be operated in large numbers over the lines of the Southern Pacific in Arizona and the adjacent affected territory, except for the state law. Over the main line between Yuma and Lordsburg, where no long trains can be operated under the law, more than 80 per cent of the freight trains would be long trains but for the restrictions of the law. The average number of cars per train on this part of the line of the Southern Pacific was about 65 in 1938 under the restricted operation, but, in the absence of the state restriction, the average number of cars per train would have been 87. (R. 3962-3)

The Arizona law interferes with and delays the movement of interstate commerce in many ways. A long train approaching the state must be broken down to the statutory length when or before it reaches the state line. This involves extra switching, substantial delays to trains, and additional delays to cars which must be cut out of long trains for storage and movement in later trains. When short trains have crossed the State of Arizona they must be remade into long trains at the first available point at or beyond the state line in order to avoid the disadvantages of short-train operation. This also requires additional switching and results in new delays.

Long freight trains entering Arizona from the West are ordinarily broken down into short trains at the Yuma yards and the westbound short trains which have moved through Arizona ordinarily are remade at those yards into long trains for further movement.[39] A quite different situation exists, however, with respect to long trains approaching Arizona from the East and short trains leaving Arizona for movement eastward. There is no terminal at the Arizona-New Mexico state line where long trains can be broken down into short trains or short trains built up into long trains, and it is impracticable to construct such a terminal at that point. As a result, westbound long trains from the East must be broken down and remade into short trains, which meet the requirements of the Arizona law, at Lordsburg, New Mexico, 23 miles east of the state line or at some terminal still further east. Likewise, eastbound short trains which have moved through Arizona cannot be built up to long trains before they reach Lordsburg or some terminal further east. As a practical matter, most trains must be broken down or built up as far east as El Paso, Texas, 171 miles from the Arizona state line.

[39] By sufferance of the state the operations between the California-Arizona line and the Yuma yards, which are in Arizona a short distance from the line, have never been treated as within the purview of the law. (R. 4043)

The extent of the extraterritorial interference with train operation by the Arizona law is shown by a special study covering June and August, 1938. This study disclosed that 30 per cent of the freight trains on the Southern Pacific between Lordsburg, New Mexico, and El Paso, Texas, were long trains, whereas 74 per cent of the trains between these points would have been long trains except for the restrictions of the statute. The average number of cars in freight trains actually operated between these points was 68. In the absence of the train-length limitations, the average number of cars would have been 89. (R. 3962-3)

The extraterritorial operation of the Arizona law affects passenger trains as well as freight trains and to a greater degree. It controls the length of passenger trains to a large extent from Los Angeles to El Paso. (R. 4049)

The delays caused by the Arizona law include not only terminal delays of the character above described but also delays in road movement. These are caused by the necessity of running more trains than would be required in the absence of the prescribed limitations. A careful redispatching study developed that in the year 1938 the Southern Pacific was required to operate 4,304 additional freight trains (or 638,569 additional train miles) over its main line between Yuma and El Paso, solely because of the restrictions of the law. It was also required to operate additional passenger trains. The running of these additional trains caused 16,512 additional train meets and passes. The law compelled an increase in the total number of trains run (both freight and passenger) in the affected territory of about 28 per cent and an increase in the number of train meets and passes of about 63 per cent. (R. 3958, 3964-5, 4021, 4051)

The operation of more trains to carry a given volume of traffic requires more locomotives and more crews to man the trains. It limits road track capacity and yard capacity because of additional train interference on the road and additional switching in the yards. In periods of heavy traffic

this can lead to paralyzing congestions. Clearly, the Arizona train-length limitations not only obstruct and delay interstate transportation and make it more costly, but also, at times of greatest need, actually restrict and prevent such transportation.

This is not a mere theoretical or hypothetical danger. Since the beginning of the present war, all transcontinental lines operating through Arizona and Oklahoma (where there is a similar train-length limitation) have frequently been congested and it has been necessary to divert traffic from these lines to other transcontinental lines. *In the Matter of Service Order No. 85*, 256 I. C. C. 523, 535. This led the Interstate Commerce Commission, on September 11, 1942, to issue its Service Order No. 85 (7 Fed. Reg. 7258) suspending state train-length laws for the duration of the war emergency.[40] The power of the Commission to enter the order was questioned by certain railway labor organizations, which did not seek to raise any issue of fact. With the consent of those organizations, the question was submitted on briefs. The Secretary of War and the principal railroads serving Arizona and Oklahoma filed briefs in support of the order, and the Attorney General of Arizona, the Attorney General of Oklahoma, and certain railway labor organizations filed briefs challenging the order. The Commission issued a report in due course in which it refused to set aside its service order. *In the Matter of Service Order No. 85, supra*, 256 I. C. C. 523. In that report it was said, at page 524, that the order:

> "was designed to save manpower, motive power, engine-miles, and train-miles; to avoid delay in the movement of trains; to increase the efficient use of locomotives and cars and to augment the available supply thereof; and to relieve congestion at terminals caused by setting out and picking up cars on each side of the train-limit law States."

[40] The Commission acted under the emergency powers granted to it in the Car Service Provisions of the Interstate Commerce Act, as amended (Part I, Sec. 1 (10)-(17)); 49 U. S. C., Sec. 1 (10)-(17).

It was further said, at page 534:

> "* * * train-limit laws are not matters of local concern and the regulation of the number of cars which may be put in a train does infringe the national interest in maintaining the free flow of commerce under the present emergency war conditions."

At page 535, it was said:

> "Service Order No. 85 recites in its preamble that the train-limit laws in question during the present emergency may result in congestion of tracks and terminals, wasteful use of locomotives, and interference with the free flow of traffic necessary in the present emergency. This shows the national interest involved. The brief of the Secretary of War shows that many trains carrying important and urgently needed war goods and exceeding in length the maximum prescribed by certain State laws are constantly being moved from interior points to points of embarkation. It also shows that military necessity requires that units of troops should not be divided while being transported and that trains carrying prisoners of war should not be split.
>
> Since the beginning of the present war, all transcontinental railroad lines operating through Oklahoma and Arizona *have frequently been congested*, and it has been *necessary to reroute traffic from these lines* to other transcontinental routes." (Emphasis supplied.)

It is helpful to an understanding of the true character and potentiality of the power which is being claimed by Arizona to consider the results which would follow the exercise of like powers by other states. What would be the effect on the national railroad transportation system?

As previously stated, Class I railroads formulated and inaugurated, in the Spring of 1923, a continuing program to rehabilitate and modernize the national railroad plant. In keeping with that program, new and heavier locomotives and stronger cars were acquired; heavier rail was laid, curves and grades were reduced; bridges, trestles and culverts were rebuilt; signal systems were extended and improved and new safety devices were installed. In many

ways the national railroad plant was remodeled and improved to permit the use of trains of greater capacity and to bring about higher speeds between terminals. During the first year of this improvement program, 1923, more than a billion dollars of gross expenditures were made on capital account, and during the 17 years ending with 1939, the total was approximately nine billion dollars. (R. 187-190, 3934-6)

In connection with and as a result of this program of plant improvement, improved methods of operation were developed and adopted, including the practice of long-train operation. Long-train operation, both freight and passenger, is the standard practice which is followed today, as a customary and ordinary method of operation upon substantially every major railroad system throughout the United States. (R. 3937)

Since 1923, and coincident with development of long-train operation, there has been a marked improvement in the efficiency and economy of operations upon the railroads of the United States generally. The trial court found (R. 3940):

> "During the period since 1923, and coincident with the substantial increase in train lengths during that period, there has been a marked improvement in the efficiency and economy of operations upon the railroads of the United States generally."

In its memorandum opinion the trial court further stated (R. 4046):

> "As a part of its comparative showing as to costs and methods of operation, casualties, etc., the defendant presented the National picture of railroading by witnesses, who are outstanding in their respective fields, from sixteen of the Class I roads of the United States. • • • This evidence clearly establishes that 'long-train' operating practice is the customary and ordinary practice throughout the United States and *that improvements in efficiency, economy and safety are an accomplishment and necessary result of the adoption of that*

practice. This type of operation is unquestionably more economical and efficient than 'short-train' operations. Freight train expenses vary inversely with train length. Furthermore, long-train operations permit improved schedules and performance by elimination of short-train interference." (Emphasis supplied.)

In passing, we refer briefly to a few indicia of the progress which has been made in the economy and efficiency of railroad operation.

The average terminal-to-terminal speed of all freight trains on all Class I railroads, which was 11.1 miles per hour in 1922, increased steadily through the succeeding years until it reached 16.7 miles per hour in 1939, an improvement of 50.5 per cent. (R. 3940)

The average amount of freight train service produced per ton of fuel consumed on freight trains of Class I railroads increased during the same period by 44.4 per cent. In 1922, there were 10,750 gross ton-miles of transportation per ton of fuel consumed, and in 1939, 15,528 gross ton-miles. (R. 3941)

The average freight operating expense for all Class I railroads, per thousand revenue ton-miles, was $8.71 for the period 1922-1925 and $6.49 for the period 1936-1939, or 25.5 per cent less. The average passenger transportation expense, per passenger train car-mile, was 20.06 per cent lower in the period 1936-1939 than in the period 1922-1925. (R. 3941)

As a direct result of the increased efficiency and economy brought about by the aforesaid 1923 betterment program, including the development of long-train operation, the rates for freight and passenger transportation paid by the railroad patrons have shown continuously decreasing trends. The average revenue per ton-mile received by all Class I railroads in the United States was 1.177 cents in 1922 and 0.973 cents in 1939, a decrease of 17.4 per cent. The average revenue per passenger-mile, received by all Class I railroads in the United States, was 3.027 cents in

1922 and 1.840 cents in 1939, a decrease of 39.2 per cent. (R. 3943).

State train-length limitations, in so far as they might become applicable, would undo, in large part, the progress which has been made over the years in improving the safety and efficiency of railroad operation and would impair the use of facilities which have been provided at huge expense.

Moreover, and more important, the evil results would extend beyond delays to transportation, increased hazards, and the loss of efficiency and economy. The physical adequacy of the national railway system would be threatened. Paralyzing congestions would result during times when transportation demands were most urgent.

Congestion in railroad operation is a menacing evil and one which develops its own momentum. When a yard is overtaxed, switching operations become slower and more difficult and this in turn leads to greater congestion and a further slowing down in switching operations. When a railroad line becomes congested, the speed of trains is retarded and this leads to greater congestion. When one route is blocked, additional and perhaps intolerable burdens are thrown upon other routes.

It is difficult to conceive of a greater calamity than a collapse of transportation or a serious transportation shortage. The volume of railroad traffic has reached unprecedented levels during this war and the railroads have carried the load successfully, but there has been no surplus margin of capacity, and serious manpower and motive power problems have presented themselves.[41] Extensive

[41] 57th Annual Report of the Interstate Commerce Commission dated November 1, 1943, at page 1. Testimony of Col. J. Monroe Johnson, then Interstate Commerce Commissioner and now also Director, Office of Defense Transportation, at hearings before a Subcommittee of the Committee on Interstate Commerce, United States Senate, pursuant to S. Res. 185, 78th Congress (Jan. 5, 1944)—Printed Transcript of Hearings, Part 2, at page 284 *et seq.* Address of Honorable Joseph B. Eastman, then Director, Office of Defense Transportation, delivered Oct. 15, 1943, before the Seventh Annual meeting of the National Association of Shippers Advisory Boards. (Printed transcript "Proceedings" of the meeting, page 34.)

interferences with effective operating practices would have brought disaster.

We have had a practical demonstration of the effect of the Arizona and Oklahoma laws in a time of heavy traffic. The lines operating in those states "have been frequently congested, and it has been necessary to reroute traffic from these lines to other transcontinental routes." *In the Matter of Service Order No. 85*, 256 I. C. C. 523, 535. What would have happened when the routes through Arizona and Oklahoma became congested if other transcontinental routes had also been congested as a result of train-length limitations and had been unable to absorb the overflow?

The power of the Interstate Commerce Commission to suspend state limitations upon train length during emergencies, as it did in Service Order No. 85, is now under challenge by railway labor organizations in *Johnston* v. *United States*, pending in the United States District Court for the Western District of Oklahoma. Even if that power should be upheld, however, plainly it could not offer protection against or remedy for the injurious effects of state limitations of train length.

Long-train operation cannot be initiated successfully overnight. It depends upon suitable railroad plant and equipment, as well as upon freedom from statutory restrictions. Engines must be of sufficient power, and cars, bridges, and track structures of sufficient strength. Sidings must be of appropriate length, and turntables, roundhouses and repair facilities must be suitable. If train-length limitations were of widespread application, railroad plant and equipment would ultimately have to be conformed to such limitations in order to minimize wasteful use of facilities and to provide a plant designed to meet the conditions created by the state laws. Under such circumstances, the temporary lifting of state limitations during a period of emergency would necessarily have only a very limited effect. The physical limitations would control.

An example is afforded by this case. Because of the Arizona law, the sidings of the Southern Pacific in that state are long enough only for short trains and the locomotives assigned to service in that state are generally not such as would be appropriate for long-train operation. (R. 3947) These difficulties in Arizona can be and will be overcome by extending sidings, reassigning locomotives, and reconstructing turntables, roundhouses, and repair facilities, at a cost of some $1,352,272. But this will take time, as well as money. (R. 3948-9)

It will be realized at once that the task of converting the Southern Pacific facilities in Arizona to long-train operation, under existing conditions, would not be comparable, in difficulty or magnitude, with the task which would confront the railroads of the country if they should attempt to reestablish long-train operations after such operations had been prohibited by law and after their facilities and equipment had been accommodated to short-train operation.

VI.

THE REGULATION OF TRAIN LENGTH CANNOT BE SUBJECTED APPROPRIATELY TO THE DIVERSE REQUIREMENTS OF THE SEVERAL STATES.

State action affecting interstate commerce is not permissible when the nature of the subject matter regulated and the nature of the regulation demonstrate that "superior fitness and propriety" demand uniformity of control by a single authority rather than diversity of control by local authorities. The single control may take the form of affirmative regulation or it may take the form of lack of regulation. The question here is not whether Congress has acted or whether actual diversity has manifested itself in the action of different states. The question is simply whether or not the subject to be regulated and the character of regulation are such as require, when tested by the standard of superior fitness and propriety, that diverse and

possibly conflicting local commands be avoided in the national interest.

In applying this standard, there are many helpful guides. Is the subject matter to be regulated predominantly of national or of local concern? Would diversity of state regulation conflict with or unduly interfere with the National Transportation Policy or injuriously affect the national interest in commerce? Would the diversity of state requirements operate to burden interstate commerce or to obstruct its free flow? Would such state requirements interfere with the essential unity and continuity of interstate train operation? Would such diversity result in flagrant extraterritorial operation of state requirements and in inflicting on one state the unwise or dubious policy of another?

While the need for control by a single authority affords a separate and independent ground for holding a state statute invalid, it is ordinarily, as in the case at bar, associated with and interrelated with other grounds.

Diversity of the requirements of different states with respect to train length would add to the interferences with and obstructions to interstate transportation beyond the simple accumulation of such interferences and obstructions in the several states.[42] It would also accentuate the extraterritorial operation of the local mandates, and it would destroy or gravely impair the essential physical continuity of train operation, which is necessary in the national interest.

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[42] *In the Matter of Service Order No. 85*, 256 I. C. C. 523, 530-531, it was said:

> "If State laws limiting the number of cars in trains are to be held valid (a question we do not decide), it would be possible for each State to set a different number of cars as the maximum to be hauled in a train. A State might even limit the length of trains to one car, although such a law would be clearly arbitrary and unreasonable. Higher limits might be set by States and found reasonable, *but lack of uniformity would place a serious burden on interstate commerce.*" (Emphasis supplied.)

In the next section of this brief, dealing with "Controlling Constitutional Considerations," we shall discuss further the doctrine of uniform control by a single authority and shall refer to precedents and authorities, but it is our purpose at this stage merely to state the rule and to direct attention to certain facts which must serve as a background for its application.

If the states are possessed with power to regulate the length of trains, one may fix a limitation of 70 cars, another of 60 cars, and still another of 80 cars. The possibility of variety is endless. What would be the effect of such variety?

There is no occasion to repeat here what we have already said with respect to the predominant national concern in adequate and efficient transportation or what has been said with respect to the burdens and obstructions inflicted upon efficient railroad transportation by a single state train-limit law. We refer to them again, however, for the light they throw upon imperative considerations opposing diversity of control and regulation.

We have shown the serious interferences with railroad operation caused by the passing of a train from a state in which train length is not regulated to a state in which a maximum train length is prescribed, and by the passing of a train from a state in which a limitation prevails to a state in which no limitation is applicable. Interferences of the same kind would result whenever a train passed from one state in which a restriction obtained to another state in which a different restriction obtained. It would be necessary to break down long trains and build up short ones at the state boundaries, so far as possible, with attendant delays, extra switching, and other hardships to which we have referred, unless the most drastic limitation should be observed in all states through which the trains operate.

The nature and extent of the effects of the diversity of control over train length can be appraised only when it is remembered that the location of railroad lines has no relation whatever to political state lines, but has been dictated

by considerations of traffic and commerce and by considerations of topography. The lines of most railroads extend through a large number of states and often they cross and re-cross state boundaries. It is quite common for an important main line to include only a relatively small mileage in one state, or in each of a number of states. Railroad terminals and division points are not to be found on state lines, except in rare cases as a result of coincidence. They have been located, and have been long established, to meet the necessities of efficient railroad operation.

As illustrating what has been said in the next preceding paragraph, a few concrete examples may be helpful.

The Chicago, Milwaukee, St. Paul and Pacific Railroad, the Pennsylvania Railroad, and the Chicago Rock Island and Pacific Railway each operates in 14 states. The Illinois Central, the Baltimore and Ohio and the Union Pacific Railroad each operates in 13 states. The Southern Railway and the Atchison, Topeka and Santa Fe Railway each operates in 12 states. The Chicago, Burlington & Quincy Railroad operates in 11 states. The Southern Pacific Company, appellant herein, operates in 7 states. For the purposes of this paragraph the District of Columbia has been considered as a state.

The main line of the Pennsylvania between Washington and New York extends through 5 states and the District of Columbia, although the entire distance is only 225 miles. In New York the distance from the state line to the passenger station is only 1.1 miles, and in the District of Columbia the corresponding distance is only 4.4 miles. In Delaware there are only 23 miles of line and in Pennsylvania only 48.

The main line of the New York Central between New York and Chicago includes only a few miles in Illinois, (and this is true of all east-west railroads with their western termini in Chicago) and only 40 miles in Pennsylvania.

The main line of the Michigan Central (operated by the New York Central) between Chicago and Detroit includes only a few miles in Illinois and only about 40 miles in Indiana.

The main line of the Atchison, Topeka and Santa Fe between Chicago and the west coast includes only about 20 miles in Iowa.

The main line of the Kansas City Southern Railway from Kansas City, Missouri, to Port Arthur, Texas, affords an excellent illustration of a line which crosses and re-crosses state lines, as shown by the following table:

Main line of Kansas City Southern Ry. from Kansas City, Missouri, to Port Arthur, Texas.

From Kansas City, Mo. to Mo.-Kans. line	120.23	miles in Mo.
From Mo.-Kans. line to Kans.-Mo. line	18.39	miles in Kans.
From Kans.-Mo. line to Mo.-Ark. line	65.22	miles in Mo.
From Mo.-Ark. line to Ark.-Okla. line	28.83	miles in Ark.
From Ark.-Okla. line to Okla.-Ark. line	127.64	miles in Okla.
From Okla.-Ark. line to Ark.-Tex. line	118.76	miles in Ark.
From Ark.-Tex. line to Tex.-Ark. line	31.42	miles in Tex.
From Tex.-Ark. line to Ark.-La. line	6.42	miles in Ark.
From Ark.-La. line to La.-Tex. line	222.46	miles in La.
From La.-Tex. line to Port Arthur, Tex.	49.61	miles in Tex.
From Kansas City, Mo. to Port Arthur, Tex.	788.98	miles

Another illustration of the same kind is to be found in the main line of the Nashville, Chattanooga & St. Louis Railway between Nashville, Tennessee, and Atlanta, Georgia, as shown in the following table:

Main line of Nashville, Chattanooga & St. Louis Ry. from Nashville, Tennessee, to Atlanta, Georgia.

From Nashville, Tenn. to Tenn.-Ala. line	102.65	miles in Tenn.
From Tenn.-Ala. line to Ala.-Tenn. line	24.11	miles in Ala.
From Ala.-Tenn. line to Tenn.-Ga. line	13.43	miles in Tenn.
From Tenn.-Ga. line to Ga.-Tenn. line	1.71	miles in Ga.
From Ga.-Tenn. line to Tenn.-Ga. line	0.69	miles in Tenn.
From Tenn.-Ga. line to Ga.-Tenn. line	1.02	miles in Ga.
From Ga.-Tenn. line to Tenn.-Ga. line	23.53	miles in Tenn.
From Tenn.-Ga. line to Atlanta, Ga.	121.10	miles in Ga.
From Nashville, Tenn. to Atlanta, Ga.	288.24	miles

These examples leave no doubt that "superior fitness and propriety" preclude local state control of the length of interstate trains and require that such control be vested in a single authority. Any other conclusion is unrealistic and must ignore the essential conditions which control train operations.

Diverse state regulations would, in many instances and with respect to many routes, result in the application of the regulation of a particular state far more extensively in neighboring states than in the regulating state. Is one state empowered not only to place grievous burdens on interstate transportation, as conducted in other states as well as within its boundaries, but also to impose upon sister states, and not necessarily adjacent states only, its own peculiar views respecting safety, especially when such views are contrary to those prevailing in the Nation and will greatly increase the hazard of serious accidents, such as those occurring at highway-railroad grade crossings?

From what has been said it clearly appears that the limitation of train length by one state necessarily spreads its effects over conduct and standards in other states, not in a minimal fashion but in a substantial and extensive manner.

The lack of fitness and propriety of local control of train length can be appreciated vividly if we assume that the power here claimed by Arizona had been delegated by it to counties, municipalities, and villages to exercise as they might choose over transportation within their political areas. So far as matters really local are concerned, such local units of Government may properly be vested with the power of local control, as they often are. Yet, if under a broadly delegated power from the state to take action for the promotion of health and safety within their limits, they should venture to do what Arizona has done, it can not be conceived that anyone would have the hardihood to argue that such action was not obnoxious to the Commerce Clause.

While such a possibility may seem fanciful, it would, in numerous instances, be no more absurd in application than

the exercise of power by a state over train length. State lines, as dividing points for train operation, are hardly less arbitrary than county lines. As we have shown by examples, there are numerous cases in which that part of an important through railroad route which lies within a single state is much less in length than the distance across many a county. If diversity of regulation by counties would destroy essential unity and uniformity in train operation, so would diversity of regulation by states.

VII.

CONTROLLING CONSTITUTIONAL CONSIDERATIONS.

Under the various formulae which have expressed the underlying canons for determining the constitutional scope of state power over interstate commerce, the different questions which must be asked and answered as the basis of judgment in each particular case may from a practical standpoint be put as a single crucial question. This is whether the local end which the state law may be found to serve is a sufficient justification for the burden on and obstruction to commerce which the law imposes. These formulae, however expressed, are not self-executing. These questions, however framed, do not answer themselves. In each case the judicial duty can be performed only by consideration of the relevant facts in the situation which calls for judgment.

While the fundamental issue can be put as a single crucial question, the answer in each case depends upon the conclusions reached about practical considerations which by further questions can be put in sharper focus. This leads to narrower tests which are stated in various ways. In their application to some situations, they may be substantially the same test, with the differences of statement chosen for the aptness of each particular inquiry to special features of the combination of elements requiring adjudication.

With respect to other situations, the differently-stated tests may be more independent of each other, and the application of some one of them may be determinative of the issue. Nevertheless in any but the simplest circumstances, the canons of judgment to be invoked are bound to be interdependent and cooperating. Strands which may be separated for analysis are interwoven in reality with a cumulative strength beyond what they would have in isolation from each other.

The primary question, primary both in the time of its formulation by this Court and in its importance, is this. Is the enterprise which spans or embraces "more states than one," of the type which, if not "imperatively demanding a single uniform rule" (*Cooley* v. *Board of Port Wardens*, 12 How. 299, 319), clearly exemplifies the "superior fitness and propriety" (*Id.* at 320) of such a uniform rule rather than that of "different systems of regulation drawn from local knowledge and experience, and conformed to local wants"? If such is the nature of the subject with which the state law interferes, state power is excluded because the diverse commands of different states cannot yield a single uniform rule. In considering this, attention must be directed both to the type of enterprise being regulated and to the type of regulation involved. Moreover, in determining the superior necessity of a single uniform rule, whether of freedom or of some restriction, the most useful criterion is usually, if not always, an estimate of the adverse effects on the unitary national interest in the freedom of commerce, if this freedom is curtailed by barriers set up by each state according to some local preference. It is not to be forgotten that the advancement of this interest of national unity was the primary purpose of substituting the Constitution for the loose tie of the Articles of Confederation.

When the answer to this primary test is that the national interest in uniformity will be defeated or unduly embarrassed by subjection to the diverse regulations of different

states, then the state law must fail because the local end which it may be found to serve is not a sufficient justification for the burden on interstate commerce which the law imposes. This, however, is not the only situation in which state regulations of interstate commerce are unconstitutional. Even if the evils to commerce do not arise from diversity of state requirements but follow rather from the unjustified severity of the particular imposition with the possibility of cumulation by the like action of other states, the state law is unconstitutional unless it can be condoned because its service to a local need outweighs its injury to interstate commerce and to those who conduct it. While a judgment of the same relative character enters into the determination of the respective merits of uniformity or diversity of regulation, the comparison of benefit and burden is not confined to the solution of that issue. There are limits to the exercise of state power where state power is not wholly excluded. If every state imposed the same rule so that uniformity were achieved, state power would still be precluded when the disadvantage to commerce is without compensation in the advantage to some local interest of the state.

The relative weighing of state and national interests must necessarily vary with the different situations in which they conflict. In estimating the weight of the national interest, it is essential to bear in mind the authoritatively declared national policy toward that interest. This policy with respect to the national railroad system has been set forth in a preceding section of our brief. Similarly we have set forth the recognition by national authorities of the indispensability of the most efficient rail transportation which can be provided and of the effectiveness of the carriers in recent years in furnishing such transportation. No one doubts for a moment that here is a national interest of the first magnitude. Any state interference with that interest must face judgment in the light of the magnitude of national concern. It must face judgment in the light of

what Congress and the Interstate Commerce Commission have done to secure and promote the very interest adduced as a justification for the state law. The alleged state need cannot be estimated in a vacuum. In weighing the assumed local justification for the state prescription, consideration must be given to the situation if the state law is denied application. Existing national regulation is an element in weighing the extent and degree of the local need.

As in weighing the interest and need of the state, account must be taken of safeguards already established, so in weighing the burden on interstate commerce, account must be taken of the extent and the degree of indispensability of the enterprise on which the burden falls. Heavier burdens may be imposed on the trivial than on the essential. It is difficult to conceive of anything more essential to national welfare than expeditious and economical long range transportation. Impediments imposed by a single state adversely affect the interests of neighboring states. If one state is permitted to prefer its assumed interest to that of others and of the Nation, sister states may claim a corresponding preference. Variations in the preferences of different states with the possibility of conflict or opposition between them would burden the national interest in effective transportation even more than by mere cumulation. When such burdens fall on the physical operations of an articulated national railroad system, the weight of the burden is not confined to the stress at any single point of immediate impact. A clot in the arteries of commerce is not to be regarded as isolated and local in its incidence. It affects the whole system. Hence obstructions to the physical operations of railroads are grievous burdens on interstate commerce.

These comparisons of diversity with uniformity and of burden with benefit almost inescapably involve analysis and estimation of many, and often of all, of the same factual elements in any subject and any state regulation thereof. While the obstruction to commerce may be unjustifiable

even where diversity is permissible, the extent of the burden and the obstruction is often intimately related to the need of uniformity. This interrelation finds striking illustration in state laws imposing on interstate transportation an interference which is not confined to the transportation in the regulating state. If compliance with the law of one state necessarily controls conduct in another, the burden is thereby enhanced and the menace of diversity and the need for uniformity are correspondingly greater. Such effects are not confined to the application of state laws which in express terms forbid and penalize conduct in other states. They are equally inevitable if such extrastate conduct is compelled and coerced by the practicalities of railroad operation which do not permit change of methods at the precise imaginary line which is the political boundary between two states. The inescapable extraterritorial incidence of a state train-limit law adds greatly to the burden on commerce, to the evil of diversity, and to the imperative need of uniformity.

So interwoven are all these considerations in the case at bar and in numerous decisions on the same general problem that separate and independent treatment of each is not desirable and is hardly feasible without an excess of repetition. The case before us as well as most of those which have preceded is a composite of various elements which have their full significance only in their interrelation and their cumulation. The canons and rules that have been announced and applied in the precedents are approaches from different angles to the same goal. Different canons are applicable to the same facts. Their bearing in any case is dependent upon their application to the facts of that case. The bearing of the precedents is dependent upon a careful comparison between the facts to which they are applied and the facts in the case at bar. "Whether state action unduly impinges upon interstate commerce depends more and more upon the particularities of fact in individual cases." (Frankfurter, "Mr. Justice Brandeis and the Con-

stitution," XLV. Harvard L. Rev. 33, 77.) For this reason the familiar doctrinal generalities need to be supplemented by subordinate and ancillary canons that give more realistic guides for the process of applying them and for determining the bearing of the precedents on issues that differ from any previously adjudicated.

The recognition of this is manifest in the analysis given by the present Chief Justice in his dissenting opinion in *Di Santo* v. *Pennsylvania*, 273 U. S. 34, a case now overruled by *California* v. *Thompson*, 313 U. S. 109, in which there is amplification of the considerations set forth in the earlier opinion. Both cases involved state requirements on transportation agents which included the furnishing of a bond to guarantee faithful performance of contracts. In the *Di Santo* opinion, Mr. Justice Stone said:

> "As this Court has many times decided, the purpose of the commerce clause was not to preclude all state regulation of commerce crossing state lines, but to prevent discrimination and the erection of barriers or obstacles to the free flow of commerce, interstate or foreign.
>
> The recognition of the power of the states to regulate commerce within certain limits is a recognition that there are matters of local concern which may properly be subject to state regulation and which, because of their local character, as well as their number and diversity, can never be adequately dealt with by Congress. Such regulation, so long as it does not impede the free flow of commerce, may properly be and for the most part has been left to the states by the decisions of this Court.
>
> In this case the traditional test of the limit of state action by inquiring whether the interference with commerce is direct or indirect seems to me too mechanical, too uncertain in its application, and too remote from actualities, to be of value. In thus making use of the expressions, 'direct' and 'indirect interference' with commerce, we are doing little more than using labels to describe a result rather than any trustworthy formula by which it is reached.

> It is difficult to say that such permitted interferences as those enumerated in Mr. Justice Brandeis' opinion are less direct than the interference prohibited here. But it seems clear that those interferences not deemed forbidden are to be sustained, not because the effect on commerce is nominally indirect, but because a consideration of all the facts and circumstances, such as the nature of the regulation, its function, the character of the business involved and the actual effect on the flow of commerce, lead to the conclusion that the regulation concerns interests peculiarly local and does not infringe the national interest in maintaining the freedom of commerce across state lines." (*Id.* at 43-44.)

Thus among the questions to be answered in the affirmative before the Arizona Train-Limit Law can be sustained are these: Is the limitation of train length a matter of local rather than of national concern? Are there peculiar local conditions in Arizona which require different treatment from that needed or given elsewhere? Are the number and the diversity of the problems of train length and of train operation generally such that these problems could "never be adequately dealt with by Congress"? And even if those questions could be answered in the affirmative, the state law could not be sustained unless these further questions could be answered in the negative: Does the Arizona Train-Limit Law erect "barriers or obstacles to the free flow of commerce"? Does it "infringe the national interest in maintaining the freedom of commerce across state lines"?

The answers to the questions so phrased are obvious. A state train-limit law erects "barriers or obstacles to the free flow of commerce" and "infringes the national interest in maintaining the freedom of commerce across state lines." The safety of train operation gives rise to no peculiar problems presented by the crossing of a state boundary. Such operation gives rise to no diversities that could be classified by states. No one can doubt that if in the view of Congress there existed any conditions which made limitation of train length desirable, the problems thus arising

could be dealt with adequately by Congress with the expert collaboration of the Interstate Commerce Commission.

Though the distinction between direct and indirect burdens on commerce cannot alone offer a single and conclusive canon of judgment, there are situations in which what may be called the directness of the burden or obstruction is an important factor. There is a decided difference between requiring security for the performance of a commercial undertaking (*Di Santo* v. *Pennsylvania*, 273 U. S. 34; *California* v. *Thompson*, 313 U. S. 109) and imposing a prohibition against bringing into the state a train which complies fully with the law of Congress and with the laws of neighboring states. Such a prohibition hits directly the physical operation of interstate trains. Even on its own highways, a state is not wholly free to limit the number of trucks and busses that shall be run in interstate commerce. (*Buck* v. *Kuykendall*, 267 U. S. 307; *Bush Co.* v. *Maloy*, 267 U. S. 317.) A direct obstruction to train service is in sharp contrast to some mere repercussion from a law dealing with something else than train service. It is in sharp contrast to requirements which, when complied with, leave the continuation of full service unfettered.

The contrasts between what the states may and may not do to interstate commerce are set forth again in the opinion of the Chief Justice in *California* v. *Thompson*, 313 U. S. 109. The Train-Limit Law can meet few, if any, of the conditions there listed as favoring the condonation of state regulations affecting interstate commerce. It does not deal with conduct "beyond the effective reach of Congressional action." Such conduct need not go largely unregulated "unless some measure of local control is permissible." The Train-Limit Law cannot be condoned because it does not involve "prohibiting interstate commerce or licensing it on conditions which restrict or obstruct it." It does not apply "to one who is not himself engaged in the transportation." It cannot be permitted because its requirement "is not conditioned upon any control or restriction of the

movement of the traffic interstate," or because "It does not appear that the regulation will operate to increase the cost of the transportation." Its character cannot be said to bring it within the class for which "there is wide scope for local regulation without impairing the uniformity of control of the national commerce in matters of national concern and without materially obstructing the free flow of commerce which were the principal objects sought to be secured by the Commerce Clause."

We do not contend that no state regulation of interstate commerce can be permitted unless it meets all conditions which cumulatively have been the basis of sanctioning the application of some other state statute. Nevertheless these recitals of types of state statutes and of situations and effects which do not run counter to "the principal objects sought to be secured by the Commerce Clause" are clear affirmations of what those objects are. The validity of a state train-limit law is to be tested by the extent and degree of its consistency or inconsistency with those objects. It is to be tested by the extent and degree of its consistency or inconsistency with the national policy toward transportation declared by Congress and advanced by various provisions of its statutes. If conformity with a declared national policy militates in favor of a state statute (*Parker* v. *Brown*, 317 U. S. 341), nonconformity to such a policy, when manifestly it impairs efficient transportation service, discourages improvement of facilities and denies the benefits of improvements already made, should certainly tip the scales against a statute offending in these various particulars.

It is largely because of the absence of state endeavors to impose any serious obstructions to efficient train operation that the considerations militating against the validity of restrictions in that field appear chiefly in distinctions drawn in the opinions of this Court in sanctioning moderate or justified regulations of other matters. The considerations which determine judgment are set forth and applied in the

analysis by Mr. Chief Justice Stone in *S. C. Hwy. Dept.* v. *Barnwell Bros.*, 303 U. S. 177. In sanctioning a state limitation on the size and weight of trucks on the public highways provided and maintained by the state, emphasis was placed on the difference between state power over such highways and state power over railroads. Both the proprietary power over the highways and the dominantly local interest in their use justify the exercise of a state control over them which is much greater than any state power applicable to railroads:

> "Few subjects of state regulation are so peculiarly of local concern as is the use of state highways. There are few, local regulation of which is so inseparable from a substantial effect on interstate commerce. Unlike the railroads, local highways are built, owned and maintained by the state or its municipal subdivisions. The state has a primary and immediate concern in their safe and economical administration. The present regulations, or any others of like purpose, if they are to accomplish their end, must be applied alike to interstate and intrastate traffic both moving in large volume over the highways. The fact that they affect alike shippers in interstate and intrastate commerce in large number within as well as without the state is a safeguard against their abuse.
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> . . . . . .
>
> With respect to the extent and nature of the local interests to be protected and the unavoidable effect upon interstate and intrastate commerce alike, regulations of the use of the highways are akin to local regulation of rivers, harbors, piers and docks, quarantine regulations, and game laws, which, Congress not acting, have been sustained even though they materially interfere with interstate commerce." (303 U. S. at 187-188.)

The essentially local nature of highway regulation is indicated by the great diversity in highway conditions. This is diversity within a single state and not merely diversity between states. Supersession of state power over the use

of the facilities which the state furnishes is hardly conceivable. To deprive the state of power over the weights and sizes of trucks would leave the highways largely subject to the uncontrolled choice of the users of them. A state train-limit law is not for the protection of facilities afforded by the state. It is not regulation of the right-of-way except as it adversely affects its use by equipment already under various national prescriptions to ensure the safety of operations, and as it increases the number of all types of accident that inevitably are the result of an increased number of trains.

The safeguard against abuse of a power on the part of the state to limit the size and weight of trucks is found in the fact that the regulations hit large numbers of resident truck owners and intrastate shippers whose interest in moderation will be a factor in legislative deliberations. This is without parallel in a law limiting train length where the interests adversely affected are so largely those of interstate railroads and extrastate shippers and consignees. Unlike large capacity trucks which are as serviceable in short local transport from distributor to retailer, from factory to freight station, as in long interstate operations, long trains are a special and compelling need of nationwide interstate carriage. In its effect on shippers and consignees, restriction of train length bears most heavily on those in other states. Enterprise in intermediate or "bridge" states suffers little, if any, compared with enterprise in terminal states. Thus the adverse effect on local interests of a train-limit law in a "bridge" state is not such as to afford the safeguards against abuse of power on which the opinion in the *Barnwell Brothers* case in part relies.

Thus both in its burden on extrastate operations and in the fact that those most adversely affected are without the political participation and representation whereby a moderating influence might be directed toward mitigating the severity of local restrictions, the Train-Limit Law is obnoxious to the condemnatory canons recognized in the *Barn-*

well Brothers case, and belongs to the class of statutes denied application to interstate transportation, which the opinion in the *Barnwell Brothers* case summarizes by saying:

> "The commerce clause, by its own force, prohibits discrimination against interstate commerce, whatever its form or method, and the decisions of this Court have recognized that there is scope for its like operation when state legislation nominally of local concern is in point of fact aimed at interstate commerce, or by its necessary operation is a means of gaining a local benefit by throwing the attendant burdens on those without the state. * * * It was to end these practices that the commerce clause was adopted. * * * The commerce clause has also been thought to set its own limitation upon state control of interstate rail carriers so as to preclude the subordination of the efficiency and convenience of interstate traffic to local service requirements." (303 U. S. 185-186.)

In further review of fundamental considerations which militate against the application of state power to interstate commerce, this same opinion adds:

> "State regulations affecting interstate commerce, whose purpose or effect is to gain for those within the state an advantage at the expense of those without, or to burden those out of the state without any corresponding advantage to those within, have been thought to impinge upon the constitutional prohibition even though Congress has not acted. [Citations omitted.]
>
> Underlying the stated rule has been the thought, often expressed in judicial opinion, that when the regulation is of such a character that its burden falls principally upon those without the state, legislative action is not likely to be subjected to those political restraints which are normally exerted on legislation where it affects adversely some interests within the state." [Citations omitted.] (303 U. S. pp. 184-185, note 2.)

Even state power over state-owned and state-maintained highways is not sufficiently strong to permit a state to re-

quire a certificate of convenience and necessity to operate interstate trucks and busses. (*Buck* v. *Kuykendall*, 267 U. S. 307; *Bush Co.* v. *Maloy*, 267 U. S. 317.) The purpose of the legislation condemned in the cases cited was so to restrict the number of entrants into the carrying enterprise as to encourage the development of service and facilities by those already established therein and to protect them from such severe competition as would threaten their ability to continue to serve. The state regulation, though limiting the number of those who could engage in the service, was designed for the promotion of adequate and effective service. Nevertheless, since the subject dealt with was interstate transportation, it was held that it was national in character and that state restrictive action was excluded notwithstanding the proprietorship of the state over its own highways. A state train-limit law, instead of promoting adequate and effective train service, obstructs and delays it and increases its cost. Transportation by rail is certainly more distinctly national in character than is transportation by truck, and therefore has a correspondingly stronger constitutional protection against state interferences with physical operations.

Because of the physical unity of railroad operations from state to state, any state law which breaks that unity is in sharp contrast to laws which leave it unimpaired. The essentially local matters which the states may control and the protective regulations which they may apply are those which involve no such material physical disturbance to the commerce between the states. Such are the matters which permit of diversity of regulation by the several states without impairment of harmony among the states. There are problems of protection against deceit and fraud and harmful substances and pecuniary loss which are peculiarly the problems of terminal states. Such are the matters which can fairly be deemed of special local concern over which state regulatory power is permissible so long as the protective prescriptions of the state are as local in application

as the malady they seek to relieve. No such exclusively or dominantly local considerations can be adduced to justify a requirement by an intermediate state that interstate trains must be broken in two before they may enter.

In our constitutional federalism it is fundamental that it is Congress and not the states which has power over interstate commerce *because* it is interstate commerce. Such power as the states enjoy over interstate commerce derives *aliunde*, and the fact that interstate commerce is thereby regulated is a hurdle or barrier rather than a justification. The judgment as to the height of the barrier and as to the desirability of being permitted to surmount it is not a judgment which the state is free to make as it chooses. When there is a conflict between the state's power in its reserved field and the power delegated to the Nation, the line of demarcation is to be drawn by national and not by state authority. Only when a state is confining itself to the legislative realm which is exclusively its own can it claim judicial tolerance toward its supposed knowledge of local conditions and its choice of policy. When it leaves its exclusive province, its preference to favor what it conceives to be its local interest in disregard of consequent burdens and impediments suffered by the commerce of the Nation must submit itself to the considered judgment of the judicial authority of the Nation.

The controversy now in issue is to be determined in the light of the same standards of judgment which this Court has heretofore announced and applied. Emphasis is here placed on these standards because, since "decision depends * * * upon the particularities of fact in individual cases", and these particularities have so little in common with each other, there may be for a novel issue no close parallel in the precedents. It may be said with confidence that no such serious physical obstruction to interstate transportation as is here involved has ever been sanctioned and that much less serious interferences and burdens have

been condemned. Among the relatively lighter burdens that have been prevented by judicial interposition is that involved in seeking to compel carriers to fight lawsuits in a forum which has no adequate relationship to the parties or to the cause of action. In condemning such an exercise of state authority in *Davis* v. *Farmers Co-operative Co.*, 262 U. S. 312 at p. 317, this Court summarized the national interests thus adversely affected as follows:

> "The public and the carriers are alike interested in maintaining adequate, uninterrupted transportation service at reasonable cost. This common interest is emphasized by Transportation Act, 1920, which authorizes rate increases necessary to ensure to carriers efficiently operated a fair return on property devoted to the public use. See *Railroad Commission of Wisconsin* v. *Chicago, Burlington & Quincy R. R. Co.*, 257 U. S. 563; *New England Divisions Case*, 261 U. S. 184. Avoidance of waste in interstate transportation as well as maintenance of service, has become a direct concern of the public."

From a practical standpoint, what the state sought to achieve and was prevented from achieving in *Kansas Southern Ry.* v. *Kaw Valley Dist.*, 233 U. S. 75, would have been a less serious burden on commerce and a less serious obstruction to interstate transportation than are the results of a state train-limit law. In that case the state sought to require the railroad to elevate bridges over a river in order to leave more room for flood waters to flow below. However, since the regulation of the height of bridges was by Congress delegated to the Secretary of War, the state supreme court sanctioned the order and this Court condemned it, not as one to elevate the bridges, but as one "to remove the bridges as they stand." (*Id.* at 78.) Such a command, independently considered, was one to break the railroad in two, which is a more serious interference with interstate transportation than a requirement to break all long trains in two. Its condemnation by this Court is a precedent against serious state obstructions to

interstate commerce, but the particular obstruction was so extreme that we can invoke the case in its legal aspects only as a bench mark. Had not state power to order the elevation of the bridges been precluded by the authority vested in the Secretary of War, the extent to which the state might go would have turned on issues of degree. *State of Pennsylvania* v. *The Wheeling & Bridge Co., et al.*, 13 How. 518; *Escanaba Co.* v. *Chicago*, 107 U. S. 678. So must the question before us turn on issues of degree.

The interrelation between train operations in local service with those in interstate service is the underlying basis of *Missouri, Kans. & Tex. Ry. Co.* v. *Texas*, 245 U. S. 484, which condemned a state law requiring passenger trains to leave on scheduled time, and of *St. Louis S. W. Ry.* v. *Arkansas*, 217 U. S. 136, which condemned a state statute and orders issued thereunder which required the furnishing of cars to shippers under specified conditions. Compliance with such train-service and car-service commands had its forbidden effect on interstate commerce because obedience, as does obedience to a train-limit law, would inevitably disturb operations in another state. In the latter case Mr. Justice White said:

> "Coming to the merits, we think it needs but statement to demonstrate that the ruling of the court below involved necessarily the assertion of power in the State to absolutely forbid the efficacious carrying on of interstate commerce, or, what is equivalent thereto, to cause the right to efficiently conduct such commerce to depend upon the willingness of the company to be subjected to enormous pecuniary penalties as a condition of the exercise of the right." (217 U. S. at 149.)

So far as we are aware, the only decisions of this Court which have sanctioned the application to interstate commerce of state laws directly imposing delays in train service are those sustaining the Georgia suspension of Sunday labor in *Hennington* v. *Georgia*, 163 U. S. 299, and sustaining statutes or administrative orders requiring the slowing down of trains at crossings and the furnishing of

train service to local stations. The considerations underlying Sunday observance laws are of an order which has no counterpart in a train-limit law. The decisions on curbing speed at crossings turn on questions of degree. The very statute sustained in *Southern Railway Co.* v. *King*, 217 U. S. 524, in the absence of facts showing an unreasonable burden on train operation, was denied application in *Seaboard Air Line Ry.* v. *Blackwell*, 244 U. S. 310, when an unreasonable burden was found on the basis of facts conceded by demurrer. This latter case is cited in the *Barnwell Brothers* case in support of the statement that "an unnecessarily harsh restriction, even though it is in the interest of safety, has been held to be unconstitutional." (303 U. S. 186-187, note 4.)

Statutes and commission orders compelling train service at local stations are of two main types. One merely requires that the service be furnished and can be satisfied by putting on additional local trains. The other compels service from interstate trains. The enforceability of either type depends upon whether the need for additional local service justifies the burden on commerce. The fact that the carrier has an option to put on additional local trains rather than to stop interstate trains does not foreclose inquiry or determine the answer. "Undoubtedly the alternative can be required, but only if the local facilities be inadequate. In other words, to justify the requirement the local conditions must justify the extra facility." So it was declared in *Chi. B. & Q. Ry.* v. *Wisconsin R. R. Com.*, 237 U. S. 220, 231, which held such an alternative order invalid.

Other statutes or orders have attempted to compel all trains to stop at a given station, as that condemned in *Illinois Central Railroad Co.* v. *Illinois*, 163 U. S. 142, or to compel all regular passenger trains to stop at county seats, as that condemned in *Cleveland &c Ry. Co.* v. *Illinois*, 177 U. S. 514, or to stop at junction points for service to passengers changing to or from branch lines, as that condemned

in *Herndon* v. *Chi. Rock Island & Pac. Ry.*, 218 U. S. 135, or they may apply to particular trains, as those condemned in *Atlantic Coast Line* v. *Wharton*, 207 U. S. 328; *Mississippi R. R. Com.* v. *Illinois Cent. R. R.*, 203 U. S. 335; *St. Louis & S. F. Ry.* v. *Pub. Serv. Comm.*, 254 U. S. 535; and *St. L.-S. F. Ry.* v. *Pub. Serv. Comm.*, 261 U. S. 369. In this latter case Mr. Justice McKenna, after quoting from an earlier opinion to the effect that it is for the Supreme Court to determine "the fact of local facilities", added that "There is, however, no inevitable test of the instances; the facts in each case must be considered." (261 U. S., at 371.) These facts deal with the adequacy of local facilities on the one hand, and the interruptions and delays to interstate service on the other.

In this comparison, some orders are sanctioned and others are condemned. As Mr. Justice Brown puts the issue in *Cleveland etc. Ry.* v. *Illinois*, *supra* (177 U. S. 514, 518):

> "Several acts in *pari materia* with the one under consideration have been before this court, and have been approved or disapproved as they have seemed reasonable or unreasonable, or bore more or less heavily upon the power of railways to regulate their trains in the respective and sometimes conflicting interests of local and through traffic."

Of the interests of the public and of the carriers adversely affected by unreasonable and excessive slowing down of passenger train service, Mr. Justice Brown adds:

> "We are not obliged to shut our eyes to the fact that competition among railways for through passenger traffic has become very spirited, and we think they have a right to demand that they shall not be unnecessarily hampered in their efforts to obtain a share of such traffic. It is evident, however, that neither the greater safety of their tracks, the superior comfort of their coaches or sleeping berths or the excellence of their tables would insure them such share, if they were unable to compete with their rivals in the matter of

> time. The great efforts of modern engineering have been directed to combining safety with the greatest possible speed in transportation, both by land and water. The public demand this; the railway and steamship companies are anxious in their own interests to furnish it, and local legislation ought not to stand in the way of it." (*Id.* 522.)

The demand and need for speed apply to freight trains as well as to passenger trains. Certainly even more applicable to a train-limit law than to a law requiring service at designated local stations is the further judgment of the Court as expressed by Mr. Justice Brown on the extraterritorial application of the statute there before it:

> "While the statute in question is operative only in the State of Illinois, it is obnoxious to the criticism made of the Louisiana statute in *Hall* v. *DeCuir*, 95 U. S. 485, that 'while it purports only to control the carrier when engaged within the State, it must necessarily influence his conduct to some extent in the management of his business throughout his entire voyage. * * * If each State was at liberty to regulate the conduct of carriers while within its jurisdiction, the confusion likely to follow could not but be productive of great inconvenience and unnecessary hardship.'" (*Id.* at 522.)

A state law which cannot be complied with except by conduct in another state is a more serious burden on interstate transportation than one which merely causes delay in reaching another state. A statute which forbids a widely-approved method of conducting interstate transportation is more of an obstruction to interstate commerce than one which merely requires interstate trains to add a local service by stopping at a local station. Such obstructions to interstate transportation fall on the shoulders of shippers and consignees throughout the country, with repercussions on all who are dependent on the product carried. Laws imposing such obstructions are in striking contrast and opposition to laws which facilitate interstate commerce by requiring qualified and sufficient operatives.

and adequate headlights or by forbidding heating appliances capable of starting fires in passenger cars on normal trips as well as in contingencies of collision or derailment.

State laws condemned because of their extraterritorial impact are not confined to laws which actually command or forbid conduct in other states. The steamboat regulation condemned in *Hall* v. *DeCuir*, 95 U. S. 485, did not command any action outside the state. It merely compelled it if the statute were to be complied with within the state. As Mr. Chief Justice Waite pointed out:

> "While it purports only to control the carrier when engaged within the State, it must necessarily influence his conduct to some extent in the management of his business throughout his entire voyage." (95 U. S. 489.)

While in *Wabash &c Railway Co.* v. *Illinois*, 118 U. S. 557, it was only because of conduct in Illinois that the carrier came within the terms of the state statute, the interstate transportation involved was said to be a unit and Illinois was denied the power to regulate the charge therefor, although the discrimination involved in the violation of its long-and-short-haul law was between two points in Illinois. After quoting from *Hall* v. *DeCuir*, *supra*, Mr. Justice Miller said:

> "The applicability of this language to the case now under consideration, of a continuous transportation of goods from New York to Central Illinois, or from the latter to New York, is obvious, and it is not easy to see how any distinction can be made. Whatever may be the instrumentalities by which this transportation from the one point to the other is effected, it is but one voyage, as much so as that of the steamboat on the Mississippi River. It is not the railroads themselves that are regulated by this act of the Illinois Legislature, so much as the charge for transportation, and, in language just cited, if each one of the States through whose territories these goods are transported can fix its own rules for prices, for modes of transit, for times and modes of delivery, and all the other incidents of

transportation to which the word 'regulation' can be applied, it is readily seen that the embarrassments upon interstate transportation, as an element of interstate commerce, might be too oppressive to be submitted to." (118 U. S. at 572.)

The vice of extraterritoriality was the essential basis of the decision in *Baldwin* v. *G. A. F. Seelig*, 294 U. S. 511, which held that a state may not forbid the local sale in less than the original package of milk purchased in other states at a price less than the regulated price to be paid to producers in the regulating state. New York did not punish any one for acts in Vermont nor dictate any conduct in Vermont. It admitted Vermont milk for local sales in New York on the same basis on which it permitted the sale of New York milk. It imposed no discrimination on the differentiating factor of state lines or of interstate commerce. It merely made conduct that was wholly lawful in the state of its occurrence a ground for denying a local market within its own borders. Similarly a state train-limit law has the mischief of spreading the practical effects of its prescription across its borders into neighboring states and requiring, even though not commanding, compliance there with the dictate which in terms is applicable only within its territory. Still more widespread are the practical effects of such a law on all enterprise in the country which would otherwise enjoy advantages of speedier and less costly interstate transportation service.

Even where there is no physical obstruction to interstate transportation, states are forbidden to extend their powers in practical effect beyond their borders to the prejudice of interstate carriers. Before Congress enacted provisions with respect to the charges of telegraph companies for the transmission of interstate messages, the application of state laws of liability was restricted to defaults occurring within the state. The state of destination could apply its rule of damages for defaults in delivery (*Western Union Telegraph Co.* v. *James*, 162 U. S. 650), but the state of

origin could not (*W. U. Telegraph Co.* v. *Pendleton*, 122 U. S. 347). In the *James* case, as noted in *West. Un. Tel. Co.* v. *Milling Co.*, 218 U. S. 406, at 420,

> "The principle determining the validity of the respective statutes was declared to be whether they could be 'fully carried out and obeyed without in any manner affecting the conduct of the company with regard to the performance of its duties in other States' ".

If it should be suggested that from some standpoints there is a technical legal distinction between dictating or penalizing conduct in other states and imposing for conduct within the state a requirement that can be complied with only by conforming thereto in other states, this cannot obscure the fact that, from a practical standpoint, what is coerced without being commanded may have the more disruptive effect on interstate commerce. This is particularly true when what is disrupted is such a physical unity as railroad transportation through intervening states between points of origin and of destination in widely separated states. Only in a few sporadic instances would there be a failure in delivery of an interstate message which would give occasion to invoke the statute of the state of origin as a basis of liability. The Train-Limit Law of Arizona by its necessary operation has extraterritorial effect whenever it applies to an interstate train. This extraterritorial effect is not only on the composition of trains in bordering states but on the efficiency and cost of service of transportation through many states. Looking at commerce among the states as a "practical conception" and exercising a practical judgment, we must recognize that Arizona undertakes to project her power beyond her borders by the necessary operation of her Train-Limit Law, and far more seriously than does a state undertaking to penalize delay in delivering a message in another state.

The same vice of extraterritoriality in the practical, though not in the legal, sense is the basis of the application of the canon of *forum non conveniens* to protect interstate

carriers from subjection to suit on causes of action which by reason of the locus of the transaction and the residence and activities of the parties are deemed to be unduly alien to the forum. (*Davis* v. *Farmers Co-operative Co.*, 262 U. S. 312; *Michigan Central* v. *Mix*, 278 U. S. 492; *Atchison Ry. Co.* v. *Wells*, 265 U. S. 101; *Denver & R. G. W. R. Co.* v. *Terte*, 284 U. S. 284.) In the territorial sense courts have jurisdiction over transitory causes of action, and the cases in which the exercise of this jurisdiction is denied do not involve issues of the application of the law of a sister state. The principle of the cases is that it is an undue burden on interstate commerce to compel a carrier to defend lawsuits in a jurisdiction without a justifiable relationship to the parties or to the cause of action. Such impediments to the efficient conduct of commerce are sporadic and minimal compared with the impediments to interstate transportation both within and without the state which inexorably result from obedience to a state train-limit law.

The considerations which determine whether the suit is alien to the forum are considerations of degree, as are those throughout the law of state burdens on interstate commerce. This, it is recognized, is true even with respect to the extraterritorial repercussions of a state regulation of the composition of trains. "Local climatic conditions" and "hazards created by the particular local physical structures" may justify a state order to provide cabooses in switching operations in terminal yards located within the state even though the terminal services extend to a point on the near border of an adjoining state (*Terminal Assn.* v. *Trainmen*, 318 U. S. 1), while more onerous and less justifiable requirements on a street car line, as recognized in the *Terminal* case, would exceed a state's power. *South Covington Ry.* v. *Covington*, 235 U. S. 537. The fact that these two cases fall on different sides of the line establishes that the line is there and must be drawn in each case upon a consideration of all the circumstances.

The conditions faced by trainmen in the switching operations of the Terminal Railroad Association of St. Louis, if they must ride on the tops and sides of cars in all kinds of weather and with the hazards of structures along and over the tracks, are so different from the conditions faced by trainmen who ride in a caboose at the end of trains of more than seventy cars that from a practical standpoint they are not comparable. Equally remote from anything approaching comparability are the burdens or the extraterritorial effects of continuing a caboose across a boundary river and the burdens and extraterritorial effects of a state train-limit law. Such wide differences and others even more serious, it is submitted, inevitably call for a difference of judgment if the principle of relative benefit and burden which runs through all the cases is to find application here.

The concern of the Commerce Clause with the inevitable extraterritorial effects of the operation of a state train-limit law is not confined to the resulting burden and confusion on the physical operations of the carriers. It extends to the relations between the states in the federal system. No state is entitled to impose its policy on its neighbors where their concern is as great as that of the one which would set a standard not only for itself but for others. The overwhelming majority of the states have positively rejected or have failed to adopt the idea of Arizona with respect to long-train operation. They have preferred such operation to the imposition of an arbitrary limit. The advantages accruing to safety from the reduction in the number of trains and train operations, as established by the record here, are impelling considerations in favor of such a preference. States which feel the force of such considerations are entitled to their choice in leaving train operations within their borders to the standard methods obtaining generally throughout the country. This choice is foreclosed if such standard methods must be departed from because of the inescapable necessity of running more

trains for a shorter or longer part of the route within the state in order to comply with the conditions set by barriers at the boundary of a neighboring state.

Any reliance by the state on the precedents which have permitted the application of so-called "full-crew" laws to interstate trains (*St. L. & Iron Mtn. Ry.* v. *Arkansas*, 240 U. S. 518; *Chicago, R. I. & Pac. Ry. Co.* v. *Arkansas*, 219 U. S. 453; *Missouri Pacific R. Co.* v. *Norwood*, 283 U. S. 249) neglects the vital distinction between the effect on transportation of such laws and that of a train-limit law. We have no inclination to minimize the serious financial burdens imposed by a so-called "full-crew" law or to accept that, as a practical matter, the considerations of safety advanced in its support are sufficient to warrant those burdens. A fuller presentation of all the factual elements than has heretofore been given to this Court might conceivably invite the same reconsideration as was given to the effects of the law requiring the drastic slowing down of trains at highway crossings. (See *Southern Ry.* v. *King* and *Seaboard Air Line Ry.* v. *Blackwell*, *supra*.) However that may be, a law prescribing an increase in the number of operatives is not an obstruction to physical operation of trains.

In contrast with a train-limit law, a full-crew law deals not with any physical characteristics of trains but with the number of the crew to operate them. It adds no other expense to operations than the wages of the extra employees. It has no extraterritorial operation beyond that incident to picking up and dropping the additional employees at the nearest stations or division points outside the state. It involves no extra switching and incident delays. It breaks no trains and leaves no cars standing on the track. It does not prevent the use of facilities to their best advantage. It involves no waste of expensive equipment and construction. It causes no delay between terminal and terminal, between division point and division point. It upsets no schedules. It does not multiply the

number of meets and passes, either within or without the state. It adds no hazards to other trains or to persons on highways which cross the tracks. It does not discourage improvement of structure and equipment to facilitate service and promote safety. It does not delay or interfere with the movement of persons or goods in interstate commerce. It does not lessen the carrying capacity of the railroad facilities and threaten the adequacy of the railroads to meet transportation requirements in times of heavy traffic.

In all these respects a train-limit law differs from a full-crew law. A train-limit law dictates the physical makeup of interstate trains. It blocks the entry from without the state of trains lawful under the legislation of Congress and of neighboring states, of trains consisting of cars complying with detailed specifications set forth in orders of the Interstate Commerce Commission under authority delegated by Congress. It increases the hazards of train operation by multiplying the number of trains, the number of meets and passes, the number of couplings and uncouplings of cars and locomotives, the number of fatalities at highway crossings. The only adverse effect on safety which can be caused by a full-crew law is that more employees may be affected by some single accident. A train-limit law multiplies the number of accidents and correspondingly both the number and the variety of the persons injured by them. Despite great improvement achieved by the railroads in recent years in the reduction of the accident rate, accidents must still occur when human beings operate trains. The fewer the trains needed to carry the commerce of the country, the fewer must be the number of accidents.

Quite aside from the increase in physical hazards caused by a train-limit law as contrasted with a full-crew law, there is another distinction equally vital. A regulation of physical operations deals with a subject more completely and exclusively national in character than a regulation con-

fined to the number of personnel. This is a fundamental difference from the standpoint of the obstruction and disorder which would be inflicted by diversities and contradictions in the regulations of different states. Checkerboard variation in permissible length of trains, with the alternating areas bounded only by political lines which have no natural relation to the conditions or the needs of transcontinental railroad operation, is obviously fatal to the desirable operation of a national railroad system on which the welfare of the Nation depends. The subject on which a train-limit law impinges is so controllingly national in character that, as the cases and the opinions make clear, if any restriction at all is needed, it should be embodied in a single uniform rule prescribed and administered by a single hand.

The contrast between a train-limit law and a full-crew law is reinforced by a consideration of the precedents invoked in the first full-crew case. The Court clearly adjudged the burden of the full-crew law to be a minimal one, so far as its obstruction to train operations is concerned, when it classed it with the group of laws requiring the licensing of engineers to guard against those of reckless or intemperate habits (*Smith* v. *Alabama*, 124 U. S. 465) or afflicted with color blindness (*Nashville, &c Railway* v. *Alabama*, 128 U. S. 96), and forbidding the use of stoves inside passenger cars except in emergencies or when the car is standing still (*N. Y., N. H. and H. Railroad* v. *New York*, 165 U. S. 628). Compliance with such laws, like compliance with a full-crew law which is grouped with them, leaves the efficiency and economy of interstate railroad operation free from any such invasions as that projected by a train-limit law. Similarly, a requirement of adequate headlights on locomotives (*Atlantic Coast Line* v. *Georgia*, 234 U. S. 280) has no obstructive effect on efficient transportation and has the special local justification of safeguarding the approaches at highway crossings—a result quite the opposite from that ensuing from an enforced

increase in the number of trains needed to carry the same volume of traffic.

We might multiply indefinitely the references to precedents which, on the issue whether state interferences with interstate commerce are moderate or excessive, have found some on one side of the line and others on the other. We have confined ourselves to those which seem to us to involve subject matters most nearly analogous to the one at bar. Since each case must turn on the particularities of its own special facts, we submit the issue here on the basis of the facts established by the findings, recorded in official reports, and known to this Court from experience and familiar sources of which it may take judicial notice. We can find no obstruction to interstate commerce that has been sanctioned because of so illusory a local advantage. We can find few cases in which so serious an interference with a vital national interest has been involved and none in which it has been sustained.

This case, we believe, rests solidly on the underlying basis of *Gibbons* v. *Ogden*, 9 Wheat. 1, in which an attempted state frustration of the benefits of invention and of improvement in methods of transportation was first condemned. The frustration here may be thought less serious, except that it cannot be avoided by payment to a licensee, but what is frustrated is of the same order and in various respects of greater magnitude. From the standpoint of essential service to the Nation, the improvements in railroading in recent years, in view of the scope of the railroad enterprise, are on a par with the early application of steam as motive power for vessels on inland waterways. The national interest in this increased effectiveness has been recognized, emphasized, and fostered by the National Congress vested with power over the instrumentalities on which the welfare of the Nation depends.

There can be no doubt that to this national interest the Arizona Train-Limit Law is opposed. The contrary can hardly be seriously urged. Can it be said that there is

adverse local interest strong enough to justify the damage to the national interest? Not only is there nothing peculiarly local to Arizona in its claim in support of its statute, but the interest in safety which it shares with other states and with the carriers and with the Nation is in its totality infringed rather than conserved by the restriction it has imposed. We submit, therefore, that on a realistic weighing of any possible local advantages to be derived therefrom, the Arizona Train-Limit Law must fall as an unconstitutional obstruction to interstate commerce.

VIII.

THE ARIZONA SUPREME COURT WHOLLY DISREGARDED THE DETERMINATIVE FACTS.

Throughout our consideration of constitutional principles and of the precedents applying them, we have emphasized that the legal doctrines and canons of judgment point to the necessity of determining each case on the basis of a consideration and comparison of all the relevant facts. In careful compliance with these appropriate canons for passing on the constitutional issues raised by the Arizona Train-Limit Law, the trial court in deciding this case in favor of the appellant made elaborate findings of fact. These covered the effect of the statute on the safety of all train operation in Arizona, the burden on the appellant in complying with the law and the consequent physical obstruction and delays imposed on interstate transportation both within and without the state. These findings of fact were not contested in the opinion of the State Supreme Court in reversing the judgment of the trial court. The State Supreme Court made no new findings, drew no contrary inferences of fact from the evidence in the record, and passed no criticism on the proof received. Instead of this, its reversal of the judgment of the trial court seems to have been based solely on the assumption of a rule of law that the statute was justified by the police power of the state notwithstand-

ing its effects on interstate commerce, and that in determining this, no consideration need be given to the facts found by the trial court or shown by the evidence. Its idea seemed to be that the only question to be passed upon was whether it might rationally be assumed that the Arizona statute bore some reasonable relation to safety.

Therefore we have in this case no judgment on the basis of a factual determination other than the judgment of the trial court in favor of the appellant.

This analysis of the action of the State Supreme Court is confirmed by the position taken by the appellee in its brief. The only factual judgment which that brief attributes to the State Supreme Court is a conclusion that the Train-Limit Law has a rational relation to safety. Such a conclusion the appellee calls the "ultimate fact" in the case, and by this it means that it is the only fact which need be determined. In regarding the action of the court below as a sufficient performance of judicial duty, appellee necessarily relies upon the assumption that the sole constitutional issue in the case is whether one can find in a train-limit law some rational relation to safety. Appellee excludes from consideration and concedes that the State Supreme Court excluded from consideration all questions of degree and all questions of fact as to the resulting burden on interstate commerce.

This raises the basic question whether the facts as to burden and benefit are pertinent to judicial judgment on the constitutional issue. On this question, the decisions and the opinions of this Court, in cases sustaining state laws as well as in those holding their application unconstitutional, are uniformly contrary to the action and lack of action of the Arizona Supreme Court.

This basic question is of more far-reaching concern in the interpretation and application of the Commerce Clause of the Federal Constitution than is the decision of any single specific controversy. In view of the mode of disposing of this controversy by the Arizona Supreme Court, the

authoritative pronouncement of this Court is essential to protect the national interest in the due freedom of interstate commerce from decisions of state courts sanctioning the application of state statutes on a theory or assumption that the competing factual considerations are not a matter for judicial inquiry and determination and judgment.

The invalidity of any such action by a state court is established by *Nashville, C. & St. L. Ry.* v. *Walters*, 294 U. S. 405, in which a state supreme court was reversed for a failure to give consideration to facts found by the trial court as material to the determination of a contention founded on the Fourteenth Amendment. More imperative still is a full consideration of facts bearing on the appropriate disposition of a Commerce Clause issue. The only objection relied on by the carrier in the *Walters* case was that it could not under the canons set by the requirement of due process of law be subjected to the expense of contributing to the cost of an underpass constructed primarily for the convenience of fast, long-haul motor carriage of passengers and goods. When, as here, the constitutional objections extend far beyond expense and embrace grievous impediments to efficient service by the railroads to the Nation, a state court clearly cannot be permitted to discountenance those objections in complete disregard of the facts.

This raises a question as to the proper disposition of an appeal from a judgment by a state supreme court which has thus acted in disregard of a constitutional requirement. In the *Walters* case, this Court required the State Supreme Court to consider the significance and persuasiveness of the findings and whether they were supported by the evidence, which, like the Arizona Supreme Court here, it had previously failed to undertake. The facts there in issue were for the most part peculiar to the locality of the underpass and to the particular rail and motor traffic involved. Thus there were special reasons why this Court in its discretion sent that case back to the State Supreme Court to do what it had left undone.

Here, however, there is no need for a similar remand. The subject matter of dispute in this case is no single, isolated and peculiar situation such as was involved in the *Walters* case. The pertinent facts already here in the record are drawn largely from official government reports. These reports contain the statistics on accidents and afford sufficient basis for weighing the claim on behalf of the statute that it is justified by considerations of promoting safety. On the other side of the scale, it is for this Court to weigh the national interest in superior efficiency in conducting interstate transportation and to give effect to the policies of Congress in promoting this national interest. It is for this Court to compare the evils of diversity of regulation by different states with the superiority of a uniform rule coming from the single hand of national authority if at any time Congress should deem it desirable to withdraw from interstate carriers the full freedom over train length which it has thus far not disturbed. On such matters, no further light from the State Supreme Court is needed for the correct disposition of this controversy.

On the ultimate weight to be accorded to duly established facts, neither the State Legislature nor the State Supreme Court can foreclose independent consideration and judgment by this Court. "This Court will determine for itself what is the necessary operation and effect of a state law challenged on the ground that it interferes with or burdens interstate commerce." *Lacoste* v. *Dept. of Conservation*, 263 U. S. 545, at 550. The "accommodation of the competing demands of the state and national interests involved" (*Parker* v. *Brown*, 317 U. S. 341, at 362) is for the ultimate judgment of this tribunal. Fully open to the consideration of this Court are both the "examination of the evidence" and the use of "available data" of which it "may take judicial notice." *Id.* at 363. In a case in which the facts found by the trial court are not questioned by the State Supreme Court and in which the pertinent data are derived largely from official government reports, there is available

in the record here an ample basis for the orderly and final disposition of this litigation through the exercise by this Court of its judgment in weighing the competing demands of state and national interests.

The contention of the appellee that the judiciary is powerless to afford a remedy against even the most extreme obstructions to interstate commerce flies in the face of a century of constitutional history from *Gibbons* v. *Ogden*, 9 Wheat. 1, to date. The contention that only Congress can grant relief is revolutionary. It asks this Court to wipe from the books every decision in which state statutes have been judicially condemned for their unjustified burden on commerce and to render inapposite and superfluous scores of opinions in which the degree of burden has been considered and weighed. "Continuity with the past" may, as Mr. Justice Holmes observed, be "only a necessity and not a duty," ("Law in Science and Science in Law," 12 Harv. Law Rev. 443, 444, Collected Legal Papers, 210, 211), but it is none the less imperative for that. As pointed out in the brief for the United States as *amicus curiae*, Congress for a century has been warranted in relying on the established doctrine and thus in assuming that no action on its part is necessary to foreclose the application to interstate commerce of state regulations which fall within the description of those which have been judicially condemned.

Such occasional suggestions of judicial impotence as have been put forth *arguendo* in dissenting opinions have recognized that state laws which discriminate against interstate commerce must be held invalid by judicial condemnation. Such recognition removes whatever support appellee's position might invoke from the language or absence of language in the Constitution, since there is no more express condemnation of discriminatory state regulations than of excessive and unjustified ones. As Mr. Justice Holmes observed in *Missouri* v. *Holland*, 252 U. S. 416, 433, "The case before us must be considered in the light of our whole experience and not merely in that of what was said a hun-

dred years ago." And in direct application to the precise problem now before us, the same Justice said in an address:

> "I do not think the United States would come to an end if we lost our power to declare an Act of Congress void. I do think the Union would be imperiled if we could not make that declaration as to the laws of the several States. For one in my place sees how often a local policy prevails with those who are not trained to national views and how often action is taken that embodies what the Commerce Clause was meant to end." (Holmes, "Law and the Court," Collected Legal Papers, 295-296.)

In this respect there is a vital distinction between state police regulations questioned only as violations of the Fourteenth Amendment without any feature of extraterritorial application or repercussions and state police regulations questioned as obstructions to the free flow of commerce among the several states. The Fourteenth Amendment, unlike the Commerce Clause, does "not express a necessary adjustment in the distribution of powers in the federal system." (Frankfurter, "Mr. Justice Holmes and the Constitution," 41 Harv. Law Rev. 121, 126.) As to the Commerce Clause issues, the same authority declares:

> "In a federated nation, especially one as vast in its territory and varied in its interests as ours, the authority must be lodged somewhere to make necessary accommodations between states and the central government. The Supreme Court is that ultimate arbiter, and it relies largely on the commerce clause for its control. But to believe that this power is exercised by distilling meaning out of the words of the Constitution would be sheer illusion. Decisions under the commerce clause, whether allowing or confining state action, whether sanctioning or denying federal power, are inevitably exercises in judgment." (*Id.* at 125.)

So revolutionary is the appellee's assertion of judicial impotence to enforce the canons of the Commerce Clause that necessarily no precedents are or can be invoked in its

support. Familiar expressions in judicial opinions that certain issues are legislative in character mean something quite different from appellee's contention that a state may do what it pleases to interstate commerce so long as what it does has some rational relation to safety. They mean that within the realm in which the state is free to act, its choice of expedients is for the determination of its legislature. They do not mean that it is for the state legislature to determine the constitutional scope of state powers to regulate interstate commerce.

The significance of the contrary contention of the appellee is not confined to its concurrence in our interpretation of the disposition of the issue by the State Supreme Court. To its recognition that the State Supreme Court did not give any consideration to the extent of the burden imposed on interstate commerce by the Arizona Train-Limit Law, the appellee adds its insistence that no such consideration is necessary. Such insistence may fairly be thought to imply a recognition and confession that the acceptance of such a position is indispensable to the affirmance of the judgment below. Only desperation on the basis of well established principles would seem an adequate explanation of reliance on a contention that this Court and all others are in duty bound to close their eyes to the relation between the contribution of a Train-Limit Law to safety on the one hand and its obstruction to interstate commerce on the other.

IX.

CONCLUSION.

This case presents an extraordinary combination of circumstances and considerations leading surely to the conclusion that the Arizona Train-Limit Law is repugnant to the Commerce Clause of the Constitution.

Certain of these considerations, standing alone and without regard to the others, might well be sufficient to establish the invalidity of the state statute. There is, however,

no occasion here to confine reliance to any single, isolated practical or legal factor. What is combined in reality cannot in law rightly be dismembered and dispersed into disconnected fragments. The statute must be judged in the light of the cumulation and association of all surrounding facts, circumstances and conditions.

It is respectfully submitted that the judgment of the Arizona Supreme Court should be reversed and that the Arizona Train-Limit Law should be held unconstitutional.

Respectfully submitted,

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Washington, D. C.,
March 8, 1945.

SUPREME COURT OF THE UNITED STATES.

No. 56.—October Term, 1944.

Southern Pacific Company, Appellant, vs. State of Arizona, *ex rel.* John L. Sullivan, Attorney General of the State of Arizona. } Appeal from the Supreme Court of the State of Arizona.

[June 18, 1945.]

Mr. Chief Justice Stone delivered the opinion of the Court.

The Arizona Train Limit Law of May 16, 1912, Arizona Code Ann., 1939, § 69-119, makes it unlawful for any person or corporation to operate within the state a railroad train of more than fourteen passenger or seventy freight cars, and authorizes the state to recover a money penalty for each violation of the Act. The questions for decision are whether Congress has, by legislative enactment, restricted the power of the states to regulate the length of interstate trains as a safety measure and, if not, whether the statute contravenes the commerce clause of the federal Constitution.

In 1940 the State of Arizona brought suit in the Arizona Superior Court against appellant, the Southern Pacific Company, to recover the statutory penalties for operating within the state two interstate trains, one a passenger train of more than fourteen cars, and one a freight train of more than seventy cars. Appellant answered, admitting the train operations, but defended on the ground that the statute offends against the commerce clause and the due process clause of the Fourteenth Amendment and conflicts with federal legislation. After an extended trial, without a jury, the court made detailed findings of fact on the basis of which it gave judgment for the railroad company. The Supreme Court of Arizona reversed and directed judgment for the state. — Ariz. —, 145 Pac. 2d 539. The case comes here on appeal under § 237(a) of the Judicial Code, appellant raising by its assignments of error the questions presented here for decision.

The Supreme Court left undisturbed the findings of the trial court and made no new findings. It held that the power of the

state to regulate the length of interstate trains had not been restricted by Congressional action. It sustained the Act as a safety measure to reduce the number of accidents attributed to the operation of trains of more than the statutory maximum length, enacted by the state legislature in the exercise of its "police power". This power the court held extended to the regulation of the operations of interstate commerce in the interests of local health, safety and well-being. It thought that a state statute, enacted in the exercise of the police power, and bearing some reasonable relation to the health, safety and well-being of the people of the state, of which the state legislature is the judge, was not to be judicially overturned, notwithstanding its admittedly adverse effect on the operation of interstate trains.

Purporting to act under § 1, paragraphs 10-17 of the Interstate Commerce Act, 24 Stat. 379 as amended (49 U. S. C. § 1 *et. seq.*), the Interstate Commerce Commission, as of September 15, 1942, promulgated as an emergency measure Service Order No. 85, 7 Fed. Reg. 7258, suspending the operation of state train limit laws for the duration of the war, and denied an application to set aside the order. *In the Matter of Service Order No. 85*, 256 I. C. C. 523. Paragraph 15 of § 1 of the Interstate Commerce Act empowers the Commission, when it is "of opinion that shortage of equipment, congestion of traffic, or other emergency requiring immediate action exists in any section of the country", to make or suspend rules and practices "with respect to car service," which includes by paragraph 10 of § 1 "the use, control, supply, movement, distribution, exchange, interchange, and return" of locomotives and cars, and the "supply of trains". Paragraph 16 of § 1 provides that when a carrier is unable properly to transport the traffic offered, the Commission may make reasonable directions "with respect to the handling, routing, and movement of the traffic of such carrier and its distribution over other lines of roads." The authority of the Commission to make Order No. 85 is currently under attack in *Johnston* v. *United States*, Civil Action No. 1408, pending in the Western District of Oklahoma.

The Commission's order was not in effect in 1940 when the present suit was brought for violations of the state law in that year, and the Commission's order is inapplicable to the train operations here charged as violations. Hence the question here is not

of the effect of the Commission's order, which we assume for purposes of decision to be valid, but whether the grant of power to the Commission operated to supersede the state act before the Commission's order. We are of opinion that, in the absence of administrative implementation by the Commission, § 1 does not of itself curtail state power to regulate train lengths. The provisions under which the Commission purported to act, phrased in broad and general language, do not in terms deal with that subject. We do not gain either from their words or from the legislative history any hint that Congress in enacting them intended, apart from Commission action, to supersede state laws regulating train lengths. We can hardly suppose that Congress, merely by conferring authority on the Commission to regulate car service in an "emergency", intended to restrict the exercise, otherwise lawful, of state power to regulate train lengths before the Commission finds an "emergency" to exist.

Congress, in enacting legislation within its constitutional authority over interstate commerce, will not be deemed to have intended to strike down a state statute designed to protect the health and safety of the public unless its purpose to do so is clearly manifested, *Reid* v. *Colorado*, 187 U. S. 137, 148; *Missouri Pacific Ry.* v. *Larabee Mills*, 211 U. S. 612, 621, *et seq.*; *Missouri, K. & T. Ry. Co.* v. *Harris*, 234 U. S. 412, 418-419; *Welch Co.* v. *New Hampshire*, 306 U. S. 79, 85; *Allen-Bradley Local* v. *Board*, 315 U. S. 740, 749, or unless the state law, in terms or in its practical administration, conflicts with the Act of Congress, or plainly and palpably infringes its policy. *Sinnot* v. *Davenport*, 22 How. 227, 243; *Missouri, K. & T. Ry.* v. *Haber*, 169 U. S. 613, 623; *Savage* v. *Jones*, 225 U. S. 501, 533; *Carey* v. *South Dakota*, 250 U. S. 118, 122; *Atchison Ry. Co.* v. *Railroad Comm.*, 283 U. S. 380, 391; *Townsend* v. *Yeomans*, 301 U. S. 441, 454.

The contention, faintly urged, that the provisions of the Safety Appliance Act, 45 U. S. C. §§ 1 and 9, providing for brakes on trains, and of § 25 of Part I of the Interstate Commerce Act, 49 U. S. C., § 26(b), permitting the Commission to order the installation of train stop and control devices, operate of their own force to exclude state regulation of train lengths, has even less support. Congress, although asked to do so,[1] has declined to

[1] See Senate Report No. 416, 75th Cong., 1st Sess.; 81 Cong. Rec. 7596; and Hearings before House Committee on Interstate and Foreign Commerce, 75th Cong., 3d Sess., S. 69, Train Lengths.

pass legislation specifically limiting trains to seventy cars. We are therefore brought to appellants principal contention, that the state statute contravenes the commerce clause of the Federal Constitution.

Although the commerce clause conferred on the national government power to regulate commerce, its possession of the power does not exclude all state power of regulation. Ever since *Willson* v. *Black-Bird Creek Marsh Co.*, 2 Pet. 245, and *Cooley* v. *Board of Wardens*, 12 How. 299, it has been recognized that, in the absence of conflicting legislation by Congress, there is a residuum of power in the state to make laws governing matters of local concern which nevertheless in some measure affect interstate commerce or even, to some extent, regulate it. *Minnesota Rate Cases*, 230 U. S. 352, 399-400; *South Carolina Highway Dept.* v. *Barnwell Bros.*, 303 U. S. 177, 187, *et seq.*; *California* v. *Thompson*, 313 U. S. 109, 113-14 and cases cited; *Parker* v. *Brown*, 317 U. S. 341, 359-60. Thus the states may regulate matters which, because of their number and diversity, may never be adequately dealt with by Congress. *Cooley* v. *Board of Wardens*, *supra*, 319; *South Carolina Highway Dept.* v. *Barnwell Bros.*, *supra*, 185; *California* v. *Thompson*, *supra*, 113; *Duckworth* v. *Arkansas*, 314 U. S. 390, 394; *Parker* v. *Brown*, *supra*, 362, 363. When the regulation of matters of local concern is local in character and effect, and its impact on the national commerce does not seriously interfere with its operation, and the consequent incentive to deal with them nationally is slight, such regulation has been generally held to be within state authority. *South Carolina Highway Dept.* v. *Barnwell Bros.*, *supra*, 188 and cases cited; *Lone Star Gas Co.* v. *Texas*, 304 U. S. 224, 238; *Milk Board* v. *Eisenberg Co.*, 306 U. S. 346, 351; *Maurer* v. *Hamilton*, 309 U. S. 598, 603; *California* v. *Thompson*, *supra*, 113-4 and cases cited.

But ever since *Gibbons* v. *Ogden*, 9 Wheat. 1, the states have not been deemed to have authority to impede substantially the free flow of commerce from state to state, or to regulate those phases of the national commerce which, because of the need of national uniformity, demand that their regulation, if any, be prescribed by a single authority.[2] *Cooley* v. *Board of Wardens*, *supra*, 319; *Leisy*

[2] In applying this rule the Court has often recognized that to the extent that the burden of state regulation falls on interests outside the state, it is unlikely to be alleviated by the operation of those political restraints normally exerted when interests within the state are affected. Cooley v. Board

v. *Hardin*, 135 U. S. 100, 108, 109; *Minnesota Rate Cases*, *supra*, 399-400; *Edwards* v. *California*, 314 U. S. 160, 176. Whether or not this long recognized distribution of power between the national and the state governments is predicated upon the implications of the commerce clause itself, *Brown* v. *Maryland*, 12 Wheat. 419, 447; *Minnesota Rates Cases*, *supra*, 399, 400; *Pennsylvania* v. *West Virginia*, 262 U. S. 553, 596; *Baldwin* v. *Seelig*, 294 U. S. 511, 522; *South Carolina Highway Dept.* v. *Barnwell Bros.*, *supra*, 185, or upon the presumed intention of Congress, where Congress has not spoken, *Welton* v. *Missouri*, 91 U. S. 275, 282; *Hall* v. *DeCuir*, 95 U. S. 485, 490; *Brown* v. *Houston*, 114 U. S. 622, 631; *Bowman* v. *Chicago, etc. Ry.*, 125 U. S. 465, 481-2; *Leisy* v. *Hardin*, *supra*, 109; *In re Rahrer*, 140 U. S. 545, 559-60; *Brennan* v. *Titusville*, 153 U. S. 289, 302; *Covington &c. Bridge Co.* v. *Kentucky*, 154 U. S. 204, 212; *Graves* v. *New York ex rel. O'Keefe*, 306 U. S. 466, 479, n., Dowling, Interstate Commerce and State Power, 27 Va. Law Rev. 1, the result is the same.

In the application of these principles some enactments may be found to be plainly within and others plainly without state power. But between these extremes lies the infinite variety of cases, in which regulation of local matters may also operate as a regulation of commerce, in which reconciliation of the conflicting claims of state and national power is to be attained only by some appraisal and accommodation of the competing demands of the state and national interests involved. *Parker* v. *Brown*, *supra*, 362; *Terminal Railroad Ass'n* v. *Brotherhood*, 318 U. S. 1, 8; see *DiSanto* v. *Pennsylvania*, 273 U. S. 34, 44 (and compare *California* v. *Thompson*, *supra*); *Illinois Gas Co.* v. *Public Service Co.*, 314 U. S. 498, 504-5.

For a hundred years it has been accepted constitutional doctrine that the commerce clause, without the aid of Congressional legislation, thus affords some protection from state legislation inimical to the national commerce, and that in such cases, where Congress has not acted, this Court, and not the state legislature, is

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of Wardens, *supra*, 315; Gilman v. Philadelphia, 3 Wall. 713, 731; Escanaba Co. v. Chicago, 107 U. S. 678, 683; Robbins v. Shelby County Taxing Dist., 120 U. S. 489, 499; Lake Shore & M. S. R. Co. v. Ohio, 173 U. S. 285, 294; South Carolina Highway Dept. v. Barnwell Bros., *supra*, 185, n.; McGoldrick v. Berwind-White Co., 309 U. S. 33, 46, n.; cf. McCulloch v. Maryland, 4 Wheat. 316, 428; Pound v. Turck, 95 U. S. 459, 464; Gloucester Ferry Co. v. Pennsylvania, 114 U. S. 196, 205; Helvering v. Gerhardt, 304 U. S. 405, 412.

under the commerce clause the final arbiter between the competing demands of state and national interests. *Cooley* v. *Board of Wardens, supra; Kansas Southern Ry.* v. *Kaw Valley District*, 233 U. S. 75, 79; *South Covington Ry.* v. *Covington*, 235 U. S. 537, 546; *M., K. & T. R. Co.* v. *Texas*, 245 U. S. 484, 488; *St. Louis & S. F. Ry.* v. *Public Service Comm'n*, 254 U. S. 535, 537; *Foster-Fountain Packing Co.* v. *Haydel*, 278 U. S. 1, 10; *Gwin, etc. Inc.* v. *Henneford*, 305 U. S. 434, 441; *McCarroll* v. *Dixie Lines*, 309 U. S. 176.

Congress has undoubted power to redefine the distribution of power over interstate commerce. It may either permit the states to regulate the commerce in a manner which would otherwise not be permissible, *In re Rahrer, supra*, 561-62; *Adams Express Co.* v. *Kentucky*, 238 U. S. 190, 198; *Rosenberger* v. *Pacific Express Co.*, 241 U. S. 48, 50, 51; *Clark Distilling Co.* v. *Western Maryland Ry. Co.*, 242 U. S. 311, 325-6; *Whitfield* v. *Ohio*, 297 U. S. 431, 438-40; *Kentucky Whip & Collar Co.* v. *Illinois Central R. Co.*, 299 U. S. 334, 350-51; *Hooven & Allison* v. *Evatt*, No. 38, 1944 Term, decided April 9, 1945, slip opinion p. 20, or exclude state regulation even of matters of peculiarly local concern which nevertheless affect interstate commerce. *Addyston Pipe & Steel Co.* v. *United States*, 175 U. S. 211, 230; *Louisville & Nashville R. R. Co.* v. *Mottley*, 219 U. S. 467; *Houston & Texas Ry.* v. *United States*, 234 U. S. 342; *American Express Co.* v. *Caldwell*, 244 U. S. 617, 626; *Ill. Cent. R. R. Co.* v. *Public Utilities Comm'n*, 245 U. S. 493, 506; *New York* v. *United States*, 257 U. S. 591, 601; *Commission* v. *Texas & N. O. R. Co.*, 284 U. S. 125, 130; *Penn. R. Co.* v. *Illinois Brick Co*, 297 U. S. 447, 459.

But in general Congress has left it to the courts to formulate the rules thus interpreting the commerce clause in its application, doubtless because it has appreciated the destructive consequences to the commerce of the nation if their protection were withdrawn. *Gwin, etc. Inc.* v. *Henneford, supra*, 441, and has been aware that in their application state laws will not be invalidated without the support of relevant factual material which will "afford a sure basis" for an informed judgment. *Terminal Railroad Ass'n* v. *Brotherhood, supra*, 8; *Southern Railway Co.* v. *King*, 217 U. S. 524. Meanwhile, Congress has accommodated its legislation, as have the states, to these rules as an established feature of our

constitutional system. There has thus been left to the states wide scope for the regulation of matters of local state concern, even though it in some measure affects the commerce, provided it does not materially restrict the free flow of commerce across state lines, or interfere with it in matters with respect to which uniformity of regulation is of predominant national concern.

Hence the matters for ultimate determination here are the nature and extent of the burden which the state regulation of interstate trains, adopted as a safety measure, imposes on interstate commerce, and whether the relative weights of the state and national interests involved are such as to make inapplicable the rule, generally observed, that the free flow of interstate commerce and its freedom from local restraints in matters requiring uniformity of regulation are interests safeguarded by the commerce clause from state interference.

While this Court is not bound by the findings of the state court, and may determine for itself the facts of a case upon which an asserted federal right depends, *Hooven & Allison* v. *Evatt*, *supra*, slip opinion p. 5, and cases cited, the facts found by the state trial court showing the nature of the interstate commerce involved, and the effect upon it of the train limit law, are not seriously questioned. Its findings with respect to the need for and effect of the statute as a safety measure, although challenged in some particulars which we do not regard as material to our decision, are likewise supported by evidence. Taken together the findings supply an adequate basis for decision of the constitutional issue.

The findings show that the operation of long trains, that is trains of more than fourteen passenger and more than seventy freight cars, is standard practice over the main lines of the railroads of the United States, and that, if the length of trains is to be regulated at all, national uniformity in the regulation adopted, such as only Congress can prescribe, is practically indispensable to the operation of an efficient and economical national railway system. On many railroads passenger trains of more than fourteen cars and freight trains of more than seventy cars are operated, and on some systems freight trains are run ranging from one hundred and twenty-five to one hundred and sixty cars in length. Outside of Arizona, where the length of trains is not restricted, appellant runs a substantial proportion of long trains. In 1939 on its com-

parable route for through traffic through Utah and Nevada from 66 to 85% of its freight trains were over 70 cars in length and over 43% of its passenger trains included more than fourteen passenger cars.

In Arizona, approximately 93% of the freight traffic and 95% of the passenger traffic is interstate. Because of the Train Limit Law appellant is required to haul over 30% more trains in Arizona than would otherwise have been necessary. The record shows a definite relationship between operating costs and the length of trains, the increase in length resulting in a reduction of operating costs per car. The additional cost of operation of trains complying with the Train Limit Law in Arizona amounts for the two railroads traversing that state to about $1,000,000 a year. The reduction in train lengths also impedes efficient operation. More locomotives and more manpower are required; the necessary conversion and reconversion of train lengths at terminals and the delay caused by breaking up and remaking long trains upon entering and leaving the state in order to comply with the law, delays the traffic and diminishes its volume moved in a given time, especially when traffic is heavy.

To relieve the railroads of these burdens, during the war emergency only, the Interstate Commerce Commission, acting under § 1 of the Interstate Commerce Act, suspended the operation of the state law for the duration of the war by its order of September 15, 1942, to which we have referred. In support of the order the Commission declared: "It was designed to save manpower, motive power, engine miles and train miles; to avoid delay in the movement of trains; to increase the efficient use of locomotives and cars and to augment the available supply thereof; and to relieve congestion of terminals caused by setting out and picking up cars on each side of the train limit law States." *In the Matter of Service Order No. 85*, 256 I. C. C. 523, 524. Appellant, because of its past compliance with the Arizona Train Law, has been unable to avail itself fully of the benefits of the suspension order because some of its equipment and the length of its sidings in Arizona are not suitable for the operation of long trains. Engines capable of hauling long trains were not in service. It can engage in long train operations to the best advantage only by rebuilding its road to some extent and by changing or adding

to its motive power equipment, which it desires to do in order to secure more efficient and economical operation of its trains.

The unchallenged findings leave no doubt that the Arizona Train Limit Law imposes a serious burden on the interstate commerce conducted by appellant. It materially impedes the movement of appellant's interstate trains through that state and interposes a substantial obstruction to the national policy proclaimed by Congress, to promote adequate, economical and efficient railway transportation service. Interstate Commerce Act, preceding § 1, 54 Stat. 899. Enforcement of the law in Arizona, while train lengths remain unregulated or are regulated by varying standards in other states, must inevitably result in an impairment of uniformity of efficient railroad operation because the railroads are subjected to regulation which is not uniform in its application. Compliance with a state statute limiting train lengths requires interstate trains of a length lawful in other states to be broken up and reconstituted as they enter each state according as it may impose varying limitations upon train lengths. The alternative is for the carrier to conform to the lowest train limit restriction of any of the states through which its trains pass, whose laws thus control the carriers' operations both within and without the regulating state.

Although the seventy car maximum for freight trains is the limitation which has been most commonly proposed, various bills introduced in the state legislatures provided for maximum freight train lengths of from fifty to one hundred and twenty-five cars, and maximum passenger train lengths of from ten to eighteen cars.[3] With such laws in force in states which are interspersed with those having no limit on train lengths, the confusion and difficulty with which interstate operations would be burdened under the varied system of state regulation and the unsatisfied need for uniformity in such regulation, if any, are evident.[4]

[3] One hundred sixty-four bills limiting train lengths have been introduced in state legislatures since 1920, of which only three were passed, in Nevada, Louisiana and Oklahoma. The Nevada and Louisiana laws were held unconstitutional and never enforced. Southern Pacific Co. *v.* Mashburn, 18 Fed. Supp. 393; Texas & New Orleans R. Co. *v.* Martin (No. 428—Equity, E. D. of La. 1936), unreported. The Arizona law, passed in 1912, was held unconstitutional in Atchison, T. & S. F. Ry. Co. *v.* La Prade, 2 Fed. Supp. 855, reversed on other grounds, 289 U. S. 444.

[4] Had these bills been passed a freight train running over established routes (from Virginia to Michigan for example) would normally proceed through states with a seventy-five car maximum (Virginia), a one hundred and twenty-five car maximum (West Virginia), a three thousand foot maximum

At present the seventy freight car laws are enforced only in Arizona and Oklahoma, with a fourteen car passenger car limit in Arizona. The record here shows that the enforcement of the Arizona statute results in freight trains being broken up and reformed at the California border and in New Mexico, some distance from the Arizona line. Frequently it is not feasible to operate a newly assembled train from the New Mexico yard nearest to Arizona, with the result that the Arizona limitation governs the flow of traffic as far east as El Paso, Texas. For similar reasons the Arizona law often controls the length of passenger trains all the way from Los Angeles to El Paso.

If one state may regulate train lengths, so may all the others, and they need not prescribe the same maximum limitation. The practical effect of such regulation is to control train operations beyond the boundaries of the state exacting it because of the necessity of breaking up and reassembling long trains at the nearest terminal points before entering and after leaving the regulating state. The serious impediment to the free flow of commerce by the local regulation of train lengths and the practical necessity that such regulation, if any, must be prescribed by a single body having a nation-wide authority are apparent.

The trial court found that the Arizona law had no reasonable relation to safety, and made train operation more dangerous. Examination of the evidence and the detailed findings makes it clear that this conclusion was rested on facts found which indicate that such increased danger of accident and personal injury as may result from the greater length of trains is more than offset by the increase in the number of accidents resulting from the larger number of trains when train lengths are reduced. In

(Ohio), and a seventy car limit (Michigan). A train from Arkansas to Wisconsin might be subjected to a fifty car maximum (Arkansas), one half mile (Mississippi), three thousand feet (Iowa), one and a half miles (Minnesota), and thirty three hundred feet (Wisconsin). A train running from Nebraska to California might be subject to a sixty, seventy five or eighty five maximum in Nebraska, to a limit fixed by commission in Kansas, to a sixty five car limit in Colorado, to a seventy five car limit in New Mexico, to a seventy car limit in Arizona, and to a seventy four car limit in California. A passenger train might be limited to fourteen cars in New Jersey, ten in Pennsylvania and eighteen in West Virginia.

[5] In Oklahoma three lines running from Chicago or Kansas City westpass through Oklahoma for distances of sixty, one hundred and seventeen and one hundred and forty three miles. Since no other state through which the traffic passes (except Arizona) restricts train lengths in any way, the effect of the Oklahoma law is to require through trains to be broken up for the short distances they pass through that state.

considering the effect of the statute as a safety measure, therefore, the factor of controlling significance for present purposes is not whether there is basis for the conclusion of the Arizona Supreme Court that the increase in length of trains beyond the statutory maximum has an adverse effect upon safety of operation. The decisive question is whether in the circumstances the total effect of the law as a safety measure in reducing accidents and casualties is so slight or problematical as not to outweigh the national interest in keeping interstate commerce free from interferences which seriously impede it and subject it to local regulation which does not have a uniform effect on the interstate train journey which it interrupts.

The principal source of danger of accident from increased length of trains is the resulting increase of "slack action" of the train. Slack action is the amount of free movement of one car before it transmits its motion to an adjoining coupled car. This free movement results from the fact that in railroad practice cars are loosely coupled, and the coupling is often combined with a shock-absorbing device, a "draft gear", which, under stress, substantially increases the free movement as the train is started or stopped. Loose coupling is necessary to enable the train to proceed freely around curves and is an aid in starting heavy trains, since the application of the locomotive power to the train operates on each car in the train successively, and the power is thus utilized to start only one car at a time.

The slack action between cars due to loose couplings varies from seven-eighths of an inch to one and one-eighth inches and, with the added free movement due to the use of draft gears, may be as high as six or seven inches between cars. The length of the train increases the slack since the slack action of a train is the total of the free movement between its several cars. The amount of slack action has some effect on the severity of the shock of train movements, and on freight trains sometimes results in injuries to operatives, which most frequently occur to occupants of the caboose. The amount and severity of slack action, however, are not wholly dependent upon the length of train, as they may be affected by the mode and conditions of operation as to grades, speed, and load. And accidents due to slack action also occur in the operation of short trains. On comparison of the number of slack action accidents in Arizona with those in Nevada, where the length of

trains is now unregulated, the trial court found that with substantially the same amount of traffic in each state the number of accidents was relatively the same in long as in short train operations. While accidents from slack action do occur in the operation of passenger trains, it does not appear that they are more frequent or the resulting shocks more severe on long than on short passenger trains. Nor does it appear that slack action accidents occurring on passenger trains, whatever their length, are of sufficient severity to cause serious injury or damage.

As the trial court found, reduction of the length of trains also tends to increase the number of accidents because of the increase in the number of trains. The application of the Arizona law compelled appellant to operate 30.08%, or 4,304, more freight trains in 1939 than would otherwise have been necessary. And the record amply supports the trial court's conclusion that the frequency of accidents is closely related to the number of trains run. The number of accidents due to grade crossing collisions between trains and motor vehicles and pedestrians, and to collisions between trains, which are usually far more serious than those due to slack action, and accidents due to locomotive failures, in general vary with the number of trains.[6] Increase in the number of trains results in more starts and stops, more "meets" and "passes", and more switching movements, all tending to increase the number of accidents not only to train operatives and other railroad employees, but to passengers and members of the public exposed to danger by train operations.

Railroad statistics introduced into the record tend to show that this is the result of the application of the Arizona Train Limit Law to appellant, both with respect to all railroad casualties within the state and those affecting only trainmen whom the train limit law is supposed to protect. The accident rate in Arizona is much higher than on comparable lines elsewhere, where there is no regulation of length of trains. The record lends support to the trial court's conclusion that the train length limitation increased rather than diminished the number of accidents. This is shown

[6] The record shows that in 1939 the number of slack accident casualties in the United States, 399, was only 6% of the number of train and train service casualties to railroad employees; 6,713. In that year three of the 399 slack accident casualties were fatal, whereas the average number of grade crossing casualties per year from 1935 to 1939 was 5,718. And in 1939, 1,394 persons were killed and 3,999 were injured in highway grade crossing accidents. I. C. C., Bureau of Statistics, Accident Bulletin No. 108, pp. 22–23.

by comparison of appellant's operations in Arizona with those in Nevada,[7] and by comparison of operations of appellant and of the Santa Fe Railroad in Arizona with those of the same roads in New Mexico,[8] and by like comparison between appellant's operations in Arizona and operations throughout the country.[9]

Upon an examination of the whole case the trial court found that "if short-train operation may or should result in any decrease in the number or severity of the 'slack' or 'slack-surge' type of accidents or casualties, such decrease is substantially more than offset by the increased number of accidents and casualties from other causes that follow the arbitrary limitation of freight trains to 70 cars . . . and passenger trains to 14 cars."

We think, as the trial court found, that the Arizona Train Limit Law, viewed as a safety measure, affords at most slight and dubious advantage, if any, over unregulated train lengths, because it results in an increase in the number of trains and train operations and the consequent increase in train accidents of a character generally more severe than those due to slack action. Its undoubted effect on the commerce is the regulation, without securing uniformity, of the length of trains operated in interstate commerce, which lack is itself a primary cause of preventing the free flow of commerce by delaying it and by substantially increasing its cost and impairing its efficiency. In these respects the case differs from those where a state, by regulatory measures affecting the commerce, has removed or reduced safety hazards without substantial interference with the interstate movement of trains. Such are measures abolishing the car stove, *New*

[7] With passenger traffic in Nevada 78% as heavy as in Arizona, from 1923 to 1938 two hundred and thirty-nine casualties were caused to persons by passenger trains in Arizona and one hundred and nine in Nevada. Between 1923 and 1939 five persons in Nevada and fourteen in Arizona were injured by sudden stops or jerks on passenger trains.

[8] Casualties to employees, occurring in freight train operations in New Mexico, have been substantially less in both number and frequency than in Arizona. From 1930 to 1940 there were one hundred and twenty-nine casualties to all classes of employees in New Mexico at the rate of 7.97 per million train miles, 12.84 per hundred million car miles. In Arizona there were two hundred and fifty-one casualties to employees, at the rate of 10.03 per million train miles, and 18.10 per hundred million car miles.

[9] On a national basis the findings show that while the national accident rate per hundred million car miles for all railroad employees and for trainmen decreased 70% to 66% respectively between 1923-1928 and 1935-1940, the rate for the Southern Pacific in Arizona declined 52.3% and 53.3%. Appellant's rate in Nevada decreased 71.1% and 69.1%

York, N. H. & H. R. Co. v. *New York*, 165 U. S. 628; requiring locomotives to be supplied with electric headlights, *Atlantic Coast Line* v. *Georgia*, 234 U. S. 280; providing for full train crews, *Chicago, R. I. & Pac. Ry. Co.* v. *Arkansas*, 219 U. S. 453; *St. Louis & Iron Mtn. Ry.* v. *Arkansas*, 240 U. S. 518; *Missouri Pacific R. Co.* v. *Norwood*, 283 U. S. 249; and for the equipment of freight trains with cabooses, *Terminal Railroad Ass'n* v. *Brotherhood*, *supra*.

The principle that, without controlling Congressional action, a state may not regulate interstate commerce so as substantially to affect its flow or deprive it of needed uniformity in its regulation is not to be avoided by "simply invoking the convenient apologetics of the police power," *Kansas Southern Ry.* v. *Kaw Valley District*, *supra*, 79; *Buck* v. *Kuykendall*, 267 U. S. 307, 315. In the *Kaw Valley* case the Court held that the state was without constitutional power to order a railroad to remove a railroad bridge over which its interstate trains passed, as a means of preventing floods in the district and of improving its drainage, because it was "not pretended that local welfare needs the removal of the defendants' bridges at the expense of the dominant requirements of commerce with other states, but merely that it would be helped by raising them." And in *Seaboard Air Line Ry.* v. *Blackwell*, 244 U. S. 310, it was held that the interference with interstate rail transportation resulting from a state statute requiring as a safety measure that trains come almost to a stop at grade crossings, outweigh the local interest in safety, when it appeared that compliance increased the scheduled running time more than six hours in a distance of one hundred and twenty-three miles. Cf. *Southern Rail-Way Co.* v. *King*, *supra*, where the crossings were less numerous and the burden to interstate commerce was not shown to be heavy; and see *Erb* v. *Morsch*, 177 U. S. 584.

Similarly the commerce clause has been held to invalidate local "police power" enactments fixing the number of cars in an interstate train and the number of passengers to be carried in each car, *South Covington Ry.* v. *Covington*, *supra*, 553; regulating the segregation of colored passengers in interstate trains, *Hall* v. *DeCuir*, *supra*, 488-9; requiring burdensome intrastate stops of interstate trains, *Illinois Central Railroad Co.* v. *Illinois*, 163 U. S. 142; *Cleveland, etc. Ry. Co.* v. *Illinois*, 177 U. S. 514; *Mississippi R. R. Com.* v. *Illinois Central R. R.*, 203 U. S. 335; *Herndon* v. *Chi., R. I. & Pac. Ry.*, 218 U. S. 135; *St. Louis S. F. Ry.* v. *Pub. Serv. Comm'n*, 261 U. S. 369; requiring an in-

terstate railroad to detour its through passenger trains for the benefit of a small city, *St. Louis & S. F. Ry.* v. *Public Service Comm'n, supra;* interfering with interstate commerce by requiring interstate trains to leave on time, *Missouri, K. & T. Ry. Co.* v. *Texas,* 245 U. S. 484; regulating car distribution to interstate shippers, *St. Louis S. W. Ry.* v. *Arkansas,* 217 U. S. 136; or establishing venue provisions requiring railroads to defend accident suits at points distant from the place of injury and the residence and activities of the parties, *Davis* v. *Farmers Cooperative Co.,* 262 U. S. 312; *Michigan Central* v. *Mix,* 278 U. S. 492; cf. *Denver & R. G. W. R. Co.* v. *Terte,* 284 U. S. 284; see also *Buck* v. *Kuykendall, supra; Foster-Fountain Packing Co.* v. *Haydel, supra; Baldwin* v. *Seelig, supra,* 524; *South Carolina Highway Dept.* v. *Barnwell Bros., supra,* 184-5 n., and cases cited.

More recently in *Kelly* v. *Washington,* 302 U. S. 1, 15, we have pointed out that when a state goes beyond safety measures which are permissible because only local in their effect upon interstate commerce, and "attempts to impose particular standards as to structure, design, equipment and operation [of vessels plying interstate] which in the judgment of its authorities may be desirable but pass beyond what is plainly essential to safety and seaworthiness, the State will encounter the principle that such requirements, if imposed at all, must be through the action of Congress which can establish a uniform rule. Whether the state in a particular matter goes too far must be left to be determined when the precise question arises."

Here we conclude that the state does go too far. Its regulation of train lengths, admittedly obstructive to interstate train operation, and having a seriously adverse effect on transportation efficiency and economy, passes beyond what is plainly essential for safety since it does not appear that it will lessen rather than increase the danger of accident. Its attempted regulation of the operation of interstate trains cannot establish nation-wide control such as is essential to the maintenance of an efficient transportation system, which Congress alone can prescribe. The state interest cannot be preserved at the expense of the national interest by an enactment which regulates interstate train lengths without securing such control, which is a matter of national concern. To this the interest of the state here asserted is subordinate.

Appellees especially rely on the full train crew cases, *Chicago, R. I. & Pac. Ry. Co.* v. *Arkansas*, *supra*; *St. Louis & Iron Mtn. Ry.* v. *Arkansas*, *supra*; *Missouri Pacific R. Co.* v. *Norwood*, *supra*, and also on *South Carolina Highway Dept.* v. *Barnwell Bros.*, *supra*, as supporting the state's authority to regulate the length of interstate trains. While the full train crew laws undoubtedly placed an added financial burden on the railroads in order to serve a local interest, they did not obstruct interstate transportation or seriously impede it. They had no effects outside the state beyond those of picking up and setting down the extra employees at the state boundaries; they involved no wasted use of facilities or serious impairment of transportation efficiency, which are among the factors of controlling weight here. In sustaining those laws the Court considered the restriction a minimal burden on the commerce comparable to the law requiring the licensing of engineers as a safeguard against those of reckless and intemperate habits, sustained in *Smith* v. *Alabama*, 124 U. S. 465, or those afflicted with color blindness, upheld in *Nashville, &c. Railway* v. *Alabama*, 128 U. S. 96, and other similar regulations. *New York, N. H. & H. R. Co.* v. *New York*, *supra*; *Atlantic Coast Line Ry.* v. *Georgia*, *supra*; cf. *County of Mobile* v. *Kimball*, 102 U. S. 691.

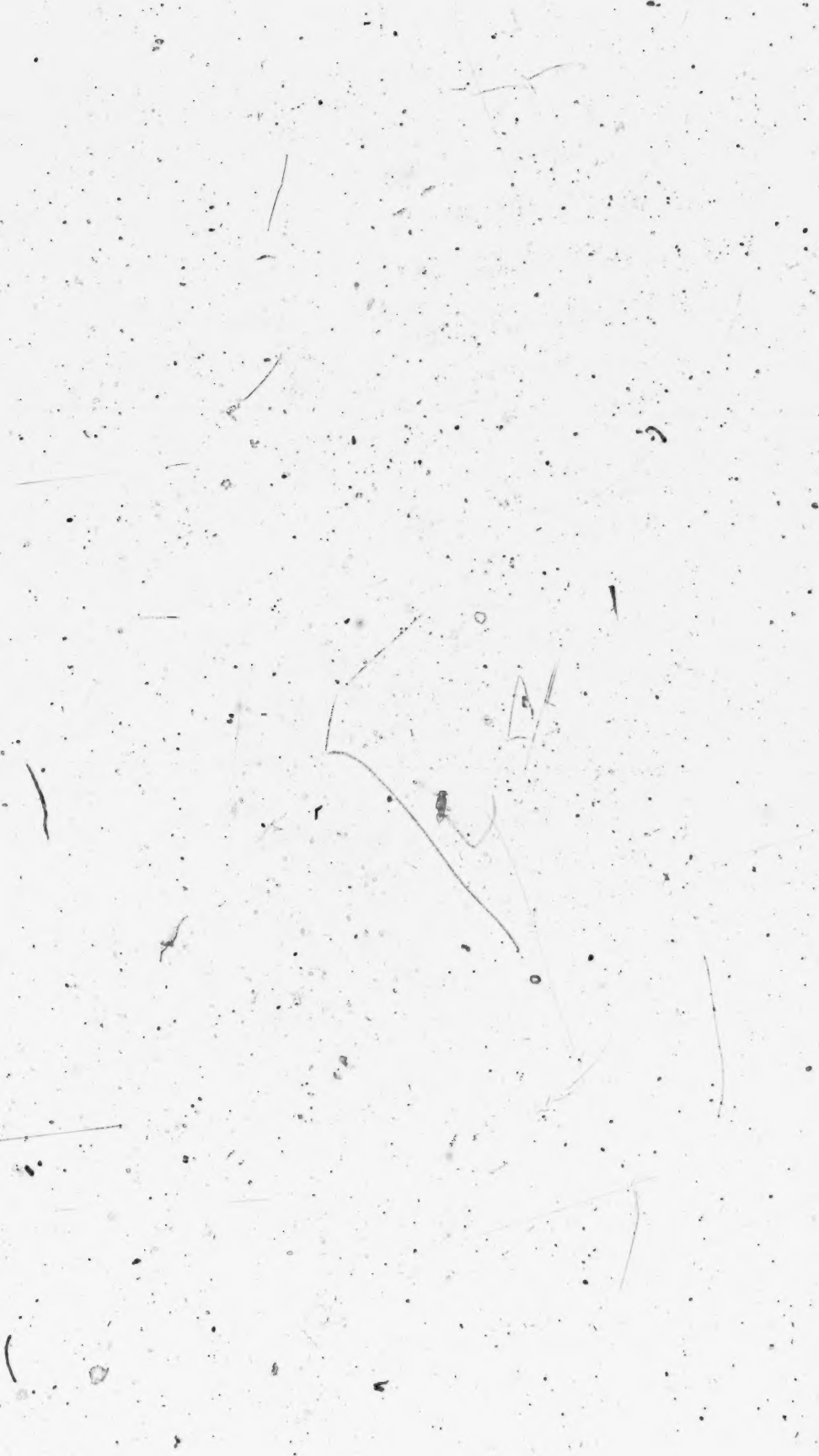
South Carolina Highway Dept. v. *Barnwell Bros.*, *supra*, was concerned with the power of the state to regulate the weight and width of motor cars passing interstate over its highways, a legislative field over which the state has a far more extensive control than over interstate railroads. In that case, and in *Maurer* v. *Hamilton*, *supra*, we were at pains to point out that there are few subjects of state regulation affecting interstate commerce which are so peculiarly of local concern as is the use of the state's highways. Unlike the railroads local highways are built, owned and maintained by the state or its municipal subdivisions. The state is responsible for their safe and economical administration. Regulations affecting the safety of their use must be applied alike to intrastate and interstate traffic. The fact that they affect alike shippers in interstate and intrastate commerce in great numbers, within as well as without the state, is a safeguard against regulatory abuses. Their regulation is akin to quarantine measures, game laws, and like local regulations of rivers, harbors, piers, and docks, with respect to which the state has exceptional scope for

the exercise of its regulatory power, and which, Congress not acting, have been sustained even though they materially interfere with interstate commerce (303 U. S. at 187-188 and cases cited).

The contrast between the present regulation and the full train crew laws in point of their effects on the commerce, and the like contrast with the highway safety regulations, in point of the nature of the subject of regulation and the state's interest in it, illustrate and emphasize the considerations which enter into a determination of the relative weights of state and national interests where state regulation affecting interstate commerce is attempted. Here examination of all the relevant factors makes it plain that the state interest is outweighed by the interest of the nation in an adequate, economical and efficient railway transportation service, which must prevail.

Reversed.

Mr. Justice RUTLEDGE concurs in the result.



SUPREME COURT OF THE UNITED STATES.

No. 56.—October Term, 1944.

Southern Pacific Company, Appellant,
vs.
State of Arizona *ex rel.* John L. Sullivan, Attorney General of the State of Arizona.

On Appeal from the Supreme Court of the State of Arizona.

[June 18, 1945.]

Mr. Justice Black, dissenting.

In *Hennington* v. *Georgia*, 163 U. S. 299, 304, a case which involved the power of a state to regulate interstate traffic, this Court said, "The whole theory of our government, federal and state, is hostile to the idea that questions of legislative authority may depend . . . upon opinions of judges as to the wisdom or want of wisdom in the enactment of laws under powers clearly conferred on the legislature." What the Court decides today is that it is unwise governmental policy to regulate the length of trains. I am therefore constrained to note my dissent.

For more than a quarter of a century, railroads and their employees have engaged in controversies over the relative virtues and dangers of long trains. Railroads have argued that they could carry goods and passengers cheaper in long trains than in short trains. They have also argued that while the danger of personal injury to their employees might in some respects be greater on account of the operation of long trains, this danger was more than offset by an increased number of accidents from other causes brought about by the operation of a much larger number of short trains. These arguments have been, and are now, vigorously denied. While there are others, the chief causes assigned for the belief that long trains unnecessarily jeopardize the lives and limbs of railroad employees relate to "slack action." Cars coupled together retain a certain free play of movement, ranging between 1½ inches and 1 foot, and this is called "slack action." Train brakes do not ordinarily apply or release simultaneously on all cars. This frequently results in a severe shock or jar to cars, particularly those in the rear of a train. It has always been the

position of the employees that the dangers from "slack action" correspond to and are proportionate with the length of the train. The argument that "slack movements" are more dangerous in long trains than in short trains seems never to have been denied. The railroads have answered it by what is in effect a plea of confession and avoidance. They say that the added cost of running long trains places an unconstitutional burden on interstate commerce. Their second answer is that the operation of short trains requires the use of more separate train units; that a certain number of accidents resulting in injury are inherent in the operation of each unit, injuries which may be inflicted either on employees or on the public; consequently, they have asserted that it is not in the public interest to prohibit the operation of long trains.

In 1912, the year Arizona became a state, its legislature adopted and referred to the people several safety measures concerning the operation of railroads. One of these required railroads to install electric headlights, a power which the state had under this Court's opinion in *Atlantic Coast Line R. Co. v. Georgia*, 234 U. S. 280. Another Arizona safety statute submitted at the same time required certain tests and service before a person could act as an engineer or train conductor, and thereby exercised a state power similar to that which this Court upheld in *Nashville, etc., R. Co. v. Alabama*, 128 U. S. 96. The third safety statute which the Arizona legislature submitted to the electorate, and which was adopted by it, is the train limitation statute now under consideration. By its enactment the legislature and the people adopted the viewpoint that long trains were more dangerous than short trains, and limited the operation of train units to 14 cars for passenger and 70 cars for freight. This same question was considered in other states, and some of them, over the vigorous protests of railroads, adopted laws similar to the Arizona statute.[1]

This controversy between the railroads and their employees, which was nation-wide, was carried to Congress. Extensive hearings took place. The employees' position was urged by members of the various Brotherhoods. The railroads' viewpoint was presented through representatives of their National Association.

[1] A resume of these laws and their reception by the Courts is set out in the opinion of the Supreme Court of Arizona in this case, — Ariz. —, 145 Pac. 2d 530.

In 1937, the Senate Interstate Commerce Committee after its own exhaustive hearings unanimously recommended that trains be limited to 70 cars as a safety measure.[2] The Committee in its Report reviewed the evidence and specifically referred to the large and increasing number of injuries and deaths suffered by railroad employees; it concluded that the admitted danger from slack movement was greatly intensified by the operation of long trains; that short trains reduce this danger; that the added cost of short trains to the railroad was no justification for jeopardizing the safety of railroad employees; and that the legislation would provide a greater degree of safety for persons and property, increase protection for railway employees and the public, and improve transportation services for shippers and consumers. The Senate passed the bill,[3] but the House Committee failed to report it out.

During the hearings on that measure, frequent references were made to the Arizona statute. It is significant, however, that American railroads never once asked Congress to exercise its unquestioned power to enact uniform legislation on that subject, and thereby invalidate the Arizona law. That which for some unexplained reason they did not ask Congress to do when it had the very subject of train length limitations under consideration, they shortly thereafter asked an Arizona state court to do.

In the state court a rather extraordinary "trial" took place. Charged with violating the law, the railroad admitted the charge. It alleged that the law was unconstitutional, however, and sought a trial of facts on that issue. The essence of its charge of unconstitutionality rested on one of these two grounds: (1) the legislature and people of Arizona erred in 1912 in determining that the running of long cars was dangerous; or (2) railroad conditions had so improved since 1912 that previous dangers did not exist to the same extent, and that the statute should be stricken down either because it cast an undue burden on interstate commerce by reason of the added cost, or because the changed conditions had rendered the Act "arbitrary and unreasonable." Thus, the issue which the Court "tried" was not whether the railroad was guilty of violating the law, but whether the law was unconstitutional either because the legislature had been guilty of mis-

[2] Senate Report No. 416, 75th Cong., 1st Sess.

[3] 81 Cong. Rec. 7596. The record does not show any dissenting votes cast against the bill. The debate on the measure appears at pp. 7564-7595.

judging the facts concerning the degree of the danger of long trains, or because the 1912 conditions of danger no longer existed.

Before the state trial judge finally determined that the dangers found by the legislature in 1912 no longer existed, he heard evidence over a period of 5½ months which appears in about 3000 pages of the printed record before us. It then adopted findings of fact submitted to it by the railroad, which cover 148 printed pages, and conclusions of law which cover 5 pages. We can best understand the nature of this "trial" by analogizing the same procedure to a defendant charged with violating a state or national safety appliance act, where the defendant comes into court and admits violation of the act. In such cases, the ordinary procedure would be for the court to pass upon the constitutionality of the act, and either discharge or convict the defendants. The procedure here, however, would justify quite a different trial method. Under it, a defendant is permitted to offer voluminous evidence to show that a legislative body has erroneously resolved disputed facts in finding a danger great enough to justify the passage of the law. This new pattern of trial procedure makes it necessary for a judge to hear all the evidence offered as to why a legislature passed a law and to make findings of fact as to the validity of those reasons. If under today's ruling a court does make findings as to a danger contrary to the findings of the legislature, and the evidence heard "lends support" to those findings, a court can then invalidate the law. In this respect, the Arizona County Court acted, and this Court today is acting, as a "super-legislature."[4]

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[4] The Court today invalidates the Arizona law in accordance with the identical "super-legislature" method (so designated by Justices Brandeis and Holmes) used by the majority to invalidate a Nebraska statute regulating the weights of loaves of bread. Burns Baking Co. v. Bryan, 264 U. S. 504, 535. For here, as there, this Court has overruled a state legislature's finding that an evil existed, and that the state law would not impose an unconstitutional "burden" upon those regulated. The dissent in the *Burns* case said:

"To decide, as a fact, that the prohibition of excess weights 'is not necessary for the protection of the purchasers against imposition and fraud by short weights'; that it 'is not calculated to effectuate that purpose'; and that it 'subjects bakers and sellers of bread' to heavy burdens, is, in my opinion, an exercise of the powers of a super-legislature—not the performance of the constitutional function of judicial review."

That decision rested on the Due Process Clause while today's decision rests on the Commerce Clause. But that difference does not make inapplicable here the principles invoked by the dissenters in the *Burns* case.

The use of the "super-legislature" technique has been repeated to strike

Even if this method of invalidating legislative acts is a correct one, I still think that the "findings" of the state court do not authorize today's decision. That court did not find that there is no unusual danger from slack movements in long trains. It did decide on disputed evidence that the long train "slack movement" dangers were more than offset by prospective dangers as a result of running a larger number of short trains, since many people might be hurt at grade crossings. There was undoubtedly some evidence before the state court from which it could have reached such a conclusion. There was undoubtedly as much evidence before it which would have justified a different conclusion.

Under those circumstances, the determination of whether it is in the interest of society for the length of trains to be governmentally regulated is a matter of public policy. Someone must fix that policy—either the Congress, or the state, or the courts. A century and a half of constitutional history and government admonishes this Court to leave that choice to the elected legislative representatives of the people themselves, where it properly belongs both on democratic principles and the requirements of efficient government.

I think that legislatures, to the exclusion of courts, have the constitutional power to enact laws limiting train lengths, for the purpose of reducing injuries brought about by "slack movements." Their power is not less because a requirement of short trains might increase grade crossing accidents. This latter fact raises an entirely different element of danger which is itself subject to legislative regulation. For legislatures may, if necessary, require railroads to take appropriate steps to reduce the likelihood of injuries at grade crossings. *Denver and R. G. R. R. Co.* v. *Denver*, 250 U. S. 241. And the fact that grade crossing improvements may be expensive is no sufficient reason to say that an unconstitutional "burden" is put upon a railroad even though it be an interstate road. *Erie R. R. Co.* v. *Public Utilities Commission*, 254 U. S. 394, 408-411.

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down other statutes. See, e. g., Chicago, M. & St. P. R. R. v. Wisconsin, 238 U. S. 491, 499; Weaver v. Palmer Bros. Co., 270 U. S. 402, dissent at 415. See also dissents in Schlesinger v. Wisconsin, 270 U. S. 230, 241, 242; New State Ice Co. v. Liebman, 285 U. S. 262, 284-285. For a case in which this Court declined to review the "economics or the facts" behind a legislative enactment, see Central Lumber Co. v. South Dakota, 226 U. S. 157, 161; cf. Standard Oil Co. v. Marysville, 279 U. S. 582, 586. See also Powell v. Pennsylvania, 127 U. S. 678, 686; dissenting opinion, Polk Company v. Glover, 305 U. S. 5, 10-19.

The Supreme Court of Arizona did not discuss the County Court's so-called findings of fact. It properly designated the Arizona statute as a safety measure, and finding that it bore a reasonable relation to its purpose declined to review the judgment of the legislature as to the necessity for the passage of the act. In so doing it was well fortified by a long line of decisions of this Court. Today's decision marks an abrupt departure from that line of cases.

There have been many sharp divisions of this Court concerning its authority, in the absence of congressional enactment, to invalidate state laws as violating the Commerce Clause. See e. g., *Adams Manufacturing Co.* v. *Storen*, 304 U. S. 307; *Gwin, etc., Inc.* v. *Henneford*, 305 U. S. 434; *McCarroll* v. *Dixie Greyhound Lines*, 309 U. S. 176. That discussion need not be renewed here, because even the broadest exponents of judicial power in this field have not heretofore expressed doubt as to a state's power, absent a paramount congressional declaration, to regulate interstate trains in the interest of safety. For as early as 1913, this Court, speaking through Mr. Justice Hughes, later Chief Justice, referred to "the settled principle that, in the absence of legislation by Congress, the states are not denied the exercise of that power to secure safety in the physical operation of railroad trains within their territory, even though such trains are used in interstate commerce. That has been the law since the beginning of railroad transportation." *Atlantic Coast Line* v. *Georgia*, 234 U. S. 280, 291. Until today, the oft-repeated principles of that case have never been repudiated in whole or in part.

But, it is said today, the principle there announced does not apply because if one state applies a regulation of its own to interstate trains, "uniformity" in regulation or rather non-regulation, is destroyed. Justice Hughes speaking for the Court in the *Atlantic Coast Line* case made short shrift of that same argument. He there referred to the contention that "if state requirement conflicts it will be necessary to carry additional apparatus and to make various adjustments of state lines which would delay and inconvenience interstate traffic." In answer to this argument he reiterated a former declaration of this Court in *New York, New Haven and Hartford R. R. Co.* v. *New York*, 165 U. S. 628, on this subject, and added that "If there is a conflict in such local

regulation, by which interstate commerce may be inconvenienced —if there appears to be need of standardization of safe appliances and of providing rules of operation which will govern the entire interstate road irrespective of state boundaries—there is a simple remedy; and it can be assumed that it can not be readily applied if there be real occasion for it. That remedy does not rest in a denial to the state, in the absence of conflicting federal action, of its power to protect life and property within its borders, but it does lie in the exercise of the paramount authority of Congress in its control of interstate commerce to establish such regulations as in its judgment may be deemed appropriate and sufficient. Congress, when it pleases, may give the rule and make the standards to be observed on the interstate highway." p. 292.

That same statement has in substance been made in many other decisions of this Court, a number of which are cited in the *Atlantic Coast Line* case, and all of them are today swept into the discard. In no one of all these previous cases was it more appropriate than here to call attention to the fact that Congress could when it pleased establish a uniform rule as to the length of trains. Congress knew about the Arizona law. It is common knowledge that the Interstate Commerce Committees of the House and the Senate keep in close and intimate touch with the affairs of railroads and other national means of transportation. Every year brings forth new legislation which goes through those Committees, much of it relating to safety. The attention of the members of Congress and of the Senate have been focused on the particular problem of the length of railroad trains. We cannot assume that they were ignorant of the commonly known fact that a long train might be more dangerous in some territories and on some particular types of railroad. The history of congressional consideration of this problem leaves little if any room to doubt that the choice of Congress to leave the state free in this field was a deliberate choice, which was taken with a full knowledge of the complexities of the problems and the probable need for diverse regulations in different localities. I am therefore compelled to reach the conclusion that today's decision is the result of the belief of a majority of this Court that both the legislature of Arizona and the Congress made wrong policy decisions in permitting a law to stand which limits the length of railroad

trains. I should at least give the Arizona statute the benefit of the same rule which this Court said should be applied in connection with state legislation under attack for violating the Fourteenth Amendment, that is, that legislative bodies have "a wide range of legislative discretion, . . . and their conclusions respecting the wisdom of their legislative acts are not reviewable by the Court." *Arizona Employers' Liability Cases*, 250 U. S. 400, 419.

When we finally get down to the gist of what the Court today actually decides, it is this: Even though more railroad employees will be injured by "slack action" movements on long trains than on short trains, there must be no regulation of this danger in the absence of "uniform regulations." That means that no one can legislate against this danger except the Congress; and even though the Congress is perfectly content to leave the matter to the different state legislatures, this Court, on the ground of "lack of uniformity", will require it to make an express avowal of that fact before it will permit a state to guard against that admitted danger.

We are not left in doubt as to why, as against the potential peril of injuries to employees, the Court tips the scales on the side of "uniformity." For the evil it finds in a lack of uniformity is that it (1) delays interstate commerce, (2) increases its cost and (3) impairs its efficiency. All three of these boil down to the same thing, and that is that running shorter trains would increase the cost of railroad operations. The "burden" on commerce reduces itself to mere cost because there was no finding, and no evidence to support a finding that by the expenditure of sufficient sums of money, the railroads could not enable themselves to carry goods and passengers just as quickly and efficiently with short trains as with long trains. Thus the conclusion that a requirement for long trains will "burden interstate commerce" is a mere euphemism for the statement that a requirement for long trains will increase the cost of railroad operations.

In the report of the Senate Committee, *supra*, attention was called to the fact that in 1935, 6,351 railroad employees were injured while on duty, with a resulting loss of more than 200,000 working days, and that injuries to trainmen and enginemen increased more than 29% in 1936.[5] Nevertheless, the Court's action

[5] These figures appear to be considerably less than those later reported. See Tiller v. Atlantic Coast Line Railroad Co., 318 U. S. 54, 58, note 4.

in requiring that money costs outweigh human values is sought to be buttressed by a reference to the express policy of Congress to promote an "economical national railroad system." I cannot believe that if Congress had defined what it meant by "economical", it would have required money to be saved at the expense of the personal safety of railway employees. Its whole history for the past 25 years belies such an interpretation of its language. Judicial opinions rather than legislative enactments have tended to emphasize costs. See *Tiller* v. *Atlantic Coast Line Railroad Co., supra*, 58-60. A different congressional attitude has been shown by the passage of numerous safety appliance provisions, a federal employees' compensation act, abolition of the judicially created doctrine of assumption of risk and contributory negligence, and various other types of legislation. Unfortunately, the record shows, as pointed out in the *Tiller* case, that the courts have by narrow and restricted interpretation too frequently reduced the full scope of protection which Congress intended to provide.

This record in its entirety leaves me with no doubt whatever that many employees have been seriously injured and killed in the past, and that many more are likely to be so in the future, because of "slack movement" in trains. Everyday knowledge as well as direct evidence presented at the various hearings, substantiates the report of the Senate Committee that the danger from slack movement is greater in long trains than in short trains. It may be that offsetting dangers are possible in the operation of short trains. The balancing of these probabilities, however, is not in my judgment a matter for judicial determination, but one which calls for legislative consideration. Representatives elected by the people to make their laws, rather than judges appointed to interpret those laws, can best determine the policies which govern the people. That at least is the basic principle on which our democratic society rests. I would affirm the judgment of the Supreme Court of Arizona.

SUPREME COURT OF THE UNITED STATES.

No. 36.—October Term, 1944.

Southern Pacific Company, Appellant,
vs.
State of Arizona, *ex rel.* John L. Sullivan, Attorney General of the State of Arizona.

Appeal from the Supreme Court of the State of Arizona.

[June 18, 1945.]

Mr. Justice Douglas, dissenting.

I have expressed my doubts whether the courts should intervene in situations like the present and strike down state legislation on the grounds that it burdens interstate commerce. *McCarroll* v. *Dixie Greyhound Lines*, 309 U. S. 176, 183-189. My view has been that the courts should intervene only where the state legislation discriminated against interstate commerce or was out of harmony with laws which Congress had enacted. p. 184. It seems to me particularly appropriate that that course be followed here. For Congress has given the Interstate Commerce Commission broad powers of regulation over interstate carriers. The Commission is the national agency which has been entrusted with the task of promoting a safe, adequate, efficient, and economical transportation service. It is the expert on this subject. It is in a position to police the field. And if its powers prove inadequate for the task, Congress, which has paramount authority in this field, can implement them.

But the Court has not taken that view. As a result the question presented is whether the total effect of Arizona's train-limit as a safety measure is so slight as not to outweigh the national interest in keeping interstate commerce free from interferences which seriously impede or burden it. The voluminous evidence has been reviewed in the opinion of the Court and in the dissenting opinion of Mr. Justice Black. If I sat as a member of the Interstate Commerce Commission or of a legislative committee to decide whether Arizona's train-limit law should be superseded by a federal regulation, the question would not be free from doubt for me.

If we had before us the ruling of the Interstate Commerce Commission (*In the Matter of Service Order No. 85*, 256 I. C. C. 523, 534) that Arizona's train-limit law infringes "the national interest in maintaining the free flow of commerce under the present emergency war conditions," I would accept its expert appraisal of the facts, assuming it had the authority to act. But that order is not before us. And the present case deals with a period of time which antedates the war emergency. Moreover, we are dealing here with state legislation in the field of safety where the propriety of local regulation has long been recognized. See *Atlantic Coast Line R. Co.* v. *Georgia*, 234 U. S. 280, 291, and cases collected in *California* v. *Thompson*, 313 U. S. 109, 113-114. Whether the question arises under the Commerce Clause or the Fourteenth Amendment, I think the legislation is entitled to a presumption of validity. If a State passed a law prohibiting the hauling of more than one freight car at a time, we would have a situation comparable in effect to a state law requiring all railroads within its borders to operate on narrow gauge tracks. The question is one of degree and calls for a close appraisal of the facts.[1] I am not persuaded that the evidence adduced by the railroads overcomes the presumption of validity to which this train-limit law is entitled. For the reasons stated by Mr. Justice BLACK, Arizona's train-limit law should stand as an allowable regulation enacted to protect the lives and limbs of the men who operate the trains.

[1] See Iiklé, Judicial Determination of Questions of Fact Affecting The Constitutional Validity of Legislative Action, 38 Harv. L. Rev. 6.